

# **PSE-SW5G15B4HM**

## **5 Port PoE Switch & Extender**

### **(Repeat Ethernet and PoE)**

# **USER'S MANUAL**



MSTRONIC CO., LTD.

# 1. General Information

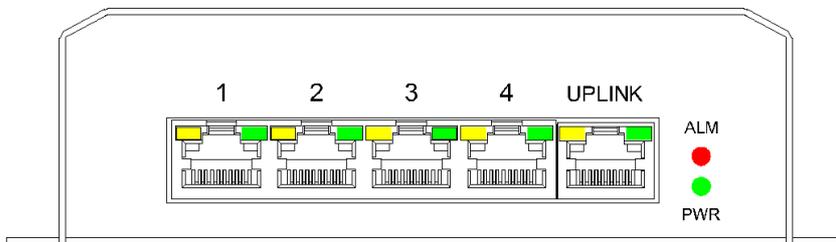
The fanless PSE-SW5G PoE (Power Over Ethernet) Extender provides four 10M/100M/1000M TX ports with PoE PSE function plus one 10M/100M/1000M TX up-link port with PoE PD function. It accepts power from PoE power sourcing equipment (PSE) and delivers power to PoE powered device (PD), which are compliant with IEEE802.3af and IEEE802.3at standard to receive and deliver both Ethernet data and DC power through the traditional UTP or STP cable. The PoE Switch can extend Ethernet data and DC power up to 200 meters when used as a PoE repeater.

# 2. Hardware Description

## \*LED Indicator

There are 12 LEDs on the PoE switch to indicate the status of power and signal. The following section describes the functions of each LED indicator.

Front panel detail



## \*POWER LED

LED	STATUS	Description
Power	Green	LED ON when power input (DC IN on rear panel or UPLINK on front panel) has valid power supplied.
	Off	No power supplied.

## \*SWITCH LED (the right indicator on RJ45)

LED	STATUS	Description
P1~P5 Link/Act	Green	A network device is detected (1000Mbps), but no communication activity is detected.
	Green Blinking	This port is transmitting to, or receiving package from another device at 1000Mbps.
	Yellow	A network device is detected (10Mbps or 100Mbps), but no communication activity is detected.
	Yellow Blinking	This port is transmitting to, or receiving package from another device at 10Mbps or 100Mbps.
	Off	No device is detected.

## \*PoE LED (the left indicator on RJ45)

P1~P4 PoE Out	Yellow	A valid Powered Device (PD) is detected and delivering power on this port.
	Off	No PD is detected on this port.
UPLINK (P5) PoE In	Yellow	Powered from another PoE, Powered via all 4 pairs.
	Yellow Blinking	Powered via 2 pairs, data pairs (pin 1,2,3,6) or spare pairs (pin 4,5,7,8) are all acceptable.
	Off	No power is detected on this port.

## \*Power wiring

The PoE switch allows to be powered by another PoE source on port 5 (UPLINK) and/or on rear terminal,

If powered on port 5 (UPLINK) as a PoE repeater, the PoE input must be 44~57VDC, the input current should not be over 2Amp.

Please note the green connector is capable of 12A max. If more current is required, use 4 pin DIN connector for up to 15A.

Model	Input Voltage (REAR)	Input Voltage (Port 5)	Output voltage
PSE-SW5G15B4HM	11-60VDC	No input	56VDC (regulated)
	No input	44-57VDC	44-57VDC (non-regulated)
	11-60VDC	44-57VDC	56VDC (regulated)

For PoE operation, total output may up to 35W (802.3at) x 4.

Ports 1~4 will deliver DC power over the Ethernet cable as detailed below:

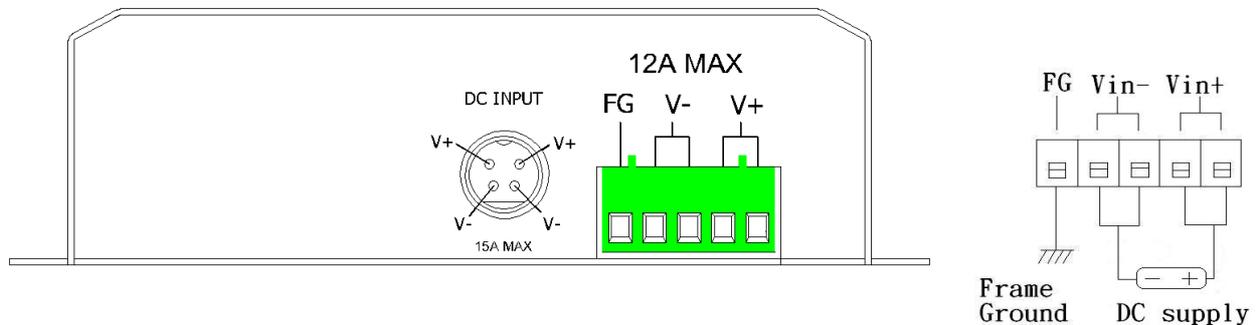
- \* Data pair A on line 1 and 2
- \* Data pair B on line 3 and 6
- \* Data pair C plus V+ on line 4 and 5
- \* Data pair D plus V- on line 7 and 8

Port 5 (UPLINK) may receive DC power over the Ethernet cable, as detailed below:

- \* Data pair A plus V+ /V- on line 1 and 2
- \* Data pair B plus V-/V+ on line 3 and 6
- \* Data pair C plus V+/V- on line 4 and 5
- \* Data pair D plus V-/V+ on line 7 and 8

The terminal block on the rear panel should be wired as detailed below, if the input voltage is in

11~16VDC, cause of heavy input current, please make sure the 4 input pins are all used.



The DIN-4P connector on the rear panel can be also used for power input, you can use an AC/DC adapter with DIN-4P connector directly, recommend adaptor MS-180-56. (OPTION)

When you connect both green connector and DIN 4P connector, the higher voltage source takes priority.

## \*Ethernet Port Wiring

The PoE switch family supports one RJ-45 uplink (port 5 with PoE PD) and four RJ-45 ports (port 1~4 with PoE PSE) with automatic MDI/MDI-X crossover, auto-sense for speed and duplex for 10Base-T, 100Base-TX or 1000Base-T connection. Automatic MDI/MDI-X crossover allows you to connect to other devices (switches, hubs, or workstations etc.), without regard to using straight-through or crossover cabling.

Port 1 to 4 provides Power over Ethernet function that delivers DC power through the data pairs C & D (pin 4,5 and pin 7,8) (mode B) to the PD. Port 5 provides PD function that receives power from 4 pairs or 2 pairs PoE.

The following tables describe the wiring diagram of straight-through and crossover cabling. The crossover cables simply cross-connect the transmit lines at each end to the receive lines at the opposite end.

Straight-through Cabling	
Pin 1	Pin 1
Pin 2	Pin 2
Pin 3	Pin 3
Pin 6	Pin 6
Pin 4	Pin 4
Pin 5	Pin 5
Pin 7	Pin 7
Pin 8	Pin 8

Cross-over Cabling	
Pin 1	Pin 3
Pin 2	Pin 6
Pin 3	Pin 1
Pin 6	Pin 2
Pin 4	Pin 7
Pin 5	Pin 8
Pin 7	Pin 4
Pin 8	Pin 5

Connect an Ethernet cable into any switch port and connect the other side to your attached device. The Link/Act LED (green or yellow) will light up when the cable is correctly connected. Refer to the **LED Indicator** section for descriptions of each LED indicator.

If a port LED is off, go back and check for connectivity problems between that port and the network device connected.

The maximum cable length for 10/100/1000BaseT with Cat 5 twisted pair cables is typically 100m (328 ft.).

## \*PD Port Wiring

Port 1 to 4 provides PoE injection function with maximum 35W ability to power up the powered device using the straight-through or cross-over Ethernet cable.

The PoE switch follows the IEEE802.3af/at Alternative B mode connector assignment. The following table shows pin assignment of alternative A and/or B for the Power Source Equipment.

Conductor	Alternative A (MDI-X)	Alternative A (MDI)	Alternative B (All)
1	Negative Vport	Positive Vport	
2	Negative Vport	Positive Vport	
3	Positive Vport	Negative port	
4			Positive Vport
5			Positive Vport
6	Positive Vport	NegativeVport	
7			Negative Vport
8			Negative Vport

Be sure the twisted pair cable is bound with the standard RJ-45 pin, especially the pins 4, 5, 7 and 8. If the RJ-45 is bound with the wrong pin number, the PoE switch will not recognize the PD and won't deliver DC power to the PD. The yellow PoE LED will light up when the cable is correctly connected. Refer to the **LED Indicator** section for descriptions of each LED indicator. If a port LED is off, go back and check for connectivity problems between that port and the network device connected.

### \*Network Application

The PoE Switch can receive power from a PoE midspan and provide power to the PD which follows the IEEE 802.3af/at standard in the network. The PoE Switch can be installed as a PoE+Ethernet repeater to extend Ethernet to 200 meters. The following figure is an example of a network application for the PoE Extender.

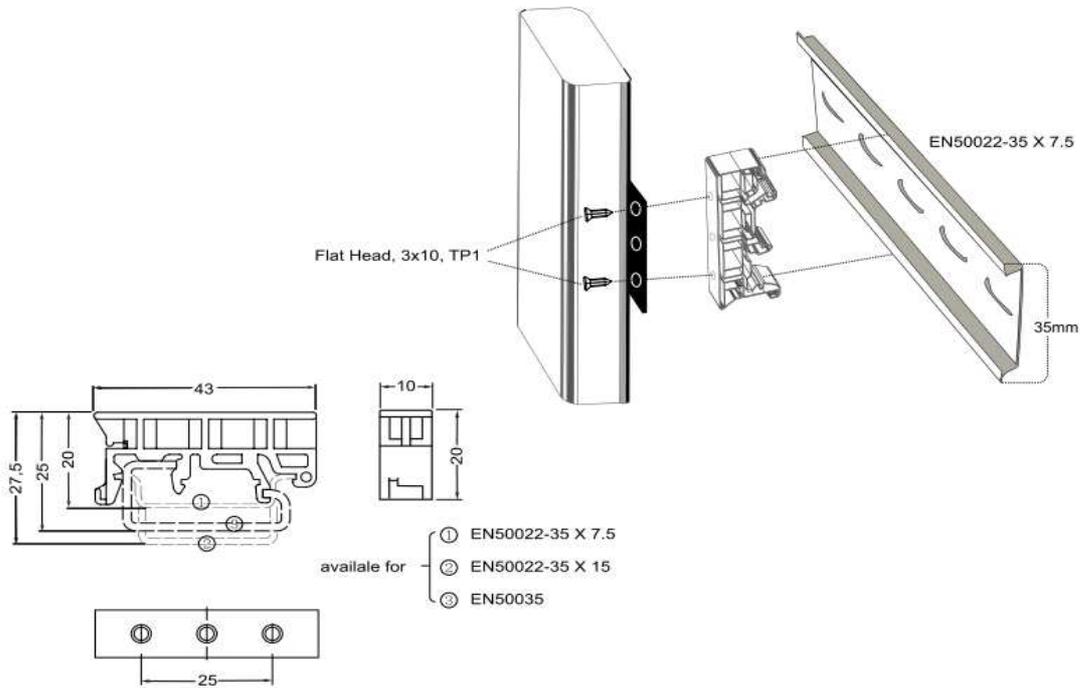


### 3. Technical Specifications

Standards	IEEE802.3/IEEE802.3u standards/IEEE802.3ab (10 base-T/100base-TX/1000base-T)
Ports	5 ports with PoE (4 PSE & 1 PD), support auto-crossover & auto-polarity
Transmission speed	1000Mbps (1000base-T).100 Mbps (100base-TX), 10 Mbps(10base-T) Auto-negotiation
Switch technology	store-and-forward
Protocols	CSMA/CD
Flow control	IEEE802.3x (full-duplex), back pressure (half-duplex)
Data transmission rate	1488000pps for1000base-T, 148800pps for 100base-T, 14880pps for 10base-T
Address table	2K MAC address table, self-learning
Connect	RJ-45
PoE port	Port 1-4, PSE auto power management  Pin assignment: data pair A (1,2), data pair B (3,6), data pair C plus V+(4,5), data pair D plus V-(7,8)  Port 5, 4 pairs PD
Maximum PoE power	Port 1-4: IEEE802.3at – 35W/port <b>Total power – 140W</b>

Port 5: 90W (802.3at 2 event classification) **INPUT**  
Current limited – 2A

PSE disconnect mode	DC disconnect						
PoE auto detection	IEEE802.3af & IEEE802.3at (2 event classification signaling)						
PoE protection	Over-temperature, over-current, over/under voltage						
LEDs	*Link/Activity (Green ON/ Green Blinking @1000Mbps, Yellow/Yellow Blinking @10M/100Mbps)  *PoE (Yellow) port 1-4 ON - PD detect Port 5 ON – 4 pair power, Blinking-2 pair power *POWER Green-normal, Red-alarm						
Power input	PoE source on Port 5 (UPLINK), and/or optional DC power supply on rear terminal. It with input low voltage protection, if input voltage lower than 9.4V, the unit will be shut down.						
Power consumption	less than 5W when without PD loading						
	<table border="1"> <thead> <tr> <th>Input</th> <th>PSE-SW5G15B4HM</th> </tr> </thead> <tbody> <tr> <td>12V</td> <td>0.23A/3.9W</td> </tr> <tr> <td>24V</td> <td>0.17A/2.7W</td> </tr> </tbody> </table>	Input	PSE-SW5G15B4HM	12V	0.23A/3.9W	24V	0.17A/2.7W
Input	PSE-SW5G15B4HM						
12V	0.23A/3.9W						
24V	0.17A/2.7W						
Power efficiency	85% at full load (@24V typical)						
Operating temperature	-40°C ~ +70°C						
Operation humidity	90% relative humidity, non-condensing with conformal coating						
Storage temperature	-40°C ~ +85°C						
Dimension	40mm(H)x139mm(W)x147mm(D) DIN RAIL Mountable						



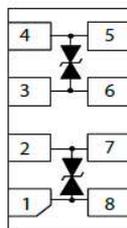
### Surge Protection on data pairs



#### Description

The SP3312T integrates 4 channels (2 differential pair) of low capacitance diodes to protect sensitive I/O pins against lightning induced surge events and ESD. This robust device can safely absorb up to 15A per IEC 61000-4-5 2nd Edition ( $t_p=8/20\mu s$ ) without performance degradation and a minimum  $\pm 30kV$  ESD per IEC 61000-4-2 international standard. The low loading capacitance makes the SP3312T ideal for protecting high-speed signal pins.

#### Pinout



#### Features

- ESD, IEC 61000-4-2,  $\pm 30kV$  contact,  $\pm 30kV$  air
- EFT, IEC 61000-4-4, 40A ( $t_p=5/50ns$ )
- Lightning, IEC 61000-4-5 2nd Edition, 15A ( $t_p=8/20\mu s$ )
- Low capacitance of 1.3pF (TYP) per I/O
- Low leakage current of 0.01 $\mu A$  (TYP) at 3.3V
- Low variation in capacitance vs. bias voltage: 0.3pF Typical ( $V_R=0$  to 2.5V)
- AEC-Q101 qualified
- Moisture Sensitivity Level (MSL-1)