

User's Manual

FST-801 FST-802 FST-802S15/802S35/802S50 FST-806A20/806B20

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

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Revision

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

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

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TABLE OF CONTENTS

| 1. INTRODUCTION | 4 |
|--|----|
| 1.1 CHECKLIST 1.2 ABOUT THE 10/100BASE-TX TO 100BASE-FX SMART MEDIA CONVERTER | 4 |
| 1.3 FEATURES 1.4 SPECIFICATION 1.5 PRODUCT OUTLOOK | 5 |
| 2. HARDWARE INSTALLATION | 7 |
| 2.1 Stand-alone Media Converter Installation | 7 |
| 2.2 SLIDE MEDIA CONVERTER MODULE INTO MC-1600MR/R48 CHASSIS INSTALLATION | |
| 2.3 REAL ETHERNET ENVIRONMENT APPLICATION | 9 |
| 3. MANAGE THE MEDIA CONVERTER | |
| 3.1 DIP Switch configuration | |
| 3.2 MANAGED MEDIA CONVERTER MODULE THROUGH MC-1600MR/R48 CHASSIS | |
| 4. LINK PASS THROUGH FUNCTION | 13 |
| 4.1 LINK LOSS CARRY FORWARD (LLCF) | |
| 4.2 LINK LOSS RETURN (LLR) | |
| | |
| 5. TROUBLESHOOTING | 15 |
| APPENDIX A NETWORKING CONNECTION | |
| A.1 Switch's RJ-45 Pin Assignments | |
| A.2 RJ-45 CABLE PIN ASSIGNMENT | |
| A.3 CABLE CONNECTION PARAMETER | |

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

| N4 - 1 - 1 | FOT 004 | FOT 000 | FOT 000045 | FOT ADDODE | FOT 000050 | FOT OCOAOO | |
|------------------------|--|---|------------------|------------------|------------------|-----------------|----------------|
| Model | FST-801 | FST-802 | FST-802S15 | FST-802S35 | FST-802S50 | FST-806A20 | FST-806B20 |
| Hardware Specification | | | | | | | |
| Standards | | | EEE 802.3u 100 | | 00Base-FX | | |
| Ports | | - | 1 100Base-FX p | | I | 1 | 1 |
| Fiber connector | ST | SC | SC | SC | SC | SC, WDM | SC, WDM |
| Wavelength Deploy- | 1310nm (T | ransmit and F | Receive) | | | 1310 (TX) | 1550 (TX) |
| ment | | | | | | 1550 (RX) | 1310 (RX) |
| Cable | 10Base-T: | 2-pair Cat. 3, | 4,5 UTP cable, | up to 100 meter | S | | |
| | 100Base-T | X: 2-pair Cat | . 5 UTP cable, u | p to 100 meters | i | | |
| | 100Base-F | ⁻ X: 50/125µm | or 62.5/125µm i | multi-mode fiber | cable, up to 2kr | n. 9/125µm sing | le-mode cable, |
| | provide lor | g distance fo | r 15/20/35/50km | 1 | • | • | • |
| Maximum Cable dis- | MM, 2km | MM, 2km | SM, 15km | SM, 35km | SM, 50km | SM, 20km | SM, 20km |
| tance | | | | | | Single wire | Single wire |
| LED indicator | System: P | System: PWR | | | | | |
| | TP: LNK/A | TP: LNK/ACT, FDX/COL, 100 | | | | | |
| | FX: LNK/A | 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 Ether | 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 successfull | |
| | | lished. | |
| | | 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 success | |
| | | | lished. |
| | | 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 environment 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.

| PLANET MC-1600MR Web | Smart Media | Converter Cha | ssis | |
|--|----------------|---|------------|--------------|
| | | | | MC-1600MR |
| | Converter | FST-8 | XC | ^ |
| Module Status | Ports | TP | Fiber | |
| Chassis Status | Link | Up | Down | |
| Converter Status | Speed | 100M | - | |
| | Duplex | Half | - | |
| Management | Device | 💿 Enable 🔘 Disab | le | |
| System Configuration | LLCF | 🔿 Enable 💿 Disab | le | |
| Location Setting | TP AN Mode | Auto ○ Force Orce | | |
| Redundant Backup Setting | TP Speed | 💿 100M 🔘 10M | | |
| Password Setting | TP Duplex | ⊙ Full ◯ Half | | |
| Firmware Update | TP FC | 💿 Enable 🔘 Disab | le | |
| Factory Reset | Fiber LLR | ◯Enable ⊙Disab | le | |
| Reboot | Fiber Duplex | I Full ○ Half | | |
| Logout | | | | |
| App | ly Cancel : | Set Default | | |
| MC-1600MR Media Converte | r Information | | | × |
| MGMT Slot1 Slot2 Slot3 Slot4 Slot5 Slot6 Slot7 Slot8 | Slot9 Slot10 3 | Slot11 Slot12 Slot1 | 3 Slot14 S | lot15 Slot16 |
| O PLANET | | | | |
| | | | | |

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.

APPENDIX A NETWORKING CONNECTION

A.1 Switch's RJ-45 Pin Assignments

10/100Mbps, 10/100Base-TX

| RJ-45 Connector pin assignment | | | | |
|--------------------------------|--------------------------------|-------------------------------------|--|--|
| Contact | MDI | MDI-X | | |
| | Media Dependant Interface | Media Dependant Interface -Cross | | |
| 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 | 100 meters | | | | |
| | Node to Switch/ Hub | | | | | |
| Multi-Mode Convert | ers | | | | | |
| MM Half | Node to Node | 412 meters | | | | |
| | Node to Switch | | | | | |
| MM Full | Node to Node | 2 kilometers | | | | |
| | Node to Switch | | | | | |
| Single-Mode Converters | | | | | | |
| (FST-80xynn; x=2,6; y=S,A,B ; nn=km) | | | | | | |
| SM Full | Node to Node Depends on mo | | | | | |
| | Node to Switch | | | | | |

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