

ITP-2204GTM-16PH & ITP-1204GTM-12PH

- ◀ 22x 10/100Base M12 + 4x GbE M12 with 16x PoE (120W, 24/48/72/110VDC)
- ▶ 12x 10/100Base M12 + 4x GbE M12 with 12x PoE (120W, 24/48/72/110VDC)



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48/72/96/110VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail
- 4KV surge protection for PoE and UTP ports



The ITP series models are managed, industrial grade, L2 Fast Ethernet PoE (Power over Ethernet) switches that provide 12/22x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. Up to 12/16 IEEE 802.3at compliant PoE plus ports are classified as power source equipment (PSE) and provide up to 30 watts of power per port with a maximum power budget of 120W. Housed in rugged wall mountable enclosures, these switches are designed for IEEE 802.3af/at compliant powered devices (PDs), such as surveillance cameras, wireless access points, and IP phones. The PoE switches use M12 connectors to ensure tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With a wide power input range of 24/48/72/96/110VDC (operating range 20 to 137.5VDC), this product series is especially suitable for rolling stock and track side installations.

Features

- M12 and M23 connector against vibration and shock, M12 X-code for Gigabit port
- Cable diagnostics, identifies opens/shorts distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) 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
- Supports TTDP for train application
- 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
- 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	Flow Control	IEEE 802.3x	for full duplex mode Back pressure for half duplex mode
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet		PoE Port	12x M12 (4-Pin D-code Female) PoE ports (ITP-1204GTM-12PH)
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair			16x M12 (4-Pin D-code Female) PoE ports (ITP-2204GTM-16PH)
	IEEE 802.1d	STP (Spanning Tree Protocol)		Maximum PoE output power budget 120W (30W/per port), Regulated PoE output voltage at 52VDC	
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)		IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode	
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		Network Connector	12x M12 (4-Pin, Female, D-Code) 10/100Base-TX UTP
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)			+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-1204GTM-12PH)
	IEEE 802.1Q	Virtual LANs (VLAN)		22x M12 (4-Pin, Female, D-Code) 10/100Base-TX UTP	
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-2204GTM-16PH)	
	IEEE802.3ac	Max frame size extended to 1522Bytes		UTP port provide auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		Build-in 2x bypass GbE UTP ports (For -BP model optional)	
	IEEE 802.3x	Flow control for Full Duplex		Console	RS-232 (5-pin A-Code M12 male)
	IEEE 802.3af	PoE (Power over Ethernet)		Network Cable	UTP/STP above Cat. 5e cable
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)		EIA/TIA-568 100-ohm (100m)	
IEEE 802.1ad	Stacked VLANs, Q-in-Q	Protocols	CSMA/CD		
IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Reverse Polarity Protection	Supported		
IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	Overload Current Protection	Supported		
IEEE 802.3az	EEE (Energy Efficient Ethernet)	CPU Watch Dog	Supported		
VLAN ID	4094	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)		
Switch Architecture	10.4 Gbps (ITP-1204GTM-12PH) 12.4Gbps (ITP-2204GTM-16PH) (Full wire-speed)		UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)		
Data Processing	Store and Forward				

LED	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (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 DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter																																
Power Consumption	<p>ITP-1204GTM-12PH</p> <table border="1"> <thead> <tr> <th>Input Voltage</th> <th>Total Power Consumption</th> <th>Device Power Consumption</th> <th>PoE Budget</th> </tr> </thead> <tbody> <tr> <td>24 VDC</td> <td>141.4W</td> <td>13W</td> <td>120W</td> </tr> <tr> <td>48 VDC</td> <td>137.9W</td> <td>14W</td> <td>120W</td> </tr> <tr> <td>110VDC</td> <td>136.4W</td> <td>16.5W</td> <td>120W</td> </tr> </tbody> </table> <p>ITP-2204GTM-16PH</p> <table border="1"> <thead> <tr> <th>Input Voltage</th> <th>Total Power Consumption</th> <th>Device Power Consumption</th> <th>PoE Budget</th> </tr> </thead> <tbody> <tr> <td>24 VDC</td> <td>149W</td> <td>17.1W</td> <td>120W</td> </tr> <tr> <td>48 VDC</td> <td>141.1W</td> <td>17.8W</td> <td>120W</td> </tr> <tr> <td>110VDC</td> <td>140.8W</td> <td>19.8</td> <td>120W</td> </tr> </tbody> </table>	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	24 VDC	141.4W	13W	120W	48 VDC	137.9W	14W	120W	110VDC	136.4W	16.5W	120W	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	24 VDC	149W	17.1W	120W	48 VDC	141.1W	17.8W	120W	110VDC	140.8W	19.8	120W
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget																														
24 VDC	141.4W	13W	120W																														
48 VDC	137.9W	14W	120W																														
110VDC	136.4W	16.5W	120W																														
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget																														
24 VDC	149W	17.1W	120W																														
48 VDC	141.1W	17.8W	120W																														
110VDC	140.8W	19.8	120W																														
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, IP54 grade housing protection																																
Dimensions	113 x 260 x 132 (D x W x H) (ITP-1204GTM-12PH) 113 x 360 x 132 (D x W x H) (ITP-2204GTM-16PH)																																

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) 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 μ-Ring	up to 5 instances that each supports μ-Ring, μ-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 <10ms Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
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 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

Weight	2.8kg (ITP-1204GTM-12PH) 3.9kg (ITP-2204GTM-16PH)
Installation Mounting	Wall mounting
MTBF	238,600 Hours (ITP-1204GTM-12PH) 227,899 Hours (ITP-2204GTM-16PH) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4
Fire protection of railway vehicles	EN 45545-2
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
Safety	EN60950-1
4KV surge protection	Supported for PoE and UTP port
Shock	IEC-61373
Freelfall	IEC 60068-2-32
Vibration	IEC-61373

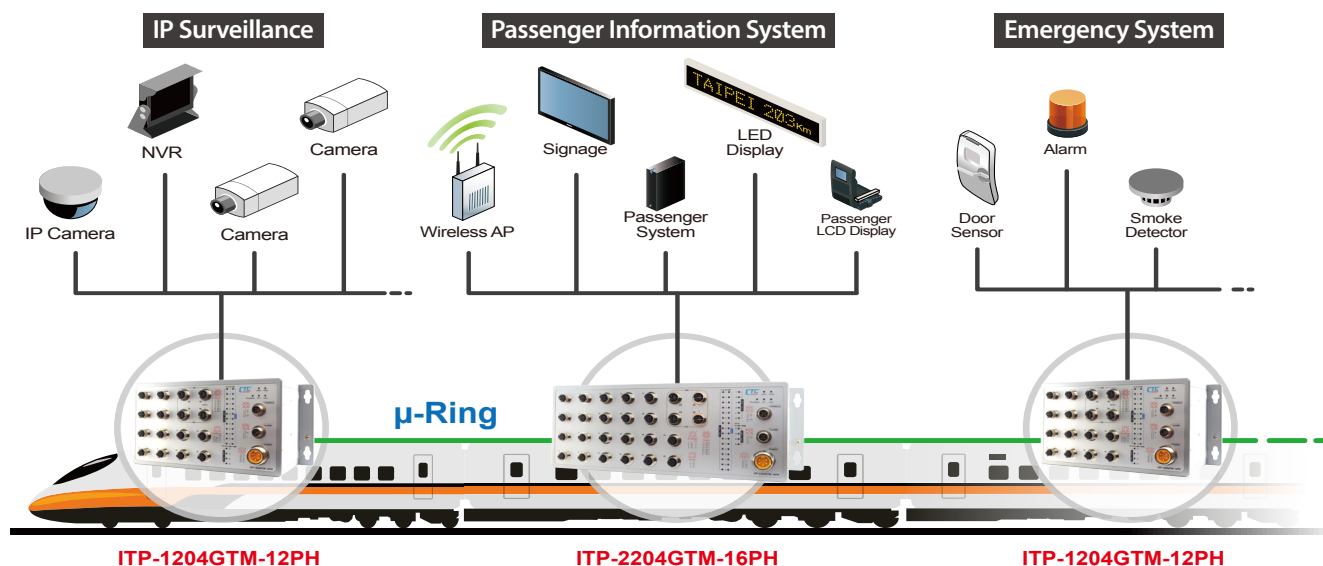
DiffServ (RF 2474) Marking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile, Throttling
IGMP / MLD Snooping	Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries for L2 / L3 / L4 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 Password Authentication	Local Authentication 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	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping

RARP	Supported
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	Server/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	Server/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 Measuring UTP cable OK or broken point distance
Cable Diagnostic	PoE PD Failure Auto Checking, and Auto reset when PD fail
Advanced PoE Management	PoE Scheduling (On/Off schedule weekly) PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budget (maximum 120W) limitation Power feeding priority

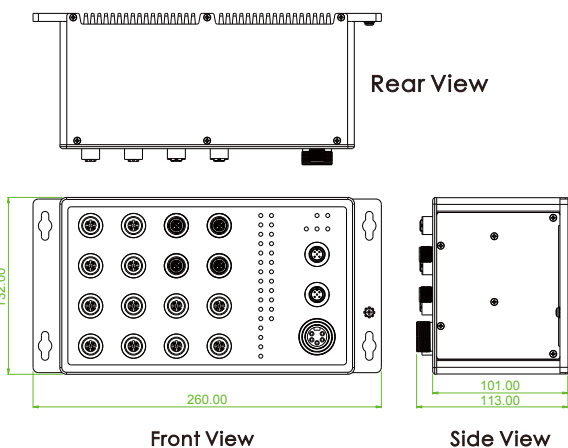
Application

Figure : ITP Series in Onboard Train Application

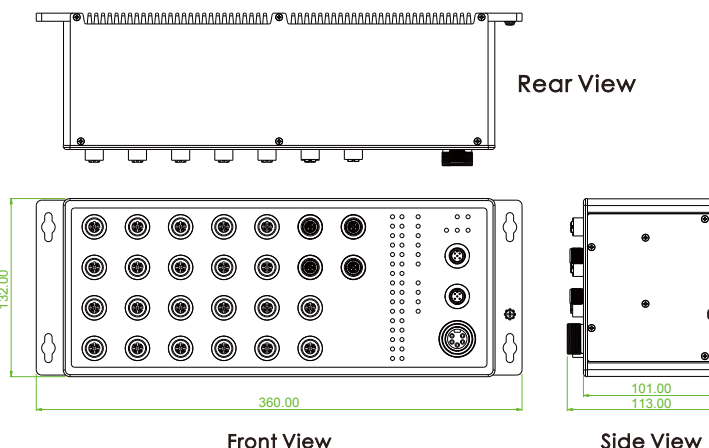


Dimensions

▶ ITP-1204GTM-12PH



▶ ITP-2204GTM-16PH



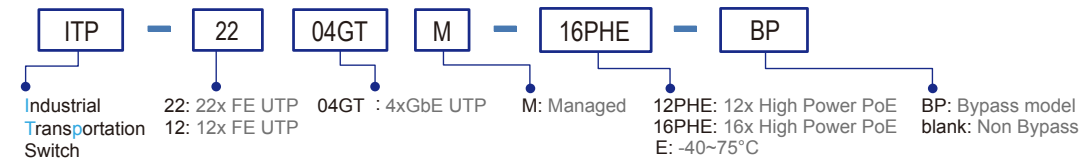
EN50155 PoE Switch ITP-1204GTM-12PH & ITP-2204GTM-16PH

Ordering Information

Model Name	Managed	Protection	Total Port	FE Port	GbE port		PoE Port		Redundant Dual Input Power 24/48/72/96/110VDC (16.8~137.5VDC)
				D-code M12	GbE X-code M12 UTP	GbE X-code M12 UTP Bypass	IEEE802.3at	PoE Total Power Budget	
ITP-1204GTM-12PHE	V	IP54	16	12	4		12	120W	V
ITP-1204GTM-12PHE-BP	V	IP54	16	12	2	2	12	120W	V
ITP-2204GTM-16PHE	V	IP54	26	22	4		16	120W	V
ITP-2204GTM-16PHE-BP	V	IP54	26	22	2	2	16	120W	V

Model Name	Certification					
	EN45545-2	EN50155 EN50121-4	EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	IEC61373
ITP-1204GTM-12PHE	V	V	V	V	V	V
ITP-1204GTM-12PHE-BP	V	V	V	V	V	V
ITP-2204GTM-16PHE	V	V	V	V	V	V
ITP-2204GTM-16PHE-BP	V	V	V	V	V	V

Model Naming Rule



Package List

- One unit device
- Protective caps for UTP ports and console, alarm port
- Console cable (M12 to DB9)

Optional Accessories

Optional Cable/Connector

P/N: CAB-M12XM8-RJ45

M12 X-code Male (8-Pin) to RJ-45, AWG 24, IP67, 1 meter



For GbE UTP (X-code)

P/N: CAB-M12DM4-RJ45

M12 D-code Male (4-Pin) to RJ-45, AWG 24, IP67, 1 meter



For FE UTP

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



P/N: M12D-M4

M12 D-code Male (4-Pin) connector, IP67



P/N: M12A-F5

M12 A-code Female (5-Pin) connector, IP67

