TP-SW5G(-NC)

5 port PoE Endspan (Switch)

(Extend Ethernet and PoE)

TYCON POWER SYSTEMS

1. General Information

The PoE (Power Over Ethernet) Switch family provide four 10M/100M/1000M TX ports with PoE PSE function plus one 10M/100M/1000M TX up-link port with PoE PD function. It allows power souring equipment (PSE) to be powered from PoE and deliver power to PoE powered device (PD), which are compliant with IEEE802.3af and IEEE802.3at standard to receiver 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. This manual will help you install and maintain the PoE switch. Installation of the PoE switch is very easy and you can start to use the product as soon as you are powered up.

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 Port 5 (UPLINK) on front panel) has valid power supplied.
	Red	The indicator is only used on TP-SW5G-NC, LED ON when the following warning condition happens. *Power input under voltage (Vin<10V) *Power input over voltage (Vin>59V) *PoE over current (2A/per port) the indicator is unused on TP-SW5G/TP-SW5G24
	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	Yellow	A valid Powered Device (PD) is detected and delivering power on this port.
	Off	No PD is detected on this port.
P5 (UPLINK) PoE	Yellow	TP-SW5G&TP-SW5G24: Powered via all 4 data pairs. TP-SW5G-NC: power via another PoE(2 data pairs or 4 data pairs)
	Yellow Blanking	TP-SW5G&TP-SW5G24: Powered via 2 data pairs. (1,2,3,6 or 4,5,7,8 are all acceptable). TP-SW5G-NC::unused.
	Off	No power is detected on this port.

*Power wiring

The PoE switch family includes 3 models, be used for 3 different ranges of input voltage:

full range voltage (12 to 57VDC) (P/N: TP-SW5G-NC)
24VDC typical (12 to 36VDC) (P/N: TP-SW5G24)
48VDC typical (40 to 57VDC) (P/N: TP-SW5G)

The PoE switch family allow powered by another PoE source on port 5 (UPLINK) as a PoE repeater or extender. For TP-SW5G/TP-SW5G24 is 42.5~57VDC, for TP-SW5G-NC is 12~57VDC.

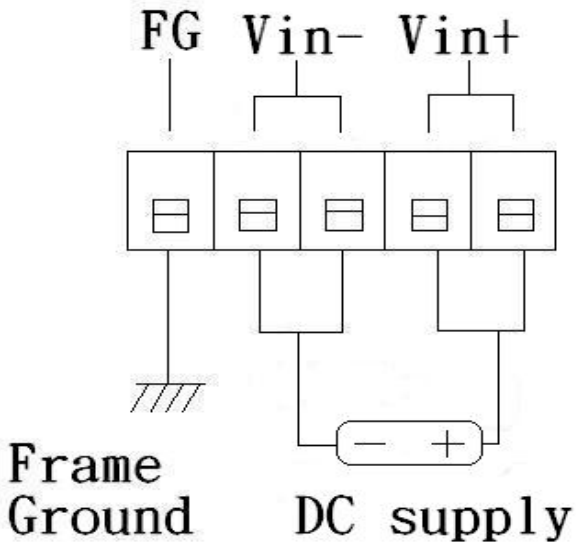
For PoE operation, make sure your power supply may offer at least 75W for 4x 802.3af PoE port, or 150W for 4x 802.3at PoE port.

If powered via the rear terminal, please make sure the input current is not over 10A. If powered on port 5, make sure the input current is not over 1Amp.

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 may get 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:



*For TP-SW5G24
Please note that the maximum power per port of 35W can only be achieved using 24VDC input operation. If your input is 12VDC, then the total power per port should be de-rated to 17W per port.
Total output of TP-SW5G24 is 35W(802.3at) x2 or 17W (802.3af) x 4.

*For TP-SW5G
The input voltage must be in the range of 44 to 57VDC if running for 802.3af operation.
The input voltage must be in the range of 50 to 57VDC if running for 802.3at operation.
If the TP-SW5G is not powered with the above designated input voltage, it will only function as an Ethernet switch without PoE output.

Model	Input Voltage (REAR)	Input Voltage (Port 5)	Output voltage	802.3af/at	Isolated
TP-SW5G-NC	12-57VDC	No input	12-57VDC (As input voltage) (non-regulated)	No	No
	No input	12-57VDC	12-57VDC (non-regulated)	No	No
	12-57VDC	12-57VDC	Higher voltage output (REAR or Port 5)	No	No
TP-SW5G24	12-36VDC	No input	56VDC (regulated)	Yes	No
	No input	42.5-57VDC	42.5-57VDC (non-regulated)	Yes	No
	12-36VDC	42.5-57VDC	56VDC (regulated)	Yes	No
TP-SW5G	40-57VDC	No input	40-57VDC (non-regulated)	Yes	No
	No input	42.5-57VDC	42.5-57VDC (non-regulated)	Yes	No
	40-57VDC	42.5-57VDC	Higher voltage output (REAR or Port5)	Yes	No

You can use the TP-SW5G(NC) series with our adaptor products as detailed below: (OPTION)

	PSHP-18	PSHP-24	PSHP-48
Maximum output	18VDC/7.5A	24VDC/6.25A	48VDC/3.125A
Related model	TP-SW5G-NC TP-SW5G24	TP-SW5G-NC TP-SW5G24	TP-SW5G-NC TP-SW5G

*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 (pair 4,5 and pair7,8) to the PD. Port 5 provides Power Device function that receive power from 4 pairs or 2 pairs Ethernet cable.

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 Alternative B mode connector assignment. The following table shows pin assignment of alternative A and B for the Power Source Equipment.

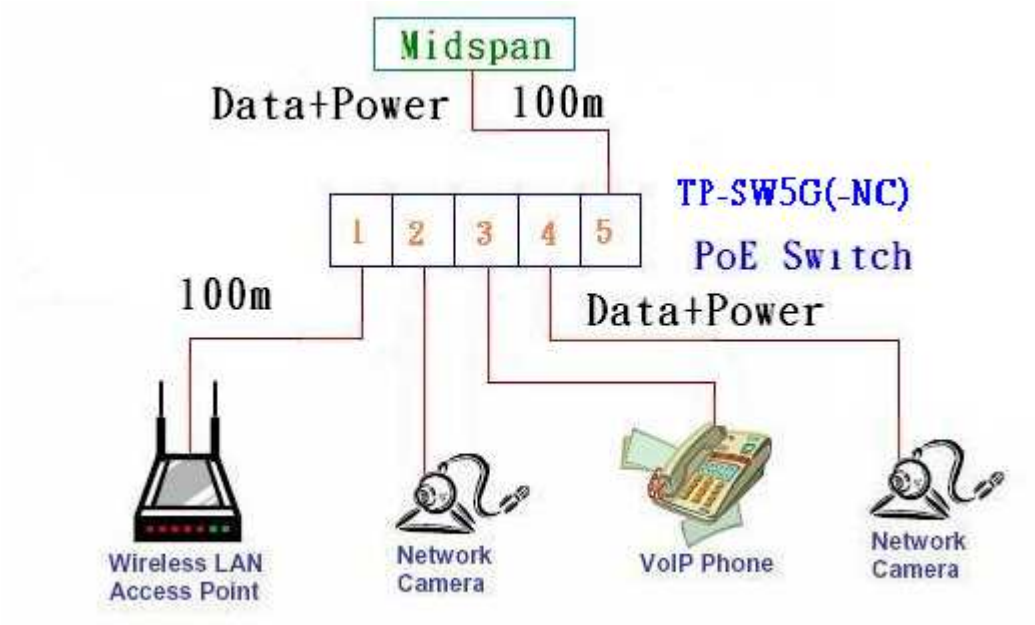
Conductor	**Alternative A (MDI-X)**	**Alternative A (MDI)**	**Alternative B (All)**
1	Negative Vport	Positive Vport	
2	Negative Vport	Positive Vport	
3	Positive Vport	Negative port	
4			Positive Vport
5			Positive Vport
6	Positive Vport	NegativeVport	
7			Negative Vport
8			Negative Vport

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 in a more appropriate position for better performance to extend Ethernet to 200 meters. The following figure is an example of a network application for the PoE Switch.

(TP-SW5G-NC added the repeater function since S/N 128000001ARC01)



3. Model Information

Model	Input Voltage (REAR)	Input Voltage (Port 5)	Output voltage	802.3af/at	Isolated
TP-SW5G-NC	12-57VDC	12-57VDC	12-57VDC (non-regulated)	No	No
TP-SW5G24	12-36VDC	42.5-57VDC	56VDC (regulated)	Yes	No
TP-SW5G	40-57VDC	42.5-57VDC	40-57VDC (non-regulated)	Yes	No

AC/DC Adapter (Option)

	PSHP-18	PSHP-24	PSHP-48
Maximum output	18VDC/7.5A	24VDC/6.25A	48VDC/3.125A
Related model	TP-SW5G-NC TP-SW5G24	TP-SW5G-NC TP-SW5G24	TP-SW5G-NC TP-SW5G

4. 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	1K 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: IEEE802.3af – 16.8W IEEE802.3at – 35W Current limited – 1A, total 4A maximum (Total power for TP-SW5G24 – 70W) Port 5: 90W (802.3at 2 event classification) Current limited – 1A
TP 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 TP-SW5G & TP-SW5G24
ON – 4 pair power, Blinking-2 pair power
TP-SW5G-NC ON – 2 or 4 pair power
*POWER Green-normal, Red-alarm

Power input Port 5 from network switch or midspan, or optional DC power supply
(see detail on page 7)

Power consumption less than 5W when without PD loading

Input	TP-SW5G-NC	TP-SW5G24	TP-SW5G
12V	0.190A	0.340A	0.190A
24V	0.104A	0.170A	0.104A
48V	0.061A	0.073A	0.061A
56V	0.056A	0.061A	0.056A

Power efficiency 85% at full load (@48V typical)

Operating temperature -20℃~ +75℃

Operation humidity 90% relative humidity, non-condensing

Storage temperature -40℃~+85℃

Dimension 40mm(H)x118mm(W)x150mm(D) DIN RAIL Mountable

Surge Protection on signal pairs

	Signal
Operating Voltage	Data 5V
Clamping Voltage	Data 16.5V (@I PP =5A, t p =8/20μs, I/O pin to GND)
Peak Pulse Current	20A (tp=8/20μs)

Pin Protected	All 8 pin protected
Max. Shut Capacitance	<3pF (VR = 0V, f = 1MHz, I/O pin to GND) < 1.5 pF (VR = 0V, f = 1MHz, Between I/O pins)
IEC COMPATIBILITY (EN61000-4)	IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact) IEC61000-4-4 (EFT) 40A (5/50ns) IEC61000-4-5 (Lightning) 20A (8/20μs)