

M727xS
10/100BaseTX-FX
‘Selectable’
Media Converter
Installation Guide

Copyright January 2004

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A010430357


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This device complies with Class B Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received including the interference that it may cause.

CE NOTICE

Marking by the symbol  indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards: EMC Class B

EN50081-1/1992: EN55022, EN61000-3-2, EN61000-3-3

EN50082-1/1998: EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, and EN61000-4-6,
EN61000-4-8, EN61000-4-11

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1. Introduction

The 10/100BaseTX-FX media converter series provides a media conversion allowing high-speed integration of fiber optic and twisted-pair segments. With 10BaseT and 100BaseTX support, the converters provide seamless translation between Ethernet and Fast Ethernet networks. A complete set of LEDs allows for quick status verification.

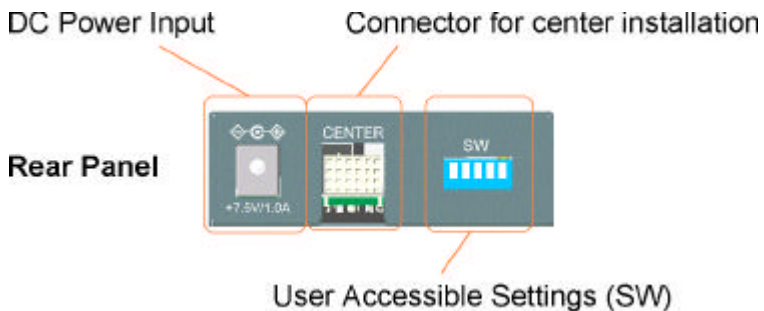
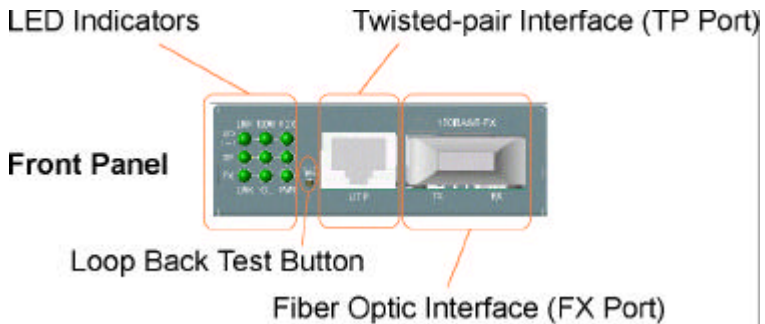


1.1 Key Features

The media converters also provide the following key features:

- Convert speed and media type
- Support full wire speed conversion
- Support 10Mbps and 100Mbps speed on TP connections
- Auto MDI/MDI-X detection function on the TP port
- Auto-negotiation function on the TP port
- Link fault pass-through function
- Provide manual configuration settings for TP port to support connection to non-auto-negotiation devices
- Transparent to 802.1Q VLAN tagged packets
- Far End Fault function on FX port
- Provide LED status display for remote TP port monitoring
- Provide Loop Back Test function for installation diagnostics
- Support wide range of fiber options on the FX port
- Support media converter center chassis installation
- Support center chassis management
- Provide user-inaccessible settings for specific system applications
- Low power consumption

1.2 Specifications



Twisted-Pair Interface (TP Port)

Connector	Shielded RJ-45
Pin Assignments	Auto MDI/MDI-X detection
Signal Compliance	802.3 10Base-T, 802.3u 100BaseTX
Data Speed	10Mbps or 100Mbps
Duplex Mode	Half-duplex or Full duplex
Configuration	Auto-negotiation capable and optional forced manual settings
Cable Types	10Mbps -- Category 3, 4, or 5 UTP 100Mbps – Category 5 UTP
Supported Link Distance	Up to 100 meters

Fiber Optic Interface (FX Port)

Signal Compliance	802.3u 100BaseFX
Connector	SC, ST, or Single SC
Data Speed	100Mbps
Duplex Mode	Full duplex and optional half-duplex
Cable Types	Multimode (MMF) - 50/125, 62.5/125 μ m Single mode (SMF) - 9/125 μ m
Supported Link Distance	MMF up to 2km SMF up to 90km Single SMF WDM up to 40km
Eye Safety compliance	IEC825 Class 1

Loop Back Test Button (LOOP TEST)

PUSH	Start loop back test
RELEASE	Stop loop back test

User Accessible Settings (SW)

NO.	SETTING	STATE	FUNCTION
SW1	TP Port Configuration	OFF	Auto-negotiation (default)
		ON	Forced mode
SW2	TP Port Duplex	OFF	Full duplex (default)
		ON	Half-duplex
SW3	TP Port Speed	OFF	100Mbps (default)
		ON	10Mbps
SW4	Link Fault Pass-through	OFF	Disable (default)
		ON	Enable
SW5	Reserved		

Optional Settings (User inaccessible JP1-JP3 on board)

NO.	SETTING	STATE	FUNCTION
JP1	Forwarding mode	Open	Store-and-forward (default)
		Short	Smart-forward mode
JP2	802.3x function	Open	Enable (default)
		Short	Disable
JP3	FX port duplex	Open	Full duplex mode (default)
		Short	Half-duplex mode

LED Indicators

LED	DISPLAY	STATE	INTERPRETATION
PWR	Power status	ON	Power on
		OFF	Power off
TP LINK	TP port link status	ON	Link up and no traffic
		OFF	Link fault
		Blink	Rx/Tx activities
TP 100M	TP port speed status	ON	100Mbps
		OFF	10Mbps
TP FDX	TP port duplex status	ON	Full duplex
		OFF	Half-duplex
		Blink	Collisions on half-duplex
FX LINK	FX port link status	ON	Link up and no traffic
		OFF	Link fault
		Blink	Rx/Tx activities
FX OL	FX port optical link	ON	Optical signal is detected
		OFF	No optical signal
RTP LINK	Remote TP port link	ON	Link up and no traffic
		OFF	Link fault
RTP 100M	Remote TP port speed	ON	100Mbps
		OFF	10Mbps
RTP FDX	Remote TP port duplex	ON	Full duplex
		OFF	Half-duplex

RTP LINK/100M/FDX LEDs are also used for loop back test report.

DC Power Input

DC Input Jack

Operating Input Voltage

Power Consumption

Power Supply Options

D6.3mm  D2.0mm

+4.75V ~ +12.6V

2W max. (0.27A@+7.5V)

External AC-DC power adapters

Rated AC120V/60Hz DC7.5V 1A

Rated AC230V/50Hz DC7.5V 1A

Rated AC100V/50-60Hz DC7.5V 1A

Rated AC100V/50-60Hz DC5V 1A

Rated AC240V/50Hz DC7.5V 1A

Center Connector

Connector	Futurebus 6x4
Function	Center chassis installation
Signal	Power inputs Ground Management interfaces

Basic Information

Forwarding Throughput	Full wire speed at 100M full duplex 10Mbps – 14,880pps at 64-byte packets 100Mbps – 14,880pps at 64-byte packets
Packet Types	Transparent and no modification for - IEEE 802.3 standard packets - IEEE 802.1Q VLAN tagged packets
Packet Length	Up to 1522 bytes at store-and-forward mode No limit at smart-forward mode 100to100
Flow Control	Back-pressure for half-duplex mode 802.3x pause-frame base for full duplex mode

Mechanical

Dimension	0.91H x 2.86W x 4.25D in. (23x72.5x108mm)
Housing	Enclosed metal with no fan
Mounting	Desktop, Wall mount, Center chassis
Weight	0.47 lbs. (212g)

Environmental

Operating Temperature	-5°C ~ 40°C
Storage Temperature	-20°C ~ 85°C
Relative Humidity	5% ~ 90%

Certificate

FCC	Part 15 Class B
CE/EMC	EMI EN50081-1 Class B, EMS EN55024
CE/LVD	EN 60950

1.3 Optical Specifications

The media converter series provides the following fiber options:

Duplex Fiber Series

<u>Model</u>	<u>Connector</u>	<u>Fiber</u>	<u>Wavelength</u>	<u>Tx Power</u>	<u>Sensitivity</u>	<u>Distance</u>
M7273S	ST Duplex	MM	1310nm	-19~ -14dBm	-33dBm	2 Km
M7274S	SC Duplex	MM	1310nm	-19~ -14dBm	-33dBm	2 Km
M7275S-2	SC Duplex	SM	1310nm	-15~ -8dBm	-30dBm	20 Km
M7275S-5	SC Duplex	SM	1310nm	-5~ 0dBm	-35dBm	50 Km
M7275S-9	SC Duplex	SM	1310nm	0~ + 5dBm	-37dBm	90 Km

Single Fiber WDM Series

<u>Model</u>	<u>Connector</u>	<u>Fiber</u>	<u>Wavelength</u>	<u>Tx Power</u>	<u>Sensitivity</u>	<u>Distance</u>
M7275S-2SFA	SC Single Fiber	SM	TX 1310nm RX 1550nm	-14~ -8dBm	-33dBm	20 Km
M7275S-2SFB	SC Single Fiber	SM	TX 1550nm RX 1310nm	-14~ -8dBm	-33dBm	20 Km
M7275S-4SFA	SC Single Fiber	SM	TX 1310nm RX 1550nm	-8~ -3dBm	-33dBm	40 Km
M7275S-4SFB	SC Single Fiber	SM	TX 1550nm RX 1310nm	-8~ -3dBm	-31dBm	40 Km

1.4 Special Functions

1.4.1 Auto MDI/MDI-X Function

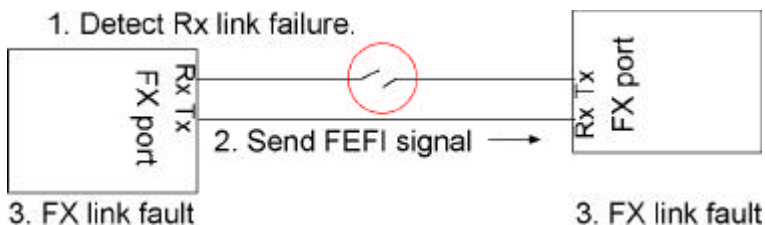
This function allows the TP port to auto-detect the twisted-pair signals and adapts itself to form a valid MDI to MDI-X connection with the remote connected device automatically.

1.4.2 Auto-negotiation Function

When the TP port is set on Auto-negotiation mode (SW1:ON), it is featured with auto-negotiation function and full capability. It performs a negotiation process for the speed and duplex configuration with the connected device automatically each time a link is being established.

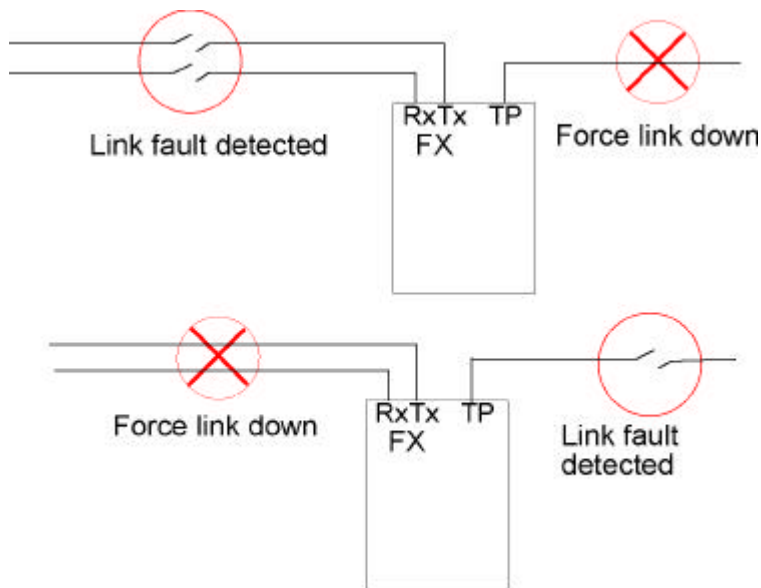
1.4.3 Far End Fault Function

The FX port is facilitated with this function, which conforms to IEEE 802.3u 100BaseFX specifications. When the FX port detects a link failure on its receiving circuitry, it will send out an FEFI (Far End Fault Indication) signal to the remote connected device to indicate a remote fault is detected. It also is capable of receiving a FEFI signal sent from the remote link partner. Upon receiving an FEFI signal, it indicates a link failure occurred on the transmitting path. This function allows the converter to report a fiber link fault even when a link failure occurred on the transmitting fiber cable.



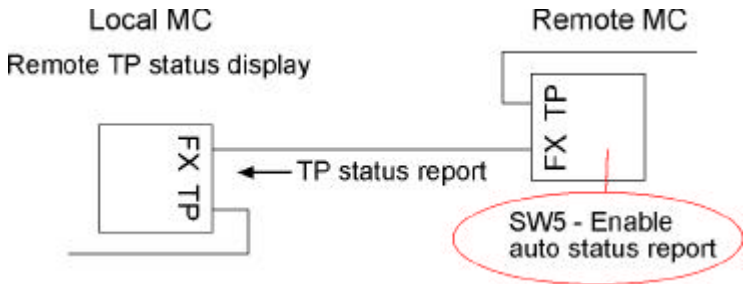
1.4.4 Link Fault Pass-Through Function

When this function is enabled, a link fault detected on the TP port will force a link down on the FX port. Similarly, a link fault detected on the FX port will also force a link down on the TP port. As illustrated in the following figure, this function allows a TP link fault to pass to the remote link partner and makes the converter act like a TP cable extender.



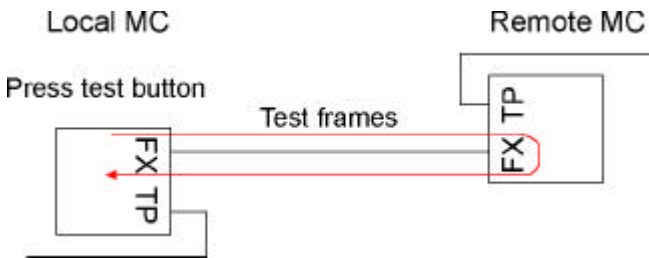
1.4.5 Remote TP Port Monitoring Function

The converter provides LED indicators labeled RTP LINK/100M/FDX to display the TP port status of its remote link partner on the FX port. As illustrated in the following figure, the remote MC must be enabled for periodical status reports.



1.4.6 Loop Back Test Function

As illustrated in the following figure, the local MC starts a loop back test by pressing the loop back test button. It sends test frames from its FX port to the remote MC. The remote MC forwards the received test frames back to the local MC from its FX port. The local MC verifies the loop back test frames and displays the test result on the RTP LINK/100M/FDX LEDs. This function can help an installer check the full path from a local MC through fiber to a connected remote MC and back to the local MC.



2. Installation

2.1 Unpacking

Check that the following components have been included:

- Installation Guide
- 10/100 Media Converter
- One AC power adapter

If any item is found missing or damaged, please contact your local reseller for replacement.

2.2 Mounting the Device

Desktop Mounting

The media converter can be mounted on a desktop or shelf. Make sure that there is proper heat dissipation from and adequate ventilation around the device. Do not place heavy objects on the device.

Wall Mounting

The media converter can be mounted on a wall. On the bottom of the device a hole is provided for wall mounting.

Installation into a Chassis Center

The media converter can be installed in any one of four chassis. The chassis center provides the power supply to the converter. Up to 16 converters can be installed in one chassis. Unscrew and remove the cover of the center connector before inserting the converter into the chassis. Refer to the operation manual of the chassis for more information.

2.3 Applying Power

Before you begin the installation, check the AC voltage of your area. The AC adapter used to supply the DC power for the unit should have the AC voltage matching the commercial power voltage in your area.

The AC Power Adapter Specifications



AC input power:

AC power voltage of your area options -

Rated AC120V/60Hz DC7.5V 1A

Rated AC230V/50Hz DC7.5V 1A

Rated AC100V/50-60Hz DC7.5V 1A

Rated AC100V/50-60Hz DC5V 1A

Rated AC240V/50Hz DC7.5V 1A

Steps to apply the power to the converters are:

1. Connect power adapter DC plug to the DC input jack located on the back of the converter before connecting to the AC outlet.
2. To ensure against accidental disconnection, tie the DC cable with the cable tie located the back of the converter.
3. Connect the power adapter to the AC outlet.
4. Check Power LED indication.

2.4 Making the TP Port Connection

TP port is featured to support connection to:

- Auto-negotiation devices
- Auto-negotiation incapable 10BASE-T devices
- Auto-negotiation incapable 100BASE-TX devices

Network Cables

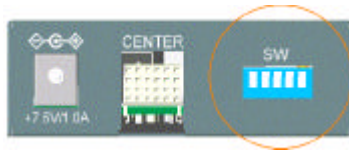
10BaseT: 2-pair UTP Cat. 3, 4, 5, EIA/TIA- 568 100-ohm STP

100BaseTX: 2-pair UTP Cat. 5, EIA/TIA-568 100-ohm STP

Link distance: Up to 100 meters

Configuration Setup

To make a proper connection, the following configuration settings are recommended:



TP port link partner

Auto-negotiation device

Fixed 10M half-duplex device

Fixed 100M half-duplex device

Fixed 10M full duplex device

Fixed 100M full duplex device

SW1

Off: auto

On: forced

On: forced

On: forced

On: forced

SW2

Off: full duplex

On: half-duplex

On: half-duplex

Off: full duplex

Off: full duplex

SW3

Off: 100M

On: 10M

Off: 100M

On: 10M

Off: 100M

2.5 Making the FX Port Connection

The FX port operates at 100Mbps and full duplex (factory default). A variety of fiber options is provided as follows:

Duplex Fiber Series

<u>Model</u>	<u>Connector</u>	<u>Fiber</u>	<u>Wavelength</u>	<u>Tx Power</u>	<u>Sensitivity</u>	<u>Distance</u>
M7273S	ST Duplex	MM	1310nm	-19~ -14dBm	-33dBm	2 Km
M7274S	SC Duplex	MM	1310nm	-19~ -14dBm	-33dBm	2 Km
M7275S-2	SC Duplex	SM	1310nm	-15~ - 8dBm	-30dBm	20 Km
M7275S-5	SC Duplex	SM	1310nm	- 5~ 0dBm	-35dBm	50 Km
M7275S-9	SC Duplex	SM	1310nm	0~ + 5dBm	-37dBm	90 Km

Single Fiber WDM Series

<u>Model</u>	<u>Connector</u>	<u>Fiber</u>	<u>Wavelength</u>	<u>Tx Power</u>	<u>Sensitivity</u>	<u>Distance</u>
M7275S-2SFA	SC Single Fiber	SM	TX 1310nm RX 1550nm	-14~ - 8dBm	-33dBm	20 Km
M7275S-2SFB	SC Single Fiber	SM	TX 1550nm RX 1310nm	-14~ - 8dBm	-33dBm	20 Km
M7275S-4SFA	SC Single Fiber	SM	TX 1310nm RX 1550nm	- 8~ - 3dBm	-33dBm	40 Km
M7275S-4SFB	SC Single Fiber	SM	TX 1550nm RX 1310nm	- 8~ - 3dBm	-31dBm	40 Km

Since the WDM single fiber media converters use different wavelengths for transmission and receiving respectively, the link partner device located on the remote end of the single fiber should match the wavelength for the single fiber converter.

2.6 LED Indicators

Link Fault Pass-Through Function is disabled

<u>LED</u>	<u>Display</u>	<u>Status</u>	<u>Interpretation</u>
PWR	Power status	On	Power on
		Off	Power off
TP LINK	TP port link status	On	Link up and no traffic
		Off	Link fault
		Blink	Rx/Tx activities
TP 100M	TP port speed status	On	100Mbps
		Off	10Mbps
TP FDX	TP port duplex status	On	Full duplex
		Off	Half-duplex
		Blink	Collisions on half-duplex
FX LINK	FX port link status	On	Link up and no traffic
		Off	Link fault
FX OL	FX port optical link	Blink	Rx/Tx activities
		On	Optical signal is detected
		Off	No optical signal is detected

Link Fault Pass-Through Function is enabled

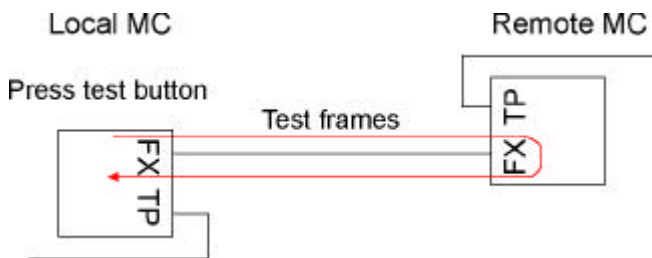
<u>TP LINK</u>	<u>FX LINK</u>	<u>FX OL</u>	<u>Interpretation</u>
On	On	On	Both TP and FX ports link up
Off	Off	On	(1) TP port link fault or (2) FX port received FEFI single (FX port Tx path failed.)
Off	Off	Off	(1) TP port link fault or (2) FX port Rx link failure detected

Remote TP port monitoring

<u>LED</u>	<u>Display</u>	<u>Status</u>	<u>Interpretation</u>
RTP LINK	Remote TP port link	On	Link up and no traffic
		Off	Link fault
RTP 100M	Remote TP port speed	On	100Mbps
		Off	10Mbps
RTP FDX	Remote TP port duplex	On	Full duplex
		Off	Half-duplex

2.7 Performing Loop Back Test

To perform a loop back test between a local MC and a remote MC connected by a fiber cable, the steps are:



1. Press and hold Loop back test button of the local MC.
2. Check RTP LINK LED. It blinks to indicate the MC is in loop back test mode.
3. Check RTP 100M LED. It is ON to indicate a completion of the loop back test and OFF during test.
4. Check RTP FDX LED for the test result. It is ON to indicate a TEST PASS and OFF for TEST FAIL.
5. Release Loop back test button. RTP LINK/100M/FDX LEDs are back to display remote TP port status.

Summary of Loop Back Test LEDs

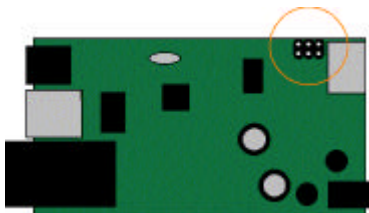
LED	Status	Interpretation
RTP LINK	Blink	The MC is in Loop Back Test mode
RTP 100M	On	Loop back test complete
	Off	Loop back test in operation
RTP FDX	On	Loop back test OK
	Off	Loop back test fail

3. Introduction

The media converter provides additional configuration settings accessible to the user. The settings are located on the circuit board inside the product case. The settings are provided for technical installers to adapt the converter to fit specific application needs.

3.1 User Accessible Jumpers

The setting jumpers are not accessible by users generally. For accessing these jumpers, the upper case must be removed from the circuit board. An authorized and experienced technician must perform removal of the case. The setting jumper block is located on the position shown below:



The setting functions are as follows:

JP1	Forwarding mode setting	Open - Store-and-forward mode Short - Smart-forward mode
JP2	802.3x function setting	Open - Enable Short - Disable
JP3	FX port duplex setting	Open - Full duplex mode Short - Half-duplex mode

3.1.1 Forwarding Mode Setting JP1

The following table lists the forward method used in different TP to FX conversions:

<u>JP1 Setting</u>	<u>TP port to/from FX port</u>	<u>Forward method</u>
Store-and-forward	10BaseT to 100BaseFX 100BaseTX to 100BaseFX	Store and forward Store and forward
Smart-forward	10BaseT to 100BaseFX 100BaseTX to 100BaseFX	Store and forward Direct conversion

In smart-forward mode, the converter can change to direct conversion automatically when it detects the same speed on both the TP port and the FX port. Direct conversion method converts the signal between the TP port and the FX port without storing the received packet on one port then forwarding to another port. The media converter operates with the minimum delay.

Note:

1. In direct conversion, both devices connected to the TP port and FX port must have the same duplex modem setting for proper transmission.
2. In direct conversion, the 802.3x function is disabled and the media converter will not generate pause frame, but forwards the received pause frame directly from one port to another.
3. In direct conversion, the media converter is not limited to the maximal length of the receiving packets.

3.1.2 802.3x Function Setting JP2

IEEE 802.3x function is the flow control used for full duplex operation on TP port and FX port under store-and-forward mode. This method uses pause frames for one port to stop further transmission from its link partner.

3.1.3 FX Duplex Setting JP3

This setting is used to set the duplex mode of the FX port.

3.2 JP1-JP3 Factory Default Settings

The factory default settings for JP1, JP2 and JP3 are as follows:

JP1	Open	Store-and-forward mode
JP2	Open	802.3x function is enabled
JP3	Open	FX port full duplex