Lantech

User Manual (Hardware)

T(P)GS-3216MGT
T(P)ES-3216MGT
T(P)ES-3212MGT
T(P)ES-3414T

L2+ Vehicle and EN50155 NAT router switch

V1.03

FEB. 2026

RP-001-31

Notice

Only 24VDC input system is applicable for E-mark approval.

The unmanaged PoE Ethernet switch is equipped with P.S.E capacity. It is designed for data communication within vehicles, to facilitate data transfer and Ethernet connectivity as well as expandability. It's important to note that these features have no impact on the safety of driving and passenger well-being and the device does not possess any immunity-related functionalities.

Approval Information

Version 1.03	Name	Title	Date
Author	Greg Tsai	Marketing	2026.02.06
Verifier	Jacky Chou	HW QA	2026.02.06
Approver	Thomas Lee	RD head	2026.02.06

Version	Date	Content of Modification	Author(s)
V1.00	2025.09.04		Greg Tsai
V1.01	2025.10.28	Added unit conversion to torque guideline: 14 kgf·cm ≈ 1.4 N·m..	Alice Huang
V1.02	2026.02.03	Added the power pin assignment of the IGN model; Updated the front panel drawings; Added the push-pull installation; T(P)GS-3216MGT is added; Updated the dimension drawings (inner lock push pull); Updated the power input range; Removed the WEB models	Greg Tsai
V1.03	2026.02.06	Add bypass section	Greg Tsai

Recommendation for Shielded network cables

STP cables have additional shielding material that is used to reduce external interference. The shield also reduces emissions at any point in the path of the cable. Our recommendation is to deploy an STP network cable in demanding electrical environments. Examples of demanding indoor environments are where the network cable is located in parallel with electrical mains supply cables or where large inductive loads such as motors or contactors are in close vicinity to the camera or its cable. It is also mandatory to use an STP cable where a power device (like an IP camera) is used outdoors or where the network cable is routed outdoors.

Important Notice

Lantech Communications Global, Inc. reserves the right to modify the equipment, its specification or this manual without prior notice, in the interest of improving performance, reliability, or servicing. At the time of publication all data is correct for the operation of the equipment at the voltage and/or temperature referred to. Performance *d*ata indicates typical values related to the particular product.

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Interference Issues

This Equipment has been tested and has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial or industrial installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions.

FCC Warning

This Equipment has been tested and found to comply with the limits for a Class-A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **Reorient or relocate the receiving antenna.**
- **Increase the separation between the equipment and receiver.**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- **Consult the dealer or an experienced radio/TV technician for help.**

CE Mark Warning

This is a 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.

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Chapter 1 Hardware Description

Lantech 3216MGT/3212MGT/3414T are high performance OS2PRO IP54/IP67 industrial NAT router switches by M12 connectors which provides L2 wire speed and advanced security function for connecting PD network.

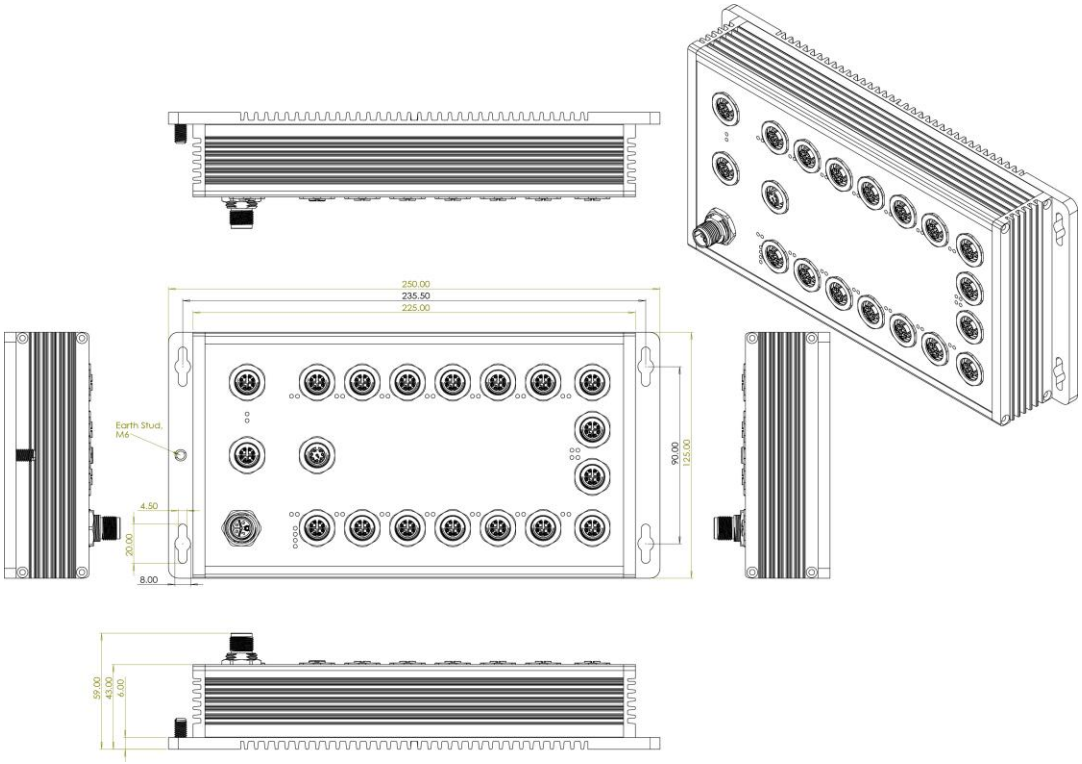
In this paragraph, it will describe the router switch's hardware spec, port, cabling information, and wiring installation.

Model name	10/100TX	10/100/1000T	1G/2.5G	PoE at/af	Ignition
TPGS-3216MGT		16	2	16	Y (IGN model)
TGS-3216MGT		16	2		Y (IGN model)
TPES-3216MGT	16		2	16	Y (IGN model)
TES-3216MGT	16		2		Y (IGN model)
TPES-3212MGT	12		2	8 or 12	Y (IGN model)
TES-3212MGT	12		2		Y (IGN model)
TPES-3414T	14	4		16	Y (IGN model)
TES-3414T	14	4			Y (IGN model)

1.1 Physical Dimension

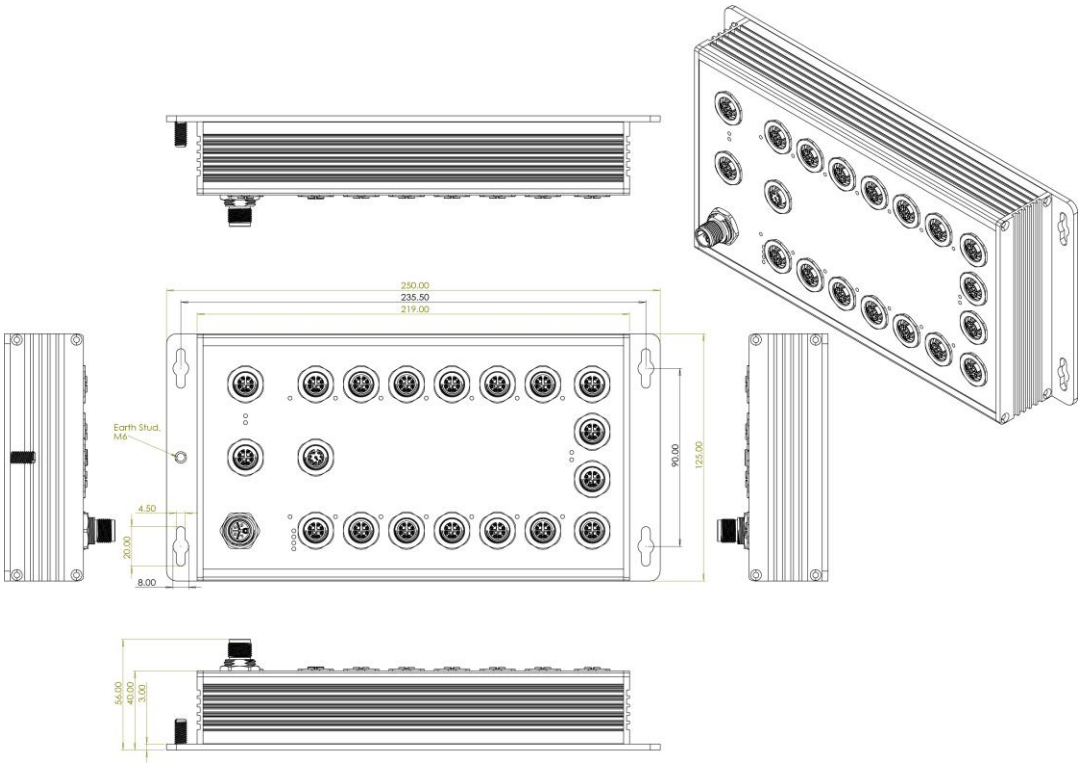
TPGS-3216MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x59mm(D)



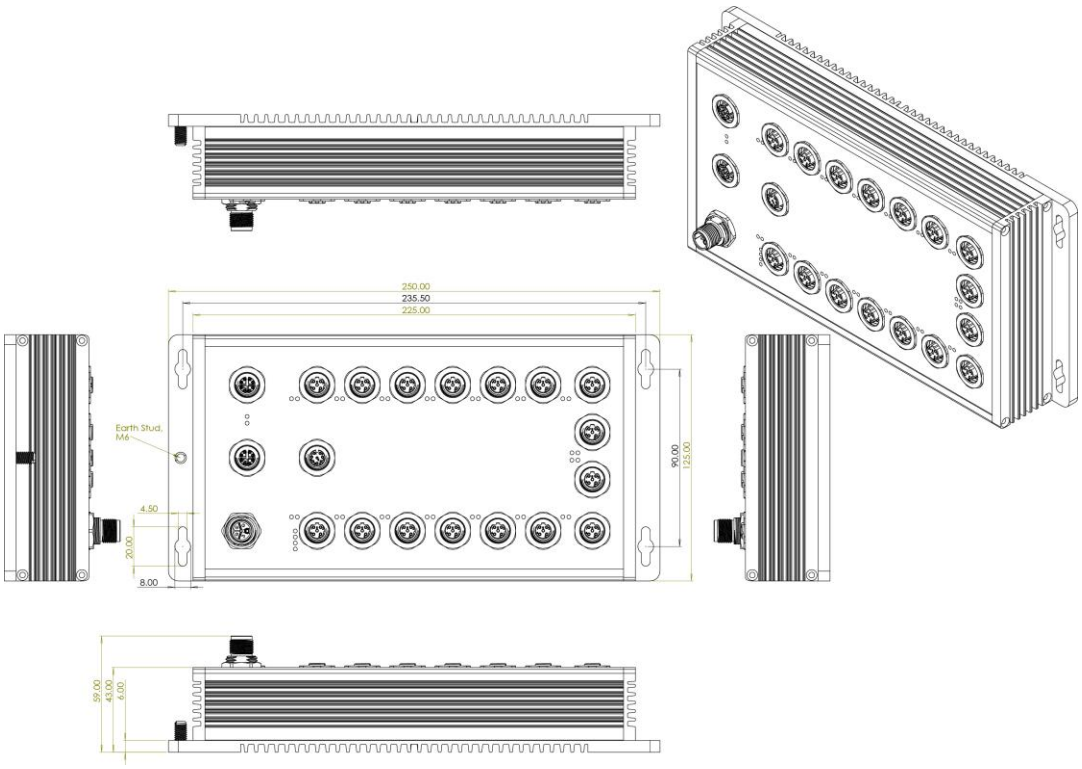
TGS-3216MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x56mm(D)



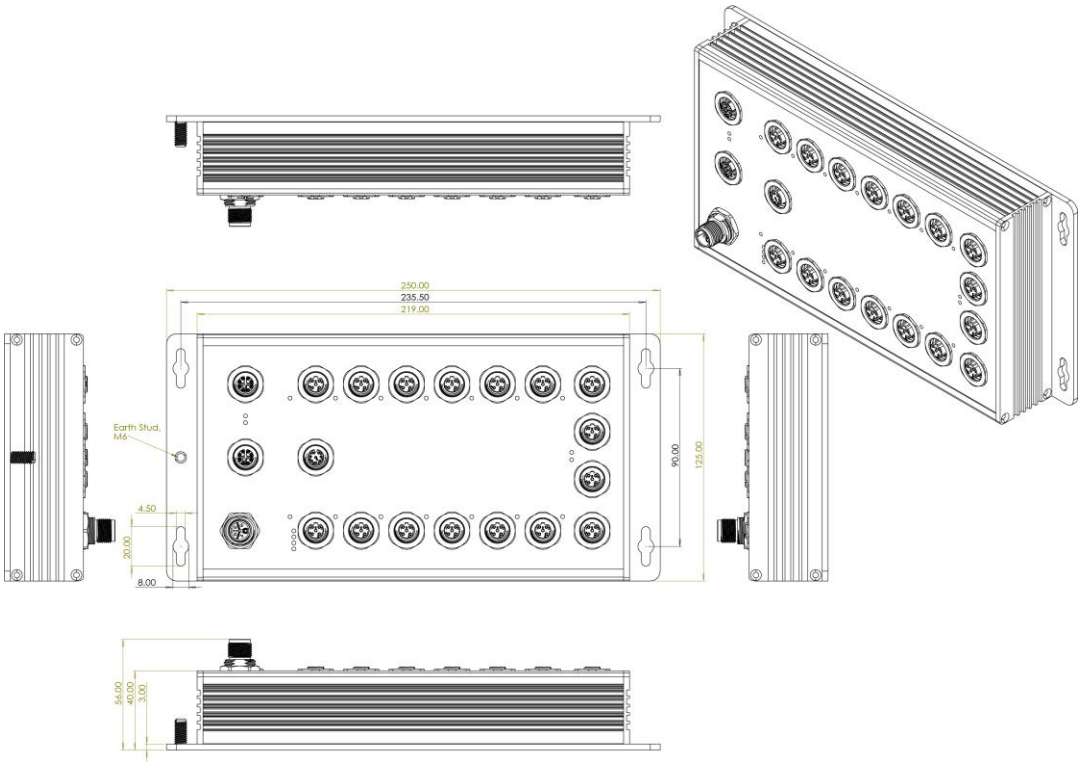
TPES-3216MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x59mm(D)



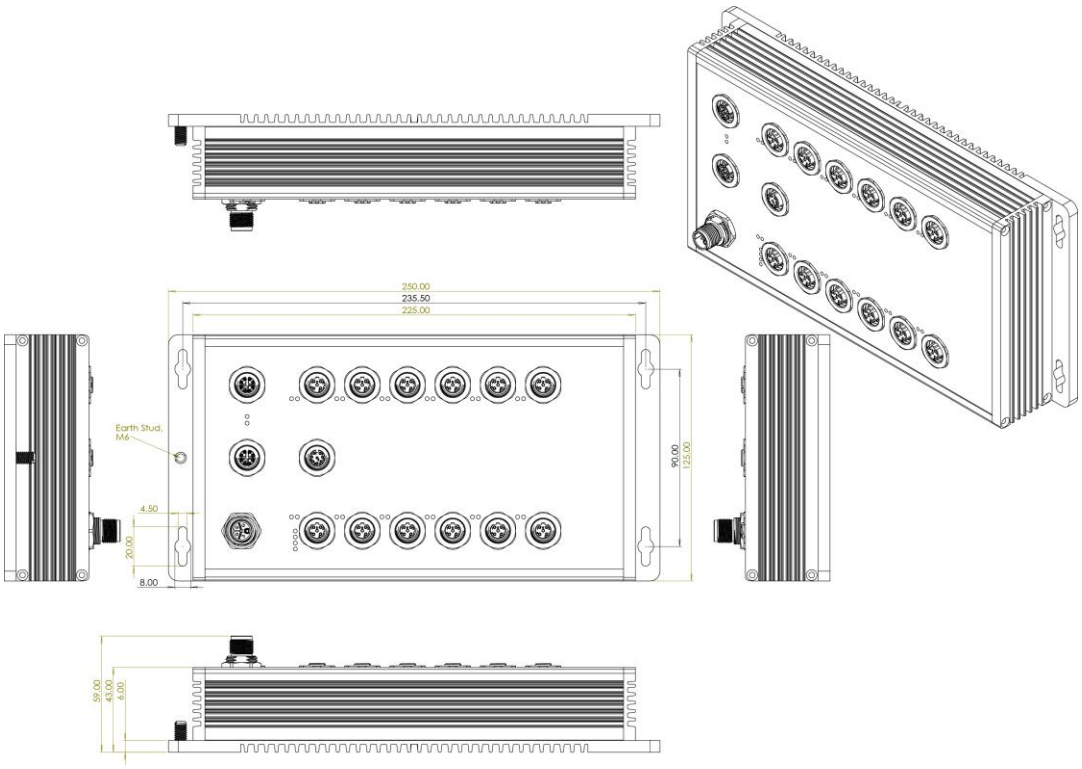
TES-3216MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x56mm(D)



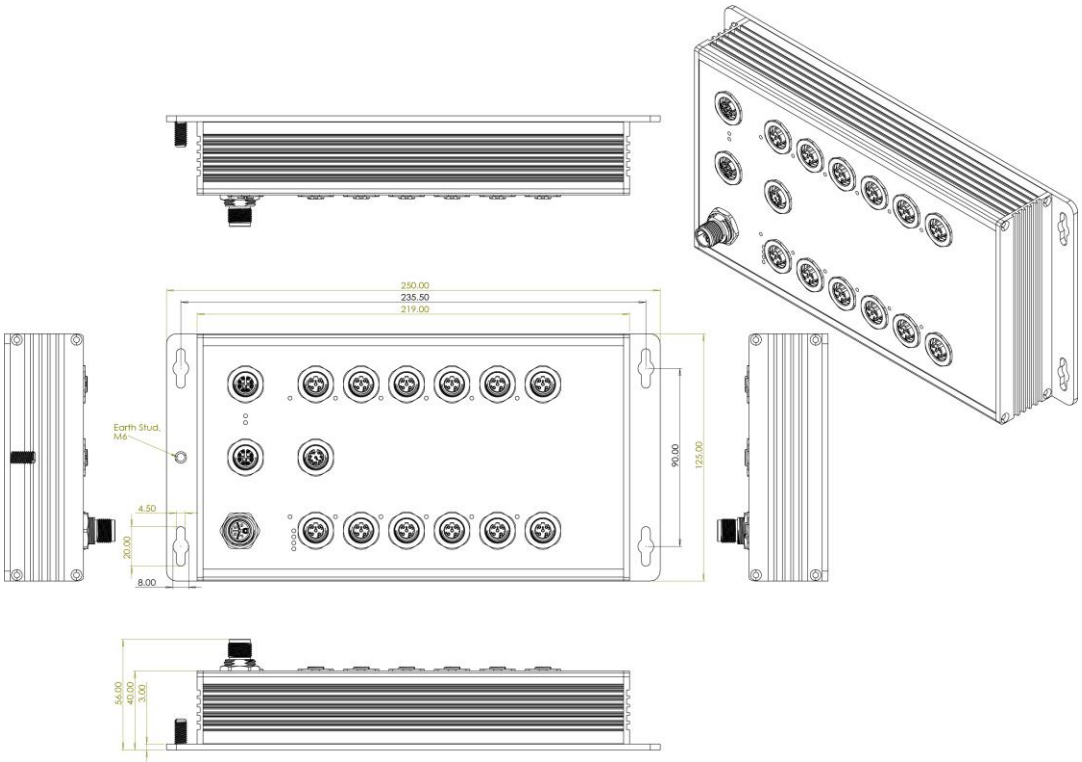
TPES-3212MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x59mm(D)



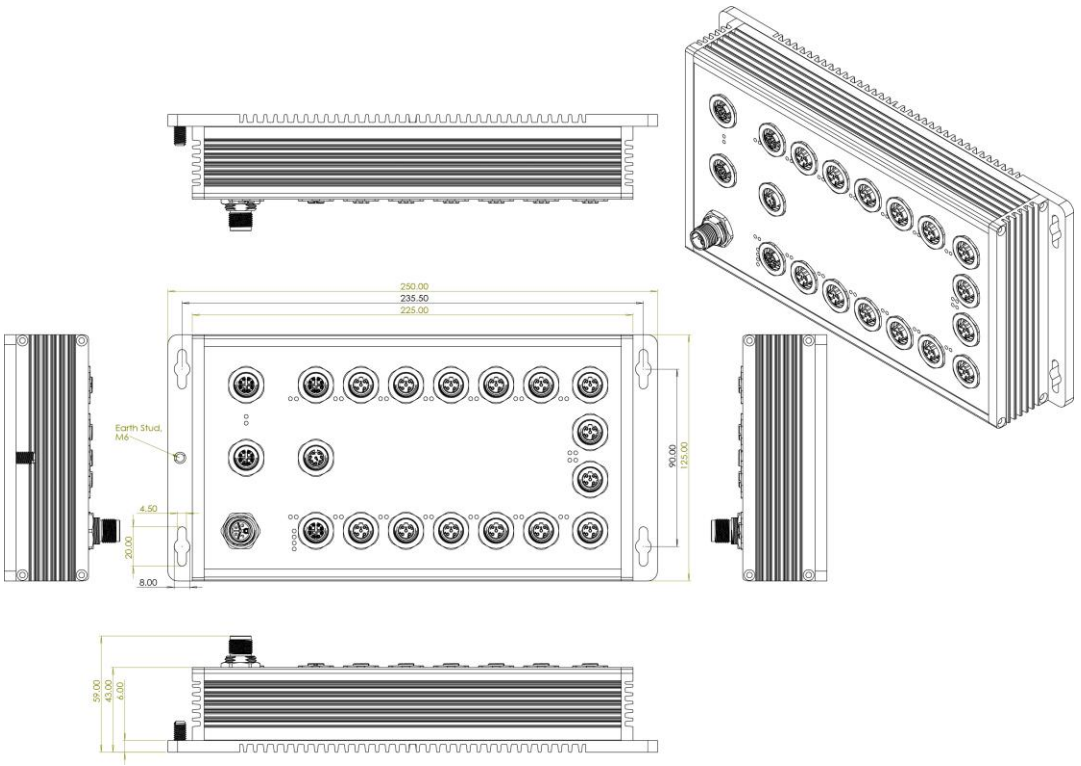
TES-3212MGT

Aluminum case. IP67/54, 250mm(W)x125mm(H)x56mm(D)



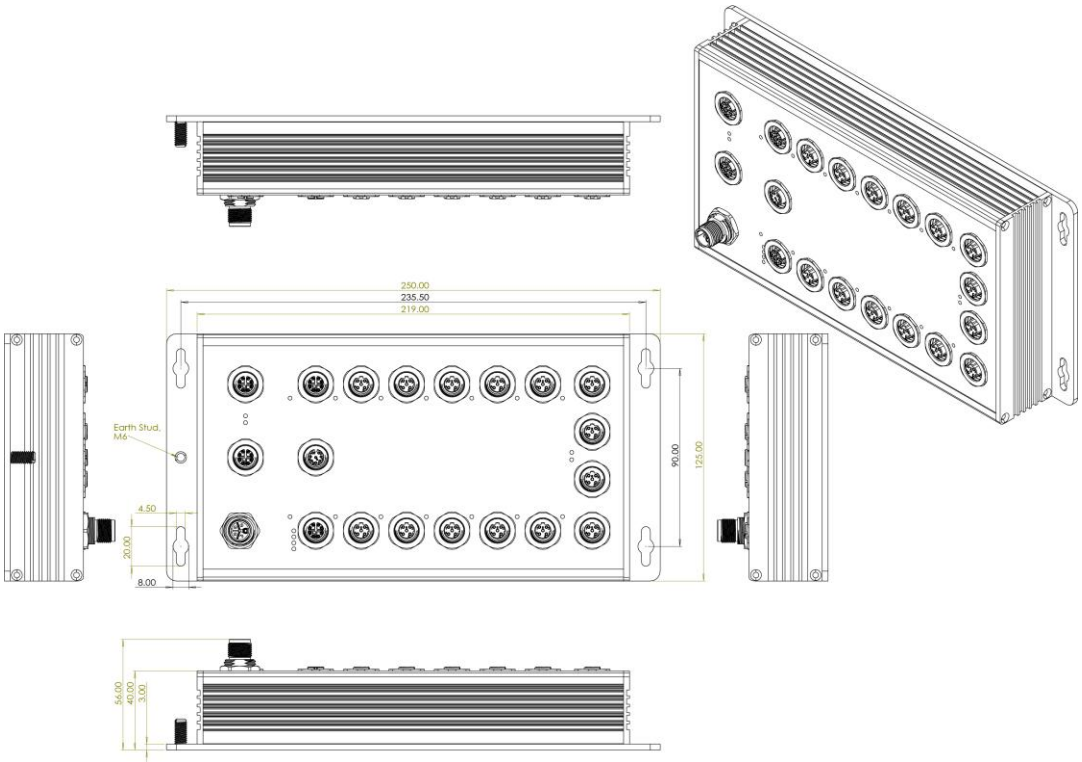
TPES-3414T

Aluminum case. IP67/54, 250mm(W)x125mm(H)x59mm(D)

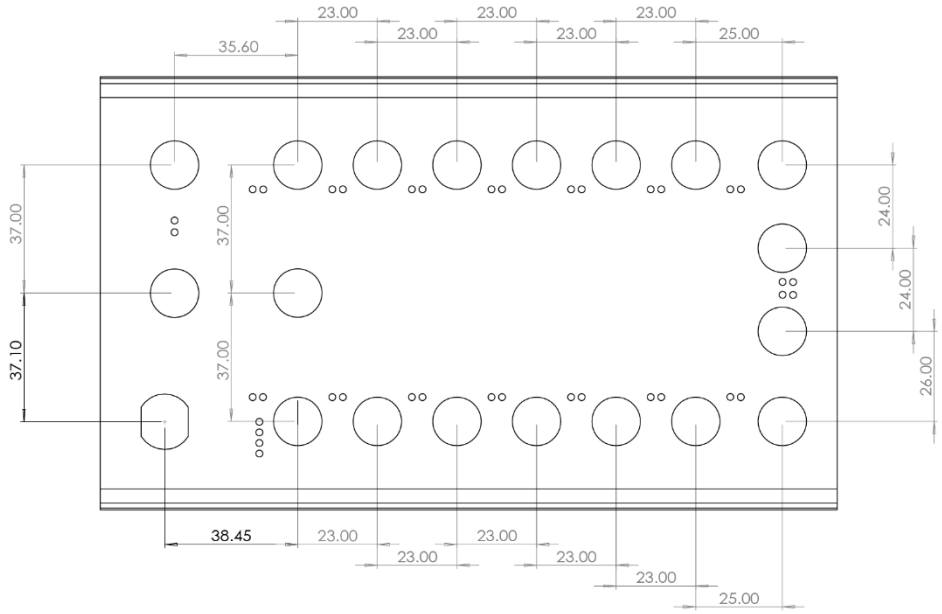


TES-3414T

Aluminum case. IP67/54, 250mm(W)x125mm(H)x56mm(D)



Distance between ports

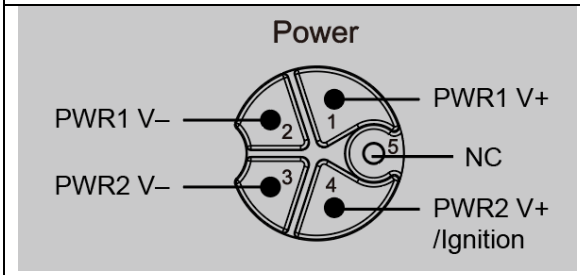
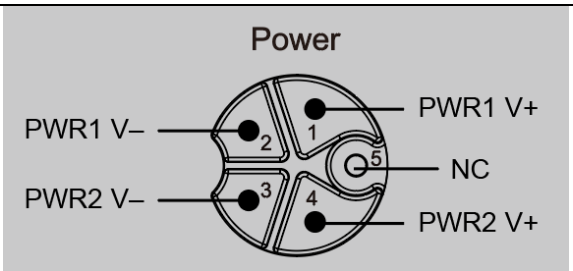


1.2 Package Content:

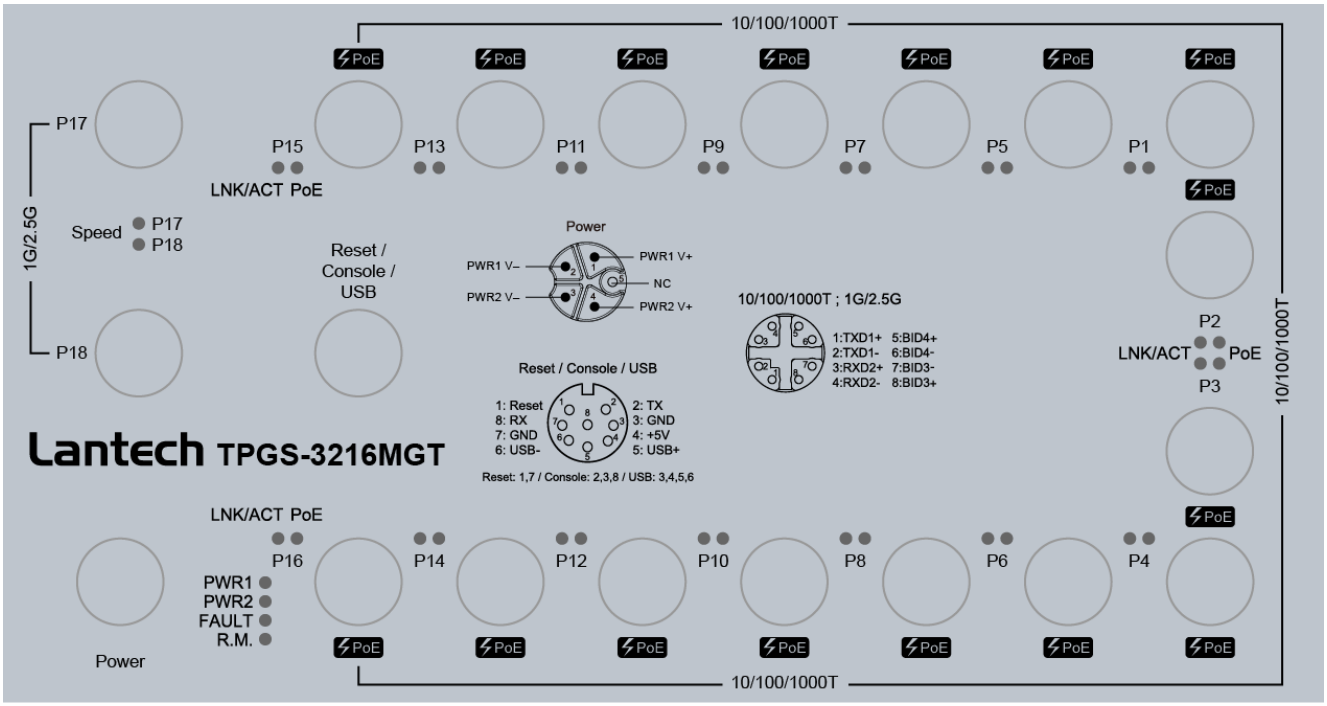
- **Product (Router Switch)**

1.3 Front Panel

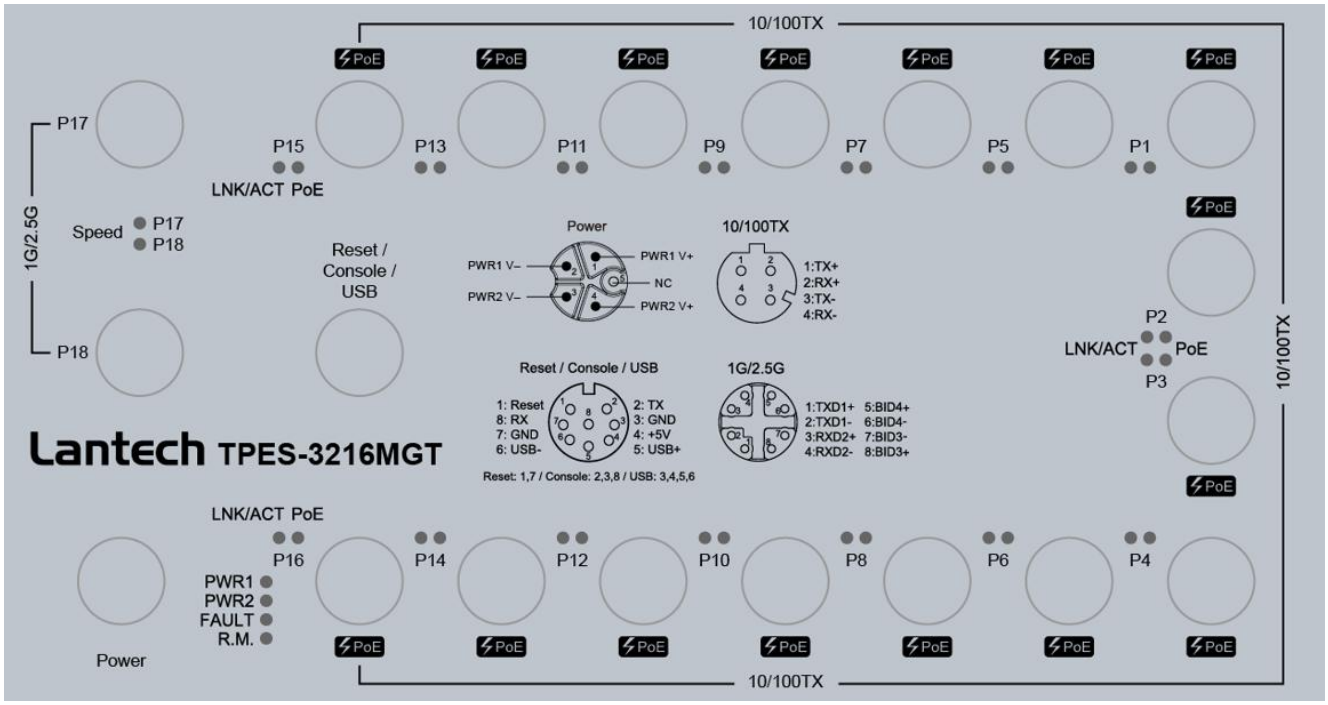
Please note that the power pin assignment may differ between the IGN and non-IGN models.

IGN models	Non IGN models
	

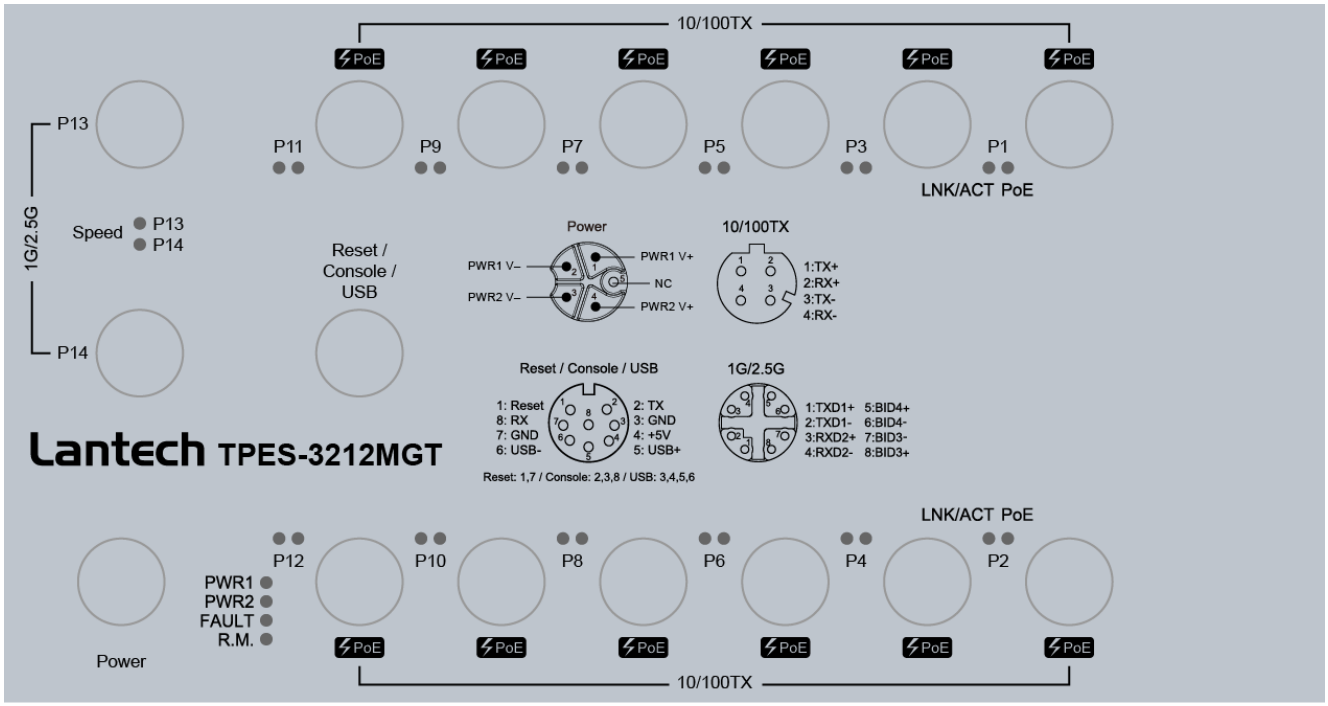
TPGS-3216MGT (For non-PoE model, there will be no PoE LED and PoE icon)



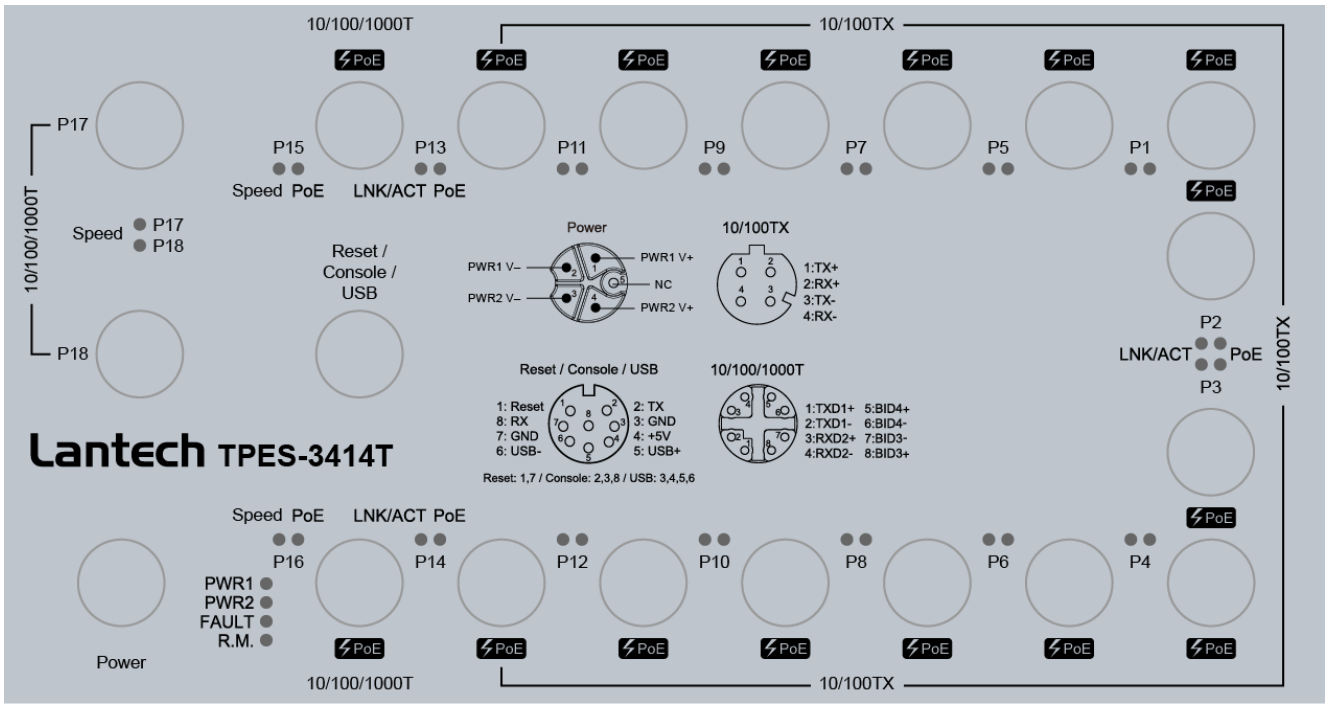
TPES-3216MGT (For non-PoE model, there will be no PoE LED and PoE icon)



TPES-3212MGT (For non-PoE model, there will be no PoE LED and PoE icon)



TPES-3414T (For non-PoE model, there will be no PoE LED and PoE icon)



1.4 IP Protection

The IP Code, Ingress Protection Rating, sometimes also interpreted as International Protection Rating, classifies and rates the degree of protection provided against the intrusion (including body parts such as hands and fingers), dust, accidental contact, and water in *mechanical casings* and with electrical enclosures. It is published by the International Electrotechnical Commission (IEC)

Solid particle protection

The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.

Level	Object size protected against	Effective against
0	—	No protection against contact and ingress of objects
1	>50 mm	Any large surface of the body, such as the back of a hand, but no protection against deliberate contact with a body part
2	>12.5 mm	Fingers or similar objects
3	>2.5 mm	Tools, thick wires, etc.
4	>1 mm	Most wires, screws, etc.
5	Dust protected	Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment; complete protection against contact
6	Dust tight	No ingress of dust; complete protection against contact

Liquid ingress protection

The second digit indicates the level of protection that the enclosure provides against harmful ingress of water.

Level	Protected against	Testing for	Details
0	Not protected	—	—
1	Dripping water	Dripping water (vertically falling drops) shall have no harmful effect.	Test duration: 10 minutes Water equivalent to 1 mm rainfall per minute
2	Dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at an angle up to 15° from its normal position.	Test duration: 10 minutes Water equivalent to 3 mm rainfall per minute
3	Spraying water	Water falling as a spray at any angle up to 60° from the vertical shall have no harmful effect.	Test duration: 5 minutes Water volume: 0.7 litres per minute Pressure: 80–100 kPa
4	Splashing of water	Water splashing against the enclosure from any direction shall have no harmful effect.	Test duration: 5 minutes Water volume: 10 litres per minute Pressure: 80–100 kPa

5	**Water jets**	**Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects.**	**Test duration: at least 15 minutes** **Water volume: 12.5 litres per minute** **Pressure: 30 kPa at distance of 3 m**
6	**Powerful water jets**	**Water projected in powerful jets (12.5 mm nozzle) against the enclosure from any direction shall have no harmful effects.**	**Test duration: at least 3 minutes** **Water volume: 100 litres per minute** **Pressure: 100 kPa at distance of 3 m**
7	**Immersion up to 1 m**	**Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion).**	**Test duration: 30 minutes** **Immersion at depth of at least 1 m measured at bottom of device, and at least 15 cm measured at top of device**
8	**Immersion beyond 1 m**	**The equipment is suitable for continuous immersion in water under conditions which shall be specified by the manufacturer. Normally, this will mean that the equipment is hermetically sealed. However, with certain types of equipment, it can mean that water can**	**Test duration: continuous immersion in water** **Depth specified by manufacturer**

		enter but only in such a manner that it produces no harmful effects.	
9	Powerful high temperature water jets	Protected against close-range high pressure, high temperature spray downs.	—

1.5 LED Indicators

The diagnostic LEDs that provide real-time information of system and optional status are located on the front panel of the industrial switch. The following table provides the description of the LED status and their meanings for the switch.

LED	Color	Status	Meaning
R.M	Green	On	The switch unit is owner switch of ITU-Ring
		Off	The switch is not owner switch
PWR1	Green	On	Power 1 is active
		Off	Power 1 is inactive
PWR2	Green	On	Power 2 is active
		Off	Power 2 is inactive
FAULT	Red	On	Power or port failure
		Off	No failure
Link/Act	Green	On	A network device is detected.
		Blinking	The port is transmitting or receiving packets from the TX device.
		Off	No device attached
PoE	Green	On	The port is operating in PoE mode.

(PoE model)		**Off**	**The port is not operating in PoE mode.**
Speed	**Green / Orange**	**Green**	**A network device is detected.**
		Blinking	**The port is transmitting or receiving packets from the TX device.**
		Orange	**Connected to network at speed of 1000Mbps (for 3414T)** **Connected to network at speed of 2.5G (for 3216MGT and 3212MGT)**
		Off	**No device attached**

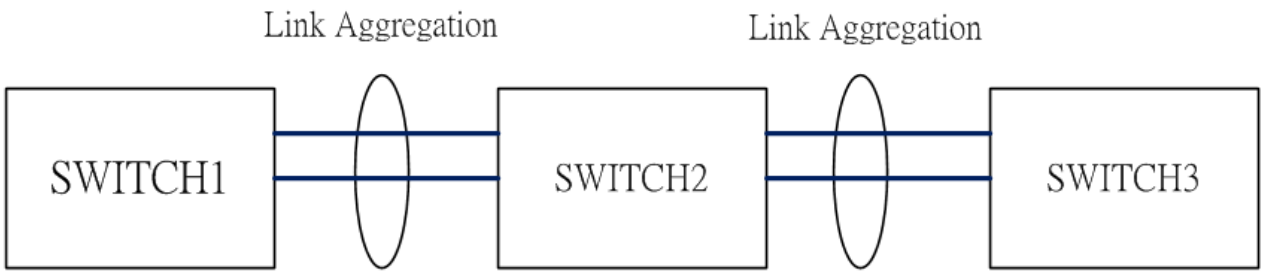
1.6 Bypass design

(Available on -BT/-BBT models; Maximum copper uplink by-pass port distance is 50m)

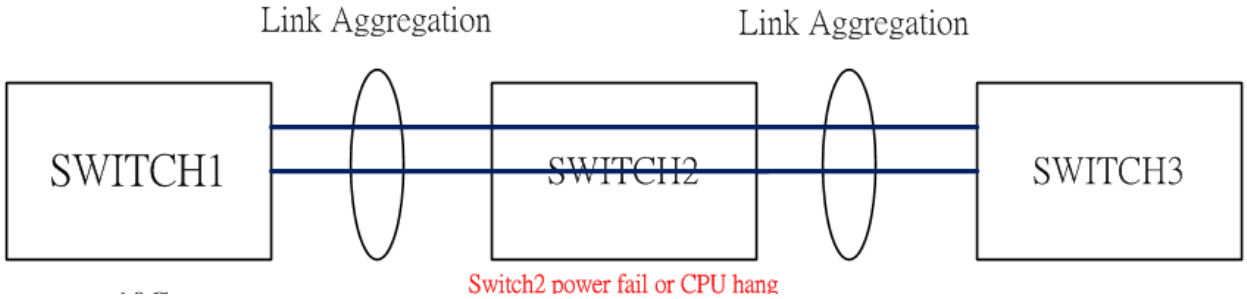
The bypass module is like an alarm relay but it has default position – close. When system finish booting procedures, CPU will ask bypass module change position from close to open and keep in open status. That's why when switch loss the power, bypass module will be active, because CPU has no ability to ask bypass module keep in open status then bypass will be restored to default position – close.

There is another condition will trigger bypass module -- CPU hang. When CPU is hang, it also loss ability to ask bypass module keep in open status. But at this time, watch dog chipset will force to reset CPU then system will reboot. The CPU will back to normal status after rebooting then ask bypass module to keep in open status.

Bypass mechanism in open status



Bypass mechanism in close status

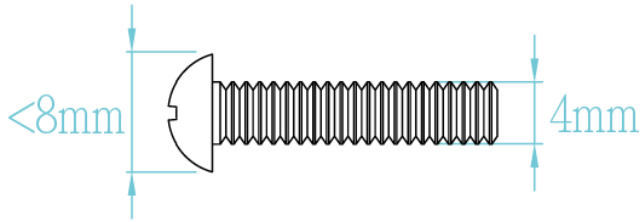


Chapter 2 Hardware Installation

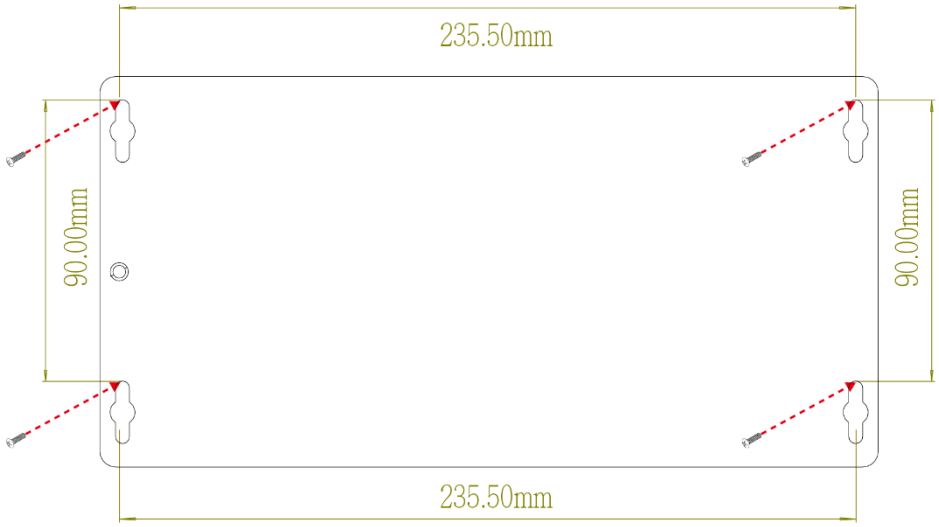
There are no mechanically active moving parts in the switch, to fix the switch into an installation position, please use M4 size screw and corresponding nut and standard M4 screwdriver to install switch in the field.

2.1 Wall mount installation

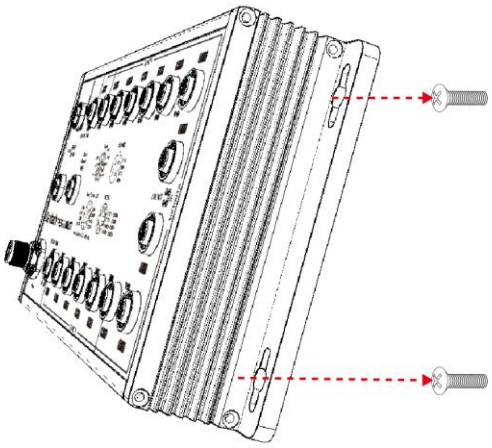
1. **Please make sure the screw diameter is M4.**



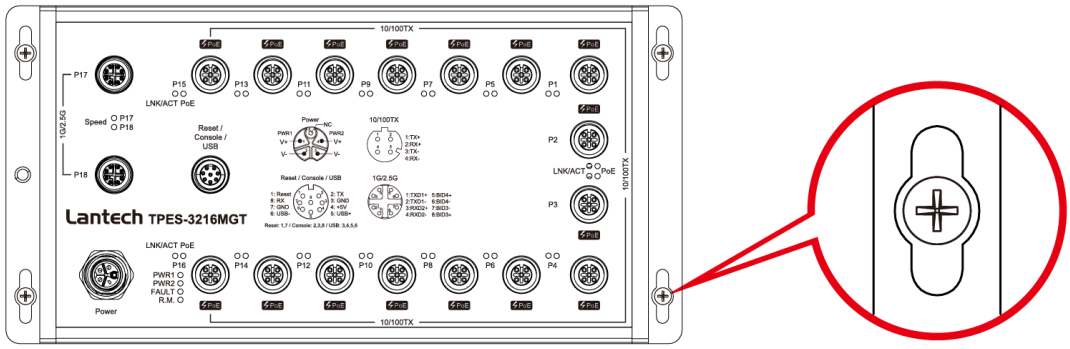
2. **Check all 4 fix holes on the switch and find corresponding position in the wall .Use the appropriate tool to drill 4 holes onto the corresponding position, make sure the diameter of holes is compatible with the M4 screws, fix the 4 screws into these 4 holes but don't screw tightly, in order to have enough space to mount the switch.**



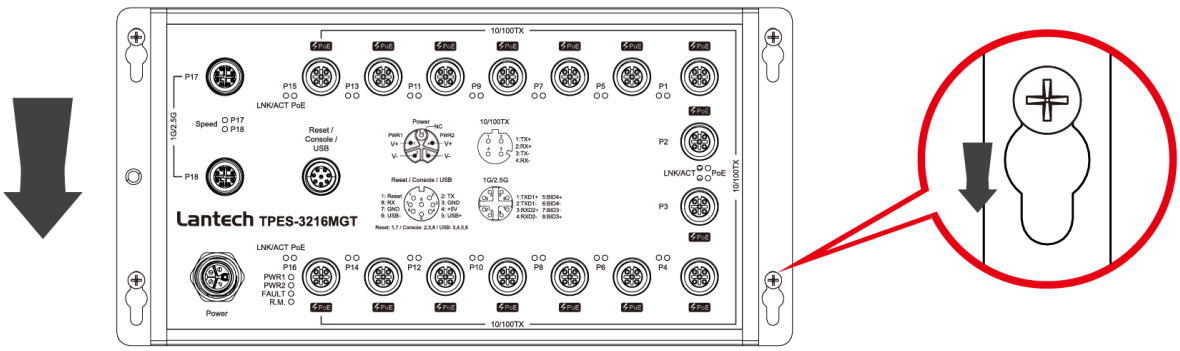
3. **Mount switch in wall with 4 fixed screws.**



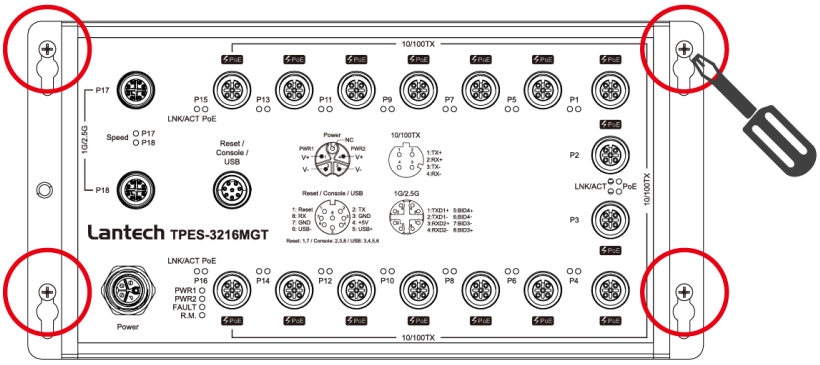
4. **Attach switch in wall with 4 screws**



5. **Move down**



6. **Tighten 4 screws**



Chapter 3 Connect Cable

Notice

Correctly connecting the grounding cable is crucial to lightning protection and EMI protection. To avoid damages caused by surge or EFT, using STP cable is highly suggested.

After the hardware installation is complete, please connect the cable to the switch. All the external interfaces use M12 connector design and follow IEC 61076 standard.

3.1 Power input M12 connector.

Note: Please check the power connector has been connected to the switch correctly before you turn on the power resource.

Spec. of power input

- **Voltage of Power Input:**
  Dual DC input, 14-36VDC (24VI model); 16.8-56VDC (24TVI model)

⚠ Warning ⚠

For the 24VI model:

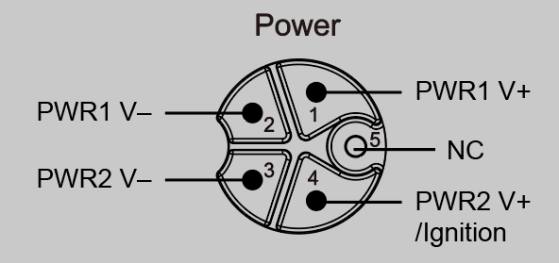
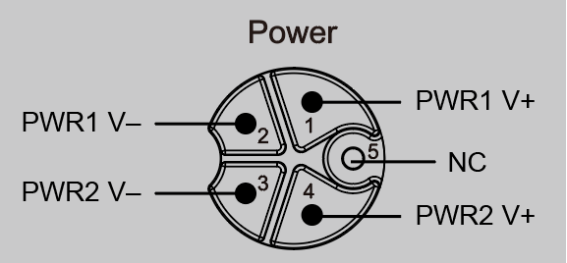
- Continuous operating voltage: **14–36 V**
- Temporary supply undervoltage: **9–14 V**, **≤0.1 s**

Supply voltage variations within the EN 50155 specified ranges, including temporary undervoltage down to 14 V and short interruptions down to 0 V, will not cause damage to the equipment, although operation may be interrupted.

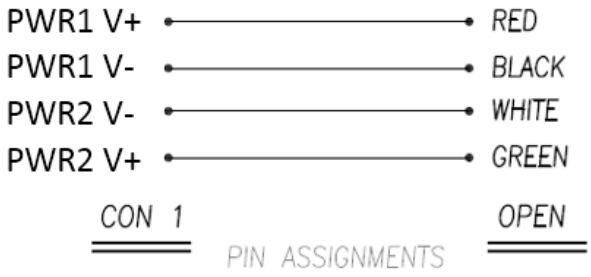
- **Total PoE budget: 120W@24V**

  Please make sure that the external power supply unit can satisfy the total power consumption in field.

- **Pin assignment of power input**

IGN models	Non IGN models
	

- **Pin assignment of optional power cable ECABM12-05K(F)-90-1.5M**



***The color is based on the optional power cable of Lantech.**

M12 K-code to MCP connector

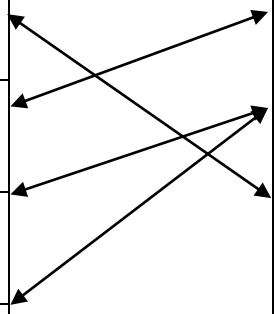
Case 1: Non-IGN model

PIN	Signal
1	V+, PWR2
2	V+, PWR1
3	V-, PWR1
4	V-, PWR2

PIN	Signal
1	24V after Manual Switch
2	Ground
3	24V after Ignition Switch
4	Full power available
5	Reserved
6	24V after Main Switch

Case 2: IGN model, using the ignition function

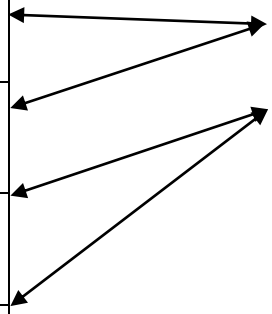
PIN	Signal
1	V+, PWR2, Ignition
2	V+, PWR1
3	V-, PWR1
4	V-, PWR2



PIN	Signal
1	24V after Manual Switch (mandatory)
2	Ground (mandatory)
3	24V after Ignition Switch (mandatory)
4	Full power available (optional)
5	Reserved
6	24V after Main Switch (optional)

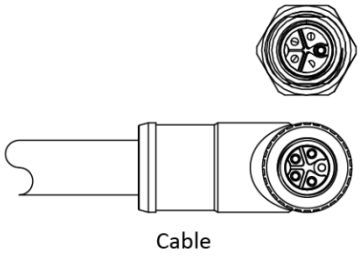
Case 3: IGN model, not using the ignition function

PIN	Signal
1	V+, PWR2 (mandatory)
2	V+, PWR1
3	V-, PWR1
4	V-, PWR2

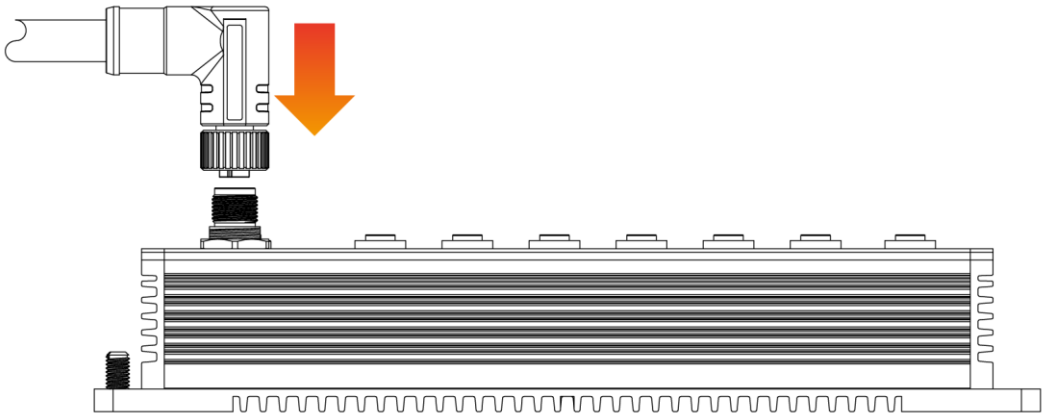


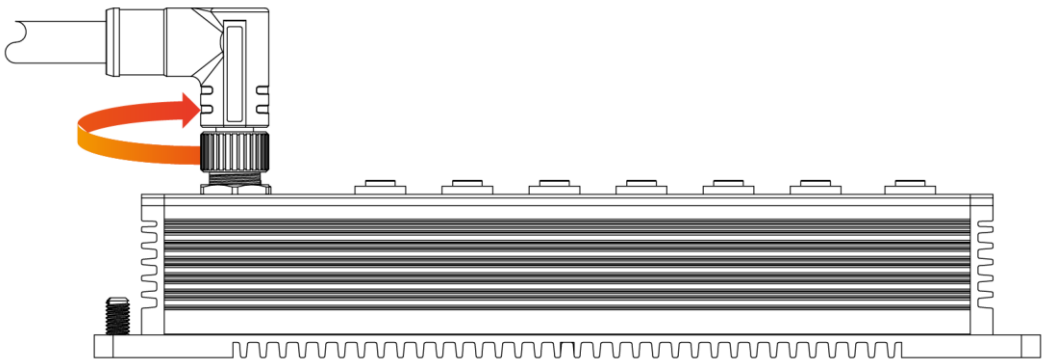
PIN	Signal
1	24V after Manual Switch (mandatory)
2	Ground (mandatory)
3	24V after Ignition Switch
4	Full power available (optional)
5	Reserved
6	24V after Main Switch (optional)

Make sure the direction of connector is correct before you connect it.



- **Plug power connector and screw in clockwise direction to fix it.**





Ignition (IGN model)

When the vehicle has been stalled by the driver, some equipment in the car may still need to run for a while. With Lantech ignition switch, even if the engine of the vehicle has been turned off by driver, the switch can still offer power to the equipment via PoE connection from the battery. (The duration time of power off can be set via web UI)

PIN	Signal
1	V+, PWR2, Ignition
2	V+, PWR1
3	V-, PWR1
4	V-, PWR2

PIN	Signal
1	24V after Manual Switch (mandatory)
2	Ground (mandatory)
3	24V after Ignition Switch (mandatory)
4	Full power available (optional)
5	Reserved
6	24V after Main Switch (optional)

ECONM12-05K(F) to MCP 6P-20CM CABLE
(Optional power cable for IGN models)

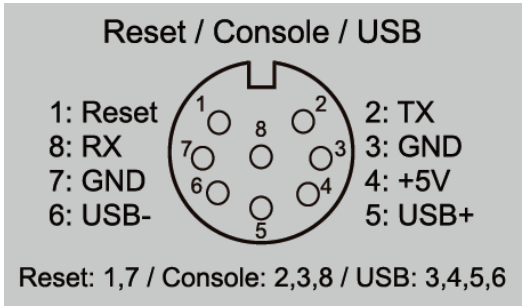
- **Power supply interfaces shall be of MCP type, even in cases where the module makes use of PoE to ensure that the correct power control inputs are present (adapters on the module side are acceptable). MCP type connectors with 6 pins shall be used**

for power supply interfaces, such as TYCO reference: 1-965641-1 Blue Code A (vehicle side) or TYCO reference: 8-968970-1 Blue Code A (module side):

1-965641-1 Blue Code A	*8-968970-1 Blue Code A*

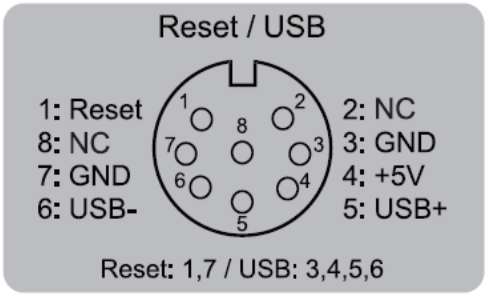
3.3 Console & USB dongle M12 connector

- **Pin assignment of console & USB dongle**

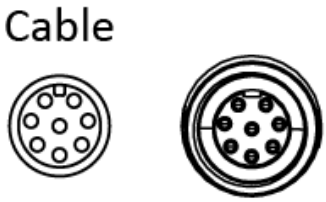


For WEB models, the Reset/Console/USB port is replaced by a Reset/USB port, so the labeling will be different.

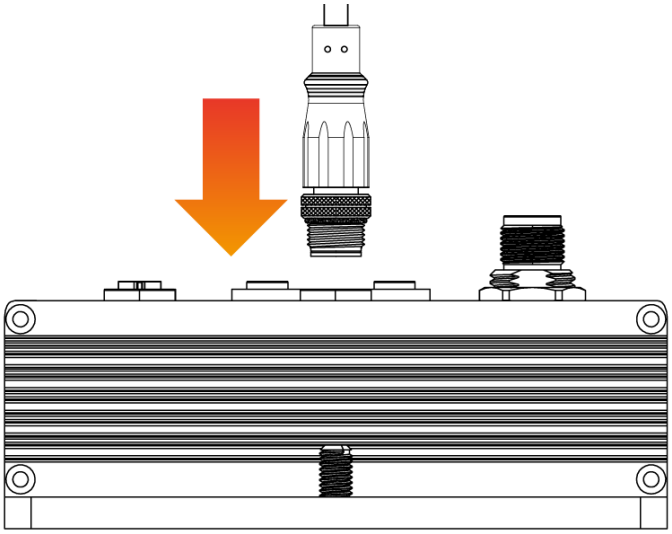
Labeling for WEB models:

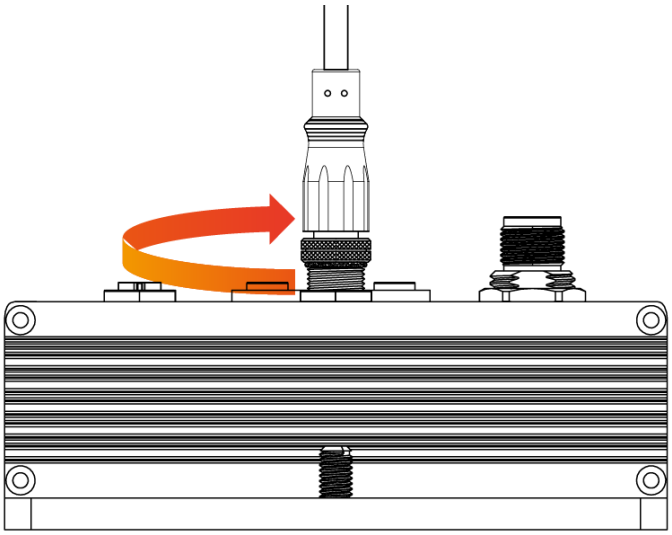


- **Make sure the connector is the right direction before you connect it.**



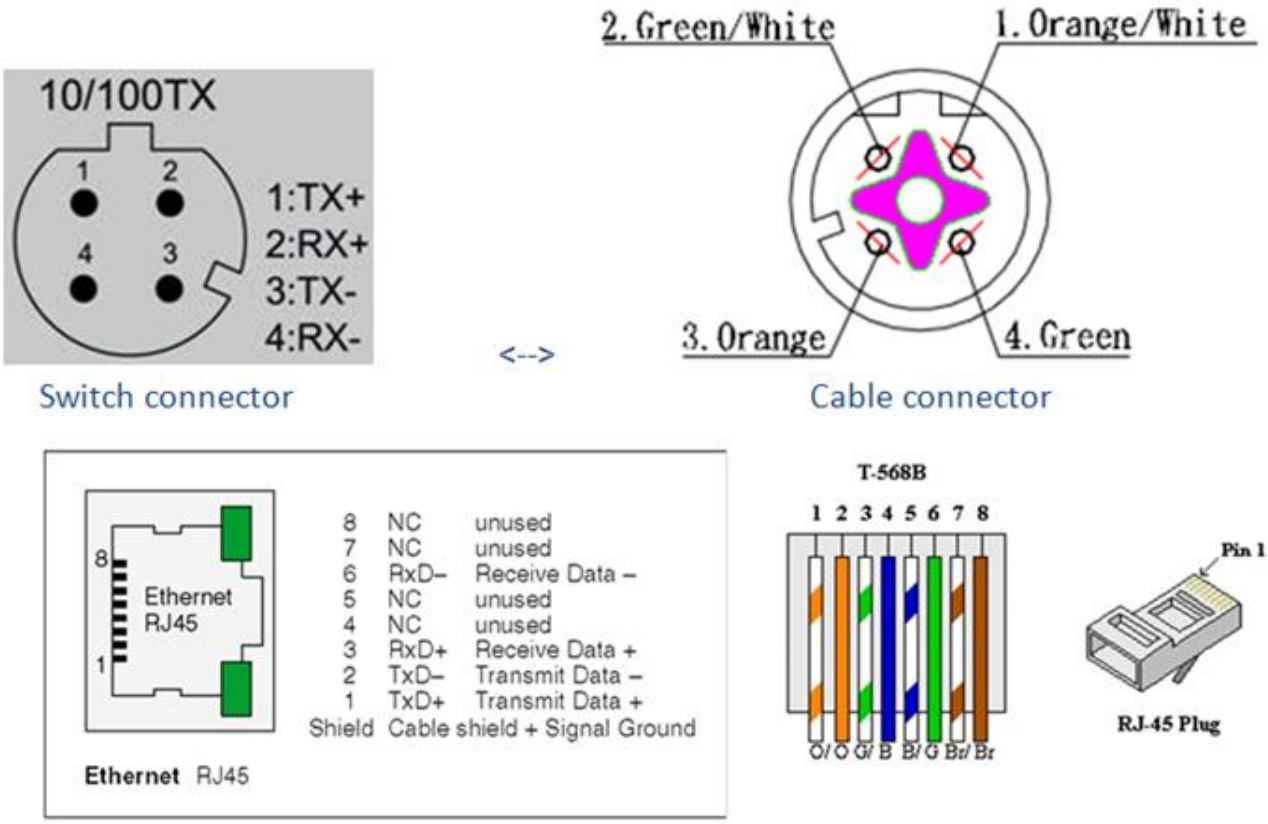
- **Plug console connector and screw in clockwise direction to fix it.**



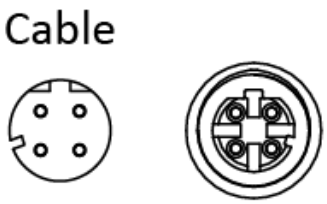


3.4 10/100TX interface M12 connector

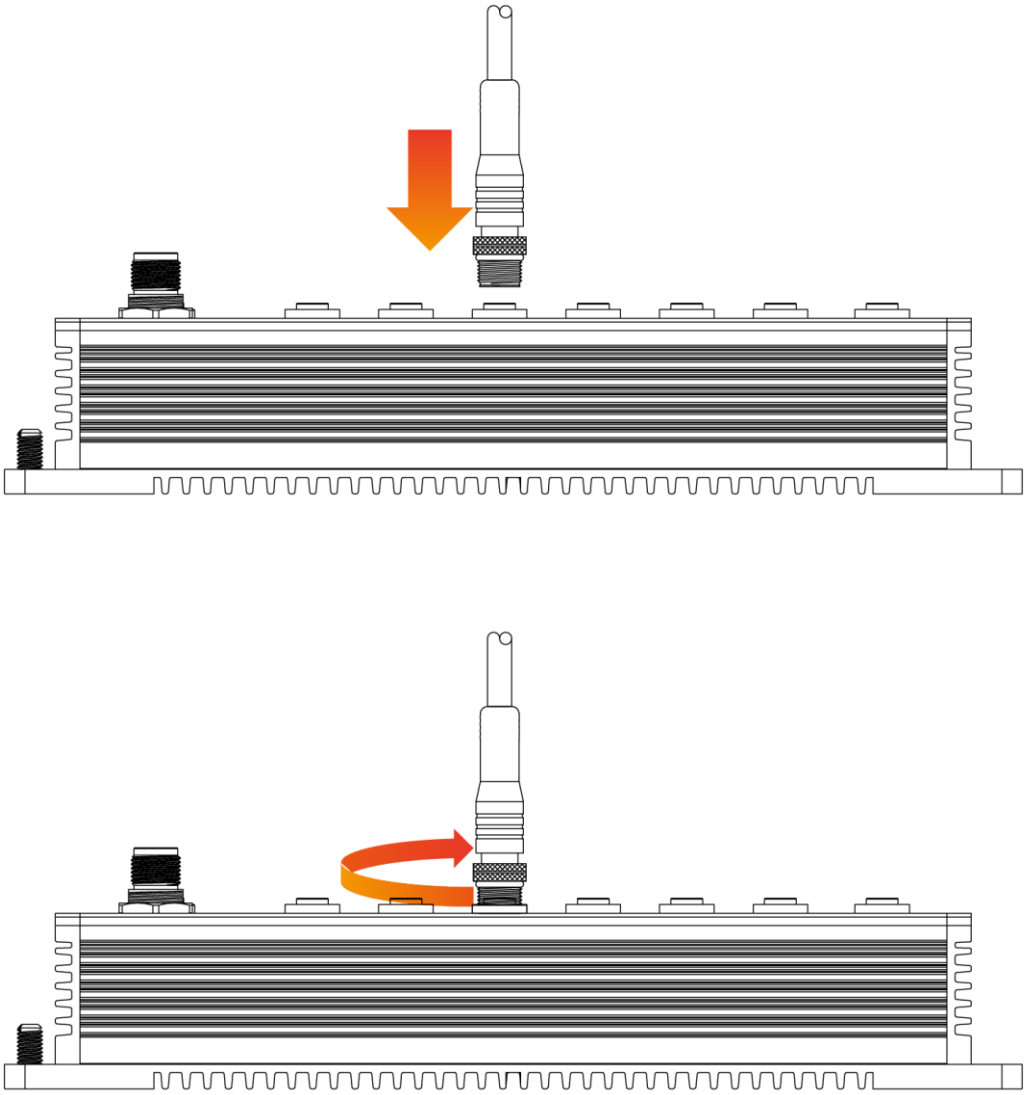
- **Pin assignment of the 10/100TX port**



- **Make sure the direction of connector is correct before you connect it.**

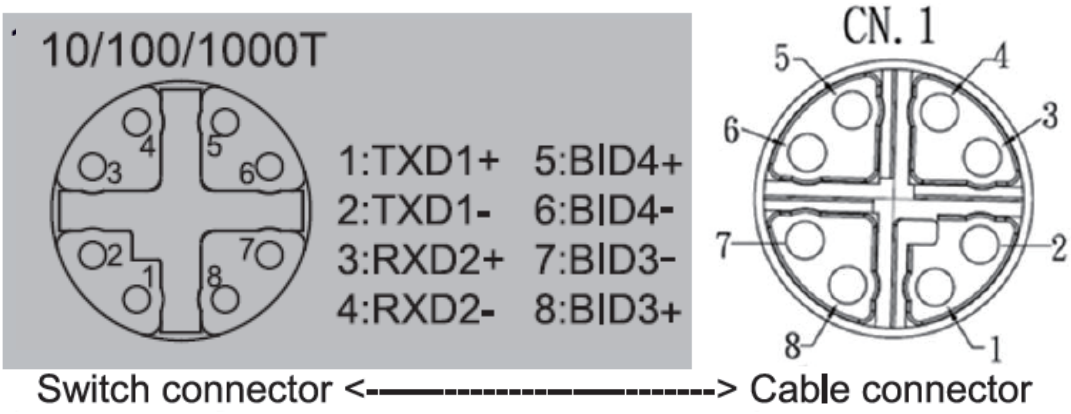


- **Plug 10/100TX connector and screw in clockwise direction to fix it.**

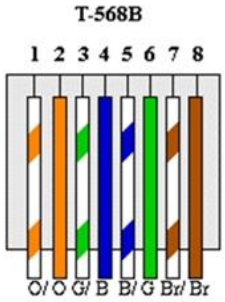


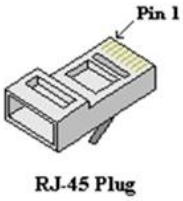
3.5 10/100/1000T interface M12 connector

- **Pin assignment of the 10/100/1000T port**

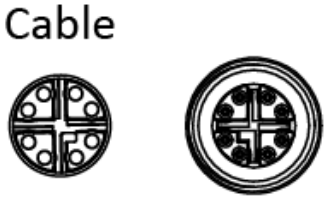


Shell	Gnd	Shell	
1	Orange/ White	1	TWIST
2	Orange	2	
3	Green/ White	3	TWIST
4	Green	6	
5	Brown/ White	7	TWIST
6	Brown	8	
7	Blue/ White	5	TWIST
8	Blue	4	
CN. 1	Wire Color	CN. 2	
PIN OUT			

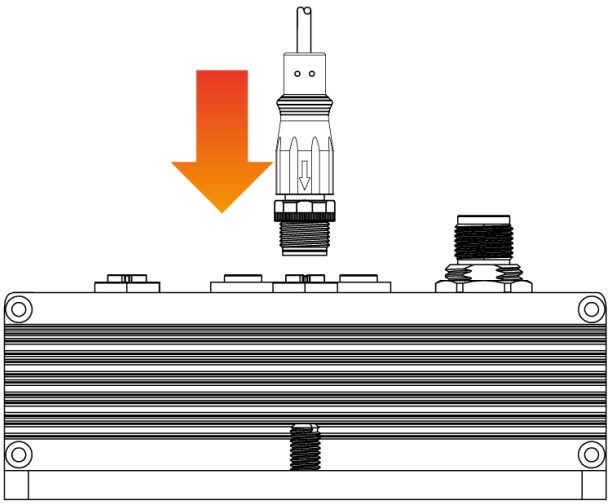


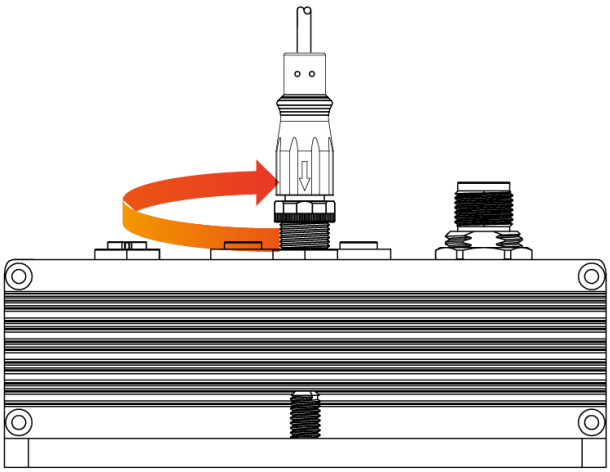


- **Make sure the direction of connector is correct before you connect it.**



- **Plug the connector and screw in clockwise direction to fix it.**





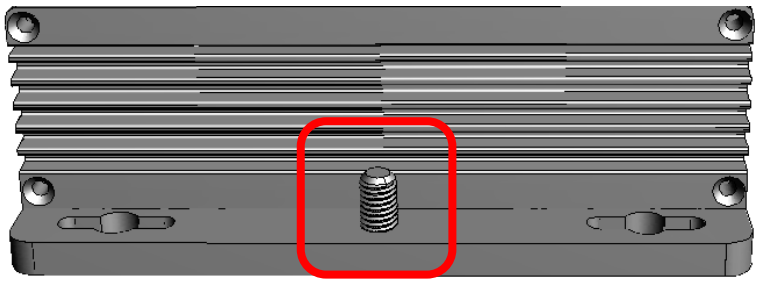
3.6 Ground interface M6 connector

Ground

The chassis is grounded via a separate grounding nut (M6).

Use toothed locking washers for a good electrical connection.

*** Note: The torque should not exceed 14 kilogram-force centimeters (kgf·cm), which is approximately 1.4 newton-meters (N·m). Applying torque beyond this limit may cause damage to the grounding components.**



Ground screw of the switch

Chapter 4 Maintenance

1 Check each switch connection and make sure they are all screwed correctly.

2 Keep the anti-dust cap on all un-used switch interface

3 Access switch via web browser and check the below points:

3.1 Compare the physical connection of the switch port with the switch icon on the web user interface to make sure the connecting status match each other.

3.2 Check the information on the hardware monitor to make sure all conditions are in normal status.

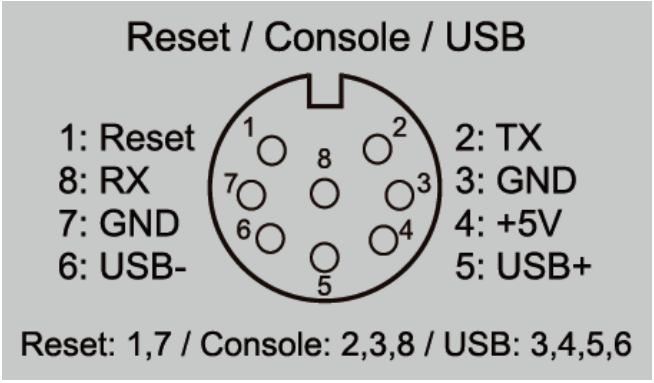
3.3 Check event log to see if there are any abnormal events.

Chapter 5 Console Management

※ **The console function is available only on standard models.**

5.1 Connecting to the Console Port

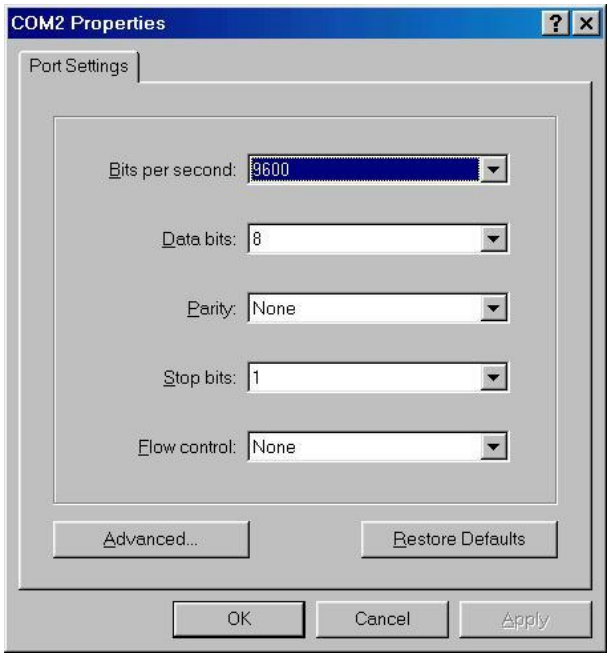
The supplied cable has one M12 4-pole connector end and another RS-232 connector end. Attach the RS-232 connector end to a PC or terminal and the other M12 connector end to the console port of the switch. The connected terminal or PC must support the terminal emulation program.



5.2 Login in to the Console Interface

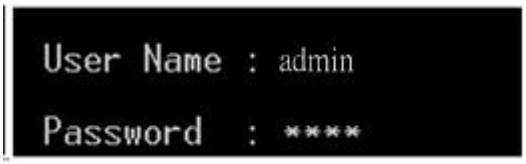
When the connection between Switch and PC is ready, turn on the PC and run a terminal emulation program or Hyper Terminal and configure the communication parameters to match the following default characteristics of the console port:

Baud Rate:115200 bps
Data Bits: 8
Parity: none
Stop Bit: 1
Flow control: None



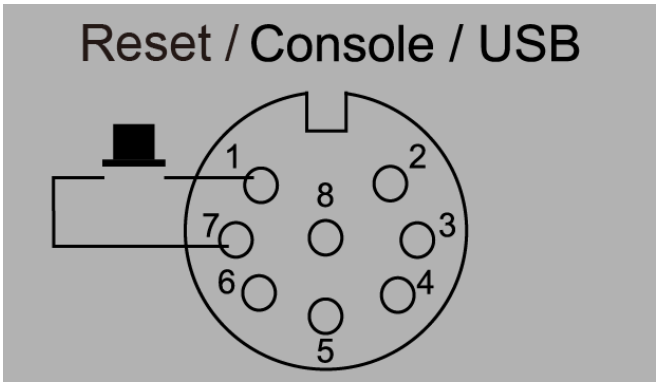
The settings of communication parameters

Having finished setting up the parameters, click 'OK'. When the blank screen shows up, press the Enter key to have the login prompt appear. Key in 'admin' (default value) for both User name and Password (use Enter key to switch), then press Enter and the Main Menu of console management should appear. Please see below figure for login screen.



Console login interface

Chapter 6 Reset the Switch



You can reset the Ethernet switch to default configuration by making pin1 and pin7 short for more than 5 seconds.

==========Notice==========

For web-based management, please refer to our "Software Management Manual". Please contact us for more information.