

10/100/Gigabit High Power PoE to 1000BASE-SX Media Converter

Converts high speed Gigabit Ethernet from copper to fiber and also powers PoE access points/cameras.

IEEE802.3at PoE (Power over Ethernet) PSE+ compatible.
 Supports LFP (Link Fault Pass-through) and FEF (Far End Fault).
 Supports jumbo frames up to 9KB.
 PSE RJ-45 Pin-out Alternatives A/B Auto detection.
 PSE MDI power enable/disable.



Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)
 FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746
 Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018
 Web site: www.blackbox.com • E-mail: info@blackbox.com

Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

European Community (CE) Electromagnetic Compatibility Directive

This is 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 to correct the interference.

Normas Oficiales Mexicanas (NOM) Electrical Safety Statement

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá de lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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1. Introduction

LPS530A-MM is a 10/100/1000BASE-T to 1000BASE-X (SC/LC) IEEE802.3z/ab GbE media converter, which allows two types of network segments to be connected easily and inexpensively. It complies with IEEE802.3at (Max. PoE output power consumption up to 30W) Power over Ethernet standard. This AC powered PoE media converter is a Power Sourcing Equipment (PSE), providing power to both IEEE802.3af and IEEE802.3at powered device (PD) over the existing CAT5e UTP cable. The converter includes a PD signal sensing and power monitoring features. We are using "PSE+" to represent the high power PoE output maximum 30W.

2. Key Features

- IEEE802.3at PoE (Power over Ethernet) PSE+ compatible
 - Internal AC power supply
 - Over-current protection
 - Under-current detection
 - Minimum load sensing
 - Fault protection input
 - PSE MDI power enable/disable
- Supports LFP (Link Fault Pass-through) and FEF (Far End Fault)
- Supports 802.3x flow control for full-duplex port and backpressure for half-duplex port
- DIP switch to set configurations
 - DIP 1:Cut-Through Mode/Normal Mode
 - DIP 2:LFP/LFP DIS
 - DIP 3:PoE/PoE DIS
- Supports jumbo frame (Normal Mode:2KB, Cut-Through Mode:9KB)
- PSE RJ-45 Pin-out Alternatives A/B Auto detection
- RoHS Compliance

3. Package Contents

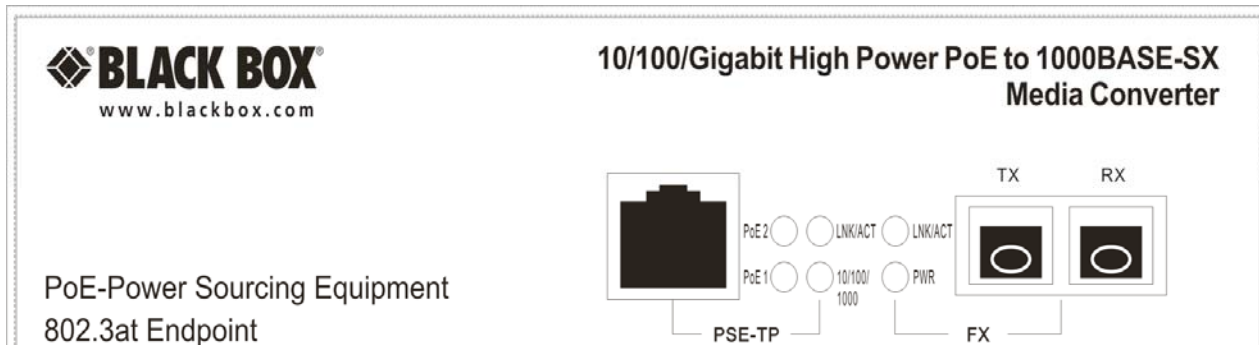
Your package should include the following items. If anything is missing or damaged, please contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

- (1) Gigabit Ethernet High Power PoE Converter
- (1) AC Power Cord
- This user manual

10/100/Gigabit High Power PoE to 1000BASE-SX Media Converter

4. Front and Back Panels

Front Panel



LED Indicators

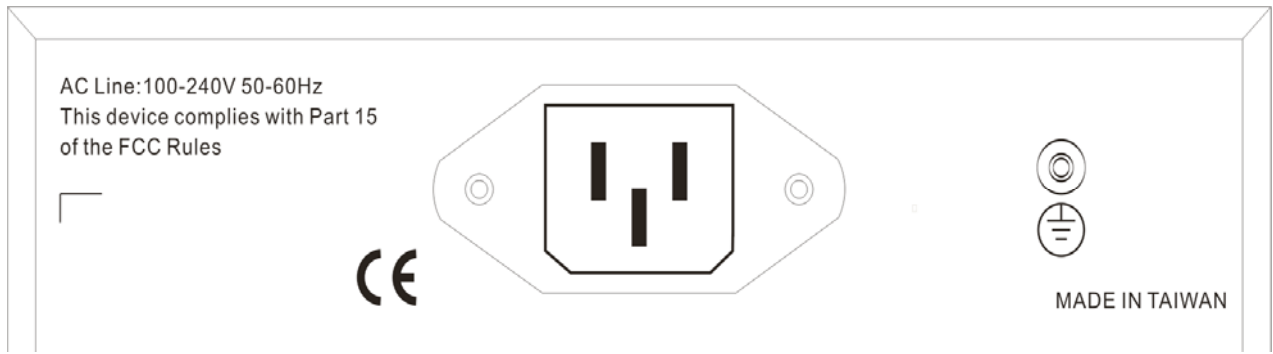
There are six diagnostic LEDs located on the front panel of the LPS530A-MM Media Converter. These LED indicators provide administrators with real-time system status. The following table describes each LED indicator.

LED	Color	Function
PWR	Green	Lit when power is on.
FX LNK/ACT	Green	Lit when fiber connection is good. Blinks when fiber data is present.
TP LNK/ACT	Green	Lit when TP connection is good. Blinks when TP data is present.
10/100/1000 Mbps	Green/ Amber	Lit Green when TP link on 1000Mbps. Lit Amber when TP link on 100Mbps. Off when TP link on 10Mbps.
PoE1	Green	Lit when RJ-45 (1,2),(3,6) pairs detect PD.
PoE2	Green	Lit when RJ-45 (4,5),(7,8) pairs detect PD.

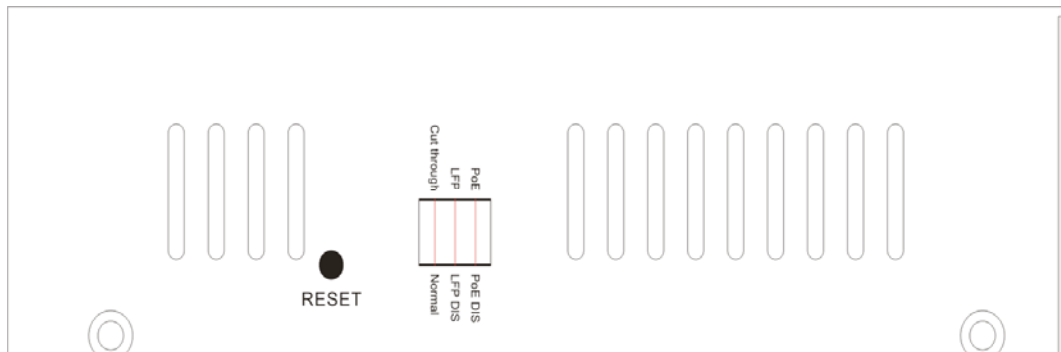
Network Interface

Port	Function
TP Port	10/100Base-TX Auto-Negotiation Auto-MDIX Flow control for Full-Duplex, backpressure for Half-Duplex
	1000Base-TX Auto-Negotiation Auto-MDIX only for Auto-Negotiation Flow control for Full-Duplex only
Fiber Port	1000Base-SX/LX (SC/LC) with NWay flow control Link partner must be 1000FDX with NWay flow control

Rear Panel



DIP switch



DIP Switch and Reset button

Before you make any changes to DIP switch settings, make sure that the power has been turned off. Or press the reset button after you change DIP switch 1 or 2 setting.

Switch	Function
DIP 1	Cut-Through Mode (default) or Normal Mode
DIP 2	LFP Enable (default) or Disable
DIP 3	PoE Enable (default) or Disable

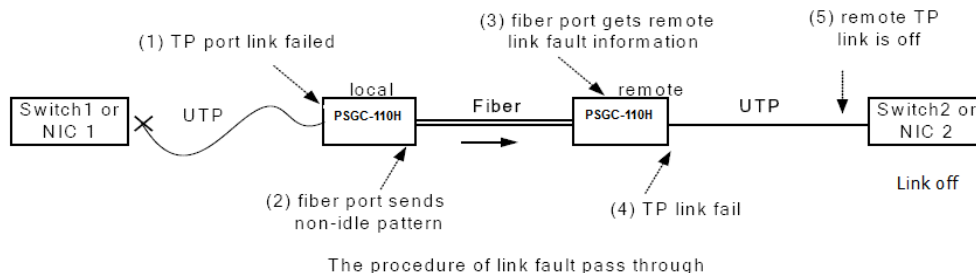
Cut-Through mode supports jumbo frames up to 9216 Bytes.

5. LFP and FEF function

The LFP (Link Fault Pass-through) allows the media converter to monitor both the fiber and copper RX ports for loss of signal. In case of a loss of RX signal on one media port, the converter will automatically disable the TX signal to the other media port, thus passing through the link fault. FEF (Far End Fault) enables the converter to stop sending link pulses to the link partner once a loss of the fiber RX signal is encountered. Then the link partner will synchronously stop sending data. FEF prevents loss of valuable data transmitted over an invalid link. Using LFP and FEF troubleshooting features of LPS530A-MM, both end devices can be notified of a loss of fiber link.

When link fault pass through function is enabled, link status on TX port will inform the FX port of the same device and vice versa. From the link fault pass through procedure illustrated in the figure on the next page, if link fail happens on TX port (1), the local FX port sends a non-idle pattern to the remote FX port (2). The remote FX port then forces its TX port to link failed after receiving the non-idle pattern (4). In other words, this mechanism will alert the link fault status of the local TX port to the remote converter's TX port, and the link status of the remote TX port will become off. Link status LED will also be off for both LPS530A-MM and its link partner.

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6. PoE Technology

Power over Ethernet or **PoE** technology describes a system to transfer electrical power, along with data, to remote devices over standard twisted-pair cable in an Ethernet network. This technology is useful for powering IP telephones, wireless LAN access points, network cameras, remote network switches, embedded computers, and other appliances where it would be inconvenient, expensive (mains wiring must often be done by qualified and/or licensed electricians for legal or insurance reasons), or infeasible to supply power separately. It doesn't require modifying your existing Ethernet cabling infrastructure.

IEEE 802.3af (Power over Ethernet), is the specification that allows the powering device to use a voltage between 44–57 VDC, though the nominal voltage is 48V, over two of the four available pairs on a CAT3/CAT5e cable with a selectable current of 10–350 mA subject to a maximum load power of 15.40W. Only about 12.95W are available after counting cable losses, and most switched power supplies will lose another 10–25% of the available power.

IEEE 802.3at (Max. PoE output power consumption up to 30W is an updated standard in progress referred to as PoE plus or 802.3at) that introduces increases available power. Numerous non-standard schemes were used prior to the PoE standard to provide Power over Ethernet cabling. Some are still in active use.

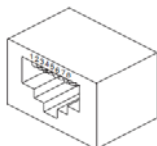
The standard describes two types of devices:

Power Sourcing Equipment(PSE) and Powered Devices(PD).
PSE provides power to the PD.

The PoE PSE+ converter may auto-detect PD and provide power via one of two valid four-wire connections. In each four-wire connection, the two conductors associated with a pair each carry the same nominal current in both magnitude and polarity. The following figure and the PSE pinout alternative table describe the valid alternatives.

PSE Pinout Alternative Table

Conductor	Alternative A (MDI-X)	Alternative B (All)
1	Negative V_{Port}	
2	Negative V_{Port}	
3	Positive V_{Port}	
4		Positive V_{Port}
5		Positive V_{Port}
6	Positive V_{Port}	
7		Negative V_{Port}
8		Negative V_{Port}



PD and PSE Eight-Pin Modular Jack (RJ-45)

7. Installation

- Power installation

Power requirement: 100–240 VAC, 50–60Hz

Connect to an AC power source with an AC power cord.

- Cabling Requirements

To help ensure a successful installation and keep the network performance good, make sure you use the required cable. Cables with worse specifications will cause the LAN to work poorly.

---Cabling Requirements for TP

The cable grade must be CAT5e that's up to 328 feet (100 meters) long.

---Cabling Requirements for FX

1000BASE-SX/LX networks only support full-duplex mode. The Switch-based Media Converter breaks up TP and Fiber segments' collision domain to extend the cabling distance.

Mode	Multi-Mode Fiber 62.5/125µm		Multi-Mode Fiber 50/125µm	
	Bandwidth MHz-Km	Distance	Bandwidth MHz-Km	Distance
1000SX (SC/LC) 850nm	160	220m	400	500m
	200	275m	500	550m
1000LX (SC/LC) 1310nm/ 1550nm	Single-Mode Fiber 9/125µm Single-Mode transceiver 1310nm: 10Km Single-Mode transceiver 1550nm: 30/50Km			

Note:

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

The following lists the types of fiber you should use. Cables not listed here are available upon request.

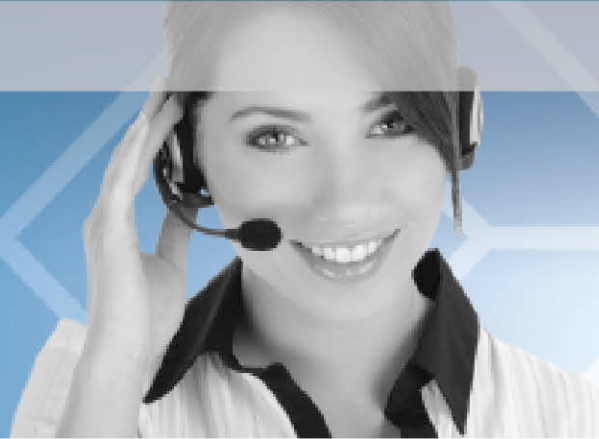
- ◆ Fiber (M-M): 50/125, 62.5/125, 100/140 µm (Supports distances up to 2 km)
- ◆ Fiber (S-M): 8.3/125, 8.7/125, 9/125, 10/125µm (Supports distances up to 100 km)

8. Technical Specifications

Feature	Detailed Description
Power Requirement	100–240 VAC, 50–60Hz
Power Consumption	35 W
Operating Temperature	0° to 40°C
Storage Temperature	-20° to 70°C
Humidity	5% to 90%
Dimensions	158(W) x 40(H) x 133(D) mm
Weight	0.44kg
Installation	Wall mount, Desktop
Complies with FCC Part 15 Class A and CE Mark	

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