



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. These switches use M12 connectors to ensure water tight, robust connections and to guarantee reliable connections against environmental disturbances, such as vibration and shock. 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, and 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 and city security. They can also work with CTC Union's platform SmartView™ Which provides 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)
- EN60950-1, CE, FCC, Rail Traffic EN50155, EN45545-2, 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 IEEE 802.3az 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/ Relay option 82/ Snooping
- Support TTDP for train application
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE 802.1q 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 IEEE 802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports IEEE 1588 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, IEEE 802.1ab 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*
- Supports SmartView for Centralized Management*

*Please see 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	
IEEE 802.3ac	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	IEEE 802.3ac	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	IEEE 802.1Q 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)	
	8x M12(8-Pin, Female, A-Code or X-code)	
	10/100/1000Base-T + 2x 100/1000Base-X SFP (ITP-G802SM)	
	UTP port provide auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
Console	Build-in 2x bypass GbE UTP ports (ITP-G802TM)	
	2x Water-proof cable connector 2x 100/1000Base-X SFP slot, with DDMI (for ITP-G802SM)	
	RS-232 (5-pin A-Code M12 male)	
	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)	
	1000 Link/Active (Amber)	
Jumbo Frame	SFP Fiber Per port: Link/Active (Green)	
	9.6KB	
	8K	
MAC Address Table	512K Bytes for packet buffer	
Memory Buffer	Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) or High (H) voltage.	
Power Supply	Low voltage (L) : 12/24/48V (8.4~60VDC)	
	High voltage (H) : 110/220VDC (88~300VDC), or 110/220VAC (85~264VAC)	
Power Consumption		

Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay		
Alarm Relay Contact	5-pin A-code M12 male 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	69 x 240 x 168mm (D x W x H)		
Weight	2.645kg (ITP-G802SM-LL)	2.82kg (ITP-G802SM-HL)	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)	353,092 Hours (ITP-G802SM-HL)	423,602 Hours (ITP-G802TM-LL)
	349,564 Hours (ITP-G802TM-HL)		(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		
Fire protection of railway vehicles	EN45545-2		
Immunity for Heavy Industrial Environment	EN61000-6-2		
Emission for Heavy Industrial Environment	EN61000-6-4		
EMS (Electromagnetic Susceptibility)	EN61000-4-2 (ESD) Level 3, Criteria B		
Protection Level	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	EN60950-1		
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(Ethernet, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
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.
	Recovery time <10ms
	The maximum number of devices allowed in a Ring supported ring is 250. (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
QoS Feature	Single Ring, Sub-Ring, Multiple ring topology network
Class of Service	IEEE802.1p 8 active priorities queues for per port

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
Bandwidth Control for Ingress	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
	Rate in steps : 1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Bandwidth Control for Egress	Rate Unit : bit or frame
	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
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 ACL	Port-Based, MAC-Based
	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	TFTP, HTTP
SW & Configuration Upgrade	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, Relay option 82 , Snooping
TTDP	Supported (Train Topology Discovery Protocol)
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

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 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 for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link 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

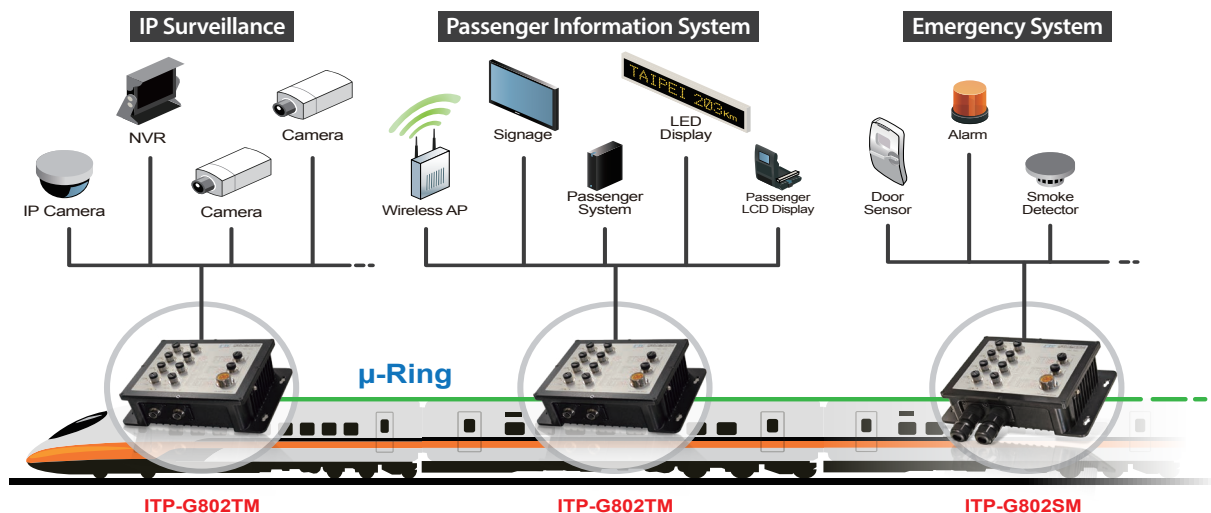


Figure 2 : ITP Series for Industrial Automation

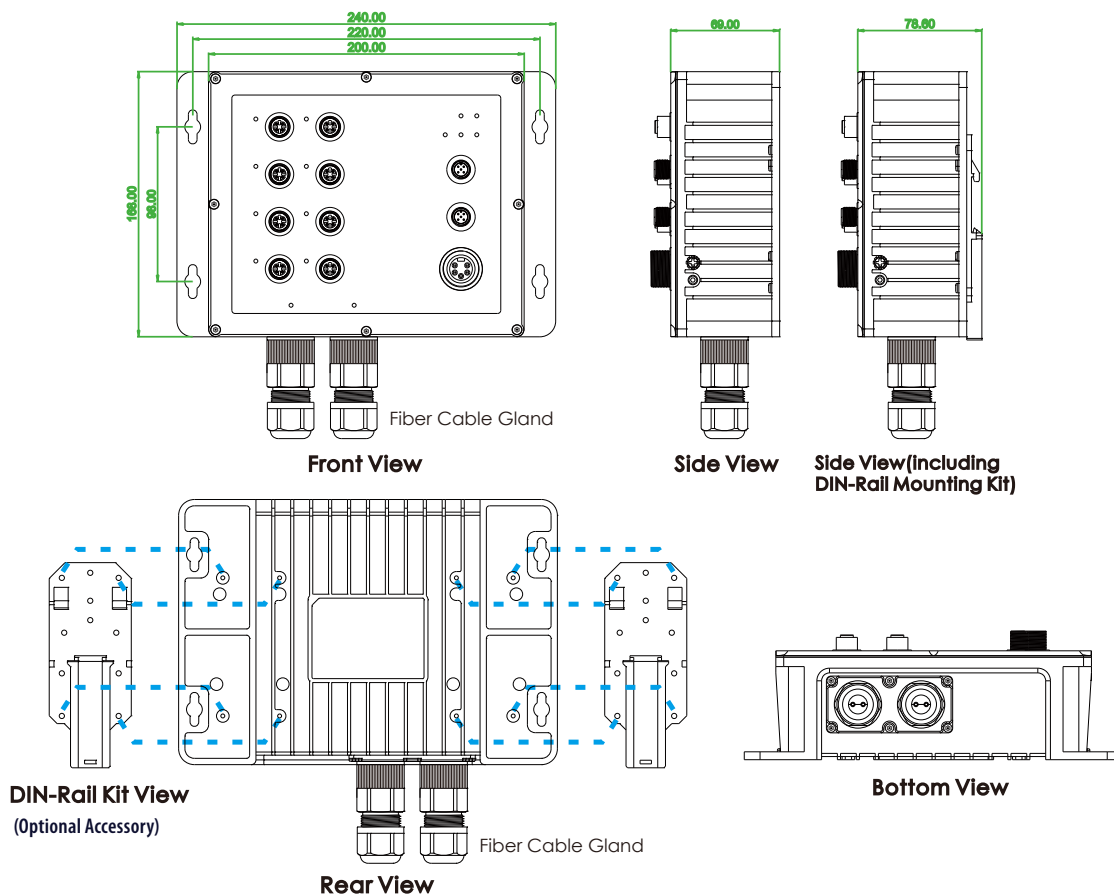


Figure 3 : IP67 Waterproof

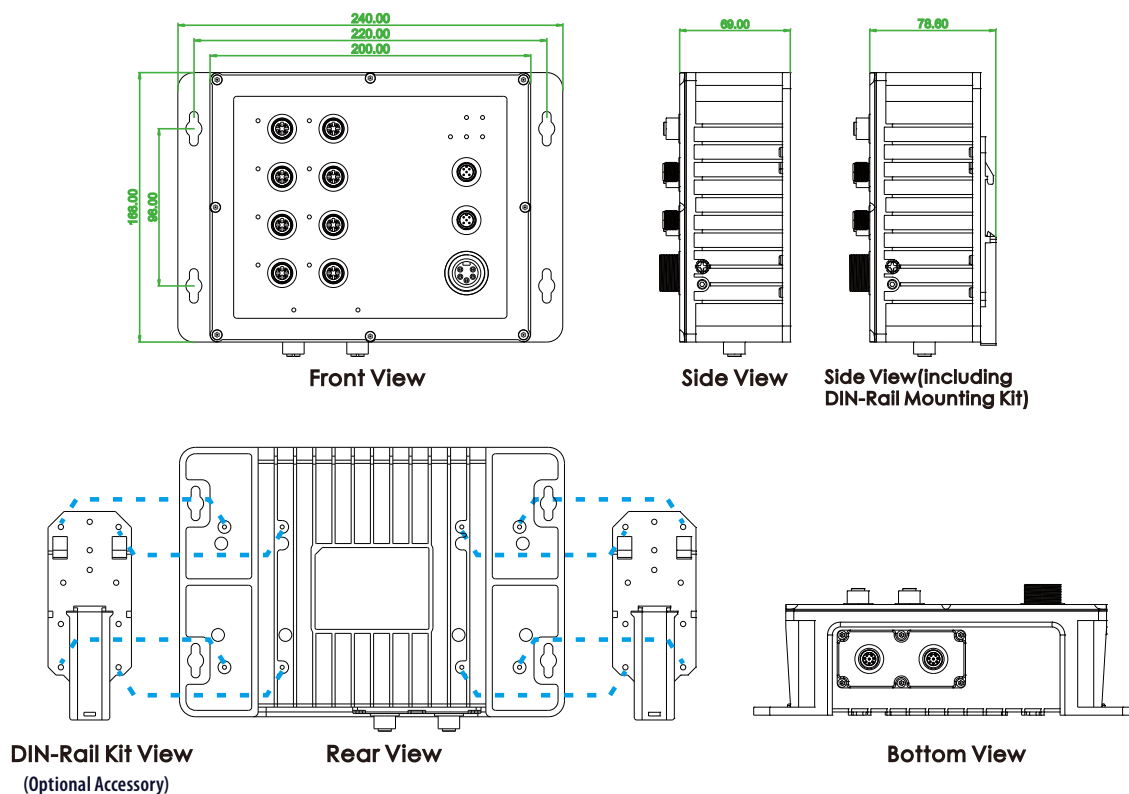


Dimensions

► ITP-G802SM



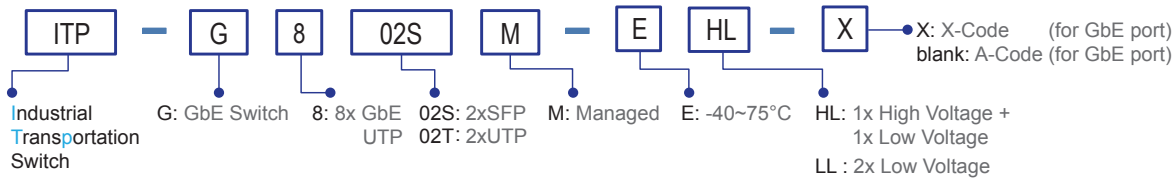
► ITP-G802TM



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	FiberPort	Redundant Power supply		Certification				Shock Vibration	Operating Temperature
				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	EN60950-1	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



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)
- Quick installation guide

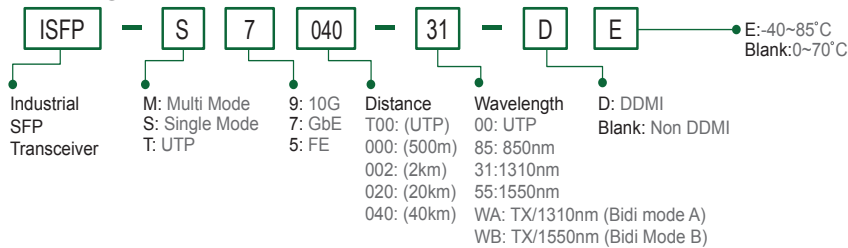
Optional Accessories

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

SFP Naming Rule



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)	