ITP-1204GTM NEW
12x 10/100Base–TX +
4x 10/100/1000Base-T
Managed Ethernet Switch

ITP-1222GTFM NEW
12x 10/100Base–TX + 2x 10/100/1000Base-T
+ 2x 1000Base-X Fiber
Managed Ethernet Switch

ITP-2204GTM NEW
22x 10/100Base–TX +
4x 10/100/1000Base-T
Managed Ethernet Switch

ITP-2222GTFM NEW
22x 10/100Base–TX + 2x 10/100/1000Base-T
+ 2x 1000Base-X Fiber
Managed Ethernet Switch

CE FC EN45545-2 EN50155 EN50121-4 EN61000-6-2 EN61000-6-4 SmartView u-Ring IEEE 1588v2 X-Code

These models of industrial grade M12 managed Ethernet switches that provide total 16/26 ports Ethernet connectivity, come with 12/22 ports 10/100Base-TX and 4 ports 10/100/1000Base-T(X) or 2 ports Gigabit copper plus 2 ports Gigabit Fiber Q-ODC™ interface with embedded fiber transceiver.
The switches use M12/M23(Power input) connectors to ensure tight and robust connections to guarantee the reliable connections against environmental disturbances, such as strongly vibration and shock, these switches provide wide power input range of 24/48/72/96/110VDC (operating range 16.8 to 137.5VDC) make this product series suitable for rolling stock and track side installations, especially the ITP series switches defined by the EN 50155 standard covering power input voltage and insulation, surge, EFT, ESD, operating temperature as well, thus making the M12 switches suitable for industrial applications, not only for rolling stock, vehicle but also for oil, gas, mining and heavy industry applications.
These switches provide a variety of advanced Ethernet functionalities including STP/RSTP/MSTP/ ITU-T G.8032 ERPS and µ-Ring, µ-Chain (recovery time <10ms @250 devices) for networking redundancy, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet, can work with CTC Union's platform SmartView™ to provide convenient, real-time and centralized device management.

Features

- 12x 10/100Base–TX + 4x 10/100/1000Base-T (ITP-1204GTM)
- 12x 10/100Base–TX + 2x 10/100/1000Base-T + 2x1000Base-X Fiber (ITP-1222GTFM)
- 22x 10/100Base–TX + 4x 10/100/1000Base-T (ITP-2204GTM)
- 22x 10/100Base–TX + 2x 10/100/1000Base-T + 2x1000Base-X Fiber (ITP-2222GTFM)
- M12, M23 and Q-ODC™ fiber connector against vibration and shock, M12 X-code for Gigabit port
- IP42 grade housing protection
- 24 to 110VDC (16.8~137.5VDC) redundant dual wide input power
- Supports negative voltage power input (for example in telecom system)
- EN45545-2, EN-60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 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 (-BP bypass model)
- 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 5 operating mode in each port: Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
- 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*
- 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)
	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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	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	10.4 Gbps (ITP-1204GTM, ITP-1222GTFM) 12.4Gbps (ITP-2204GTM, ITP-2222GTFM) (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	12x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-1204GTM) 12x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP + 2x Q-ODC™ 1000Base-SX/LX Fiber (ITP-1222GTFM) 22x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-2204GTM) 22x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP +2x Q-ODC™ 1000Base-SX/LX Fiber (ITP-2222GTFM) UTP port provide auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function Build-in 2x bypass GbE UTP ports (For -BP model optional)
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) 1000 Link/Active (Amber)
	Fiber 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 DC 24 to 110VDC (16.8~137.5VDC) wide input power Supports negative voltage power input (for example in telecom system)
Power Consumption	TBD
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 , IP42 grade housing protection
Dimensions	125 x 230 x 132 (D x W x H) (ITP-1204GTM, ITP-1222GTFM) 125 x 350 x 132 (D x W x H) (ITP-2204GTM, ITP-2222GTFM)
Weight	TBD
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	TBD (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	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
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for UTP port
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 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

Traffic Classification QoS	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 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 Filtering	Web, Telnet / SSH, CLI, RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP 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 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
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

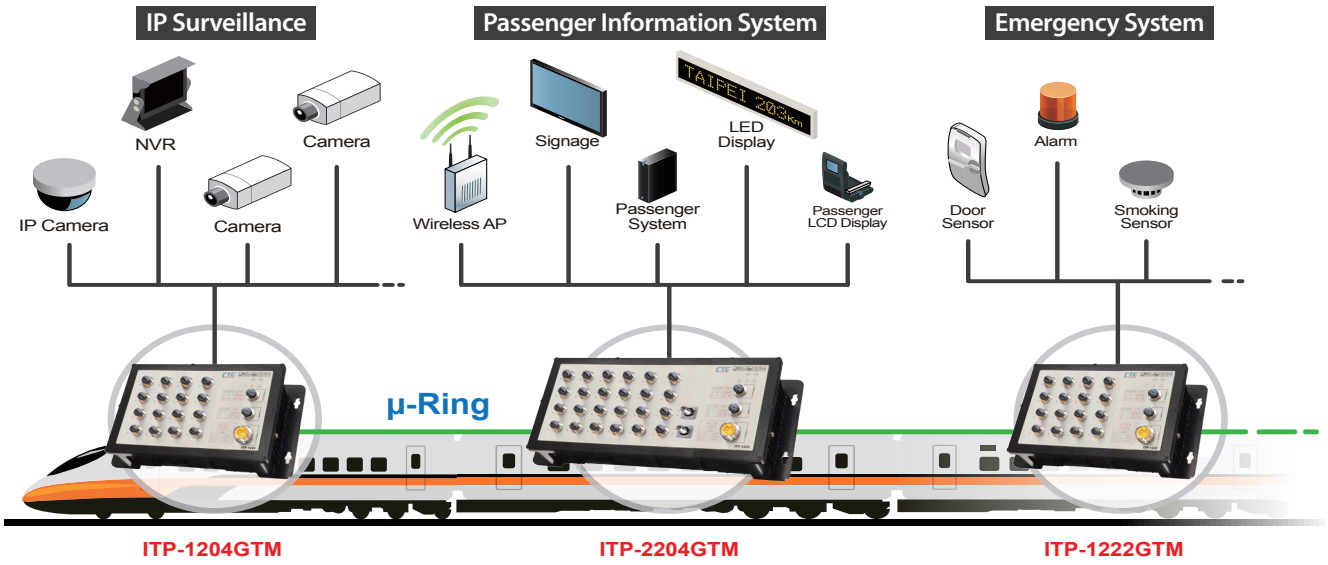

Figure : ITP Series in Onboard Train Application

Ordering Information

Model Name	Managed	Protection	Total Port	FE Port	GbE port			Redundant Dual Input Power
				D-code M12	GbE X-code M12 UTP	GbE X-code M12 UTP Bypass	Q-ODC™ Fiber	24 to 110VDC (16.8~137.5VDC)
ITP-1222GTFM-E	V	IP42	16	12	2		2	V
ITP-1204GTM-E	V	IP42	16	12	4			V
ITP-1204GTM-E-BP	V	IP42	16	12	2	2		V
ITP-2222GTFM-E	V	IP42	26	22	2		2	V
ITP-2204GTM-E	V	IP42	26	22	4			V
ITP-2204GTM-E-BP	V	IP42	26	22	2	2		V

Model Name	Certification					
	EN45545-2	EN50155 EN50121-4	EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	IEC61373
ITP-1222GTFM-E	V	V	V	V	V	V
ITP-1204GTM-E	V	V	V	V	V	V
ITP-1204GTM-E-BP	V	V	V	V	V	V
ITP-2222GTFM-E	V	V	V	V	V	V
ITP-2204GTM-E	V	V	V	V	V	V
ITP-2204GTM-E-BP	V	V	V	V	V	V

Model Naming Rule

ITP – 22 – 04GT – M – E – BP – ODC002 (For fiber optional model)

- ITP: Industrial Transportation Switch
- 22: 22x FE UTP; 12: 12x FE UTP
- 22GTF: 2xGbE UTP+ 2GbE Fiber; 04GT : 4xGbE UTP
- M: Managed
- E: -40~75°C
- BP: Bypass model; Non: Non Bypass
- ODC002: M/M 2km; ODC020: S/M 20km

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)

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

For Power

P/N: M12D-M4
M12 D-code Male (4-Pin) connector, IP67

For FE UTP

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)

Package List

- One unit device
- Protective caps for UTP port and Console, Alarm port
- Console cable (M12 to DB9)
- CD (SmartConfig, Manual)
- Quickly installation guide