# ITP-G802TM

**10x 100/1000Base-T Managed Ethernet Switch**

# ITP-G802SM

**8x 100/1000Base-T + 2x 100/1000Base-X SFP Managed Ethernet Switch**

These models are managed industrial grade Gigabit switches that provide 8x GbE UTP + 2x GbE SFP or 10x GbE UTP. These switches provide advanced Ethernet functions are supported and include STP/RSTP/MSTP/ ITU-T G.8032 ERPS and multiple µ-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS ,Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.
Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Specifically, These switches use M12 connectors to ensure water tight, robust connections and to guarantee reliable connections against environmental disturbances, such as vibration and shock. Besides, these models are compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.
These models are IP67 rated to protect against dust and water submersion, they are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as IP surveillance, city security. They can also work with CTC Union's platform SmartView™ to provide convenient, real-time and centralized device management.

## Features

- 10x 10/100/1000Base-T M12 UTP (Total 10 ports) (ITP-G802TM)
- 8x 10/100/1000Base-T M12 UTP and 2x 100/1000Base-X SFP Fiber (Total 10 ports) (ITP-G802SM)
- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- IP67 grade housing for against water, dust, and oil (Figure 3)
- Redundant and wide input range voltage, Low voltage (12/24/48VDC) and High Voltage (110/220VDC or 110/220VAC)
- UL60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostics, identifies opens/shorts from 7 to 100 meters
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provides up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's µ-Ring white paper for more details)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Build-in 2 bypass GbE UTP ports to avoid one or more nodes power fail in a ring or bus structure to collapse the network (ITP-G802TM)
- DHCP Server/Client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports IEEE1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration tool (Please see Catalog chapter 1- Software Management for more details)
- Supports SmartView for Centralized Management. (Please see Catalog chapter 1- Software Management for more details)
- Supporting Central EMS for management of up to 50 SmartView Server, and maximum up to 25,000 devices (Please see Catalog chapter 1- Software Management for more details)

## Specifications

| | | |
|---|---|---|
| **Standard** | IEEE 802.3 | 10Base-T 10Mbit/s Ethernet |
| | IEEE 802.3u | 100Base-TX, 100Base-FX, Fast Ethernet |
| | IEEE 802.3ab | 1000Base-T Gbit/s Ethernet over twisted pair |
| | IEEE 802.3z | 1000Base-X Gbit/s Ethernet over Fiber-Optic |
| | IEEE 802.1d | STP (Spanning Tree Protocol) |
| | IEEE 802.1w | RSTP (Rapid Spanning Tree Protocol ) |
| | IEEE 802.1s | MSTP (Multiple Spanning Tree Protocol) |

| | | |
|---|---|---|
| **Standard** | ITU-T G.8032 / Y.1344 | ERPS (Ethernet Ring Protection Switching) |
| | IEEE 802.1Q | Virtual LANs (VLAN) |
| | IEEE 802.1X | Port based and MAC based Network Access Control, Authentication |
| | IEEE802.3ac | Max frame size extended to 1522Bytes |
| | IEEE 802.3ad | Link aggregation for parallel links with LACP(Link Aggregation Control Protocol) |
| | IEEE 802.3x | Flow control for Full Duplex |

| | | |
|---|---|---|
| **Standard** | IEEE802.3ac | Max frame size extended to 1522Bytes |
| | IEEE 802.1ad | Stacked VLANs, Q-in-Q |
| | IEEE 802.1p | LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization |
| | IEEE 802.1ab | Link Layer Discovery Protocol (LLDP) |
| | IEEE 802.3az | EEE (Energy Efficient Ethernet) |
| **VLAN ID** | 4094 IEEE802.1Q VLAN VID | |
| **Switch Architecture** | Back-plane (Switching Fabric): 20Gbps (Full wire-speed) | |
| **Data Processing** | Store and Forward | |
| **Flow Control** | IEEE 802.3x for full duplex mode Back pressure for half duplex mode | |
| **Network Connector** | 10x M12 (8-Pin, Female, A-Code or X-code) 10/100/1000Base-T UTP (ITP-G802TM)<br>8x M12(8-Pin, Female, A-Code or X-code) 10/100/1000Base-T + 2x 100/1000Base-X SFP (ITP-G802SM)<br>UTP port provide auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function<br>Build-in 2x bypass GbE UTP ports (ITP-G802TM)<br>2x Water-proof cable connector 2x 100/1000Base-X SFP slot, with DDMI (for ITP-G802SM) | |
| **Console** | RS-232 (5-pin A-Code M12 male ) | |
| **Network Cable** | UTP/STP above Cat. 5e cable | |
| | EIA/TIA-568 100-ohm (100m) | |
| **Protocols** | CSMA/CD | |
| **Reverse Polarity Protection** | Supported | |
| **Overload Current Protection** | Supported | |
| **CPU Watch Dog** | Supported | |
| **LED** | Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber) | |
| | UTP port: 10/100 Link/Active (Green)<br>1000 Link/Active (Amber) | |
| | SFP Fiber Per port: Link/Active (Green) | |
| **Jumbo Frame** | 9.6KB | |
| **MAC Address Table** | 8K | |
| **Memory Buffer** | 512K Bytes for packet buffer | |
| **Power Supply** | Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) or High (H) voltage.<br>Low voltage (L) : 12/24/48V (8.4~60VDC)<br>High voltage (H) : 110/220VDC (88~300VDC), or 110/220VAC (88~264VAC) | |

**Power Consumption**

| | ITP-G802SM-LL | ITP-G802SM-HL | ITP-G802TM-LL | ITP-G802TM-HL |
|---|---|---|---|---|
| 12VDC | 8.5W | 9.9W | 10.1W | 11.9W |
| 24VDC | 9.2W | 10.3W | 10.9W | 12.3W |
| 48VDC | 11W | 11.6W | 13.1W | 14W |
| 110 VAC/VDC | | 9.9W | | 11.9W |
| 220 VAC/VDC | | 9.9W | | 11.9W |

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|---|---|
| **Warning Message** | System Syslog, SMTP/ e-mail event message, alarm relay |
| **Alarm Relay Contact** | 5-pin A-code M12 male<br>Relay outputs with current carrying capacity of 1 A @24VDC |
| **Operating Temperature** | -40 ~ 75°C |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Storage Temperature** | -40 ~ 85°C |
| **Housing** | Rugged Metal, Fanless , IP67 grade housing for against water, dust, and oil (Figure 3) |
| **Dimensions** | 70 x 240 x 168mm (D x W x H) |
| **Weight** | 2.645kg (ITP-G802SM-LL) 2.82kg (ITP-G802SM-HL)<br>2.625kg (ITP-G802TM-LL) 2.8kg (ITP-G802TM-HL) |
| **Installation Mounting** | Wall mounting, or DIN Rail mounting (Optional) |
| **MTBF** | 443,868 Hours (ITP-G802SM-LL)<br>353,092 Hours (ITP-G802SM-HL)<br>423,602 Hours (ITP-G802TM-LL)<br>349,564 Hours (ITP-G802TM-HL)<br>(MIL-HDBK-217) |
| **Warranty** | 5 years |
| **Certification** | |
| **EMC** | CE |
| **EMI (Electromagnetic Interference)** | FCC Part 15 Subpart B Class A, CE |
| **Railway Traffic** | EN50155, EN50121-4 |
| **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 |
| **Safety** | UL60950-1 |
| **Shock** | IEC-61373 |
| **Freefall** | IEC 60068-2-32 |
| **Vibration** | IEC-61373 |

## Software Specifications

| | |
|---|---|
| **Topology** | |
| **VLAN** | IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID |
| | IEEE 802.1q VLAN,up to 4094 Groups |
| | IEEE 802.1ad Q-in-Q |
| | MAC-based VLAN,up to 256 entries |
| | IP Subnet-based VLAN, up to 128 entries |
| | Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries |
| | VLAN Translation, up to 256 entries |
| | GVRP (GARP VLAN Registration Protocol) |
| | MVR ( Multicast VLAN Registration ) |
| **Link Aggregation (Port Trunk)** | Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group |
| | Dynamic (IEEE 802.3ad LACP), up to 5 trunk group |
| **Spanning Tree** | IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP |
| **Multiple u-Ring** | up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings.<br>Recovery time <10ms<br>The maximum number of devices allowed in a Ring supported ring is 250.<br>(Please see CTC µ-Ring white paper for more details and more topology application) |
| **Loop Protection** | Supported |
| **ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )** | Recovery time <50ms |
| | Single Ring, Sub-Ring, Multiple ring topology network |
| **QoS Feature** | |
| **Class of Service** | IEEE802.1p 8 active priorities queues for per port |

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|---|---|
| **Traffic Classification QoS** | IEEE802.1p based CoS |
| | IP Precedence based CoS |
| | IP DSCP based CoS |
| | QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI |
| | QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number |
| **Bandwidth Control for Ingress** | Rate in steps : 1 kbps / Mbps / fps / kfps |
| | Range : 100 kbps to 1Gbps / 1fps to 3300kfps |
| | Rate Unit : bit or frame |
| **Bandwidth Control for Egress** | Rate in steps : 1 kbps / Mbps |
| | Range : 100 kbps to 1Gbps |
| | Rate Unit : bit Per queue / Per port shaper |
| **DiffServ (RF 2474) Remarking** | |
| **Storm Control** | for Unicast, Broadcast, Multicast |
| **IP Multicasting Feature** | |
| **IGMP / MLD Snooping** | IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 |
| | Port Filtering Profile, Throttling |
| **IGMP / MLD Snooping** | Fast Leave |
| | Maximum Multicast Group : up to 1022 entries |
| | Query / Static Router Port |
| **Security Features** | |
| **IEEE 802.1X** | Port-Based, MAC-Based |
| **ACL** | Number of rules : up to 256 entries |
| | for L2 / L3 / L4<br>L2: Mac address SA/DA/VLAN<br>L3: IP address SA/DA, Subnet<br>L4: TCP/UDP |

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|---|---|
| **RADIUS authentication & accounting** | |
| **TACACS+ authentication & accounting, TACACS+ 3.0** | |
| **HTTPS, HTTP** | Supported |
| **SSL / SSH v2** | Supported |
| **User Name Password Authentication** | Local Authentication<br>Remote Authentication (via RADIUS / TACACS+) |
| **Management Interface Access Filtering** | Web, Telnet / SSH , CLI RS-232 console |
| **Management Features** | |
| **CLI** | Cisco® like CLI |
| **Web Based Management** | |
| **Telnet** | Server |
| **SNMP** | TFTP, HTTP |
| **SW & Configuration Upgrade** | TFTP, HTTP<br>Redundant firmware in case of upgrade failure |
| **RMON** | RMON I (1, 2, 3, 9 group), RMON II |
| **MIB II** | RFC 1213 |
| **UPnP** | Supported |
| **DHCP** | Server, Client, Relay, Snooping<br>Snooping option 82, Relay option 82 |
| **IP Source Guard** | Supported |
| **Port Mirroring** | Supported |
| **Event Syslog** | Syslog server (RFC3164) (Support 1 server ) |
| **Warning Message** | System syslog, e-mail, alarm relay |
| **DNS** | Client, Proxy |

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|---|---|
| **IEEE1588 PTP V2** | Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave |
| **NTP, SNTP** | Client |
| **LLDP (IEEE 802.1ab)** | Link Layer Discovery Protocol<br>LLDP-MED |
| **IPv6 Features** | |
| **IPv6 Management** | Telnet Server/ICMP v6 |
| **SNMP over IPv6** | Supported |
| **HTTP over IPv6** | Supported |
| **SSH over IPv6** | Supported |
| **IPv6 Telnet** | Supported |
| **IPv6 NTP, SNTP** | Client |
| **IPv6 TFTP** | Supported |
| **IPv6 QoS** | Supported |
| **IPv6 ACL** | Number of rules: up to 256 entries<br>for L2 / L3 / L4<br>L2: Mac address SA/DA/VLAN<br>L3: IP address SA/DA, Subnet<br>L4: TCP/UDP |
| **Others Features** | |
| **Green Ethernet** | Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption<br>Determine the cable length and lowering the power for ports with short cables<br>Lower the power for a port when there is no link<br>LED Power Management :Adjustment LEDs intensity |
| **Cable Diagnostic** | Measuring UTP cable OK or broken point distance |

## Application

**Figure 1 :** ITP Series in Onboard Train Application

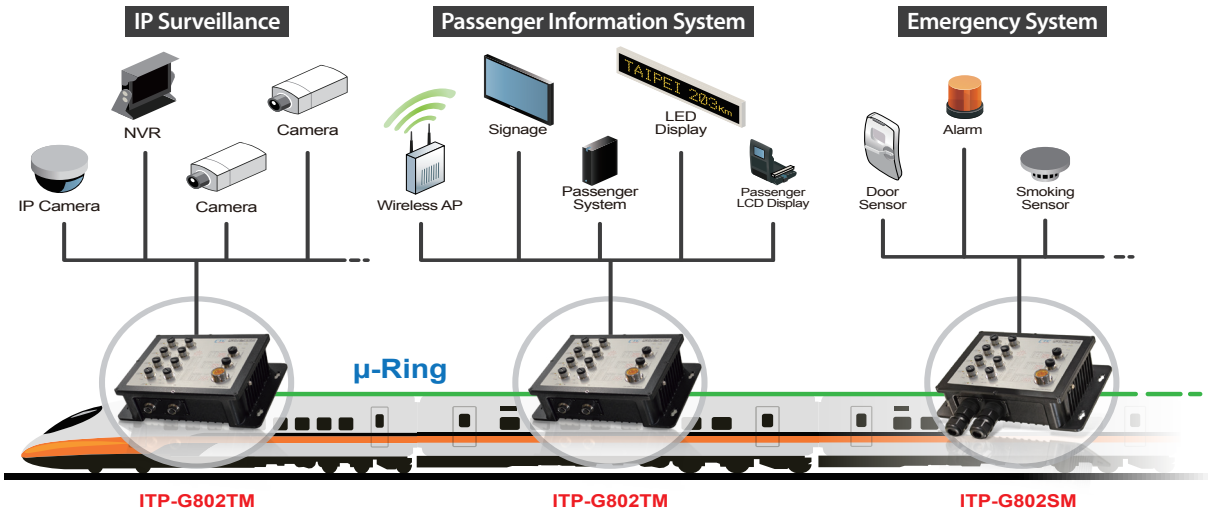
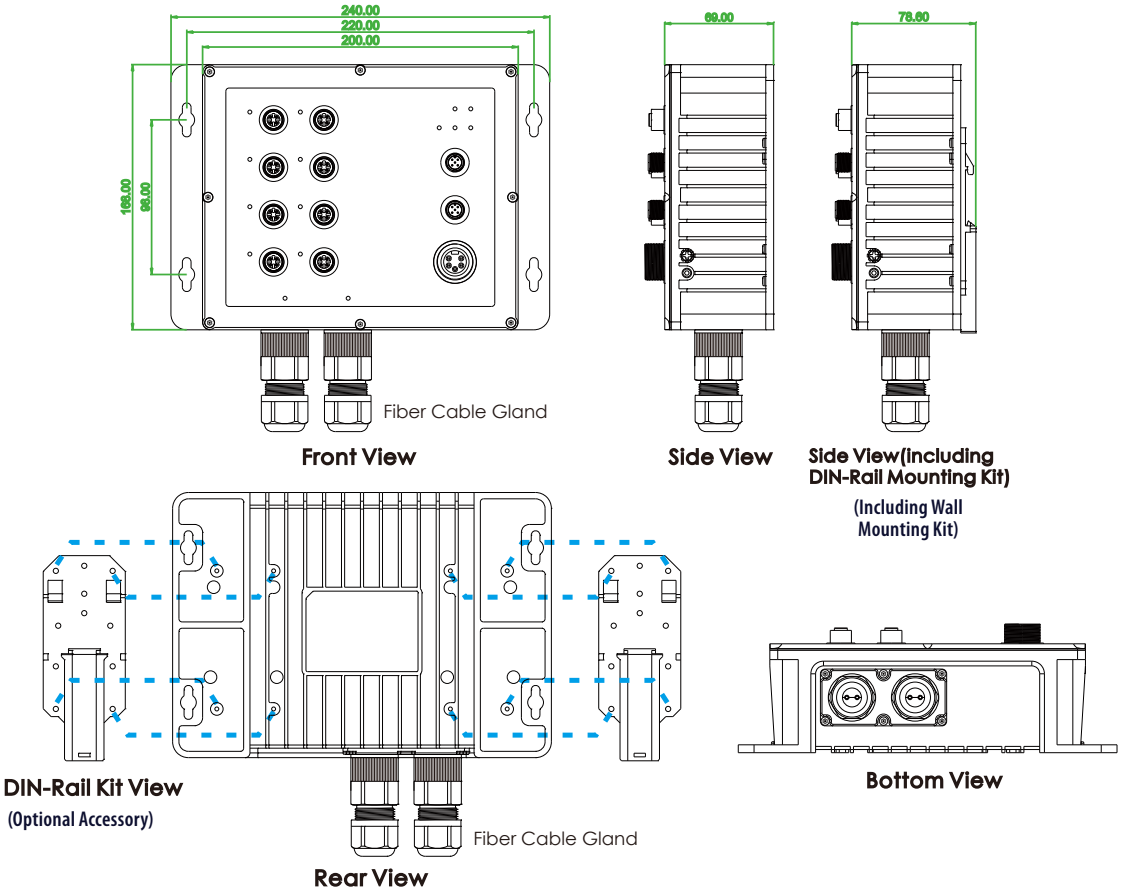



**Figure 2 :** ITP Series for Industrial Automation

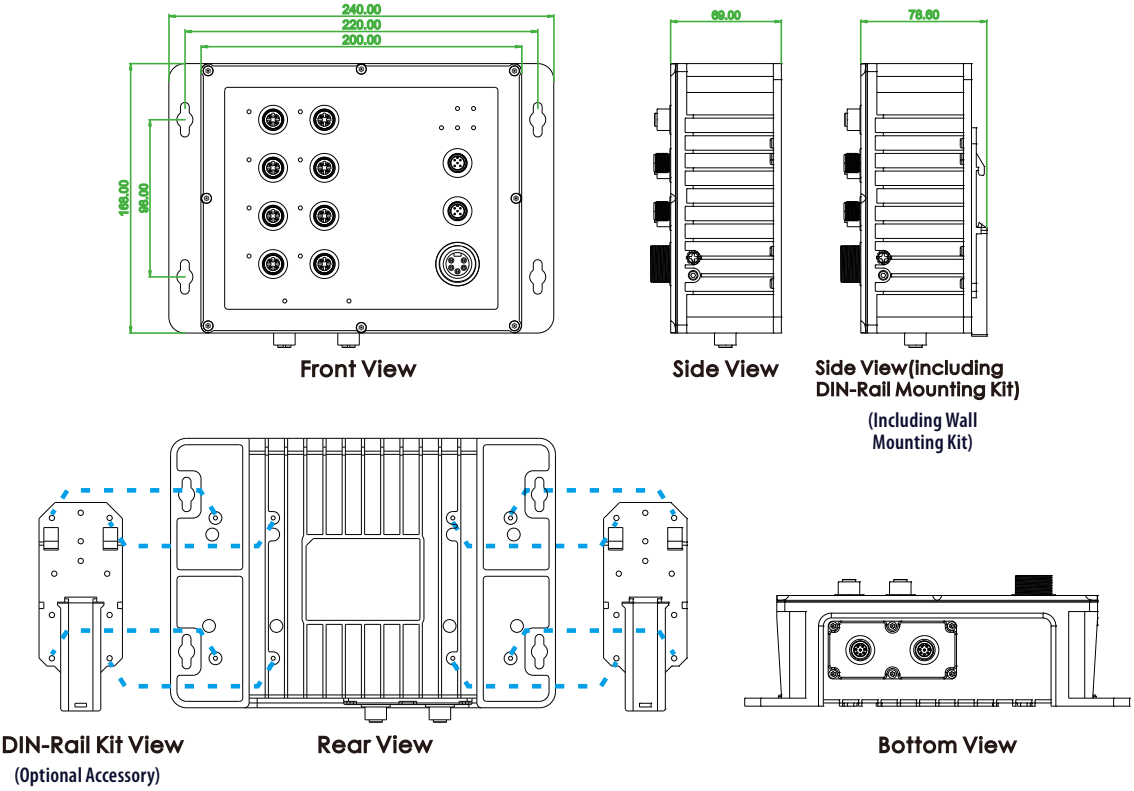
**Figure 3 : IP67 Waterproof**

## Dimensions

▶ ITP-G802SM




▶ ITP-G802TM



# Ordering Information

| Model Name | Managed | IP67 | Total Port | UTP Port M12 | Fiber Port | Redundant Power supply | | Certification | | | | Shock Vibration | Operating Temperture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 10/100/1000 Base-T(X) | 100/1000 Base-X | Low Volt 12/24/48VDC (8.4~60VDC) | High Volt 110/220 VDC 110/220 VAC | EN50155 EN50121-4 | UL60950-1 | EN61000-6-2 EN61000-6-4 | CE FCC | IEC61373 | |
| ITP-G802SM-ELL-X | V | V | 10 | 8 (X-code) | 2 SFP | 2 | | V | V | V | V | V | -40~75°C |
| ITP-G802SM-EHL-X | V | V | 10 | 8 (X-code) | 2 SFP | 1 | 1 | V | V | V | V | V | -40~75°C |
| ITP-G802SM-ELL | V | V | 10 | 8 (A-code) | 2 SFP | 2 | | V | V | V | V | V | -40~75°C |
| ITP-G802SM-EHL | V | V | 10 | 8 (A-code) | 2 SFP | 1 | 1 | V | V | V | V | V | -40~75°C |
| ITP-G802TM-ELL-X | V | V | 10 | 10 (X-code) | | 2 | | V | V | V | V | V | -40~75°C |
| ITP-G802TM-EHL-X | V | V | 10 | 10 (X-code) | | 1 | 1 | V | V | V | V | V | -40~75°C |
| ITP-G802TM-ELL | V | V | 10 | 10 (A-code) | | 2 | | V | V | V | V | V | -40~75°C |
| ITP-G802TM-EHL | V | V | 10 | 10 (A-code) | | 1 | 1 | V | V | V | V | V | -40~75°C |

## Model Naming Rule

ITP – G 8 02S M – E HL – X

- ITP: Industrial Transportation Switch
- G: GbE Switch
- 8: 8x GbE UTP
- 02S: 2xSFP
- 02T: 2xUTP
- M: Managed
- E: -40~75°C
- HL: 1x High Voltage + 1x Low Voltage
- LL : 2x Low Voltage
- X: X-Code (for GbE port)
- blank: A-Code (for GbE port)

## Package List

- One of the device series
- Protective caps for SFP ports and console, alarm port
- Fiber Cable Gland for SFP port x 2 set (for ITP-G802SM)
- Console cable (M12 to DB9)
- CD (Smartconfig, Manual)
- Quickly installation guide

# Optional Accessories

## Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the ITP-G802SM for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

| | |
|---|---|
| ISFP-M7000-85-D(E) | Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C) |
| ISFP-S7020-31-D(E) | Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C) |
| ISFP-M5002-31-D(E) | Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C) |
| ISFP-S5030-31-D(E) | Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C) |

### SFP Naming Rule

ISFP – S 7 040 – 31 – D E

- ISFP: Industrial SFP Transceiver
- S: M: Multi Mode, S: Single Mode, T: UTP
- 7: 9: 10G, 7: GbE, 5: FE
- 040: Distance — T00: (UTP), 000: (500m), 002: (2km), 020: (20km), 040: (40km)
- 31: Wavelength — 00: UTP, 85: 850nm, 31:1310nm, 55:1550nm, WA: TX/1310nm (Bidi mode A), WB: TX/1550nm (Bidi Mode B)
- D: DDMI, Blank: Non DDMI
- E: E:-40~85°C, Blank:0~70°C

## Optional Cable/Connector & Din-Rail Kit

**P/N: CAB-M12XM8-RJ45**
M12 X-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter

For GbE UTP (X-code model)

**P/N: CAB-M12AM8-RJ45**
M12 A-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter

For GbE UTP (A-code model)

**P/N: CAB-M12AF5-OPEN**
M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter

For Alarm

**P/N: CAB-M23F5-OPEN**
M23 Female (5-Pin) to open wire, (AWG 16) , IP67, 1 meter

For Power

**P/N: M12A-M8**
M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

**P/N: M12A-F5**
M12 A-code Female (5-Pin) connector, IP67

For Alarm

**P/N: IND-DNK04**
Din Rail Kit for Industrial, Wide: 52mm

(130 X52mm / 4 Screws) (2pcs/set)