PLANET
Networking & Communication

User's Manual

FST-801

FST-802

FST-802S15/802S35/802S50

FST-806A20/806B20

10/100Base-TX to 100Base-FX Smart Media Converter

Trademarks

Disclaimer

FCC Warning

CE Mark Warning

WEEE Warning

Revision

PLANET 10/100Base-TX to 100Base-FX Smart Media Converter User's manual

MULTI-MODE: FST-801/ FST-802

SINGLE-MODE: FST-802S15 / FST-802S35 / FST-802S50 / FST-806A20 / FST-806B20

REVISION: 1.0 (MARCH.2007)

Part No.: EM-FST80x_v1.0 (2080-AA3450-000)

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1. INTRODUCTION

1.1 Checklist

Thank you for purchasing PLANET 10/100Base-TX to 100Base-FX Smart Media Converter, the 10/100Base-TX to 100Base-FX Smart Media Converter package shall contain following contents:

Check the contents of your package for following parts:

- 10/100Base-TX to 100Base-FX Smart Media Converter x1
- User's manual CD x1
- DC 5V 2A Power Adapter x1

If any of these pieces are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

1.2 About the 10/100Base-TX to 100Base-FX Smart Media Converter

The FST-80x series Smart Media Converter provide Media conversion between 10/100Base-TX and 100Base-FX interfaces, such as multi-mode ST/SC connectors(2km), single-mode SC connector(15/35/50km) and single fiber connector(WDM,20km) fiber connection options for various application.

The FST-80x series Smart Media Converter provide Auto MDI/MDI-X on its TP port and store-and-forward mechanism for eliminate faulty packets. Use the DIP switch from the FST-80x to configure the available smart functions, such as the half / full duplex, auto-negotiation / force and 10/100Mbps options for TP and fiber interface. Also the LLR and LLCF function can immediately alarm network administrator the media link issue and provide efficient solution to monitor the entire network.

The FST-80x series Smart Media Converter can allow two type segments connect easily with efficiently and cost effective, these Smart Media converter can be use us a standalone unit when it power on by it's DC adapter. Or use as a slide-in module to the PLANET new 19-inch Web Smart 16-Slots Media converter chassis (MC-1600MR/MC-1600MR48), with this Web Smart Media converter chassis, the FST-80x able to manage and status monitor through the local RS-232 console and remote web interface.

1.3 Features

- Complies with IEEE 802.3, 10Base-T, IEEE 802.3u, 100Base-TX and 100Base-FX Ethernet standard
- Provides one 10/100Base-TX port with RJ-45 connector, one 100Base-FX port with ST/SC/WDM connector supporting multi-mode or single-mode fiber optic cable
- LED indicators for converter status
- Provide DIP switch to setting fiber(HDX/FDX), UTP(Auto-negotiation / Manual), speed(10/100Mbps), duplex mode(Half / Full duplex mode), LLR(Disable / Enable), LLCF(Disable / Enable)
- Auto-MDI / MDI-X for 10/100Base-TX port
- Store-and-Forward mechanism
- Back-pressure & IEEE 802.3x compliant flow control and full wire-speed forwarding rate
- Link Loss Return(LLR) switch on each fiber optic to aid in troubleshooting remote network connections
- Link Loss Carry Forward(LLCF) work with LLR in diagnosing network connections
- Manageable through Web Smart Media Converter Chassis System
- Used as a stand-alone device or with a chassis for up to 16 converter with redundant power supply for optional expansion use
- EMI standards complies with FCC, CE class B

1.4 Specification

Model	FST-801	FST-802	FST-802S15	FST-802S35	FST-802S50	FST-806A20	FST-806B20
Hardware Specification							
Standards	IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX and 100Base-FX						
Ports	1 10/100Base-TX port , 1 100Base-FX port						
Fiber connector	ST	SC	SC	SC	SC	SC, WDM	SC, WDM
Wavelength Deployment	1310nm (Transmit and Receive)					1310 (TX) 1550 (RX)	1550 (TX) 1310 (RX)
Cable	10Base-T: 2-pair Cat. 3,4,5 UTP cable, up to 100 meters 100Base-TX: 2-pair Cat. 5 UTP cable, up to 100 meters 100Base-FX: 50/125μm or 62.5/125μm multi-mode fiber cable, up to 2km. 9/125μm single-mode cable, provide long distance for 15/20/35/50km						
Maximum Cable distance	MM, 2km	MM, 2km	SM, 15km	SM, 35km	SM, 50km	SM, 20km Single wire	SM, 20km Single wire
LED indicator	System: PWR TP: LNK/ACT, FDX/COL, 100 FX: LNK/ACT, FDX/COL						
DIP switch	Fiber (HDX/FDX), UTP (Auto-negotiation / Manual), speed (10/100Mbps), duplex mode (Half / Full duplex mode), LLR (Disable / Enable), LLCF (Disable / Enable)						
Speed	Ethernet: 10/20Mbps for half / full-duplex Fast Ethernet: 100/200Mbps for half / full-duplex						
Power input	DC 5V 2A						
Power consumption	6.2 Watts / 21 BTU (maximum)						
Operate environment	0~50 Degree C, 5%~90%RH						
Storage environment	-20~70 Degree C, 5%~90%RH						
Dimension (W x D xH)	81 x 94 x 26mm						
Weight	0.22kg						
Emission	FCC Class B, CE mark						

1.5 Product Outlook

Right View: there is one RJ-45 twisted-Pair jack (Auto-MDI/MDI-X), one fiber-optic connector (vary by model) and six LED indicators.

Left View: there is one DC jack for DC 5V power adapter.
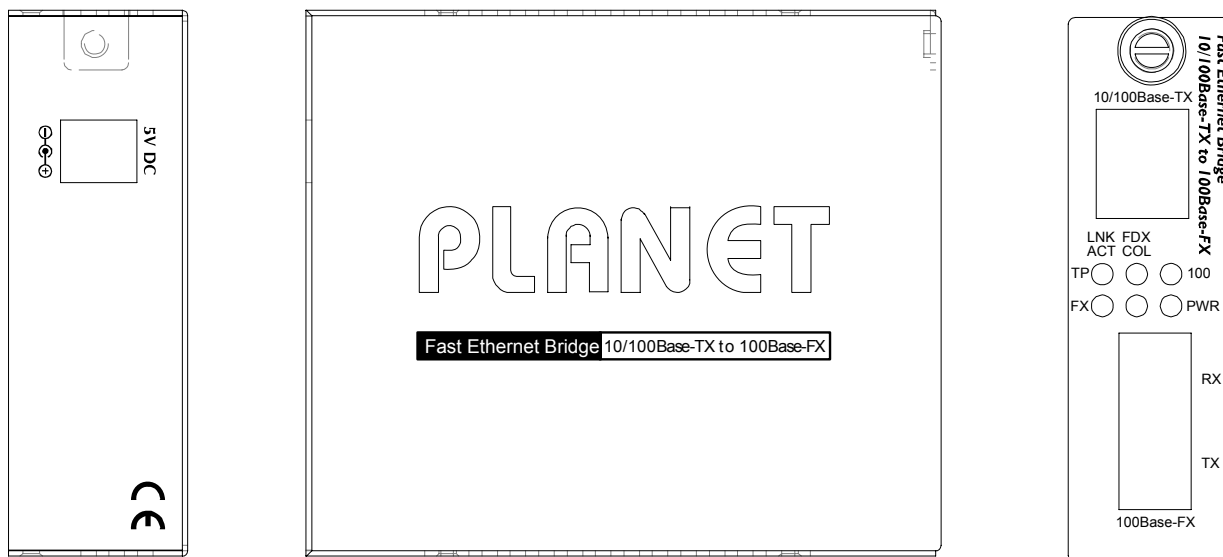
LED Indicators

| LED	Color	Status	Indication
PWR(Power)	Green	Lights On	Power on – when +5V DC detected.
		Lights Off	Power off.
TP Speed (100Mbps)	Green	Lights On	The port is operating at 100Mbps.
		Lights Off	The port is operating at 10Mbps.
TP FDX/COL	Green	Lights On	Connection at Full-Duplex mode.
		Lights Off	Connection at Half-Duplex mode.
		Lights Blinking	The port is experiencing collisions.
TP LINK/ACT	Green	Lights On	The link through that port is successfully established.
		Lights Off	The link through that port is not established.
		Lights Blinking	Data transmitting or receiving on that port.
FX FDX/COL	Green	Lights On	Connection at Full-Duplex mode.
		Lights Off	Connection at Half-Duplex mode.
		Lights Blinking	The port is experiencing collisions.
FX LINK/ACT	Green	Lights On	The link through that port is successfully established.
		Lights Off	The link through that port is not established.
		Lights Blinking	Data transmitting or receiving on that port.

2. HARDWARE INSTALLATION

This product provides two different running speeds – 10/100Base-TX and 100Base-FX in the same device and the 10/100Base-TX RJ-45 port can automatically distinguish the speed of incoming connection.

This section describes the hardware installation of FST-80x. Before connecting any network device to the FST-80x, read this chapter carefully.

2.1 Stand-alone Media Converter Installation

The FST-80x can use as a stand-alone Media Converter for Plug & Play and quick network environment deploy, please follow these steps to install the converter:

- Turn off the power of the device/station in a network to which the FST-80X will be attached.

- Ensure that there is no activity in the network.

- Attach fiber cable from the FST-80X to the fiber network. TX, RX must be paired at both ends.

- Attach a Cat. 5 UTP cable from the 10/100Base-TX network to the RJ-45 port on the FT-80X.

- Connect the 5VDC power adapter to the FST-80X and verify that the Power LED lights up.

- Turn on the power of the device/station, the TX Link /Act and FX Link/Act LEDs should light when all cables are attached.
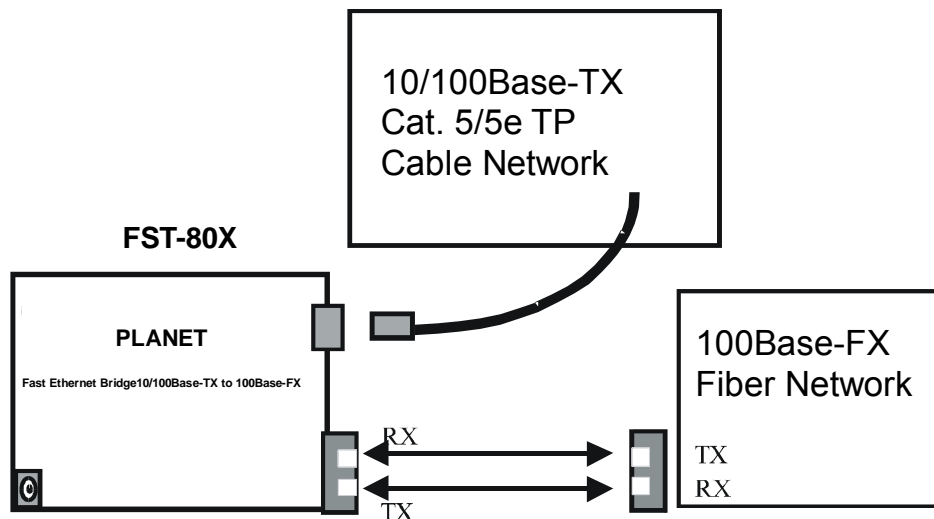
✎ Notice:

- ■ 1. RJ-45/STP, UTP Cat 5, straight/crossover cable is accepted.

- ■ 2. Please refer to Appendix A for more about the wiring distance of your UTP and fiber-Optic cable.

2.2 Slide Media Converter module into MC-1600MR/R48 Chassis installation

Step 1- Unscrew and pull out the FST-80x Media Converter board.
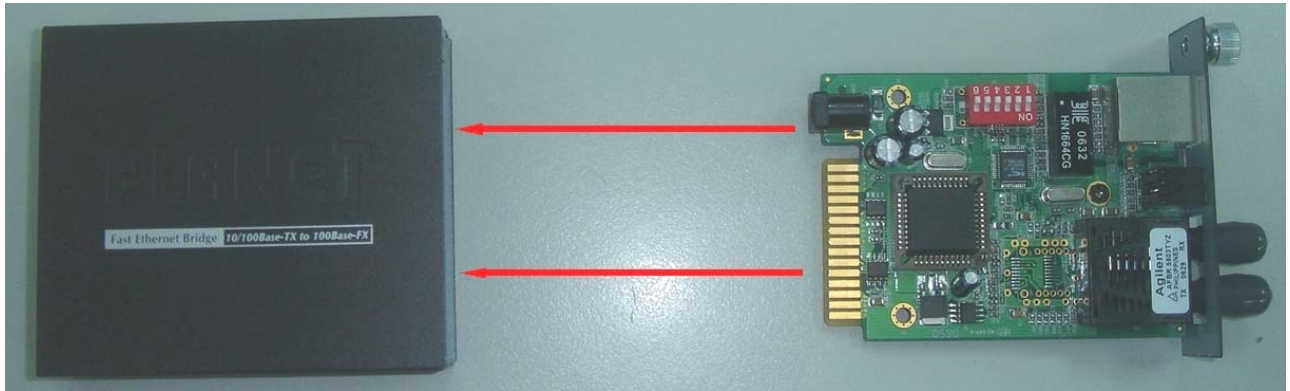
Step 2- Remove a blank faceplate from an empty expansion slot on the front of the chassis. The FST-80x Media Converter board can be installed in any expansion slot.

Step 3- Slide the FST-80x Media Converter board into the expansion slot, aligning it with the guide rails, until it firmly connects to the chassis' backplane.

Step 4- Secure the FST-80x Media Converter board to the chassis by tightening the thumbscrew.

2.3 Real Ethernet environment application

Standalone and centralize management Media Converter installation

Afford the current network grows and expanding, the PLANET FST-80x provide advanced Media conversion technology to fill this kind of demand. The FST-80x provide the diverse fiber connect type options to meet different network application, it is very flexible for FST-80x work as a standalone devices or install into the central Web Smart Media converter chassis for centralize management. Once, install into Web Smart Media Converter chassis and the FST-80x supports hot swappable to avoid network downtime, the FST-80x is ideal solution for building a network solution of FTTH (Fiber to the Home) or FTTC (Fiber to the Curb) and FTTB (Fiber to the Building) for ISPs, campuses and enterprise.
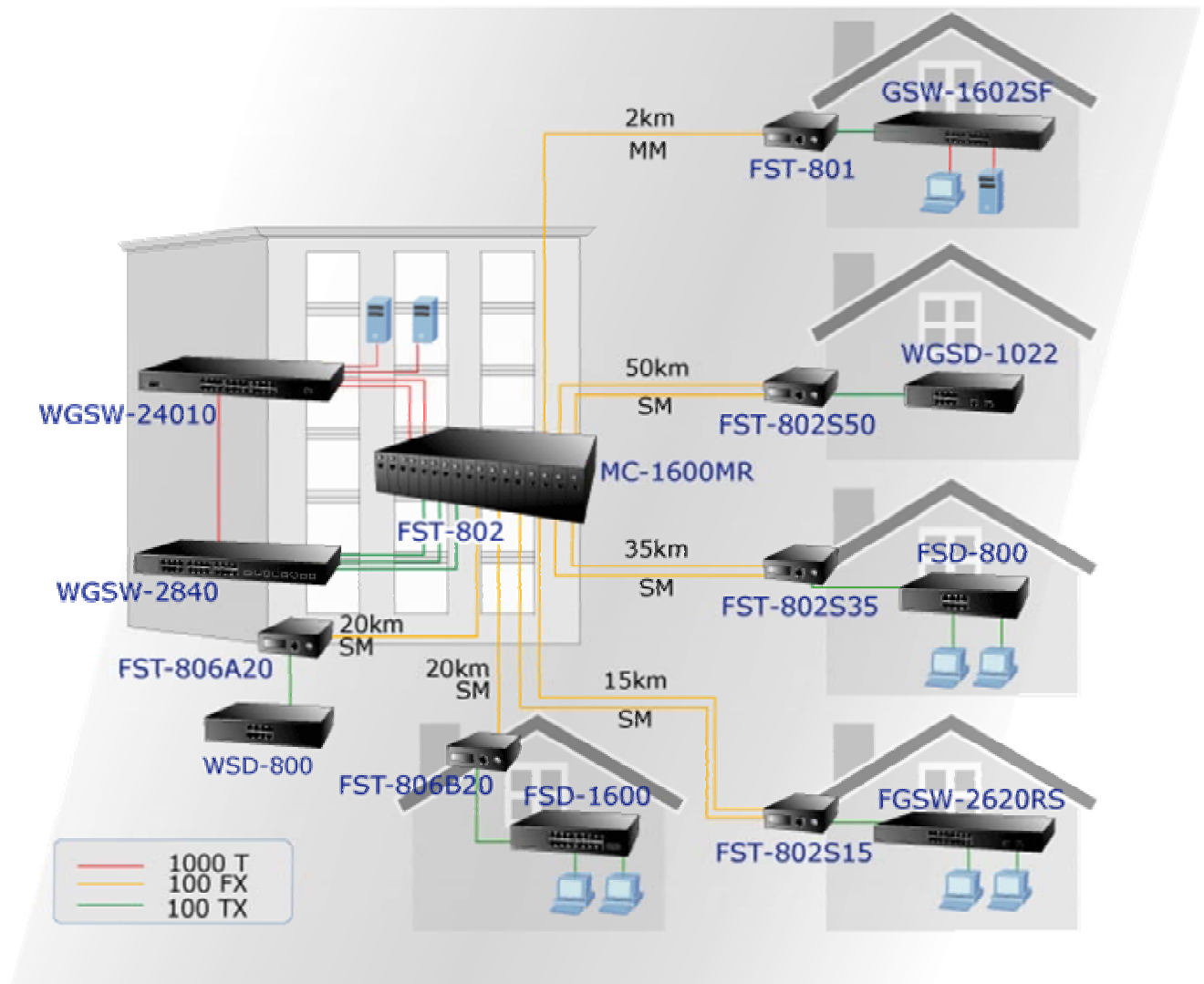

Figure 1. FST-80x Ethernet envirnoment application

3. MANAGE THE MEDIA CONVERTER

This product provides two different managed methods – configure through its DIP Switch or install into the central Web Smart Media converter chassis for centralize management.

This section describes how to managed the FST-80x through its DIP Switch and Web Smart Media converter chassis. Before use the FST-80x smart function, please read this chapter carefully.

3.1 DIP Switch configuration

The FST-80x provide DIP switch to setting fiber (HDX/FDX), UTP (Auto-negotiation / Manual), speed (10/100Mbps), duplex mode (Half / Full duplex mode), LLR (Disable / Enable), LLCF (Disable / Enable). Please refer to the table below for more detail decription.

| DIP Switch	Mode	Description
DIP Switch 1	On	Fiber operates at Half Duplex mode.
	Off	Fiber operates at Full Duplex mode **(default)**.
DIP Switch 2	On	TX operates at Forced Mode.
	Off	TX operates at Auto-Negotiation **(default)**.
DIP Switch 3	On	TX operates at 10Mbps duplex mode.
	Off	TX operates at 100Mbps duplex mode **(default)**.
DIP Switch 4	On	TX operates at Half Duplex mode.
	Off	TX operates at Full Duplex mode **(default)**.
DIP Switch 5	On	LLR Enable.
	Off	LLR Disable **(default)**.
DIP Switch 6	On	LLCF Enable.
	Off	LLCF Disable **(default)**.

✎ *Notice:*

■ After change the DIP Switch setting, please power off and power on the FST-80x to take affect.

3.2 Managed Media Converter module through MC-1600MR/R48 Chassis

The Web Smart Media Coverter Chassis that can control FST-80X through the management system,FST-80X can be controlled through Web Browser and terminal emulation program.

The Web Smart Media Converter Chassis will display out the status of FST-80x, also the Web Smart Media Coverter Chassis can control the function through the management system.
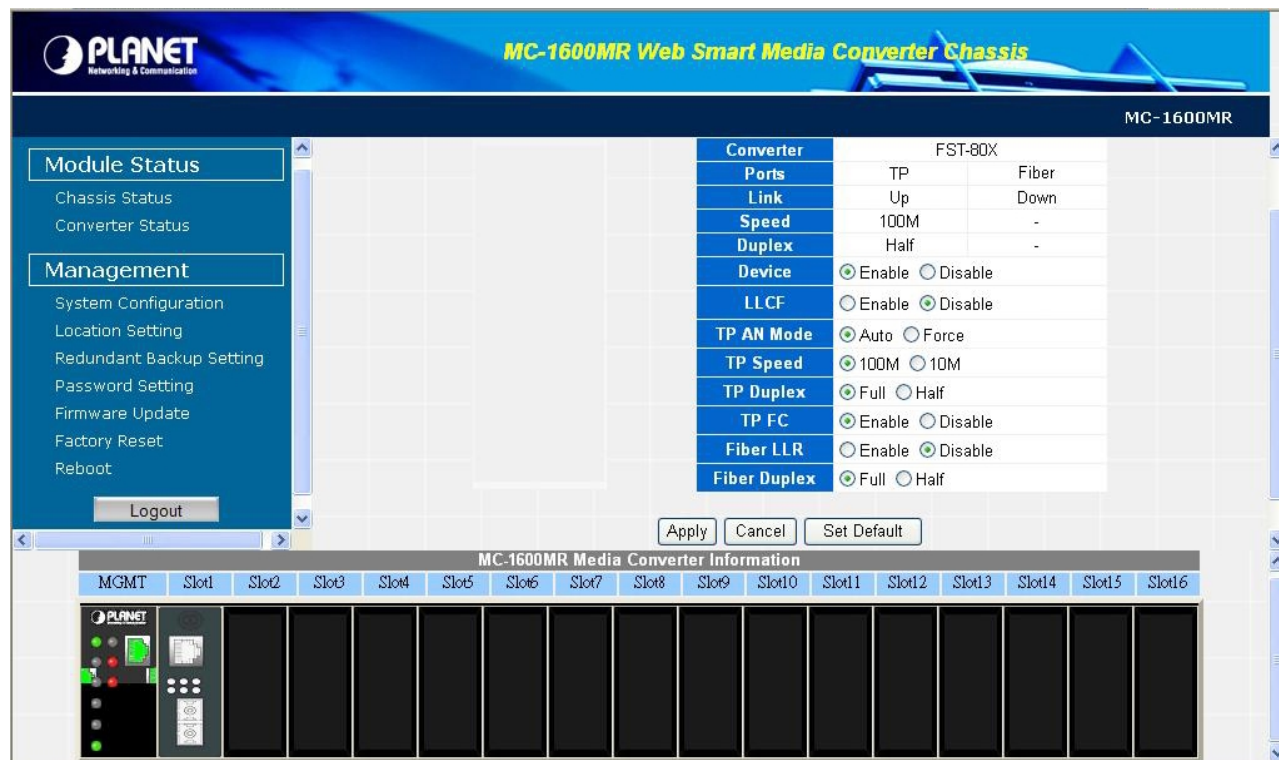
Through the Web Smart Media Coverter Chassis System, you can control the setting of FST-80X, such as fiber (HDX/FDX), UTP (Auto-negotiation / Manual), speed (10/100Mbps), duplex mode (Half / Full duplex mode), LLR (Disable / Enable), LLCF (Disable / Enable).

| Item	Description
Device	To enable or disable per FST-80x Converter board.
LLCF	To enable or disable the LLCF function from FST-80x Converter board.
TP AN Mode	To set the UTP port runs at Auto-negotiation or Forced Mode.
TP Speed	To set the UTP port runs at 100Mbps or 10Mbps.
TP Duplex	To set the UTP port runs at Full duplex or Half duplex mode.
TP FC	To set the Flow Control of the UTP port to enable or disable.
Fiber LLR	To enable or disable the LLR function of the Fiber port.
Fiber Duplex	To set the Duplex Mode of Fiber port to Full duplex or Half duplex mode.

4. LINK PASS THROUGH FUNCTION

The LFP function includes the Link Fault Pass Through function (LLCF/LLR) and the DIP Switch design. LLCF/LLR can immediately alarm administrators the problem of the link media and provide efficient solution to monitor the net. The DIP Switch provides disable or enable the LFP function.

LLCF (Link Loss Carry Forward) means when a device connected to the converter and the TP line loss the link, the converter's fiber will disconnect the link of transmit. LLR (Link Loss Return) means when a device connected to the converter and the fiber line loss the link, the converter's fiber will disconnect the link of transmit. Both can immediately alarm administrators the problem of the link media and provide efficient solution to monitor the net.

4.1 Link Loss Carry Forward (LLCF)

The FST-80X modules incorporates an LLCF function for troubleshooting a remote connection. When LLCF is enabled, the FL/TP ports do not transmit a link signal until they receive a link signal from the opposite port.
The diagram below shows a typical network configuration with a good link status using FST-80X for remote connectivity. Note that LLCF is enabled on DIP switch.
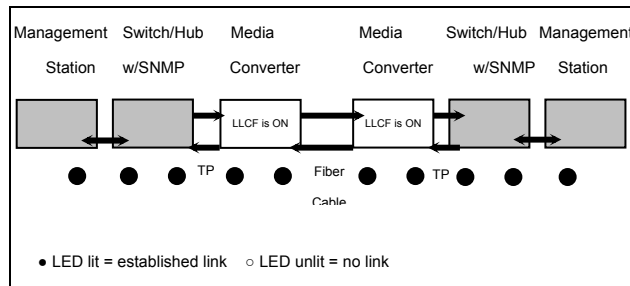
If the connection breaks, FST-80X that link loss forward to the switch/hub which generates a trap to the management station. The administrator can then determine the source of the problem.
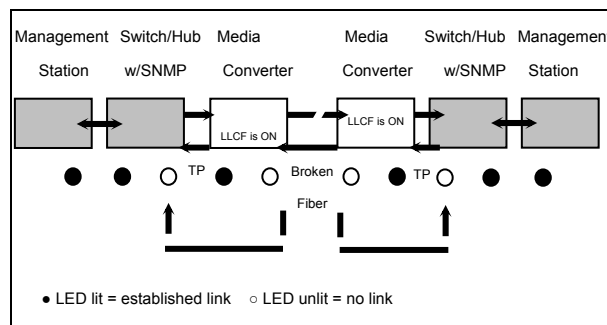

✎ Notice:

1: When connecting FST-80X with LLCF enabled to an auto-negotiating-capable device, force both sides of the configuration to 10 or 100Mbps full or half duplex. This allows the converter to immediately see link pulses and start passing data.

2. Units are shipped with the LLCF function disabled (DOWN).

4.2 Link Loss Return (LLR)

The fiber ports of FST-80X have been designed with an LLR function for troubleshooting a remote connection. LLR works in conjunction with LLCF.

When LLR is enabled*, the port's transmitter shuts down when its receiver fails to detect a valid receive link. LLR should only be enabled on one end of the link and is typically enabled on either the unmanaged or remote device.

The diagram below shows a typical network configuration with a good link status using FST-80X for remote connectivity. Note that LLR and LLCF are enabled as indicated in the diagram.
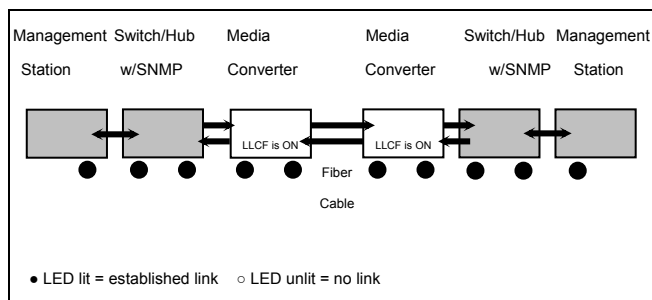
If one of the optical conductors is bad (as shown in the diagram box below), the converter with LLR enabled will return a no-link condition to its link partner. With LLCF also enabled, the no-link condition is carried forward to the switch/hub where a trap is generated to the management station, and the administrator can then determine the source of the loss.
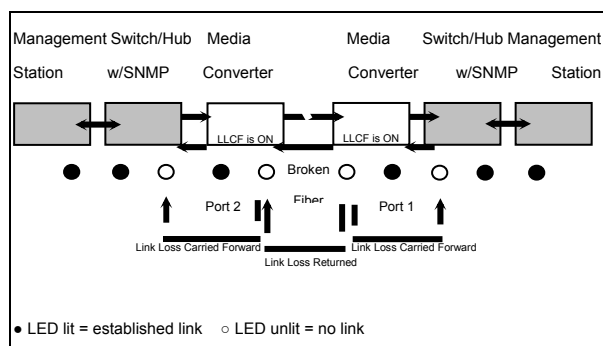
✎ *Notice:*

1: LLR must NOT be active on both ends of a configuration. If it is, the link can never be established.

2. Units are shipped with the LLR function disabled (DOWN).

5. TROUBLESHOOTING

This chapter contains information to help you solve issues. If the FST-80x is not functioning properly, make sure the FST-80x was set up according to instructions in this manual.

The Power LED is not lit
    Solution:
        Check the power cable connection between power adapter and FST-80X.

Why I connect FST-80x to device with 100Base-FX interface and the 100Base-FX fiber connection fail?
    Solution:
      1. Please check the fiber connection between two devices is correct.

      2. Please check the 100Base-FX interface from both devices run at the same full or half duplex mode.

10/100Base-TX port link LED is lit, but the traffic is irregular
    Solution:
      1. Check that the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

      2. Check the FST-80x DIP Switch setting and assure the same speed duplex mode setting on FST-80x and attached device.

Why I change the FST-80x DIP switch setting and seems the function without any different?
    Solution:
   Please power off and power on the FST-80x to take effect.

A.1 Switch's RJ-45 Pin Assignments

10/100Mbps, 10/100Base-TX

Contact	MDI Media Dependant Interface	MDI-X Media Dependant Interface -Cross
RJ-45 Connector pin assignment		
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

A.2 RJ-45 cable pin assignment
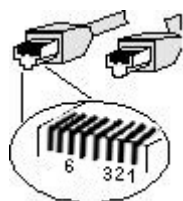
The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as above picture before deploying the cables into your network.

A.3 Cable Connection Parameter

The limitations are shown as below;

Duplex	Connection	Limitation (max.)
Twisted Pair		
Half / Full	Node to Node Node to Switch/ Hub	100 meters
Multi-Mode Converters		
MM Half	Node to Node Node to Switch	412 meters
MM Full	Node to Node Node to Switch	2 kilometers
Single-Mode Converters (FST-80xynn; x=2,6; y=S,A,B ; nn=km)		
SM Full	Node to Node Node to Switch	Depends on model

✎ Notice:

1: Consult your local dealer for more about PLANET single mode fiber connectivity.

2. A model (TX: 1310nm; RX: 1550nm) and B model (TX: 1550nm; RX: 1310nm) should runs in pair.

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CE