USER'S MANUAL

10/100Base-TX to 100Base-FX PoE PSE FE Media Converter

10/100Base-TX to 100Base-FX PoE PSE FE Media Converter
User's Manual

Release 1.0

DURATION OF HARDWARE WARRANTY

HARDWARE: In accordance with the provisions described under, Manufactory Corporation (hereinafter called "Manufactory") warrants its hardware products (hereinafter referred to as "Product") specified herein to be for a period of twelve (12) months from the date of shipment.

Should a Product fail to perform during the effective warranty period as described above, Manufactory shall replace the defective Product or part, or delivering a functionally equivalent Product or part in receipt of customer's request, provided that the customer complies with the return material authorization (RMA) procedures and returns all defective Product prior to installation of the replacements to Manufactory.

All defective Products must be returned to Manufactory with issuance of a Return Material Authorization number (RMA number) assigned to the reseller from whom the end customer originally purchased the Product. The reseller is responsible for ensuring the shipments are insured, with the transportation charges prepaid and the RMA number clearly marked on the outside of the package. Manufactory will not accept collect shipments or those returned without an RMA number.

Manufactory shall not be responsible for any software, firmware, information or memory data contained in, stored on or integrated with any Product returned to Manufactory pursuant to any warranty.

EXCLUSIONS. **The warranty as mentioned above does not apply to the following conditions, in Manufactory's judgment, it contains (1) customer does not comply with the manual instructions offered by Manufactory in installation, operation, repair or maintenance, (2) Product fails due to damage from unusual external or electrical stress, shipment, storage, accident, abuse or misuse, (3) Product is used in an extra hazardous environment or activities, (4) any serial number on the Product has been removed or defaced, (5) this warranty will be of no effect if the repair is via anyone other than Manufactory or the approved agents, or (6) In the event of any failures or delays by either party hereto in the performance of all or any part of this agreement due to acts of God, war, riot, insurrection, national emergency, strike, embargo, storm, earthquake, or other natural forces, or by the acts of anyone not a party to this agreement, or by the inability to secure materials or transportation, then the party so affected shall be executed from any further performance for a period of time after the occurrence as may reasonably be necessary to remedy the effects of that occurrence, but in no event more than sixty (60) days. If any of the stated events should occur, Party A shall promptly notify Party B in writing as soon as commercially practicable, but in no event more than twenty (20) business days and provide documentation evidencing such occurrence. In no event shall the maximum liability of Manufactory under this warranty exceed the purchase price of the Product covered by this warranty.**

DISCLAIMER. **EXCEPT AS SPECIFICALLY PROVIDED ABOVE AS REQUIRED "AS IS" AND THE WARRANTIES AND REMEDIES STATED ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHERS, ORAL OR WRITTEN, EXPRESS OR IMPLIED. ANY AND ALL OTHER WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR THIRD PARTY RIGHTS ARE EXPRESSLY EXCLUDED.**

MANUFACTORY SOFTWARE LICENSE AGREEMENT

NOTICE: Please carefully read this Software License Agreement (hereinafter referred to as this "Agreement") before copying or using the accompanying software or installing the hardware unit with pre-enabled software or firmware (each of which is referred to as "Software" in this Agreement). BY COPYING OR USING THE SOFTWARE, YOU ACCEPT ALL OF THE PROVISIONS AND CONDITIONS OF THIS AGREEMENT. THE PROVISIONS EXPRESSED IN THIS AGREEMENT ARE THE ONLY PROVISION UNDER WHICH MANUFACTORY WILL PERMIT YOU TO USE THE SOFTWARE. If you do not accept these provisions and conditions, please immediately return the unused software, manual and the related product. Written approval is <u>NOT</u> a prerequisite to the validity or enforceability of this Agreement and no solicitation of any such written approval by or on behalf of Manufactory shall be deemed as an inference to the contrary.

LICENSE GRANT. **The end user (hereinafter referred to as "Licensee") of the Software is granted a personal, non-sublicensable, nonexclusive, nontransferable license by Manufactory Corporation ("Manufactory"): (1) To use the Manufactory's software ("Software") in object code form solely on a single central processing unit owned or leased by Licensee or otherwise embedded in the equipment offered by Manufactory. (2) To copy the Software only for backup purposes in support of authorized use of the Software. (3) To use and copy the documentation related to the Software solely in support of authorized use of the Software by Licensee. The License applies to the Software only except other Manufactory's software or hardware products. Without the prior written consent of Manufactory, Licensee has no right to receive any source code or design documentation with respect to the Software.**

RESTRICTIONS ON USE; RESERVATION OF RIGHTS. **The Software and related documentation are protected under copyright laws. Manufactory and/or its licensors retain all title and ownership in both the Software and its related documentation, including any revisions made by Manufactory. The copyright notice must be reproduced and included with any copy of any portion of the Software or related documentation. Except as expressly authorized above, Licensee shall not copy or transfer the Software or related documentation, in whole or in part. Licensee also shall not modify, translate, decompile, disassemble, use for any competitive analysis, reverse compile or reverse assemble all or any portion of the Software, related documentation or any copy. The Software and related documentation embody Manufactory's confidential and proprietary intellectual property. Licensee is not allowed to disclose the Software, or any information about the operation, design, performance or implementation of the Software and related documentation that is confidential to Manufactory to any third party. Software and related documentation may be delivered to you subject to export authorization required by governments of Taiwan and other countries. You agree that you will not export or re-export any Software or related documentation without the proper export licenses required by the governments of affected countries.**

LIMITED SOFTWARE WARRANTY. **Manufactory warrants that any media on which the Software is recorded will be free from defects in materials under normal use for a period of twelve (12) months from date of shipment. If a defect in any such media should occur during the effective warranty period, the media may be returned to Manufactory, then Manufactory will replace the media. Manufactory shall not be responsible for the replacement of media if the failure of the media results from accident, abuse or misapplication of the media.**

EXCLUSIONS. **The warranty as mentioned above does not apply to the Software, which (1) customer does not comply with the manual instructions offered by Manufactory in installation, operation, or maintenance, (2) Product fails due to damage from unusual external or electrical stress, shipment, storage, accident, abuse or misuse, (3) Product is used in an extra hazardous environment or activities, (4) any serial number on the Product has been removed or defaced, or (5) this warranty will be of no effect if the repair is via anyone other than Manufactory or the authorized agents. The maximum liability of Manufactory under this warranty is confined to the purchase price of the Product covered by this warranty.**

DISCLAIMER. **EXCEPT AS PROVIDED ABOVE, THE SOFTWARE IS PROVIDED "AS IS " AND MANUFACTORY AND ITS LICENSORS MAKE NO WARRANTIES, EXPRESS OR IMPLIED, WITH REPSECT TO THE SOFTWARE AND DOCUMENTAITON. MANUFACTORY AND ITS LICENSORS DISCLAIM ALL OTHER WARRANTIES, INCLUSIVE OF WITHOUT LIMITATION, IMPLIED WARRANTIES OR MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. FURTHER, MANUFACTORY DOES NOT WARRANT, GUARANTEE, OR MAKE ANY REPRESENTATIONS REGARDING THE USE, OR THE RESULTS OF THE USE, OF THE SOFTWARE OR RELATED WRITTEN DOCUMENTAITON IN TERMS OF CORRECTNESS, ACCURACY, RELIABILITY, OR OTHERWISE.**

CONSEQUENTIAL DAMAGES. **IN NO EVENT SHALL MANUFACTORY OR ITS AUTHORIZED RESELLER BE LIABLE TO LICENSEE OR ANY THIRD PARTY FOR (A) ANY MATTER BEYOND ITS REASONABLE CONTROL OR (B) ANY CONSEQUENTIAL, SPECIAL, INDIRECT OR INCIDENTAL DAMAGES ARISING OUT OF THIS LICENSE OR USE OF THE SOFTWARE PROVIDED BY MANUFACTORY, EVEN IF MANUFACTORY HAS BEEN NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES IN ADVANCE. IN NO EVENT SHALL THE LIABILITY OF MANUFACTORY IN CONNECTION WITH THE SOFTWARE OR THIS AGREEMENT EXCEED THE PRICE PAID TO MANUFACTORY FOR THE LICENSE.**

TERM AND TERMINATION. **The License is effective until terminated; however, all of the restrictions in regard to Manufactory's copyright in the Software and related documentation will cease being effective at the date of expiration; Notwithstanding the termination or expiration of the term of this agreement, it is acknowledged and agreed that those obligations relating to use and disclosure of Manufactory's confidential information shall survive. Licensee may terminate this License at any time by destroying the software together with all copies thereof. This License will be immediately terminated if Licensee fails to comply with any term and condition of the Agreement. Upon any termination of this License for any reason, Licensee shall discontinue to use the Software and shall destroy or return all copies of the Software and the related documentation.**

GENERAL. **This License shall be governed by and construed pursuant to the laws of Taiwan. If any portion hereof is held to be invalid or unenforceable, the remaining provisions of this License shall remain in full force and effect. Neither the License nor this Agreement is assignable or transferable by Licensee without Manufactory's prior written consent; any attempt to do so shall be void. This License constitutes the entire License between the parties with respect to the use of the Software.**

LICENSEE ACKNOWLEDGES THAT LICENSEE HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. LICENSEE FURTHER AGREES THAT THIS AGREEMENT IS THE ENTIRE AND EXCLUSIVE AGREEMENT BETWEEN MANUFACTORY AND LICENSEE.

Table of Contents

1. Overview

IEEE802.3u 100Mbps Fast Ethernet supports two types of media, 10/100Base-TX and 100Base-FX, for network connection. LFP (Link Fault Pass Through) feature enhances the TP-Fiber Link integrity and conformity. Either one of TP or Fiber port is in link-fail state, the LFP converter forces the other port to be at link-disabled state. The PSE media converter complies with IEEE 802.3af, its advanced auto-sensing algorithm enables providing power devices (PD) discovery, classification, current limit, and other necessary functions. It also supports high safety with short circuit protection and power-out auto-detection to PD.

2. Model Description

Model	Power Description
PoE PSE TP-Fiber	AC Line: 100-240V 50-60Hz

The 100Mbps Fiber Transceiver	Wavelength
ST/SC/LC multi-mode 2Km	*1310nm*
SC/LC.S05/S20/S40/S60Km single-mode	*1310nm*
SC/LC.S80/S100Km single-mode	1550nm

∗:Any other fiber model, such as MT-RJ is available upon request.

Single Fiber Model	TX, RX Wavelength	
1310nm Single-Mode 20Km	TX (Transmit)	1310nm
∗ 40/60Km models are option	RX (Receive)	1550nm
1550nm Single-Mode 20Km	TX (Transmit)	1550nm
∗ 40/60Km models are option	RX (Receive)	1310nm

Note:

The 1310nm and 1550nm models must be installed in pairs, i.e., install 1310nm model at one end and 1550nm model at the other one.

3. Checklist

Before you start installing the Converter, verify that the package contains the following:

— The PoE PSE TP-Fiber Converter

— AC Power Cord

— This User's Manual

Please notify your sales representative immediately if any of the aforementioned items is missing or damaged.

4. Installing the Converter

Note: The Media Converter is hot-swappable.
⇒ Wear a grounding device for electrostatic discharge

4.1 PSE TP-Fiber Converter with Powered Device (PD)
⇒ Connect the PSE media converter to an AC power source
⇒ Install the TP media cable to the IEEE 802.3af PD converter (See Fig. 2)

Note: It can work as a pure converter that connects to the non-PoE converter.
⇒ Install the media cable for network connection

Warning:
⇒ Verify that the AC input conforms to your country AC power requirement and then insert the power plug
⇒ Ensure that the power of PSE device is turned on
⇒ Install the media cable for network connection

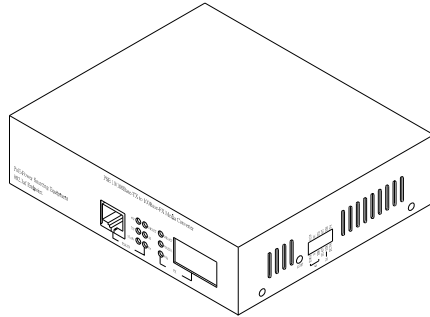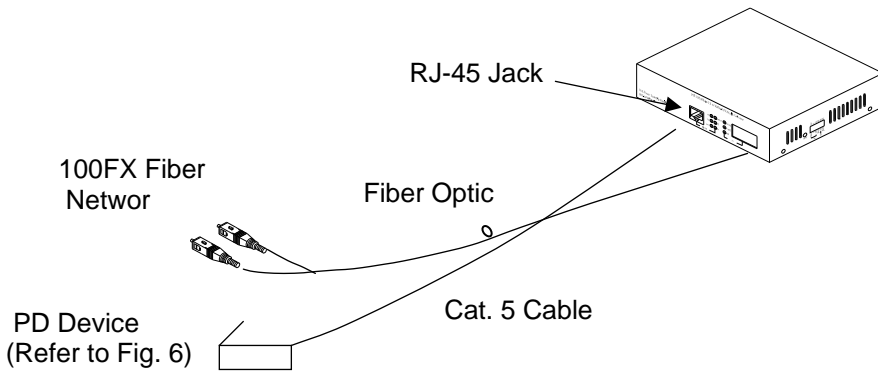|	
TP Port	**Default**: AUTO AUTO or FORCE setting, see Fig. 12 S1—Bit 1
	Attach TP Cat. 5 cable to TP port, and the distance can be up to 100m. Use the straight-through cable to connect the switch or workstation, the 10/100 TP port can support AUTO MDI-X sensing.
Fiber Port	**Default**: 100FDX "100FDX"/"100HDX" setting, see Fig. 12 S1—Bit 5

Fig. 1 The View of PoE PSE Media Converter

RJ-45 Jack

100FX Fiber
Networ

Fiber Optic

PD Device
(Refer to Fig. 6)

Cat. 5 Cable

Fig. 2 Connection among PSE Ethernet Switch, Fiber and TP Cables

100FX
Fiber
Network

RX

TX

TX

RX

PoE PSE TP-to-100FX
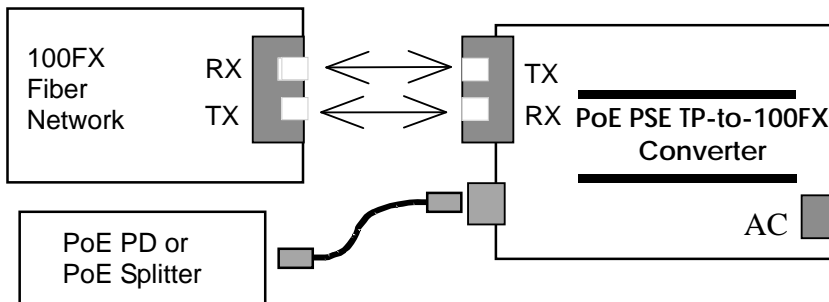Converter

PoE PD or
PoE Splitter
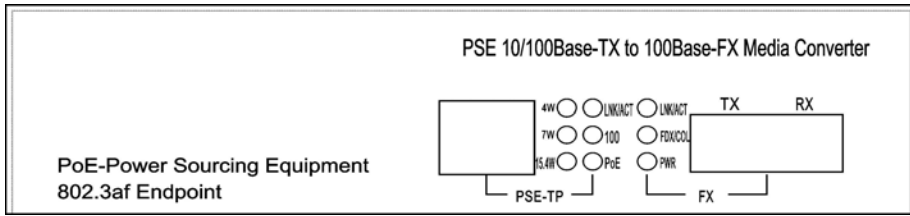
AC

Fig. 3 PSE to PD or PoE Splıtter

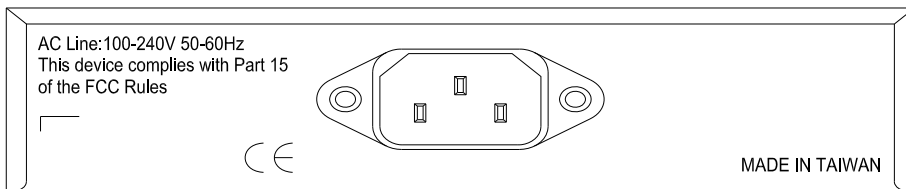Fig. 4 PoE PSE Media Converter Front Panel

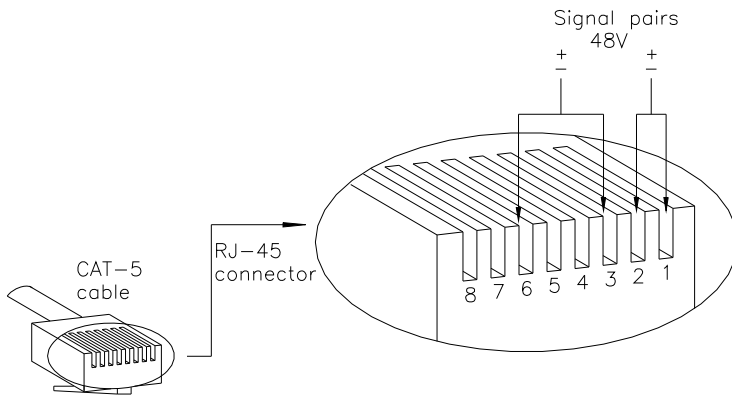Fig. 5 PoE PSE Media Converter Rear Panel

Fig. 6 Endpoint PSE RJ-45 Male Connector

Note:

IEEE802.3af assigns pairs on the RJ-45 connector and Cat.5 cable of Endpoint PSE.

Endpoint : -48V via TP pin 1, 2, 3, 6

5. WDM Single Fiber Model

    The TP-Fiber converter is specially designed with an optic Wavelength Division Multiplexing (WDM) model that can transport bi-directional full duplex signal over a single fiber simultaneously.

Single Fiber Model	TX, RX Wavelength
1310nm Single-Mode 20Km * 40/60Km models are option	TX (Transmit) 1310nm
	RX (Receive) 1550nm
1550nm Single-Mode 20Km * 40/60Km models are option	TX (Transmit) 1550nm
	RX (Receive) 1310nm

Note:
  The 1310nm and 1550nm models must be installed in pairs, i.e., install 1310nm model at one end and 1550nm model at the other one.
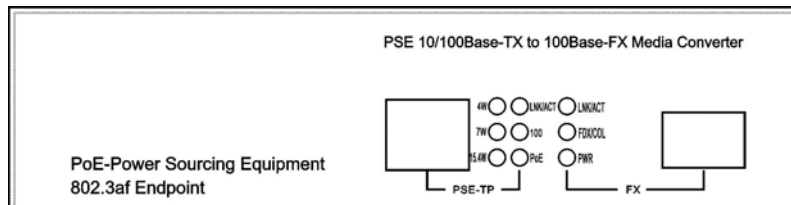

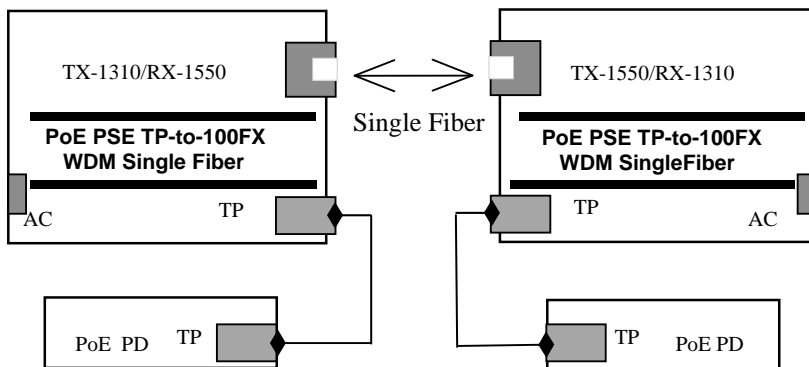Fig.7 PoE PSE WDM Single Fiber Converter Front Panel

Fig. 8 Power from PSE to PD

6. Link Fault Pass Through

This media converter supports link fault pass through (LFP) in TX/FX converter application. Link status on one port is propagated to the other port to notice the remote nodes. If TP port is unplugged, this converter stops transmission on fiber port. This causes the remote fiber node link to fail. LED shows the link failure on both TP and fiber ports. If fiber link fails, this converter restarts auto-negotiation on TP port but always stays in the link failure state. This causes the remote TP node link to fail. LED also shows the link failure on both TP and fiber ports. Refer to Fig. 9 shown below for the normal status when the link succeeds. Also refer to Fig. 10 and Fig. 11 for the erroneous status when TP Cable A, Fiber Cable B or Fiber Cable C fails to connect.

Note: Link fault pass through (LFP) function only takes effect as S1-Bit4 (see Fig. 12) is enabled. Disabled S1-Bit4 will turn this media converter into a general one.
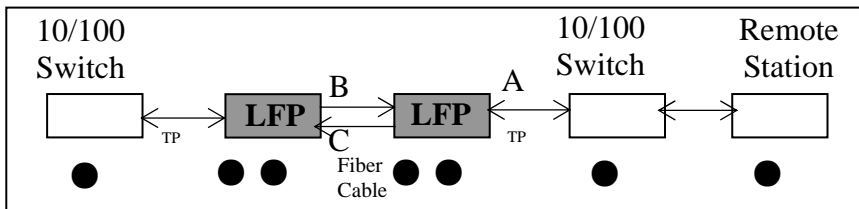
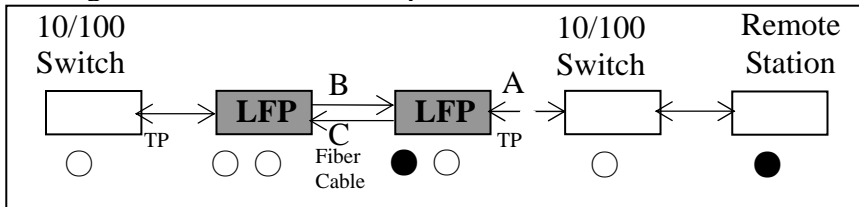Fig. 9 Normal status via a pair of LFPs
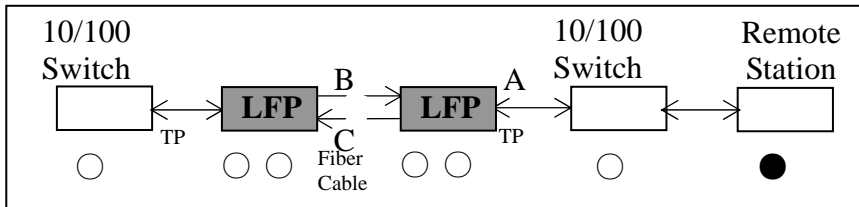
Fig. 10 The status as TP Cable A is broken

Fig. 11 The status as Fiber Cable B or C is broken

Note : ●   indicates LNK/ACT LED Lit
○   indicates LNK/ACT LED Off

Warning:
The LFP (Link Fault Pass Through) function works only when both two converters own this capability in pairs.   Furthermore, both LFP converters should be supplied only by the same manufacturer/vender. The connection coming from LFP converters with odd models or non-LFP converters will cease the LFP function.

7. LED Description

LED	Color	Function
FX LNK/ACT	Green	Lit when fiber connection is good Blinks when fiber data is present
FX FDX/COL	Amber	Lit when full-duplex mode is active Off when half-duplex is active Blinks when collision is present
TP LNK/ACT	Green	Lit when TP connection is good Blinks when TP data is present
TP 100	Green	Lit when TP speed is 100Mbps Off when TP speed is 10Mbps
PWR	Green	Lit when +5V power is coming up
PoE PSE-TP	Green	Lit when PoE feeding power is active
	Red	Lit when PoE feeding power is disrupted (In case of overtemperature/overcurrent)
4W	Green	Light when PD Class Type is Class 1
7W	Green	Light when PD Class Type is Class 2
15.4W	Green	Light when PD Class Type is Class 0 or 3

8. Connecting to TP, Fiber Device

Converter TP Port 10/100TP	AUTO, FORCE selectable: Bit 1, 2, 3 of S1 a. AUTO: 10/100 NWay Auto-negotiation b. FORCE: 100 or 10, FDX or HDX
Converter Fiber Port 100FX	100Mbps duplex selectable: Bit 5 of S1 a. FDX for 100FDX fiber link partner, default b. HDX for 100HDX fiber link partner

```
                              LFP
          TP-AUTO  100   FDX  EN  FDX-FX PoE

   S1       [1]   [2]   [3]   [4]   [5]   [6]
             1     2     3     4     5     6
   ○
  RESET     TP-FORCE 10  HDX   LFP  HDX-FX PoE
                               DIS         DIS
```
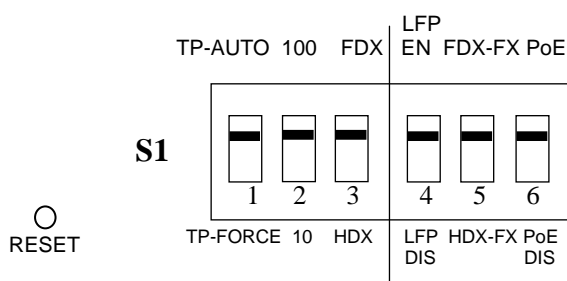
Fig. 12 Reset button and S1—Bit 1, 2, 3, 4, 5, 6
Configuration and Setting

Reset : Once S1-1, S1-2, S1-3, S1-4 or S1-5 is changed, please press this button to have the setting taken effect.
S1-1 TP port mode : AUTO(default) or FORCE
S1-2 TP port speed : 100 or 10 when TP at Force
S1-3 TP port duplex : FDX or HDX when TP at Force
S1-4 LFP : LFP enabled(default) or disabled
S1-5 Fiber port duplex: 100FDX(default) or 100HDX
S1-6 PoE ON/OFF : Enable(default) or disable

Note:
1. S1-2 and S1-3 will take effect only when S1-1 is set at TP-FORCE.
2. S1-5 must be set to 100FDX for Single Fiber Model.
3. S1-6 must be set to PoE ON while power supplies to PD.

Warning:
—When TP Nway port is connected to TP 100FDX(force mode) instead of Nway partner, it will result in 100HDX mode with invalid collision signal
—Ensure that all network nodes are configured at an identical operation mode. Improper operation and flow control mode between TP and Fiber port connections will render the LAN to work poorly.

9. Cable Connection Parameter

100Base-X network allows 512-bit time delay between any two node-stations in a collision domain. Switch-based Media Converter breaks up TP and Fiber segments' collision domain to extend the cabling distance.

- TP Cable Limitations: Cat. 5 and up to 100m
- Converter Fiber Cable Limitations:

SC/ST/LC Converter Models	
Multi-mode Half-duplex	412m
Multi-mode Full-duplex	2Km
Single-mode Half-duplex	412m
Single-mode Full-duplex	5/20/40/60/80/100Km

10. PoE PSE TP-Fiber

Technical Specifications

- **Standards** **:** IEEE802.3u 10/100Base-TX, 100Base-FX
  IEEE802.3af Power over Ethernet
- **UTP Cable** **:** Cat. 5 cable and up to100m
  Fiber Cable **:** 50/125, 62.5/125 or 100/140μm multi-mode
  8.3/125, 8.7/125, 9/125 or 10/125μm single-mode

- **PSE Power Feeding Supports :** "Endpoint" via TP pin 1, 2, 3, 6
- **LED Indicators :**
  POWER, PoE, TP LNK/ACT, 100, FX LNK/ACT, FDX/COL,4W,7W,15.4W
- **Data Transfer Rate :**
-
Speed	Forwarding Rate
100Mbps	148,800 PPS
10Mbps	14,880 PPS

- **Flow Control** **:** IEEE802.3x compliant for full duplex
  Backpressure flow control for half duplex
- **Power Requirement** **: AC Line :** 100-240V 50-60Hz

- **Power Consumption** **:** 24W
- **Ambient Temperature** **:** 0° to 50°C
- **Humidity** **:** 5% to 90%
- **Dimensions** **:** 40(H) × 158(W) × 133(D) mm
- **Complies with FCC Part 15 Class A and CE Mark**

Note: For connecting this device to Router, Bridge or Switch, please refer to the corresponding device's Technical Manual.