CTC Union Technologies Co., Ltd.

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Quick Installation Guide

ITP-800A

ITP-800A-E

EN50155 & EN45545-2 Switch

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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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference in which case the user will be required to correct the interference at his own expense. NOTICE: (1) The changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment. (2) Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

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.

Table of Contents

Introduction

The ITP-800A(-E) is an unmanaged Fast Ethernet switch that provides eight 10/100Base-TX Fast Ethernet ports for industrial applications in harsh environments. The switches use M12 connectors as Ethernet ports so as to ensure tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock.

The ITP-800A(-E) Ethernet switches comply with EN50155 & EN45545-2 standards that cover strict demands on operating temperature, power input voltage, surge, ESD, vibration, shock and fire, thus making these switches suitable for industrial applications such as vehicle, rolling stock and railway.

Package List

- One ITP-800A(-E) device with a wall-mounting bracket
- Protective caps for UTP ports

Features

- Use M12 anti-vibration and anti-shock connector for mission-critical applications
- Wide temperature range -40°C~75°C (ITP-800A-E)
- IP40 protection and fanless design
- 12/24/48VDC (8.4~60VDC) redundant dual input power
- Built-in two bypass ports to avoid power fail of one or more nodes such as in transportation topology
- Low power consumption
- Wall-mounting installation
- CE, FCC, EN50155, EN50121-4 and EN45545-2certified
- Industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

Network Interface

- Speed: 8 x 10/100Base-TX
- Connector Type: 4-Pin D-code (Female) M12
- Built-in 2 bypass ports
- Support Auto-negotiation and MDI/MDI-X
- Support 802.3x Flow Control
- Full/Half Duplex
- Data Processing: Store & Forward
- Switching Fabric: 1.6Gbps
- MAC Address Table: 1K
- Packet Buffer Size: 448Kbits

Power Supply

- Connector Type: 1 x 5-Pin A-code (Male) M12
- Redundant Dual DC 12/24/48V (8.4~60VDC) input power
- Support Reverse Polarity Protection
- Support Overload Current Protection
- Consumption: 1.8W (12VDC), 2.2W (24VDC), 3.4W (48VDC)

Mechanical

- Rugged metal with IP40 protection
- Fanless Design
- Dimensions: 45 mm (D) x 71.5 mm (W) x 219 mm (H)
- Installation Method: Wall-mounting installation
- Weight: 420g

Environmental

- Operating Temperature: -10°C~60°C (ITP-800A); -40°C~75°C (ITP-800A-E)
- Storage Temperature: -40°C~85°C
- Humidity: 5%~95% (Non-condensing)

Certifications

- EMC: CE (EN55024, EN55032)
- EMI (Electromagnetic Interference): FCC Part 15 Subpart B Class A, CE
- Railway Traffic: EN50155, EN50121-4
- Fire Protection of Railway Vehicle: EN45545-2
- Immunity for Heavy Industrial Environment: EN61000-6-2
- Emission for Heavy Industrial Environment: EN61000-6-4
- EMS (Electromagnetic Susceptibility) Protection Level:
  - EN61000-4-2 (ESD) Level 3, Criteria B
  - EN61000-4-3 (RS) Level 3, Criteria A
  - EN61000-4-4 (Burst) Level 3, Criteria A
  - EN61000-4-5 (Surge) Level 3, Criteria B
  - EN61000-4-6 (CS) Level 3, Criteria A
  - EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
  - EN61000-4-11 Voltage Dips
- Safety: UL60950-1 (Pending)
- Shock: IEC 61373
- Freefall: IEC 60068-2-32
- Vibration: IEC 61373

MTBF (MIL-HDBK-217)

- 1,492,660 Hours

Panels

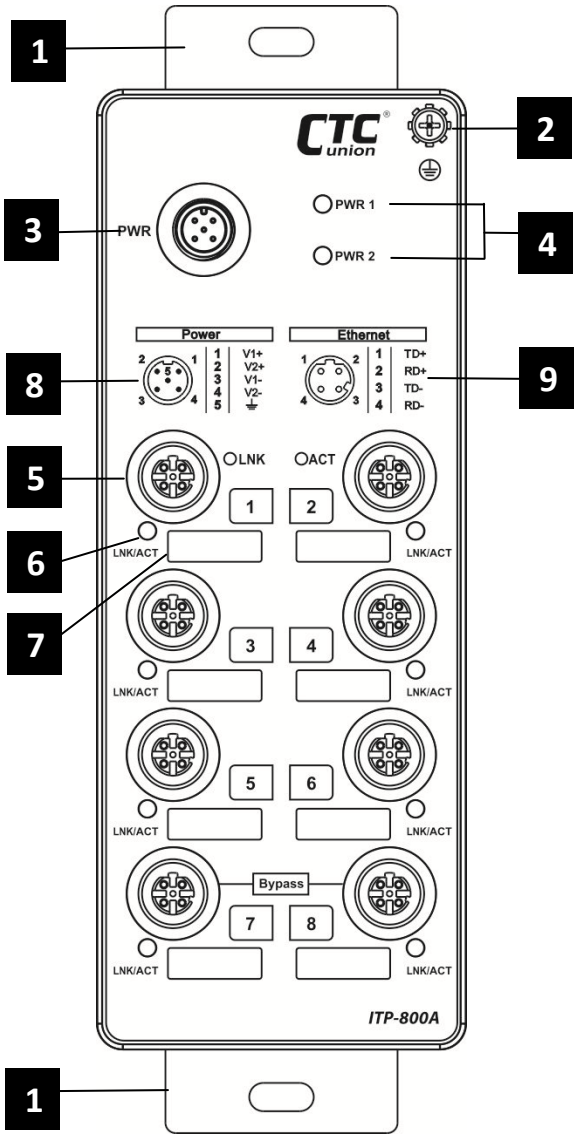
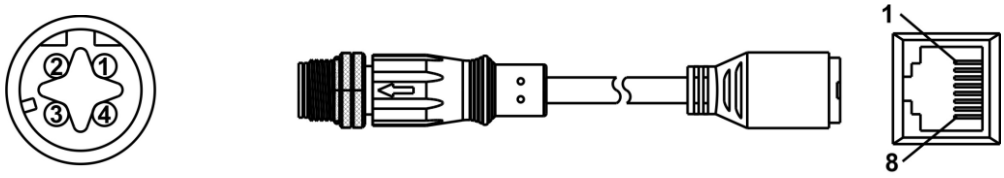


Figure 1. Front Panel

Index No.	Description
1	Wall mounting holes
2	Grounding screw
3	M12 Power input port
4	Power LED
5	M12 Ethernet ports
6	Ethernet port LED
7	Ethernet port label
8	Power port pin assignment table
9	Ethernet port pin assignment table

PIN Assignment

M12 Ethernet Cable



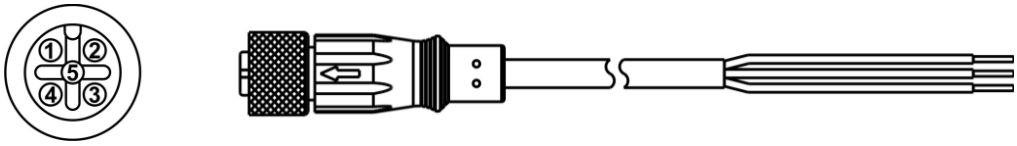
Male M12 Connector

Model: CAB-M12DM4-RJ45

Figure 2. M12 D-code Male to RJ-45 Socket Cable

M12 Pins		RJ-45 Pins		Color
TD+	1	3	RD+	Green / White
TD-	3	6	RD-	Green
RD+	2	1	TD+	Orange / White
RD-	4	2	TD-	Orange

M12 Power Input Cable



Female M12 Connector

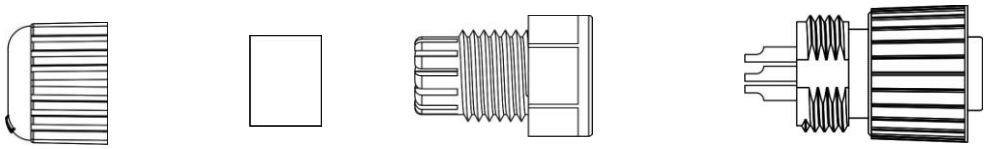
Model: CAB-M12AF5-OPEN

Figure 3. M12 A-code Female Cable

Cable Pin	Color	Descriptions	
1	Black	V1+	Power Supply 1 Positive
2	Blue	V2+	Power Supply 2 Positive
3	Red	V1-	Power Supply 1 Negative
4	Orange	V2-	Power Supply 2 Negative
5	Yellow	⏚	Grounding

M12 Cable Connector Installation

Before assembling M12 open cable, make sure you have the following M12 cable connector components (Model: M12D-M4 M12 D-Code Male) and open cable at hand.



Screw Nut | O-Ring | Housing | Male Contact Connector

Assembly Steps:

Step 1. Insert the screw nut, O-ring, and housing into the cable in the order shown in Figure 2 and keep them loose in this step.

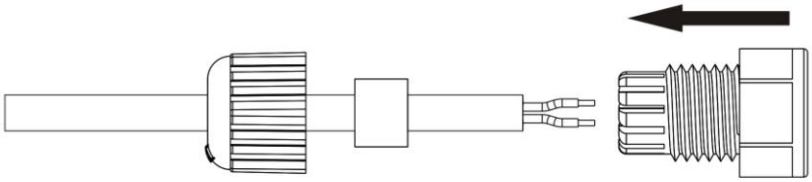


Figure 4. Insert Components into the Cable

Step 2. Strip the cable and the individual cores to fit the connector. Insert the stripped wires into the opened contact clamps.

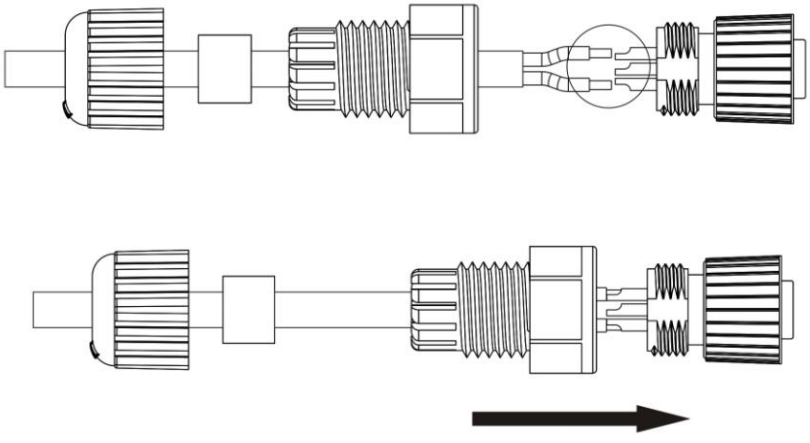


Figure 5. Insert the Stripped Wires to Contact Clamps

Step 3. Tighten the connector in clockwise direction, making sure that the wires inside the connector are not twisted as the screwed housing is assembled.

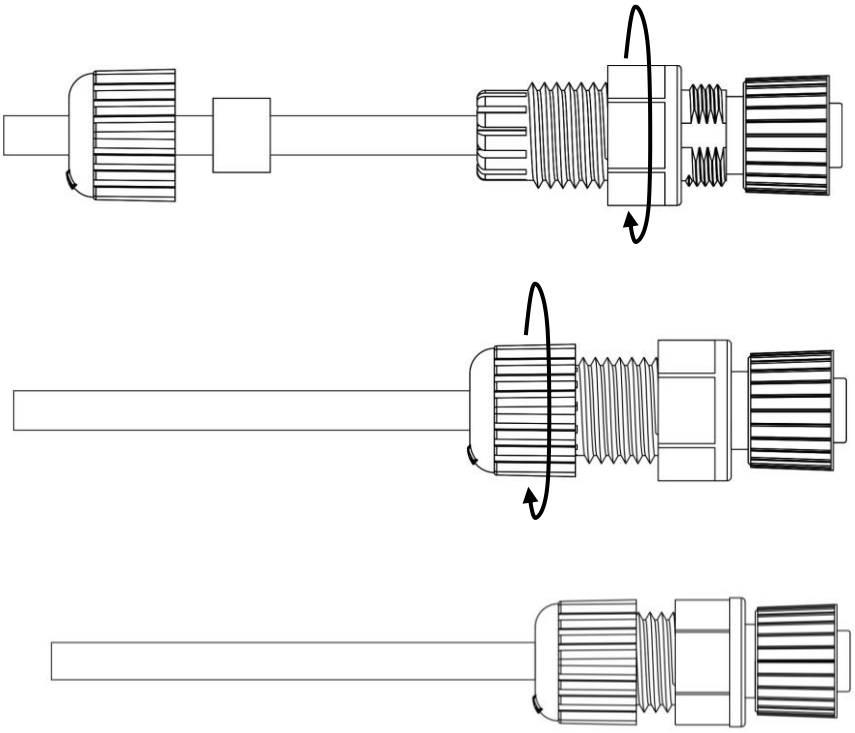
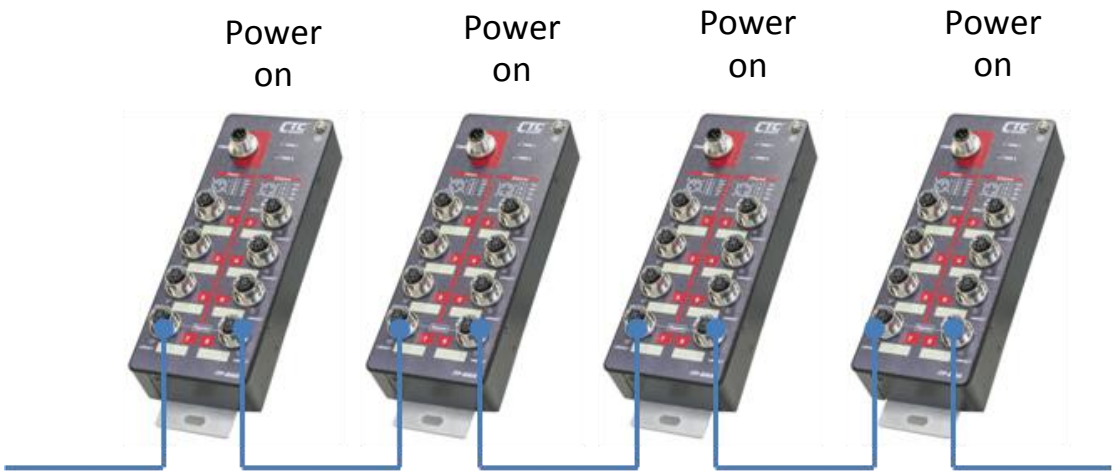


Figure 6. Tighten the Connector

Bypass Relay Function

ITP-800A(-E) provides two Ethernet interfaces (port 7 & 8) with auto bypass relay function in the event of sudden power loss particularly in daisy chain or linear topology. When power failure occurs in one of the switches, bypass relay function can activate bypassing mechanism by interconnecting internal circuits automatically to ensure that links between switches operate uninterruptedly and continuously.

➢ **Normal State**



➢ **Bypass Relay Function Activated**

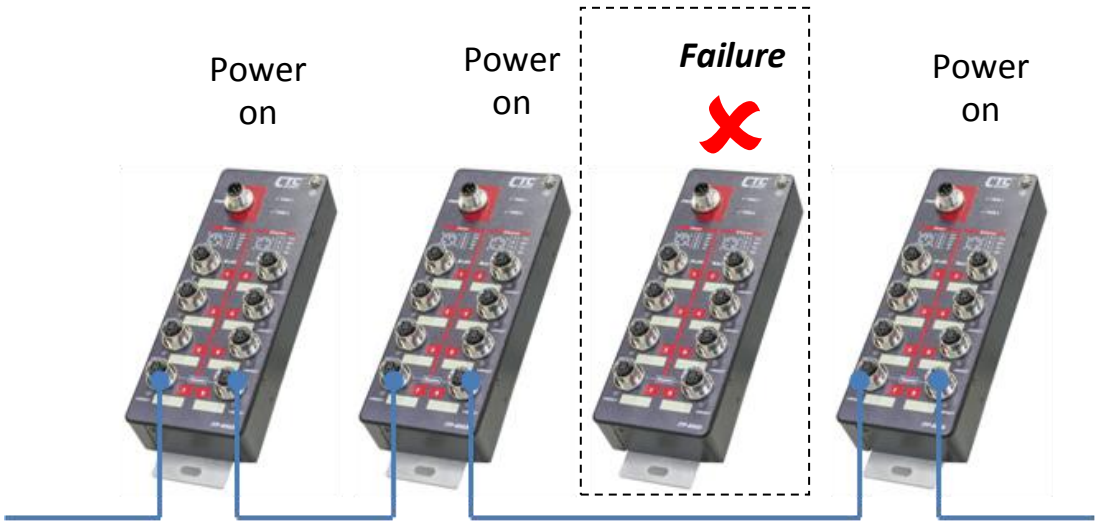


Figure 7. Bypass Relay Function Illustration

Earth Ground Connection

An earth grounding connection hole is provided in the upper right-hand corner of the front panel with an earth ground sign next to it. Grounding the device can help to release leakage of electricity to the earth safely so as to reduce injuries from electromagnetic interference (EMI).

Prior to connecting to the power, it is important to connect the ground wire to the earth. Follow steps below to install ground wire:

Step 1. Make sure you have the grounding screw and grounding cable at hand.

Step 2. Unfasten the ground screw on the front panel.

Step 3. Attach the grounding screw to the ring terminal of the grounding cable. Make sure that the grounding cable is long enough to reach the earth.

Step 4. Use a screwdriver (or other tools) to fasten the grounding screw on the earth ground hole securely.

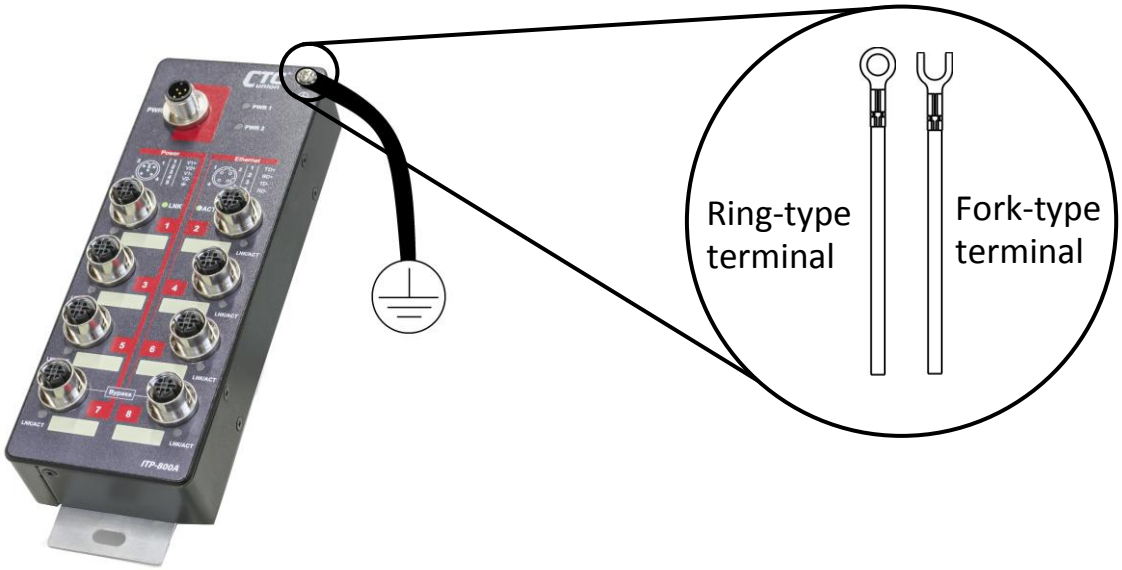


Figure 8. Earth Grounding Connection

LED Indicators

LED	Color	Status	Description
PWR1	Green	On	Lit if power 1 is connected and active.
		Off	Power is not connected.
PWR2	Green	On	Lit if power 2 is connected and active.
		Off	Power is not connected.
Link/ ACT	Green	On	Lit when the LAN connected speed is 10M or 100M.
		Blinking	Blinking if there is Ethernet traffic.
		Off	No Ethernet link.

Wall-Mounting Installation

The Ethernet Switch can be mounted on the wall using the attached wall-mounting bracket with two wall-mounting holes. The installation is simple and easy and only requires to prepare two appropriate wall screws for mounting the Ethernet Switch. After you find a suitable place to wall-mount the Ethernet Switch, remember to align the mounting holes (marked X in Figure 9) with wall screws. Then, fasten the two wall screws securely to prevent the Ethernet Switch from falling.

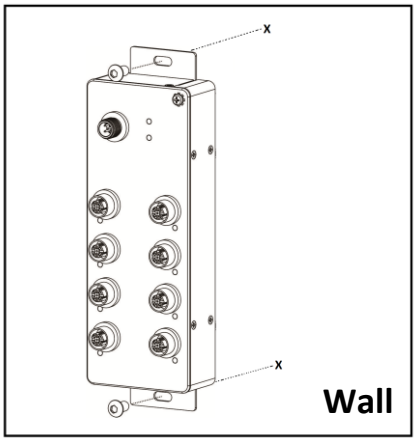


Figure 9. Wall Mounting Installation

Application

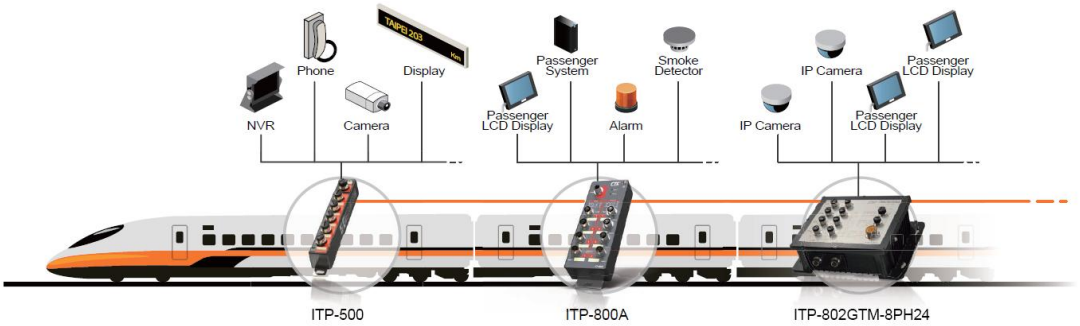


Figure 10. On-board Train Application Diagram

NOTES: