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SmartView™ WEB EMS

NEW

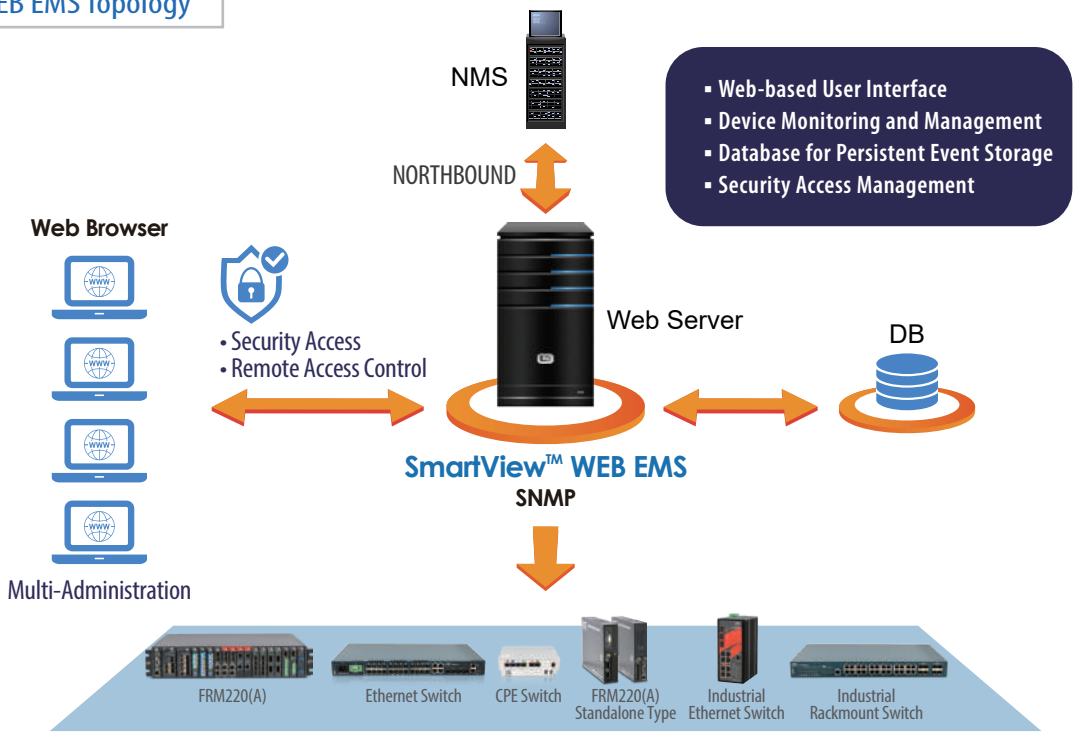
- Web-based User Interface
- Remote Access and Centralized Device Management
- Real-time visual representations & processing of alarms
- Long term event storage (up to 1 year)

CTC Union's SmartView™ WEB EMS (Element Management System) is a comprehensive device management solution that monitors performance, enables remote configuration and provisioning and provides fault notification status for CTC Union network devices. Smartview™ Web EMS uses the Database Server for long term storage along with Web Server to provide a Web based management experience for device administrators. By utilizing a Web based platform, administrators are free to use their favorite Web browser on personal computers or on mobile devices anywhere. All devices under Smartview™ Web EMS management are accessed via the Simple Network Management Protocol or SNMP, as they are constantly polled and monitored for alarm traps. A single Smartview™ Web EMS server is capable of managing hundreds of devices.

// Features

- Main Functions (FCAPS):
  Fault Management,
  Configuration Management,
  Accounting Management,
  Performance Management,
  Security Management
- Remote access control for efficient configuration
- Network element performance monitoring
- Alarm event and notification
- Auto discovery and device viewer
- Allow multiple concurrent operating users

WEB EMS Topology



SmartView™ WEB EMS Server

The server handles connection with the network devices using SNMP protocol, and is responsible for HTTP requests from management clients. Smartview™ Web EMS Server collects the information data from specific SNMP agents, stores the information into a persistent database and sends commands to control network elements.

Microsoft SQL Server Database

SQL Server is the place where Smartview™ Web EMS stores collected data, such as alarms, traps and user actions, for long term retrieval. Smartview™ Web EMS supports the free Microsoft SQL Server Express Edition for data storage.

Multi-Administrators

Management clients use web browser to monitor and control the devices at far end. Multiple operating connections are allowed, up to the limit of hardware and network .

// Features at a Glance

- ***Fault Management***

Alarm Detection

SmartView™ WEB EMS continuously polls all network devices under its management and will visually display all alarm conditions found. Alarms will be categorized as Major, Minor or Warning, depending on severity and be cleared when alarm condition recovered.

Alarm Selection

Alarm events of network element are configurable. All alarm events are warned by default, but they can be manually disabled to ignore warning messages.

Alarm Notification

The SmartView™ WEB EMS is capable of sending emails to selected administrators when critical alarms occur. Prompt notification of system problems aid in getting problems in the network devices fixed in the shortest time possible.

Trap Collection

When an SNMP agent experiences an abnormal condition, it will send a SNMP trap message to SmartView™ WEB EMS which then receives the message, and records it in the database.

Network Topology

Network elements and connections are monitored and displayed in network topology. Elements in color indicate some alarm condition is present. The screen may be zoomed in or out and a search function may be used to quickly find a device.

- ***Configuration Management***

Network Element Configuration

SmartView™ WEB EMS is able to provide a single point of configuration for the device elements. Most settings only require mouse clicks and by using a tab format, most scrolling is eliminated. Current settings and status are displayed along with hardware and firmware versions for each element.

Firmware Upgrade

SmartView™ WEB EMS is able to download firmware to device elements and perform configuration backup/restore.

Network Element Discovery

SmartView™ WEB EMS has a tool for automatically discovering SNMP agents on the network. Simply enter an IP address range and the discovery program will ping every IP address looking for SNMP agents. Once discovered, the agents can be selected and brought into the polling.

- ***Accounting Management***

Network Inventory

SmartView™ WEB EMS is able of accounting the number of network elements and line cards. Firmware version, MAC address and factory programmed serial number are displayed for each element.

- ***Performance Management***

SmartView™ is able to monitor device performance parameters through polling of specific OIDs. Graphs of performance information (for example hardware parameters such as fan speed, temperature, optical Tx/Rx power) can be generated on an X Y axis showing different trend data.

- ***Security Management***

User Privilege

The administrator can add necessary user logins with specific privileges, from Administrator to Operator and lastly to normal user.

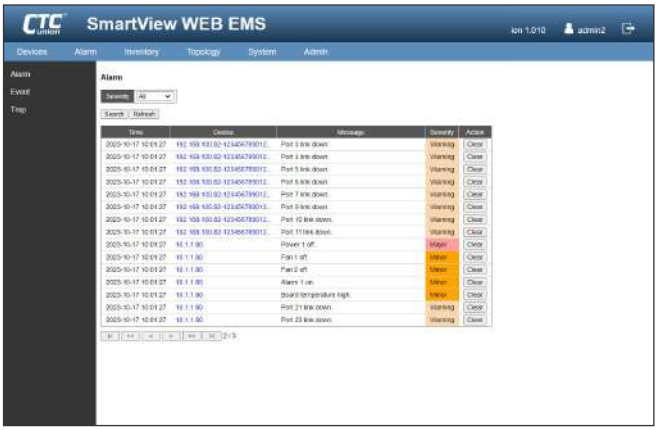
User Role

A user role is a group and defines privileges for users to perform management tasks. The access to network elements is also restricted by user role.

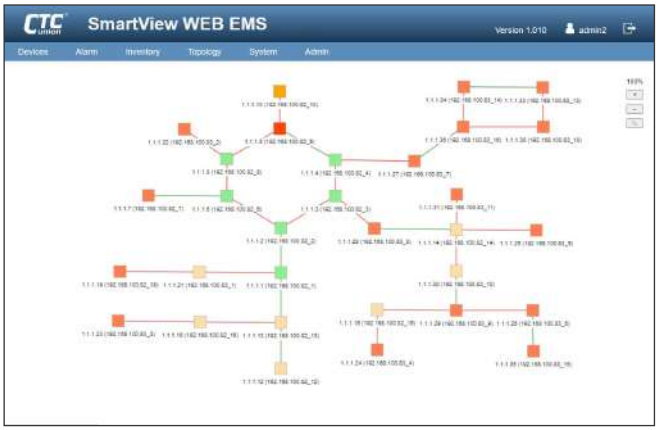
User Activity

Provides viewing and clearing of the user login and configuration action logs.

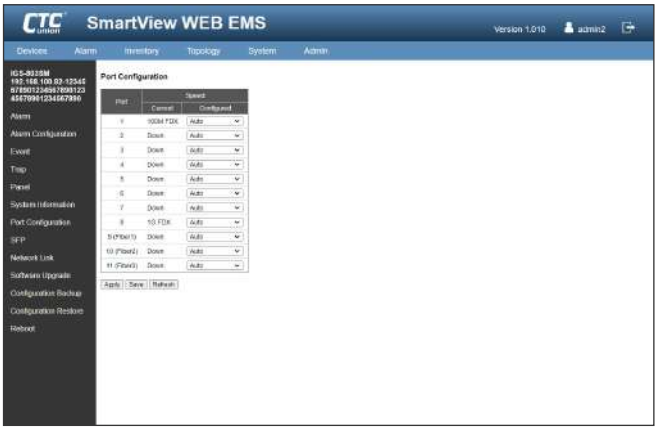
Alarm Detection



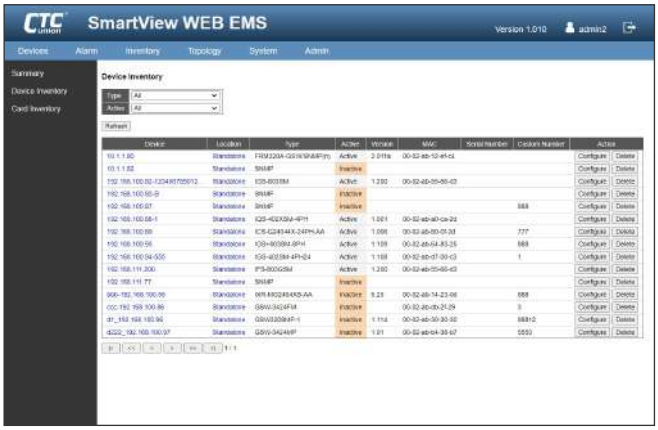
Network Topology



Network Element Configuration



Network Inventory



System Requirements

- **Operating System:**

Windows Server 2016, Win 10 Pro 64bit.

- **Hardware:**

Intel Core I5 or Xeon E5 2.4GHz 4 cores Processors, 8GB RAM, 100GB HD

Ordering Information

Model Name	Description
SVW2-AGT-50	SmartView™ WEB EMS management software with 50 nodes
SVW2-AGT-100	SmartView™ WEB EMS management software with 100 nodes
SVW2-AGT-200	SmartView™ WEB EMS management software with 200 nodes
SVW2-AGT-500	SmartView™ WEB EMS management software with 500 nodes

IXR-MG2404XS

L3 3x Modular Slots + 4x 1G/10G SFP+

- Static Routing, RIP v1, RIP v2, BGP v4, OSPF v2, PIM-SM, PIM-DM, PIM-SSM, DVMRP, VRRP v2
- Supports IEEE802.1AE MACsec network security (IRM-4GS-SEC, IRM-4GT-SEC)
- Supports ERPS, MRP, MSTP, RSTP, STP for redundant cabling
- EN62368-1, CE and FCC certified
- Modular design for flexible application

The industrial L3 10G Ethernet Switch adopt an enhanced and hardened design to meet critical and centralized strict requirements. It provides up to 24 Gigabit Ethernet ports, which can be implemented by 3 types of Ethernet module of Gigabit copper, PoE port and SFP slot, and come with 4 ports of 10 Gigabit SFP+ slot for uplink. Its redundant power input can improve system reliability and uninterrupted availability of the network backbone. The switch is ideal for smart city, surveillance, intelligent traffic control systems and production automation applications.

Features

- Redundant 48VDC, or 110/220VAC power inputs
- Rugged metal, IP30 protection & Fanless design
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in BC, End-End mode for each port

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 802.3ae	10Gbit/s Ethernet over fiber
	IEEE802.3af	PoE (Power over Ethernet)
	IEEE802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	IEC62439-2	Media Redundancy Protocol (MRP)
	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 802.1AE	MACsec, Local and metropolitan area networks-Media Access Control (MAC) Security
	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
	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)
VLAN ID	4094 IEEE 802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 128Gbps (Full wire-speed)	
Throughput	95.24Mpps maximum	

Data Processing	Store and Forward
Network Connector	3x modular slot + 4x 1000/10GBase-X SFP+ Provide various type of module for modular slot: 8x 10/100/1000Base-T RJ45 module 8x 10/100/1000Base-T RJ45 with IEEE802.3af/at PoE module 8x 100/1000Base-X SFP module 4x 10/100/1000Base-T RJ45 MACsec module 4x 100/1000Base-X SFP MACsec module PoE: Supports 3x PoE module/24x PoE ports maximum Maximum 30W/port, maximum total 720W/per device All SFP support DDMI All RJ45 support Auto negotiation speed, auto MDI/MDI-X function
Console Port	RS232 (RJ45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Power Supply (For Device)	Redundant 2x AC input power (-AA model) Redundant 1x AC + 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : 110/220VAC (85VAC~264VAC) IEC320 C-16 type connector DC input power (D) : 48VDC (48~57VDC) Removable Terminal Block
Power Supply (For PoE)	Dual 48VDC for PoE (45~57VDC, For IEEE802.3af) (51~57VDC, For IEEE802.3at) Terminal Block
Power Consumption	Maximum 64W@110-220VAC (Not include PoE) Maximum 32.7W@48VDC (Not include PoE) Maximum 370W for PoE
PoE Power Budget	360W (In full PoE Module)
LED (System)	Power 1 (Green), Power 2 (Green) for Device Power 1 (Green), Power 2(Green) for PoE
	Sys (Green) Blinking: Normally operate OFF: Not ready
	Ring (Green) ON: Rings in normal / OFF: Ring is disabled / Blinking: port link down in Ring
	Master (Green) ON: The device is a Master of the Ring / OFF: Slave of the ERPS Ring
	Alarm (Red) ON: Alarm is triggered by user defined / OFF: Alarm is not triggered
LED (Module)	Per RJ-45 port Amber: ON: 1000M Link / Blink: 100M Link / OFF: 10M Green: ON: Link / Blink: Link & Active / OFF: No Link
	Per SFP Fiber port Amber : ON: 1000M Link / Blink: 100M Link Green: ON: Link / Blink: Link & Active / OFF: No Link
	PoE (Amber) ON: PoE Active / OFF: PoE Inactive
Jumbo Frame	9216 Byte
MAC Address Table	16K
Memory Buffer	1.5M Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	340 x 440 x 44mm (Dx W x H)
Weight	5kg (Not include module)
Installation Mounting	19" rack mount
MTBF	106,872 Hours (MIL-HDBK-217)
Warranty	5 years

Certification	
EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications

Topology	
Layer 3 Routing	Static routing, RIP v1/v2, OSPFv2, DVMRP, PIM-DM, PIM-SM, PIM-SSM
Layer 3 Redundancy	VRRP v2
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	MAC-based VLAN
	GARP
	GVRP (GARP VLAN Registration Protocol)
	GMRP
Link Aggregation (Port Trunk)	Static, Dynamic (IEEE 802.3ad LACP)
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP, IEC62439-2 MRP(Client)
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring

QoS	
QoS	Supported

IP Multicasting Feature	
IGMP	IGMP v1, v2, v3 / IGMP Snooping

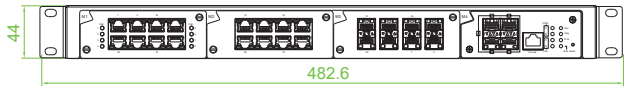
Security Features	
IEEE802.1AE	Support IEEE802.1AE MACsec network security Provide by IRM-4GS-SEC, IRM-4GT-SEC optional module
IEEE 802.1X	Port-Based
ACL	Supp orted
RADIUS	Authentication & Accounting
TACACS+	Authentication, Authorization, Accounting
HTTPS, HTTP	Supported
SSH	Supported
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console

Management Features	
CLI	Supported
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
SMTP	SMTP, SMTP (Gmail)

Automation Profile	Profinet v2 conformance Modbus/TCP status registers
SW & Configuration Upgrade	TFTP
RMON	RMON I (1, 2, 3, 9 group)
MIB	RFC1213 MIB II, Private MIB
DHCP	Server, Client, Relay, DHCP option 66/67/82
BootP	Supported
RARP	Supported
Mirroring	Supported
Event Syslog	Client
Warning Message	System syslog, SMTP e-mail, alarm relay
IEEE 1588 PTP V2	BC, End-End mode for each port
NTP V4.0, SNTP	NTP (server/ Client), SNTP (Client)
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol

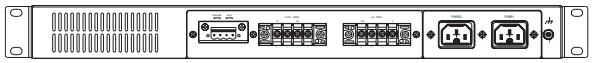
Dimensions

Front View

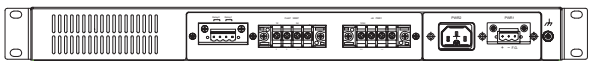


Rear View

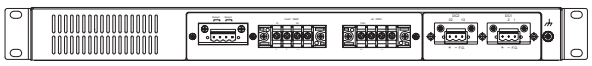
-AA Power



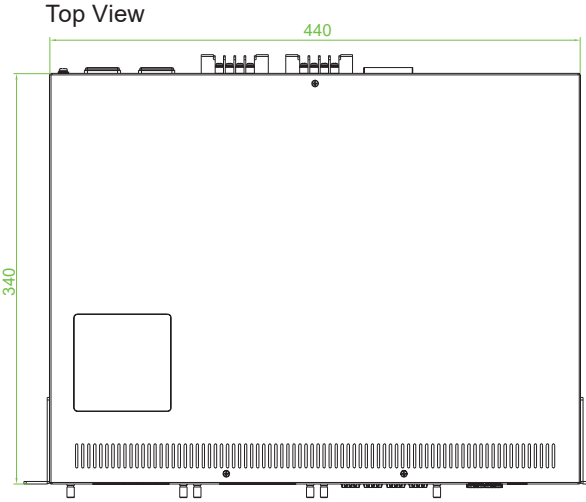
-AD Power



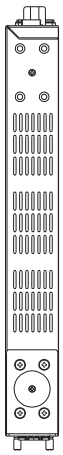
-DD Power



Top View



Side View



Ordering Information

Model Name	Managed	Total Ports (Max)	Extension Port	Modular Slot	Input Power	Certification		Operating Temerature
			1G/10G SFP+	See Module selection table for Optional	Device and PoE	Safety EN62368-1	CE, FCC	
IXR-MG2404XS-AA	V	28	4	3	Dual 110/220VAC Dual 48VDC for PoE	V	V	-40 ~ 60°C
IXR-MG2404XS-AD	V	28	4	3	110/220VAC and 48VDC Dual 48VDC for PoE	V	V	-40 ~ 60°C
IXR-MG2404XS-DD	V	28	4	3	Dual 48VDC Dual 48VDC for PoE	V	V	-40 ~ 60°C

Module Selection

Model Name	100/1000 Base-X SFP	10/100/1000 Base-TX RJ45	IEEE802.3 af/at PoE	MACsec
IRM-8GS	8			
IRM-8GT		8		
IRM-8GP		8	8	
IRM-4GS-SEC	4			V
IRM-4GT-SEC		4		V


IRM-8GS


IRM-8GT


IRM-8GP


IRM-4GS-SEC


IRM-4GT-SEC

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC input type, Non PoE)
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For PoE application)

IXR-G24044X-24PH

L3 24x GbE RJ45 + 4x 100/1000 SFP + 4x 1G/2.5G/10G SFP+ with 24x PoE 400W, 48VDC

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports IEEE 1588 PTP V2
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

As an Industrial L3 10G Ethernet Switch for process automation and transportation automation applications, the IXR-G24044X-24PH combines data, voice, and video transmissions with high performance and high reliability. The IXR Series has 4x 10G SFP+ slots and 24x RJ45 GbE ports with PoE features and supports Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large-scale industrial network backbones.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- Provides 14 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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)

Data Processing	Store and Forward
VLAN ID	4094 IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 136Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+:** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **SFP:** 4x 100/1000Base-X SFP socket, Supports DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Supports Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 400W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant dual input power 48VDC (44~57VDC) (Removable terminal block) (50~57VDC input is recommended for IEEE 802.3at PoE+ in 30W applications)
Power Consumption	< 33W @50VDC without PoE load < 449W @50VDC with 400W PoE load
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P28** SFP Slot: 100 /1000Base-X Link/Active (Amber) **P29~P32** SFP Slot: 1000Base-X Link/Active (Amber), 10GBase-X Link/Active (Blue)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount
MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2/v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper

DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
sFlow	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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

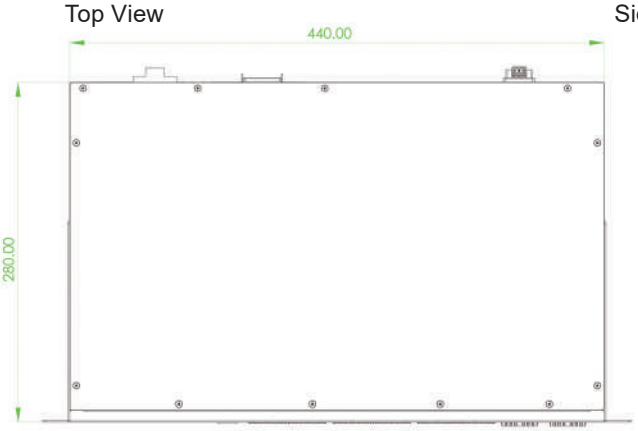
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation maximum 400W
Others Features	Green Ethernet Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Total Port	GbE Port		10GbE	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	IEEE 802.3at/af	Power Budget	48VDC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IXR-G24044X-24PH	32	24	4	4	24	400W	2	V	V	V	V	-40 ~ 60°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IXR-GS24044X

NEW

L3 24x FE/GbE SFP + 4x GbE RJ45 + 4x 1G/2.5G/10G SFP+

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

EN50121-4 | EN61000-6-2 EN61000-6-4 | EN62368-1 | IPv6 | µ-Ring | IEEE 1588v2 | Negative Voltage

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IXR-GS24044X supports static and dynamic routing protocols, features 4 10G SFP+ slots, 24 100/1000 SFP slots and 4 Gigabit UTP ports, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 136Gbp (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+ :** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **GbE SFP:** 24x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 4x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<36W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P25~28 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P1~24** SFP Slot: Link/Active (Amber) **P29~32** SFP+ Slot: Link/Active (Amber), 10GBase-X Link/Active (Blue)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 512M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.92kg (IXR-GS24044X-AA) 3.82kg (IXR-GS24044X-AD) 3.72kg (IXR-GS24044X-DD)
Installation Mounting	19" rack mount
MTBF	190,213 Hours (IXR-GS24044X-AA) 205,524 Hours (IXR-GS24044X-AD) 223,567 Hours (IXR-GS24044X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

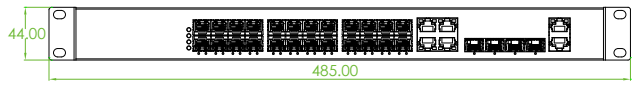
IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported

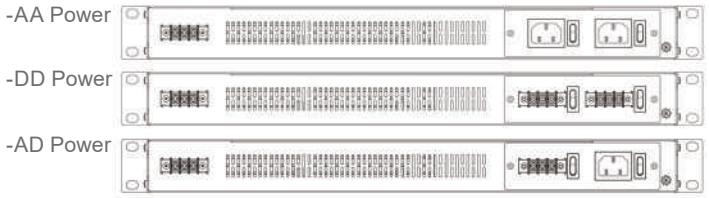
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L 3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az EEE (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

Dimensions

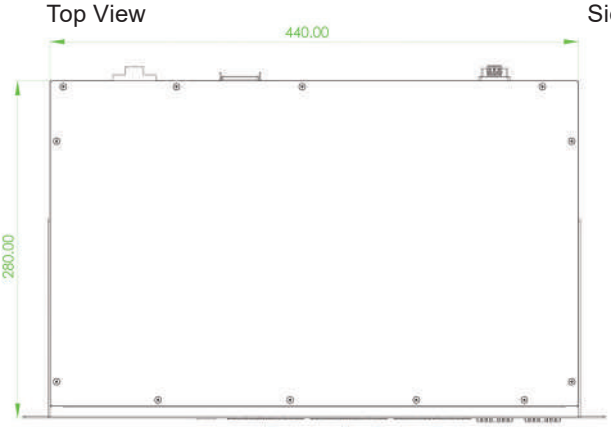
Front View



Rear View



Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		10GbE	Input Power		Certification			
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	Safety EN62368-1	RailWay EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC
IXR-GS24044X-AA	V	32	4	24	4		2	V	V	V	V
IXR-GS24044X-AD	V	32	4	24	4	1	1	V	V	V	V
IXR-GS24044X-DD	V	32	4	24	4	2		V	V	V	V

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IXR-G24044X

L3 24x GbE RJ45 + 4x 100/1000 SFP + 4x 1G/2.5G/10G SFP+

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4 CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IXR-G24044X supports static and dynamic routing protocols, features 4 10G SFP+ slots, 24 Gigabit UTP ports and 4 100/1000 SFP slots, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 136Gbp (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+ :** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **GbE SFP:** 4x 100/1000Base-X SFP socket **RJ45:** 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<33W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~28** SFP Slot: Link/Active (Amber) **P29~32** SFP+ Slot: Link/Active (Amber), 10GBase-X Link/Active (Blue)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4,755kg (IXR-G24044X-AA) 4.51kg (IXR-G24044X-AD) 4.26kg (IXR-G24044X-DD)
Installation Mounting	19" rack mount
MTBF	103,057 Hours (IXR-G24044X-AA) 103,451 Hours (IXR-G24044X-AD) 103,447 Hours (IXR-G24044X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

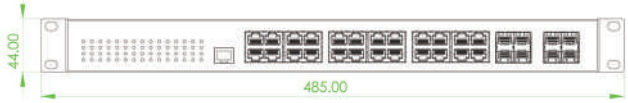
IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP 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 / L 3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

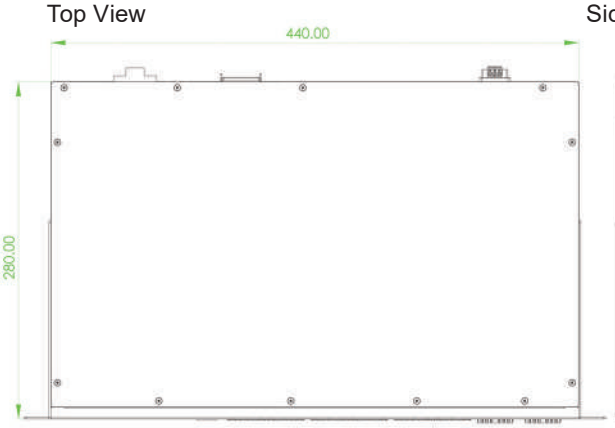
Dimensions

Front View



Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		10GbE	Input Power		Certification			
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	Safety EN62368-1	RailWay EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC
IXR-G24044X-AA	V	32	24	4	4		2	V	V	V	V
IXR-G24044X-AD	V	32	24	4	4	1	1	V	V	V	V
IXR-G24044X-DD	V	32	24	4	4	2		V	V	V	V

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IXR-G4804X

NEW

L3 48x GbE RJ45 + 4x 1G/2.5G/10G SFP+

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

EN50121-4 | EN61000-6-2 EN61000-6-4 | EN62368-1 | IPv6 | µ-Ring | Negative Voltage

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IXR-G4804X supports static and dynamic routing protocols, features 4 10G+ SFP slots and 48 Gigabit UTP ports, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTPs G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 176Gbp (Full wire-speed)
Data Processing	Store and Forward
Network Connector	10GbE SFP+ : 4x 1G/2.5G/10G SFP+ socket, Supports DDMI RJ45: 48x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<52W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~48 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P49~52 SFP+ Slot: Link/Active (Amber), 10GBase-X Link/Active (Blue)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.23kg (IXR-G4804X-AA) 3.115kg (IXR-G4804X-AD) 3.0kg (IXR-G4804X-DD)
Installation Mounting	19" rack mount
MTBF	91,012 Hours (IXR-G4804X-AA) 99,582 Hours (IXR-G4804X-AD) 110,547 Hours (IXR-G4804X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP V4.0, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

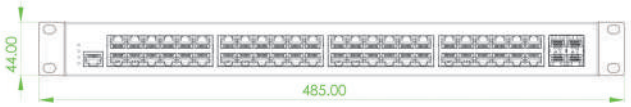
IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP 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 / L 3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions

Front View



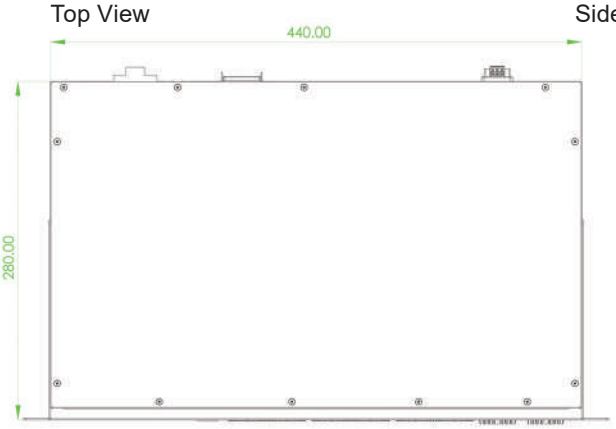
Rear View

-AA Power

-DD Power

-AD Power

Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE	10GbE	Input Power		Certification			
			10/100/1000 Base-T(X) RJ45	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	Safety EN62368-1	RailWay EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IXR-G4804X-AA	V	52	48	4		2	V	V	V	V
IXR-G4804X-AD	V	52	48	4	1	1	V	V	V	V
IXR-G4804X-DD	V	52	48	4	2		V	V	V	V

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGR-2408SM-24PH

L3 24x GbE RJ45 + 8x 100/1000 SFP with 24x PoE 400W 48VDC

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

As an Industrial grade Layer 3 Ethernet switch, the IGR-2408SM-24PH provides full Gigabit capability with high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. IGR series has 8x Gigabit SFP slots and 24x Gigabit RJ45 Ethernet ports with PoE. They support Layer 3 routing function, ERPS ring, RSTP/STP and u-Ring redundancy technologies, support wide operating temperature, fanless design, to increase system reliability and the availability of your network.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supported EMS Management

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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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): 64Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**SFP:** 8x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 400W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant dual input power 48VDC (44~57VDC) (Removable terminal block) (50~57VDC input is recommended for IEEE802.3at PoE+ in 30W applications)
Power Consumption	< 30W @50VDC without PoE load <445W @50VDC with 400W PoE load
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P32** SFP Slot: Link/Active (Amber)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGR-2408SM-24PHE) -10 ~ 60°C (IGR-2408SM-24PH)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount
MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2/v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 16 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 16 trunk group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
sFlow	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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

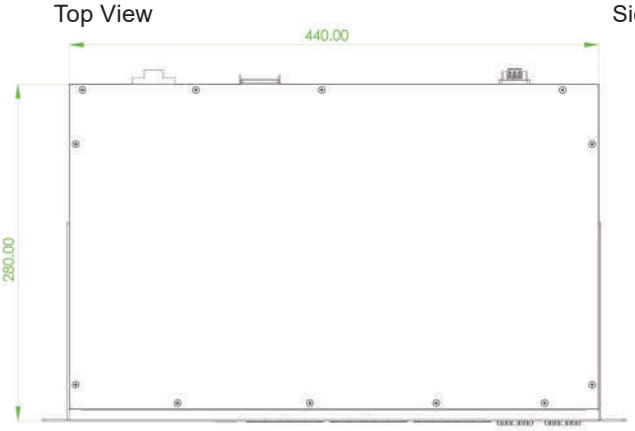
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budge limitation management: Maximum 400W power budget Power feeding priority
Other Features	**Green Ethernet** Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Port	RJ45	SFP	PoE		Input Power	Certification				Operating Temperature
			10/100/1000 Base-T(X)	100/1000 Base-X	IEEE 802.3af/at	Power Budget	48VDC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGR-2408SM-24PHE	V	32	24	8	24	400W	2	V	V	V	V	-40~75°C
IGR-2408SM-24PH	V	32	24	8	24	400W	2	V	V	V	V	-10~60°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGR-S2804GTM

NEW

L3 28x 100/1000 SFP + 4x GbE RJ45

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

EN50121-4 | EN61000-6-2 EN61000-6-4 | EN62368-1 | IPv6 | µ-Ring | IEEE 1588v2 | Negative Voltage

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IGR-S2804GTM supports static and dynamic routing protocols, features up to 28 100/1000 SFP slots and 4 Gigabit UTP ports, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Suports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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
	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): 64 Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	GbE SFP: 28x 100/1000Base-X SFP socket, Support DDMI RJ45: 4x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	< 34W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P25~28 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P1~P24, P29~32 SFP Slot: Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 512M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGR-S2804GTM-E) -10 ~ 60°C (IGR-S2804GTM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.92kg (IGR-S2804GTM-AA) 3.82kg (IGR-S2804GTM-AD) 3.72kg (IGR-S2804GTM-DD)
Installation Mounting	19" rack mount
MTBF	190,213 Hours (IGR-S2804GTM-AA) 205,524 Hours (IGR-S2804GTM-AD) 223,567 Hours (IGR-S2804GTM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

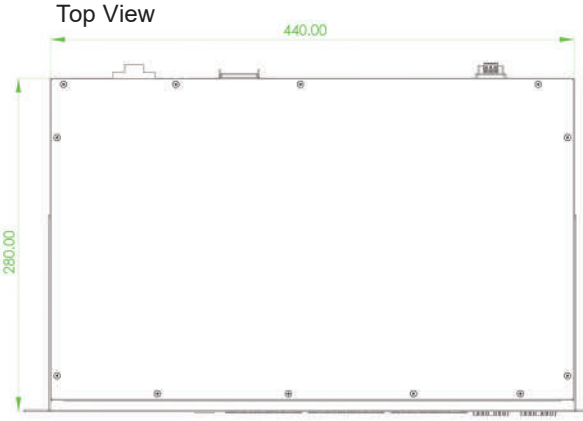
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az EEE (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

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		Input Power		Certification				Operating Temperature
			10/100/1000 Base-T(X) RJ45	GbE SFP	24/48/-48VDC	110/220VAC	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGR-S2804GTM-E-AA	V	32	4	28		2	V	V	V	V	-40~75°C
IGR-S2804GTM-E-AD	V	32	4	28	1	1	V	V	V	V	-40~75°C
IGR-S2804GTM-E-DD	V	32	4	28	2		V	V	V	V	-40~75°C
IGR-S2804GTM-AA	V	32	4	28		2	V	V	V	V	-10~60°C
IGR-S2804GTM-AD	V	32	4	28	1	1	V	V	V	V	-10~60°C
IGR-S2804GTM-DD	V	32	4	28	2		V	V	V	V	-10~60°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGR-2408SM

L3 24x GbE RJ45 + 8x 100/1000 SFP

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2 and EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IGR-2408SM supports static and dynamic routing protocols, features 24 Gigabit UTP ports and 8 100/1000 SFP slots, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Suports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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
	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): 64 Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	GbE SFP: 8x 100/1000Base-X SFP socket, Supports DDMI RJ45: 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	< 33W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P25~32 SFP Slot: Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGR-2408SM-E) -10 ~ 60°C (IGR-2408SM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.755kg (IGR-2408SM-AA) 4.51kg (IGR-2408SM-AD) 4.26kg (IGR-2408SM-DD)
Installation Mounting	19" rack mount
MTBF	103,057 Hours (IGR-2408SM-AA) 103,451 Hours (IGR-2408SM-AD) 103,447 Hours (IGR-2408SM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI
	Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

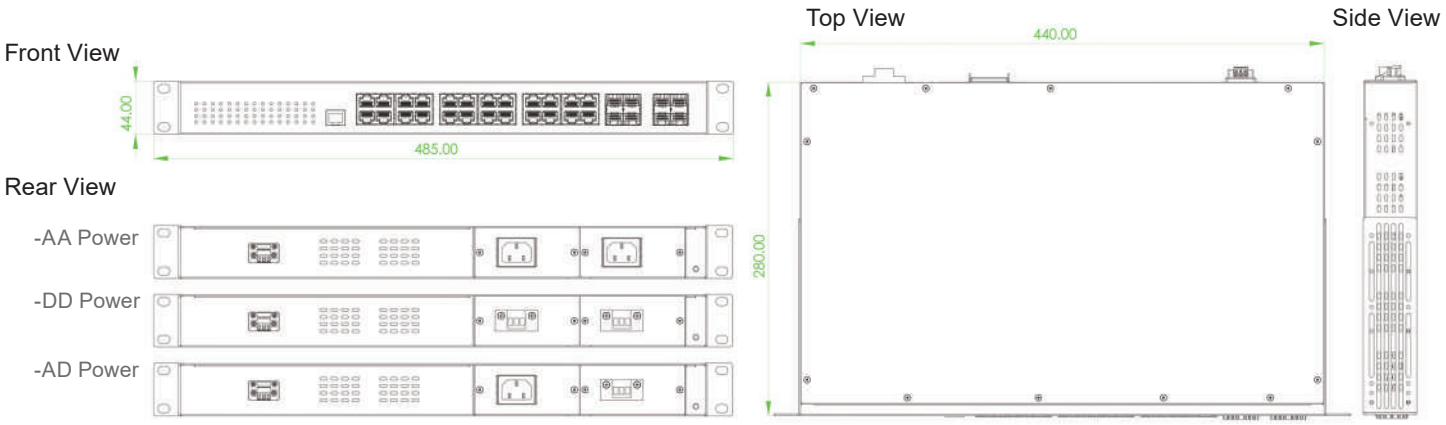
CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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 SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions



Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		Input Power		Certification				Operating Temperature
			10/100/1000 Base-T(X) RJ45	GbE SFP	24/48/-48VDC	110/220VAC	EN62368-1	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IGR-2408SM-E-AA	V	32	24	8		2	V	V	V	V	-40 ~ 75°C
IGR-2408SM-E-AD	V	32	24	8	1	1	V	V	V	V	-40 ~ 75°C
IGR-2408SM-E-DD	V	32	24	8	2		V	V	V	V	-40 ~ 75°C
IGR-2408SM-AA	V	32	24	8		2	V	V	V	V	-10 ~ 60°C
IGR-2408SM-AD	V	32	24	8	1	1	V	V	V	V	-10 ~ 60°C
IGR-2408SM-DD	V	32	24	8	2		V	V	V	V	-10 ~ 60°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGR-4804SM

NEW

L3 48x GbE RJ45 + 4x 100/1000 SFP

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IGR-4804SM supports static and dynamic routing protocols, features 48 Gigabit UTP ports and 4 100/1000 SFP slots, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- Suports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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
	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): 104 Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	GbE SFP: 4x 1000Base-X SFP socket, Support DDMI RJ45: 48x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	< 51.3W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~48 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P49~52 SFP Slot: Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 70°C (IGR-4804SM-E) -10 ~ 60°C (IGR-4804SM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.23kg (IGR-4804SM-AA) 3.115kg (IGR-4804SM-AD) 3.0kg (IGR-4804SM-DD)
Installation Mounting	19" rack mount
MTBF	91,378 Hours (IGR-4804SM-AA) 100,011 Hours (IGR-4804SM-AD) 110,457 Hours (IGR-4804SM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based

Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

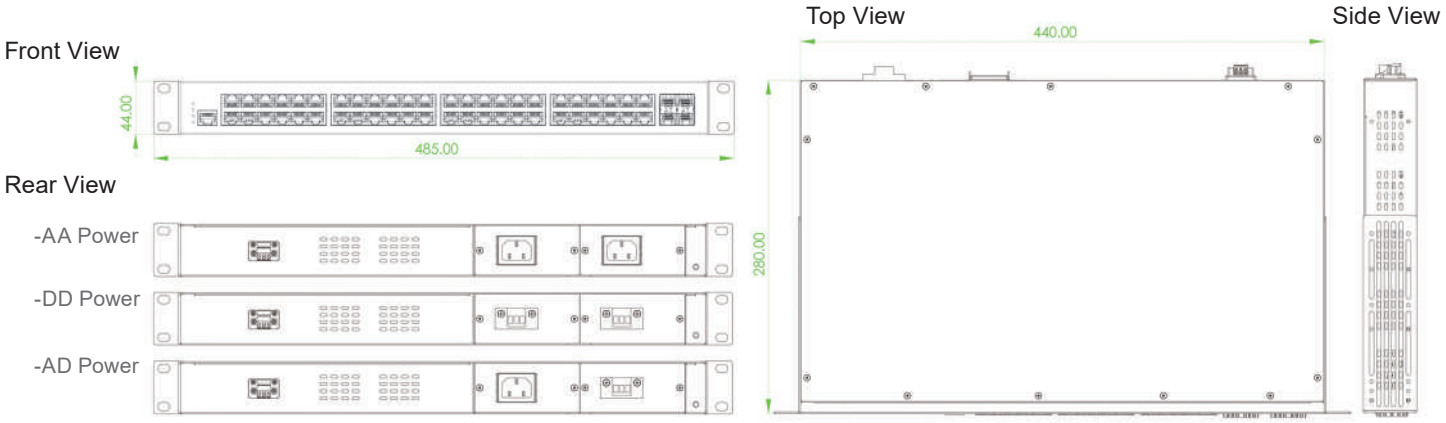
CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP V4.0, 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 SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions



Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		Input Power		Certification				Operating Temperature
			10/100/1000 Base-T(X) RJ45	GbE SFP	24/48/-48VDC	110/220VAC	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGR-4804SM-E-AA	V	52	48	4		2	V	V	V	V	-40 ~ 75°C
IGR-4804SM-E-AD	V	52	48	4	1	1	V	V	V	V	-40 ~ 75°C
IGR-4804SM-E-DD	V	52	48	4	2		V	V	V	V	-40 ~ 75°C
IGR-4804SM-AA	V	52	48	4		2	V	V	V	V	-10 ~ 60°C
IGR-4804SM-AD	V	52	48	4	1	1	V	V	V	V	-10 ~ 60°C
IGR-4804SM-DD	V	52	48	4	2		V	V	V	V	-10 ~ 60°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGR-1604XSM-16PH

NEW

16x GbE RJ45 + 4x 1G/2.5G/10G SFP+ with 16x PoE 300W

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

As an industrial Layer 3 PoE Ethernet switch, DIN-RAIL mounting type, suitable for process and transportation automation applications, IGR-1604XSM-16PH has 4 10G SFP+ slots and 16 Gigabit UTP ports, up to 16 PoE+/PSE ports to meet the stringent requirements of centralized and mission-critical applications, compliant with IEEE 802.3af/IEEE 802.3at standards providing up to 30 watts of power output per port for connecting heavy-duty industrial PoE equipment, Support for static and dynamic routing protocols, fanless design and redundant power input are certified by many industry standards, making it ideal for deployment in harsh environments to provide mission-critical network services.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output (30W per port. total 300W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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 802.3ae	10G bit/s Ethernet over Fiber
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 112Gbps (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	16x 10/100/1000Base-T RJ-45 + 4x 100/1000/2.5G/5G/10GBase-X SFP connector RJ-45 UTP port supports Auto-negotiation speed, Auto MDI/MDI-X function SFP port supports 1G/2.5G/5G/10G speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	16x IEEE 802.3af /IEEE 802.3at 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (46~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE802.3at PoE+ applications)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	337W	28.5W	300W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port Total 300W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 1G/2.5G Link/Active (Amber), 10G Link/Active (Blue)
	PoE: ON (Green)
Jumbo Frame	10KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DO(Alarm Relay Contact)	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1, 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for DO (Alarm Relay), DI, redundant power PWR1 and PWR2
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	155.6 x 77 x 160mm (D x W x H)
Weight	2.065kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	224,776 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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

EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
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 SIP, Subnet (32bit) L4: TCP/UDP

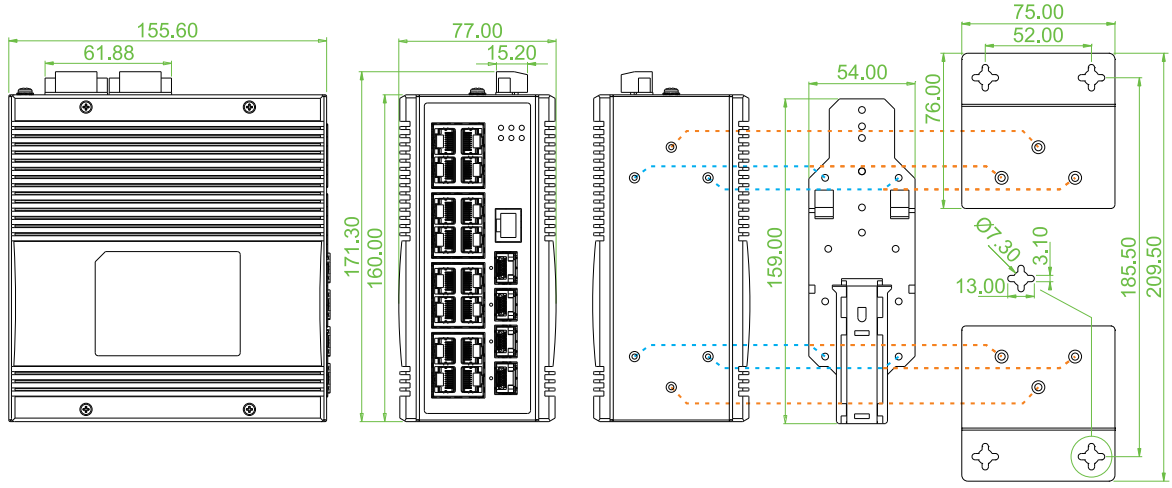
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 300W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	1000/2.5G/5G/10G Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGR-1604XSM-16PH	20	16	4 SFP	16	300W	48VDC	V	V	V	V	-40~60°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGR-1604XSM

NEW

16x GbE + 4x GbE/2.5G/5G/10GBase-X SFP+

- L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

As an industrial Layer 3 Ethernet switch, DIN-RAIL mounting type, suitable for process and transportation automation applications, IGR-1604XSM has 4 10G SFP+ slots and 16 Gigabit UTP ports, Support for static and dynamic routing protocols, fanless design and redundant power input are certified by many industry standards, making it ideal for deployment in harsh environments to provide mission-critical network services.

Features

- 12/24/48VDC (9.6~60VDC) redundant dual input power
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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
	IEEE802.3ae	10G bit/s Ethernet over Fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 112Gbps (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	16x 10/100/1000Base-T RJ-45 + 4x 100/1000/2.5G/5G/10GBase-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 1G/2.5G/5G/10G speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) input power, (Removable terminal block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	22.7W
24 VDC	24.3W
48 VDC	28.5W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 1G/2.5G/5G Link/Active (Green), 10G Link/Active (Blue)
Jumbo Frame	10KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DO (Alarm Relay Contact)	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1 / 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for DO (Alarm Relay), DI, redundant power PWR1 and PWR2
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	155.6 x 77 x 160mm (D x W x H)
Weight	2.035g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	251,400 (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications

L3 Routing

IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" mand 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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

TACACS+	Authentication, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

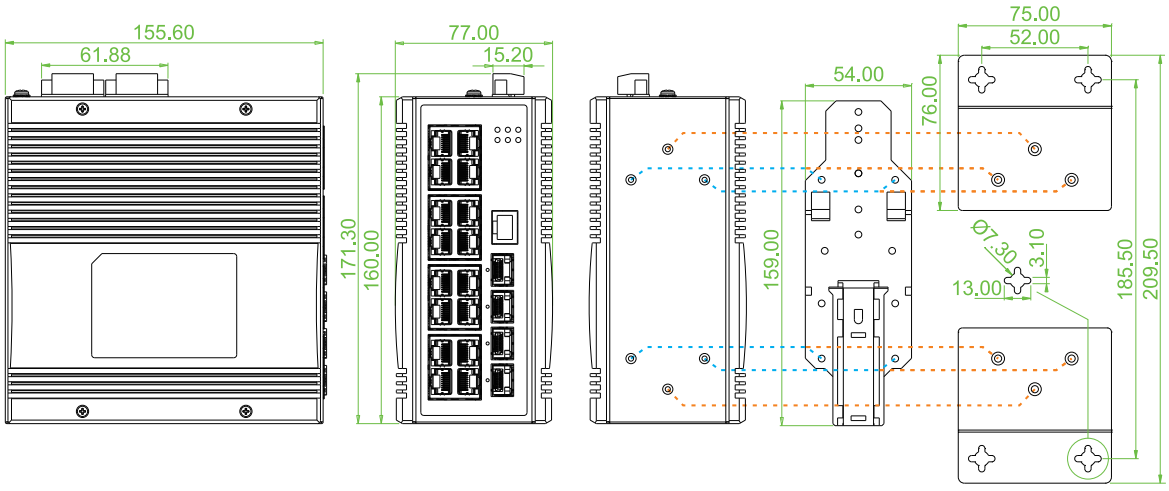
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber	Input Power	Certification				Operating Temperature
		10/100/1000Base-T	1000/2.5G/5G/10GBase-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGR-1604XSM	20	16	4 SFP	12/24/48VDC	V	V	V	V	-40 ~ 60°C

Optional Accessories

■ Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W -20 ~ +70°C

ICS-G24044X-24PH-AA

24x GbE RJ45 + 4x 100/1000 SFP + 4x 1G/2.5G/10G SFP+ with
24x PoE 150W, 110/240VAC

- Supports IEEE 1588 PTP V2
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Support maximum up to 14 u-rings in one device
- 4KV surge protection for PoE, RJ45 and SFP ports
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified

The hardened Layer 2 managed PoE switch ICS-G24044X-24PH-AA supports up to 24 PoE+/PSE ports to meet the stringent requirements of centralized and mission-critical applications, features 4 10G SFP+ slots and 24 Gigabit UTP ports, supports IEEE 802.3af/IEEE 802.3at standards, each port provides up to 30 watt power output for connecting heavy industrial PoE equipment, fanless design and isolated redundancy AC power supplies are ideal solutions for smart city, surveillance, intelligent traffic control systems and production automation applications.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 150W PoE power budget in total
- Redundant dual input power 110/240VAC
- Provides 14 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supported EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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)

Data Processing	Store and Forward
VLAN ID	4094 IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 136Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+:** 4x 1G/2.5G/10G SFP+ socket , Supports DDMI **SFP:** 4x 100/1000Base-X SFP socket, Supports DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Supports Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 150W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant dual input power 110/240VAC (Built in 2x 450W AC to DC power supply inside)
Power Consumption	< 33W without PoE load < 209W with 150W PoE load
PoE Power Budget	150W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P28** SFP Slot: 100 /1000Base-X Link/Active (Amber) **P29~P32** SFP+ Slot: 1000Base-X Link/Active (Amber), 10GBase-X Link/Active (Blue)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	330 x 440 x 44mm (D x W x H)
Weight	5.2kg
Installation Mounting	19" rack mount
MTBF	43,259 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
sFlow	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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

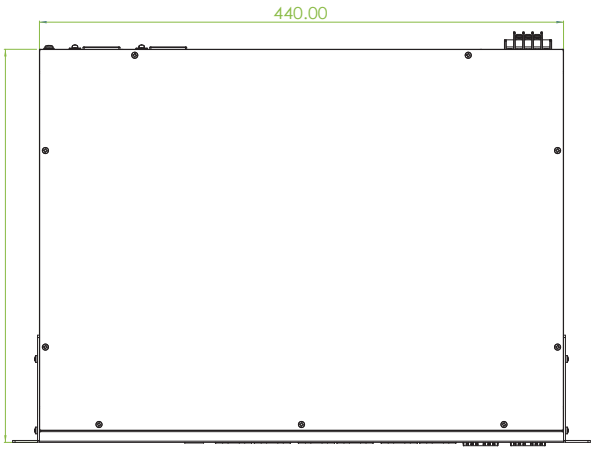
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budge limitation management: Maximum 150W power budget Power feeding priority
Others Features	**Green Ethernet** Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Total Port	GbE		10GbE	PoE		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	IEEE 802.3at/af	Power Budget	110/240VAC	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
ICS-G24044X-24PH-AA	32	24	4	4	24	150W	2	V	V	V	V	-40 ~ 60°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

ICS-G24044X-24PH

24x GbE RJ45 + 4x 100/1000 SFP + 4x 1G/2.5G/10G SFP+
with 24x PoE 400W, 48VDC

- Supports IEEE 1588 PTP V2
- Support u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Support maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The hardened Layer 2 managed PoE switch ICS-G24044X-24PH supports up to 24 PoE+/PSE ports to meet the stringent requirements of centralized and mission-critical applications, features 4 10G SFP+ slots and 24 Gigabit UTP ports, supports IEEE 802.3af/IEEE 802.3at standards, each port provides up to 30 watt power output for connecting heavy industrial PoE equipment, fanless design and isolated redundancy DC power supplies are ideal solutions for smart city, surveillance, intelligent traffic control systems and production automation applications.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- Provides 14 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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)

Data Processing	Store and Forward
VLAN ID	4094 IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 136Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+:** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **SFP:** 4x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 400W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant dual input power 48VDC (44~57VDC) (Removable terminal block) (50~57VDC input is recommended for IEEE 802.3at PoE+ in 30W applications)
Power Consumption	< 33W @50VDC without PoE load < 449W @50VDC with 400W PoE load
LED	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P28** SFP Slot: 100 /1000Base-X Link/Active (Amber) **P29~P32** SFP+ Slot: 1000Base-X Link/Active (Amber), 10GBase-X Link/Active (Blue)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount
MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
sFlow	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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

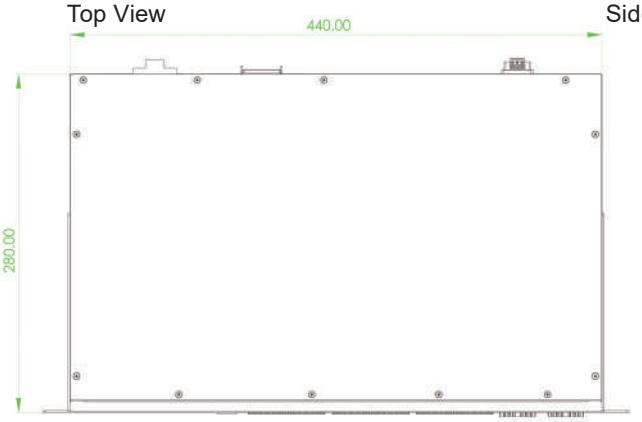
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budge limitation maximum 400W
Others Features	Green Ethernet Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Total Port	GbE Port		10GbE	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	IEEE 802.3at/af	Power Budget	48VDC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
ICS-G24044X-24PH	32	24	4	4	24	400W	2	V	V	V	V	-40 ~ 60°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

ICS-GS24044X

NEW

24x 100/1000 SFP + 4x GbE RJ45 + 4x 1G/2.5G/10G SFP+

- Support u-Ring, ,ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

Hardened Layer 2 managed switch ICS-GS24044X features up to 24 100/1000 SFP slots, 4 Gigabit UTP ports and 4 10G SFP+ slots for centralized and mission-critical applications, fanless design , long MTBF and isolated redundant power supply requirements, and certified by multiple industry-level standards, it is an ideal solution for smart city, surveillance, smart traffic control systems and production automation applications.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 136Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+ :** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **GbE SFP:** 24x 100/1000Base-X SFP socket, Supports DDMI **RJ45:** 4x 10/100/1000Base-T RJ-45, Supports Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<36W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P25~P28 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P1~P24** SFP Slot: Link/Active (Amber) **P29~32** SFP Slot: 1G/2.5G/5G Link/Active (Amber), 10G Link/Active (Bluer)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 512M Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.92kg (ICS-GS24044X-AA) 3.82kg (ICS-GS24044X-AD) 3.72kg (ICS-GS24044X-DD)
Installation Mounting	19" rack mount
MTBF	190,213Hours (ICS-GS24044X-AA) 205,524Hours (ICS-GS24044X-AD) 223,567Hours (ICS-GS24044X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4

EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-3 (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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

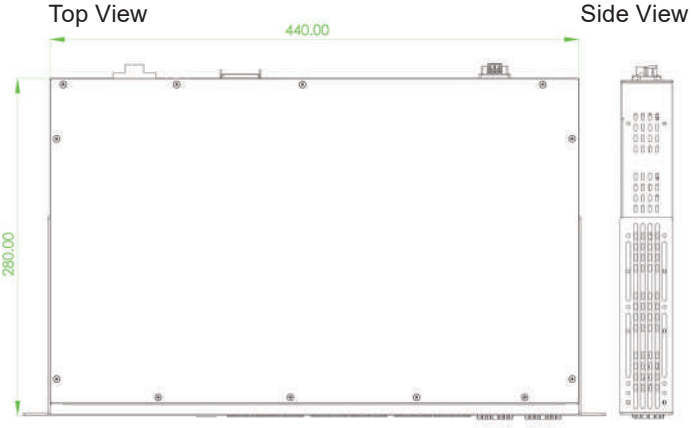
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the 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

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		10GbE	Input Power		Certification		
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4
ICS-GS24044X-AA	V	32	4	24	4		2	V	V	V
ICS-GS24044X-AD	V	32	4	24	4	1	1	V	V	V
ICS-GS24044X-DD	V	32	4	24	4	2		V	V	V

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

ICS-G24044X

24x GbE RJ45 + 4x 100/1000 SFP + 4x 1G/2.5G/10G SFP+

- Support u-Ring, ,ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

Hardened Layer 2 managed switch ICS-G24044X features up to 24 Gigabit UTP ports, 4 100/1000 SFP and 4 10G SFP+ slots for centralized and mission-critical applications, fanless design , long MTBF and isolated redundant power supply requirements, and certified by multiple industry-level standards, it is an ideal solution for smart city, surveillance, smart traffic control systems and production automation applications.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 136Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**10GbE SFP+ :** 4x 1G/2.5G/10G SFP+ socket, Supports DDMI **GbE SFP:** 4x 100/1000Base-X SFP socket, Supports DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Supports Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	< 33W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~28** SFP Slot: Link/Active (Amber) **P29~32** SFP+ Slot: Link/Active (Amber), 10GBase-X Link/Active (Blue)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4,755kg (ICS-G24044X-AA) 4.51kg (ICS-G24044X-AD) 4.26kg (ICS-G24044X-DD)
Installation Mounting	19" rack mount
MTBF	103,057 Hours (ICS-G24044X-AA) 103,451 Hours (ICS-G24044X-AD) 103,447 Hours (ICS-G24044X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4

EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-3 (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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

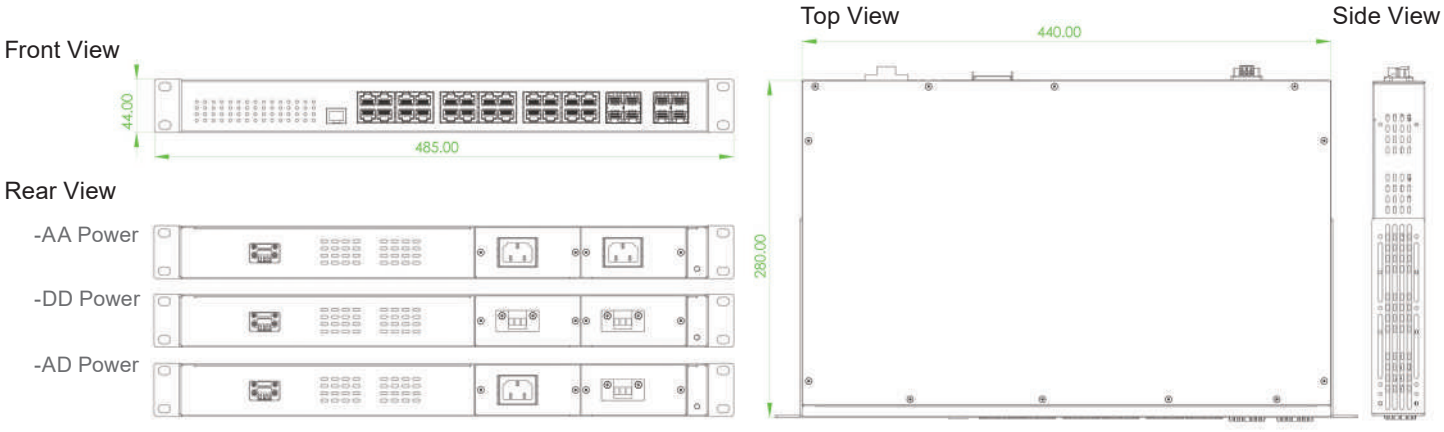
CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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 SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions



Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		10GbE	Input Power		Certification		
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	Safety EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4
ICS-G24044X-AA	V	32	24	4	4		2	V	V	V
ICS-G24044X-AD	V	32	24	4	4	1	1	V	V	V
ICS-G24044X-DD	V	32	24	4	4	2		V	V	V

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

ICS-G4804X

48x GbE RJ45 + 4x 1G/2.5G/10G SFP+

- Support u-Ring, ,ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input

Hardened Layer 2 managed switch ICS-G4804X features up to 48 Gigabit UTP ports and 4 10G SFP+ slots for centralized and mission-critical applications, fanless design , long MTBF and isolated redundant power supply requirements, and certified by multiple industry-level standards, it is an ideal solution for smart city, surveillance, smart traffic control systems and production automation applications.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- Supports EMS Management

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 802.3ae	10 Gbit/s Ethernet over fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 176Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	10GbE SFP+ : 4x 1G/2.5G/10G SFP+ socket, Supports DDMI RJ45: 48x 10/100/1000Base-T RJ-45, Supports Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity	Protection for input power
Overload Current	Protection Supported
Power Supply	Redundant 2x AC input power (-AA model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<52W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~48 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber P49~52 SFP Slot: 1G/2.5G/5G Link/Active (Amber), 10G Link/Active (Bluer)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.23kg (ICS-G4804X-AA) 3.115kg (ICS-G4804X-AD) 3.0kg (ICS-G4804X-DD)
Installation Mounting	19" rack mount
MTBF	91,012 Hours (ICS-G4804X-AA) 99,582 Hours (ICS-G4804X-AD) 110,547 Hours (ICS-G4804X-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-3 (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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP V4.0, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

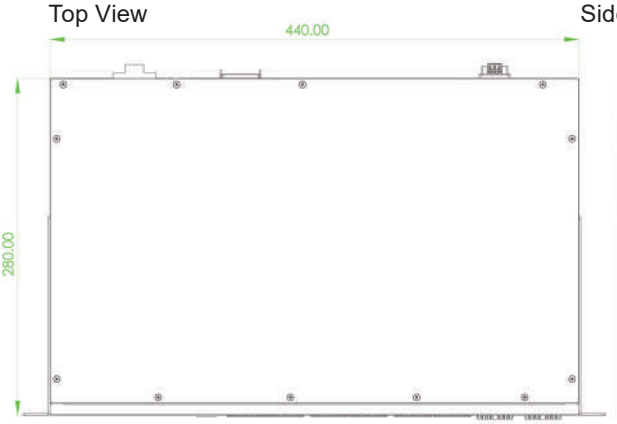
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE	10GbE	Input Power		Certification		
			10/100/1000 Base-T(X) RJ45	1G/2.5G/10G SFP+	24/48/-48VDC	110/220VAC	EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4
ICS-G4804X-AA	V	52	48	4		2	V	V	V
ICS-G4804X-AD	V	52	48	4	1	1	V	V	V
ICS-G4804X-DD	V	52	48	4	2		V	V	V

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGS-2408SM-24PH-AA

24x GbE RJ45 + 8x 100/1000 SFP with 24x PoE 150W, 110/220VAC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4,EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The hardened Layer 2 managed PoE switch IGS-2408SM-24PH-AA up to 24 PoE+/PSE ports to meet the stringent requirements of centralized and mission-critical applications, features 8 100/1000 SFP slots and 24 Gigabit UTP ports, supports IEEE 802.3af/IEEE 802.3at standards, each port provides up to 30 watt power output for connecting heavy industrial PoE equipment, fanless design and isolated redundancy AC power supplies are ideal solutions for smart city, surveillance, intelligent traffic control systems and production automation applications.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 150W PoE power budget in total
- Redundant dual input power 110/240VAC
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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): 64Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**SFP:** 8x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45 Support Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 150W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant dual input power 110/240VAC (Built in 2x 450W AC to DC power supply inside)
Power Consumption	< 33W without PoE load < 206W with 150W PoE load
PoE Power Budget	150W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P32** SFP Slot: Link/Active (Amber)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	330 x 440 x 44mm (D x W x H)
Weight	5.2kg
Installation Mounting	19" rack mount
MTBF	43,259 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 16 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 16 trunk group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

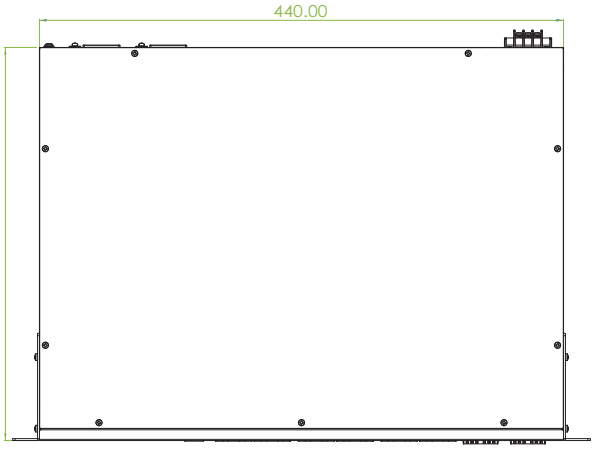
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budge limitation maximum 150W Power feeding priority
Other Features	**Green Ethernet** Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Port	RJ45	SFP	PoE		Input Power	Certification				Operating Temperature
			10/100/1000 Base-T(X)	100/1000 Base-X	IEEE802.3 af/at	Power Budget	110/220VAC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-2408SM-24PH-AA	V	32	24	8	24	150W	2	V	V	V	V	-40~60°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

IGS-2408SM-24PH

24x GbE RJ45 + 8x 100/1000 SFP with 24x PoE 400W 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4,EN61000-6-2/4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The hardened Layer 2 managed PoE switch IGS-2408SM-24PH supports up to 24 PoE+/PSE ports to meet the stringent requirements of centralized and mission-critical applications, features 8 100/1000 SFP slots and 24 Gigabit UTP ports, supports IEEE 802.3af/IEEE 802.3at standards, each port provides up to 30 watt power output for connecting heavy industrial PoE equipment, fanless design and isolated redundancy DC power supplies are ideal solutions for smart city, surveillance, intelligent traffic control systems and production automation applications.

Features

- Maximum up to 24x IEEE 802.3af / 802.3at PoE+ output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3X	Flow control for full duplex
	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): 64Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**SFP:** 8x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function **PoE:** 24x IEEE 802.3af /IEEE 802.3at PoE+, End-Span, Alternative A mode. Maximum 30W per port, 400W PoE power budget in total **RJ45 Pin Assignment:** PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant dual input power 48VDC (44~57VDC) (Removable terminal block) (50~57VDC input is recommended for IEEE802.3at PoE+ in 30W applications)
Power Consumption	< 30W @50VDC without PoE load <445W @50VDC with 400W PoE load
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P25~P32** SFP Slot: Link/Active (Amber)
	PoE (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGS+2408SM-24PHE) -10 ~ 60°C (IGS+2408SM-24PH)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount
MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 16 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 16 trunk group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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

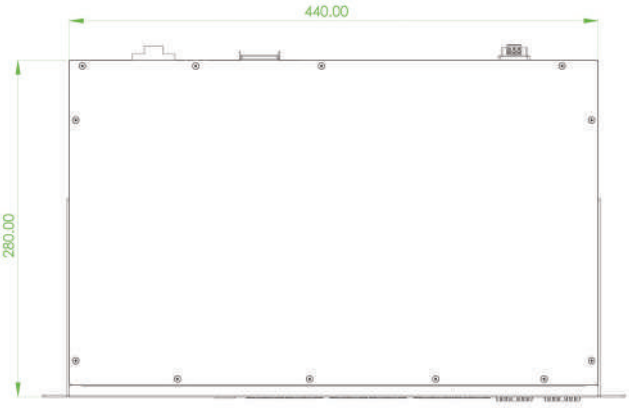
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE Power budge limitation management: Maximum 400W power budget Power feeding priority
Other Features	**Green Ethernet** Supports IEEE 802.3az 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 normal or broken point distance

Dimensions

Front View

Rear View

Top View



Side View

Ordering Information

Model Name	Managed	Total Port	RJ45	SFP	PoE		Input Power	Certification				Operating Temperature
			10/100/1000 Base-T(X)	100/1000 Base-X	IEEE802.3 af/at	Power Budget	48VDC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-2408SM-24PHE	V	32	24	8	24	400W	2	V	V	V	V	-40~75°C
IGS-2408SM-24PH	V	32	24	8	24	400W	2	V	V	V	V	-10~60°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGS-2408SM

24x GbE RJ45 + 8x GbE SFP

- Supports u-Ring , ERPS, EPS, MSTP, RSTP,STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Supports negative voltage power input

As an industrial Layer 2 Ethernet switch for process and transportation automation applications, IGS-2408SM supports static and dynamic routing protocols, features 24 Gigabit UTP ports and 8 100/1000 SFP slots, fanless design and redundancy Isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 64Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	SFP: 8x 100/1000Base-X SFP socket, Support DDMI RJ45: 24x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant 2x AC input power (-AA model) 1x AC input power (-A model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) 1x DC input power (-D model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	< 30W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P25~P32 SFP Slot: 100 /1000Base-X, Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 1G Bytes RAM
Warning Message	System Syslog, SMTP / e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGS-2408SM-E) -10 ~ 60°C (IGS-2408SM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.755kg (IGS-2408SM-(E)AA) 4.51kg (IGS-2408SM-(E)AD) 4.26kg (IGS-2408SM-(E)DD)
Installation Mounting	19" rack mount
MTBF	103,057 Hours (IGS-2408SM-AA) 103,451 Hours (IGS-2408SM-AD) 103,447 Hours (IGS-2408SM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

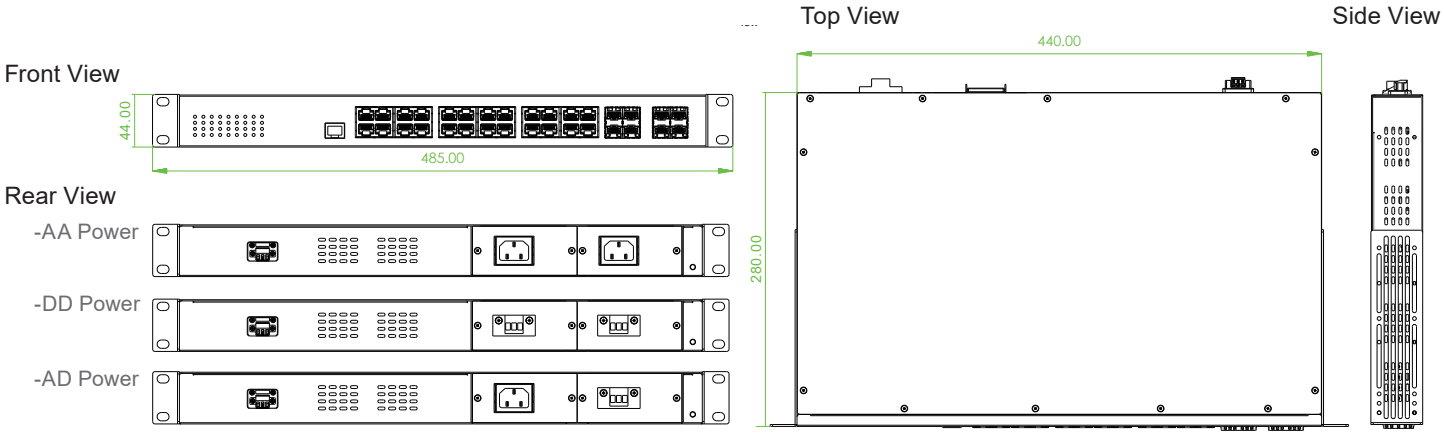
CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, 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 SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

Dimensions



Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	Input Power		Certification			Operating Temperature
			10/100/1000 Base-T	1000 Base-X	24/48/-48VDC	110/220V AC	Safety EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4	
IGS-2408SM-E-AA	V	32	24	8		2	V	V	V	-40~75℃
IGS-2408SM-E-AD	V	32	24	8	1	1	V	V	V	-40~75℃
IGS-2408SM-E-DD	V	32	24	8	2		V	V	V	-40~75℃
IGS-2408SM-AA	V	32	24	8		2	V	V	V	-10~60℃
IGS-2408SM-AD	V	32	24	8	1	1	V	V	V	-10~60℃
IGS-2408SM-DD	V	32	24	8	2		V	V	V	-10~60℃

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGS-S2804GTM

NEW

28x 100/1000 SFP + 4x GbE RJ45

- Supports u-Ring , ERPS, EPS, MSTP, RSTP,STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Supports negative voltage power input

EN50121-4 | EN61000-6-2 EN61000-6-4 | EN62368-1 | SmartView | µ-Ring | Negative Voltage

As an industrial Layer 2 Ethernet switch for process and transportation automation applications, IGS-S2804GTM supports static and dynamic routing protocols, features up to 28 100/1000 SFP slots and 4 Gigabit UTP ports, fanless design and redundancy Isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 64Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**SFP:** 28x 100/1000Base-X SFP socket, Support DDMI **RJ45:** 4x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant 2x AC input power (-AA model) 1x AC input power (-A model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) 1x DC input power (-D model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<34W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P25~P28 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) **P1~24, 29~P32** SFP Slot: 100 /1000Base-X, Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 512M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGS-S2804GTM-E) -10 ~ 60°C (IGS-S2804GTM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.92kg (IGS-S2804GTM-AA) 3.82kg (IGS-S2804GTM-AD) 3.72kg (IGS-S2804GTM-DD)
Installation Mounting	19" rack mount
MTBF	190,213 Hours (IGS-S2804GTM-AA) 205,524 Hours (IGS-S2804GTM-AD) 223,567 Hours (IGS-S2804GTM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP V4.0, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

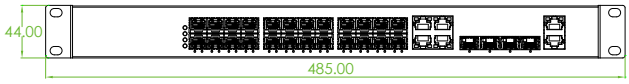
IPv6 Features

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 SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az 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

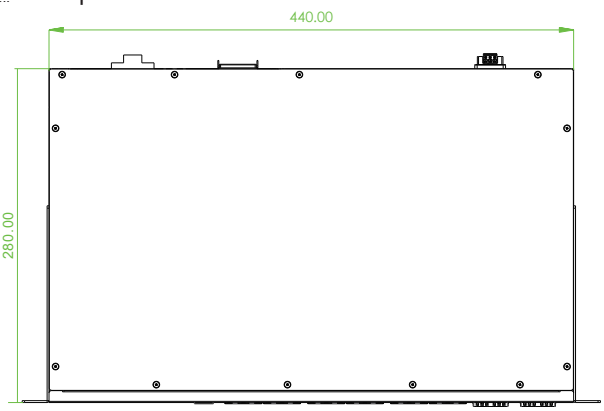
Dimensions

Front View

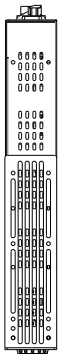


Rear View

Top View



Side View



Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	Input Power		Certification			Operating Temperature
			10/100/1000 Base-T	1000 Base-X	24/48/-48VDC	110/220V AC	EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4	
IGS-S2804GTM-E-AA	V	32	4	28		2	V	V	V	-40~75℃
IGS-S2804GTM-E-AD	V	32	4	28	1	1	V	V	V	-40~75℃
IGS-S2804GTM-E-DD	V	32	4	28	2		V	V	V	-40~75℃
IGS-S2804GTM-AA	V	32	4	28		2	V	V	V	-10~60℃
IGS-S2804GTM-AD	V	32	4	28	1	1	V	V	V	-10~60℃
IGS-S2804GTM-DD	V	32	4	28	2		V	V	V	-10~60℃

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

IGS-4804SM

48x GbE RJ45 + 4x 100/1000 SFP

- Supports u-Ring , ERPS, EPS, MSTP, RSTP,STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for RJ45 and SFP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Supports negative voltage power input

As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IGS-4804SM supports static and dynamic routing protocols, features 48 Gigabit UTP ports and 4 100/1000 SFP slots, fanless design and redundancy Isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services.

Features

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <20ms in 250 devices
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 104Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	SFP: 4x 1000Base-X SFP socket, Support DDMI RJ45: 48x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant 2x AC input power (-AA model) 1x AC input power (-A model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) 1x DC input power (-D model) AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input
Power Consumption	<51.3W
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P48 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) P49~P52 SFP Slot: 100 /1000Base-X, Link/Active (Amber)
Jumbo Frame	10K Byte
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 70°C (IGS-4804SM-E) -10 ~ 60°C (IGS-4804SM)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	3.23kg (IGS-4804SM-AA) 3.115kg (IGS-4804SM-AD) 3.0kg (IGS-4804SM-DD)
Installation Mounting	19" rack mount
MTBF	91,378 Hours (IGS-4804SM-AA) 100,011 Hours (IGS-4804SM-AD) 110,457 Hours (IGS-4804SM-DD) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 26group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 26group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IP Source Guard	Supported
Mirroring	Local and Remote
Event Syslog	Syslog server (RFC3164) (Support 4 server)
NTP V4.0, 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

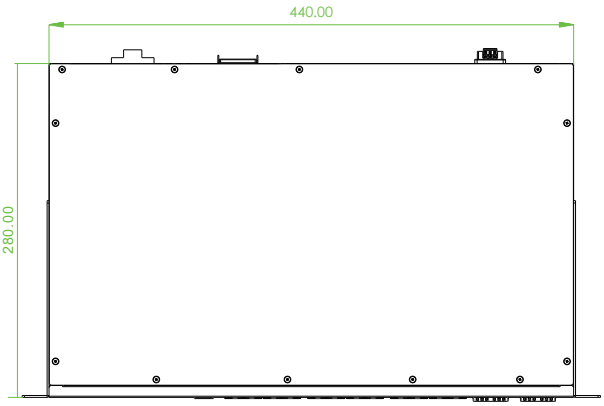
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SIP, Subnet (32bit) L4 : TCP/UDP
Other Features	Green Ethernet Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link LED Power Management : Adjustment LEDs intensity

Dimensions

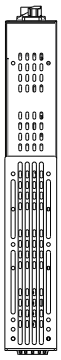
Front View

Rear View

Top View



Side View



Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	Input Power		Certification			Operating Temperature
			10/100/1000 Base-T	1000 Base-X	24/48/-48VDC	110/220V AC	Safety EN62368-1	CE, FCC	EN50121-4 EN61000-6-2 EN61000-6-4	
IGS-4804SM-E-AA	V	52	48	4		2	V	V	V	-40~70°C
IGS-4804SM-E-AD	V	52	48	4	1	1	V	V	V	-40~70°C
IGS-4804SM-E-DD	V	52	48	4	2		V	V	V	-40~70°C
IGS-4804SM-AA	V	52	48	4		2	V	V	V	-10~60°C
IGS-4804SM-AD	V	52	48	4	1	1	V	V	V	-10~60°C
IGS-4804SM-DD	V	52	48	4	2		V	V	V	-10~60°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For DC type)

ITP-G802SM-8PH24

IP67, 8x GbE M12 + 2x 100/1000Base SFP with 8x PoE 180W, 24/48VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail

The EN50155 certified managed PoE switch ITP-G802SM-8PH24, full Gigabit, that provides 8 Gigabit M12 A-code Ethernet ports and 2 100/1000 SFP slots. Supports a variety of PoE operation functions, including automatic detection of PoE device power, automatic reset, PoE scheduling, etc. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, withstand environmental disturbances such as vibration and shock. with IP67 rating to protect against dust and water submersion, 24VDC power input design compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- M12 and M23 connector against vibration and shock
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters
- Cable diagnostics, identifies opens/shorts distance
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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	
PoE RJ-45 Pin Assignment	8x M12 (8-Pin A-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.	
Network Connector	8x M12(8-Pin, Female, A-Code) 10/100/1000Base-T + 2x 100/1000Base-X SFP	
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
	2x Water-proof cable connector 2x 100/1000Base-X SFP slot, support DDMI	
Console	RS-232 (5-pin A-Code M12 male)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000Link/Active (Amber)	
	SFP Slot: Link/Active (Green)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
PoE Standard	IEEE802.3af, IEEE802.3at	
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 50VDC	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power	
	Built-in very high efficiency booster(94~97%) to rise up 50VDC for PoE output	
	Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	198.5W	9.8W	180W	95.30%
48 VDC	199.2W	11.5W	180W	95.80%

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.170kg
Installation Mounting	Wall mounting or DIN Rail mounting (Optional)
MTBF	371,857 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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
	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

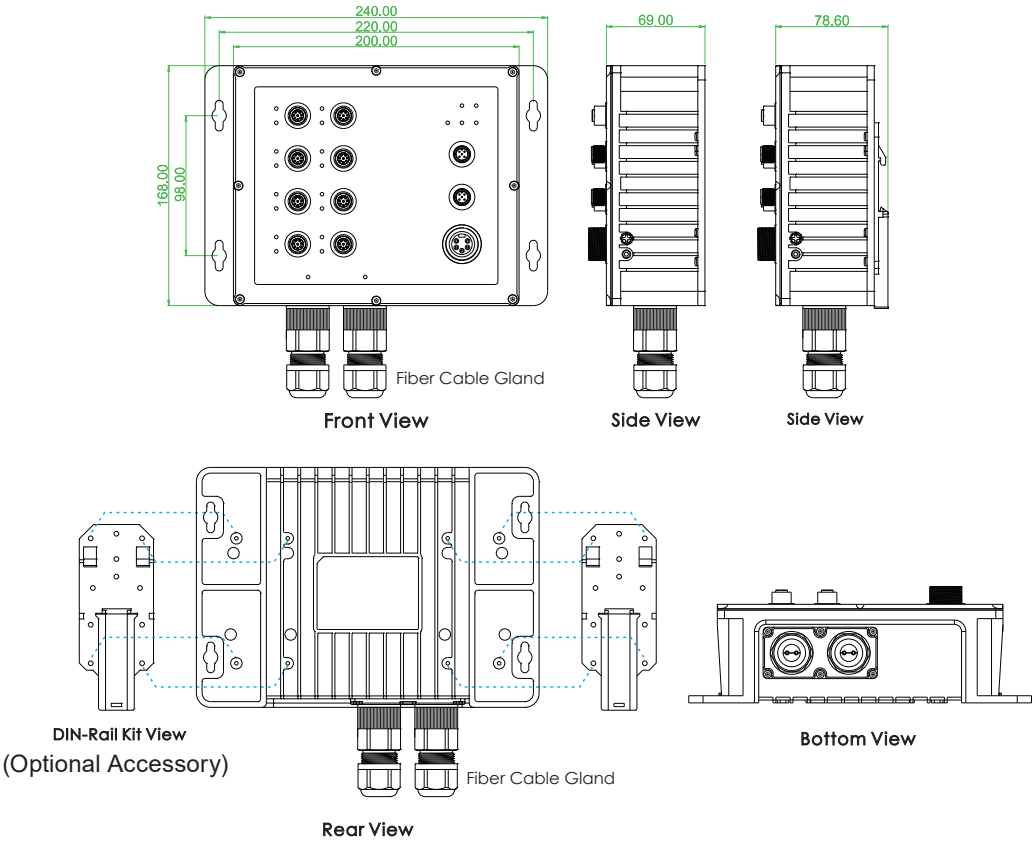
IPv6 Features

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 SIP, Subnet (32bit) 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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 180W) limitation
	Power feeding priority

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Fiber	PoE Port	PoE Total Power Budget	Power Input	Certification			Operating Temperature
				10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3at		Redundant	EN50155 EN50121-4	CE FCC	EN61000-6-2 EN61000-6-4	
ITP-G802SM-8PHE24	V	V	10	8 (A-Code)	2 SFP	8	180W	24/48VDC	V	V	V	-40~75°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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)

Optional Cable/Connector & Din-Rail Kit

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

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

ITP-G802TM-8PH24

IP67, 10x GbE M12 with 8x PoE 180W, 24/48VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail
- Build-in2 bypass GbE UTP port

The EN50155 certified managed PoE switch ITP-G802TM-8PH24, full Gigabit, that provides 10 Gigabit M12 A-code Ethernet ports. Supports a variety of PoE operation functions, including automatic detection of PoE device power, automatic reset, PoE scheduling, etc. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, withstand environmental disturbances such as vibration and shock. with IP67 rating to protect against dust and water submersion, 24VDC power input design compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- M12 and M23 connector against vibration and shock
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters
- Cable diagnostics, identifies opens/shorts distance
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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	
PoE RJ-45 Pin Assignment	8x M12 (8-Pin A-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.	
Network Connector	10x M12 (8-Pin, Female, A-Code) 10/100/1000Base-T UTP	
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
	Build-in 2x bypass GbE UTP ports	
Console	RS-232 (5-pin A-Code M12 male)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	SFP Slot: Link/Active (Green)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
PoE Standard	IEEE802.3af, IEEE802.3at	
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 50VDC	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power	
	Built-in very high efficiency booster(94~97%) to rise up 50VDC for PoE output	
	Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	200.4W	11.7W	180W	95.6%
48 VDC	200.2W	12.5W	180W	95.9%

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.15kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	362,429 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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
	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

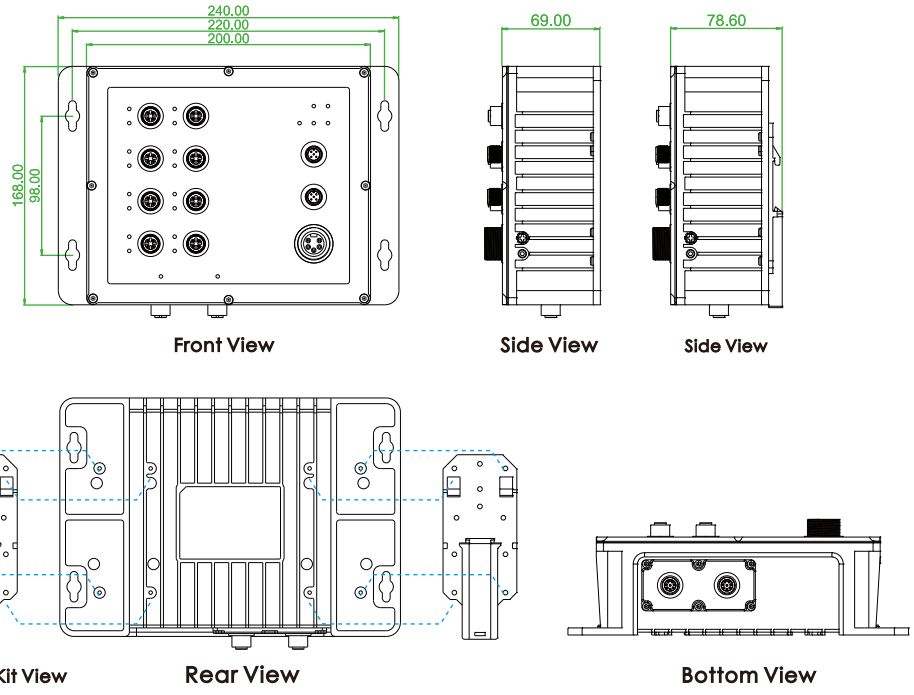
IPv6 Features

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 SIP, Subnet (32bit) 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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 180W) limitation
	Power feeding priority

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	PoE Port	PoE Total Power Budget	Power Input	Certification				Operating Temperature
				10/100/1000 Base-T	IEEE 802.3at		Redundant	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-G802TM-8PHE24	V	V	10	10 (A-Code)	8	180W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector & Din-Rail Kit

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

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

ITP-802GSM-8PH24

IP67, 8x 10/100Base M12 + 2x 100/1000Base SFP with 8x PoE 180W, 24/48VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail

The EN50155 certified managed PoE switch ITP-802GSM-8PH24, that provides 8 10/100 M12 D-code Ethernet ports and 2 100/1000 SFP slots. Supports a variety of PoE operation functions, including automatic detection of PoE device power, automatic reset, PoE scheduling, etc. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, withstand environmental disturbances such as vibration and shock. with IP67 rating to protect against dust and water submersion, 24VDC power input design compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- M12 and M23 connector against vibration and shock
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters
- Advanced PoE Management, management, PoE PD failure, auto checking and auto reset, PoE configuration for power planning, weekly scheduling
- Cable diagnostics, identifies opens/shorts distance
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)

Standard	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
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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): 5.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
PoE Port	8x M12 (4-Pin D-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.	
Network Connector	8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x 100/1000Base-X SFP	
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
	2x Water-proof cable connector 2x 100/1000Base-X SFP slot, support DDMI	
Console	RS-232 (5-pin A-Code M12 male)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green)	
	SFP Slot: Link/Active (Green)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
PoE Standard	IEEE 802.3af, IEEE 802.3at	
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 50VDC	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power	
	Built-in very high efficiency booster(94~97%) to rise up 50VDC for PoE output	
	Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	196.4W	8.1W	180W	95.50%
48 VDC	197.8W	9.6W	180W	95.60%

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.170kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	371,961 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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
	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

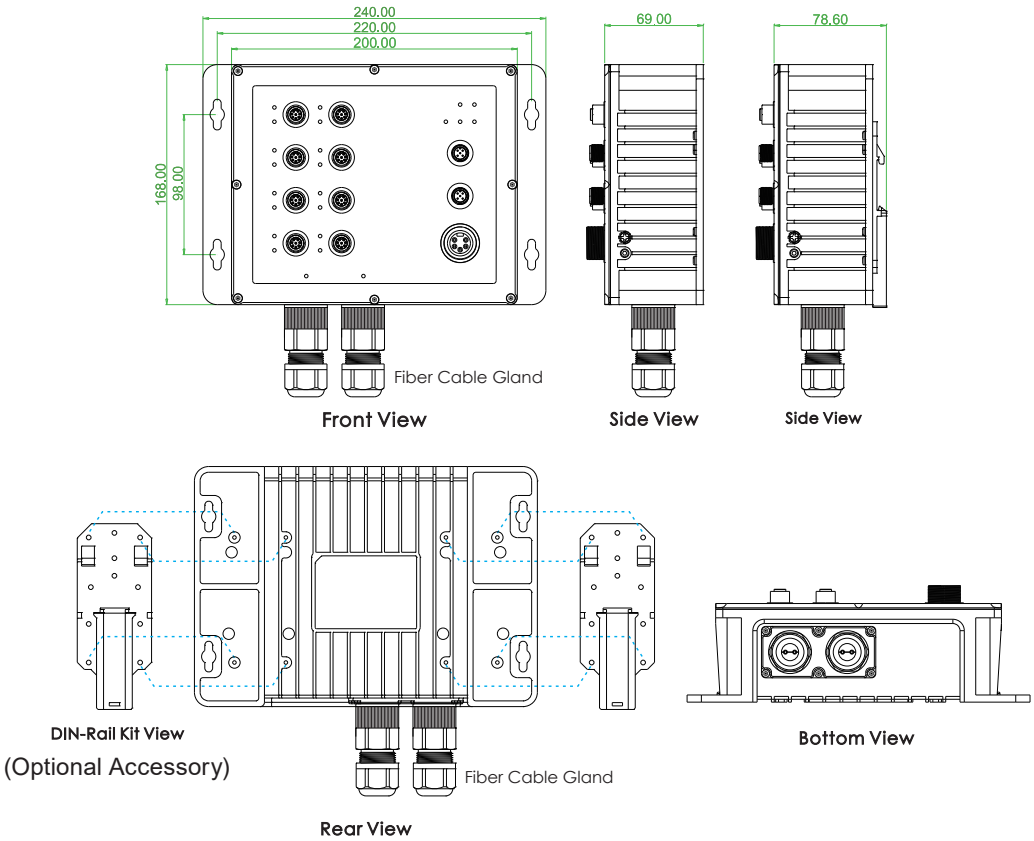
IPv6 Features

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 SIP, Subnet (32bit) 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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 180W) limitation
	Power feeding priority

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	UTP or SFP	PoE	PoE Total Power Budget	Power Input	Certification				Operating Temperature
				10/100 Base-TX	100/1000 Base-X	IEEEE 802.3at		Redundant	EN50155 EN50121-4	EN45545-2		CE FCC	
ITP-802GSM-8PHE24	V	V	10	8	2 SFP	8	180W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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)

Optional Cable/Connector & Din-Rail Kit

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-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: M12A-M8
M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

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

For GbE UTP (A-code model)

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

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

ITP-802GTM-8PH24

IP67, 8x 10/100Base M12 + 2x GbE M12 with 8x PoE 180W, 24/48VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail
- Build-in 2 bypass GbE UTP ports

The EN50155 certified managed PoE switch ITP-802GTM-8PH24, that provides 8 10/100 M12 D-code and 2 Gigabit M12 A-code Ethernet ports. Supports a variety of PoE operation functions, including automatic detection of PoE device power, automatic reset, PoE scheduling, etc. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, withstand environmental disturbances such as vibration and shock. with IP67 rating to protect against dust and water submersion, 24VDC power input design compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- M12 and M23 connector against vibration and shock
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters
- Advanced PoE Management, management, PoE PD failure, auto checking and auto reset, PoE configuration for power planning, weekly scheduling
- Cable diagnostics, identifies opens/shorts distance
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)

Standard	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
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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): 5.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
PoE Port	8x M12 (4-Pin D-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.	
Network Connector	8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x M12 (8-Pin, female,A-code) 10/100/1000Base-T UTP	
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function	
	Build-in 2x bypass GbE UTP ports	
Console	RS-232 (5-pin A-Code M12 male)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
PoE Standard	IEEE 802.3af, IEEE 802.3at	
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 50VDC	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power	
	Built-in very high efficiency booster (94~97%) to rise up 50VDC for PoE output	
	Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	198.3W	8.9W	180W	95.00%
48 VDC	198.8W	10.1W	180W	95.30%

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.15kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	362,429 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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
	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

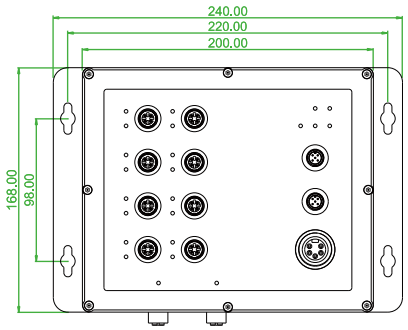
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

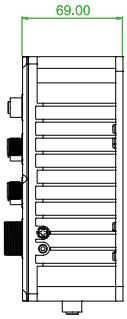
Others Features

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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 180W) limitation
	Power feeding priority

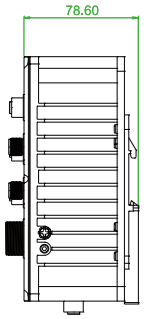
Dimensions



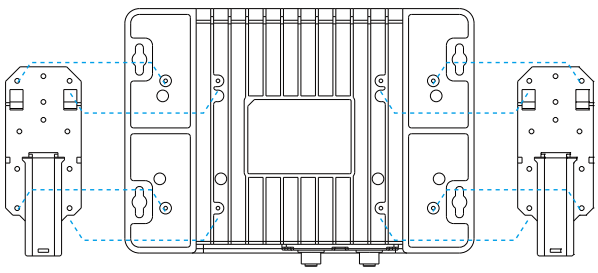
Front View



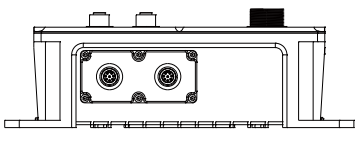
Side View



Side View



DIN-Rail Kit View
(Optional Accessory)



Rear View

Bottom View

Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	UTP or SFP	PoE	PoE Total Power Budget	Power Input	Certification				Operating Temperature
				10/100 Base-TX	100/1000 Base-X	IEEEE 802.3at		Redundant	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-802GTM-8PHE24	V	V	10	8	2 (A-code)	8	180W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Optional Cable/Connector & Din-Rail Kit

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-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: M12A-M8

M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

P/N: M12A-M8

M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

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

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

ITP-1204GTM-12PH

12x 10/100Base M12 + 4x GbE M12 with 12x PoE 120W, 24/48/72/110VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and 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 12x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. Up to 12 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.8031 ERP, 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
- Supports EMS Management

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 802.1d	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.1AX	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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 (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
PoE Port	12x M12 (4-Pin D-code Female) PoE ports Maximum PoE output power budget 120W (30W/per port), Regulated PoE output voltage at 52VDC IEEE 802.3af / IEEE 802.3at End-Span, Alternative A 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	
	UTP port provides 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 Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
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 100 meter	

Power Consumption

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

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)
Weight	2.8kg
Installation Mounting	Wall mounting
MTBF	238,600 Hours (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
4KV Surge Protection	Supported for PoE and 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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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
	Support IEEE802.1AX passive and active mode
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <10ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port ： Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

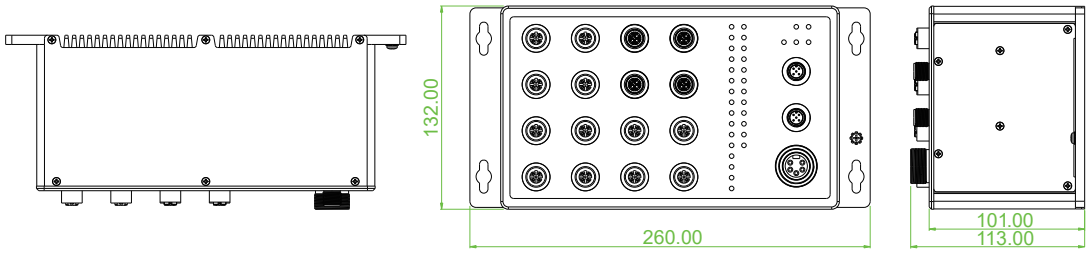
IPv6 Features

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 SIP, Subnet (32bit) 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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 120W) limitation
	Power feeding priority

Dimensions



Rear View　　Front View　　Side View

Ordering Information

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

Model Name	Certification				
	EN45545-2	EN50155	EN61000-6-2/ EN61000-6-4	CE, FCC	IEC61373
ITP-1204GTM-12PHE-BP	V	V	V	V	V

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

ITP-2204GTM-16PH

22x 10/100Base M12 + 4x GbE M12 with 16x PoE 120W, 24/48/72/110VDC

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and 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 22x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. Up to 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.8031 ERP, 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
- Supports EMS Management

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 802.1d	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.1AX	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet ehancements)
	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	12.4Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
PoE Port	16x M12 (4-Pin D-code Female) PoE ports Maximum PoE output power budget 120W (30W/per port), Regulated PoE output voltage at 52VDC IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode	
Network Connector	22x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP	
	UTP port provides 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 Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	PoE: ON (Green)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
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 100 meter	

Power Consumption

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 360 x 132 (D x W x H)
Weight	3.9kg
Installation Mounting	Wall mounting
MTBF	227,899 Hours (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 and 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
4KV surge protection	Supported for PoE and 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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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
	Support IEEE802.1AX passive and active mode
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <10ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port ： Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

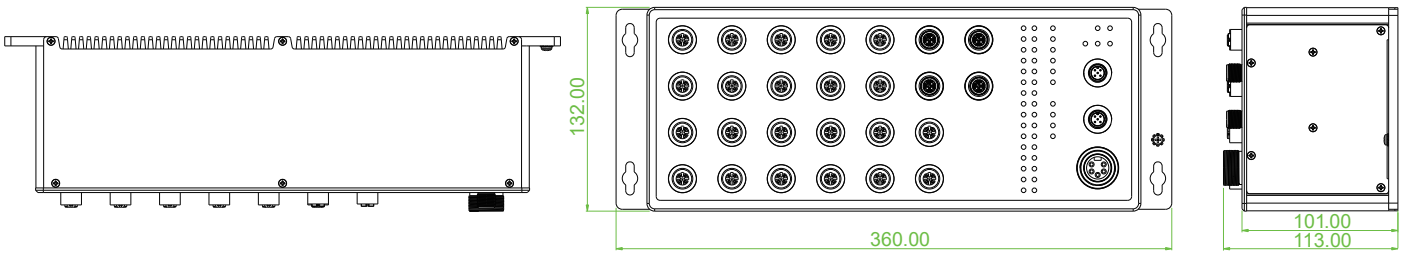
IPv6 Features

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 SIP, Subnet (32bit) 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
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail
	PoE Scheduling (On/Off schedule weekly)
	PoE Configuration
	PoE Enable/Disable
	Power limit by classification
	Power limit by management
	Total PoE Power budge (maximum 120W) limitation
	Power feeding priority

Dimensions



Rear View　　Front View　　Side View

Ordering Information

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

Model Name	Certification					
	EN45545-2	EN50155	EN61000-6-2 EN61000-6-4	EEN50121-4	CE, FCC	IEC61373
ITP-2204GTM-16PHE-BP	V	V	V	V	V	V

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

ITP-802GT-8PH24

2x Gigabit M12 + 8x 10/100Base M12 with 8x PoE 120W, 24/48VDC

- 24/48VDC input power
- Regulated PoE output voltage
- M12 connector for UTP and Power
- EN50155, EN50121-4, EN61000-6-2, EN61000-6-4, EN45545-2, CE and FCC certified

As an EN50155 certified M12 PoE switch, ITP-802GT-8PH24 has 8 10/100Base-TX M12 D-code Ethernet ports and 2 Gigabit M12 X-code ports. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, and withstand environmental disturbances such as vibration and shock. 24VDC power input design, compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Regulated PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters
- Wide operating temperature -40~75° C
- CE, FCC, EN51055, EN50121-4 and EN45545-2 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	4 K	
Packet Buffer Size	448Kbits	
Network Connector	8x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	2x M12 X-code Female	
	10/100/1000Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable above	
	EIA/TIA-568 100-ohm (100meter)	

Protocols	CSMA/CD
LED	System: Power 1 (Green)
	Per: Link/Active (Green)
	PoE: ON (Green)
Reverse Polarity Protection	Present for power input
Overload Current Protection	Supported
PoE Standard	IEEE 802.3af, IEEE 802.3at
PoE Power Budget	Maximum PoE output power budget 120W (30W/per port)
Power Supply	Provides 1x M12 (5-Pin) for DC 24/48V (20~57VDC) input power
	Built-in very high efficiency (97~98%) to boost PoE output voltage to 53VDC
	Regulate PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters

Power Consumption

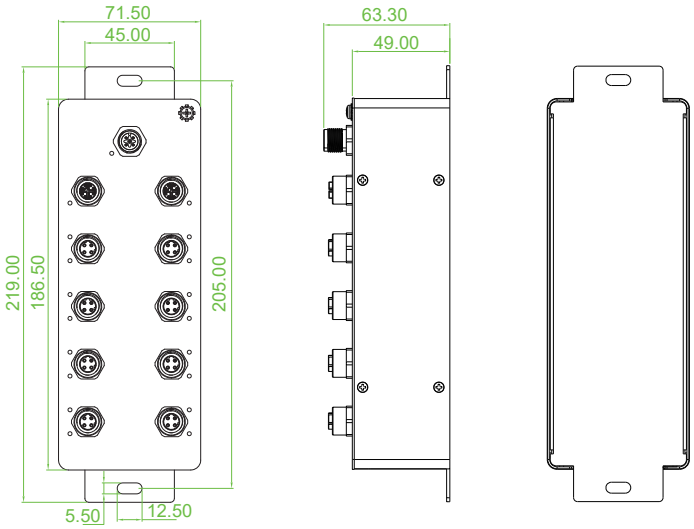
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	125W	3.6W	120W	98%
48 VDC	127W	4.3W	120W	97%

Operating Temperature	-10°C~60°C (ITP-802GT-8PH24) -40°C~75°C (ITP-802GT-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	Rugged metal, IP30 protection housing, and fanless
Dimensions	63.3 x 71.5 x 219mm (D x W x H)
Weight	0.8kg
Installation Mounting	Wall mounting
MTBF	531,231 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55035, EN55032)
EMI	FCC, 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) 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
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Side View　　Front View　　Rear View

Ordering Information

Model Name	Total Port	UTP Port M12		PoE Port	PoE Total Power Budget	Power Input	Certification				Shock Vibration	Operating Temperature
		10/100 Base-TX	10/100/1000 Base-TX	IEEE802.3at		Redundant	EN45545-2	EN50155 EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	IEC61373	
ITP-802GT-8PH24	8	8	2	8	120W	24/48VDC	V	V	V	V	V	-10~60°C
ITP-802GT-8PHE24	8	8	2	8	120W	24/48VDC	V	V	V	V	V	-40~75°C

Optional Accessories

■ Optional Cable/Connector

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

For Power

P/N: CAB-M12XM8-RJ45

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

For Alarm

P/N: M12D-M4

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

For FE UTP

ITP-800A-8PH24

8x 10/100Base M12 with 8x PoE 120W, 24/48VDC

- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- M12/M23 connector for UTP and Power
- EN50155, EN50121-4, EN61000-6-2, EN61000-6-4, EN62368-1, EN45545-2 , CE and FCC certified

The EN50155 certified M12 PoE switches ITP-800A-8PH24, metal housing IP40 protection, have 8 10/100Base-TX M12 D-code Ethernet ports, fanless and redundant power input. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, and withstand environmental disturbances such as vibration and shock. 24VDC power input design, compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- Use M12/M23 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency (97~98%) to boost PoE output voltage to 50VDC
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters
- Wide operating temperature -40~75° C (ITP-800A-8PHE24)
- CE, FCC, EN62368-1, EN51055, EN50121-4 and EN45545-2 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-plane (Switching Fabric): 1.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1 K	
Packet Buffer Size	448Kbits	
Network Connector	8x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)
	Per: Link/Active (Green)
	PoE: ON (Green)
Reverse Polarity Protection	Present for power input
Overload Current Protection	Supported
PoE Standard	IEEE 802.3af, IEEE 802.3at
PoE Power Budget	Maximum PoE output power budget 120W (30W/per port), Regulated PoE output voltage at 50VDC
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC, 24/48V (20~57VDC) input power
	Built-in very high efficiency (97~98%) to boost PoE output voltage to 50VDC
	Regulate PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters
Power Consumption	

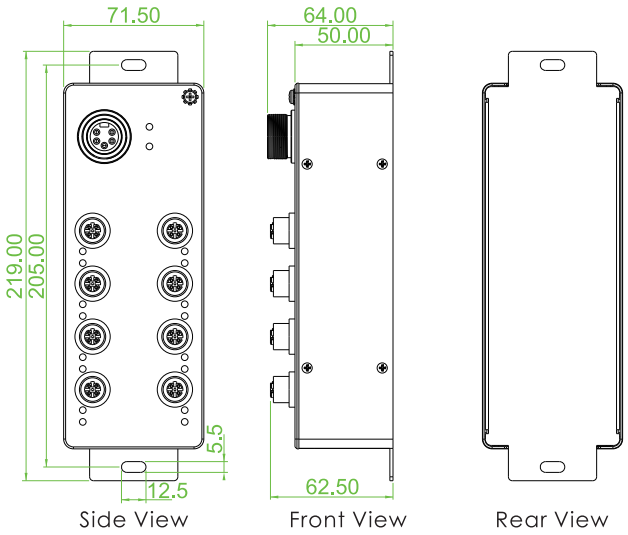
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	125W	3.6W	120W	98%
48 VDC	127W	4.3W	120W	97%

Operating Temperature	-10°C~60°C (ITP-800A-8PH24) -40°C~75°C (ITP-800A-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	Rugged metal, IP40 protection housing, and fanless
Dimensions	64 x 71.5 x 219 mm (D x W x H)
Weight	860g
Installation Mounting	Wall mounting
MTBF	937,878 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI	FCC, 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) 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	EN62368-1
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Ordering Information

Model Name	Total Port	UTP Port M12	PoE Port	PoE Total Power Budget	Power Input	Certification					Shock Vibration	Operating Temperature
		10/100 Base-TX	IEEE802.3at		Redundant	EN45545-2	EN62368-1	EN50155 EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	IEC61373	
ITP-800A-8PH24	8	8	8	120W	24/48VDC	V	V	V	V	V	V	-10~60°C
ITP-800A-8PHE24	8	8	8	120W	24/48VDC	V	V	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector

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-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

ITP-800-8PH24

IP56, 8x 10/100Base M12 with 8x PoE 120W, 24/48VDC

- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- M12/M23 connector for UTP and Power
- EN50155, EN50121-4, EN61000-6-2, EN61000-6-4, EN62368-1, CE and FCC certified
- IP56 protection for water and dust

The EN50155 certified M12 PoE switches ITP-800-8PH24, plastic housing IP56 protection, have 8 10/100Base-TX M12 D-code Ethernet ports, fanless and redundant power input. Designed for heavy industrial, vehicle and rolling stock applications, utilizing M12 connectors to ensure secure connections and reliable operation, and withstand environmental disturbances such as vibration and shock. 24VDC power input design, compatible with vehicle battery power supply, realizes PoE function through voltage boosting. EN50155 certification covers operating temperature, mains input voltage, surge, ESD, vibration and shock, making the switch suitable for vehicle, rolling stock applications.

Features

- Use M12/M23 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency (97~98%) to boost PoE output voltage to 50VDC
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters
- Wide operating temperature -40~75° C (ITP-800-8PHE24)
- CE, FCC, EN62368-1, EN50155 and EN50121-4 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-plane (Switching Fabric): 1.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1 K	
Packet Buffer Size	448Kbits	
Network Connector	8x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)
	Per: Link/Active (Green)
	PoE: ON (Green)
Reverse Polarity Protection	Present for power input
Overload Current Protection	Supported
PoE Standard	IEEE 802.3af, IEEE 802.3at
PoE Power Budget	PoE power budget 120W (30W/port), Regulated PoE output voltage at 50VDC
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC, 24/48V (20~57VDC) input power
	Built-in very high efficiency (97~98%) to boost PoE output voltage to 50VDC
	Regulate PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters
Power Consumption	

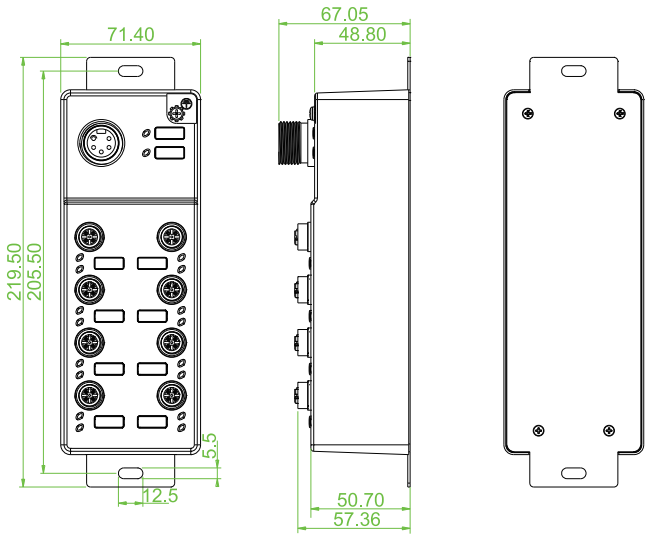
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24 VDC	125W	3.6W	120W	98%
48 VDC	127W	4.3W	120W	97%

Operating Temperature	-10°C~60°C (ITP-800-8PH24) -40°C~75°C (ITP-800-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	IP56 water-proof grade housing, and fanless
Dimensions	67 x 71.4 x 219.5 mm (D x W x H)
Weight	715g
Installation Mounting	Wall mounting
MTBF	937,878 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI	FCC, 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
	EN61000-4-11 Voltage Dips
Safety	EN62368-1
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Ordering Information

Model Name	Total Port	UTP Port M12	PoE Port	PoE Total Power Budget	Power Input	Certification				Operating Temperature
		10/100Base-TX	IEEE802.3at		Redundant	EN50121-4 EN50155	EN62368-1	CE, FCC	EN61000-6-2 EN61000-6-4	
ITP-800-8PH24	8	8	8	120W	24/48VDC	V	V	V	V	-10~60°C
ITP-800-8PHE24	8	8	8	120W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector

P/N: CAB-M12DM4-RJ45

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

For 100M UTP

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 100M UTP

ITP-G802SM

IP67, 8x GbE + 2x 100/1000Base SFP

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 GbE switches that provide 8x GbE UTP plus 2x GbE SFP or 10x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-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 an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

Features

- M12 and M23 connector against vibration and shock
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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	8x M12(8-Pin, Female, A-Code) 10/100/1000Base-T + 2x 100/1000Base-X SFP
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function
	2x Water-proof cable connector 2x 100/1000Base-X SFP slot, support DDMI
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) Low voltage (L) : 12/24/48V (8.4~60VDC)
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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.645kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	443,868 Hours (MIL-HDBK-217)
Warranty	5 years

Input Voltage	ITP-G802SM-LL
12VDC	8.5W
24VDC	9.2W
48VDC	11W

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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	TFTP, HTTP
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

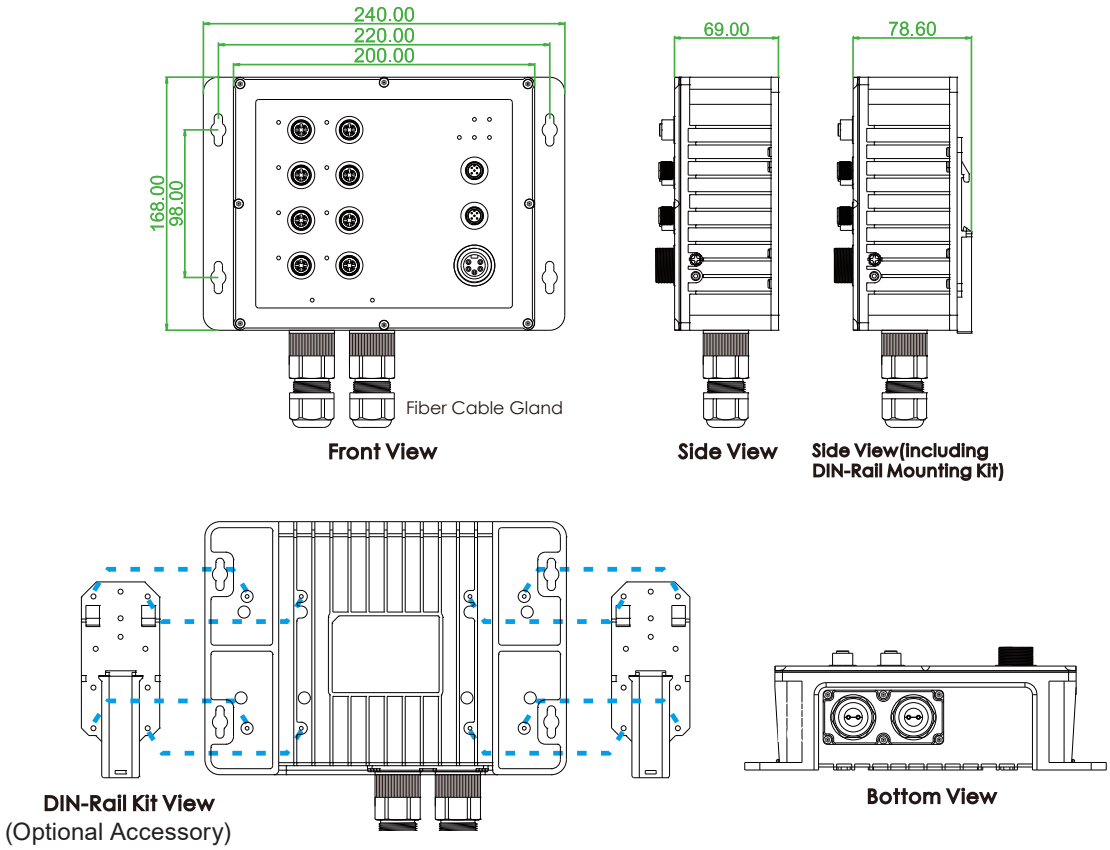
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported

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 SIP, Subnet (32bit) 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

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Fiber	Redundant Power Supply	Certification				Operating Temperature
				10/100/1000 Base-T(X)	100/1000 Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-G802SM-ELL	V	V	10	8 (A-code)	2 SFP	2	V	V	V	V	-40~75°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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)

Optional Cable/Connector & Din-Rail Kit

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

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

ITP-G802TM

IP67, 10x GbE M12

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Build-in 2 bypass GbE UTP ports
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 GbE switches that provide 8x GbE UTP plus 2x GbE SFP or 10x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-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 an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

Features

- M12 and M23 connector against vibration and shock, A-code M12 for Gigabit port
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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) 10/100/1000Base-T UTP
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function
	Build-in 2x bypass GbE UTP ports
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100 meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) Low voltage (L) : 12/24/48V (8.4~60VDC)
Power Consumption	

Input Voltage	ITP-G802TM-LL
12VDC	10.1W
24VDC	10.9W
48VDC	13.1W

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.625kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	423,602 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	TFTP, HTTP
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

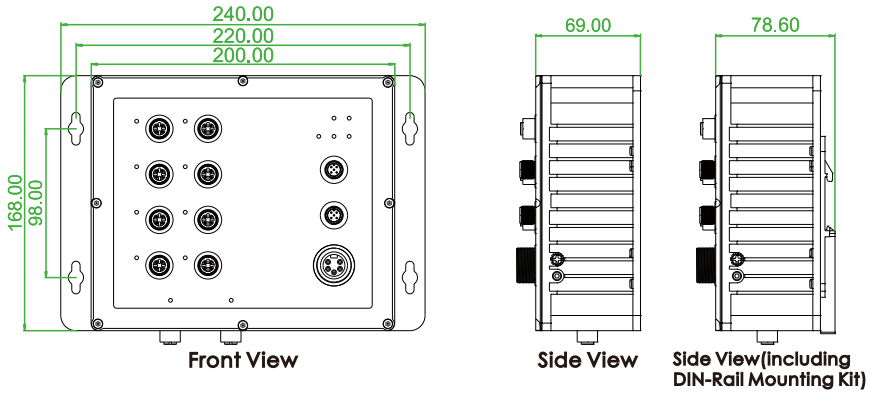
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported

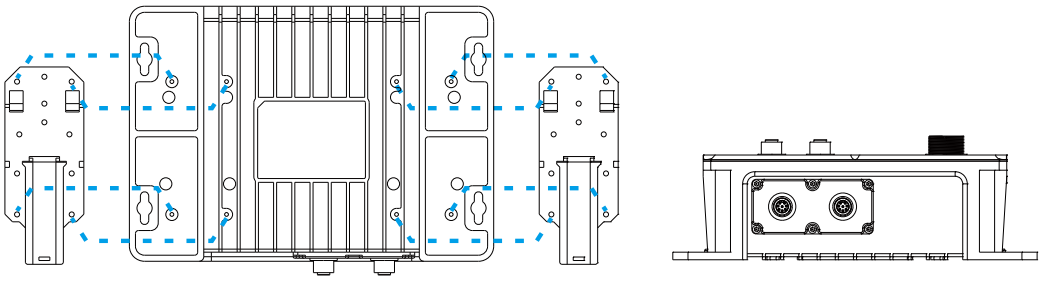
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SIP, Subnet (32bit) L4: TCP/UDP

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

Dimensions





Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Redundant Power Supply	Certification				Operating Temperature
				10/100/1000 Base-T(X)	Low Volt 12/24/48VDC (8.4~60VDC)	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-G802TM-ELL	V	V	10	10 (A-code)	2	V	V	V	V	-40~75°C

Optional Accessories

■ Optional Cable/Connector & Din-Rail Kit

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

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

ITP-802GSM

IP67, 8x 10/100Base M12 + 2x 100/1000Base SFP

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Build-in 2 bypass GbE UTP ports
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 8x Fast Ethernet UTP plus 2x GbE SFP or 8x Fast Ethernet UTP plus 2x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-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 an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

Features

- M12 and M23 connector against vibration and shock
- 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)
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 5.6Gbps (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	8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x 100/1000Base-X SFP
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function 2x Water-proof cable connector, 2x 100/1000Base-X SFP slot, support DDMI
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) Low voltage (L) : 12/24/48V (8.4~60VDC)
Power Consumption	

Input Voltage	ITP-G802TM-LL
12VDC	6.9W
24VDC	8.3W
48VDC	9.8W

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.645kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	443,868 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	TFTP, HTTP
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

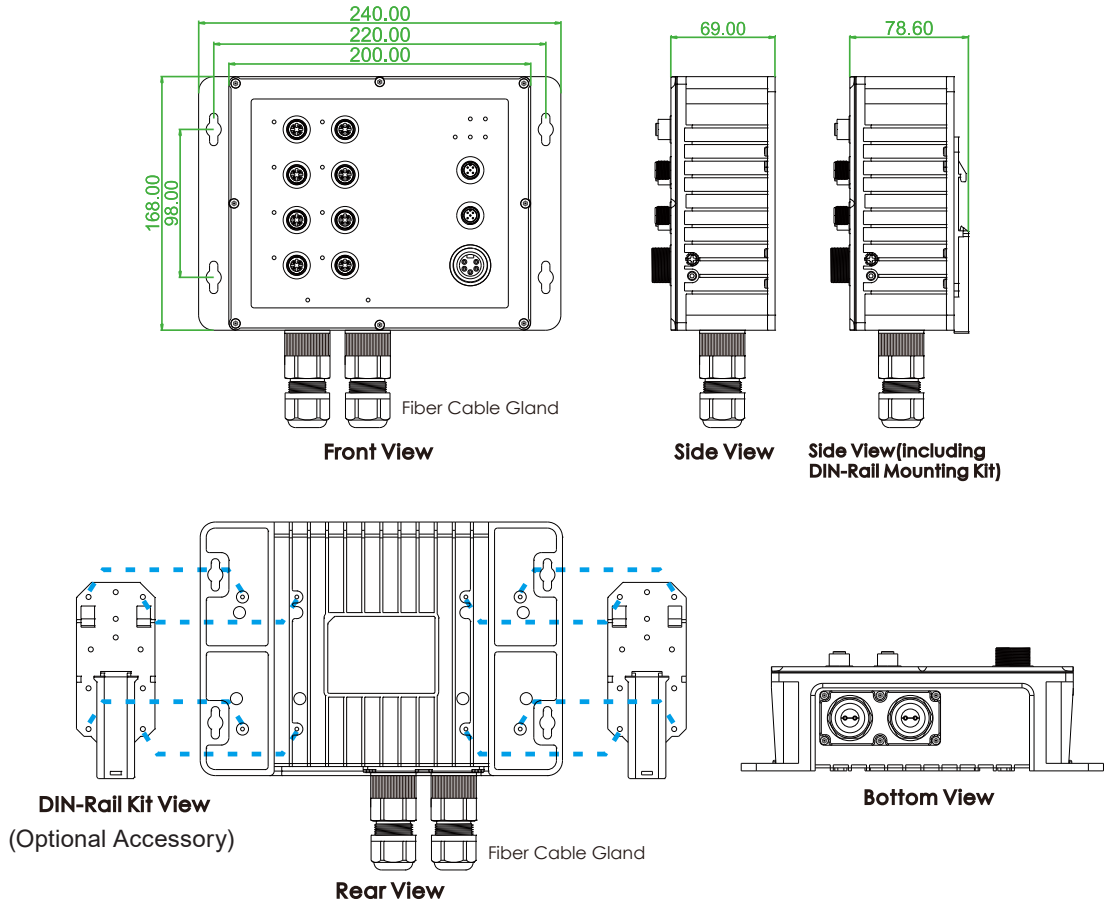
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported

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 SIP, Subnet (32bit) 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

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	SFP or UTP	Redundant Power Supply	Certification				Operating Temperature
				10/100M Base-TX	100/1000M Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-802GSM-ELL	V	V	10	8	2 SFP	2	V	V	V	V	-40~75°C

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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)

Optional Cable/Connector & Din-Rail Kit

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-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: M12A-M8

M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

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

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

ITP-802GTM

IP67, 8x 10/100Base M12 + 2x GbE M12

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Build-in 2 bypass GbE UTP ports
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 8x Fast Ethernet UTP plus 2x GbE SFP or 8x Fast Ethernet UTP plus 2x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-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 an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

Features

- M12 and M23 connector against vibration and shock, A-code M12 for Gigabit port
- 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)
- 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
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 5.6Gbps (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	8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x M12 (8-Pin, female,A-code) 10/100/1000Base-T UTP
	UTP port provides Auto negotiation speed, Auto MDI/MDI-X, Full/Half duplex function
	Build-in 2x bypass GbE UTP ports
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100 meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual input, optional Low (L) Low voltage (L) : 12/24/48V (8.4~60VDC)
Power Consumption	

Input Voltage	ITP-802GTM-LL
12VDC	8.8W
24VDC	9.2W
48VDC	10.6W

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
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.625kg
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	335,823 Hours (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) 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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	TFTP, HTTP
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

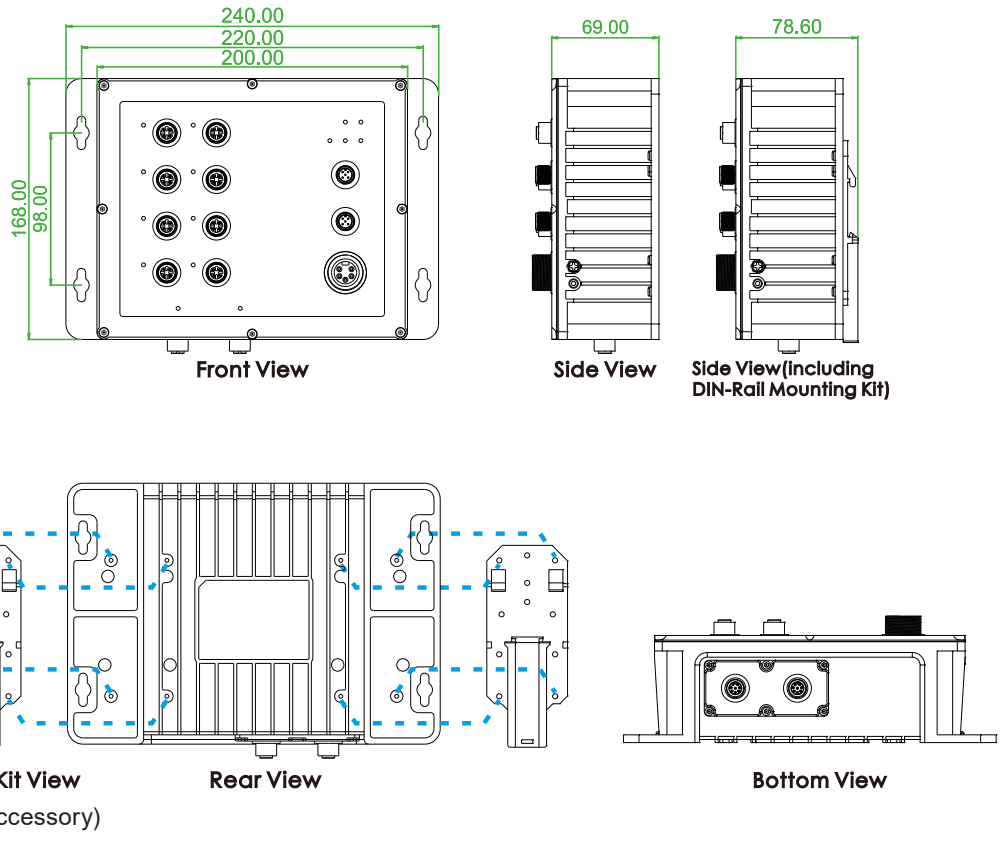
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported

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 SIP, Subnet (32bit) 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

Dimensions



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	SFP or UTP	Redundant Power Supply	Certification				Operating Temperature
				10/100M Base-TX	100/1000M Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	
ITP-802GTM-ELL	V	V	10	8	2 UTP (A-code)	2	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector & Din-Rail Kit

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-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: M12A-M8
M12 A-code Male (8-Pin) connector, IP67

For GbE UTP (A-code model)

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

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

ITP-1204GTM

12x 10/100Base M12+ 4x GbE M12

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4 CE, FCC certified
- 24/48/72/96/110VDC redundant dual input power
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 12x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. The ITP 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 fiber connector against vibration and shock, M12 X-code for Gigabit port
- STP, RSTP, MSTP, ITU-T G.8031 ERP, 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
- Supports EMS Management

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 802.1d	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1AX	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3ac	Max frame size extended to 1522Bytes
	IEEE 802.1ad	Stacked VLANs, Q-in-Q

Standard	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 (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	
	UTP port provides 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 Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power	
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, IP54 grade housing protection	
Dimensions	113 x 260 x 132 (D x W x H)	
Weight	2.8kg	
Installation Mounting	Wall mounting	
MTBF	290,905 Hours (MIL-HDBK-217)	
Warranty	5 years	

Input Voltage	Device Power Consumption
24VDC	13W
48VDC	14W
110VDC	16.5W

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
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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
	Support IEEE802.1AX passive and active mode
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <10ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

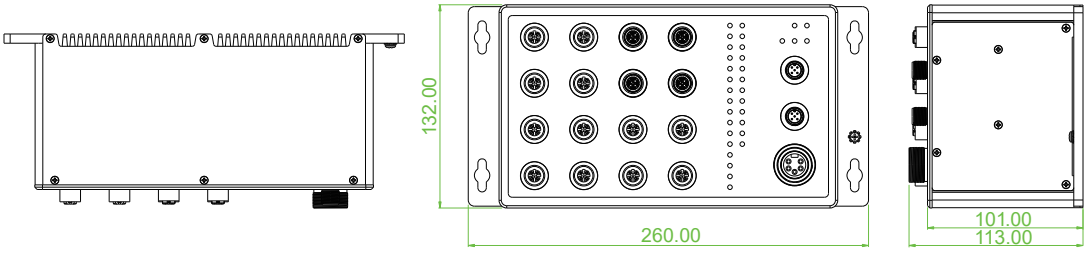
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported

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 SIP, Subnet (32bit) 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

Dimensions



Rear View　　Front View　　Side View

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	24/48/72/96/110VDC (16.8~137.5VDC)
ITP-1204GTM-E-BP	V	IP54	16	12	2	2	V

Model Name	Certification				
	EN45545-2	EN50155 / EN50121-4	EN61000-6-2 / EN61000-6-4	CE, FCC	IEC61373
ITP-1204GTM-E-BP	V	V	V	V	V

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

ITP-2204GTM

22x 10/100Base M12+ 4x GbE M12

- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4 CE and FCC certified
- 24/48/72/96/110VDC redundant dual input power
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Cable diagnostics, identifies opens/shorts distance

The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 22x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. The ITP 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 fiber connector against vibration and shock, M12 X-code for Gigabit port
- STP, RSTP, MSTP, ITU-T G.8031 ERP, 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
- Supports EMS Management

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 802.1d	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1AX	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.3ac	Max frame size extended to 1522Bytes
	IEEE 802.1ad	Stacked VLANs, Q-in-Q

Standard	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	12.4Gbps (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	22x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP	
	UTP port provides 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 Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
Jumbo Frame	9.6KB	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM	
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power	
Power Consumption		

Input Voltage	Device Power Consumption
24VDC	17.1W
48VDC	17.8W
110VDC	19.8W

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 360 x 132 (D x W x H)
Weight	3.9kg
Installation Mounting	Wall mounting
MTBF	230,352 Hours (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
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for UTP port
Safety	EN62368-1
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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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
	Support IEEE802.1AX passive and active mode
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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <10ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE802.1p 8 active priorities queues 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	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
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

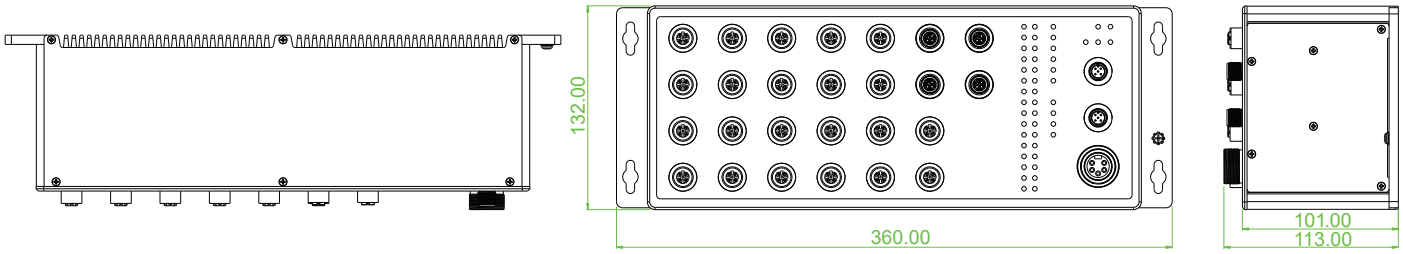
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported

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 SIP, Subnet (32bit) 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

Dimensions



Rear View　　Front View　　Side View

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	24/48/72/96/110VDC (16.8~137.5VDC)
ITP-2204GTM-E-BP	V	IP54	26	22	2	2	V

Model Name	Certification				
	EN45545-2	EN50155 / EN50121-4	EN61000-6-2 / EN61000-6-4	CE, FCC	IEC61373
ITP-2204GTM-E-BP	V	V	V	V	V

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

ITP-500

IP56, 5x 10/100Base M12

- M12 connector for Ethernet and Power
- Slim and Fanless Design
- EN50155, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

An EN50155 certified M12 type Ethernet switch, ITP-500 has 5 10/100Base-TX Fast Ethernet ports, fanless, IP56 protection, designed for industrial applications in harsh environments, and utilizes M12 connectors to ensure waterproof, Sturdy connections and guaranteed reliable operation without environmental disturbances such as vibration and shock. EN50155 certification covers critical regulation of operating temperature, mains input voltage, surge, ESD, vibration and shock, making it suitable for industrial applications such as vehicles, rolling stock and factory automation.

Features

- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Slim design
- DC input power 12/24/48VDC (8.4~60VDC)
- Wide operating temperature -40~75° C (ITP-500-E)
- CE, FCC, EN50155 and EN50121-4 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 1Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1 K	
Packet Buffer Size	448Kbits	
Network Connector	5x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
LED	Per unit: Power (Green)	
	Per port: Link/Active (Green)	
Reverse Polarity Protection	Present for power input	
Overload Current Protection	Supported	
Power Supply	DC 12/24/48V (8.4~60VDC) Input power	

Power Connector	5 Pin Male A-Code M12
Power Consumption	

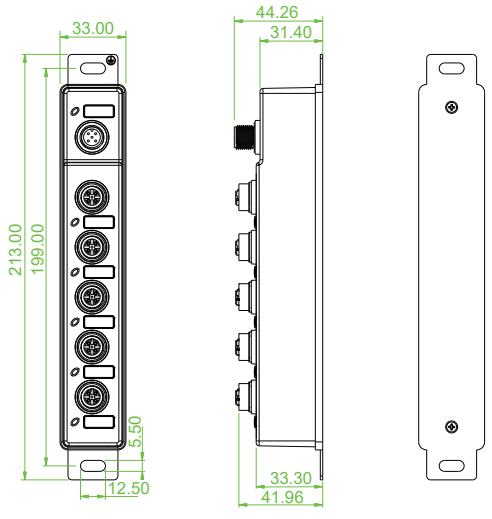
Input Voltage	ITP-500
12VDC	0.8W
24VDC	1.0W
48VDC	1.9W

Operating Temperature	-40°C~75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	IP56 Rugged housing, and fanless
Dimensions	44.3 x 33 x 213 mm (D x W x H)
Weight	150g
Installation Mounting	Wall mounting
MTBF	2,315,383 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI	FCC, 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
	EN 61000-4-11 Voltage Dips
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Side View Front View Rear View

Ordering Information

Model Name	Total Port	UTP Port M12	Redundant Power Supply	Certification				Shock Vibration	Operating Temperature
		10/100Base-TX	12/24/48VDC (8.4~60VDC)	EN50155	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-500-E	5	5	1	V	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector

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 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 Power

ITP-800

IP56, 8x 10/100Base M12

- M12 connector for Ethernet and Power
- Slim and Fanless Design
- Build-in 2 bypass port
- EN50155, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The EN50155 certified M12 type Ethernet switch, ITP-800, plastic housing, have 8 10/100Base-TX Fast Ethernet ports, fanless, IP40 protection, designed for industrial applications in harsh environments, and utilizes M12 connectors to ensure waterproof, Sturdy connections and guaranteed reliable operation without environmental disturbances such as vibration and shock. EN50155 certification covers critical regulation of operating temperature, mains input voltage, surge, ESD, vibration and shock, making it suitable for industrial applications such as vehicles, rolling stock and factory automation.

Features

- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Slim design
- Build-in 2 bypass port to avoid one or more nodes power fail in a bus structure to collapse the network
- Redundant dual DC input power 12/24/48VDC (8.4~60VDC)
- Wide operating temperature -40~75° C (ITP-800-E)
- CE, FCC, EN50155 and EN50121-4 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 1.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1 K	
Packet Buffer Size	448Kbits	
Network Connector	8x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
	Built in 2 bypass port	
Network Cable	UTP/STP Cat. 5e cable above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
LED	Per unit: Power 1 (Green), Power 2 (Green	
	Per port: Link/Active (Green)	
Reverse Polarity Protection	Present for power input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (8.4~60VDC) Input power	

Power Connector	5 Pin Male A-Code M12
Power Consumption	

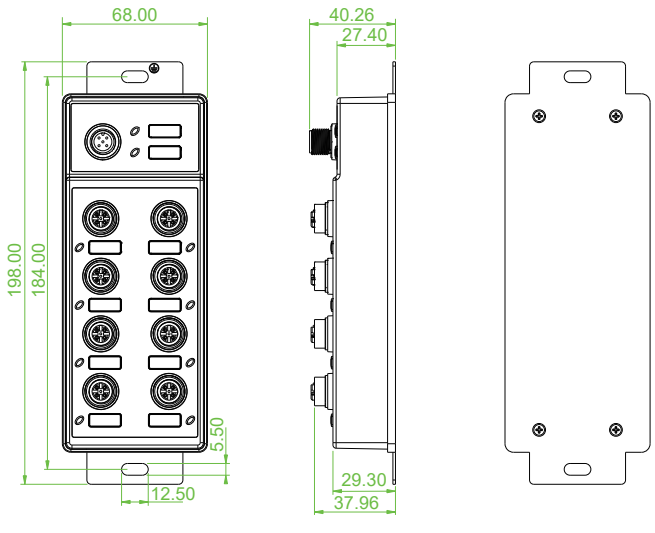
Input Voltage	ITP-800
12VDC	1.8W
24VDC	2.2W
48VDC	3.4W

Operating Temperature	-40°C~75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	IP56 Rugged housing, and fanless
Dimensions	40.3 x 68 x 198 mm (D x W x H)
Weight	300g
Installation Mounting	Wall mounting
MTBF	1,492,660 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI	FCC, 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
	EN 61000-4-11 Voltage Dips
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Side View Front View Rear View

Ordering Information

Model Name	Total Port	UTP Port M12	Redundant Power Supply	Certification				Shock Vibration	Operating Temperature
		10/100Base-TX	12/24/48VDC (8.4~60VDC)	EN50155	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-800-E	8	8	2	V	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector

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 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 Power

ITP-800A

8x 10/100Base M12

- M12 connector for Ethernet and Power
- EN50155, EN50121-4, EN45545-2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- Rugged metal housing and fanless design
- Build-in 2 bypass port
- 12/24/48VDC redundant dual input power

The EN50155 certified M12 type Ethernet switch, ITP-800A, metal housing, have 8 10/100Base-TX Fast Ethernet ports, fanless, IP56 protection, designed for industrial applications in harsh environments, and utilizes M12 connectors to ensure waterproof, Sturdy connections and guaranteed reliable operation without environmental disturbances such as vibration and shock. EN50155 certification covers critical regulation of operating temperature, mains input voltage, surge, ESD, vibration and shock, making it suitable for industrial applications such as vehicles, rolling stock and factory automation.

Features

- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Build-in 2 bypass port to avoid one or more nodes power fail in a bus structure to collapse the network
- Redundant dual DC input power 12/24/48VDC (8.4~60VDC)
- Rugged metal, IP40 protection and fanless design
- Wide operating temperature -40~75° C
- CE, FCC, EN50155, EN50121-4 and EN45545-2 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 1.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1 K	
Packet Buffer Size	448Kbits	
	8x M12 D-code Female	
	10/100Base-TX Auto negotiation speed	
	Auto MDI/MDI-X function	
	Full/Half duplex	
	Built in 2 bypass port	
Network Cable	10Base-T: 2-pair UTP/STP Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
	100Base-TX: 2-pair UTP/STP Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
Protocols	CSMA/CD	
LED	Per unit: Power 1 (Green), Power 2 (Green)	
	Per port: Link/Active (Green)	
Reverse Polarity Protection	Present for power input	

Overload Current Protection	Supported
Power Supply	Redundant Dual DC 12/24/48V (8.4~60VDC) Input power
Power Connector	5 Pin Male A-Code M12
Power Consumption	

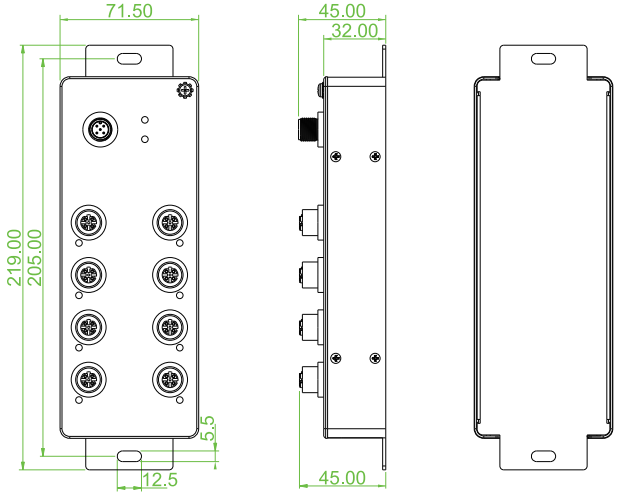
Input Voltage	ITP-800A
12VDC	1.8W
24VDC	2.2W
48VDC	3.4W

Operating Temperature	-40°C~75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	Rugged metal housing, IP40 protection and fanless
Dimensions	45x 71.5x 219 mm (D x W x H)
Weight	420g
Installation Mounting	Wall mounting
MTBF	1,492,660 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI	FCC, 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) 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
	EN 61000-4-11 Voltage Dips
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Dimensions



Side View Front View Rear View

Ordering Information

Model Name	Total Port	UTP Port M12	Redundant Power Supply	Certification				Shock Vibration	Operating Temperature
		10/100Base-TX	12/24/48VDC (8.4~60VDC)	EN50155 EN50121-4	EN45545-2	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-800A-E	8	8	V	V	V	V	V	V	-40~75°C

Optional Accessories

Optional Cable/Connector

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 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 Power

IVS-802GT-8PH24

8x FE RJ45 with 8x PoE + 2x GbE RJ45, 12/24/48VDC, E-Mark

- 24/48VDC redundant dual input power with built-in very high efficiency booster
- Regulate PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- E-Mark, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial grade E-Mark certified PoE switch IVS-802GT-8PH24, with 2 Gigabit UTP ports and 8 10/100 PoE ports, input power range 24/48VDC, suitable for vehicle battery power supply. E-Mark is a European conformity mark that certifies that a vehicle or vehicle part complies with EU regulations. Laws and directives to ensure adequate safety and meet all environmental requirements for vehicle installation.

Features

- Provides 8x IEEE 802.3at/af PoE+ output, 30W/per port
- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9K Bytes	
MAC Address Table	4K	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3at/af PoE+ 2 pairs PoE, PoE+ Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	8x 10/100Base-TX RJ45 and 2x 10/100/1000Base-T(X) RJ45, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100 meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	PoE:ON (Green)
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 24/48VDC (9.6~57VDC) input power (Removable Terminal Block)
	Built-in very high efficiency booster(94~97%) to rise up 53VDC for PoE output
	Regulated PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter

Power Consumption

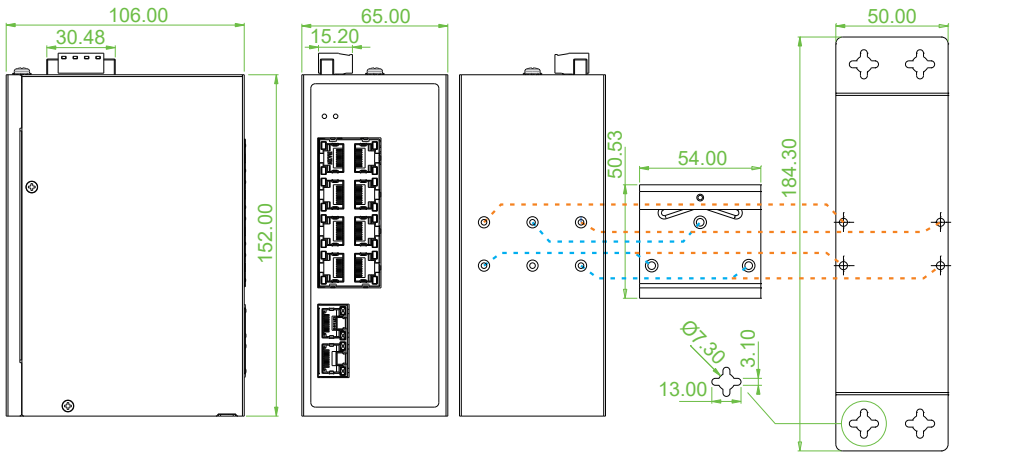
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Power Budget
24VDC	135.6W	11W	120W
48VDC	132.1W	9.8W	120W

PoE Power Budget	Total 120W, 30W/port
Removable Terminal Block	Provides 2 Redundant power, 4 pin
Operating Temperature	-10 ~ 60°C (IVS-802GT-8PH24)
	-40 ~ 75°C (IVS-802GT-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Dimensions	106 x 55.5 x 135mm (D x W x H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	795g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	490,144 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Vehicle	E13, E-Mark @24VDC
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port		PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T(X)	10/100 Base-TX	IEEE802.3af/at	Power Budget	Redundant	E Mark	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IVS-802GT-8PH24	10	2	8	8	120W	24/48VDC	V	V	V	V	-10~60°C
IVS-802GT-8PHE24	10	2	8	8	120W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C

NEW

IVS-G802T-8PH24

10x GbE RJ45 with 8x PoE ,12/24/48VDC, E-Mark

- 24/48VDC redundant dual input power with built-in very high efficiency booster
- Regulate PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- E-Mark, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial grade E-Mark certified PoE switch IVS-G802T-8PH24, with 2 Gigabit UTP ports and 8 Gigabit PoE ports, input power range 24/48VDC, suitable for vehicle battery power supply. E-Mark is a European conformity mark that certifies that a vehicle or vehicle part complies with EU regulations. Laws and directives to ensure adequate safety and meet all environmental requirements for vehicle installation.

Features

- Provides 8x IEEE 802.3at/af PoE+ output, 30W/per port
- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-plane (Switching Fabric): 20Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9K Bytes	
MAC Address Table	4K	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3at/af PoE+ 2 pairs PoE, PoE+ Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	10x RJ-45, 10/100/1000Base-T, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100 meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	PoE:ON (Green)
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~57VDC) input power (Removable Terminal Block)
	Built-in very high efficiency booster(94~97%) to rise up 53VDC for PoE output
	Regulated PoE output voltage (53VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter

Power Consumption

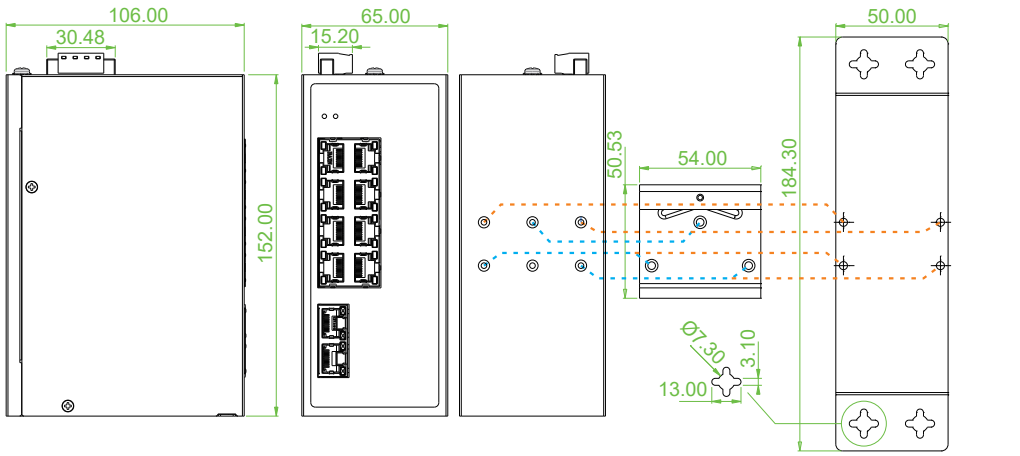
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Power Budget
24VDC	134.5W	9.9W	120W
48VDC	131W	8.7W	120W

PoE Power Budget	Total 120W, 30W/port
Removable Terminal Block	Provides 2 Redundant power, 4 pin
Operating Temperature	-10 ~ 60°C (IVS-G802T-8PH24)
	-40 ~ 75°C (IVS-G802T-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Dimensions	106 x 55.5 x 135mm (D x W x H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	795g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	490,144 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Vehicle	E13, E-Mark @24VDC
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T(X)	IEEE802.3af/at	Power Budget	Redundant	E Mark	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IVS-G802T-8PH24	10	2	8	120W	24/48VDC	V	V	V	V	-10~60°C
IVS-G802T-8PHE24	10	2	8	120W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C

IVS-802GT

8x FE RJ45 and 2x GbE RJ45, E-Mark

- 12/24/48VDC redundant dual input power
- E-Mark, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial grade E-Mark certified PoE switch IVS-802GT, with 2 Gigabit UTP ports and 8 10/100 UTP ports, input power range 12/24/48VDC, suitable for vehicle battery power supply. E-Mark is a European conformity mark that certifies that a vehicle or vehicle part complies with EU regulations. Laws and directives to ensure adequate safety and meet all environmental requirements for vehicle installation.

Features

- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9K Bytes	
MAC Address Table	4K	
Network Connector	8x 10/100Base-TX RJ4 and 2x 10/100/1000Base- T(X) RJ45, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100 meter)	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) input power (Removable Terminal Block)	
Power Consumption		

Input Voltage	Device Power Consumption
12VDC	10.1W
24VDC	9.9W
48VDC	8.7W

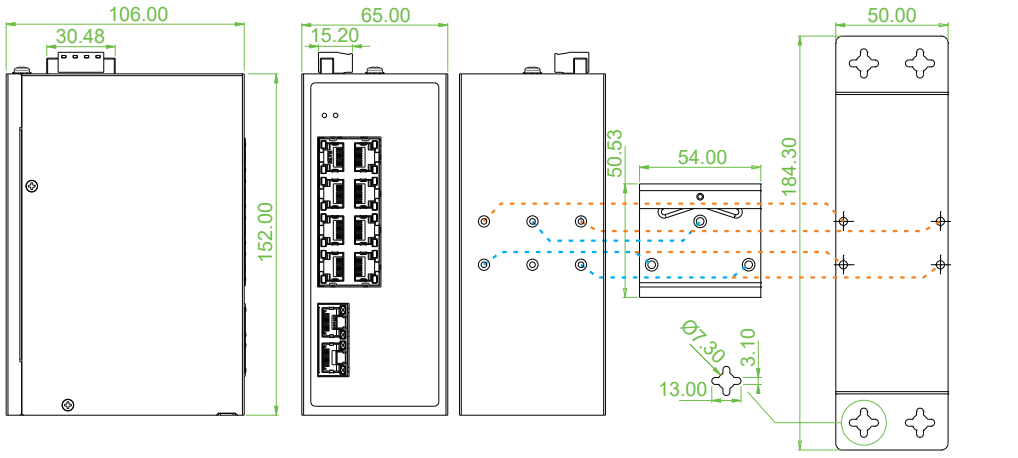
Removable Terminal Block	Provides 2 Redundant power, 4 pin
Operating Temperature	-10 ~ 60°C (IVS-802GT)
	-40 ~ 75°C (IVS-802GT-E)

Operating Humidity	5% to 95% (Non-condensing)
Dimensions	106 x 55.5 x 135mm (D x W x H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	600g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	658,027 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Vehicle	E13, E-Mark @24VDC
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port		Input Power	Certification				Operating Temperature
		10/100/1000Base-T(X)	10/100Base-TX	Redundant	E Mark	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IVS-802GT	10	2	8	12/24/48VDC	V	V	V	V	-10~60°C
IVS-802GT-E	10	2	8	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IVS-G802T

10x GbE RJ45, E-Mark

- 12/24/48VDC redundant dual input power
- E-Mark, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial grade E-Mark certified Ethernet switch IVS-G802T, with 2 Gigabit UTP ports and 8 Gigabit UTP ports, input power range 12/24/48VDC, suitable for vehicle battery power supply. E-Mark is a European conformity mark that certifies that a vehicle or vehicle part complies with EU regulations. Laws and directives to ensure adequate safety and meet all environmental requirements for vehicle installation.

Features

- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 20Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9K Bytes	
MAC Address Table	4K	
Network Connector	10x RJ-45 , 10/100/1000Base-, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100 meter)	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) input power (Removable Terminal Block)	
Power Consumption		

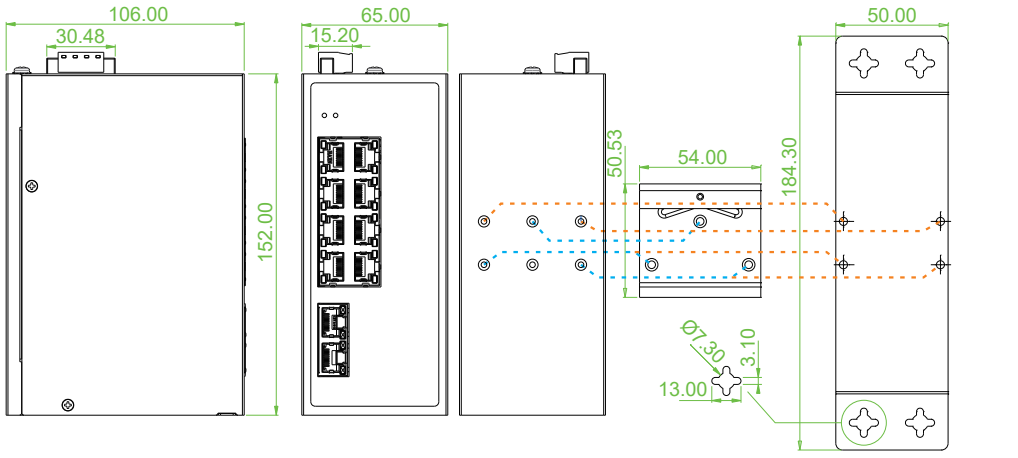
Input Voltage	Device Power Consumption
12VDC	11.2W
24VDC	11W
48VDC	9.8W

Removable Terminal Block	Provides 2 Redundant power, 4 pin
Operating Temperature	-10 ~ 60°C (IVS-G802T)
	-40 ~ 75°C (IVS-G802T-E)

Operating Humidity	5% to 95% (Non-condensing)
Dimensions	106 x 55.5 x 135mm (D x W x H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	600g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	658,027 Hours (MIL-HDBK-217)
Warranty	5 years

Certification	
EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Vehicle	E13, E-Mark @24VDC
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port	Input Power	Certification				Operating Temperature
		10/100/1000Base-T(X)	Redundant	E Mark	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IVS-G802T	10	2	12/24/48VDC	V	V	V	V	-10~60°C
IVS-G802T-E	10	2	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IPS-G2404SM-8C

24x GbE RJ45 with 8x Combo (RJ45/SFP) + 4x 100/1000Base-X SFP

- Supports, ERPS, MSTP, RSTP,STP for redundant cabling
- IEC61850-3, IEEE1613, EN62368-1, CE and FCC certified
- Wide Operating Temperature -40~85° C
- Supports IEEE1588 PtP v2

The Industrial-grade rack-mounted IEC61850 Gigabit Ethernet switch, IPS-G2404SM-8C with 4 independent 100/1000 SFP slots and 24 Gigabit UTP ports, 8 of which have both UTP and SFP slots, fully compliant with IEC 61850-3 and IEEE 1613 requirements, this standard specifies general requirements for the construction, design and environmental conditions of utility communications and smart electronics equipment in power plant and substation environments. IPS-G2404SM-8C is an ideal solution for Ethernet communication deployment in substations.

Features

- Redundant isolated High voltage 110/220VAC/DC (90~264VAC or 88~370/VDC) power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Supports EMS Management

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
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3X	Flow control for full duplex
	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)

VLAN ID	4094 IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 56Gbps (Full wire-speed)
Data Processing	Store and Forward
Network Connector	**SFP:** 12x 100/1000Base-X SFP socket. Supports DDMI **RJ45:** 24x 10/100/1000Base-T RJ-45 Supports Auto negotiation speed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)
USB	1x USB 2.0 For storage to update firmware, Configuration back, Configuration restore, boot up and syslog
Push button	For reset and multiple function
Network Cable	UTP/STP Cat.5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	For input power
Overload Current Protection	Supported
Power Supply	Redundant High voltage AC/DC : Isolated 110/220V AC/DC (90VAC~264VAC) or (88~370VDC)
Power Consumption	<50.6W @ 110/220V AC/DC
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Green/Amber), Ring Master (Green), Ring State (Green)
	P1~P28 Link/Active (Green)
	P1~P28 Speed:1000M (Amber), 10/100M (OFF)
Jumbo Frame	9K Byte
MAC Address Table	16K
Memory Buffer	1.5M Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, removable terminal block
Digital Input	1x isolated input : 13~30VDC for state 1, -30~ 3VDC for state 0
Operating Temperature	-40 ~ 85°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	331 x 440 x 44mm (D x W x H)
Weight	4.8 kg
Installation Mounting	19" rack mount
MTBF	70,621 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 4, Criteria B
	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (Burst) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
Power Substation	IEC 61850-3, IEEE 1613
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

Topology

VLAN	IEEE 802.1q VLAN,up to 4094 ID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
Link Aggregation (Port Trunk)	Supports IEEE802.1AB LLDP port trunking
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <20ms
	Single Ring, Sub-Ring, Multiple ring topology

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP DSCP based CoS
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile

Security Features

IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 512 entries
RADIUS	Authentication & Accounting
TACACS+	Authentication
SSL / SSH v2	Supported
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console

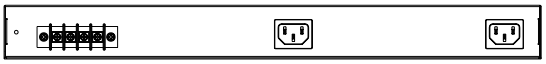
Management Features

CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, USB
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
DHCP	Server/Client/Relay/Relay option 82/Snooping
Warning Message	System syslog, e-mail, alarm relay
Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
IEEE 1588 PTP V2	Supports OC (Ordinary Clock)
NTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

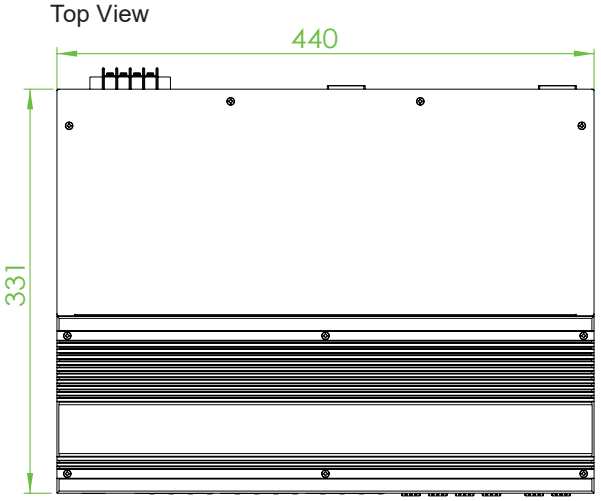
Dimensions

Front View

Rear View



Top View



Side View

Ordering Information

Model Name	Managed	Total Port	UTP	Combo UTP/SFP	Fiber	Input Power	Certification				Operating Temperature
			10/100/1000 Base-T		100/1000 Base-X	110/220V AC/DC	IEC61850-3	IEEE1613	CE, FCC	EN62368-1	
IPS-G2404SM-8C-HH	V	28	16	8 (RJ45/SFP)	4 SFP	2	V	V	V	V	-40 ~ 85°C

Optional Accessories

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

IPS-G803SM

8x GbE RJ45 + 3x 100/1000Base SFP, Managed Ethernet Switch

- IEC 61850-3, IEEE 1613 certified for power substation
- Supports IEEE 1588 PTP V2
- Supports GOOSE Message that complies with IEC61850 standard to achieve zero packet loss
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The managed industrial-grade IEC61850 Gigabit Ethernet switch with 8 Gigabit UTP ports and 3 100/1000 SFP slots, it is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provides a variety of redundant functions to increase the reliability of your communications system, including redundant and isolated power supplies of 24/48 VDC and 110/220V AC/DC and link redundancy functions of STP/RSTP/MSTP/ERPS and a proprietary ring protocol, features of IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring. Supports wide temperature operation of -40°C~85°C, fanless and rugged enclosure specifically designed for harsh substation network environments.

Features

- Redundant isolated low voltage 24/48VDC, or/and isolated High voltage AC/DC (110/220 VAC/VDC) power inputs
- Wide Operating Temperature -40~85° C
- DIN Rail mounting or wall mounting
- IP30 rugged metal housing, Fanless
- Cable diagnostic, Measuring cable normal or broken point distance
- 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 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units
- Supports EMS Management

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)
	IEEE 802.1Q	for VLAN Tagging
	IEEE 802.1X	Port based and MAC based Network mAccess Control, Authentication
	IEEE 802.3ac	Flow Control and Back Pressure
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow Control and Back Pressure
	ITU-T G.8032/ Y.1344	ERPS (Ethernet Ring Protection Switching)

Standard	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)
	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)
Switch Architecture	Back-plane (Switching Fabric): 22 Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control:	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9.6KB	
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Network Connector	8x 10/100/1000Base-T RJ-45, Auto negotiation speed	
	Auto MDI/MDI-X function, Full/Half duplex	
	3x 100/1000Base-X dual speed mode SFP slot, support DDMI	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber) (-LL Model)	
	System: Power 1 (Green), Power 2 (Green), Power 3 (Green), Fault (Amber) (-HL Model)	
	UTP:10/100 Link/Active: (Green), 1000Link/Active: (Amber)	
	SFP Slot: Link/Active (Green)	
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Input	Redundant 2x Isolated Low Voltage DC Input power (-LL model)	
	Redundant 2x isolated Low Voltage DC and 1 High Voltage AC/DC input power (-HL model)	
	Isolated Low Voltage DC : Isolated 24/48V (18~72VDC), Removable Terminal Block	
	High voltage AC/DC : Isolated 110/220VAC (85VAC~264VAC) or 110/220VDC (88~300VDC), Removable Terminal Block	
Power consumption		

Input Voltage	IPS-G803SM
110VAC	9.3 W
220VAC	9.2 W
24VDC	9.6 W
48VDC	11.1 W

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant low volt power, alarm relay contact (6 Pin) (-LL Model)
	Provide 2 redundant low volt power, alarm relay contact (6 Pin) , and High volt Power (2 Pin) (-HL Model)
Operating Temperature	-40°C ~ 85°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimension	106 x 82 x 152mm (D x W x H)
Weight	0.885kg (IPS-G803SM-LL) 1.085kg (IPS-G803SM-HL)
Installation mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	535,335 Hours (IPS-G803SM-LL) 143,943 Hours (IPS-G803SM-HL) (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A, EN55032 Class A

Railway Traffic	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 4, Criteria B
	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
Safety	UL60950-1, EN60950-1
Power Substation	IEC 61850-3, IEEE 1613
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
Shock	IEC-60068-2-27

Software Specifications

Topology

Static Route	IPV4/ IPV6, 32 entries
VLAN	IEEE 802.1q VLAN,up to 4094 ID
	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
	MVR (Multiple VLAN Registration)
	GVRP (GARP VLAN Registration Protocol)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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, Maximum 250 devices in a Ring
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Convergence time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE 802.1p 8 active priorities queues for per port
GOOSE Message	Complies with IEC61850 standard to achieve zero packet loss
Traffic Classification QoS	IEEE 802.1p 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
	Supports 1022 IGMP groups, Port Filtering Profile
IGMP / MLD Snooping	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	MIB II RFC1213, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP / SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

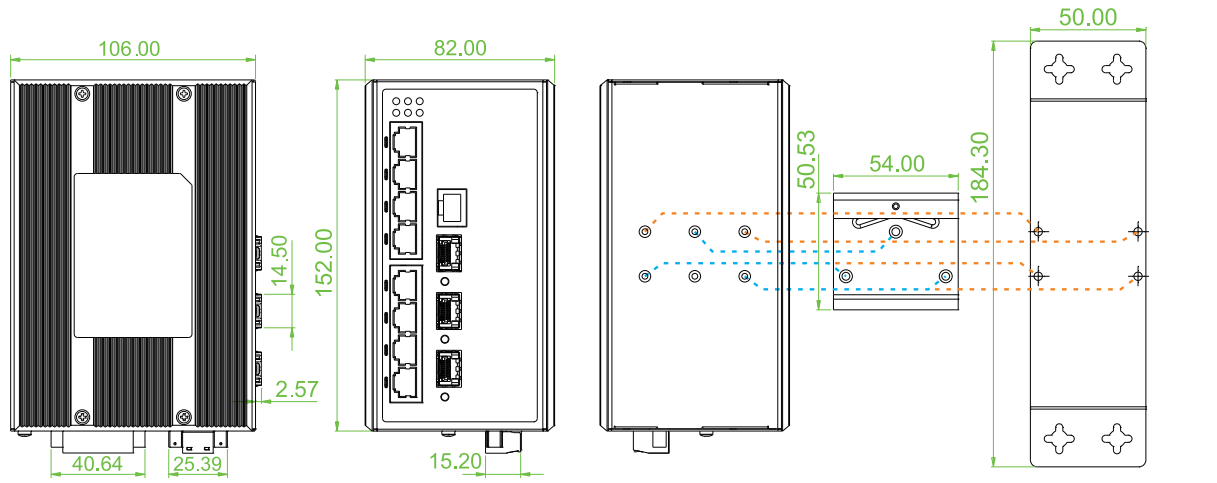
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported

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 IEEE 802.3az 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 is normal or broken point distance

Dimensions



Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber	Redundant Input Power		Certification				
			10/100/1000 Base-T	100/1000 Base-X	Low Voltage 24/48VDC	High Voltage 110/220V DC/AC	IEC61850-3 IEEE 1613	UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IPS-G803SM-LL	V	11	8	3 SFP	2		V	V	V	V	V
IPS-G803SM-HL	V	11	8	3 SFP	2	1	V	V	V	V	V

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

IPS-803GSM

8x 10/100Base RJ45 + 3x 100/1000Base SFP, Managed Ethernet Switch

- IEC 61850-3, IEEE 1613 certified for power substation
- Supports IEEE 1588 PTP V2
- Supports GOOSE Message that complies with IEC61850 standard to achieve zero packet loss
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The managed industrial-grade IEC61850 Gigabit Ethernet switch with 8 10/100 UTP ports and 3 100/1000 SFP slots,it is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provides a variety of redundant functions to increase the reliability of your communications system, including redundant and isolated power supplies of 24/48 VDC and 110/220V AC/DC and link redundancy functions of STP/RSTP/MSTP/ERPS and a proprietary ring protocol, features of IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring. Supports wide temperature operation of -40°C~85°C, fanless and rugged enclosure specifically designed for harsh substation network environments.

Features

- Redundant isolated low voltage 24/48VDC, or/and isolated High voltage AC/DC (110/220 VAC/VDC) power inputs
- Wide Operating Temperature -40~85° C
- DIN Rail mounting or wall mounting
- IP30 rugged metal housing, Fanless
- Cable diagnostic, measuring cable normal or broken point distance
- 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 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	IEEE 802.1Q	for VLAN Tagging
	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 and Back Pressure
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)

Standard	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)
Switch Architecture	Back-plane (Switching Fabric): 7.6 Gbps (Full wire-speed)	
Data Processing	Store and Forward	
Flow Control:	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9.6KB	
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)	
MAC Address Table	8K	
Memory Buffer	512K Bytes for packet buffer	
Network Connector	8x 10/100Base-TX RJ-45, Auto negotiation speed	
	Auto MDI/MDI-X function, Full/Half duplex	
	3x 100/1000Base-X dual speed mode SFP slot, support DDMI	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber) (-LL Model)	
	System: Power 1 (Green), Power 2 (Green), Power 3 (Green), Fault (Amber) (-HL Model)	
	UTP: 10/100 Link/Active: (Green)	
	SFP Slot: Link/Active (Green)	
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Input	Redundant 2x Isolated Low Voltage DC Input power (-LL Model)	
	Redundant 2x isolated Low Voltage DC and 1 High Voltage AC/DC input power (-HL Model)	
	Isolated Low Voltage DC : Isolated 24/48V (18~72VDC), Removable Terminal Block	
	High voltage AC/DC : Isolated 110/220VAC (85VAC~264VAC) or 110/220VDC (88~300VDC), Removable Terminal Block	
Power consumption		
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC	
Removable Terminal Block	Provide 2 redundant low volt power, alarm relay contact (6 Pin) (-LL Model)	
	Provide 2 redundant low volt power, alarm relay contact (6 Pin) , and High volt Power (2 Pin) (-HL Model)	
Operating Temperature	-40°C ~ 85°C	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40°C ~ 85°C	
Housing	Rugged Metal, IP30 Protection, Fanless	
Dimension	106 x 82 x 152mm (D x W x H)	
Weight	0.885kg (IPS-803GSM-LL) 1.085kg (IPS-803GSM-HL)	
Installation mounting	DIN Rail mounting, or wall mounting (Optional)	
MTBF	535,335 Hours (IPS-803GSM-LL) 143,943 Hours (IPS-803GSM-HL) (MIL-HDBK-217)	
Warranty	5 years	

Input Voltage	IPS-803GSM
110VAC	7.3 W
220VAC	7 W
24VDC	8W
48VDC	9.2 W

Certification

EMC/EMS	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A
	EN55032 Class A

Railway Traffic	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 4, Criteria B
	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
Safety	UL60950-1, EN60950-1
Power Substation	IEC 61850-3, IEEE 1613
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27

Software Specifications

Topology

VLAN	IEEE 802.1q VLAN,up to 4094 ID
	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
	MVR (Multiple VLAN Registration)
	GVRP (GARP VLAN Registration Protocol)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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
	Maximum 250 devices in a Ring
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Convergence time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Feature

Class of Service	IEEE 802.1p 8 active priorities queues for per port
GOOSE Message	Complies with IEC61850 standard to achieve zero packet loss
Traffic Classification QoS	IEEE 802.1p 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 Supports 1022 IGMP groups, Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	MIB II RFC1213, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP / SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

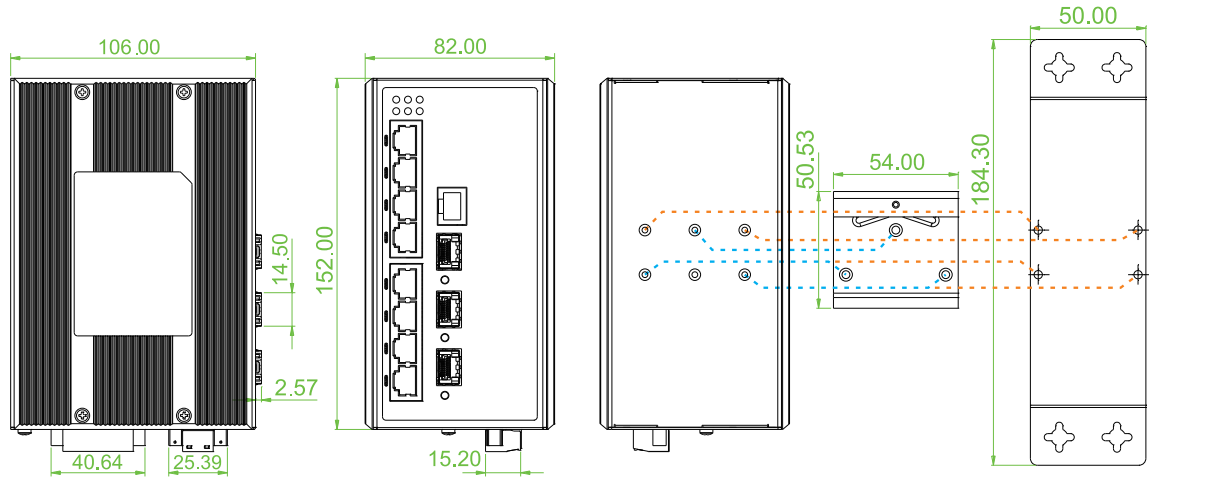
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported

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 IEEE 802.3az 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 is normal or broken point distance

Dimensions



Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber	Redundant Input Power		Certification				
			10/100Base-TX	100/1000 Base-X	Low Voltage 24/48VDC	High Voltage 110/220V DC/AC	IEC61850-3 IEEE 1613	UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IPS-803GSM-LL	V	11	8	3 SFP	2		V	V	V	V	V
IPS-803GSM-HL	V	11	8	3 SFP	2	1	V	V	V	V	V

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

IGS-804SM-SE

8x GbE RJ45 + 4x 100/1000Base SFP with SyncE

- Supports Sync Ethernet & IEEE1588 PTP v2
- Utilizes a DPLL & TCXO for accurate clock recovery.
- Timing accuracy of <20ns for SyncE & IEEE1588 v2
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial grade of synchronization Ethernet switch IGS-804SM-SE with 8 Gigabit UTP ports and 4 100/1000 SFP slots, supports timing synchronization features of SyncE and IEEE1588 PTP that allow operators to deliver services with optimal stability and continuity in end to end connectivity. it provides a variety functions of power input redundancy, link redundancy of STP/RSTP/MSTP/ERPS and a proprietary ring protocol, it features of IGMP, VLAN QoS, ACL bandwidth control and port mirroring. fanless and rugged enclosure specifically designed for harsh network environments.

Features

- Cable diagnostic, measuring cable normal or broken point distance
- u-Ring, STP, RSTP, MSTP, EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses.
  (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports Sync Ethernet allow operators to deliver service with optimal stability and continuity in end-to-end connectivity
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1ad	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): 24Gbps (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	8x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports dual speed with DDMI	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Consumption		

Input Voltage	IGS-804SM-SE
12 VDC	11W
24 VDC	12.4W
48 VDC	12.9W

Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power
	Removable Terminal Block for input power connector
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-804SM-SE) -40 ~ 75°C (IGS-804SM-SE-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (Dx Wx H)
Weight	0.74kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	593,726 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber ports
Safety	EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Aggregation Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 6group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 6group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus TCP	Supported
SW & Configuration Upgrade	TFTP, HTTP, FTP client
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BootP	Bootstrap Protocol Supported
RARP	Reverse Address Resolution Protocol Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
SyncE	ITU-T G.8262 Sync Ethernet
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

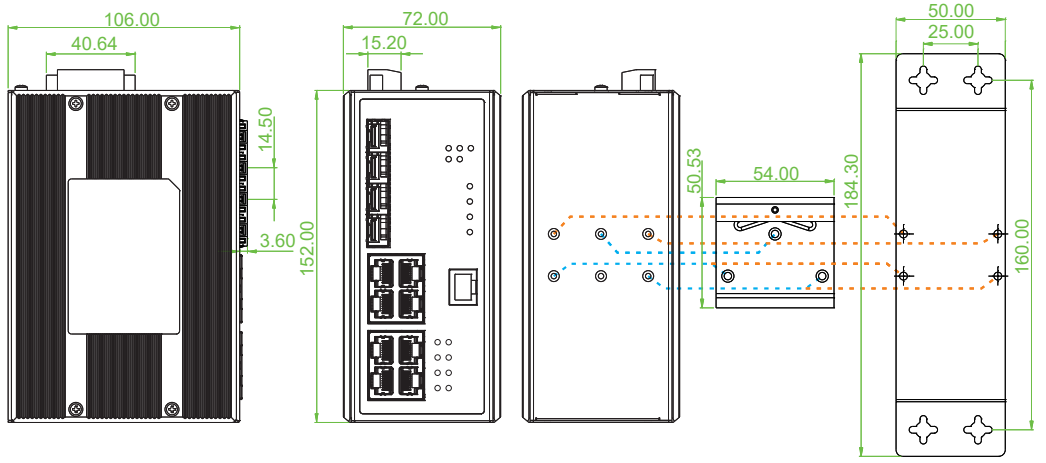
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Ordering Information

Model Name	Managed	Total Port	UTP Port	Fiber Port	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-804SM-SE	V	12	8	4 SFP	V	V	V	V	-10~60°C
IGS-804SM-SE-E	V	12	8	4 SFP	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-1608SM-SE

16x GbE RJ45 + 8x 100/1000Base SFP with SyncE

- Supports Sync Ethernet & IEEE1588 PTP v2
- Utilizes a DPLL & TCXO for accurate clock recovery.
- Timing accuracy of <20ns for SyncE & IEEE1588 v2
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial grade of synchronization Ethernet switch IGS-1608SM-SE with 16 Gigabit UTP ports and 8 100/1000 SFP slots, supports timing synchronization features of SyncE and IEEE1588 PTP that allow operators to deliver services with optimal stability and continuity in end to end connectivity. it provides a variety functions of power input redundancy, link redundancy of STP/RSTP/MSTP/ERPS and a proprietary ring protocol, it features of IGMP, VLAN QoS, ACL bandwidth control and port mirroring. fanless and rugged enclosure specifically designed for harsh network environments.

Features

- Cable diagnostic, measuring cable normal or broken point distance
- u-Ring, STP, RSTP, MSTP, EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports Sync Ethernet allow operators to deliver service with optimal stability and continuity in end-to-end connectivity
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1ad	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): 48Gbps (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	16x 10/100/1000Base-T RJ-45+ 8x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports dual speed with DDMI	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Consumption		

Input Voltage	IGS-1608SM-SE
12 VDC	17W
24 VDC	17.8W
48 VDC	20.2W

Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power
	Removable Terminal Block for input power connector
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-1608SM-SE) -40 ~ 75°C (IGS-1608SM-SE-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	116 x 92 x 160 mm (Dx Wx H)
Weight	1.35kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	431,610 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber ports
Safety	UL60950-1, EN60950-1, EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Aggregation Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 12group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 12group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper

DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus TCP	Supported
SW & Configuration Upgrade	TFTP, HTTP, FTP client
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BootP	Bootstrap Protocol Supported
RARP	Reverse Address Resolution Protocol Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
SyncE	ITU-T G.8262 Sync Ethernet
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

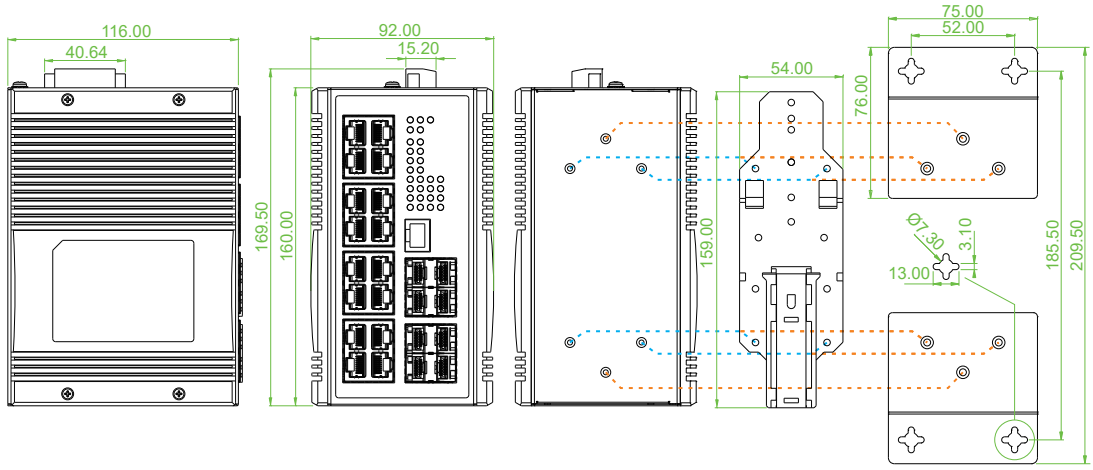
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View　Front View　Rear View　DIN-Rail Kit View　Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP Port	Fiber Port	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	UL60950-1, EN60950-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-1608SM-SE	V	24	16	8 SFP	V	V	V	V	-10~60°C
IGS-1608SM-SE-E	V	24	16	8 SFP	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (2 pcs in 1 set, 76mm x 75mm x 2pcs)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IQS-402XSM-4PH

4x 2.5G RJ45 + 2x 1G/2.5G/10G SFP+ with 4x PoE 120W, Compact Size

- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset when PD fail, PoE port on/off weekly scheduling
- Redundant 48VDC power input
- Supports µ-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial 2.5G PoE Ethernet switch IQS-402XSM-4PH features 4 2.5G UTP ports, each supporting 30W PoE+. Equipped with 2 10G SFP+ slots to meet high-bandwidth transmission requirements, fanless design, high MTBF, supports wide operating temperature, and redundant 48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 4x 10/100/1G/2.5G Base-T RJ-45+ 2x 1G/2.5G/10G Base-X SFP+ with 4x PoE, total 120W power budget
- Provides 3 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses.
- Supports up to 3 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- 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
- Flexibility 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 upgrade failure
- 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

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 802.3bz	2.5GBase-T
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3ae	10G bit/s Ethernet over Fiber
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	IEEE 802.1Q	Virtual LANs (VLAN)

Standard ;	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
	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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Enhance Power over Ethernet)
Switch Architecture	Back-Plane (Switching Fabric): 60Gbps (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	4x 10M/100M/1G/2.5GBase-T RJ-45 + 2x 1G/2.5G/10GBase-X SFP	
	RJ-45 UTP port supports Auto negotiation	
	Auto MDI/MDI-X function	
	SFP port supports 1G/2.5G/10G speed with DDMI	
PoE standard & RJ-45 pin assignment	4x IEEE 802.3af/at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant dual power input 48VDC (44~57VDC) (Removable terminal block)	
	(50~57VDC input is recommended for IEEE 802.3at PoE+ in 30W applications)	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	139.4W	14W	120W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 120W
LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1G/2.5G Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6K Byte
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides redundant power PWR1, PWR2 and Alarm Relay, 6 pin
Operating Temperature	-10 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	127.6x 48.6x 160mm (Dx W x H)
Weight	1,535g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	531,055 Hours (MIL-HDBK-217)
Warranty	5 Years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 in the ring supports 250 nodes.
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported
Loop Protection	Supported

QoS Features

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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"

Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

Management Features

CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Supports 4 servers)
Warning Message	System syslog, SMTP/e-mail event message, alarm relay
DNS	Client, Proxy
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

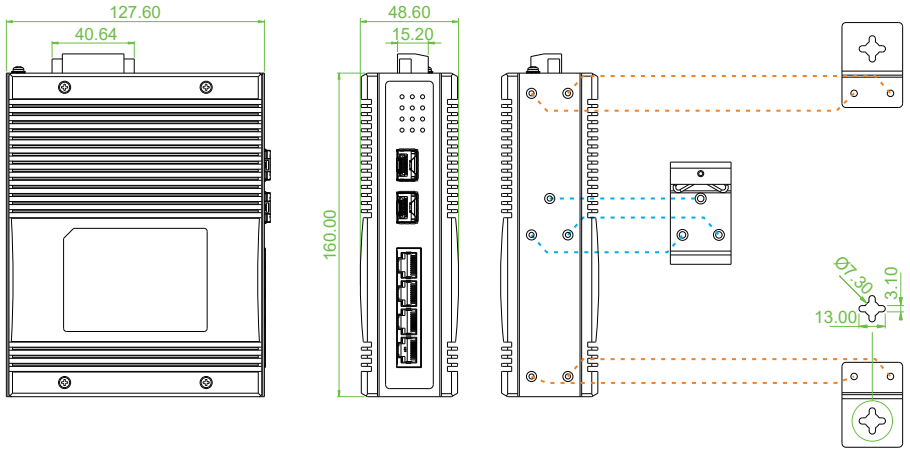
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported

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 SIP, Subnet (32bit) L4 : TCP/UDP

Advanced PoE

Advanced PoE Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Total PoE power budget limitation: maximum 120W Power feeding priority

Dimensions



Side View Front View Rear View DIN-Rail Kit View Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Ports	UTP (RJ45)	Fiber	PoE Port		Redundant Power Input	Certification		
		10/100/1G/2.5G Base-T	1G/2.5G/10G	IEEE802.3af/at	Power Budget		EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IQS-402XSM-4PH	6	4	2 SFP	4	120W	48VDC	V	V	V

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (IQS-402XSM-4PH)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IGS-402SM-4PH24

4x GbE RJ45 + 1x 100/1000 SFP + 1x 100M/1G/2.5G SFP with 4x PoE 120W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial PoE Ethernet switch IGS-402SM-4PH24 has 4 Gigabit UTP ports and each port supports 30W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides 4-port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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 802.3cb	2.5GBase-X
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1ad	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)
Switch Architecture	Back-Plane (Switching Fabric): 15Gbps (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	4x 10/100/1000Base-T RJ-45 + 1x FE/GbE SFP + 1x FE/GbE/2.5G SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP ports supports 100/1000 or 2.5G with DDMI	
PoE standard & RJ-45 pin assignment	4x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	
	Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output	
	Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	135.2W	7.5W	120W	94.0%
48VDC	132.5W	9W	120W	97.2%

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 120W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-402SM-4PH24) -40 ~ 75°C (IGS-402SM-4PHE244)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.715kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	674,963 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
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
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Supports for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported

Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Server/Client
LLDP (IEEE802.1ab)	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 SIP, Subnet (32bit) L4: TCP/UDP

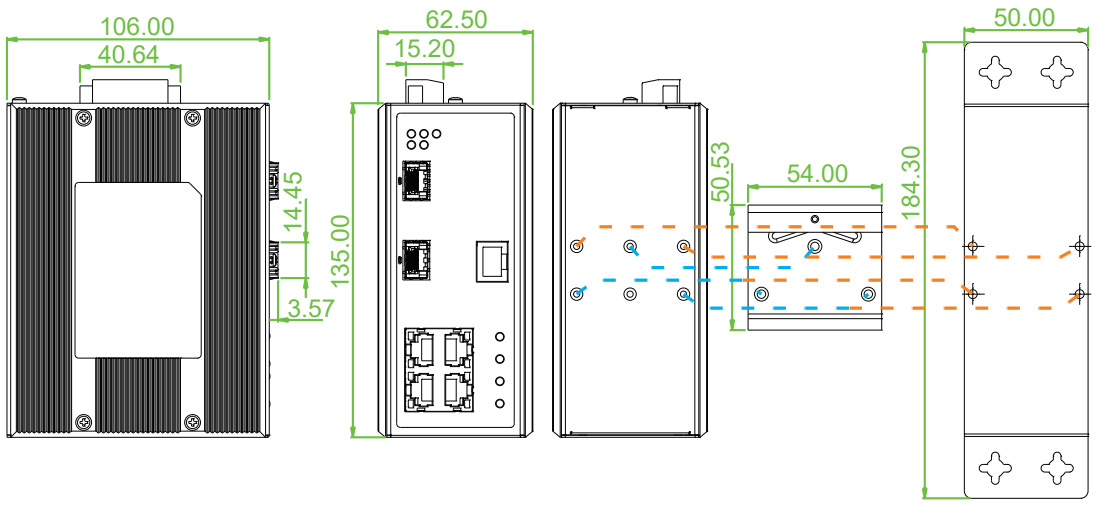
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 120W

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber		PoE		Input Power	Certification					Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	100/1000/ 2.5G Base-X	IEEE802.3 at/af	Power Budget	Redundant	UL60950-1	EN50121-4	NEMA-TS2	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402SM-4PH24	6	4	1 SFP	1 SFP	4	120W	24/48VDC	V	V	V	V	V	-10~60°C
IGS-402SM-4PHE24	6	4	1 SFP	1 SFP	4	120W	24/48VDC	V	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C

IGS-402SW-4PB

NEW

4x GbE RJ45 + 2x 100/1000 SFP with 4x IEEE802.3bt PoE++ 240W, 48VDC

- Supports MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- 4KV surge protection for PoE, RJ45 and SFP ports
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial 90W PoE Ethernet switch IGS-402SW-4PB, Layer 2 managed, has 4 Gigabit UTP ports, each port complies with the IEEE802.3bt 90W PoE++ standard. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, and supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (44~57VDC) redundant dual input power
- Provides 4-port IEEE802.3bt PoE++ output (90W per port, total 240W)
- Cable diagnostics, identifies opens/shorts distance
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE802.3bt	PoE++
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (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	4x 10/100/1000Base-T RJ-45 + 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000 dual speed with DDMI
Console	USB Type C
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3af/at/bt PoE++ 4 pairs PoE, 90W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) Below recommended is for different PoE application 54~57VDC VDC for 90W (4 Pairs) PoE application 52~57VDC for 60W (4 Pairs) PoE application 52~57VDC for 30W (2 Pairs) PoE application 44~57VDC for 15.4W (2 Pairs) PoE application
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
57VDC	254	9	240

PoE Power Budget	Maximum PoE Output power budget 90W / Per Port Total 240W
LED	System: Power 1 (Green), Power 2 (Green),
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	220K Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provide 2 redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IGS-402SW-4PB) -40 ~ 75°C (IGS-402SW-4PBE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 38.6 x 152mm (D x W x H)
Weight	635g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	772,953 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Surge Protection	4KV for PoE, UTP and Fiber ports
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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, Console

Management Features

CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
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 SIP, Subnet (32bit) L4: TCP/UDP

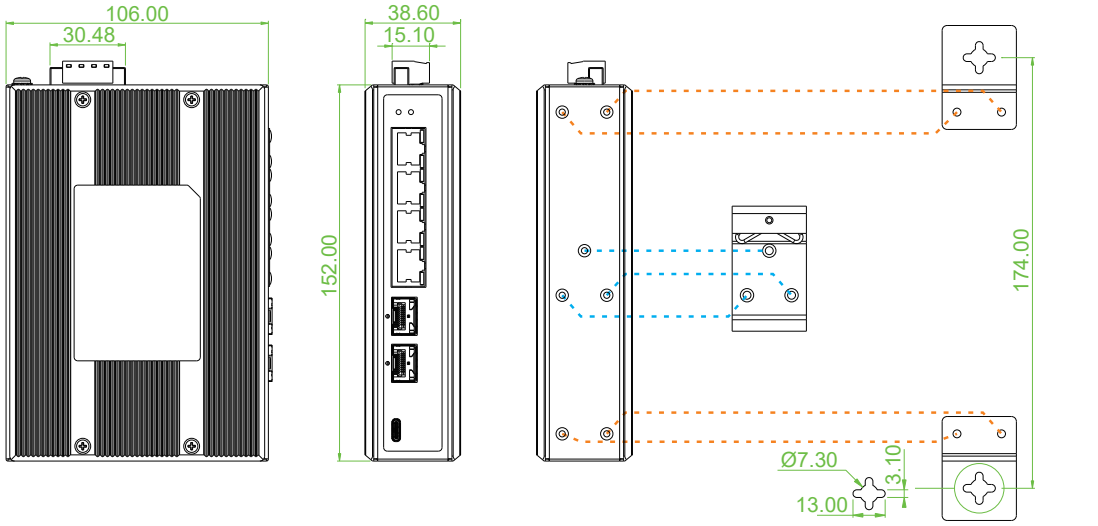
Others Features

Green Ethernet	Supports IEEE 802.3az 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

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3 af/at/bt 90W	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402SW-4PB	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-10~60°C
IGS-402SW-4PBE	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK05	Wall Mount kit for Industrial product (2pcs in 1 set, 42 x 30mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For more ref.)

IGS-402SM-4PU

4x GbE RJ45 + 2x 100/1000 SFP with 4x 60W PoE 240W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, EN60950-1, EN62368-1, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial PoE Ethernet switch IGS-402SM-4PU has 4 Gigabit UTP ports and each port supports up to 60W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (44~57VDC) redundant dual input power
- Provides 4-port IEEE 802.3af / 802.3at PoE+ output (60W per port, total 240W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Provides SmartConfig for quick and easy mass Configuration*
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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
	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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (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	4x 10/100/1000Base-T RJ-45 + 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3at/ 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE802.3at PoE+ in 30W/ 60W applications)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	249.6W	9.6W	240W

PoE Power Budget	Maximum PoE Output power budget 60W / Per Port Total 240W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-402SM-4PU) -40 ~ 75°C (IGS-402SM-4PUE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.7kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	589,078 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1, EN62368-1
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
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 Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
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 and 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 SIP, Subnet (32bit) L4: TCP/UDP

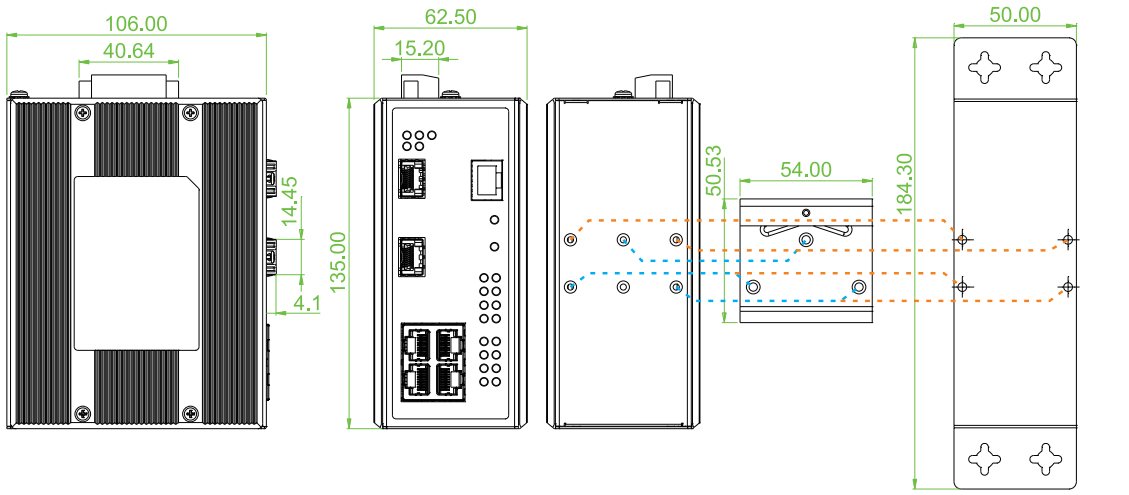
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3at 4 pairs PoE/60W	Power Budget	Redundant	UL60950-1 EN60950-1	EN50121-4	EN62368-1	CE, FCC EN61000-6-2 EN61000-6-4	
IGS-402SM-4PU	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-10~60°C
IGS-402SM-4PUE	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK05	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For IGS-402SM-4PU)
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For more ref.)

IGS-402CSW-4PH

4x GbE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, Compact size

- 4KV surge protection for PoE, UTP and SFP ports
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- Compact size for easy installation
- Auto checking and auto reset when PoE PD fail

These Gigabit Ethernet switch models are managed industrial grade L2 switches with 4 10/100/1000Base-T ports and 2 GbE/100M SFP ports which also supports PoE+/PSE and provide stable and reliable transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking. They are an ideal solution for Smart City, surveillance, Intelligent traffic control systems, production automation applications and support up to 4 PoE/PoE+ (IEEE 802.3af/IEEE 802.3at) ports which can provide 15.4/30watts power output per port for connecting with heavy-duty industrial PoE devices, such as PTZ IP surveillance cameras, high-performance wireless access points, digital signage and IP phones. Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- Redundant power input
- Provides 4 port IEEE 802.3af / 802.3at PoE output
- Cable diagnostics
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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
	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)

Switch Architecture	Back-plane (Switching Fabric): 12Gbps (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	4x 10/100/1000Base-T RJ-45 + 2x FE/GbE SFP slot
	RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports FE/GbE with DDMI
PoE standard & RJ-45 pin assignment	4x IEEE 802.3af / IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC48V (44~57VDC) Input power (Removable Terminal Block) (50~57V input is recommended for IEEE 802.3at PoE+ application)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	130W	8.2W	120W

PoE Power Budget	Maximum PoE Output power budget 120W, (30W/per port)
LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)
	PoE: ON (Green)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	1.75M bits for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provide 2 redundant power 4 Pin
Operating Temperature	-10 ~ 60°C (IGS-402CSW-4PH) -40 ~ 75°C (IGS-402CSW-4PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106x 38.6x 142mm (Dx Wx H)
Weight	820g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	820,215Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Loop Protection	Supported
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Supports for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
NTP	Client
LLDP (IEEE802.1ab)	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	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 SIP, Subnet (32bit) L4: TCP/UDP

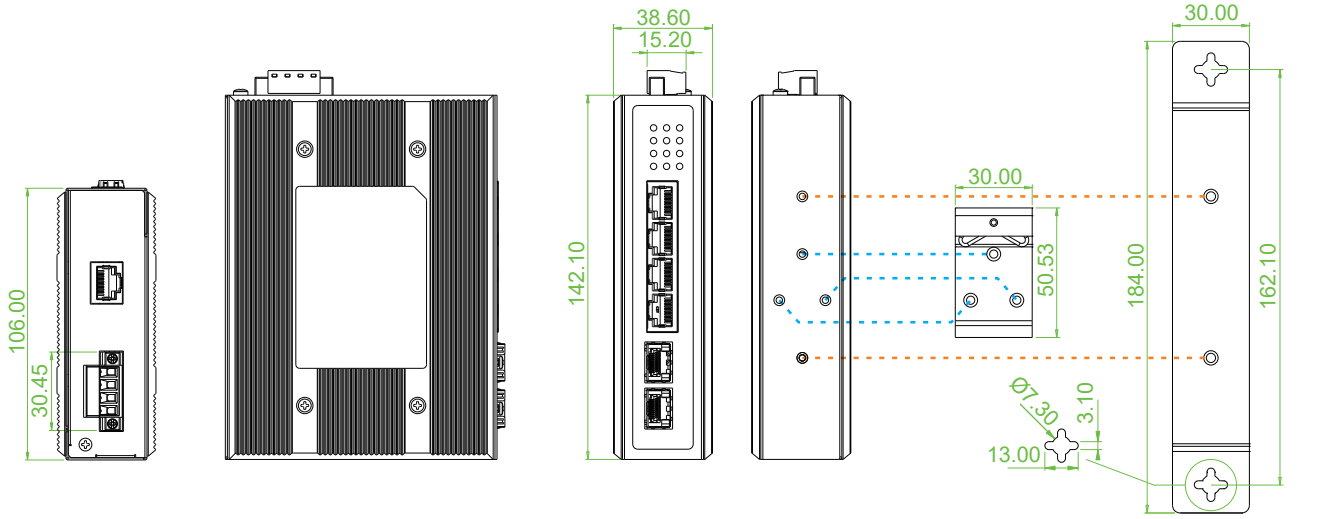
Others Features

Green Ethernet	Supports IEEE 802.3az 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
Cable Diagnostic	Measuring UTP cable normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 120W

Dimensions



Top View | Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45	Fiber	PoE Port		Input Power	Certification			Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IGS-402CSW-4PH	6	4	2 SFP	4	120W	48VDC	V	V	V	-10~60°C
IGS-402CSW-4PHE	6	4	2 SFP	4	120W	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For IGS-402CSW-4PH)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IGS+803SM-8PH & IGS+803SM-8PH24

- 8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE 240W, 48VDC
- 8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE 180W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial PoE Ethernet switches IGS+803SM-8PH and IGS+803SM-8PH24 has 8 Gigabit UTP ports and each port complies with the IEEE802.3af/at up to 30W PoE+ standard. Equipped with 3 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant power input, 48VDC IGS+803SM-8PH, and 24/48VDC IGS+803SM-8PH24, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (46~57VDC) redundant dual input power (IGS+803SM-8PH)
- 24/48VDC (20~57VDC) redundant dual input power (IGS+803SM-8PH24)
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 240W) (IGS+803SM-8PH)
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 180W) (IGS+803SM-8PH24)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication

Standard	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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 22Gbps (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	8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports 100/1000 dual speed with DDMI	
Console	RS-232 (RJ-45)	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af /IEEE 802.3a 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	**IGS+803SM-8PH** Redundant Dual input power (Removable terminal block) 48VDC (44~57VDC) (50~57V input is recommended for IEEE802.3at PoE+ applications)	
	IGS+803SM-8PH24 Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

IGS+803SM-8PH

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	255.5W	15.5W	240W

IGS+803SM-8PH24

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	194.2W	10.8W	180W	97%
48VDC	196W	11.5W	180W	97%

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 240W (IGS+803SM-8PH)
	Maximum PoE Output power budget 30W / Per Port, Total 180W (IGS+803SM-8PH24)
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 1 terminal block for Alarm relay, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IGS+803SM-8PH, IGS+803SM-8PH24)
	-40 ~ 75°C (IGS+803SM-8PHE, IGS+803SM-8PHE24)

Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.85kg (IGS+803SM-8PH)
	0.86kg (IGS+803SM-8PH24)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF (MIL-HDBK-217)	487,189 Hours (IGS+803SM-8PH)
	528,753 Hours (IGS+803SM-8PH24)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
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
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1, EN62368-1
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported

ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB

UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
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 and 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 SIP, Subnet (32bit) L4: TCP/UDP

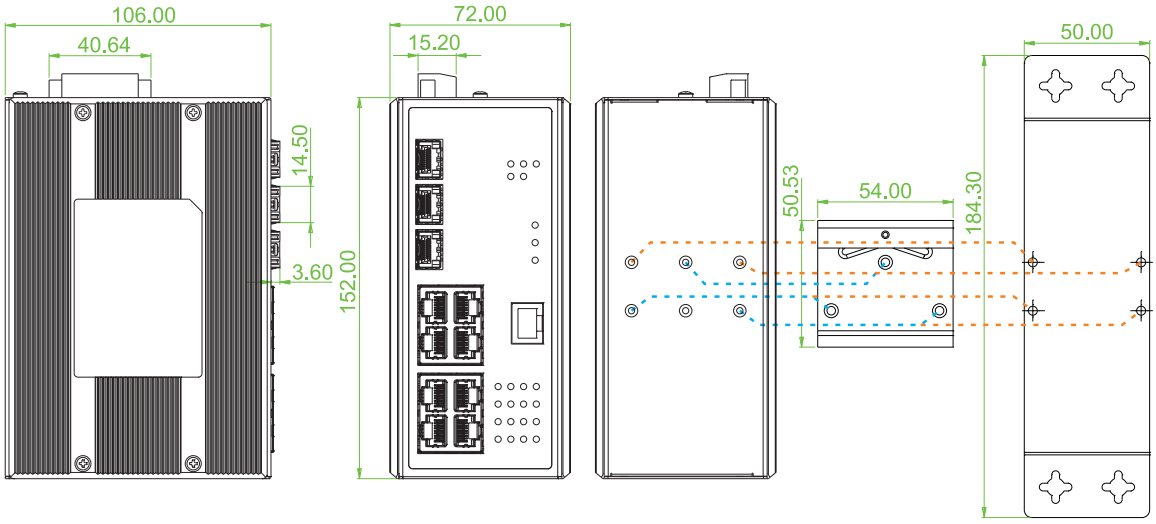
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W (IGS+803SM-8PH) Total PoE power budget limitation: maximum 180W (IGS+803SM-8PH24)

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification					Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	NEMA TS2	UL60950-1 EN60950-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	
IGS+803SM-8PH	11	8	3 SFP	8	240W	48VDC	V	V	V	V	V	-10~60°C
IGS+803SM-8PHE	11	8	3 SFP	8	240W	48VDC	V	V	V	V	V	-40~75°C
IGS+803SM-8PH24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-10~60°C
IGS+803SM-8PHE24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C

IGS-803SM-8PH24

8x GbE RJ45 + 1x 100/1000 SFP + 2x 100M/1G/2.5G SFP with 8x PoE 180W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial PoE Ethernet switch, Layer 2 managed, IGS-803SM-8PH24 has 8 Gigabit UTP ports, each port complies with IEEE802.3af/at up to 30W PoE+ standard. Equipped with 3 SFP slots, 2 of which can reach 2.5G bandwidth, for fiber optic connections to meet the requirements for extended transmission distance and high-speed transmission, fanless design, high MTBF, supports wide operating temperature, 24/48VDC redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides 8-port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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 802.3cb	2.5GBase-X
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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)

Standard	IEEE 802.3x	Flow control for Full Duplex
	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)
Switch Architecture	Back-Plane (Switching Fabric): 28Gbps (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	8x 10/100/1000Base-T RJ-45 + 1x FE/GbE SFP + 2x FE/GbE/2.5G SFP	
	RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports 100/1000 or 2.5G with DDMI	
PoE standard & RJ-45 pin assignment	8x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	
	Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output	
	Regulated PoE output voltage (52VDC) to stabilize, PoE device, and guarantee delivery PoE power distance to 100meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	200.2W	9.2W	180W	94%
48VDC	195.1W	9.8W	180W	97%

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 180W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-803SM-8PH24) -40 ~ 75°C (IGS-803SM-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.96kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	466,542 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
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 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Supports for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay

DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Server/Client
LLDP (IEEE802.1ab)	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 SIP, Subnet (32bit) L4: TCP/UDP

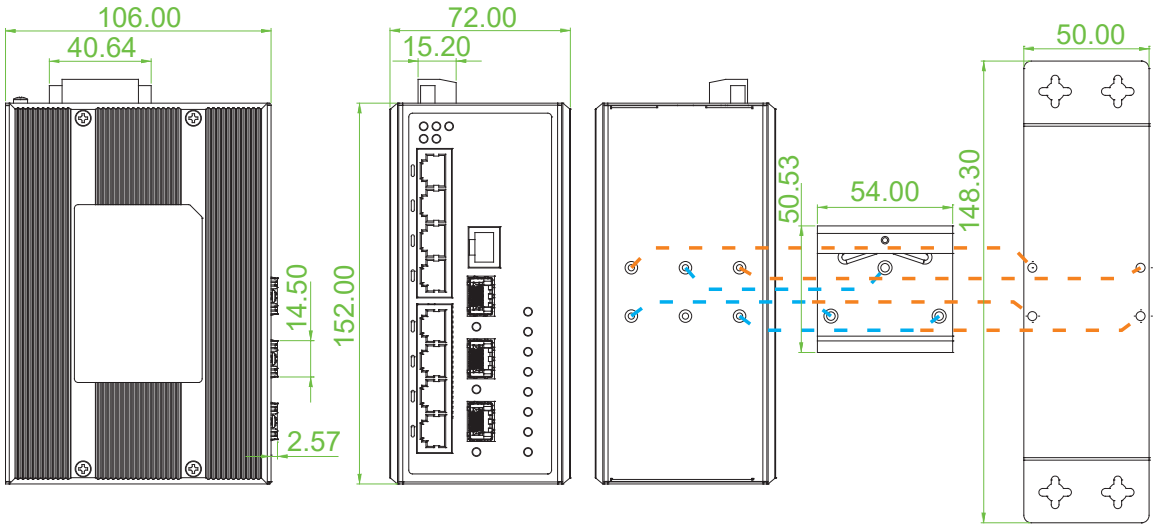
Others Features

Green Ethernet	Supports IEEE 802.3az 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	Measuri ng UTP cable normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 180W

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber		PoE Port		Input Power	Certification			Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	100/1000/ 2.5G Base-X	IEEE802.3 at/af	Power Budget	Redundant	NEMA TS2	UL60950-1 EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IGS-803SM-8PH24	11	8	1 SFP	2 SFP	8	180W	24/48VDC	V	V	V	-10~60°C
IGS-803SM-8PHE24	11	8	1 SFP	2 SFP	8	180W	24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C

IGS-804SM-8PH

NEW

8x GbE RJ45 + 4x 100/1000Base-X SFP with 8x PoE

- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- EN60950-1,EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial grade managed Gigabit PoE switch with 8 Gigabit UTP ports, each port complies with IEEE802.3af/at PoE standard, the total PoE power budget is 240 watts, 4 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance. Fanless design, high MTBF, supports wide operating temperature, and has redundant 48VDC power input, providing stable and reliable transmission, suitable for heavy-duty applications in harsh environments, such as industrial factory automation and data centers, intelligent transportation systems, and environmental conditions exceeding commercial product specifications Military and utility market applications.

Features

- 8x 10/100/1000Base-T RJ-45 and 4x 100/1000Base-X SFP with 8x IEEE 802.3af/at PoE,240W PoE power budget
- Redundant dual DC input power 48VDC (44~57VDC)
- Isolated RS-232 console port
- Cable diagnostic, Measuring cable normal or broken point distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP Server/Client/Relay /Relay option 82 /Snooping
- 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/SSH server for management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.1d	STP (Spanning Tree Protocol)

Standard	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
	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
	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): 24Gbps (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	8x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP connector RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function SFP port support dual speed with DDMI	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af/at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.	
Console	RS-232 (RJ-45)	
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	
Power Supply	Redundant Dual DC 48VDC (44~57VDC) Input power Removable Terminal Block for input power connector (50~57V input is recommended for IEEE 802.3at PoE+ in 30W applications)	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	253.5W	13.5W	240W

LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per RJ-45 port: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Fiber Per port: Link/Active (Green)
	PoE Port LED, 1 LED /per Port: PoE Output Power On : ON (Green), PoE Output Power OFF : OFF
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-804SM-8PH) -40 ~ 75°C (IGS-804SM-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x152 mm (D x W x H)
Weight	0.76kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	564,484 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN60950-1
Surge Protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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 Protocal)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group: 6group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group: 6group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 Union µ-Ring white paper for more details and more topology applications)
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 Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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 Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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	
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	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
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

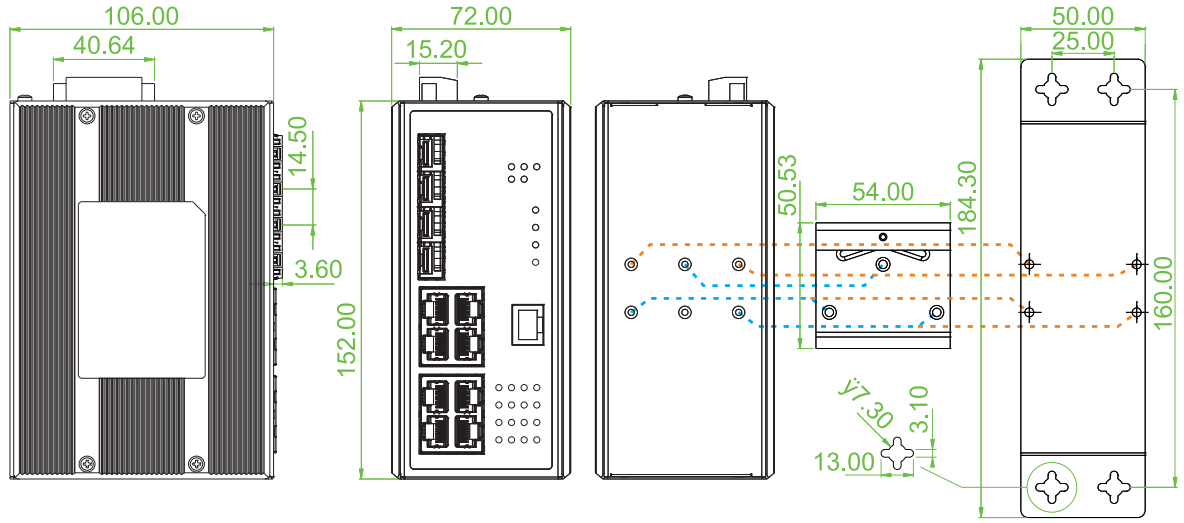
IPv6 Features

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 IEEE 802.3az 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 normal or broken point distance
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE Power budge limitation: Maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3af/at	Power Budget	Redundant	Railway EN50121-4	Safety	EN61000-6-2 EN61000-6-4	CE FCC	
IGS-804SM-8PH	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-10~60°C
IGS-804SM-8PHE	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For more ref)

IGS-1604XSM-16PH

16x GbE RJ45 + 4x 1G/2.5G/10G SFP+ with 16x PoE 300W

- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

An Industrial 16-port PoE Gigabit Ethernet switch with 4-port 10 Gigabit SFP+ slot, supporting various types of 10 and 2.5 Gigabit optical small form-factor pluggable transceivers for long-distance and wide-bandwidth transmission, each PoE port support IEEE802.3af/at standard of the maximum 30W power output, each switch has a total power budget of up to 300Watts, used to connect and feed various types of Ethernet power devices, such as smoke sensors, Wi-Fi access points, femtocells, alarm centers, and IP cameras. the din-rail and fan less 20-port switch adopts an enhanced and hardened design for high surge protection, wide operating temperature and safety certified to meet critical and centralize strict requirements.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output (30W per port. total 300W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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 802.3ae	10G bit/s Ethernet over Fiber
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 /Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 112Gbps (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	16x 10/100/1000Base-T RJ-45 + 4x 100/1000/2.5G/5G/10GBase-X SFP
	RJ-45 UTP port supports Auto-negotiation speed, Auto MDI/MDI-X function
	SFP port supports 1G/2.5G/5G/10G speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	16x IEEE 802.3af /IEEE 802.3at 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (46~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE802.3at PoE+ applications)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	337W	28.5W	300W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port Total 300W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 1G/2.5G Link/Active (Amber), 10G Link/Active (Blue)
	PoE: ON (Green)
Jumbo Frame	10KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DO(Alarm Relay Contact)	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1, 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for DO (Alarm Relay), DI, redundant power PWR1 and PWR2
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	155.6 x 77 x 160mm (D x W x H)
Weight	2.065kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	224,776 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
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 SIP, Subnet (32bit) L4: TCP/UDP

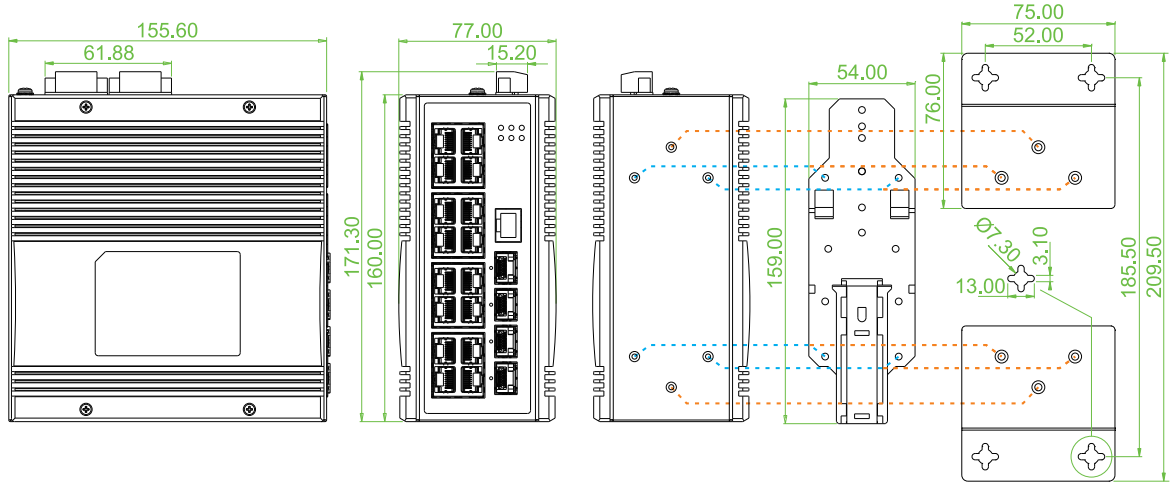
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 300W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	1000/2.5G/5G/10G Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-1604XSM-16PH	20	16	4 SFP	16	300W	48VDC	V	V	V	V	-40~60°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGS-1608SM-8PH

16x GbE RJ45 + 8x 100/1000 SFP with 8x PoE 240W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial Gigabit PoE Ethernet switch has 24 Gigabit Ethernet ports, of which 8 PoE ports support the IEEE802.3af/at standard with a maximum power output of 30W, and 8-port 100/1000 SFP slots, the fanless design, redundant power input, rugged din-rail type, IP30 enclosure, ideal for harsh environment applications where environmental conditions exceed commercial product specifications, such as industrial networking, intelligent transportation systems (ITS), military and utility market applications.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 240W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 48Gbps (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	16x 10/100/1000Base-T RJ-45 + 8x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af /IEEE 802.3at 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual input power (Removable terminal block) 48VDC (44~57VDC) (50~57V input is recommended for IEEE802.3at PoE+ applications)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	255.2W	15.2W	240W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port Total 240W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 1 terminal block for Alarm relay, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IGS-1608SM-8PH) -40 ~ 75°C (IGS-1608SM-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	116 x 92 x 160mm (Dx Wx H)
Weight	1.375kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	439,881 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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, EN60950-1, EN62368-1
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

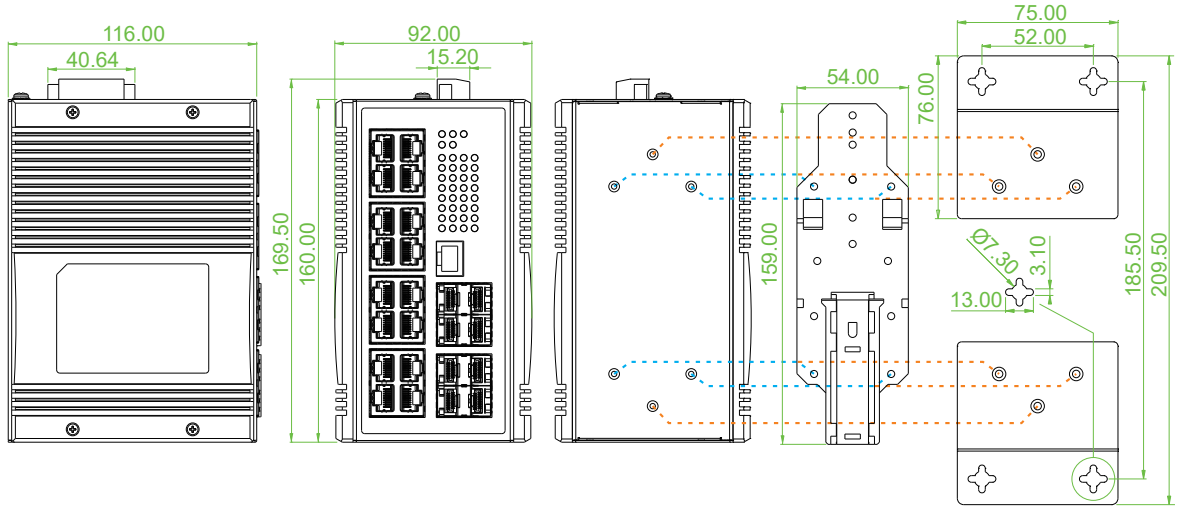
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	UL60950-1 EN60950-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-1608SM-8PH	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-10~60°C
IGS-1608SM-8PHE	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGS-1608SM-16PH

16x GbE RJ45 + 8x 100/1000 SFP with 16x PoE 360W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN62368-1, EN50121-4,EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

An Industrial 16-port PoE Gigabit Ethernet switch with 8 port 100/1000 SFP slots, each PoE port support IEEE802.3af/at standard of the maximum 30W power output, used to connect and feed various types of Ethernet power devices, such as smoke sensors, Wi-Fi access points, femtocells, alarm centers, and IP cameras. the din-rail and fanless 24-port switch adopts an enhanced and hardened design for high surge protection, wide operating temperature and safety certified to meet critical and centralize strict requirements.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 360W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 48Gbps (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	16x 10/100/1000Base-T RJ-45 + 8x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed,Auto MDI/MDI-X function
	SFP port supports 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	16x IEEE 802.3af /IEEE 802.3at 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual input power (Removable terminal block) 48VDC (44~57VDC) (50~57V input is recommended for IEEE802.3at PoE+ applications)
Power Consumption	
PoE Power Budget	Maximum PoE Output power budget 30W / Per Port Total 360W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1, 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for Alarm relay, DI, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IGS-1608SM-16PH) -40 ~ 75°C (IGS-1608SM-16PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	135.6x 99x 160mm (Dx Wx H)
Weight	2.5kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	436,353 Hours (MIL-HDBK-217)
Warranty	5 years

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	387W	20W	360W

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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	EN62368-1
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

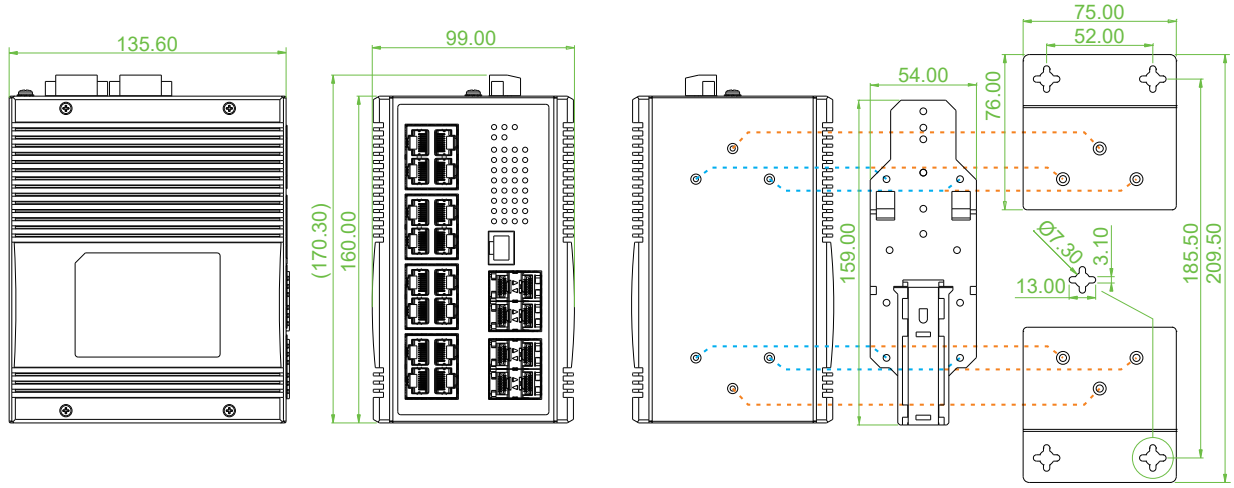
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 360W

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-1608SM-16PH	24	16	8 SFP	16	360W	48VDC	V	V	V	V	-10~60°C
IGS-1608SM-16PHE	24	16	8 SFP	16	360W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IFS-402GSW-4PB

NEW

4x FE RJ45 + 2x 100/1000 SFP with 4x IEEE802.3bt PoE++ 240W, 48VDC

- Supports MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- 4KV surge protection for PoE, RJ45 and SFP ports
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial 90W PoE Ethernet switch IFS-402GSW-4PB, Layer 2 managed, has 4 10/100 UTP ports, each port complies with the IEEE802.3bt 90W PoE++ standard. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, and supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (44~57VDC) redundant dual input power
- Provides 4-port IEEE802.3bt PoE++ output, 90W per port, total 240W
- Cable diagnostics, identifies opens/shorts distance
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.3bt	PoE++
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 4.8Gbps (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	4x10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000 dual speed with DDMI
Console	USB Type C
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3af/at/bt PoE++ 4 pairs PoE, 90W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) Below recommended is for different PoE application 54~57VDC VDC for 90W (4 Pairs) PoE application 52~57VDC for 60W (4 Pairs) PoE application 52~57VDC for 30W (2 Pairs) PoE application 44~57VDC for 15.4W (2 Pairs) PoE application

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
57VDC	253W	8W	240W

PoE Power Budget	Maximum PoE Output power budget 90W / Per Port, Total 240W
LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	220K Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provide 2 redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IFS-402GSW-4PB) -40 ~ 75°C (IFS-402GSW-4PBE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 38.6 x 152mm (D x W x H)
Weight	635g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	772,953 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Surge Protection	4KV for PoE, UTP and Fiber ports
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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, Console

Management Features

CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
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 SIP, Subnet (32bit) L4: TCP/UDP

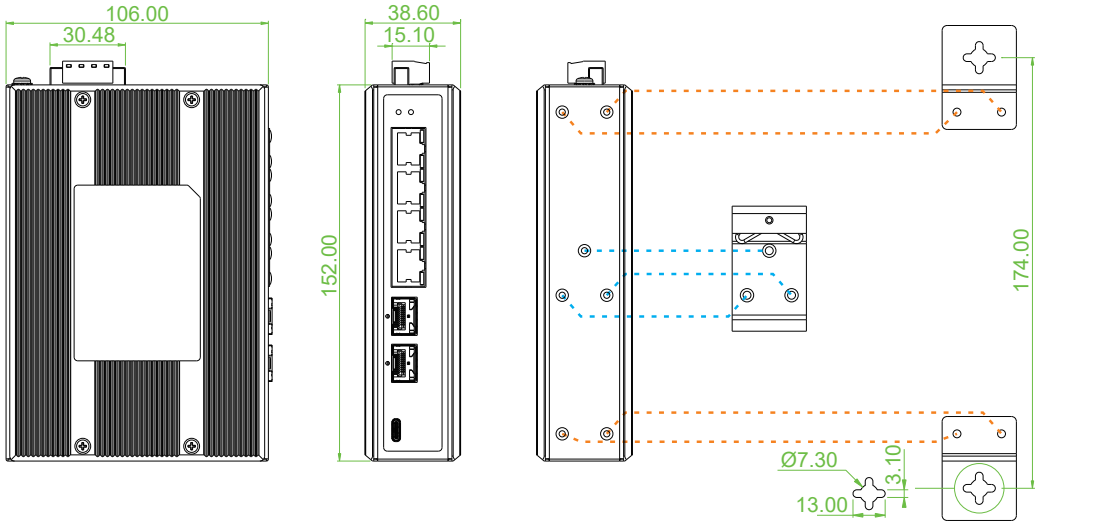
Others Features

Green Ethernet	Supports IEEE 802.3az 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

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
		10/100 Base-TX	100/1000 Base-X	IEEE 802.3 af/at/bt 90W	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-402GSW-4PB	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-10~60°C
IFS-402GSW-4PBE	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK05	Wall Mount kit for Industrial product (2pcs in 1 set, 42 x 30mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For more ref.)

IFS-402GSM-4PU

4x FE RJ45 + 4x 100/1000 SFP with 4x 60W PoE 240W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, EN60950-1, EN62368-1,, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial PoE Ethernet switch IFS-402GSM-4PU, Layer 2 managed, has 4 10/100 UTP ports and each port supports up to 60W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (44~57VDC) redundant dual input power
- Provides 4-port IEEE 802.3af / 802.3at PoE+ output (60W per port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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 EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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
	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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 4.8Gbps (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	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function,
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3at/ 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	248.5W	8.5W	240W

PoE Power Budget	Maximum PoE Output power budget 60W / Per Port 240W for total
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-402GSM-4PU) -40 ~ 75°C (IFS-402GSM-4PUE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.7kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	589,078 hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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, EN60950-1, EN62368-1
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
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 Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

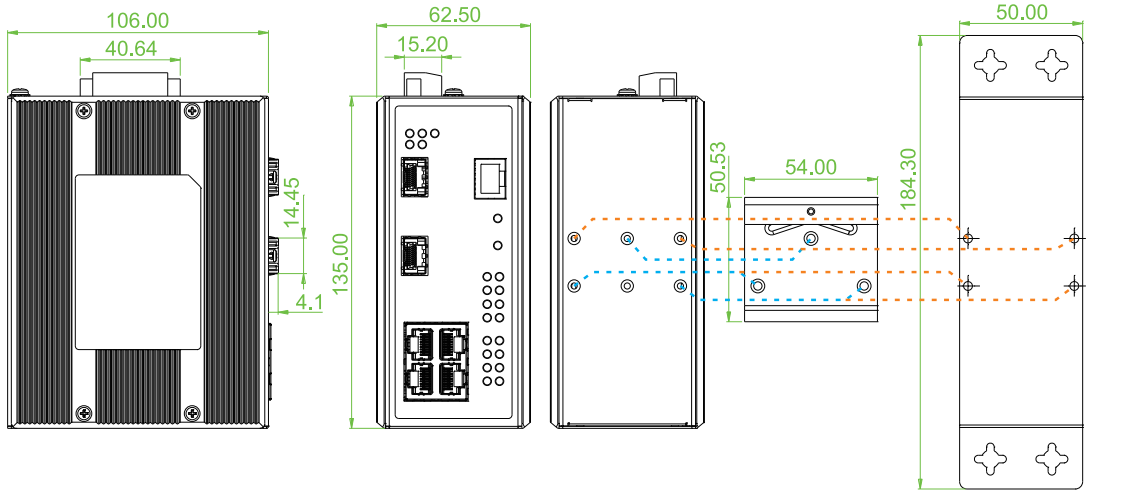
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE		Input Power	Certification				Operating Temperature
		10/100 Base-TX	100/1000 Base-X	IEEE 802.3at 4 pairs PoE/60W	Power Budget	Redundant	EN50121-4	EN62368-1 UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	
IFS-402GSM-4PU	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-10~60°C
IFS-402GSM-4PUE	6	4	2 SFP	4	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (for IGS-402GSM-4PU)
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C (For more ref.)

IFS-402GSM-4PH24

4x FE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial PoE Ethernet switch, Layer 2 managed, IFS-402GSM-4PH24 has 4 10/100 UTP ports and each port supports 30W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides 4-port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	IEEE 802.1ad	Stacked VLANs, Q-in-Q

Standard	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)
Switch Architecture	Back-Plane (Switching Fabric): 7.8Gbps (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	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports 100/1000M with DDMI	
PoE standard & RJ-45 pin assignment	4x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6)	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	
	Built-in very high efficiency booster (94~97%) to rise up 52VDC for PoE output	
	Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	134.8W	7.1W	120W	94.0%
48VDC	132.2W	8.5W	120W	97.2%

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 120W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-402GSM-4PH24) -40 ~ 75°C (IFS-402GSM-4PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.715kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	674,963 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE

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
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client

LLDP (IEEE802.1ab)	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 SIP, Subnet (32bit) L4: TCP/UDP

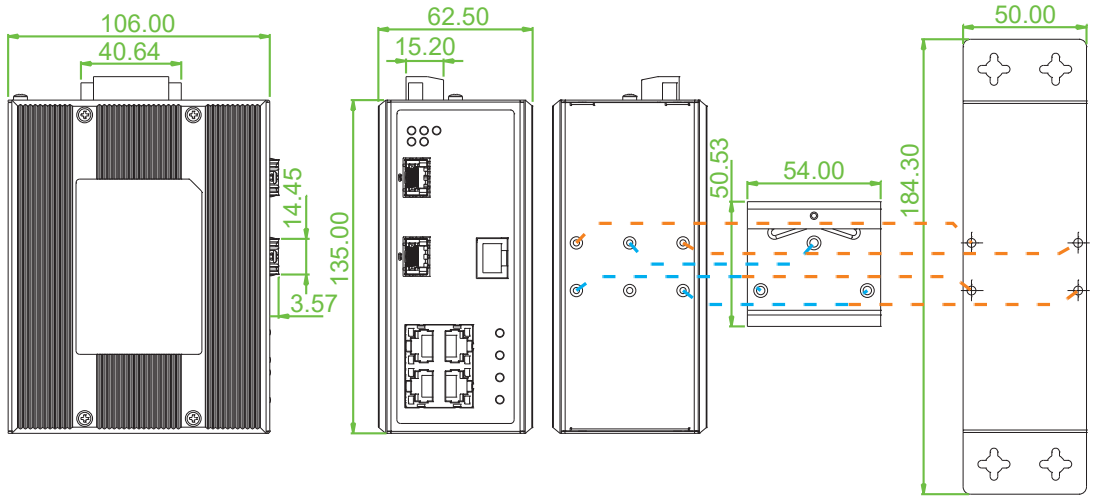
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 120W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
		10/100 Base-TX	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	UL60950-1	EN50121-4	NEMA-TS2	CE, FCC EN61000-6-2 EN61000-6-4	
IFS-402GSM-4PH24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	V	-10~60°C
IFS-402GSM-4PHE24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C

IFS-402CGSW-4PH

4x FE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, Compact size

- 4KV surge protection for PoE, UTP and SFP ports
- Compact size for easy installation
- Auto checking and auto reset when PoE PD fail
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

These Gigabit Ethernet switch models are managed industrial grade L2 switches with 4 10/100Base-TX ports and 2 GbE/100M SFP ports which also supports PoE+/PSE and provide stable and reliable transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking. They are an ideal solution for Smart City, surveillance, Intelligent traffic control systems, production automation applications and support up to 8/4 PoE/PoE+ (IEEE 802.3af/IEEE 802.3at) ports which can provide 15.4/30watts power output per port for connecting with heavy-duty industrial PoE devices, such as PTZ IP surveillance cameras, high-performance wireless access points, digital signage and IP phones. Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- Redundant power input
- Provides 4 port IEEE 802.3af / 802.3at PoE output
- Cable diagnostics
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 4.8Gbps (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	4x 10/100Base-TX RJ-45 + 2x FE/GbE SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports FE/GbE with DDMI
PoE standard & RJ-45 pin assignment	4x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6)
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC48V (44~57VDC) Input power (Removable Terminal Block) (50~57V input is recommended for IEEE 802.3at PoE+ application)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	127.5W	5.3W	120W

PoE Power Budget	Maximum PoE Output power budget 120W, (30W/per port)
LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 100 Link/Active (Green), 10 Link/Active (Amber)
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)
	PoE: ON (Green)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	1.75M bits for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provides 2 redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IFS-402CGSW-4PH) -40 ~ 75°C (IFS-402CGSW-4PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106x 38.6x 142mm (Dx Wx H)
Weight	820g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	897,992Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
Surge Protection	4KV for PoE, UTP and Fiber ports
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Supports for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
NTP	Client
LLDP (IEEE802.1ab)	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	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 SIP ,Subnet (32bit) L4: TCP/UDP

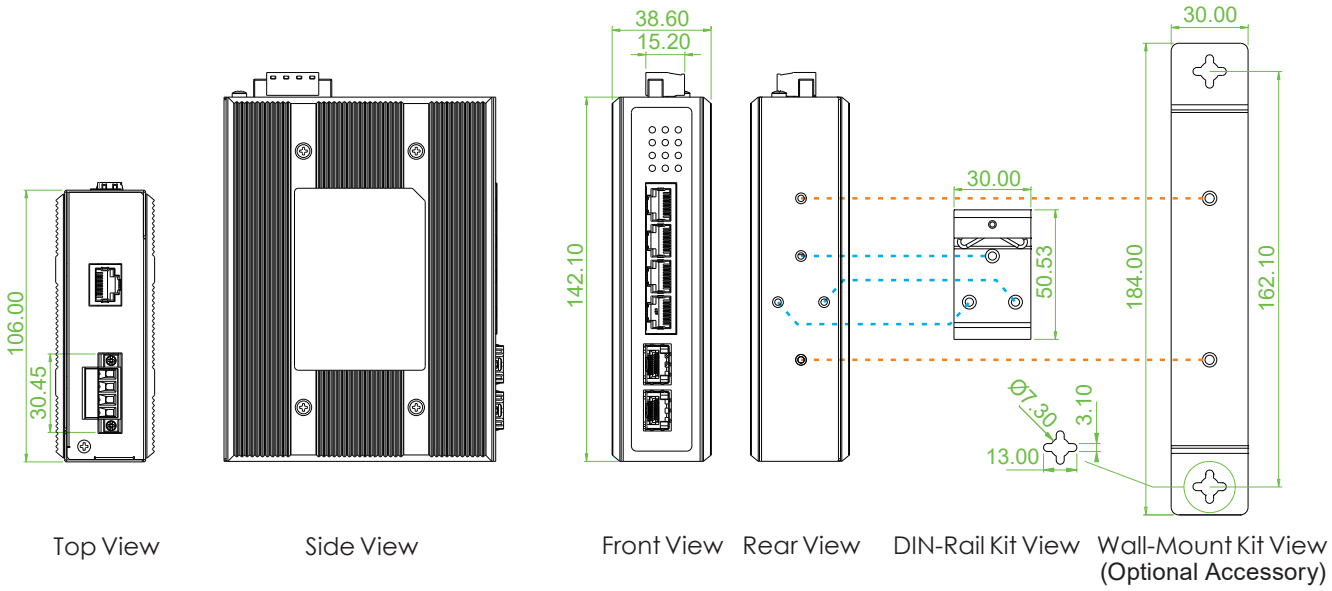
Others Features

Green Ethernet	Supports IEEE 802.3az 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
Cable Diagnostic	Measuring UTP cable normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 120W

Dimensions



Ordering Information

Model Name	Total Port	RJ45	Fiber	PoE Port		Input Power	Certification				Operating 10/100Base-TX
		10/100 Base-TX	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-402CGSW-4PH	6	4	2 SFP	4	120W	48VDC	V	V	V	V	-10~60°C
IFS-402CGSW-4PHE	6	4	2 SFP	4	120W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For IFS-402CGSW-4PH)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IFS-803GSM-8PH24

8x FE RJ45 + 3x 100/1000 SFP with 8x PoE 180W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail
- EN50121-4, UL60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial PoE Ethernet switch IFS-803GSM-8PH24 has 8 Gigabit UTP ports, each port complies with IEEE802.3af/at up to 30W PoE+ standard. Equipped with 3 100/1000 SFP slots, for fiber optic connections to meet the requirements for extended transmission distance and high-speed transmission, fanless design, high MTBF, supports wide operating temperature, redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides 8 port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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 802.1ad	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)
Switch Architecture	Back-Plane (Switching Fabric): 10.6Gbps (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	8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto-negotiation speed, Auto MDI/MDI-X function	
	SFP ports suppors 100/1000M with DDMI	
PoE standard & RJ-45 pin assignment	8x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6)	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	
	Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output	
	Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meter	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	198.3W	7.3W	180W	94%
48VDC	193.2W	7.9W	180W	97%

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 180W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-803GSM-8PH24) -40 ~ 75°C (IFS-803GSM-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.96kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	466,542 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
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 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client

LLDP (IEEE802.1ab)	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 SIP, Subnet (32bit) L4: TCP/UDP

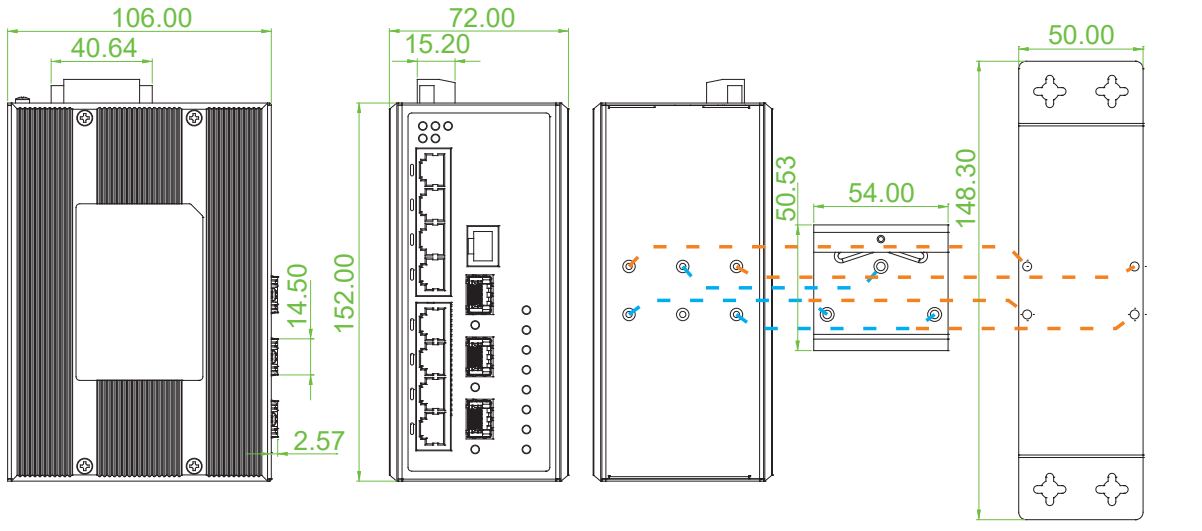
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking ,and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE power budget limitation: maximum 180W

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
		10/100 Base-TX	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	UL60950-1	EN50121-4	NEMA-TS2	CE, FCC EN61000-6-2 EN61000-6-4	
IFS-803GSM-8PH24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	-10~60°C
IFS-803GSM-8PHE24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IFS+803GSM-8PH & IFS+803GSM-8PH24

- 8x FE RJ45 + 3x 100/1000 SFP with 8x PoE 240W, 48VDC
- 8x FE RJ45 + 3x 100/1000 SFP with 8x PoE 180W, 24/48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial PoE Ethernet switches IFS+803GSM-8PH and IFS+803GSM-8PH24 has 8 Gigabit UTP ports and each port complies with the IEEE802.3af/at up to 30W PoE+ standard. Equipped with 3 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant power input, 48VDC IFS+803GSM-8PH, and 24/48VDC IFS+803GSM-8PH24, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 48VDC (46~57VDC) redundant dual input power (IFS+803GSM-8PH)
- 24/48VDC (20~57VDC) redundant dual input power (IFS+803GSM-8PH24)
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 240W) (IFS+803GSM-8PH)
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 180W) (IFS+803GSM-8PH24)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	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)
Switch Architecture	Back-Plane (Switching Fabric): 7.6Gbps (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	8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports 100/1000M dual speed with DDMI	
Console	RS-232 (RJ-45)	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af /IEEE 802.3at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	**IGS+803SM-8PH** Redundant Dual input power (Removable terminal block) 48VDC (44~57VDC) (50~57V input is recommended for IEEE802.3at PoE+ applications)	
	IGS+803SM-8PH24 Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter	

Power Consumption

IFS+803GSM-8PH

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	252.5W	12.9W	240W

IFS+803GSM-8PH24

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	191.2W	7.8W	180W	97%
48VDC	193.4W	8.9W	180W	97%

PoE Power Budget	Maximum PoE Output power budget 30W/port,Total 240W (IFS+803GSM-8PH)
	Maximum PoE Output power budget 30W/port,Total 180W (IFS+803GSM-8PH24)
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides1 terminal block for Alarm relay, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IFS+803GSM-8PH, IFS+803GSM-8PH24) -40 ~ 75°C (IFS+803GSM-8PHE, IFS+803GSM-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)

Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152mm (Dx Wx H)
Weight	0.85kg (IFS+803GSM-8PH)
	0.86kg (IFS+803GSM-8PH24)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF (MIL-HDBK-217)	487,189 Hours (IFS+803GSM-8PH)
	528,753 Hours (IFS+803GSM-8PH24)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
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, EN60950-1, EN62368-1
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported

ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported

BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 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 SIP, Subnet (32bit) L4: TCP/UDP

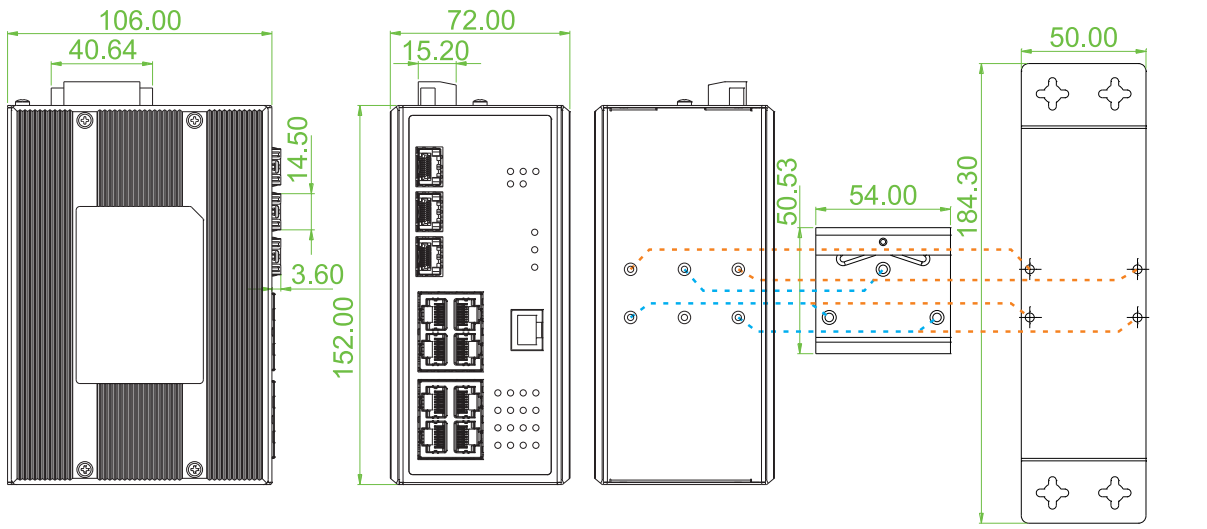
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W (IFS+803GSM-8PH) Total PoE power budget limitation: maximum 180W (IFS+803GSM-8PH24)

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE Port		Input Power
			10/100Base-TX	100/1000Base-X	IEEE802.3at/af	Power Budget	Redundant
IFS+803GSM-8PH24	V	11	8	3 SFP	8	180W	24/48VDC
IFS+803GSM-8PHE24	V	11	8	3 SFP	8	180W	24/48VDC
IFS+803GSM-8PH	V	11	8	3 SFP	8	240W	48VDC
IFS+803GSM-8PHE	V	11	8	3 SFP	8	240W	48VDC

Model Name	Certification					Operating Temperature
	Traffic Control NEMA TS2	UL60950-1, EN60950-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS+803GSM-8PH24	V	V	V	V	V	-10~60°C
IFS+803GSM-8PHE24	V	V	V	V	V	-40~75°C
IFS+803GSM-8PH	V	V	V	V	V	-10~60°C
IFS+803GSM-8PHE	V	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C

IFS-1608GSM-8PH

16x FE RJ45 + 8x 100/1000 SFP with 8x PoE 240W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- UL60950-1, EN60950-1, EN62368-1, EN50121-4,EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

The industrial Gigabit PoE Ethernet switch has 24 Gigabit Ethernet ports, IFS-1608GSM-8PH of which 8 PoE ports support the IEEE802.3af/at standard with a maximum power output of 30W, and 8-port 100/1000 SFP slots, the fanless design, redundant power input, rugged din-rail type, IP30 enclosure, ideal for harsh environment applications where environmental conditions exceed commercial product specifications, such as industrial networking, intelligent transportation systems (ITS), military and utility market applications.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 240W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 19.2Gbps (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	16x 10/100Base-TX RJ-45 + 8x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af /IEEE 802.3at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (46~57VDC) input power, Removable terminal block (50~57V input is recommended for IEEE 802.3at PoE+)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	254.2W	14.2W	240W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 240W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides1 terminal block for Alarm relay, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IFS-1608GSM-8PH) -40 ~ 75°C (IFS-1608GSM-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	116 x 92 x 160mm (Dx Wx H)
Weight	1.375kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	439,881 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A

Safety	UL60950-1, EN60950-1, EN62368-1
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

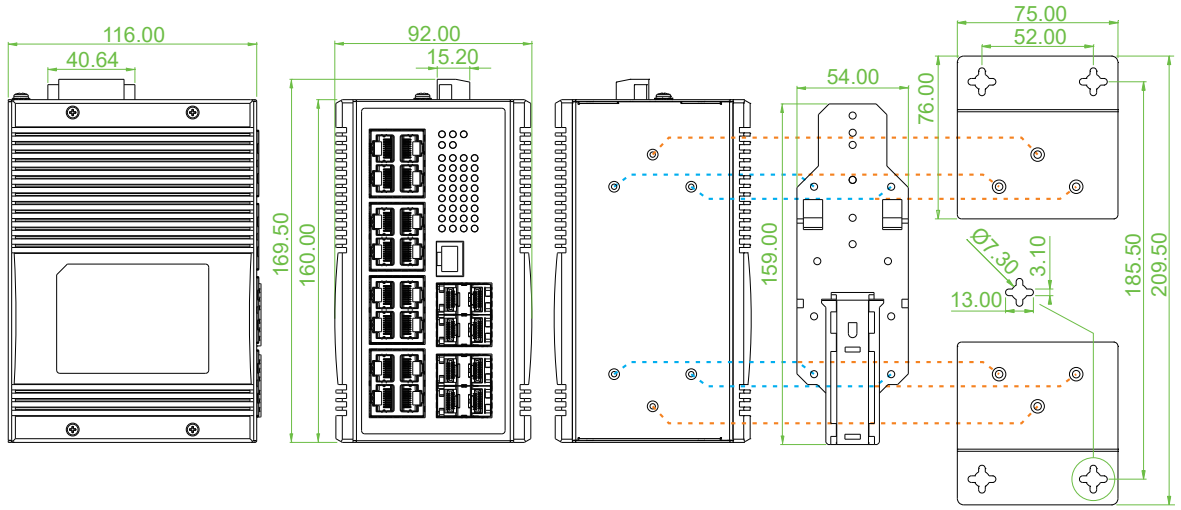
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 240W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
			10/100 Base-TX	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	UL60950-1 EN60950-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-1608GSM-8PH	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-10~60°C
IFS-1608GSM-8PHE	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IFS-1608GSM-16PH

16x FE RJ45 + 8x 100/1000 SFP with 16x PoE 360W, 48VDC

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Auto checking and auto reset when PoE PD fail
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified
- 4KV surge protection for PoE, RJ45 and SFP ports

An Industrial 16-port PoE Ethernet switch, Layer 2 managed, IFS-1608GSM-16PH with 8port 100/1000 SFP slots, each PoE port support IEEE802.3af/at standard of the maximum 30W power output, used to connect and feed various types of Ethernet power devices, such as smoke sensors, Wi-Fi access points, femtocells, alarm centers, and IP cameras. the din-rail and fanless 24-port switch adopts an enhanced and hardened design for high surge protection, wide operating temperature and safety certified to meet critical and centralize strict requirements.

Features

- 48VDC (46~57VDC) redundant dual input power
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output (30W per port, total 360W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 19.2Gbps (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	16x 10/100Base-TX RJ-45 + 8x 100/1000Base-X SFP
	RJ-45 UTP port supports, Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	16x IEEE 802.3af /IEEE 802.3at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (46~57VDC) input power, Removable terminal block (50~57V input is recommended for IEEE 802.3at PoE+)
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
52 VDC	382W	16W	360W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port, Total 360W
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1, 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for Alarm relay, DI, redundant power PWR1 and PWR2
Operating Temperature	-10 ~ 60°C (IFS-1608GSM-16PH) -40 ~ 75°C (IFS-1608GSM-16PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	135.6x 99x 160mm (Dx Wx H)
Weight	2.5kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	436,353 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A

Safety	EN62368-1
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Surge Protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	Up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for U uses, and maximum up to 5 Rings
	Recovery time <10ms
	The maximum number of devices in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 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 SIP, Subnet (32bit) L4: TCP/UDP

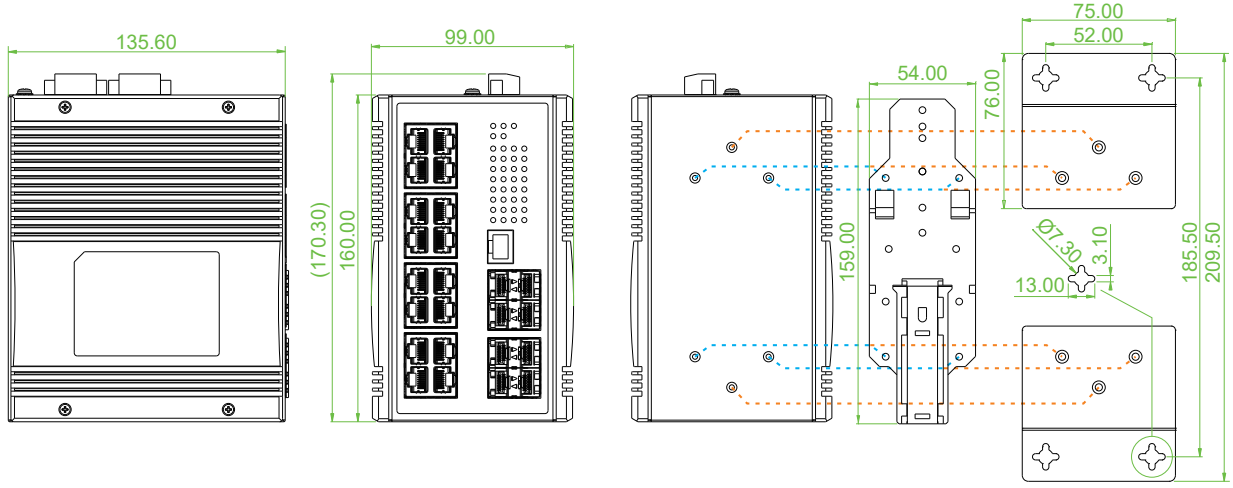
Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Advanced PoE

Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE power budget limitation: maximum 360W

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE Port		Input Power	Certification				Operating Temperature
			10/100 Base-TX	100/1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-1608GSM-16PH	V	24	16	8 SFP	16	360W	48VDC	V	V	V	V	-10~60°C
IFS-1608GSM-16PHE	V	24	16	8 SFP	16	360W	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IGS-402S-4PH24

4x GbE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, 24/48VDC

- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides a DIP-Switch to set functions
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The model is 6 ports unmanaged industrial grade Gigabit PoE switch with 4x 10/100/1000Base-T PoE ports that provides stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, the switch is designed for harsh environments, such as industrial networking, security automation applications, IP Surveillance, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- Provides 4-port IEEE 802.3at/af PoE+ output (30W per port)
- Supports power failure alarm message by relay
- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Provides Broadcast Storm Protection	Enable / Disable set by DIP SW	
Jumbo Frame	10K Bytes	
MAC Address Table	8K	
Packet Buffer Size	1Mbits	
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3at/af PoE+ 2 pairs PoE, PoE+ Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	

Network Connector	4 x RJ-45 10/100/1000Base-T, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex
	2x 100/1000Base-X SFP
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um / Fiber Cable (Single-mode): 9/125um
Protocols	CSMA/CD
LED	Sysrem: Power 1 (Green), Power 2 (Green), Fault (Amber)
	SFP Slot: Link/Active (Green)
	PoE: ON (Green)
DIP SW	DIP 1 ON : Disable power failure alarm / OFF : Enable power failure alarm
	DIP 2 ON : Disables broadcast storm protection / OFF : Enable broadcast storm protection
	DIP 3 ON : Fiber 2 for 100Base-FX SFP / OFF : Fiber 2 for Gigabit SFP
	DIP 4 ON : Fiber 1 for 100Base-FX SFP / OFF : Fiber 1 for Gigabit SFP
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 24/48V (20~57VDC) input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure)
Power Consumption	

Input Voltage	IGS-402S-4PH24
24VDC	143.3W
48VDC	138.2W

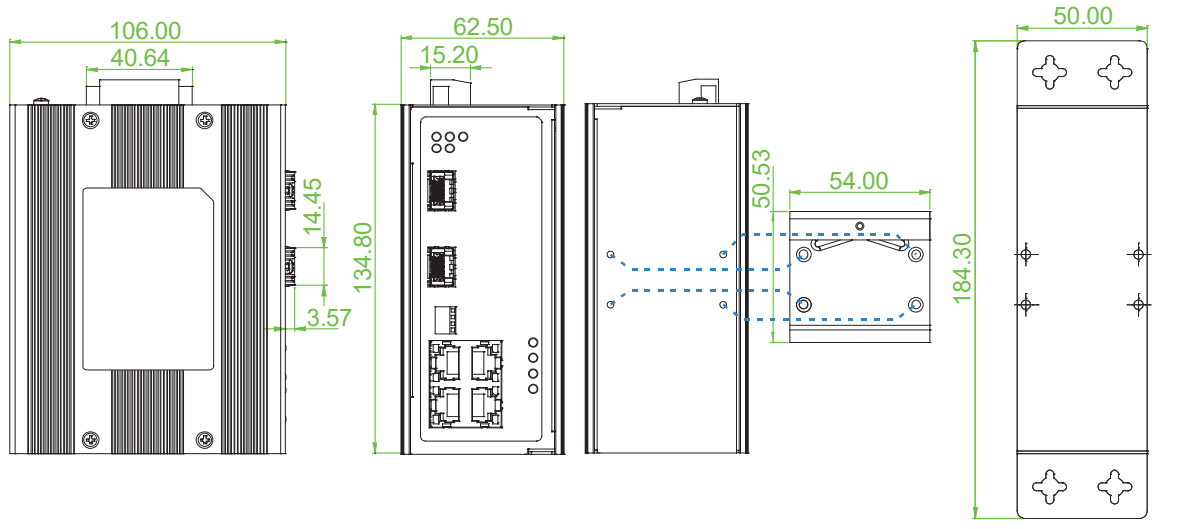
(Include full load 120W PoE output)

PoE Power Budget	Maximum PoE Output power budget 120W, 30W/ per port
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6Pin
Operating Temperature	-10 ~ 60°C (IGS-402S-4PH24)
	-40 ~ 75°C (IGS-402S-4PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Dimensions	106 x 62.5 x 134.8mm (D x W x H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	0.84kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	736,988 Hours @25°C (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
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
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100/1000 Base-T(X)	100/1000 Base-X	IEEE 802.3 af/at	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402S-4PH24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	-10~60°C
IGS-402S-4PHE24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184x50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IGS-402CS-4PH

4x GbE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, Compact size

- 4KV surge protection for PoE, UTP and SFP ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size PoE Ethernet switch, unmanaged plug-and-play easy for use, has 4 Gigabit UTP ports and each port supports 30W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 4-port IEEE 802.3at/af PoE output (30W/Per Port)
- Maximum PoE output power budget 120W
- 48VDC (44~57VDC) redundant dual input power
- Supports DIP switch to set broadcast storm protection, SFP Auto/Force Mode, SFP 100M/1000M ; RJ45 Auto/force mode, 10M/100M, Full/half.
- Supports flow control
- Provides broadcast storm protection
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.3af	PoE (Power over Ethernet)
Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	4K	
Packet Buffer Size	1.75Mbit	
Max Frame Size	1522Bytes	
Jumbo Frame	10K Byte	
PoE standard	IEEE 802.3at/af	

PoE RJ-45 pin Assignment	RJ-45 port #1~#4 support IEEE 802.3at/af, End-Span, Alternative A mode	
	Positive (V+): RJ-45 pin 1, 2.	
	Negative (V-): RJ-45 pin 3, 6.	
	Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	4x RJ-45 for 10/100/1000Base-T, Auto negotiation Speed or Force Mode, Auto MDI/MDI-X function, Full/Half duplex	
	2x 100/1000Base-X SFP, Auto or Force Mode	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um / Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Act (Amber)	
	SFP Slot: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	PoE: ON (Green)	
DIP SW	DIP 1	Broadcast Protection
		OFF : Enable ON : Disable
	DIP 2	Off: Fiber Auto
		On: Fiber Force Mode
	DIP 3	SFP Fiber Speed
		OFF: Giga ON: 100M
	DIP 4	RJ45 Mode
		OFF: Auto ON: Force
	DIP 5	RJ45 Speed
		OFF: 100M ON: 10M
	DIP 6	RJ45 Duplex
		OFF: Full ON: Half
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 48VDC (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE802.3at in 30W applications)	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	130W	8.2W	120W

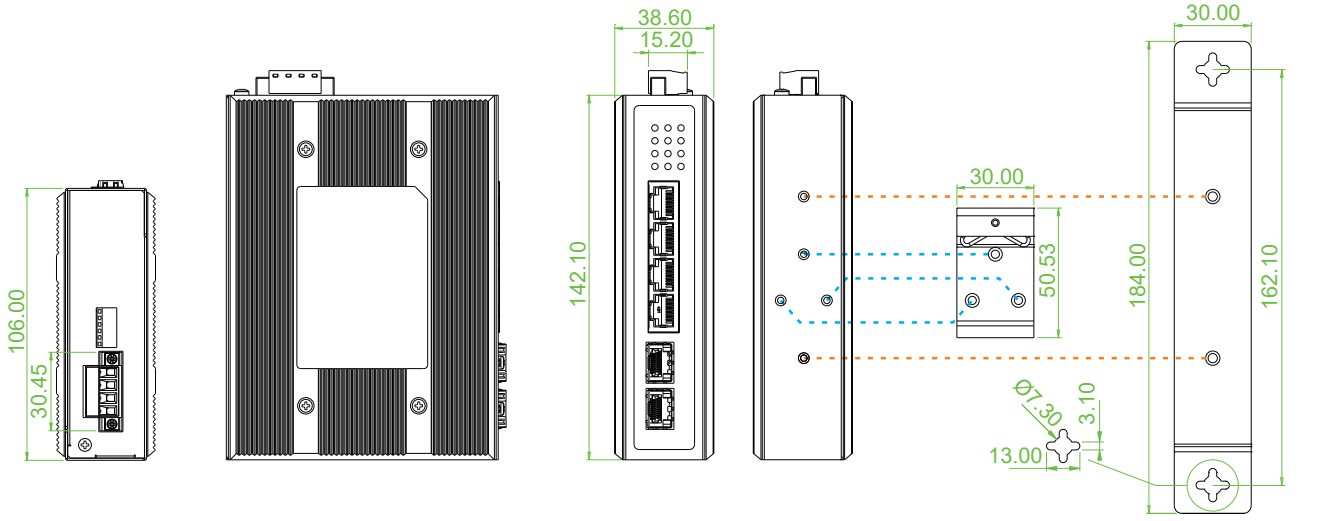
PoE Power Budget	Maximum PoE Output power budget 120W (30W/Per Port)
Removable Terminal Block	Provides 2 Redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IGS-402CS-4PH)
	-40 ~ 75°C (IGS-402CS-4PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106x 38.6x 142mm (D X W X H)
Weight	705g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	745,955Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
4KV Surge Protection	Supported for PoE, UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Top View | Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100/1000 Base-T(X)	100/1000Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IGS-402CS-4PH	6	4	2 SFP	4	120W	48VDC	V	V	V	-10~60°C
IGS-402CS-4PHE	6	4	2 SFP	4	120W	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For IGS-402CS-4PH)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IGS-800C-8PH

8x GbE RJ45 with 8x PoE, Compact size 240W, 48VDC

- 48VDC (44~57VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- 4KV surge protection for RJ45 and PoE ports
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size 8-port PoE Ethernet switch, unmanaged plug-and-play easy for use, has 8 Gigabit UTP ports and each port supports 30W PoE+. fanless design, high MTBF, supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 8-port IEEE 802.3at/af PoE+ output (30W per port, total 240W)
- 48VDC (44~57VDC) redundant dual input power
- Supports flow control
- Jumbo frame support
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40 ~ 70° C ("E" model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.3af	PoE (Power over Ethernet)
Switch Architecture	Back-Plane (Switching Fabric): 16Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	9K Bytes	
MAC Address Table	4K	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3at/af PoE+ 2 pairs PoE, PoE+ Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	8x RJ-45 10/100/1000Base-T, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Acttive (Green), 1000 Link/Active (Amber)
	PoE: ON (Green)
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+)

Power Consumption

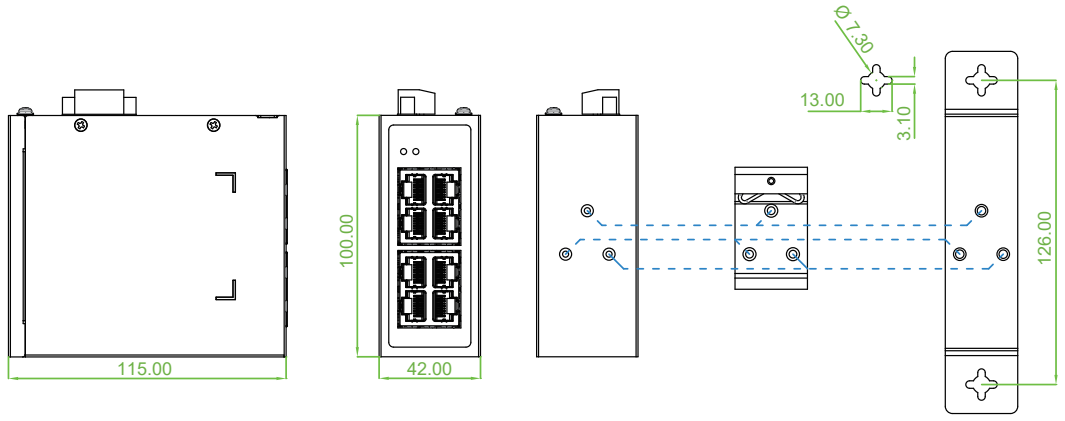
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	247.6W	6.8W	240W

PoE Power Budget	Maximum PoE Output power budget 240W, 30W/ per port
Removable Terminal Block	Provides 2 Redundant power, 4 pin
Operating Temperature	-10 ~ 60°C (IGS-800C-8PH) -40 ~ 70°C (IGS-800C-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Dimensions	100x 42x 115mm (D X W X H)
Housing	Rugged Metal, IP30 Protection, Fanless
Weight	0.95kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional accessories)
MTBF	1,494,598 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Railway Traffic	EN50121-4
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
Surge Protection	4KV for PoE and UTP ports
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100/1000 Base-T(X)	IEEE802.3 at/af	Power Budget	Redundant	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-800C-8PH	8	8	8	240W	48VDC	V	V	V	-10~60°C
IGS-800C-8PHE	8	8	8	240W	48VDC	V	V	V	-40~70°C

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IFS-402CGS-4PH

4x FE RJ45 + 2x 100/1000 SFP with 4x PoE 120W, Compact size

- 4KV surge protection for PoE, UTP and SFP ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN62368-1, EN50121-4, EN61000-6-2,EN61000-6-4, CE and FCC certified

The industrial compact size PoE Ethernet switch, unmanaged plug-and-play easy for use, has 4 10/100 UTP ports and each port supports 30W PoE+. Equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 4-port IEEE 802.3at/af PoE output (30W/Per Port)
- Maximum PoE output power budget 120W
- 48VDC (44~57VDC) redundant dual input power
- Supports DIP switch to set broadcast storm protection, SFP Auto/Force Mode, SFP 100M/1000M ; RJ45 Auto/force mode, 10M/100M, Full/half.
- Supports flow control
- Provides broadcast storm protection
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3af	PoE (Power over Ethernet)
Switch Architecture	Back-Plane (Switching Fabric): 4.8Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	4K	
Packet Buffer Size	1.75Mbit	
Max Frame Size	1522Bytes	
Jumbo Frame	10K Byte	
PoE standard	IEEE 802.3at/af	

PoE RJ-45 pin Assignment	RJ-45 port #1~#4 support IEEE 802.3at/af End-Span, Alternative A mode	
	Positive (V+): RJ-45 pin 1, 2.	
	Negative (V-): RJ-45 pin 3, 6.	
	Data (1, 2, 3, 6)	
Network Connector	4x RJ-45 for 10/100Base-TX, Auto negotiation Speed or Force Mode, Auto MDI/MDI-X function, Full/Half duplex	
	2x 100/1000Base-X SFP, Auto or Force Mode	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um / Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 100 Link/Act (Green), 10 Link/Act (Amber)	
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)	
	PoE: ON (Green)	
DIP SW	DIP 1	Broadcast Protection
		OFF : Enable ON : Disable
	DIP 2	Off: Fiber Auto
		On: Fiber Force Mode
	DIP 3	SFP Fiber Speed
		OFF: Giga ON: 100M
	DIP 4	RJ45 Mode
		OFF: Auto ON: Force
	DIP 5	RJ45 Speed
		OFF: 100M ON: 10M
	DIP 6	RJ45 Duplex
		OFF: Full ON: Half
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 48VDC (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE802.3at in 30W applications)	

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	127.5W	5.3W	120W

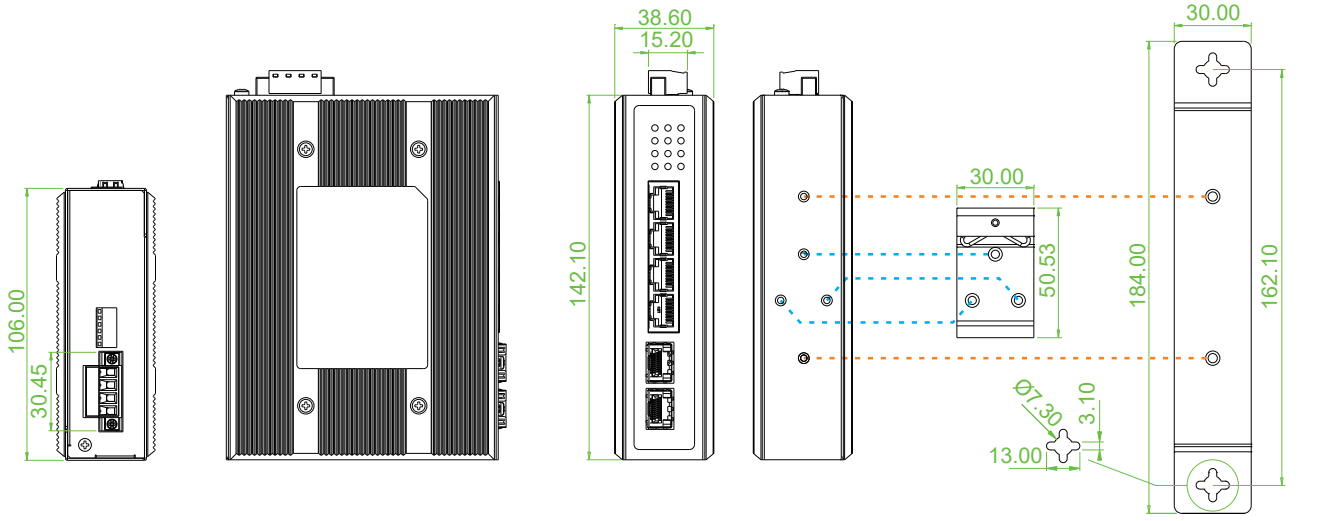
PoE Power Budget	Maximum PoE Output power budget 120W (30W/Per Port)
Removable Terminal Block	Provides 2 Redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IFS-402CGS-4PH)
	-40 ~ 75°C (IFS-402CGS-4PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106x 38.6x 142mm (D X W X H)
Weight	705g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	823,732Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
4KV Surge Protection	Supported for PoE, UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Top View | Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100 Base-T(X)	100/1000Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IFS-402CGS-4PH	6	4	2 SFP	4	120W	48VDC	V	V	V	-10~60°C
IFS-402CGS-4PHE	6	4	2 SFP	4	120W	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For IFS-402CGS-4PH)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more ref.)

IFS-802GS-8PH

8x FE RJ45 + 2x 1000 SFP with 8x PoE 240W, 48VDC

- 4KV surge protection for PoE UTP and PoE ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial 8-port PoE Ethernet switch, unmanaged plug-and-play easy for use, has 8 10/100 UTP ports and each port supports 30W PoE+. Equipped with two Gigabit SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 8-port IEEE 802.3at/af PoE output (30W/Per Port)
- Maximum PoE output power budget 240W
- 48VDC (44~57VDC) redundant dual input power
- Supports power failure alarm message by relay
- Supports flow control
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber optical
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-Plane (Switching Fabric): 5.6Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	8K	
Packet Buffer Size	1Mbits	
Max Frame Size	1632 Bytes	
PoE standard	IEEE 802.3at/af	
PoE RJ-45 pin Assignment	RJ-45 port #1~# 8 support IEEE 802.3at/af End-Span, Alternative A mode	
	Positive (V+): RJ-45 pin 1, 2.	
	Negative (V-): RJ-45 pin 3, 6.	
	Data (1, 2, 3, 6)	
Network Connector	8x RJ-45 for 10/100Base-TX, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
	2x 1000Base-X SFP	

Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um / Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: 10 Link/Active (Green), 100 Link/Active (Yellow)	
	SFP Slot: Link/Active (Green)	
	PoE: ON (Green)	
DIP SW	DIP 1	Power failure alarm
		OFF : Enable ON : Disable
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 48VDC (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE802.3at in 30W applications)	

Power Consumption

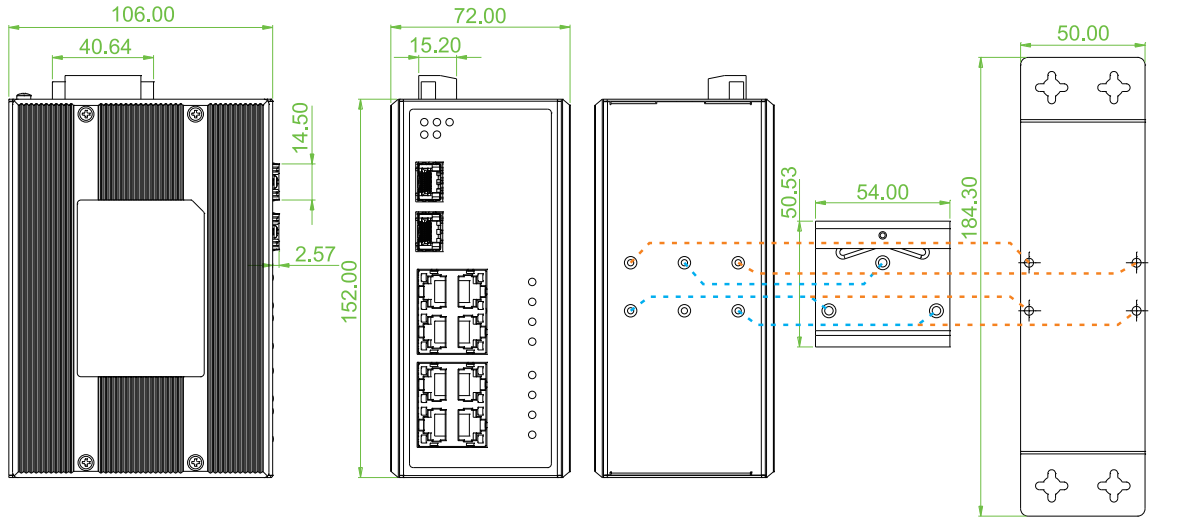
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	251W	5.2W	240W

PoE Power Budget	Maximum PoE Output power budget 240W (30W/Per Port)
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-802GS-8PH)
	-40 ~ 75°C (IFS-802GS-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106 x 72 x 152 mm (D X W X H)
Weight	765g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	635,446Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
4KV Surge Protection	Supported for PoE, UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100 Base-T(X)	1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-802GS-8PH	10	8	2 SFP	8	240W	48VDC	V	V	V	-10~60°C
IFS-802GS-8PHE	10	8	2 SFP	8	240W	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IFS-1602GS-8PH

16x FE RJ45 + 2x 1000 SFP with 8x PoE 240W, 48VDC

- 4KV surge protection for PoE UTP and PoE ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial PoE Ethernet switch, unmanaged plug-and-play easy for use, has 16 10/100 UTP ports of which 8 PoE ports support the IEEE802.3af/at standard, each port supports 30W PoE+. Equipped with two Gigabit SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, redundant 48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 8-port IEEE 802.3at/af PoE output (30W/Per Port)
- Maximum PoE output power budget 240W
- 48VDC (44~57VDC) redundant dual input power
- Supports power failure alarm message by relay
- Supports flow control
- Provides broadcast storm protection
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber optical
	IEEE 802.3x	Flow Control and Back Pressure
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
Switch Architecture	Back-Plane (Switching Fabric): 7.2Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	16K	
Packet Buffer Size	4Mbits	
Max Frame Size	1664 Bytes	
Jumbo Frame	16K Byte	
PoE standard	IEEE 802.3at/af	
PoE RJ-45 pin Assignment	RJ-45 port #9~# 16 support IEEE 802.3at/af End-Span, Alternative A mode	
	Positive (V+): RJ-45 pin 1, 2.	
	Negative (V-): RJ-45 pin 3, 6.	
	Data (1, 2, 3, 6)	
Network Connector	16x RJ-45 for 10/100Base-TX, Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
	2x 1000Base-X SFP	

Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um / Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: 10 Link/Active (Green), 100 Link/Active (Yellow)	
	SFP Slot: Link/Active (Green)	
	PoE: ON (Green)	
DIP SW	DIP 1	Power failure alarm
		OFF : Enable ON : Disable
	DIP 2	Broadcast Protection
		OFF : Enable ON : Disable
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 48VDC (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE802.3at in 30W applications)	

Power Consumption

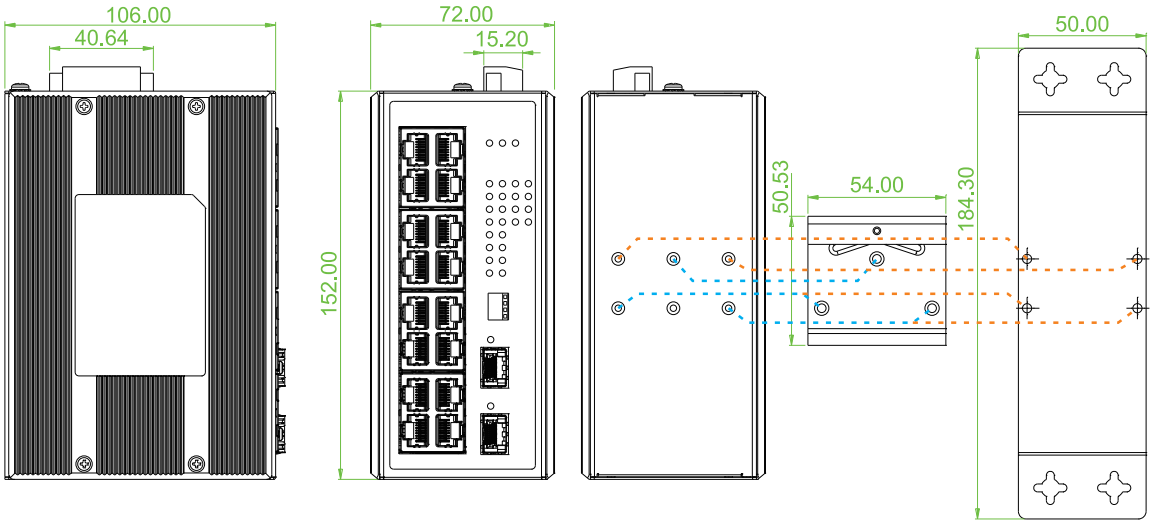
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50 VDC	253.2W	8.9W	240W

PoE Power Budget	Maximum PoE Output power budget 240W (30W/Per Port)
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-1602GS-8PH)
	-40 ~ 75°C (IFS-1602GS-8PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106 x 72 x 152 mm (D X W X H)
Weight	850g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	493,382Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
4KV Surge Protection	Supported for PoE, UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	PoE Port		Input Power	Certification			Operating Temperature
		10/100 Base-T(X)	1000 Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-1602GS-8PH	18	16	2 SFP	8	240W	48VDC	V	V	V	-10~60°C
IFS-1602GS-8PHE	10	8	2 SFP	8	240W	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C
NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ +70°C

IQS-402XSM

4x 2.5G RJ45 + 2x 1G/2.5G/10G SFP+ Compact Size

- Redundant 12/24/48VDC power input
- Supports µ-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial 2.5G managed Ethernet switch IQS-402XSM features 4 ports 2.5Gbps UTP and equipped with 2 SFP plus slots of maximum 10Gbps to meet high-bandwidth transmission requirements, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 4x 10M/100M/1G/2.5GBase-T RJ-45+ 2x 1G/2.5G/10GBase-X SFP+
- Provides 3 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses.
- Supports up to 3 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- 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
- Flexibility 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 upgrade failure
- 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

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 802.3bz	2.5GBase-T
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3ae	10G bit/s Ethernet over Fiber
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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)

Standard	IEEE 802.3x	Flow control for Full Duplex
	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)
Switch Architecture	Back-Plane (Switching Fabric): 60Gbps (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	4x 10M/100M/1G/2.5GBase-T RJ-45 + 2x 1G/2.5G/10GBase-X SFP	
	RJ45 port supports Auto negotiation, Auto MDI/MDI-X function	
	SFP port supports 1G/2.5G/10G speed with DDMI	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant dual power input 12/24/48VDC(9.6~60VDC) (Removable terminal block)	

Power Consumption

Input Voltage	Total Power Consumption
12VDC	11.7W
24VDC	12.3W
48VDC	14W

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1G/2.5G Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6K Byte
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides redundant power PWR1, PWR2 and Alarm Relay, 6 pin
Operating Temperature	-10 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	127.6x 48.6x 160mm (Dx W x H)
Weight	1,530g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	588,603 Hours (MIL-HDBK-217)
Warranty	5 Years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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 3 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 3 Rings
	Recovery time <10ms
	The maximum number of devices in the ring supports 250 nodes
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported
Loop Protection	Supported

QoS Features

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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

Management Features

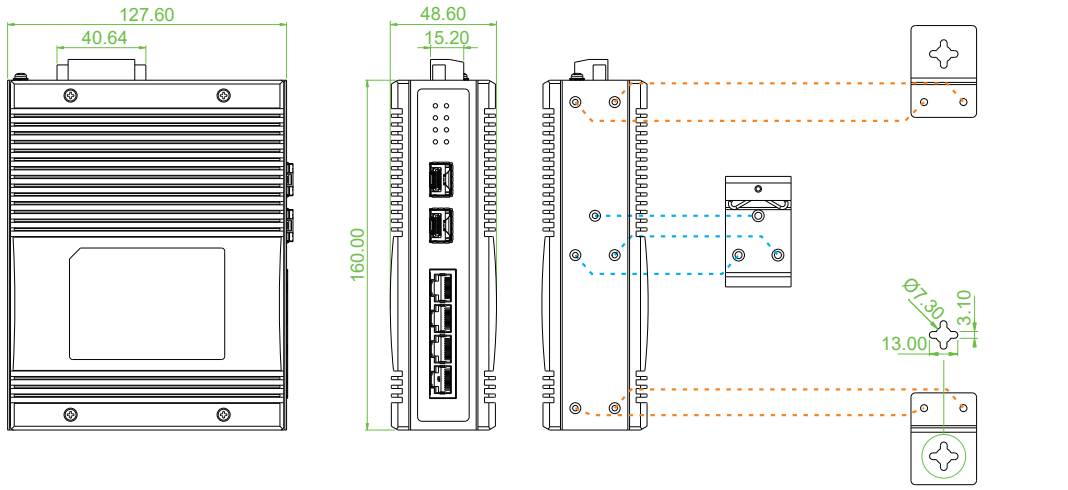
CLI	Cisco® like CLI
WeB UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Supports 4 servers)
Warning Message	System syslog, SMTP/e-mail event message, alarm relay
DNS	Client, Proxy
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 SIP, Subnet (32bit) L4 : TCP/UDP

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Ports	UTP (RJ45)	Fiber	Redundant Power Input	Certification		
		10/100/1G/2.5G Base-T	1G/2.5G/10G		EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IQS-402XSM	6	4	2 SFP	12/24/48VDC	V	V	V

Optional Accessories

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-402CSW

4x GbE RJ45 + 2x 100/1000 SFP, Compact size

- 4KV surge protection for UTP and SFP ports
- Compact size for easy installation
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size Gigabit managed Ethernet switch IGS-402CSW features 4 ports 1Gbps UTP and equipped with 2 100/1000bps SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant power input
- Cable diagnostics
- Supports EMS Management

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)
	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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (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	4x 10/100/1000Base-T RJ-45 + 2x FE/GbE SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports FE/GbE with DDMI	
Console	RS-232 (RJ-45)	

Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12VDC	5.8W
24VDC	6.5W
48VDC	8.2W

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	1.75M bits for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provide 2 redundant power 4 Pin
Operating Temperature	-10 ~ 60°C (IGS-402CSW) -40 ~ 75°C (IGS-402CSW-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106x 31.6x 142mm (Dx Wx H)
Weight	535g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	960,226Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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	EN62368-1
Surge Protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Support for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
NTP	Client
LLDP (IEEE802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

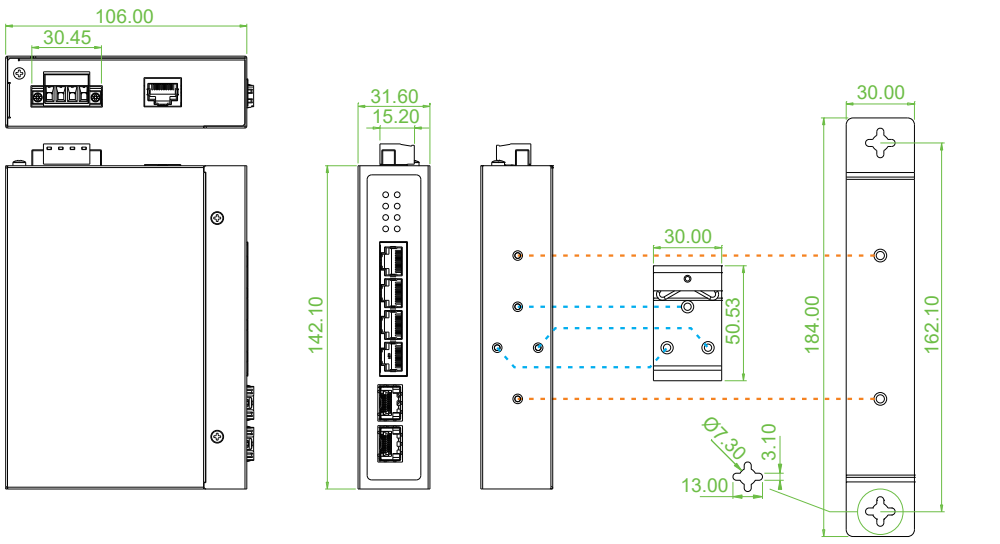
IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP	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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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
Cable Diagnostic	Measuring UTP cable normal or broken point distance

Dimensions



Side View Front View Rear View DIN-Rail Kit View Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45	Fiber	Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402CSW	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-402CSW-E	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS+404SM

4x GbE RJ45 + 4x 100/1000Base-X SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial managed Ethernet switch IGS+404SM has 4 Gigabit UTP ports, equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant 12/24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant dual DC input power 12/24/48VDC (9.6~60VDC)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 16Gbps (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	4x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	12VDC	24VDC	48VDC
IGS+404SM	7.7W	8W	9.2W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS+404SM) -40 ~ 75°C (IGS+404SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.65kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	861,962 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	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

Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
FTP client	Support for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

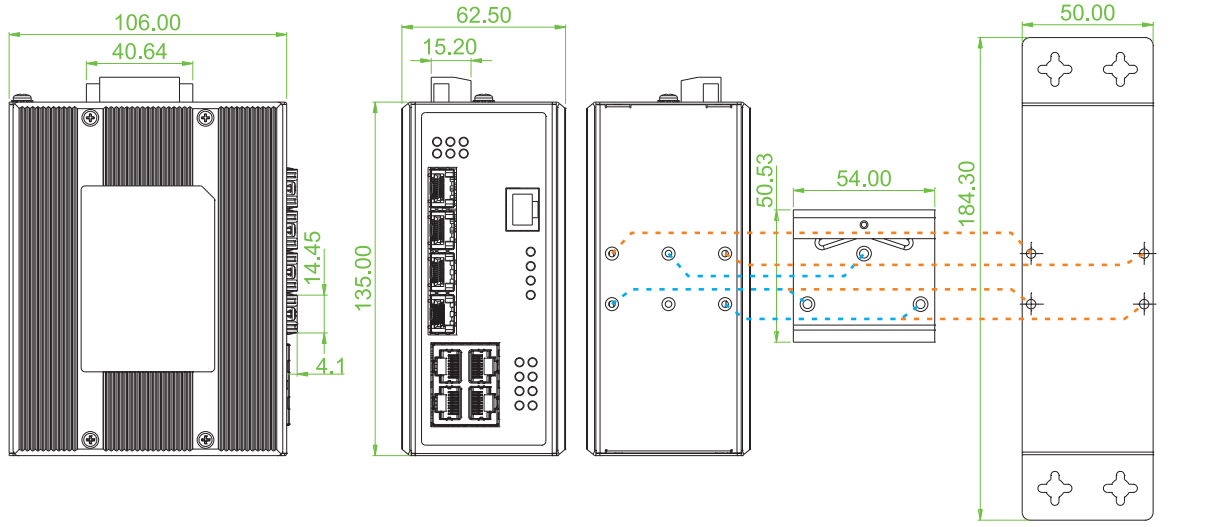
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification			Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS+404SM	V	8	4	4 SFP	12/24/48VDC	V	V	V	-10~60°C
IGS+404SM-E	V	8	4	4 SFP	12/24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS+803SM

8x GbE RJ45 + 3x 100/1000Base-X SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial managed Ethernet switch IGS+803SM has 8 Gigabit UTP ports, equipped with three 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection and supports wide operating temperature, redundant 12/24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant dual DC input power 12/24/48/-48VDC (9.6~60VDC)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 22Gbps (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	8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	12VDC	24VDC	48VDC
IGS+803SM	8.6W	10.8W	11.5W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS+803SM) -40 ~ 75°C (IGS+803SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x152 mm (D x W x H)
Weight	0.81kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	688,248 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	EN50121-4
Traffic Control	NEMA-TS2
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, EN60950-1, EN62368-1
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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

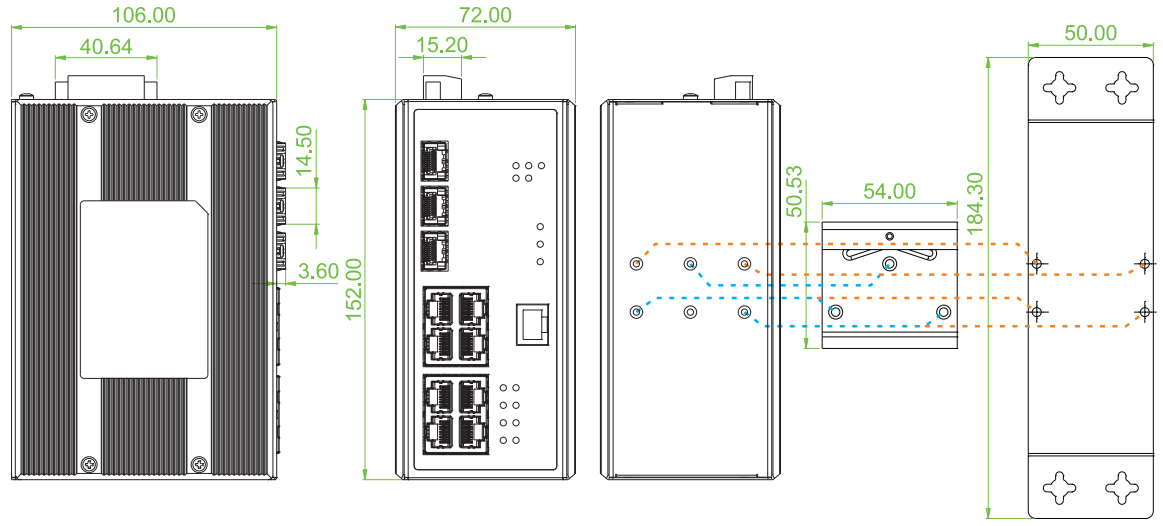
CLI	Cisco® like CLI
WeB UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
FTP client	Support for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features	
Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	Redundant	NEMA TS2	UL60950-1 EN60950-1 EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IGS+803SM	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS+803SM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-804SM

NEW

8x GbE RJ45 + 4x 100/1000Base SFP

- EN60950-1,EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports

Industrial-grade managed Gigabit Ethernet switch with 8 Gigabit UTP ports and 4 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance. Fanless design, high MTBF, supports wide operating temperature, and has redundant 12/24/48VDC power input, providing stable and reliable transmission, suitable for heavy-duty applications in harsh environments, such as industrial factory automation and data centers, intelligent transportation systems, and environmental conditions exceeding commercial product specifications Military and utility market applications.

Features

- Cable diagnostic, measuring cable normal or broken point distance
- u-Ring, STP, RSTP, MSTP, EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 24Gbps (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	8x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP connector RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function SFP port support dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	11W
24 VDC	12.4W
48 VDC	12.9W

Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power Removable Terminal Block for input power connector
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per RJ-45 port: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Fiber Per port: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-804SM) -40 ~ 75°C (IGS-804SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.74kg
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	593,726 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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

Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge protection	4KV for UTP and Fiber ports
Safety	EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
Link Aggregation (Port Aggregation Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 6group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 6group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
TACACS+	Authentication
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus TCP	Supported
SW & Configuration Upgrade	TFTP, HTTP, FTP client
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BootP	Bootstrap Protocol Supported
RARP	Reverse Address Resolution Protocol Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 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

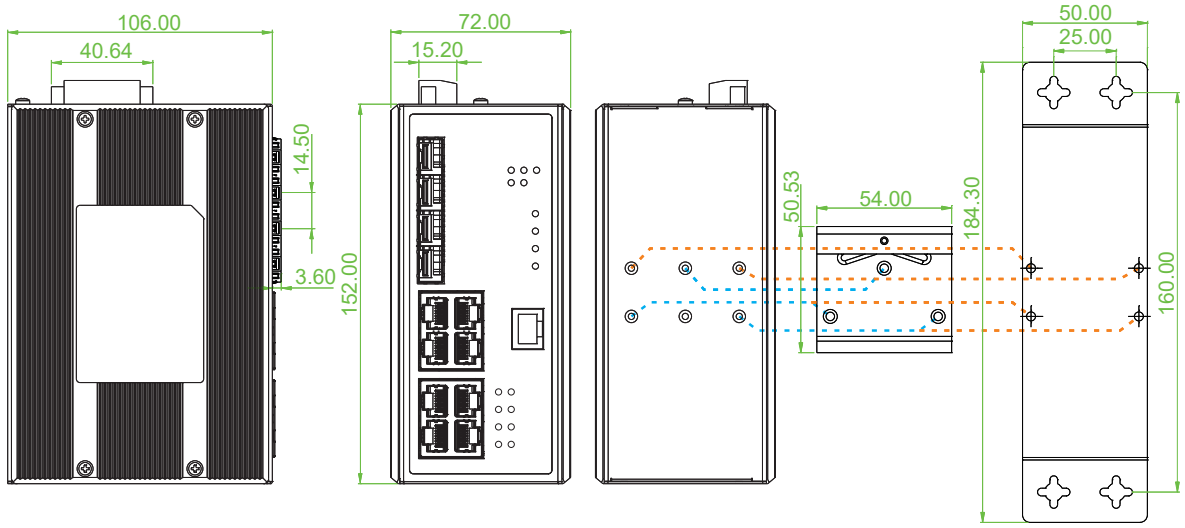
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-804SM	V	12	8	4 SFP	V	V	V	V	-10~60°C
IGS-804SM-E	V	12	8	4 SFP	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm) (For IGS-804SM-SE)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-812SM

8x GbE RJ45 + 12x 100/1000Base-X SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The Layer 2 managed industrial Ethernet switch, IGS-812SM, has 8 Gigabit UTP ports and is equipped with 12 100/1000 SFP slots for centralized fiber optic connections to meet expanded transmission in a variety of requirements and locations. Long distance and high-speed transmission, fanless design, high MTBF, 4KV surge protection, supports wide operating temperature, 12/24/48VDC redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automation, data centers, smart transportation systems, military, and harsh application conditions such as utility markets exceed commercial product specifications.

Features

- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 40Gbps (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	8x 10/100/1000Base-T RJ-45+ 12x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100 meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	14.3W
24 VDC	14.2W
48 VDC	15.8W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-812SM) -40 ~ 75°C (IGS-812SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x152 mm (D x W x H)
Weight	0.795kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	517,181 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE EN55022 Class A
Railway Traffic	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, EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

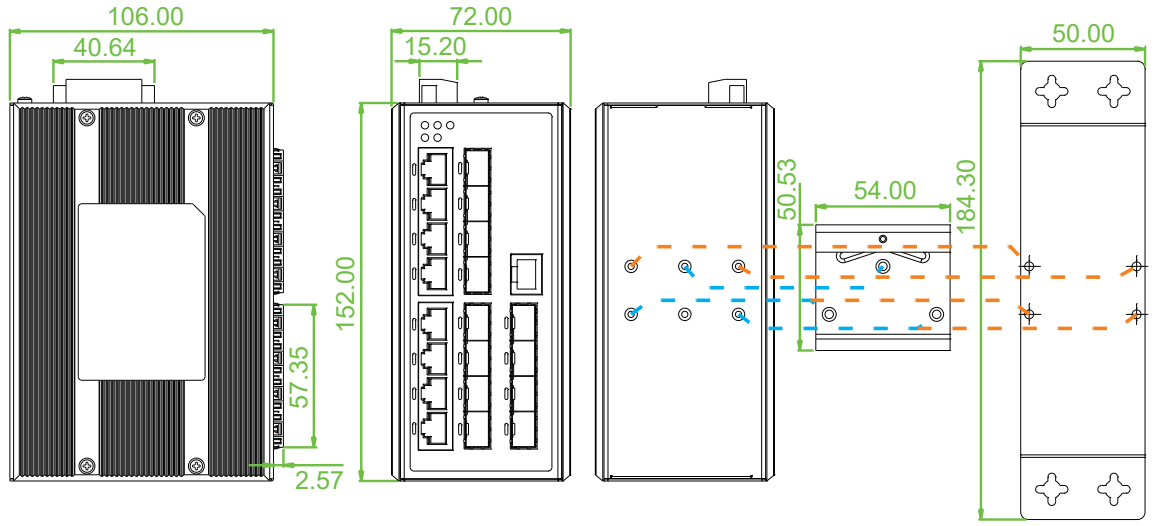
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported

IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	Redundant	UL60950-1 EN62368-1	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IGS-812SM	V	20	8	12 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-812SM-E	V	20	8	12 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-1604SM

16x GbE RJ45 + 4x 100/1000Base-X SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The Layer 2 managed industrial Ethernet switch, IGS-1604SM, has 16 Gigabit UTP ports and is equipped with 4 100/1000 SFP slots for centralized fiber optic connections to meet expanded transmission in a variety of requirements and locations. Long distance and high-speed transmission, fanless design, high MTBF, 4KV surge protection, supports wide operating temperature, 12/24/48VDC redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automation, data centers, smart transportation systems, military, and harsh application conditions such as utility markets exceed commercial product specifications.

Features

- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 40Gbps (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	16x 10/100/1000Base-T RJ-45+ 4x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto-negotiation speed, Auto MDI/MDI-X function
	SFP port supports dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	14.5W
24 VDC	14.4W
48 VDC	16.3W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-1604SM) -40 ~ 75°C (IGS-1604SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x152 mm (D x W x H)
Weight	0.82kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	412,015 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE EN55022 Class A
Railway Traffic	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, EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

IPv6 Features

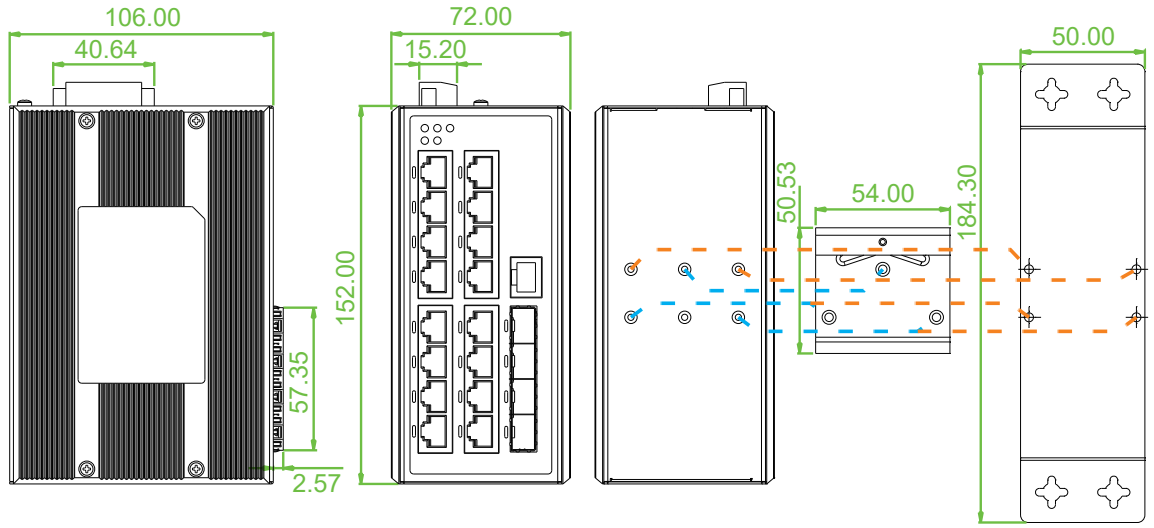
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported

IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100/1000 Base-T	100/1000 Base-X	Redundant	UL60950-1 EN62368-1	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IGS-1604SM	V	20	16	4 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-1604SM-E	V	20	16	4 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-1604XSM

16x GbE + 4x GbE/2.5G/5G/10GBase-X SFP+

- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

An Industrial 20-port Ethernet switch comes with 16 ports Gigabit copper interface and 4 ports 10 Gigabit SFP+ slots, supporting various types of 10 and 2.5Gigabit optical small form-factor pluggable transceivers for long-distance and wide-bandwidth transmission, supports STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for link redundancy. Moreover, CTC proprietary µ-Ring supports recovery time<10ms in 250 devices to enhance a reliable non-stop network that used to connect various types of Ethernet devices. It adopts an enhanced and hardened design for high surge protection, wide operating temperature and safety certified to meet critical and centralize strict requirements.

Features

- 12/24/48VDC (9.6~60VDC) redundant dual input power
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

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
	IEEE802.3ae	10G bit/s Ethernet over Fiber
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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)

Switch Architecture	Back-Plane (Switching Fabric): 112Gbps (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	16x 10/100/1000Base-T RJ-45 + 4x 100/1000/2.5G/5G/10GBase-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 1G/2.5G/5G/10G speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 12/24/48VDC (9.6~60VDC) input power, (Removable terminal block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	22.7W
24 VDC	24.3W
48 VDC	28.5W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)
	SFP Slot: 1G/2.5G/5G Link/Active (Amber), 10G Link/Active (Blue)
Jumbo Frame	10KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	32K
Memory Buffer	4M Bytes for packet buffer
Device Memory	128M Bytes Flash ROM, 2G Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DO (Alarm Relay Contact)	Relay outputs with current carrying capacity of 1 A @24VDC
DI Input	DI 17 to 30 V for state 1 / 0 to 15 V for state 0
Removable Terminal Block	Provides 2 terminal block for DO (Alarm Relay), DI, redundant power PWR1 and PWR2
Operating Temperature	-40 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	155.6 x 77 x 160mm (D x W x H)
Weight	2.035g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	251,400 (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" mand 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

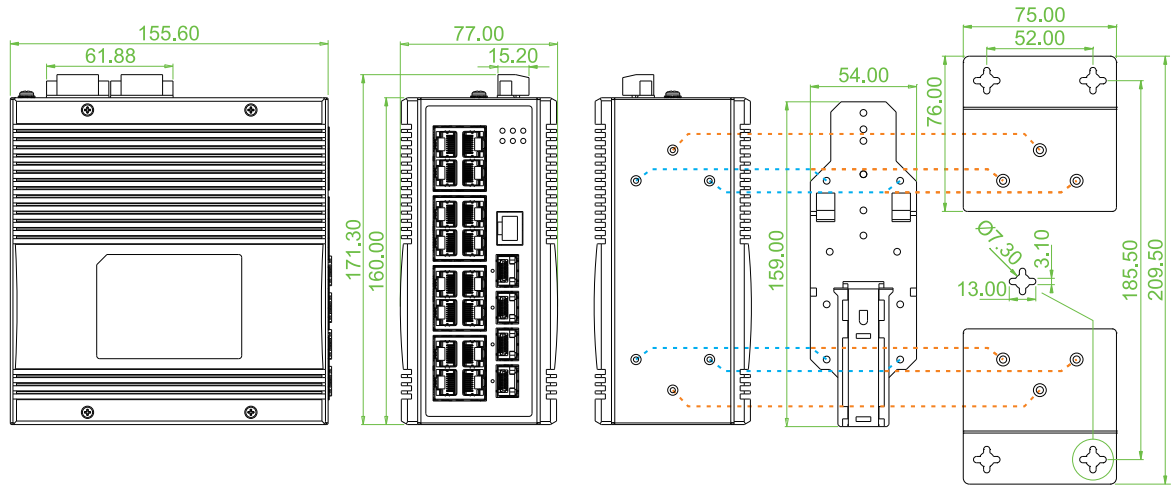
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Ordering Information

Model Name	Total Port	UTP	Fiber	Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	1000/2.5G/5G/10G Base-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-1604XSM	20	16	4 SFP	12/24/48VDC	V	V	V	V	-40 ~ 60°C

Optional Accessories

■ Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W -20 ~ +70°C

IFS-402CGSW

4x FE RJ45 + 2x 100/1000 SFP, Compact size

- 4KV surge protection for UTP and SFP ports
- Compact size for easy installation
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size managed Ethernet switch IFS-402CGSW, features 4 ports 10/100bps UTP and equipped with 2 100/1000bps SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant power input
- Cable diagnostics
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	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
	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)
Switch Architecture	Back-Plane (Switching Fabric): 4.8Gbps (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	4x 10/100Base-TX RJ-45 + 2x FE/GbE SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports FE/GbE with DDMI	
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	

Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	4.7W
24 VDC	4.8W
48 VDC	5.3W

LED	System: Power 1 (Green), Power 2 (Green)
	UTP: 100 Link/Active (Green), 10 Link/Active (Amber)
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)
Jumbo Frame	10K
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	4K
Memory Buffer	1.75M bits for packet buffer
Device Memory	128M Bytes Flash ROM, 256M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message
Removable Terminal Block	Provides 2 redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IFS-402CGSW) -40 ~ 75°C (IFS-402CGSW-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106x 31.6x 142mm (Dx Wx H)
Weight	535g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	1038,003Hours (MIL-HKBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
Surge Protection	4KV for UTP and Fiber ports
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Loop Protection	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Supports for management and monitoring
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Supports 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail
DNS	Client, Proxy
NTP	Client
LLDP (IEEE802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

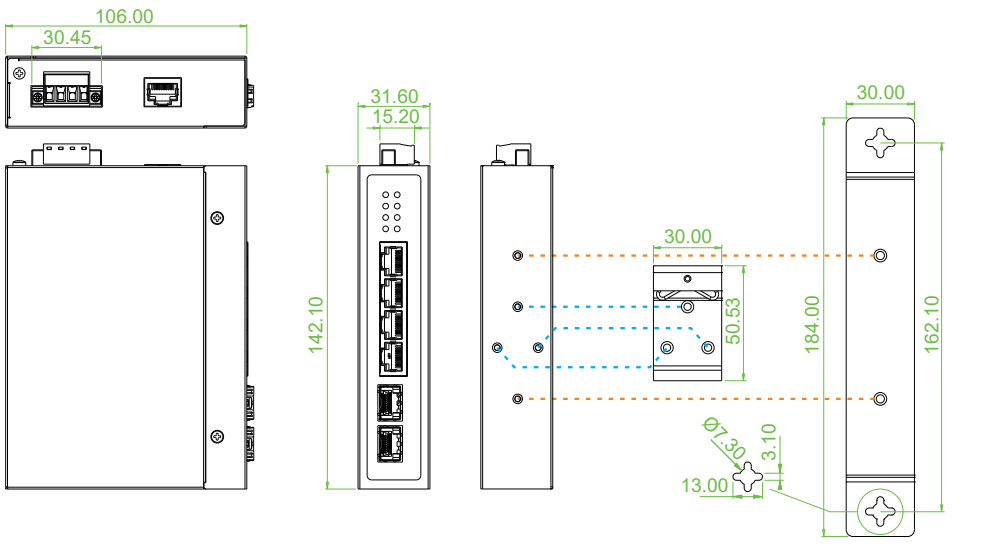
IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP	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 SIP ,Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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
Cable Diagnostic	Measuring UTP cable normal or broken point distance

Dimensions



Side View Front View Rear View DIN-Rail Kit View Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45	Fiber	Input Power	Certification				Operating 10/100Base-TX
		10/100Base-TX	100/1000 Base-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-402CGSW	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS-402CGSW-E	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-402GSM

4x 10/100Base RJ45 + 2x 100/1000Base SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial managed Ethernet switch IFS-402GSM has 4 10/100 UTP ports, equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, and supports wide operating temperature, redundant 12/24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses.Supports up to 5 rings in one device (Please see CTC u-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 4.8Gbps (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	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual Input power (Removable Terminal Block) 12/24/48V
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	5.7W
24 VDC	5.8W
48 VDC	8.5W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-402GSM) -40 ~ 75°C (IFS-402GSM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.715kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	861,962 hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Traffic control	NEMA TS2
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 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Support 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

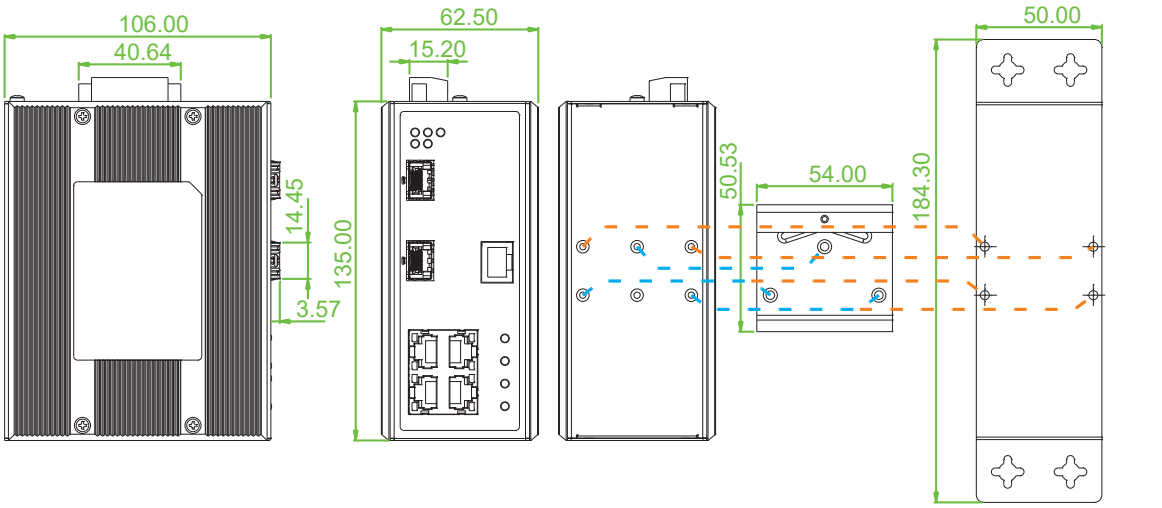
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	UL60950-1	NEMA TS 2	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IFS-402GSM	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS-402GSM-E	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS+402GSM

4x 10/100Base RJ45 + 2x 100/1000Base SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial managed Ethernet switch IFS+402GSM has 4 10/100 UTP ports, equipped with two 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection, and supports wide operating temperature, redundant 12/24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant dual DC input power 12/24/48VDC (9.6~60VDC)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 4.8Gbps (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	4x 10/100Base-TX RJ-45 and 2x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	6.3W
24 VDC	6.5W
48 VDC	7.7W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS+402GSM) -40 ~ 75°C (IFS+402GSM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.64kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	861,962 hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	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

Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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
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

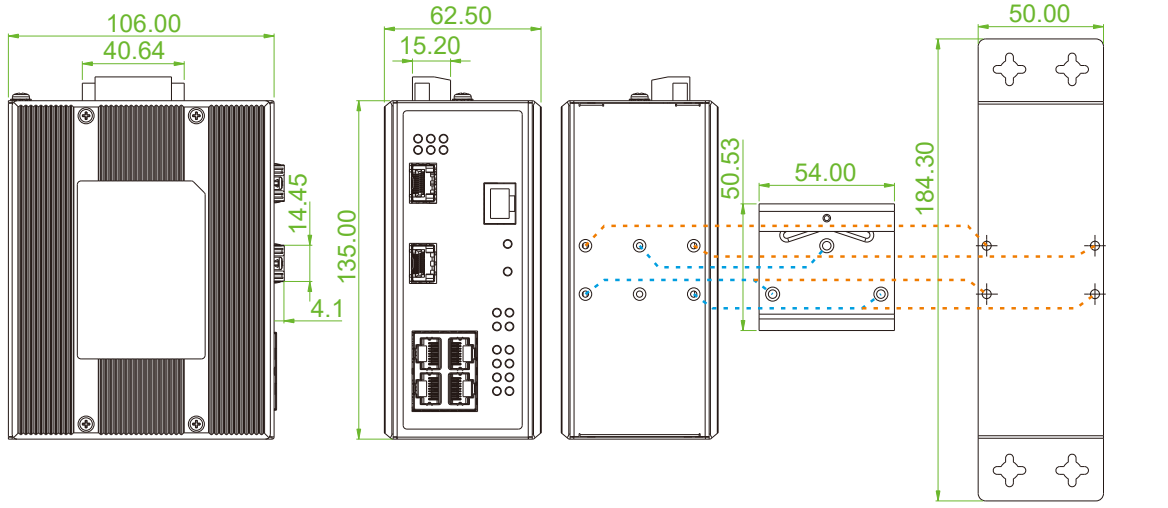
CLI	Cisco® like CLI
WeB UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features	
Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification			Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	
IFS+402GSM	V	6	4	2 SFP	12/24/48VDC	V	V	V	-10~60°C
IFS+402GSM-E	V	6	4	2 SFP	12/24/48VDC	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS+803GSM

8x 10/100Base RJ45 + 3x 100/1000Base SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN60950-1, EN62368-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial managed Ethernet switch IFS+803GSM has 8 10/100 UTP ports, equipped with three 100/1000 SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, 4KV surge protection, and supports wide operating temperature, redundant 12/24/48VDC power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automations, data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Redundant dual DC input power 12/24/48VDC (9.6~60VDC)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 7.6Gbps (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	8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	7.4W
24 VDC	7.8W
48 VDC	8.9W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS+803GSM) -40 ~ 75°C (IFS+803GSM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.81kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	688,248 hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
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, EN60950-1, EN62368-1
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge Protection	4KV for UTP and Fiber port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Support 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

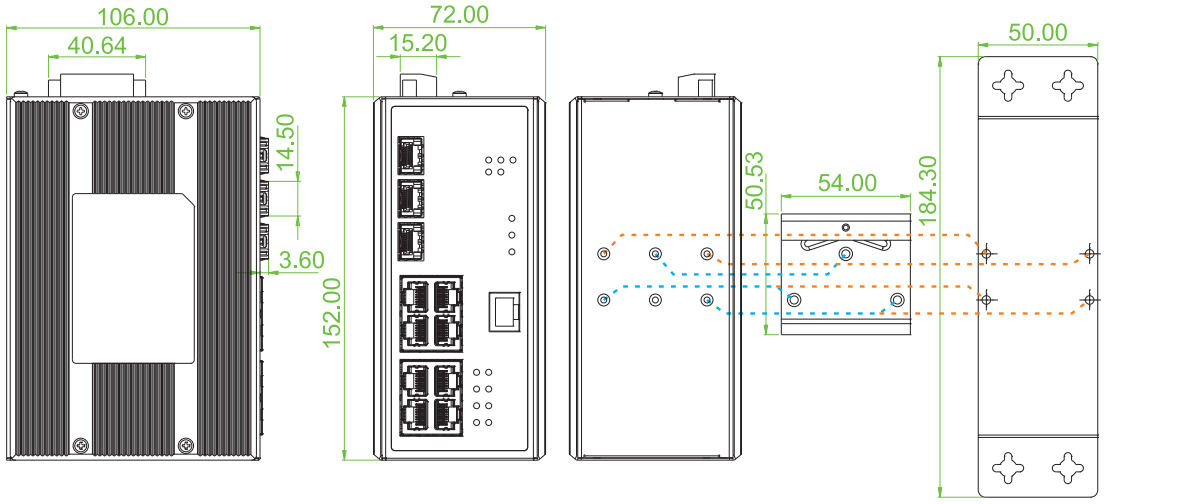
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	NEMA TS2	UL60950-1 EN60950-1 EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IFS+803GSM	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS+803GSM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-1604GSM

16x 10/100Base RJ45 + 4x 100/1000Base SFP

- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance
- UL60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The Layer 2 managed industrial Ethernet switch, IFS-1604GSM, has 16 10/100 UTP ports and is equipped with 4 100/1000 SFP slots for centralized fiber optic connections to meet expanded transmission in a variety of requirements and locations. Long distance and high-speed transmission, fanless design, high MTBF, 4KV surge protection, supports wide operating temperature, 12/24/48VDC redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automation, data centers, smart transportation systems, military, and harsh application conditions such as utility markets exceed commercial product specifications.

Features

- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses.Supports up to 5 rings in one device (Please see CTC u-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- 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
- Supports EMS Management

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	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)
	ITU-T G.8031 / Y.1342	EPS (Ethernet 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
	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): 11.2Gbps (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	16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP
	RJ-45 UTP port suppors Auto negotiation speed, Auto MDI/MDI-X function
	SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP Cat. 5e cable or above
	EIA/TIA-568 100-ohm (100meter)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual Input power (Removable Terminal Block) 12/24/48VDC (9.6~60VDC)
Power Consumption	

Input Voltage	Total Power Consumption
12 VDC	10.8W
24 VDC	10.6W
48 VDC	12.5W

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	UTP: 10/100 Link/Active (Green)
	SFP Slot: Link/Active (Green)
Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Device Memory	16M Bytes Flash ROM, 128M Bytes RAM
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-1604GSM) -40 ~ 75°C (IFS-1604GSM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.82kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	419,048 hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
Railway Traffic	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, EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
	Voice VLAN
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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 in the ring supports 250 nodes.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p 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	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, 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, Authorization, Accounting
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 UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
ModBus/TCP	Support 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	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED

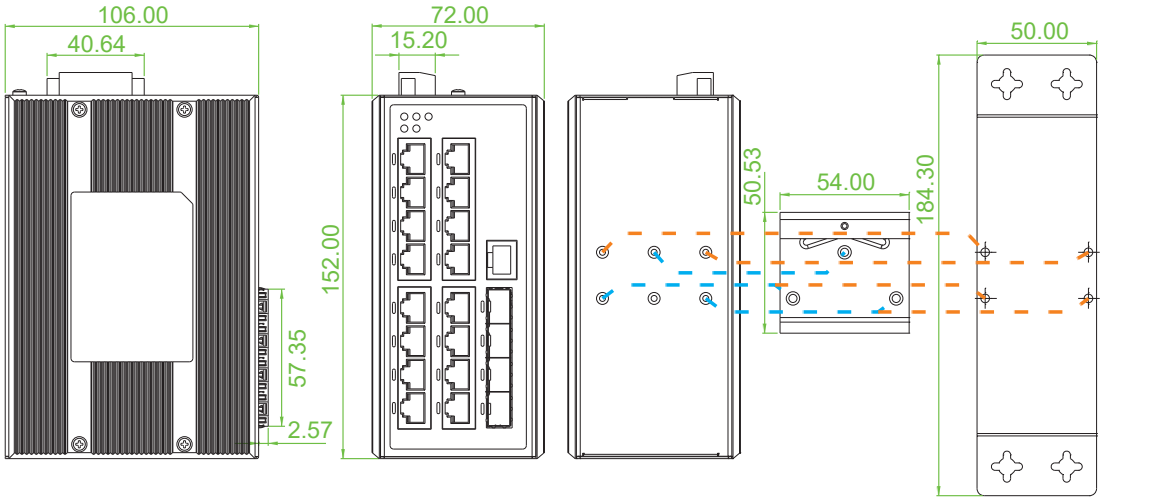
IPv6 Features

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 SIP, Subnet (32bit) L4: TCP/UDP

Others Features

Green Ethernet	Supports IEEE 802.3az 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 normal or broken point distance

Dimensions



Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification			Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	UL60950-1 EN62368-1	EN50121-4	CE, FCC EN61000-6-2 EN61000-6-4	
IFS-1604GSM	V	20	16	4 SFP	12/24/48VDC	V	V	V	-10~60°C
IFS-1604GSM-E	V	20	16	4 SFP	12/24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-402CS

4x GbE RJ45 + 2x 100/1000Base-X SFP, Compact size

- 4KV surge protection for UTP and SFP ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size Gigabit Ethernet switch IGS-402CS, plug and play easy to use, features 4 ports Gigabit UTP and equipped with 2 100/1000bps SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 12/24/48VDC (9.6~60VDC) redundant dual input power
- Supports DIP switch to set broadcast storm protection, SFP Auto/Force Mode, SFP 100M/1000M ; RJ45 Auto/force mode, 10M/100M, Full/half.
- Supports flow control
- Provides broadcast storm protection
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 12 Gbps	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	4K	
Packet Buffer Size	1.75Mbit	
Max Frame Size	1522Bytes	
Jumbo Frame	10K Byte	
Network Connector	4x RJ-45 for 10/100/1000Base-T Auto Negotiation Speed or Force Mode, Auto MDI/MDI-X function, Full/Half duplex	
	2x 100/1000Base-X SFP, Auto or Force Mode	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um	
	Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)	
DIP SW	DIP 1	Broadcast Protection
		OFF : Enable ON : Disable
	DIP 2	Off: Fiber Auto
		On: Fiber Force Mode
	DIP 3	SFP Fiber Speed
		OFF: Giga ON: 100M
	DIP 4	RJ45 Mode
		OFF: Auto ON: Force
	DIP 5	RJ45 Speed
		OFF: 100M ON: 10M
	DIP 6	RJ45 Duplex
		OFF: Full ON: Half
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 12/24/48VDC (9.6~60VDC) input power (Removable terminal block)	

Power Consumption

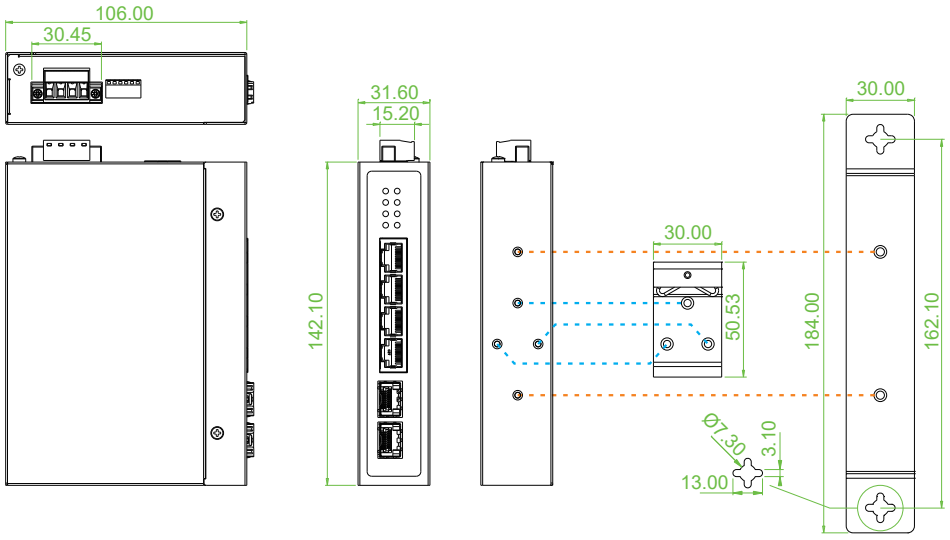
Input Voltage	Total Power Consumption
12 VDC	5.8W
24 VDC	6.5W
48 VDC	8.2W

Removable Terminal Block	Provides 2 Redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IGS-402CS)
	-40 ~ 75°C (IGS-402CS-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106x 31.6x 142mm (D X W X H)
Weight	420g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	862,267Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
4KV Surge Protection	Supported for UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Side View Front View Rear View DIN-Rail Kit View Wall-Mount Kit View

(Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	Input Power	Certification				Operating Temperature
		10/100/1000 Base-T	100/1000 Base-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402CS	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-402CS-E	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-402S & IGS-402F

- 4x GbE RJ45 + 2x 100/1000Base SFP
- 4x GbE RJ45 + 2x 1000Base Fiber (ST/SC)

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- UL60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial unmanaged Ethernet switches provide stable and reliable Ethernet transmission. IGS-402S and IGS-402F have 4 Gigabit UTP ports and are equipped with 2 Gigabit SFP slots or 2 SC/ ST connector type Gigabit optical fiber ports to meet extended transmission distance requirements. It adopts a rugged enclosure designed for harsh environments, is fanless, has high MTBF, and supports wide operating temperature, redundant 12/24/48VDC power input, and is suitable for industrial networks, intelligent transportation systems (ITS) and environmental applications, and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C ("-E" model)
- Supports flow control
- Supports jumbo frame

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-Plane (Switching Fabric): 12Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Provides Broadcast Storm Protection	Present, Enable / Disable set by DIP SW	
Jumbo Frame	10K Bytes	
MAC Address Table	8K	
Packet Buffer Size	1Mbits	
Network Connector	4 x RJ-45	
	10/100/1000Base-TX Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
	2 1000Base-X Fiber SC connector (IGS-402F) 2 100/1000Base-X SFP connector (IGS-402S)	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um	
	Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	

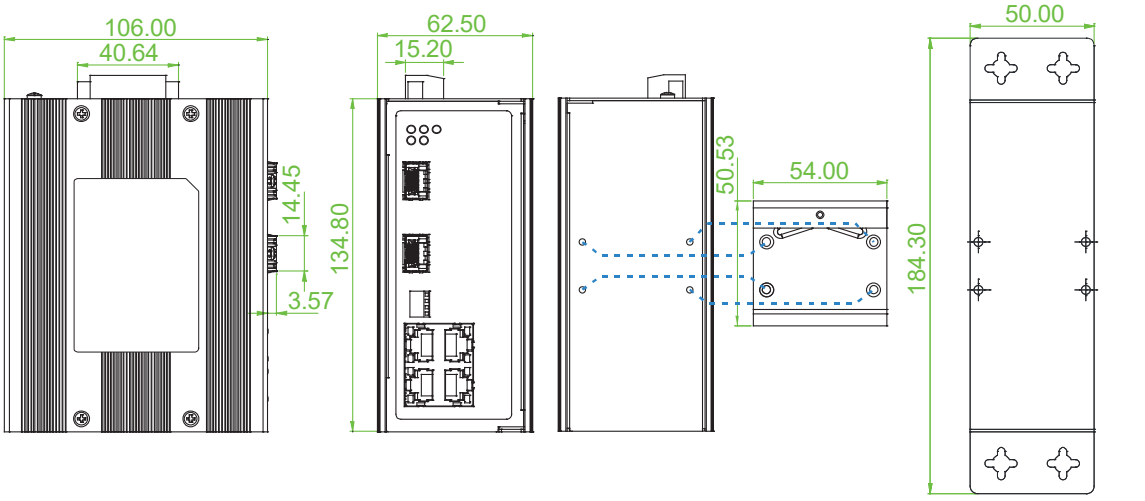
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green)	
	Speed 10 (OFF), 100 (Green), 1000 (Yellow)	
	SFP Slot: Link/Active (Green)	
DIP SW	DIP 1	ON : Disable power failure alarm
		OFF : Enable power failure alarm
	DIP 2	ON : Disables broadcast storm protection
		OFF : Enable broadcast storm protection
	DIP 4	ON : Fiber 2 for 100Base-FX SFP
		OFF : Fiber 2 for Gigabit SFP (IGS-402S)
	DIP 4	ON : Fiber 1 for 100Base-FX SFP
		OFF : Fiber 1 for Gigabit SFP (IGS-402S)
Reverse Polarity Protection	Supported for Power Input	
Overload current protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)	
Power Consumption	7.9W (IGS-402F)	
	7.9W (IGS-402S)	
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC	
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin	
Operating Temperature	-10 ~ 60°C (IGS-402S, IGS-402F)	
	-40 ~ 75°C (IGS-402S-E, IGS-402F-E)	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection, Fanless	
Dimensions	106 x 62.5 x 134.8 mm (D X W X H)	
Weight	0.84kg (IGS-402S) 0.68kg (IGS-402F)	
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)	
MTBF	1,000,643 Hours (IGS-402S) 821,412 Hours (IGS-402F) (MIL-HDBK-217)	
Warranty	5 years	

Certification

EMC/EMS	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

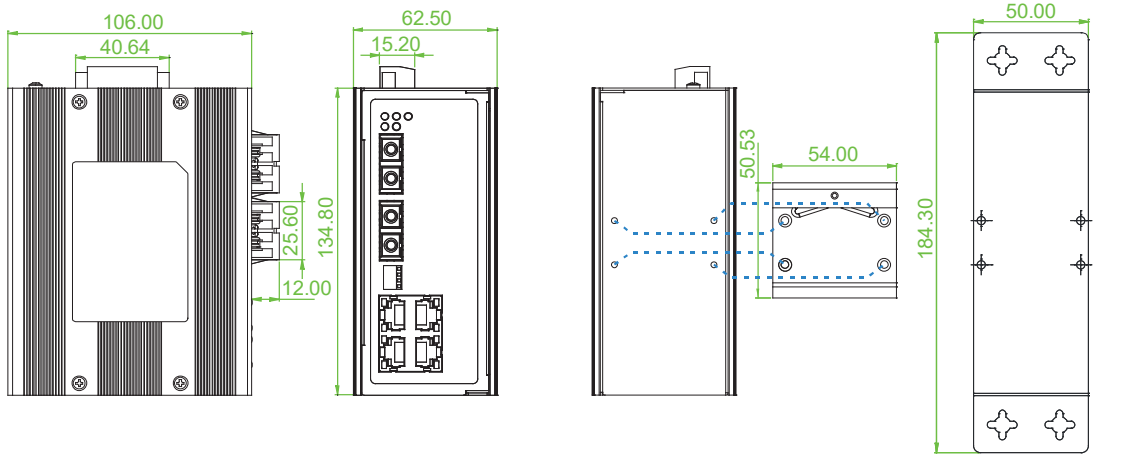
Dimensions

▶ IGS-402S



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

▶ IGS-402F



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port		Power Input	Certification				Operating Temperature
		10/100/1000 Base-T	1000 Base-X	100/1000 Base-X	Redundant	UL60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402S	6	4		2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-402S-E	6	4		2 SFP	12/24/48VDC	V	V	V	V	-40~75°C
IGS-402F	6	4	2 SC		12/24/48VDC	V	V	V	V	-10~60°C
IGS-402F-E	6	4	2 SC		12/24/48VDC	V	V	V	V	-40~75°C

Fiber Connector	Connectivity Distance
SC (IGS-402F only)	SC001: 500m (SC, M/M) 002 : 2km (M/M) SC020: 20km (SC, S/M) SC040: 40km (SC, S/M)
	SC020A: WDM 20km A type (TX:1310nm)
	SC020B: WDM 20km B type (TX:1550nm)

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-500

5x GbE RJ45

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Gigabit Ethernet switch IGS-500 provides stable and reliable Ethernet transmission, features 5 ports Gigabit UTP. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Supports flow control
- Jumbo frame support
- Supports IEEE 802.3az Green Ethernet
- Supports auto-negotiation and auto-MDI/MDI-X
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40~75° C (-E model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 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 802.3x	Flow Control
Switch Architecture	Back-Plane (Switching Fabric): 10Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control for Full duplex , back pressure for half duplex	
Provides Broadcast Storm Protection	Supported	
Jumbo Frame	9.6KBytes	
MAC Address Table	8K	
Packet Buffer Size	128K Byte	
Network Connector	5 x 10/100/1000Base-T RJ-45	
	10/100/1000Base-TX Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5 cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	SFP Slot: Link/Active (Green)	
DIP SW	DIP 1	ON : Disable
		OFF : Enable power failure alarm
	DIP 2	ON : Disables broadcast storm protection
		OFF : Enable broadcast storm protection
	DIP 3	Green Ethernet
		ON : Disable Green Ethernet
		OFF : Enable 802.3az Green Ethernet
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC), or AC 24V (18~36VAC) Input power (Removable Terminal Block)	

Power Consumption

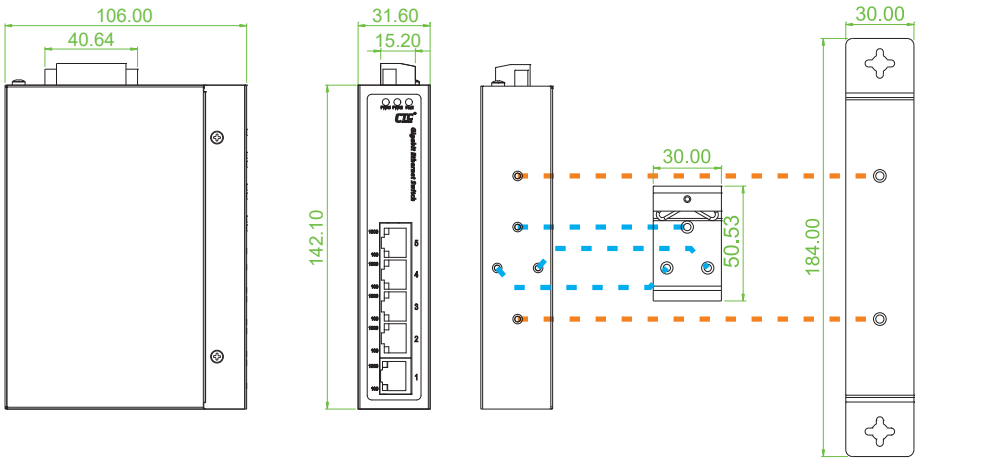
Input Voltage	Total Power Consumption
12 VDC	3.3W
24 VDC	3.4W
48 VDC	4.8W

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10°C~60°C (IGS-500)
	-40°C~75°C (IGS-500-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30Protection and fanless
Dimensions	106 x 31.6 x 142 mm (D x W x H)
Weight	0.41kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,154,166hrs (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port	Power Input	Certification			Operating Temperature
		10/100/1000Base-T	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-500	5	5	12/24/48VDC	V	V	V	-10~60°C
IGS-500-E	5	5	12/24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IGS-800

8x GbE RJ45

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Gigabit Ethernet switch IGS-800 provides stable and reliable Ethernet transmission, features 8 ports Gigabit UTP. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Supports flow control
- Jumbo frame support
- Supports IEEE 802.3az Green Ethernet
- Supports auto-negotiation and auto-MDI/MDI-X
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40~75° C (-E model)

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 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 802.3x	Flow Control
Switch Architecture	Back-Plane (Switching Fabric): 16 Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control for Full duplex , back pressure for half duplex	
Provides Broadcast Storm Protection	Supported	
Jumbo Frame	9.6KBytes	
MAC Address Table	8K	
Packet Buffer Size	512K Byte	
Network Connector	8 x 10/100/1000Base-T RJ-45	
	10/100/1000Base-TX Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex	
Network Cable	UTP/STP Cat. 5 cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Yellow)	
	SFP Slot: Link/Active (Green)	
DIP SW	DIP 1	ON : Disable
		OFF : Enable power failure alarm
	DIP 2	ON : Disables broadcast storm protection
		OFF : Enable broadcast storm protection
	DIP 3	Green Ethernet
		ON : Disable Green Ethernet
		OFF : Enable 802.3az Green Ethernet
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC), or AC 24V (18~36VAC) Input power (Removable Terminal Block)	

Power Consumption

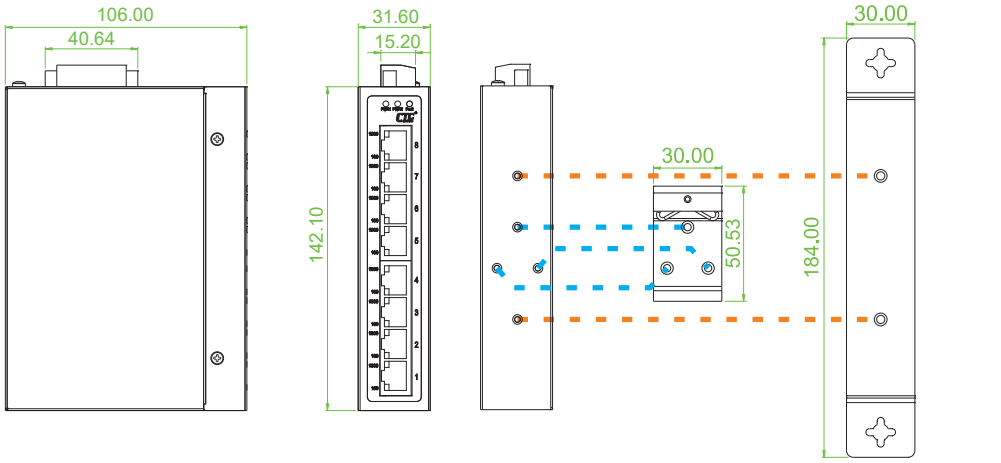
Input Voltage	Total Power Consumption
12 VDC	7.0W
24 VDC	7.0W
48 VDC	8.7W

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10°C~60°C (IGS-800)
	-40°C~75°C (IGS-800-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30Protection and fanless
Dimensions	106 x 31.6 x 142 mm (D x W x H)
Weight	0.44kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	747,984hrs (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port	Power Input	Certification			Operating Temperature
		10/100/1000Base-T	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-800	8	8	12/24/48VDC	V	V	V	-10~60°C
IGS-800-E	8	8	12/24/48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-401F & IFS-402F

4x 10/100Base RJ45 + 1x (or 2x) 100Base Fiber (ST/SC)

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Ethernet switches provide stable and reliable Ethernet transmission, IFS-401F and IFS-402F have 4-port 10/100 UTP and are equipped with 1 or 2 100bps SC/ST optical fiber ports to meet Requirements for extending transmission distance Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C (-E model)
- Provides broadcast storm protection

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-Plane (Switching Fabric): IFS-401 1.0Gbps, IFS-402 1.2Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
	1,488,000pps for Giga Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Provides Broadcast Storm Protection	Present, Enable /Disable set by DIP SW	
MAC Address Table	2K	
Packet Buffer Size	448Kbit	
Network Connector	4x RJ-45, 1x Fiber (IFS-401F), 4x RJ-45, 2x Fiber (IFS-402F)	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX Auto negotiation speed, Full/Half duplex	
	1 or 2x 100Base-FX SC/ST fiber port, Multi/Single Mode	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um~62.5/125um	
	Fiber Cable (Single-mode): 8/125um~10/125um	
	Wavelength: 1310nm (Multi-mode/Single-mode)	
	Available distance: 2KM (Multi-Mode), 30KM (Single-Mode), 50KM (Single Mode)	

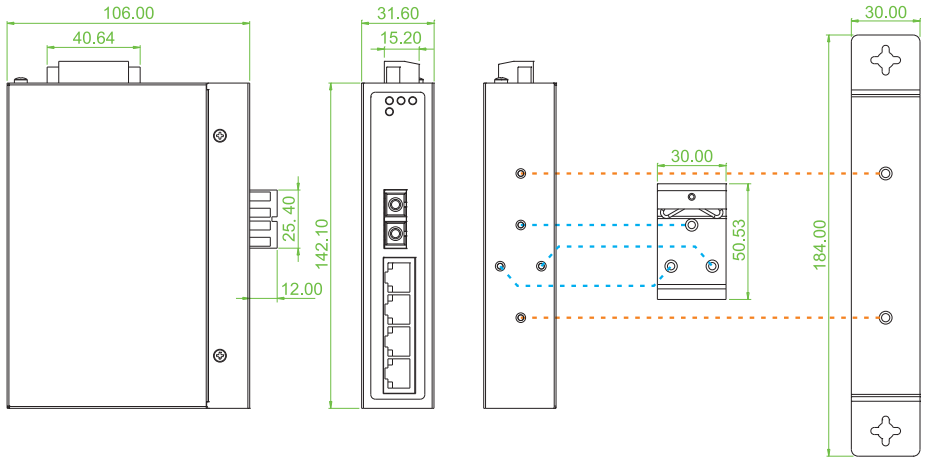
Protocol	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green), Speed 100 (Yellow)	
	Fiber: Link/Active (Green)	
DIP SW	DIP 1	OFF : Enable power failure alarm
		ON : Disable
	DIP 2	Broadcast storm protection
		OFF : Enable ON : Disables
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)	
Power Consumption	4.4W (IFS-401F) 5.8W (IFS-402F)	
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC	
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin	
Operating Temperature	-10 ~ 60°C (IFS-401F, IFS-402F)	
	-40 ~ 75°C (IFS-401F-E, IFS-402F-E)	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection and Fanless	
Dimensions	106 x 31.6 x 142mm (D x W x H)	
Weight	0.37kg (IFS-401F), 0.42kg (IFS-402F)	
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)	
MTBF	908,971 Hours (IFS-401F) 907,622 Hours (IFS-402F) (MIL-HDBK-217)	
Warranty	5 years	

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

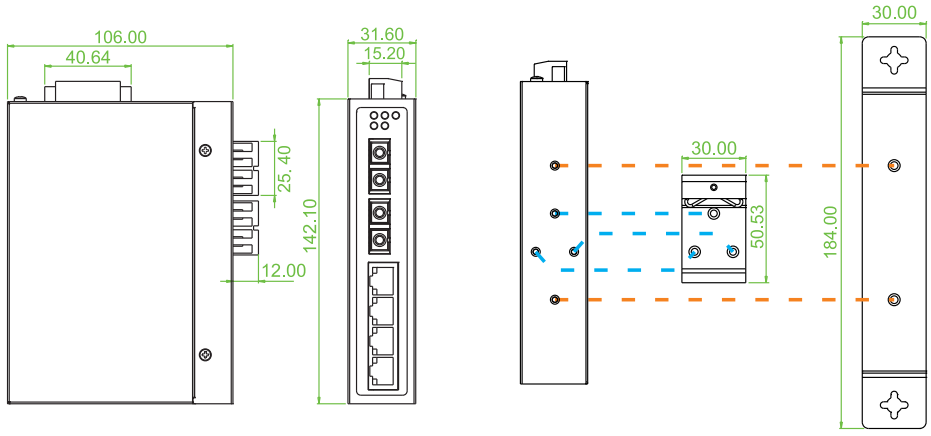
Dimensions

▶ IFS-401F



Side View　Front View　Rear View　DIN-Rail Kit View　Wall-Mount Kit View (Optional Accessory)

▶ IFS-402F



Side View　Front View　Rear View　DIN-Rail Kit View　Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	Certification			Operating Temperature
		10/100Base-TX	100Base-FX	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-401F	5	4	1 SC/ST	V	V	V	-10~60°C
IFS-401F-E	5	4	1 SC/ST	V	V	V	-40~75°C
IFS-402F	6	4	2 SC/ST	V	V	V	-10~60°C
IFS-402F-E	6	4	2 SC/ST	V	V	V	-40~75°C

Fiber Connector	Connectivity Distance
SC, ST	002: 2km　030: 30km　050: 50km
	020A: WDM Bidi 20km A type (TX:1310nm)
	020B: WDM Bidi 20km B type (TX: 1550nm)

Optional Accessories

■ Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm (Narrow)

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-402CGS

4x 10/100Base-TX RJ45 + 2x 100/1000Base-X SFP, Compact size

- 4KV surge protection for UTP and SFP ports
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size unmanaged Ethernet switch IFS-402CGS, plug and play easy to use, features 4 ports 10/100 UTP and equipped with 2 100/1000bps SFP slots for fiber optic connections to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 12/24/48VDC (9.6~60VDC) redundant dual input power
- Supports DIP switch to set broadcast storm protection, SFP Auto/Force Mode, SFP 100M/1000M ; RJ45 Auto/force mode, 10M/100M, Full/half.
- Supports flow control
- Provides broadcast storm protection
- DIN Rail mounting or wall mounting

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 4.8 Gbps	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	4K	
Packet Buffer Size	1.75Mbit	
Max Frame Size	1522Bytes	
Jumbo Frame	10K Byte	
Network Connector	4x RJ-45 for 10/100Base-TX	
	Auto negotiation Speed or Force Mode, Auto MDI/MDI-X function, Full/Half duplex	
	2x 100/1000Base-X SFP, Auto or Force Mode	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Network Cable	Fiber Cable (Multi-mode): 50/125um, 62.5/125um Fiber Cable (Single-mode): 9/125um	
Protocols	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green)	
	UTP: 10 Link/Active (Amber), 100 Link/Active (Green)	
	SFP Slot: 100 Link/Active (Green), 1000 Link/Active (Amber)	
DIP SW	DIP 1	Broadcast Protection
		OFF : Enable ON : Disable
	DIP 2	Off: Fiber Auto
		On: Fiber Force Mode
	DIP 3	SFP Fiber Speed
		OFF: Giga ON: 100M
	DIP 4	RJ45 Mode
		OFF: Auto ON: Force
	DIP 5	RJ45 Speed
		OFF: 100M ON: 10M
	DIP 6	RJ45 Duplex
		OFF: Full ON: Half
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant dual 12/24/48VDC (9.6~60VDC) input power (Removable terminal block)	

Power Consumption

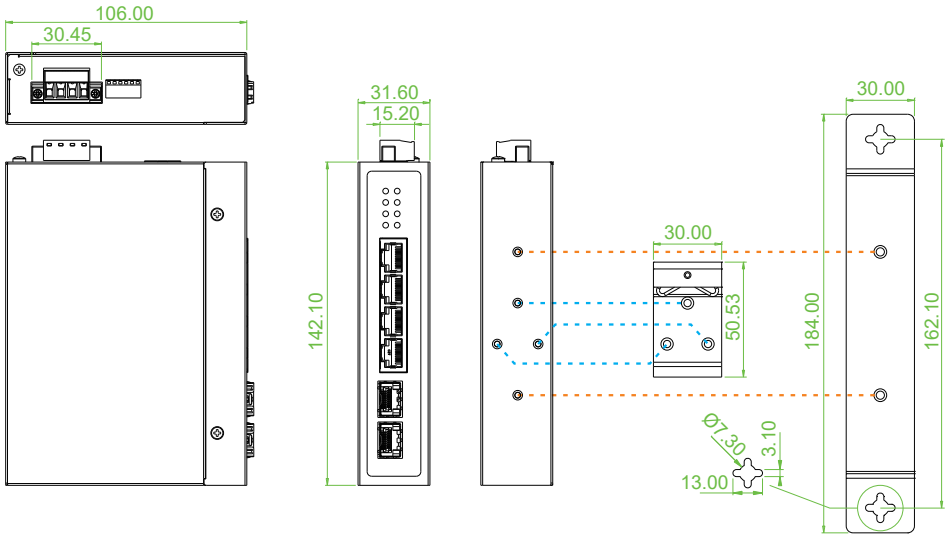
Input Voltage	Total Power Consumption
12 VDC	4.7W
24 VDC	4.8W
48 VDC	5.3W

Removable Terminal Block	Provides 2 Redundant power, 4 Pin
Operating Temperature	-10 ~ 60°C (IFS-402CGS)
	-40 ~ 75°C (IFS-402CGS-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106x 31.6x 142mm (D X W X H)
Weight	420g
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	940,044Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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	EN62368-1
4KV Surge Protection	Supported for UTP and SFP port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Side View Front View Rear View DIN-Rail Kit View Wall-Mount Kit View

(Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	Input Power	Certification				Operating Temperature
		10/100Base-T(X)	100/1000 Base-X	Redundant	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-402CGS	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS-402CGS-E	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product (184x30mm) (Narrow)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-500C

5x 10/100Base RJ45 (Compact Size)

- Compact size for easy installation
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial compact size unmanaged Ethernet switch IFS-500C provides stable and reliable Ethernet transmission, features 5 ports 10/100 UTP. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide range input power 12/24/48VDC (9.6~60VDC), or AC24V (18~36VAC)
- Wide operating temperature -40 ~ 75° C (-E model)
- Very low power consumption
- Supports flow control

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3x	Flow Control
Switch Architecture	Back-Plane (Switching Fabric): 1.0Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	1K	
Packet Buffer Size	448Kbits	
Network Connector	5x RJ-45	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX Auto negotiation speed, Full/Half duplex	
Network Cable	UTP/STP Cat. 5 cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocol	CSMA/CD	
LED	System: Power (Green)	
	UTP: Link/Active (Green)	
	Speed 100 (Yellow)	
Reverse Polarity Protection	For DC input power protection	
Overload Current Protection	Supported	
Power Supply	DC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)	

Power Consumption

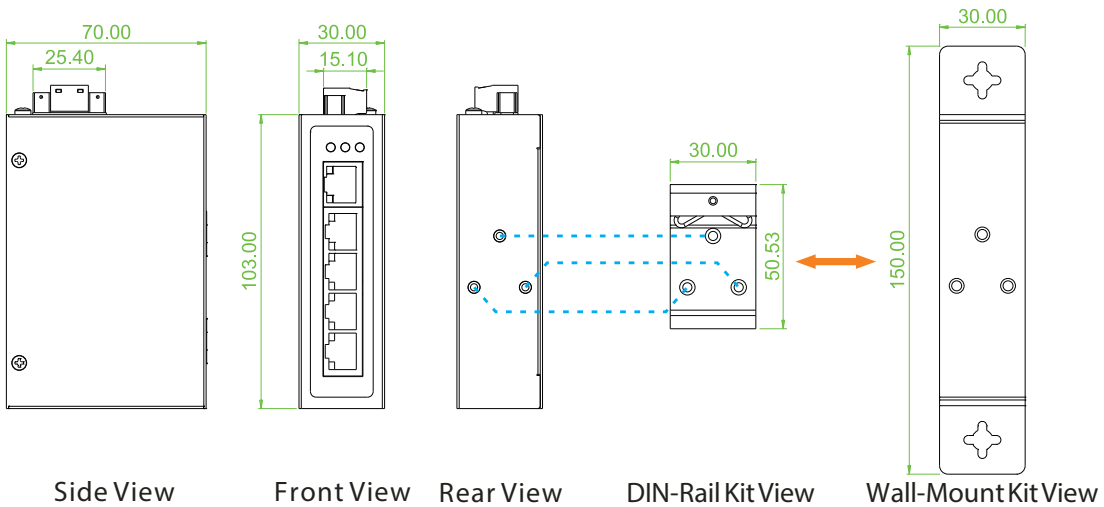
Input Voltage	Total Power Consumption
12 VDC	0.9W
24 VDC	1.2W
48 VDC	2W

Removable Terminal Block	Provides for input power (2 Pin)
Operating Temperature	-10 ~ 60°C (IFS-500C)
	-40 ~ 75°C (IFS-500C-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and Fanless
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	220g
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	1,738,327 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Power Input	Certification			Operating Temperature
		10/100Base-TX	Single Power	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-500C	5	5	12/24/48VDC, 24VAC	V	V	V	-10~60°C
IFS-500C-E	5	5	12/24/48VDC, 24VAC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-500

5x 10/100Base RJ45

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Ethernet switch IFS-500 provides stable and reliable Ethernet transmission, features 5 ports 10/100 UTP. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C (-E model)
- Provides broadcast storm protection
- Supports DIP SW for alarm setting and broadcast storm protection
- Supports flow control

Specifications

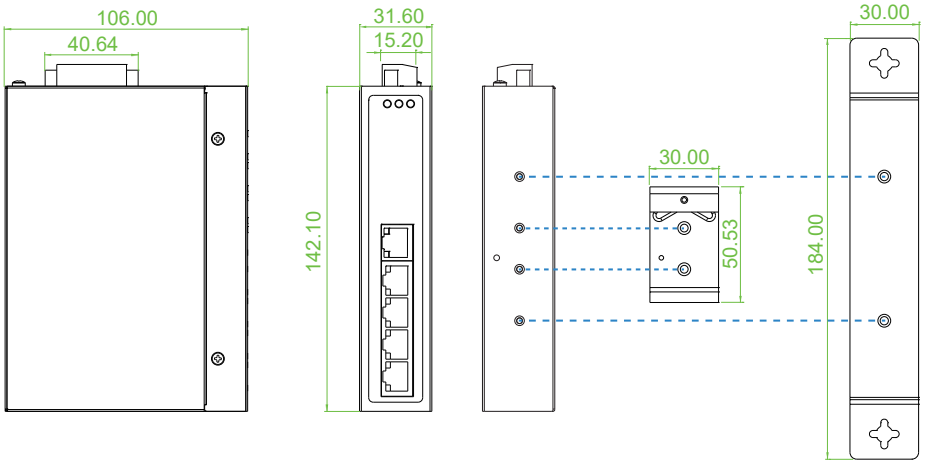
Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric) : 1.0 Gbps	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
	1,488,000pps for Giga Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Provides Broadcast Storm Protection	Present, Enable /Disable set by DIP SW	
MAC Address Table	2K	
Packet Buffer Size	448Kbit	
Network Connector	5x RJ-45	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX Auto negotiation speed, Full/Half duplex	
Network Cable	10Base-T: 2-pair UTP/STP Cat. 5 cable	
	EIA/TIA-568 100-ohm (100m)	
	100Base-TX: 2-pair UTP/STP Cat. 5 cable	
	EIA/TIA-568 100-ohm (100m)	

Protocol	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green)	
	Speed 100 (Yellow)	
DIP SW	DIP 1	OFF : Enable power failure alarm
		ON : Disable
	DIP 2	OFF : Enable broadcast storm protection
		ON : Disables broadcast storm protection
Reverse Polarity Protection	Present	
Overload Current Protection	Present	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)	
Power Consumption	2.9W	
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC	
Removable Terminal Block	Provide 2 Redundant power, Alarm relay contact, 6 Pin	
Operating Temperature	-10 ~ 60°C (IFS-500)	
	-40 ~ 75°C (IFS-500-E)	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection and Fanless	
Dimensions	106 x 31.6 x 142mm (D x W x H)	
Weight	0.42kg	
Installation Mounting	DIN Rail mounting or wall mounting	
MTBF	650,473Hrs (MIL-HDBK-217)	
Warranty	5 years	

Certification

EMC/EMS	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE EN55022 Class A
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	UTP Port	Certification				Operating Temperture
		10/100Base-TX	EN50121-4	EN61000-6-2, EN61000-6-4	CE	FCC	
IFS-500	5	5	V	V	V	V	-10~60 C
IFS-500-E	5	5	V	V	V	V	-40~75 C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm (Narrow)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C

IFS-800

8x 10/100Base RJ45

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Ethernet switch IFS-800 provides stable and reliable Ethernet transmission, features 8 ports 10/100 UTP. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C (-E model)
- Provides broadcast storm protection

Specifications

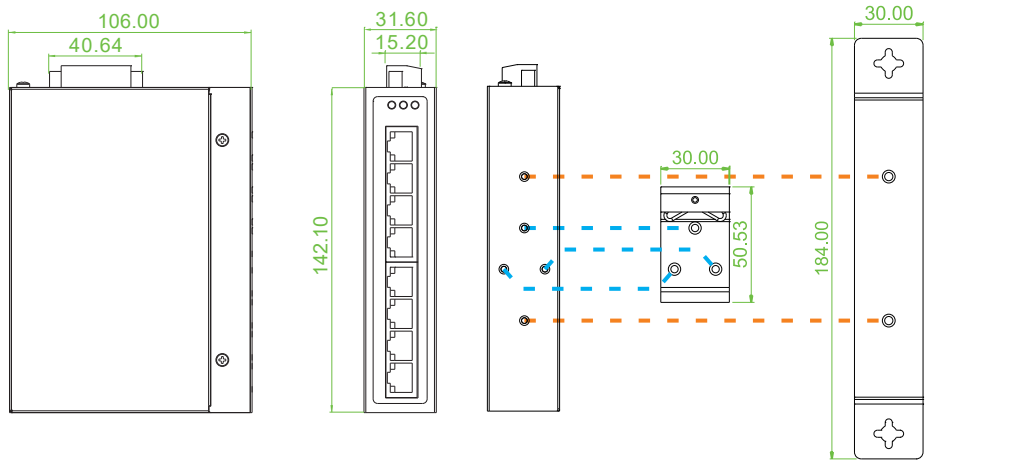
Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-Plane (Switching Fabric): 1.6Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
	1,488,000pps for Giga Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Provides Broadcast Storm Protection	Present, Enable / Disable set by DIP SW	
MAC Address Table	2K	
Packet Buffer Size	448Kbit	
Network Connector	8x RJ-45	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX Auto negotiation speed, Full/Half duplex	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocol	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green)	
	Speed 100 (Yellow)	
DIP SW	DIP 1	OFF : Enable power failure alarm
		ON : Disable
	DIP 2	Broadcast storm protection
		OFF : Enable ON : Disables

Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	3.9W
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-800)
	-40 ~ 75°C (IFS-800-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and Fanless
Dimensions	106 x 31.6 x 142mm (D x W x H)
Weight	0.43kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,064,064 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Total Port	RJ45 UTP Port	Certification			Operating Temperature
		10/100Base-TX	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IFS-800	8	8	V	V	V	-10~60°C
IFS-800-E	8	8	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm (Narrow)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-802GS

8x 10/100Base RJ45 + 2x 1000Base SFP

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Ethernet switch IFS-802GS provides stable and reliable Ethernet transmission, features 8 ports 10/100 UTP and equipped with 2 100/1000bps SFP slots. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C (-E model)
- IP30, rugged metal housing and fanless

Specifications

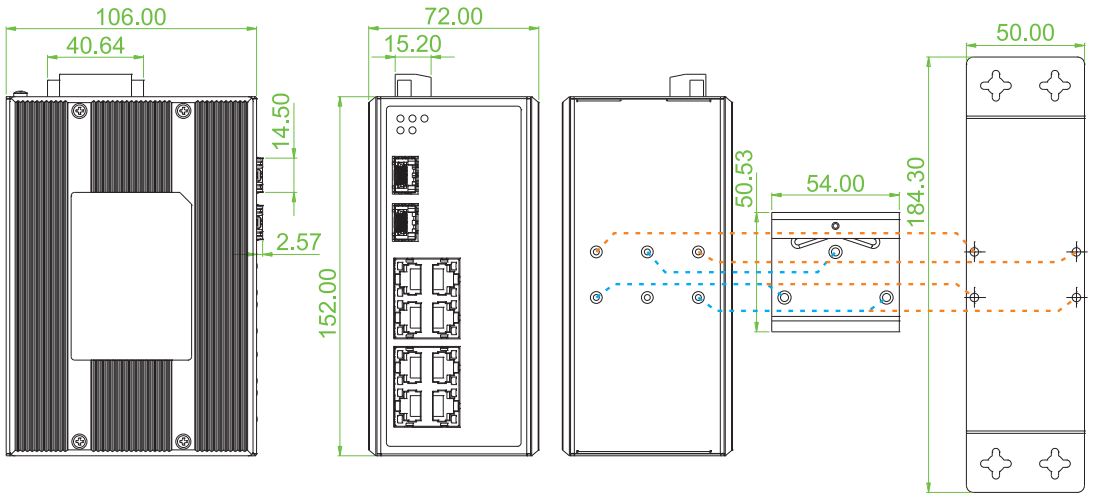
Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-Plane (Switching Fabric): 5.6Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
	1,488,000pps for Giga Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
MAC Address Table	8K	
Packet Buffer Size	1024Kbit	
Network Connector	8x RJ-45, 2x SFP	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplex	
	2x 1000Base-X SFP port	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Fiber Cable	Fiber Cable (Single-mode): 8/125um~10/125um	
	Wavelength: 1310nm (Multi-mode/Single-mode)	
	SFP: Distance depend on SFP Fiber Transceiver	
Protocol	CSMA/CD	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green), Speed 100 (Yellow)	
	SFP Slot : Link/Active (Green)	
DIP SW	DIP 1	OFF : Enable power failure alarm
		ON : Disable
	DIP 2	Reserve

Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	4.4W
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-802GS)
	-40 ~ 75°C (IFS-802GS-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and Fanless
Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.67kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	837,414 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	Certification			Operating Temperature
		10/100Base-TX	1000Base-X	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IFS-802GS	10	8	2 SFP	V	V	V	-10~60°C
IFS-802GS-E	10	8	2 SFP	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm (Wide)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFS-1602GS

16x 10/100Base RJ45 + 2x 1000Base SFP

- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial unmanaged Ethernet switch IFS-1602GS provides stable and reliable Ethernet transmission, features 16 ports 10/100 UTP and equipped with 2 100/1000bps SFP slots. Housed in rugged enclosures, designed for harsh environments, fanless, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Wide operating temperature -40 ~ 75° C (-E model)
- Provides broadcast storm protection
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power

Specifications

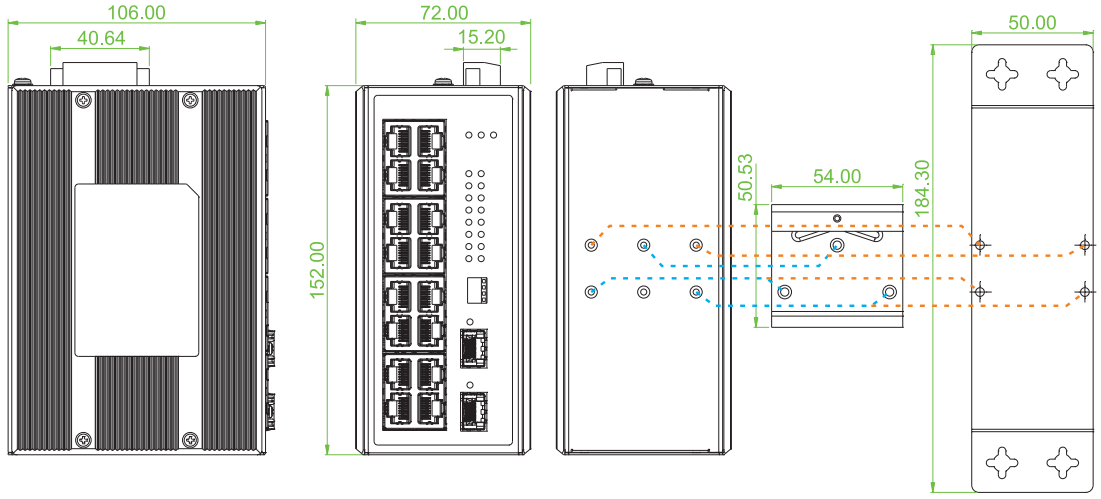
Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX and 100Base-FX Fast Ethernet
	IEEE 802.3z	1000Base-X Gigabit Ethernet over fiber-optic
	IEEE 802.3x	Flow Control and Back Pressure
Switch Architecture	Back-Plane (Switching Fabric): 7.2Gbps (Full Wire-Speed)	
Data Processing	Store and Forward	
Transfer Rate	14,880pps for Ethernet port	
	148,800pps for Fast Ethernet port	
	1,488,000pps for Giga Ethernet port	
Flow Control	IEEE 802.3x flow control, back pressure flow control	
Jumbo Frame	16K Byte	
MAC Address Table	16K	
Packet Buffer Size	4M bit	
Network Connector	16x RJ-45, 2x SFP	
	RJ-45 Port: Auto MDI/MDI-X function, 10/100Base-TX Auto negotiation speed, Full/Half duplex	
	2x 1000Base-X SFP port	
Fiber Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
	Fiber Cable (Multi-mode): 50/125um~62.5/125um	
Network Cable	Fiber Cable (Single-mode): 8/125um~10/125um	
	Wavelength: 1310nm (Multi-mode/Single-mode)	
	SFP: Distance depend on SFP Fiber Transceiver	
Protocol	CSMA/CD	

LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	UTP: Link/Active (Green), Speed 100 (Yellow)	
	SFP Slot : Link/Active (Green)	
DIP SW	DIP 1	OFF : Enable power failure alarm
		ON : Disable
	DIP 2	Broadcast storm protection
		OFF : Enable ON : Disables
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)	
Power Consumption	8.7W	
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC	
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin	
Operating Temperature	-10 ~ 60°C (IFS-1602GS)	
	-40 ~ 75°C (IFS-1602GS-E)	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection and Fanless	
Dimensions	106 x 72 x 152 mm (D x W x H)	
Weight	0.82kg	
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)	
MTBF	461,653 Hours (MIL-HDBK-217)	
Warranty	5 years	

Certification

EMC/EMS	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Hi-Pot Isolation Protection	DC 2.25KV for power to chassis ground, and UTP port to chassis ground
4KV Surge Protection	Supported for UTP Port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Total Port	RJ45 UTP Port	Fiber Port	Certification			Operating Temperature
		10/100Base-TX	1000Base-X	EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC	
IFS-1602GS	18	16	2 SFP	V	V	V	-10~60°C
IFS-1602GS-E	18	16	2 SFP	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm (Wide)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IBP-202

Optical Fiber Bypass Switch

- 100M/1G/2.5G/10G Ethernet or Telecom applications
- SC/ST/LC SM or MM optical
- Optical bypass switching time <10ms
- Provides rotary switch to set delay boot time (0~180 seconds)
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial-grade fiber optic bypass switches can be installed in 100M/1G/10G fiber optic networks. It protects the network from failures and subsequent maintenance by ensuring the integrity of the network during power outages. When a power failure occurs, the bypass switch is quickly set to bypass mode to isolate the main network from local network equipment. When the power returns to normal, the bypass switch will switch to the normal state and the local network equipment will be connected to the main network. It can be used with a CTCU industrial network switches to ensure non-stop network connectivity.

Features

- Low insertions loss (<1.5dB)
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 70° C

Specifications

Fiber Connector	SC, ST, LC
Operating wavelength	SM: 1260 ~ 1650nm / MM: 810~890nm , 1260~1340nm
Optic Fiber cable	Single mode: 8/125um~10/125um / Multi mode: 50/125um
Insertion loss	<1.5dB
Optical Switching time	< 10ms
LED indicator	Power 1, Power 2, Operation mode (Normal /Bypass)
Boot up delay adjuster	Provides a rotary switch to configure boot up delay time (0~180 seconds)
Removable Terminal Block	Provide for redundant power
Power supply	12/24/48VDC (9.6~60VDC), Redundant power with polarity reverse protect function and removable terminal block
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power consumption	0.4W (12VDC), 0.5W (24VDC), 0.8W (48VDC)
Housing	Rugged metal, IP30 protection and fanless
Dimensions	106 x 62.5 x 135mm (D x W x H)
Weight	530g (IBP-202-SLC) 545g (IBP-202-SSC, IBP-202-SST)
Installation	DIN Rail mounting, or wall mounting (Optional)
Operating Temperature	-20~70°C
Storage temperature	-40 ~ 85°C
Operating Humidity	5% ~ 95% (Non-condensing)
MTBF	273,054 Hours (MIL-HDBK-217)
Warranty	5 Years

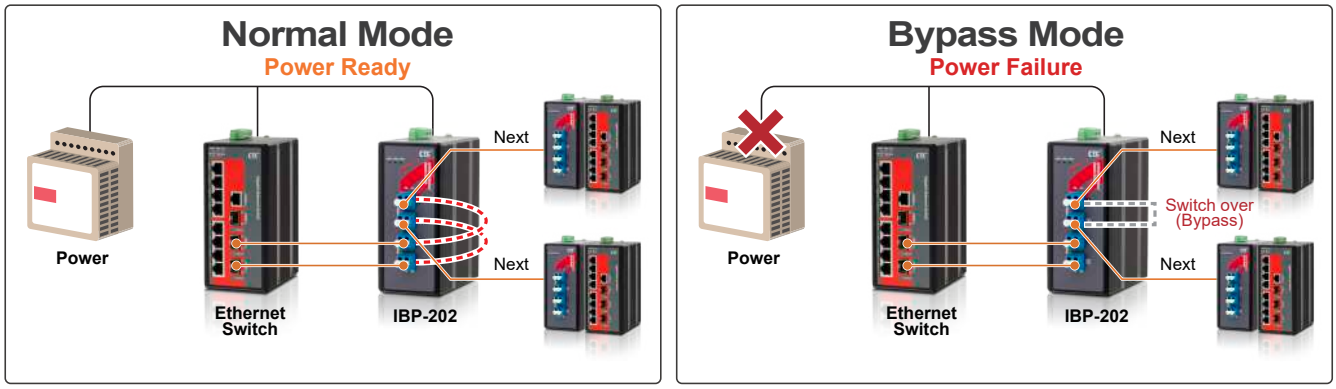
Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Leve	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

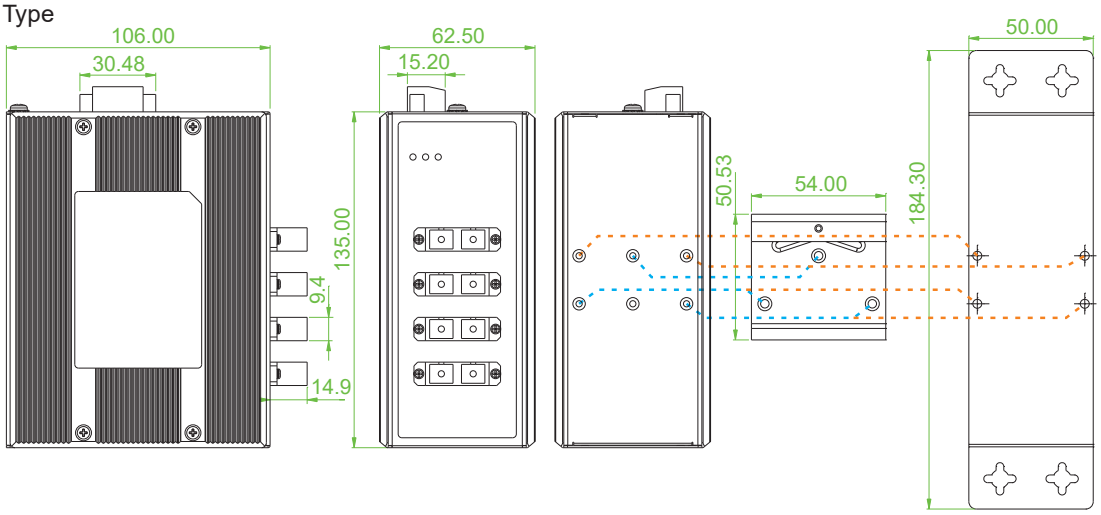
The IBP-202 supports the function of optical path Normal mode and Bypass mode for fiber optical networks. It offers a simple mechanism to switch both of upload and down load fiber path when a power system failure occurs, and a path restores when power back. It offers a simple way to reduce the risk of optical network Node-Down which is caused by the power system.

IBP-202 Data flow in Normal or Bypass mode



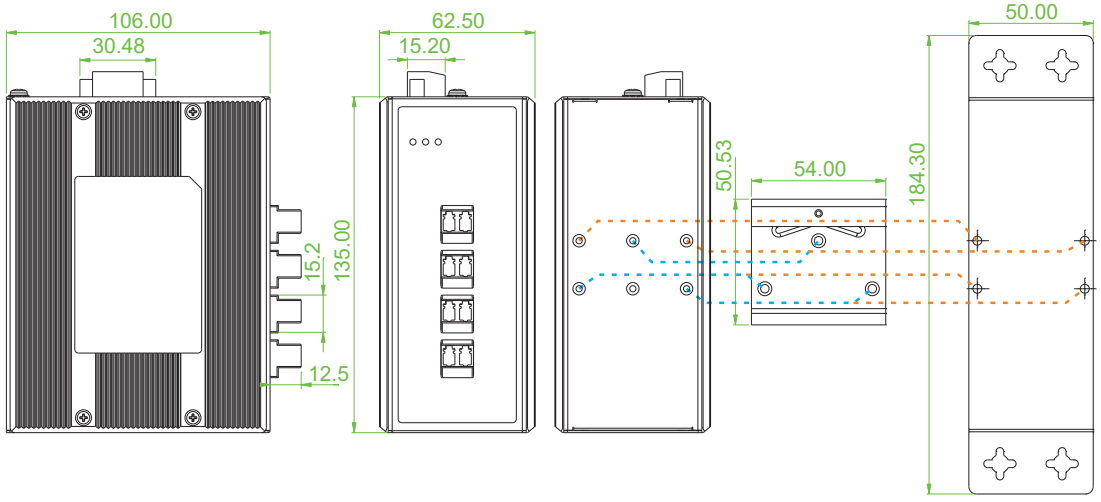
Dimensions

▶ IBP-202 SC Type



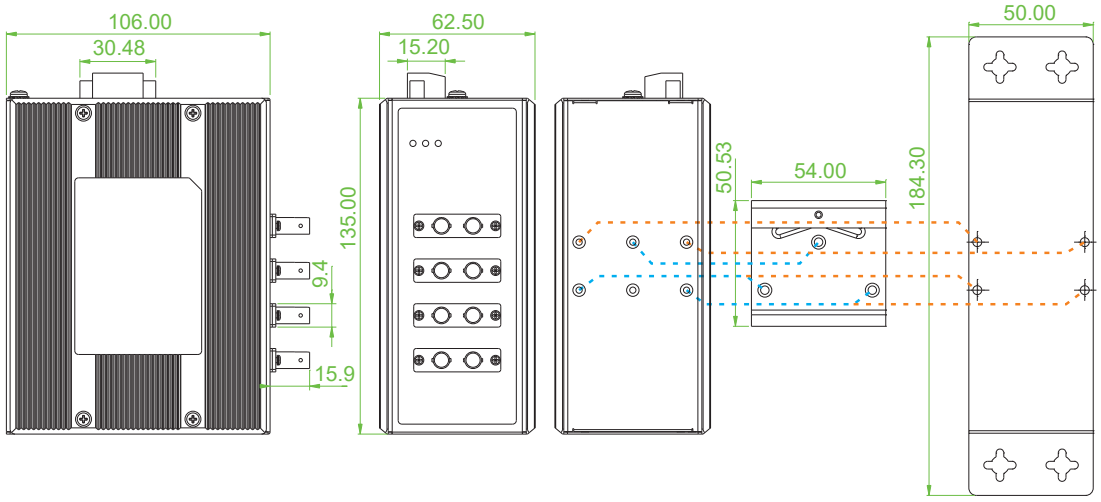
Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

▶ IBP-202 LC Type



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

▶ IBP-202 ST Type



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Fiber connector			Power Input	Certification			Operating Temperature
	Connector type	Connector Q'ty	Data Rate	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IBP-202-SSC	SM SC	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C
IBP-202-SST	SM ST	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C
IBP-202-SLC	SM LC	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C
IBP-202-MSC	MM SC	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C
IBP-202-MST	MM ST	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C
IBP-202-MLC	MM LC	4	100M/Giga/10G	12/24/48VDC	V	V	V	-20~70°C

Optional Accessories

■ Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

ICR-W401

4G LTE, GPS, IEEE 802.11 b/g/n 2T2R and DI/DO Router

- Multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4
- IEEE 802.11b/g/n WiFi 2T2R
- Enhance security and encryption for authentication and transmission
- -30 ~ 70° C for use in harsh environments
- Compact size
- EN62368-1, CE, RED and NCC certified

The industrial grade 4G LTE router ICR-W401 is a compact, lightweight and cost-effective product that has 1 LAN plus 1 WAN Fast Ethernet connection and supports uplink to 2G/3G/4G mobile data networks. Built for harsh environments, the router is equipped with a DI/DO interface. The ICR-W401 is simple to configure through its embedded Web user interface applications. The ICR-W401's WiFi is compliant with IEEE 802.11b/g/n wireless connectivity. The Router features VPN Tunneling with Firewall and management capability via TR069 and SNMP. The ICR-W401 provides highly secure authentication, encryption and management, to protect your data between public and private networks and simplify your complicated solutions for smart city and industrial networking.

Features

- Highly reliable and secure for mission-critical cellular communications
- Compact and lightweight design with 1 LAN and 1 WAN Ethernet interfaces
- Supports multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4
- Provides IEEE 802.11b/g/n WiFi 2T2R
- Micro SIM connector and DI/DO interfaces
- LED indicators for connection and data transmission status
- Industrial temperature rated from -30 ~ 70° C for use in harsh environments
- IPv6/IPv4 dual stack and all applications are IPv6 ready
- Enhance security and encryption for authentication and transmission

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.1Q	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1p	LAN Layer 2 QoS for Traffic Prioritization
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
LTE Interface	Cellular MobilComm standard: (Please see order information for optional area and band) 4G LTE: FDD-LTE, TDD-LTE 3G: WCDMA 2G: GSM/EDGE GNSS: GPS LTE Data rate: Cat 4, 150Mbps (Download), 50Mbps (upload) 1x micro SIM Connector (push-push type)	
WiFi Interface (ICR-W401)	IEEE 802.11b/g/n WiFi Standards	
	Supports AP or Station mode	
	2x RP-SMA for WiFi Antenna	
	2T2R 300Mbps wireless operation rate	
	2.4GHz radio for wireless	

Hardware Interface	1x Micro SIM Connector (push-push type)
	1x LAN 10/100 Mbps Ethernet port
	1x WAN 10/100 Mbps Ethernet port
	Reset Button for device reset
	1x RS232 for console configuration (TXD/RXD/GND)
	1x DI (Non-Isolated), 1x DO (Non-Isolated)
	2x SMA connectors for detachable LTE Antenna
	2x RP-SMA for WiFi Antenna
	1x GPS detachable Antenna
Housing	Rugged metal, Fanless, IP30 protection
Dimensions	75x 92x 30mm (D x W x H)
Weight	400g
Installation	DIN Rail mounting, or wall mounting (optional)
LED Display	1x Power LED
	2x Ethernet LED for each port (LAN/WAN)
	1x LTE LED
	1x Function LED (User define by Web)
Power Supply	Power Consumption: 7 Watt(Max)
	Power Input: 12/24/48VDC (9.6~60VDC)
Operating Temperature	-30 ~ 70°C
Storage Temperature	-40 ~ 85°C
Operating Humidity	10 ~ 95% (non-condensing)
MTBF	271,952 Hours (MIL-HDBK-217)
Warranty	5 Years

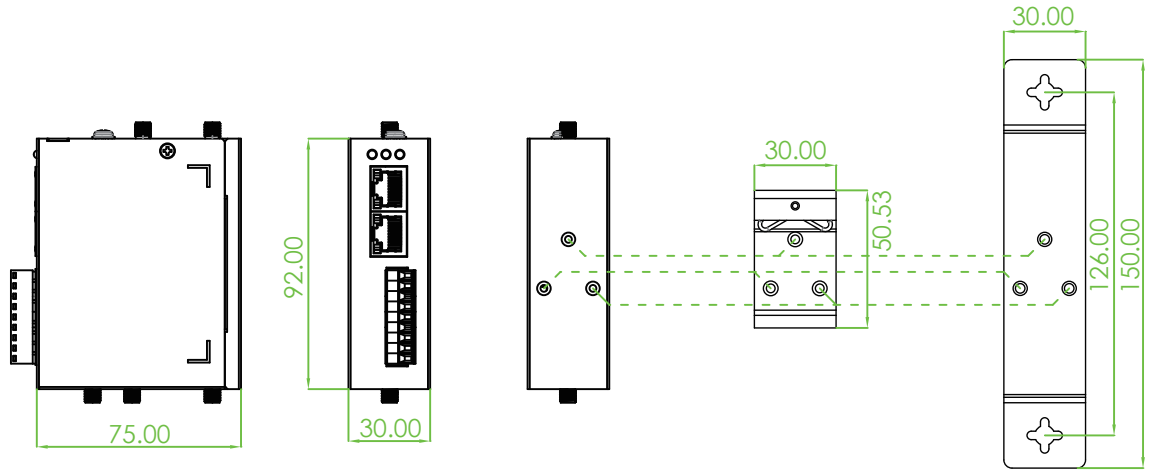
Certification

EMC	CE (EN55032, EN55035)
Radio	NCC (ICR-W401-TW)
	EN62311
	RED ETSI EN301 489-1
	RED ETSI EN301 489-17
	RED ETSI EN301 489-19
	RED ETSI EN301 489-52
	RED ETSI EN301 511
	RED ETSI EN301 908-1
	RED ETSI EN301 908-2
	RED ETSI EN301 908-13
	RED ETSI EN300 328
	RED ETSI EN303 413
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications

Network Protocols	IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and client, PPPoE, Static IP, SNTP, GPS sync time, DNS Proxy, VRRP, OSPF, Message Queue Telemetry Transport (MQTT Broker), BGP
Routing/Firewall	NAT, Virtual Server, DMZ, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing, RIP 1, RIP 2, IPS, Policy Route
VPN	OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256), GRE, PPTP, L2TP
WiFi	Security with WPA2-PSK (AES)
	Multiple SSID
	Wireless Mac Filtering
	Wireless client isolation
	Wireless Connectivity: WAN WiFi Client
Others	DDNS, QoS, UPnP, SMS action, GPS track Drawing, GPS TCP Push
Alarm	DI, DO, SMS, VPN/WAN Disconnect, SNMP Trap, Email, TR069
Management	Web GUI for remote and local management, CLI
	Syslog monitor
	SNMP, TR069
	Remote management via SSH v2, HTTPS
	Local management via Telnet, SSH v2, HTTP/HTTPS

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	WAN		LAN			Certification				
		Cellular Mobile Band	10/100 Base-TX	WiFi IEEE 802.11 b/g/n	10/100 Base-TX	DI/DO	EN62368-1	CE	RED	NCC	Shock, Freefall, Vibration
ICR-W401-EU	V	see Region code table-EU	1	1	1	1	V	V	V		V
ICR-W401-A	V	see Region code table-A	1	1	1	1	V	V	V		V
ICR-W401-TW	V	see Region code table-TW	1	1	1	1	V	V	V	V	V

Region Code Table

	4G LTE		3G	2G	Region
Region Code	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	
EU	B1(2100), B3(1800), B5(850), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B5(850), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		USA (AT&T, T-Mobile)
TW	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America, Taiwan

Optional Accessories

Antenna Accessories

ANT-BASE-01	Antennas Base with Magnetic, SMA (Male) connector, 1.5meter for 4G LTE extension


ANT-BASE-01

Wall Mount Kit Accessories

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

ICR-W402

4G LTE, GPS, IEEE 802.11 b/g/n 2T2R Router

- Multi-band connectivity with LTE Cat 4 / FDD LTE/ TDD LTE/ WCDMA/ GSM
- IEEE 802.11b/g/n WiFi 2T2R
- Enhance security and encryption for authentication and transmission
- Provides dual SIM slots
- -30 ~ 70° C for using in harsh environments
- Compact size
- CE, RED certified

This compact, cost-effective, industrial grade 4G LTE router, ICR-W402, provides 2 LAN plus 1 WAN Fast Ethernet connections and supports uplink to 2G/3G/4G cellular mobile data networks. Built for harsh environments, the router is equipped with a DI/DO interface, has WiFi compliant with IEEE 802.11b/g/n and features VPN Tunneling with Firewall and management capability. The ICR-W402 is easy to configure through its embedded Web user interface. It provides highly secure authentication, encryption and management, to protect your data between public and private networks and simplifies your complicated solutions for smart city and industrial networking.

Features

- Highly reliable and secure for mission-critical cellular communications
- Compact and lightweight design with 2 LAN and 1 WAN Ethernet interfaces
- Supports multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4
- Provides IEEE 802.11b/g/n WiFi 2T2R
- LED indicators for connection and data transmission status
- Industrial temperature rated from -30 ~ 70° C for use in harsh environments
- Enhance security and encryption for authentication and transmission

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
LTE Interface	Cellular MobilComm standard: (Please see order information for optional area and band) 4G LTE: FDD-LTE, TDD-LTE 3G: WCDMA 2G: GSM/EDGE LTE Data rate: Cat 4, 150Mbps (Download), 50Mbps (upload) 2x SIM slots	
WiFi Interface	IEEE 802.11b/g/n WiFi Standards	
	Supports AP, Client	

Hardware Interface	2x SIM slots
	2x LAN Fast Ethernet port
	1x WAN Fast Ethernet port
	Reset Button for device reset
	1x RS232 (TXD/RXD/GND) and 1x RS485
	2x SMA connectors for detachable LTE Antenna
	2x RP-SMA for WiFi Antenna
	1x SMA for GPS detachable Antenna
Housing	Rugged metal, Fanless, IP30 protection
Dimensions	98 x 98 x 32mm (D x W x H)
Weight	400g
Installation	DIN Rail mounting, or wall mounting (optional)
LED Display	1x Power
	1x System
	2x LTE signal (Good/Poor)
	3x Ethernet LED for each port (LINK/ACT)
Power Supply	Power Consumption: 7 Watt (Max)
	Power Input: 12/24VDC
Operating Temperature	-30 ~ 70°C
Storage Temperature	-40 ~ 85°C
Operating Humidity	10 ~ 95% (non-condensing)
Warranty	5 Years

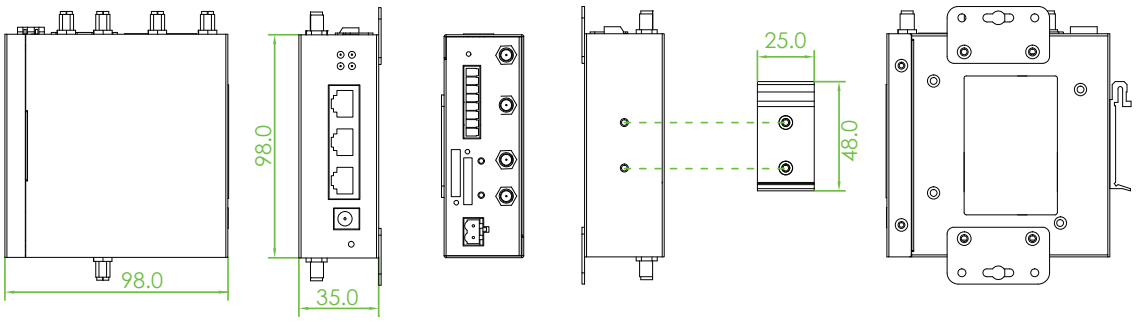
Certification

EMC	CE (EN55032, EN55035)
Radio	EN62311
	RED ETSI EN301 489-1
	RED ETSI EN301 489-17
	RED ETSI EN301 489-19
	RED ETSI EN301 489-52
	RED ETSI EN301 511
	RED ETSI EN301 908-1
	RED ETSI EN301 908-2
	RED ETSI EN301 908-13
	RED ETSI EN300 328
	RED ETSI EN303 413

Software Specifications

Network Protocols	IPv4, DHCP server and client, PPPoE, Static IP, NTP, VRRP
Routing/Firewall	NAT, DMZ, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing
VPN	OpenVPN, IPSec, GRE, PPTP, L2TP
WiFi	Multiple SSID
	Security with WEP, WPA, WPA2, WPA-PSK, WPA2-PSK
	Supports WiFi AP mode, Client mode
Others	DDNS, UPnP, GPS TCP Push, MQTT
Management	Web GUI for remote and local management
	Syslog monitor
	Remote management via SSH v2, HTTPS
	Local management via Telnet, SSH v2, HTTP/HTTPS

Dimensions



Side View | Front View | Left View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	WAN		LAN			Certification	
		Cellular Mobile Band	10/100 Base-TX	WiFi IEEE 802.11 b/g/n	10/100 Base-TX	DI/DO	CE	RED
ICR-W402-EUX	V	see Region code table-EUX	1	1	2	1	V	V
ICR-W402-AUX	V	see Region code table-AUX	1	1	2	1	V	V

Region Code Table

	4G LTE		3G	2G	Region
Region Code	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	
EUX	B1(2100), B3(1800), B28A(700), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
AUX	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900), B4(1700)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America, Taiwan

Optional Accessories

Antenna Accessories

ANT-BASE-01	Antennas Base with Magnetic, SMA (Male) connector, 1.5meter for 4G LTE extension


ANT-BASE-01

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 20W, -20 ~ +70°C

ICR-GW404

4G LTE, GPS, IEEE802.11 b/g/n/ac 2T2R, 2x SIM, 4x GbE, DI/DO, RS232/485

- Multi-band connectivity with FDD 4G LTE/TDD, 3G WCDMA, 2G GSM
- Concurrent dual band WiFi 802.11n 2T2R (2.4GHz), and 802.11ac 2T2R (5GHz)
- 4G LTE and Ethernet WAN failover redundancy
- NAT/Port Forward/Routing are compatible with existing IP networks
- Various VPN protocols, Firewall and Authentication to enhance access security
- CE, RED certified

This high-performance industrial grade 4G LTE router, ICR-GW404, combines IEEE 802.11b/g/n/ac WLAN and 4G LTE cellular technologies to provide flexible wireless network connectivity. With 4 Ethernet ports and dual SIM cards for failover redundancy to ensure uninterrupted connectivity, ICR-GW404 supports secure VPN communications, GPS, static and dynamic IP routing of RIP1/2 and OSPF, NAT, port forwarding, Firewall, built-in DI/DO and Serial port services. It is an ideal solution for Industrial Internet of Things (IIoT) and M2M (Machine-to-Machine) applications, such as remote control and monitoring, fleet management, bus ticketing collection systems, CCTV, SCADA, digital signage, KIOSK and intelligent traffic systems.

Features

- Highly reliable and secure for mission-critical cellular communications
- Compact and lightweight design with 3 LAN and 1 LAN/WAN Ethernet interfaces
- Supports multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4
- Provides IEEE 802.11b/g/n/ac 2T2R Wireless LAN
- Provides Dual SIM connector and DI/DO interfaces
- Industrial temperature rated from -30 ~ +70° C for use in harsh environments
- Enhance security and encryption for authentication and transmission

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit Ethernet over twisted pair
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1p	LAN Layer 2 QoS for Traffic Prioritization
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
LTE Interface	Cellular MobilComm standard: (Please see order information for optional area and band) 4G LTE: FDD-LTE, TDD-LTE 3G: WCDMA 2G: GSM/EDGE LTE Data rate: Cat 4, 150Mbps (Download), 50Mbps (upload) 2x SIM slots	
WiFi Interface	IEEE 802.11b/g/n/ac WiFi Standards	
	Support AP, Client and bridge mode	

Hardware Interface	2x SIM slots
	3x LAN GbE Ethernet port
	1x LAN/WAN configurable GbE Ethernet port
	Reset Button for device reset
	1x RS232 (TXD/RXD/GND)
	2x DI (Non-Isolated), 1x DO (Non-Isolated)
	2x SMA connectors for detachable LTE Antenna
	2x RP-SMA for WiFi Antenna
	1x SMA for GPS detachable Antenna
Housing	Rugged metal, Fanless, IP30 protection
Dimensions	132 x 112 x 44mm (D x W x H)
Weight	400g
Installation	DIN Rail mounting, or wall mounting (optional)
LED Display	1x Power (Green)
	1x WLAN (Green)
	3x LTE signal (Strong/Good/Weak)
	1x ERR LED (RED)
	4x Ethernet LED for each port (LINK/ACT)
Power Supply	Power Consumption: 7 Watt (Max)
	Power Input: 12/24VDC (9~36VDC)
Operating Temperature	-30 ~ 70°C
Storage Temperature	-40 ~ 85°C
Operating Humidity	10 ~ 95% (non-condensing)
Warranty	5 Years

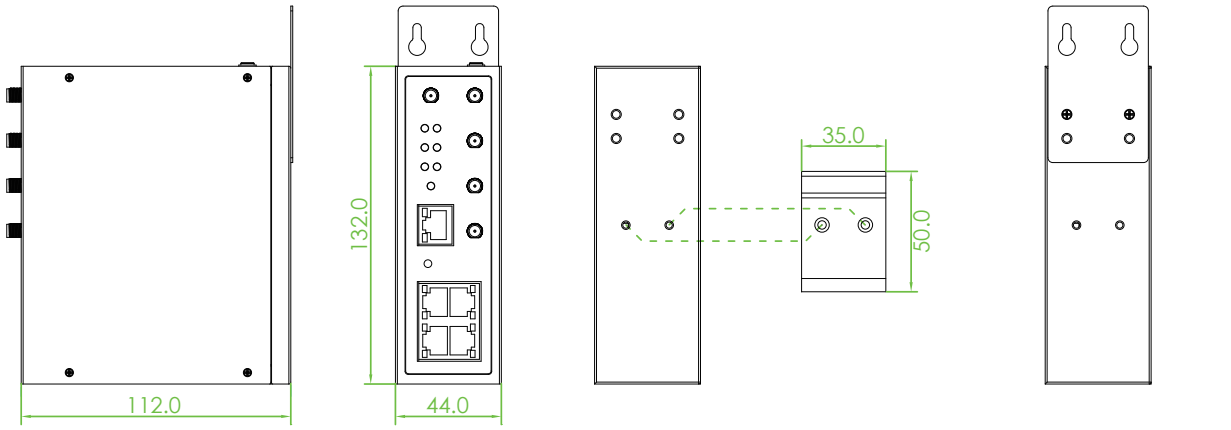
Certification

EMC	CE (EN55032, EN55035)
Radio	EN62311
	RED ETSI EN301 489-1
	RED ETSI EN301 489-17
	RED ETSI EN301 489-19
	RED ETSI EN301 489-52
	RED ETSI EN301 511
	RED ETSI EN301 908-1
	RED ETSI EN301 908-2
	RED ETSI EN301 908-13
	RED ETSI EN300 328
	RED ETSI EN303 413

Software Specifications

Network Protocols	IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and client, PPPoE, Static IP, SNTP, GPS sync time, DNS Proxy, VRRP, OSPF, Message Queue Telemetry Transport (MQTT Broker), BGP
Routing/Firewall	NAT, Virtual Server, DMZ, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing, RIP 1, RIP 2, IPS, Policy Route
VPN	OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256), GRE, PPTP, L2TP
WiFi	Security with WPA2-PSK (AES)
	Multiple SSID
	Wireless Mac Filtering
	Wireless client isolation
	Wireless Connectivity: WAN WiFi Client
Others	DDNS, QoS, UPnP, SMS action, GPS track Drawing, GPS TCP Push
Alarm	DI, DO, SMS, VPN/WAN Disconnect, SNMP Trap, Email, TR069
Management	Web GUI for remote and local management, CLI
	Syslog monitor
	SNMP, TR069
	Remote management via SSH v2, HTTPS
	Local management via Telnet, SSH v2, HTTP/HTTPS

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	WAN		LAN			Certification	
		Cellular Mobile Band	10/100/1000 Base-T	WiFi IEEE 802.11 b/g/n/ac	10/100/1000 Base-T	DI/DO	CE	RED
ICR-GW404-EUX	V	see Region code table-EUX	1	1	3	2/1	V	V
ICR-GW404-AUX	V	see Region code table-AUX	1	1	3	2/1	V	V

Region Code Table

	4G LTE		3G	2G	Region
Region Code	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	
EU	B1(2100), B3(1800), B5(850), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B5(850), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		USA (AT&T, T-Mobile)
TW	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America, Taiwan

Optional Accessories

Antenna Accessories

ANT-BASE-01	Antennas Base with Magnetic, SMA (Male) connector, 1.5meter for 4G LTE extension

ANT-BASE-01

Wall Mount Kit Accessories

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

ICR-4103

4G LTE, 2x SIM, 4x FE + 2x DI/1x DO, 1x RS485, 2x RS232

- Multi-band connectivity with FDD 4G LTE/ TDD 4G LTE/ 3G WCDMA/2G GSM
- 4G LTE/ UTP to configure WAN port for failover redundant
- CE, RED and NCC certified
- NAT/Port Forward/Routing/IPv6 are compatible with existing IP networks
- Supports 3x Serial port (1x RS485, 2x RS232) for IoT and automation application, Modbus RTU and Modbus/TCP gateway, MQTT
- Various VPN protocols for security, Firewall & IPS, Authentication to enhance access security

The industrial grade 4G LTE router ICR-4103 is a high-performance cellular router which is designed to offer fast connectivity over cellular networks for industrial applications. features up to 3 Ethernet ports and provides dual SIM card slots and one Ethernet WAN port which can automatically re-connect and auto-switch to offer cellular network redundancy and ensure uninterrupted connectivity. The ICR-4103 cellular router is integrated with WAN, LAN, SIM, VPN, Firewall, built-in DI/DO and Serial port services.

In addition, ICR-4103 uses the highest level of industrial grade design for connection in the most demanding environments and is an ideal solution for Industrial Internet of Things (IIoT) and M2M (Machine-to-Machine) applications, such as remote control and monitoring, bus ticketing collection system, CCTV, SCADA, digital signage, kiosk and intelligent traffic systems.

Features

- Supports multi-band connectivity with FDD 4G LTE/ TDD 4G LTE/ 3G WCDMA/2G GSM/ LTE Cat4
- 2 SIM card slots 4G LTE antenna, 1x WAN (10/100Base-TX) + 3x LAN (10/100Base-TX UTP), 2x DI + 1x DO, 3x Serial COM port (2x RS232, 1x RS485)
- Highly reliable and secure for mission-critical cellular communications
- Provide flexible options to configure LAN/ WAN ports
- Built-in dual SIM for network redundancy / failover/ roaming over/ back up
- Integrated dual detachable antenna against radio interference
- 4G LTE and WAN port for seamless connection and redundancy
- Supports 3x Serial port (1x RS485, 2x RS232) for IoT and automation application, Modbus RTU and Modbus/TCP gateway, MQTT
- Supports Routing/Firewall, NAT, Virtual Server, DMZ, Port filtering, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing and RIP 1 & 2, VRRP, OSPF V2 & V3, BGP
- Supports VPN, OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256), GRE, PPPTP, L2TP
- IPv6/IPv4 dual stack and all applications are IPv6 ready
- Supports DHCP server and client, PPPoE, Static IP, SNTP, DNS Proxy, DDNS, QoS, Virtual Com, UPnP
- Supports Alarm message : DO, SNMP Trap, E-mail
- Supports SNMP, TR069,Web, Telnet, CLI for management
- Supports dual Image firmware upgrade by Web
- CE, FCC, Rail Traffic EN50121-4 certified
- Safety EN60950-1 certified
- Radio RED ETSI EN301 489-1/-19/-52, EN301 908-1, EN303 413, NCC certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Rugged metal, IP30 protection & Fanless design
- Wide operating temperature -20 ~ 75° C

Specifications

Standard	Cellular MobilComm standard: 4G LTE: FDD-LTE, TDD-LTE 3G: WCDMA 2G: GSM/EDGE	
	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.1Q	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3x	Flow control for Full Duplex
Connector	**Cellular MobilComm and WAN:** Built-in dual SIM card slots for network redundancy / failover/ roaming over/ back up	
	2 SMA (female) connector for Antenna (Please see ordering information for optional accessories) 1x 10/100Base-TX RJ45 for WAN port	
	LAN: 3x 10/100Base-TX RJ45	
	Serial: 1x RS485 and 2x RS232 (one of RS232 could be configured for console)	
	Programmable DI/DO: 2x DI and 1x DO	
LTE data rate	Cat 4 ,Max download 150Mbps, Max upload 50 Mbps	
Removable terminal block	Provides for Power input, DO, DI1, DI2, COM2 (RS232), COM3 (RS485)	
Power Supply	Input 10-32VDC removable terminal block	
Power consumption	< 7W	
LED	System status (Green)	
	VPN (Green), SIM 1 (Green), SIM 2 (Green)	
	Cell signal Strong / Weak: H/L (Green)	
DIP SW for RS485 port	DIP 1 Pull Low : OFF: Disable / ON: Enable	
	DIP 2 Pull High : OFF: Disable / ON: Enable	
	DIP 3 120 ohm terminal resistor : OFF: Disable / ON: Enable	
Alarm message	DO for alarm message, with current capacity of 500mA/50VDC maximum, SNMP trap, E-mail, SMS, Alarm trigger by DI, VPN or WAN disconnection	
Operation Temperature	-20~75°C	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, Fanless , IP30 grade housing protection	
Dimensions	106 x 62.5 x 135mm (D x W x H)	
Weight	0.74kg	
Installation	Mounting : DIN Rail mounting or Wall mounting (Optional)	
MTBF	296,306 Hours (MIL-HDBK-217)	
Warranty	5 years	

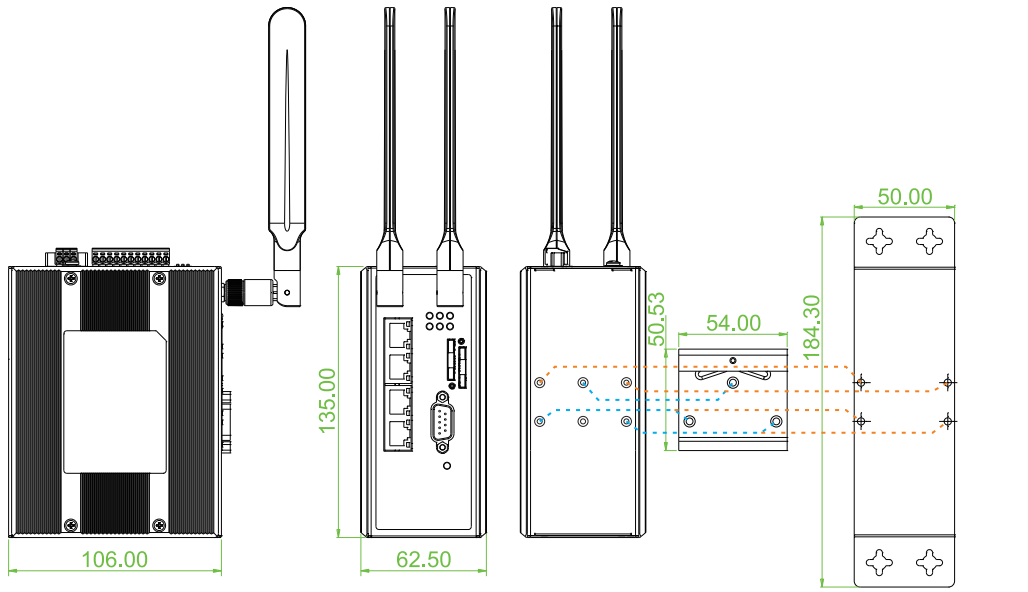
Certification

EMC	CE (EN55024, EN55032)
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
Radio	RED ETSI EN301 908-1
	RED ETSI EN303 413
	RED ETSI EN301 489-1
	RED ETSI EN301 489-19
	RED ETSI EN301 489-52
	NCC (ICR-4103-TW)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

Network Protocols	IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and client, DNS Proxy, PPPoE, Static IP, SNTP, VRRP, OSPF V2, OSPF V3, BGP, MQTT, TCP, UDP, ARP
Modbus TCP, Modbus RTU	Gatway between Ethernet and COM3 (RS485) port
Routing/Firewall	NAT, Virtual Server, DMZ, Port filtering, MAC Filter,
	URL Filter, IP Filter, VLAN, Static Routing and RIP 1, RIP 2
VPN	OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256), GRE, PPPTP, L2TP
MobilComm Connectivity	Two SIM for failover/ roaming over/ back up Seamless multi WAN connections switch (2x SIM and 1x Ethernet WAN)
Others	DDNS, UPnP, QoS
	Virtual COM for serial COM port
Alarm message	Sent by DO, SMS, SNMP Trap, E-mail
Management	Web GUI for remote and local management
	CLI
	Dual Image firmware upgrade by Web GUI, TFTP
	Syslog monitor
	SNMP V1, V2c, V3
	TR069: TR098 model
	Access Control list, SSH v2
	Remote management via Telnet, SSH v2, HTTPS
	Local management via Telnet, SSH v2, HTTP/HTTPS

Dimensions



Ordering Information

Model Name	Managed	WAN		LAN			Certification	
		Cellular MobilComm band (2 SIM for Redundancy)	10/100Base-TX	10/100Base-TX	RS232	RS485 (Modbus)	Radio	CE
ICR-4103-EU	V	see Region code table-EU	1	3	2	1	RED	V
ICR-4103-A	V	see Region code table-A	1	3	2	1	RED	V
ICR-4103-TW	V	see Region code table-TW	1	3	2	1	NCC, RED	V

Region Code Table

	4G LTE		3G	2G	Region
Region Code	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	
EU	B1(2100) , B3(1800), B5(850), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B5(850), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		USA (AT&T, T-Mobile)
TW	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America, Taiwan

Optional Accessories

Antenna Accessories

ANT-BASE-01	Antennas Base with Magnetic, SMA (Male) connector, 1.5meter for 4G LTE extension

ANT-BASE-01

Wall Mount Kit Accessories

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C

Industrial Media Converter Chassis - IRC200

- Fan-less ,Rugged and Harden design
- Wide operation temperature
- 2U 19", 20-slot & Rack-Mountable
- Line Card and Power supply Hot Swappable
- Network Management by NMC Card
- Optional Media Converter (Ethernet, Serial, Contact Closure Fiber)
- EN62368-1, CE and FCC certified

This 20 slot, industrial grade, media converter chassis, the IRC200, is a 2U rack, fan-less design, that supports two hot swappable modular power supplies. The twenty slots support one management card and up to nineteen media converter cards. The chassis is able to operate temperature ranges (-10~65°C). The media converter cards available support conversion for Fast Ethernet, Gigabit Ethernet, serial communications or I/O Contact Closure over fiber media. This chassis may be deployed in Industrial Ethernet, automation, security, intelligent transportation systems (ITS) and utility market applications where environmental conditions exceed commercial product specifications.

Features

- 2U 19", 20-slot & Rack-Mountable
- Fan-less ,Rugged and Harden design
- Wide operation temperature
- Line Card and Power supply Hot Swappable
- Network Management by NMC Card
- Optional Media Converter (Ethernet, Serial, Contact Closure Fiber)

Specifications

Module Slot (Hotswap Modular)	1-slot for NMC Management Card	
	19-slot for Line Card	
	2-slot for Power Supply	
Power Supply (Hotswap Modular)	AC Power Module	AC Power 100-240VAC (88~264VAC) (IRC200-AC) Power on LED On/Off Switch IEC320 Power Connector
	DC Power Module	DC Power 48VDC (36~60VDC) (IRC200-DC) Power on LED On/Off Switch Removable Termintal Block 2 pin
Power Consumption	2.5W @110VAC	(Without module card)
	44.5W @110VAC	(With 1x IRC200-NMC, and 19x IRC200-2000MS module card)
	4.5W @48VDC	(Without module card)
	43.5W @48VDC	(With 1x IRC200-NMC, and 19x IRC200-2000MS module card)
Operation Temperature	-10~65℃	
Storage Temperature	-40~85℃	
Humidity	5%~90% (Non Condensing)	
Dimension	302 x 438 x 88mm (D x Wx H)	
Housing	Fanless, Rack Mount 2U, Rugged Metal, IP30 Protection	
Weight	4.4 kg	

Installation Mounting	19" Rack Mounting
MTBF	2,233,738 Hours (IRC200-CH20) 155,277 Hours (IRC200-AC) 1,636,753 Hours (IRC200-DC) (MIL-HDBK-217)
Warranty	5 Years (Chassis & Card)
	2 Years (Power Supply)

Certification

EMC	CE (EN55032, EN55035)
EMI	FCC
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software (with IRC200-NMC Card)

Protocol	IP, UDP, SNMP V1/V2c, TCP, ARP, ICMP, TFTP, HTTP
MIB	Support MIB II, Enterprise MIB
Management Interface	Web GUI, Telnet, Console, SNMP
SNTP	Supported
Quick Configuration	Configuration File Copy/Backup/Restore
F/W Upgrade	For Line Card and Chassis
Configure, Monitor and Fault Management	For Alll Installed Line Cards

Modular Converter Cards

IRC200-NMC

Network Management Control Card

- Configure, monitor and provide fault management for all installed line cards
- Provides upgrade feature for line card
- Running System log with time stamping for SNTP (time server)
- Quick configuration, configurationcopy/backup/restore

Specification

Protocol	IP, UDP, SNMP V1/V2c, TCP, ARP, ICMP, TFTP, HTTP
MIB	Supported MIB II, Enterprise MIB
Management	Web GUI, Telnet, Console, SNMP
Ports	1x DB9-F for RS232 console, 1x RJ45 for 10/100Base-TX Ethernet
LED	PWR1, PWR2, ALM1, ALM2, STK, ACT, LAN LNK/SPD
Power Consumption	2W
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimensions	159.5 x 20.8 x 88mm (D x W x H)
Weight	120g
MTBF	1,337,311Hours (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

IRC200-1000DS

1G 2R Multi-rate Transponder

- Transparent FE or GbE fiber media converter/repeater
- Perform optical repeater function (Re-amplification & Reshaping)
- Digital diagnostic monitoring of SFP modules
- Supports Link Fault Pass-Through LFTP function
- 2x SFP slot for FE or GbE SFP transceiver

Specification

LED	Power, FX-Link1, FX-Link2
Power Input	Powered from Chassis (12VDC)
Power Consumption	1.5W
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimension	159.5 x 20.8 x 88mm (D x W x H)
Weight	130g
MTBF	4,054,842Hours (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

IRC200-2000MS

Web Smart OAM Managed
10/100/1000Base-T to 100/1000Base-X
GbE Switch

- 1x RJ45 10/100/1000Base-T to 1x 100/1000Base-X SFP converter
- Ingress/Egress bandwidth control
- Supports in-band IEEE 802.3ah OAM management
- Firmware upgrade via Web
- Dying gasp (remote power failure detection on stand-alone)
- Supports Link Fault Pass-Through (LFPT) Function
- DDMI diagnostic function for SFP fiber transceiver
- 16 Tag VLAN Group
- USB Console port, Telnet, SNMP, Web management
- Flow control enable or disable
- Jumbo Frame 16K Packet

Specification

Standards	IEEE 802.3, IEEE 802.3u IEEE 802.3ab, 802.3z, 802.3ah, 802.1Q
LED	Power, FX-Link, LAN Speed, LAN Link
Power Input	Powered from Chassis (12VDC)
Power Consumption	2.4W
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimension	159.5 x 20.8 x 88mm (D x W x H)
Weight	105g
MTBF	1,568,756Hours (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

IRC200-10/100i

10/100Base-TX to 100Base-FX In-Band
Managed Converter

- 1x RJ45 10/100Base-TX to 1x SC/ST 100Base-FX Converter
- Auto-Negotiation / Auto MDI/MDIX in TP port
- Supports remote CPE power fail detect (dying gasp)
- Supports Link Fault Pass-Through (LFPT) and Far End Fault (FEF)
- Supports Loop Back Test
- Forward 2046 bytes (max.) packets in switch mode
- Forward 9K jumbo packets in converter mode
- Transparent Q in Q double tagged frame
- IEEE 802.1q Tag VLAN pass through
- Local / remote In-band management (Monitor and Configure) by the SNMP manager.
- Bandwidth control (Nx32Kbps or Nx512Kbps)
- IEEE 802.3x flow control
- Online local / remote f/w upgrade

Specification

Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3x
LED	Power, FEF, FX-Link, TX-SPD, TX-Duplex, TX-Link
Power Input	Powered from Chassis (12VDC)
Power Consumption	3W
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimension	159.5 x 20.8 x 88mm (D x W x H)
Weight	120g
MTBF	1,129,076Hours (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

IRC200-Serial

RS232/485 over Fiber

- Extend RS232/422/485 serial transmission distance over fiber
- In-band network management via terminal, Web or SNMP
- Selectable data interface for RS-232/ 485
- RS232/Async. 3 wire or 5 wire up to 256Kbps
- RS485/Async. 2 wire (half duplex) or 4 wire (full duplex) up to 1Mbps
- Software selectable 2 wire (half duplex) or 4 wire (full duplex) RS-485

Specification

Standards	EIA/TIA RS-485, RS-232
LED	Power, FX Link, DI, DO, Test
Power Input	Powered from Chassis (12VDC)
Power Consumption	2.5W
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimension	159.5 x 20.8 x 88mm (D x W x H)
Weight	130g
MTBF	1,611,089Hours (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

IRC200-CCF40 & IRC200-CCF20

◀4 Channel Contact Closure Fiber Converter
▶2 Channel Contact Closure Fiber Converter

- 30 VDC, 0.5 amp relay N.O. (Normally Open)
- Point-to-Point transmission architecture
- Plug-and-play design ensures ease of installation requiring no
- electrical or optical adjustments
- Relay contact for Carrier Detect, N.C. (Normally Close)
- Indicating LEDs are provided for confirming equipment operating status

Specification

Optical Interface	1 x SFP, Data rate 155Mbps Duplex mode: Full duplex Distance 2KM (Multimode), 30KM (Single-mode), depend on SFP transceiver Point-to-Point transmission architecture
Contacts	4 Channel Contact Closure, 4x Open/close Input, 4xRelay for output (IRC200-CCF40) 2 Channel Contact Closure, 2x Open/close Input, 2xRelay for output (IRC200-CCF20) Input Dry Contact Closure Output SPST Relay, 30 VDC @ 0.5 A, Resistive loads only. 0.5 A Relay contact Rating - normally open
LED	Contact Relay, Carrier Detect
Power Input	Powered from Chassis (12VDC)
Power Consumption	2.1W (IRC200-CCF40) 1.5W (IRC200-CCF20)
Operation Temperature	-10°C~65°C
Storage Temperature	-40°C~85°C
Humidity	10 ~ 90% non-condensing
Chassis	IRC200-CH20 or IRC200-CH01M or IRC200-CH01
Dimension	159.5 x 20.8 x 88mm (D x W x H)
Weight	200g (IRC200-CCF40) 190g (IRC200-CCF20)
MTBF	1,043,016Hours (IRC200-CCF40) 1,204,602Hours (IRC200-CCF40) (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

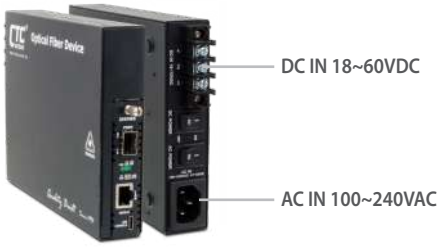
Standalone Chassis

▪ IRC200-CH01M Chassis (Power Built-in)

Specification

Slot	1 slot for insertion module card
Console	1x RS232 for configuration
Power Input	AC 100-240VAC (IRC200-CH01M-AC) DC 18-60VDC (IRC200-CH01M-DC)
Housing	IP30, Metal Case
Installation	Desktop
Dimension	185 x 30 x 135mm (D x W x H)
Operating Temperature	-10~65°C
Humidity	5%~90%
Weight	1.2kg
MTBF	97,968 Hours (IRC200-CH01M-AC) 282,218 Hours (IRC200-CH01M-DC) (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

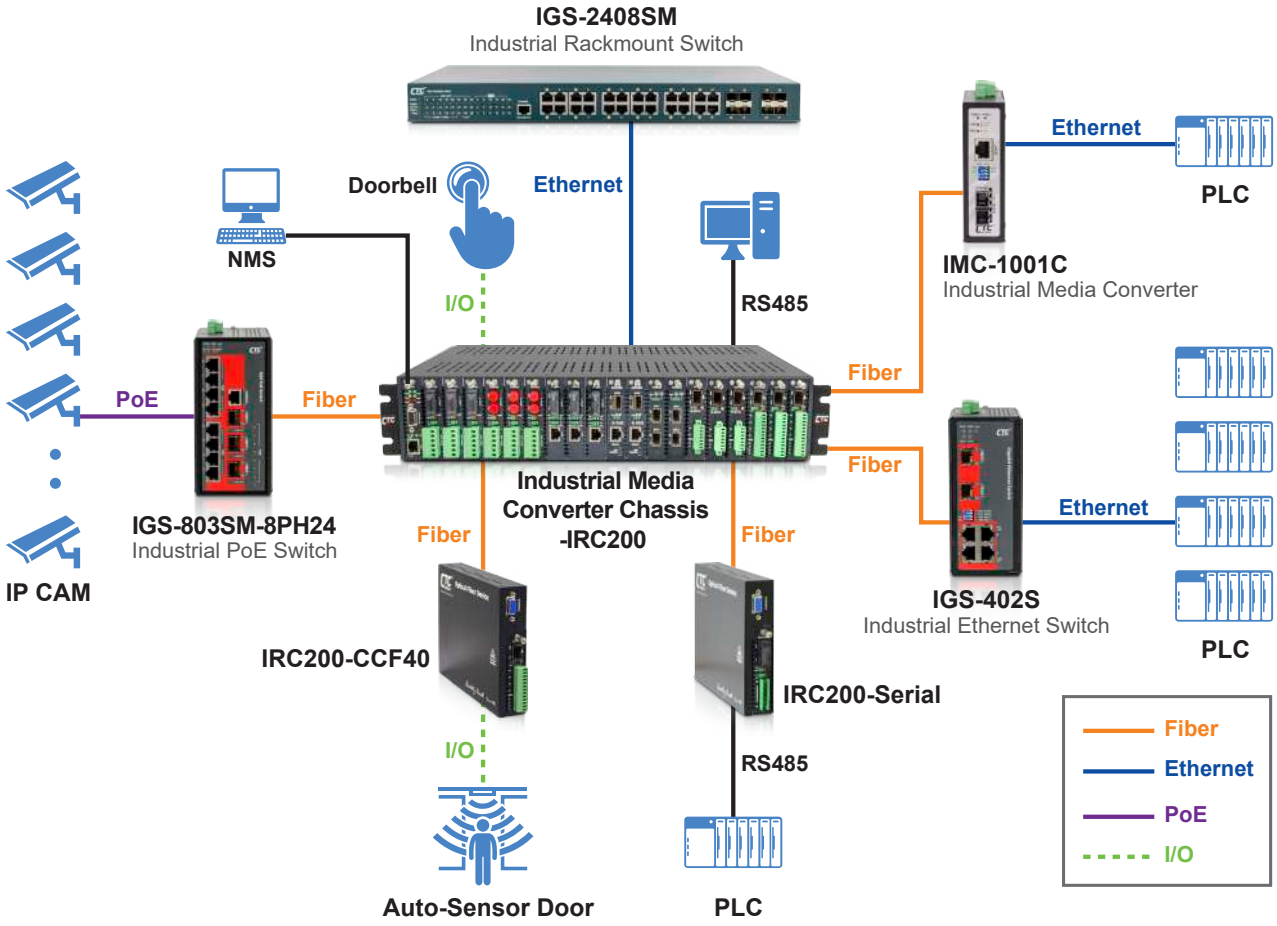
▪ IRC200-CH01 Chassis (Power Built-in)



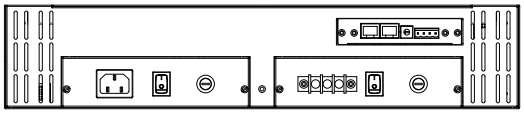
Specification

Slot	1 slot for insertion module card
Power Input	AC 100-240VAC (IRC200-CH01-AC ,IRC200-CH01-AA) DC 18-60VDC (IRC200-CH01-DC, IRC200-CH01-DD)
Housing	IP30, Metal Case
Installation	Desktop
Dimension	185 x 30 x 135mm (D x W x H)
Operating Temperature	-10~65°C
Humidity	5%~90%
Weight	0.8kg
MTBF	98,967 Hours (IRC200-CH01-AC) 290,805 Hours (IRC200-CH01-DC) (MIL-HDBK-217)
Warranty	5 Year
Certification	EN62368-1, CE and FCC

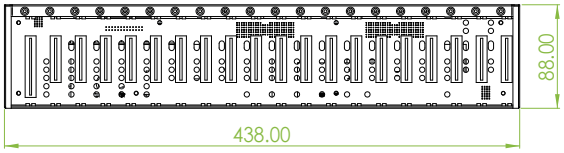
Application



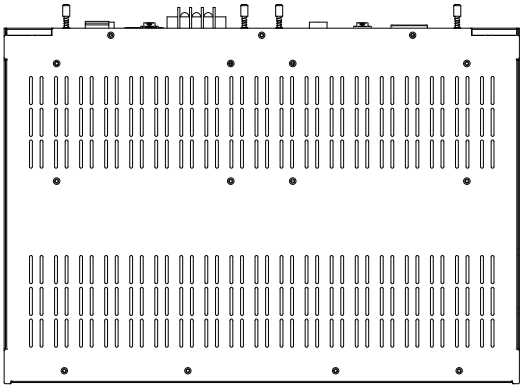
Dimensions



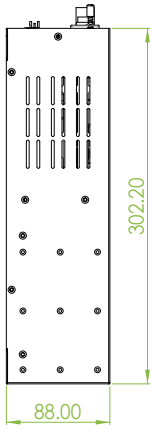
Rear View



Front View



Top View



Side View

Ordering Information

Model Name	Description
20 Slot Chassis	
IRC200-CH20	Industrial 19" 2U 20 slots Converter Chassis
Power Module for IRC200-CH20	
IRC200-AC	Power supply module 100~240VAC
IRC200-DC	Power supply module 36~60VDC
Module Cards	
IRC200-NMC	Network management control card
IRC200-10/100i	10/100Base-TX to 100Base-FX In-band management converter
IRC200-2000MS	Web managed OAM 10/100/1000Base-T to 100/1000Base-X converter
IRC200-1000DS	1000Base-X SFP to 1000Base-X SFP media converter
IRC200-Serial	RS-232/422/485 to fiber converter
IRC200-CCF40	4 channel contact closure Fiber (155M SFP) converter
IRC200-CCF20	2 channel contact closure Fiber (155M SFP) converter
1 Slot Standalone Chassis	
IRC200-CH01M-AC	Industrial 1 slot converter chassis with console, 100~240VAC input
IRC200-CH01M-AA	Industrial 1 slot converter chassis with console, dual 100~240VAC redundant power input
IRC200-CH01M-DC	Industrial 1 slot converter chassis with console, 18~60VDC input
IRC200-CH01M-DD	Industrial 1 slot converter chassis with console, dual 18~60VDC redundant power input
IRC200-CH01-AC	Industrial 1 slot converter chassis, 100~240VAC input
IRC200-CH01-AA	Industrial 1 slot converter chassis, dual 100~240VAC redundant power input
IRC200-CH01-DC	Industrial 1 slot converter chassis, 18~60VDC input
IRC200-CH01-DD	Industrial 1 slot converter chassis, dual 18~60VDC redundant power input

IMC-1000WS-PB

NEW

1x GbE RJ45 to 100/1000Base SFP with IEEE802.3bt PoE PSE (90W)

- SNMP, Web based, OAM, Remote Loop-Back test
- Supports LFPT (Link Fault Pass Through)
- Support IEEE802.3af/at/bt type 4 PoE upto 90W
- CE and FCC certified

Industrial managed media converter with 1 Gigabit UTP port and 1 100/1000 SFP slot for copper and fiber interface conversion, it supports the PoE+ standard IEEE802.3af/at/bt to inject up to 90 watts of power into PoE devices, IMC-1000WS-PB is designed for harsh environments, such as IP surveillance, industrial networking, intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Conversion between 10/100/1000Base-T and 100/1000Base-X fiber cable interface
- Redundant 48VDC power input
- IP30 rugged metal housing and fanless
- Supports Jumbo frame 16K bytes packet
- DHCP, Auto Provision, SNTP, VLAN, QoS, Dual firmware image
- PoE PD auto check and auto Reset, Weekly schedule

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 802.3x	Flow Control and Back pressure
	IEEE802.3bt	PoE++
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.1q	Tag VLAN
Fiber Ports	SFP slot for 100Base-X or 1000Base-X, 100M/1000M speed set by Web	
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function	
	Supports UTP CAT.5e Twisted Pair cable	
Push Button	Reset, Load default setting	
Data Process Architecture	Pass Through or Store and Forward mode	
Jumbo Frame	16K bytes	
LFPT (Link Fault Pass Through)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Connector and Pin Assignment	SFP Slot	
	RJ-45 Socket: Cat 5e (10/100/1000Mbps) Twisted Pair cable	
	Auto MDI/MDI-X and Auto negotiation Function	
Connector and Pin Assignment	RJ-45 Port support IEEE802.3af/at/bt End-Span, Alternative A mode	
	PoE (V+): RJ-45 pin 1, 2, 4, 5	
	PoE (V-): RJ-45 pin 3, 6, 7, 8	
	Data (1, 2, 3, 6, 4, 5, 7, 8)	

LED	Per Unit: Power 1 (Green), Power 2 (Green)
	Fiber LNK/ACT (Green): ON : Connected to network, OFF: Not connected to network, BLK : Receive /Transmit data
	Fiber Speed: 1000Base-X (Amber), 100Base-X (Green)
	RJ-45 port Speed: 10 /100 (Green), 1000 (Amber)
	LNK/ACT for RJ45(Green): ON : Connected to network, OFF: Not connected to network, BLK : Networking is active
	PoE : On (Green): ON : PoE normal working, OFF : PoE No power output
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Removable Terminal Block	Provide for 2 Redundant power, 4 Pin
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	-20°C ~ 70°C
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	70 x 30 x 103 mm (D X W X H)
Weight	245g
Installation	DIN Rail mounting, or wall mounting (Optional)
Power Supply	48VDC (44~57VDC), Redundant power with polarity reverse protect function and removable terminal block Below recommend is for difference PoE application: 55~57VDC VDC for 90W (4 Pairs) 52~57VDC for 60W (4 Pairs) 52~57VDC for 30W (2 Pairs) 44~57VDC for 15.4W (2 Pairs)
PoE Power budget	90W
Power Consumption	

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
55VDC	98.5W	5.0W	90W

MTBF	1,178,420 Hours (MIL-HDBK-217)
Warranty	5 years

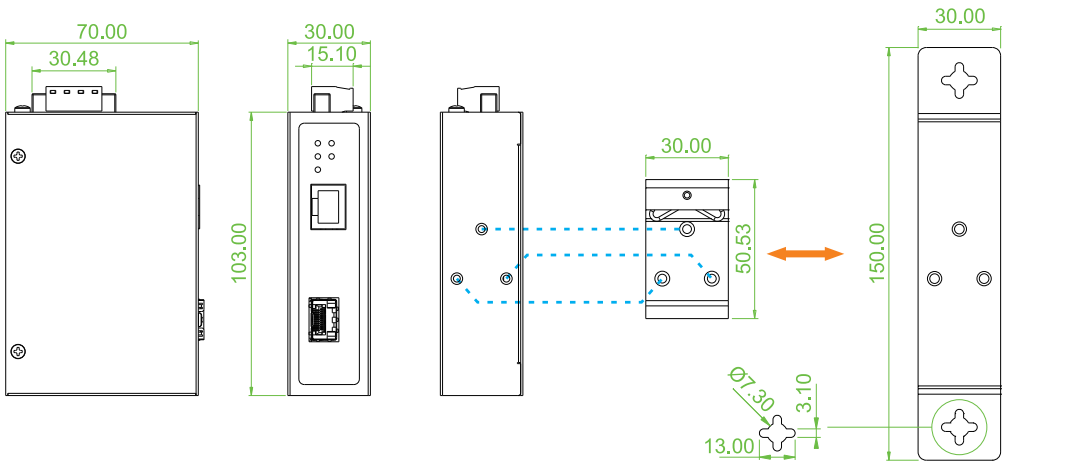
Certifications

EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications

Management	Supports Web Management
	Supports IPv4/6 DHCP and Auto Provision
	Supports OAM and Remote Loop-Back Test
	Supports SNTP and Qos
	Firmware Upgrade by TFTP or Web
	Dual Firmware Image
	Supports 802.1Q tag VLAN
Configuation	IP Configuration, Password Setting, Converter Configuration, Port Configuration, VLAN Group Configuration, Alarm Configuration, PoE Configuration, Download/Upload Setting Parameter
Diagnostic & Monitor	Supports Link Fault Pass-Through (LFPT) Function, Remote Loop Back Test and PoE Status
PoE	PoE Weekly Schedule, PoE PD Auto Checking & Auto Reset When PD Fail, PoE Configuration and Diagnostic PoE status

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	RJ45 UTP	Fiber	PoE Port		Power Input	Certification		Operating Temperature
		10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE802.3 af/at/bt (PSE)	Power Budget	Redundant	CE	FCC	
IMC-1000WS-PBE	V	1	1 SFP	1	90W	48VDC	V	V	-20~70°C

Related Product

IRC200-CH20	Industrial Converter Chassis, 20 Module slot
IRC200-2000MS	Industrial Managed 10/100/1000Base-T RJ45 to 100/1000Base-X SFP Media Converter for IRC200 Chassis
IMC-1001MS	Managed 10/100/1000Base-T RJ45 to 100/1000Base-X SFP Media Converter
IMC-1001CS	10/100/1000Base-T RJ45 to 100/1000Base-X SFP Media Converter

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product, (Compact 150 x 30mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For IMC-1000WS-PB)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For more reserve)

IMC-1000MS-PH12

NEW

1x GbE RJ45 to 100/1000Base SFP with PoE PSE (30W, 12/24/48VDC)

- 12/24/48VDC (9.6~57VDC) redundant dual input power
- Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- SNMP, Web based and In-band management, Remote Loop-Back test
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial managed media converter with 1 Gigabit UTP port and 1 100/1000 SFP slot for copper and fiber interface conversion, Not only it supports the PoE+ standard IEEE802.3af/at to inject up to 30 watts of power into PoE devices, but it also supports 12Vdc boost. IMC-1000MS-PH12 converter is designed for harsh environments, such as IP surveillance, industrial networking, intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Conversion between 10/100/1000Base-T and 100/1000Base-X fiber cable interface
- Provides IEEE 802.3at PoE output (30W)
- IP30 rugged metal housing and fanless
- Supports Jumbo frame 9K bytes packet
- Ingress/Egress bandwidth control with 64K granularity
- PoE configuration and monitor
- Supports EMS Management

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 802.3x	Flow Control and Back pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.1q	Tag VLAN
Fiber Ports	SFP slot for 100Base-X or 1000Base-X, 100M/1000M speed set by Web	
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function Supports UTP CAT.5e Twisted Pair cable	
Push Button	Reset, Load default setting	
Data Process Architecture	Pass through mode	
Jumbo Frame	9K bytes	
LFPT (Link Fault Pass Through)	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	

Connector and Pin Assignment	SFP Slot
	RJ-45 Socket: Cat 5e (10/100/1000Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto negotiation Function
Connector and Pin Assignment	RJ-45 Port support IEEE 802.3at/af End-Span, Alternative A mode
	PoE (V+): RJ-45 pin 1, 2
	PoE (V-): RJ-45 pin 3, 6
	Data (1,2,3,6,4,5,7,8)
LED	Per Unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	Fiber LNK/ACT (Green): ON : Connected to network, OFF: Not connected to network, BLK : Receive /Transmit data
	Fiber Speed: Yellow : 1000Base-X, Green : 100Base-X
	RJ-45 port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)
	LNK/ACT for RJ45(Green): ON : Connected to network, OFF: Not connected to network, BLK : Networking is active
	PoE : On (Green) Flash : PoE Fault (Over-load or short), ON : PoE normal working, OFF : PoE No power output
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	-20°C ~ 75°C
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	650g
Installation	DIN Rail mounting, or wall mounting (Optional)
Power Supply	12/24/48VDC (9.6~57VDC), Redundant power with polarity reverse protect function and removable terminal block
	Built-in very high efficiency booster(97~99%) to rise up 52VDC for PoE output
	Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
PoE Power Budget	30W
Power Consumption	Power consumption & Boost efficiency

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
12VDC	34.2W	3.9W	30W	99.0%
24VDC	34.7W	4.4W	30W	99.0%
48VDC	35.4W	4.7W	30W	97.7%

MTBF	864,121 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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 (EFT) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

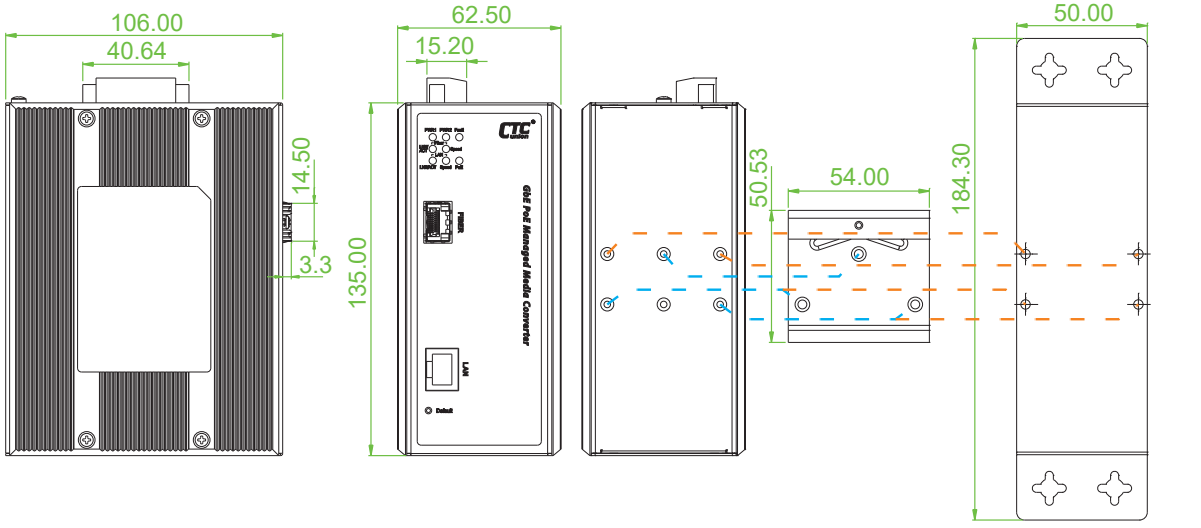
SNMP or Web Mode

Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuation	IP Configuration, Password Setting, Converter Configuration, Port Configuration, VLAN Group Configuration, Alarm Configuration and PoE Configuration
Diagnostic & Monitor	Supports Link Fault Pass-Through (LFPT) Function, Broadcast/Multicast/Unicast Storm Filter, SNMP Alarm Trap for Power Loss and Port Link Up/Down, and PoE Status

In-Band Remote mode

Management	Supports in-band management from FRM220 Chassis With FRM220-1000MS card
	Ingress/Egress bandwidth control with 64K granularity
Configuation	IP Configuration, Converter Configuration, Port Configuration, MIB Counter, VLAN Group Configuration, Alarm Configuration and PoE Configuration
Diagnostic & Monitor	Remote loop back test
	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter
	PoE Status

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	RJ45	Fiber	PoE		Power Input	Certification			Operating Temperature
		10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE802.3af/at (PSE)	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IMC-1000MS-PHE12	V	1	1 SFP	1	30W	12/24/48VDC	V	V	V	-20~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-1000MS

1x GbE RJ45 to 1x 100/1000Base SFP

- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- SNMP, Web based and In-band management,
- Remote Loop-Back test
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial managed media converter with 1 Gigabit UTP port and 1 100/1000 SFP slot for copper and fiber interface conversion, to meet the requirements for extended transmission distance, fanless design, high MTBF, supports wide operating temperature, and redundant 12/24/48VDC power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Conversion between 10/100/1000Base-T and 100/1000Base-X Fiber cable interface
- Supports Dual Rate (100/1000) SFP for selectable Fast or Gigabit speed on fiber
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75° C (IMC-1000MS-E)
- Supports Digital Diagnostic Monitor Interface (DDMI) for SFP
- Supports EMS Management
- Dying gasp (remote power failure detection)

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-TX Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-optic
	IEEE 802.3x	Flow Control and Back pressure
	IEEE 802.3ah	OAM management
Fiber Ports	100Base-X or 1000Base-X set by Web supports Auto Laser Shutdown (ALS) Supports DDMI for SFP diagnostic	
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function Supports UTP CAT.5e Twisted Pair Cable	
CPU watch dog	Supported	
Push Button	Reset, Load default seting	
Jumbo Frame	9K bytes	
Link Fault Pass Through (LFPT)	TX-Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	

LED	Per Unit : Power 1 (Green), Power 2 (Green), Fault (Amber)
	Fiber LNK/ACT (Green): ON: Connected to network, OFF: Not connected to network, BLK: Receive /Transmit data Fiber speed : Yellow : 1000Base-X, Green : 100Base-X
	RJ-45 port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)
	LNK/ACT for RJ45(Green): ON : Connected to network, OFF: Not connected to network, BLK: Networking is active
Reverse Polarity Protection	Supported for power Input
Overload Current Protection	Supported
Power Supply	12/24/48VDC (9.6~60VDC) , Redundant power with polarity Reverse protect function and removable terminal block
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
	Relay alarm output for power fail or port link down
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 7 Pin
Power Consumption	4.8 W
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-20 ~ 75°C (IMC-1000MS-E)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142.1mm (D x W x H)
Weight	0.62kg
Installation	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,153,428 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMI	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

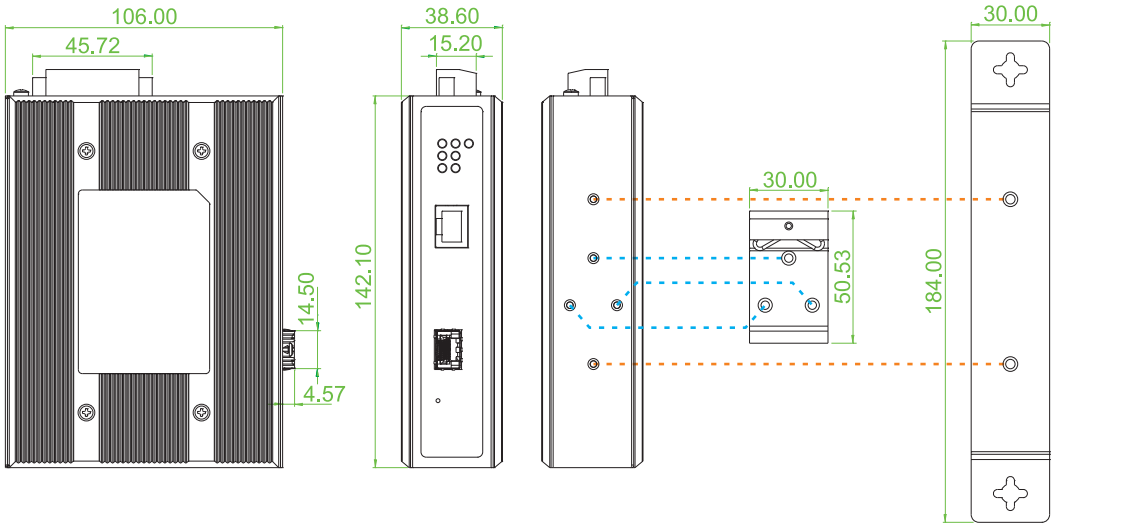
SNMP or Web Mode

Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuration	IP Configuration, Password Setting, Converter Configuration, Port Configuration, MIB Counter, SNMP Configuration, VLAN Group Configuration and Alarm Configuration
Diagnostic & Monitor	Supports Link Fault Pass-Through (LFPT) Function, Broadcast/Multicast/Unicast Storm Filter, SNMP Alarm Trap for Power Loss and Port Link Up/Down

In-Band Remote mode

Management	Supports in-band management from FRM220 Chassis with FRM220-1000MS card
	Ingress/Egress bandwidth control with 64K granularity
Configuration	IP Configuration, Converter Configuration, Port Configuration, MIB Counter, VLAN Group Configuration, Alarm Configuration and PoE Configuration
Diagnostic & Monitor	Remote Loop Back Test, Supports Link Fault Pass Through (LFPT) Function, Broadcast/Multicast/ Unicast Storm Filter

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Managed	RJ45	Fiber	Power Input	Certification			Operating Temperature
		10/100/1000 Base-T	Dual Speed 100/1000Base-X	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IMC-1000MS-E	V	1	1 SFP	12/24/48VDC	V	V	V	-20~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-1001S-PH & IMC-1001-PH

NEW

- 1x GbE RJ45 to 1x 100/1000Base SFP with PoE PSE (30W)
- 1x GbE RJ45 to 1x 100/1000Base-X SC with PoE PSE (30W)

- Supports LFPT (Link Fault Pass Through)
- CE and FCC certified

The industrial grade unmanaged Gigabit PoE media converter with 1 Gigabit UTP port and features 1 SC/ST Gigabit fiber on IMC-1001-PH or 1 100/1000 SFP slot on IMC-1001S-PH, used for copper cable to optical fiber interface conversion, supports PoE+ standard IEEE802.3af/at and can inject up to 30 watts of power into PoE equipment. They are designed for harsh environments such as IP surveillance, industrial networks, Intelligent Transportation Systems (ITS) are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Conversion between 10/100/1000Base-T and 100/1000Base-X SFP Fiber interface (IMC-1001S-PH)
- Conversion between 10/100/1000Base-T and 1000Base-X SC Fiber interface (IMC-1001-PH)
- Supports dual rate (100/1000) SFP for selectable Fast or Gigabit speed on fiber
- Provides IEEE 802.3at PoE output (30Watts)
- Provides a DIP-Switch to set functions
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~70° C (IMC-1001S-PHE)
- Supports Jumbo frame 9K bytes packet

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 802.3x	Flow Control and Back pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.1q	Tag VLAN
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function Supports UTP CAT.5e Twisted Pair cable	
Fiber Ports	100Base-X or 1000Base-X SFP slot (IMC-1001S-PH) 100Base-X or 1000Base-X set by DIP SW (IMC-1001S-PH) 100Base-X SC (IMC-1001-PH)	
Data Process Architecture	Store and Forward mode or Pass Through mode Set by DIP SW	
Jumbo Frame	16K bytes	
Fiber Parameters	Fiber Cable (Multi-mode): 50/125um, 62.5/125um	
	Fiber Cable (Single-mode): 9/125um	
	Available distance: • SFP, Distance depend on plug-in Fiber Transceiver	

Link Fault Pass Through (LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	
DIP Switch	SW1	Data Process Architecture Off : Store and Forward Switch Mode / On : Pass Through Mode
	SW2	Off : LFPT Disable / On: LFPT Enable
	SW3	SFP Fiber Speed Off: 1000BaseX / On: 100Base X (IMC-1001S-PH)
	SW4	PoE Off: PoE Output Enable / On: PoE Output Disable
Connector and Pin Assignment	100M or 1000M SFP Slot (IMC-1001S-PH) 1000M SC (IMC-1001-PH)	
	RJ-45 Socket: CAT.5e (10/100/1000Mbps) Twisted Pair cable	
	Auto MDI/MDI-X and Auto negotiation Function	
	RJ-45 Port supports IEEE 802.3at/af End-Span, Alternative A mode	
	PoE (V+): RJ-45 pin 1, 2.	
	PoE (V-): RJ-45 pin 3, 6.	
	Data (1, 2, 3, 6, 4, 5, 7, 8)	
LED	Fiber Port: LNK/ACT: 100 (Green), 1000 (Amber) ON: Connected to network / OFF: Not connected to network / BLK: Networking is active	
	RJ-45 port: LNK/ACT: 10/100 (Green), 1000 (Amber) ON: Connected to network / OFF: Not connected to network / BLK: Networking is active	
	PoE Status(Green): ON: PoE normal working / OFF : PoE No Power output	
Reverse Polarity Protection	Supported for Power Input	
Overload Current Protection	Supported	
Power Supply	48VDC (44~57VDC), Redundant power with polarity reverse protect function and removable terminal block	
PoE Power Budget	30W	
Power Consumption		

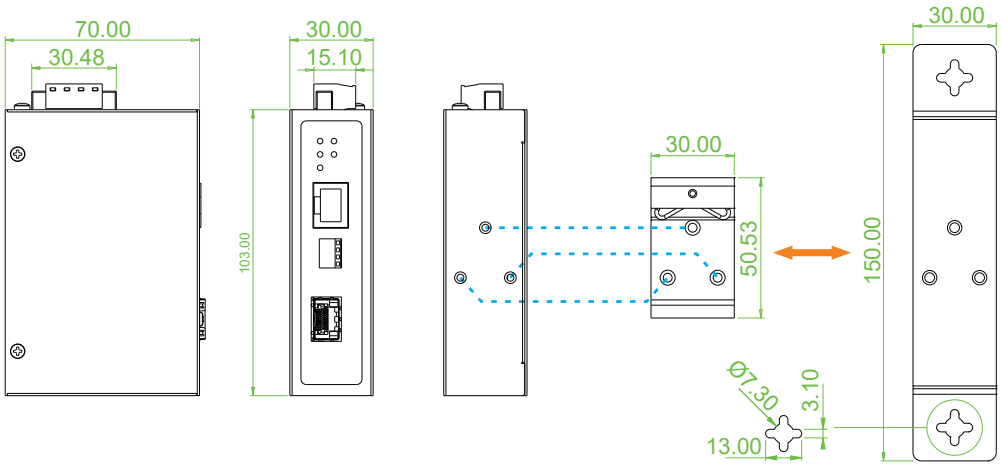
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
48VDC	33.4W	3.2W	30W

Removable Terminal Block	Provides 2 redundant power, 4 Pin
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	-20~70°C (IMC-1001S-PHE)
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	235g (IMC-1001S-PH) 240g (IMC-1001-PH)
Installation	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,639,119 Hours (IMC-1001S-PH) 997,294 Hours (IMC-1001-PH) MIL-HDBK-217
Warranty	5 years

Certifications

EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	RJ45	Fiber	PoE		Power Input	Certification		Operating Temperature
	10/100/1000 Base-T		IEEE 802.3at (PSE)	Power Budget	Redundant	CE	FCC	
IMC-1001S-PHE	1	100/1G SFP	1	30W	48VDC	V	V	-20~70°C
IMC-1001-PHE	1	1G SC/ST	1	30W	48VDC	V	V	-20~70°C

Connector Type	Connectivity Distance
SC (IMC-1001-PH)	001:500M (M/M) 002 : 2km (M/M) 020:20km (S/M) 040:40km (S/M)
	020A: WDM 20km A type (TX:1310nm)
	020B: WDM 20km B type (TX: 1550nm)type

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-1000S-PB

1x GbE RJ45 to 100/1000Base-X SFP with IEEE802.3bt PoE PSE (90W)

- Supports LFPT (Link Fault Pass Through)
- Support Store & Forward, or Pass through mode
- CE and FCC certified

Industrial unmanaged media converter with 1 Gigabit UTP port and 1 100/1000 SFP slot for copper and fiber interface conversion, It supports PoE+ standard IEEE802.3af/at/bt and can inject up to 90 watts of power into PoE devices, meet the requirements of long-distance transmission and high power injection, fanless design, high MTBF, supports wide operating temperature, and redundant power input, it is suitable for heavy-duty applications in harsh environments such as industrial factory automation and data centers, intelligent transportation systems, military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides IEEE 802.3af/at/bt Type 4 PoE output (Up to 90W)
- Supports DIP SW for setting LFPT, Store & Forward or Pass through mode, and SFP speed

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 802.3x	Flow Control and Back pressure
	IEEE 802.3bt	PoE++
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3af	PoE (Power over Ethernet)
Fiber Ports	SFP slot for 100Base-X or 1000Base-X, 100M/1000M speed set by DIP SW	
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function Supports UTP CAT.5e Twisted Pair cable	
Data Process Architecture	Store and Forward	
Jumbo Frame	16K bytes	
LFPT (Link Fault Pass Through)	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
DIP SW	SW1	LFTP OFF : LFPT disable / ON: LFPT enable
	SW2	Data Process Architecture OFF : Store and Forward switch mode / ON : Pass through mode
	SW3	Fiber Speed OFF: 1000BaseX / ON: 100Base X
	SW4	Reserve

Connector and Pin Assignment	SFP slot support 100/1000M SFP transceiver
	RJ-45 Socket: Cat 5e (10/100/1000Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto negotiation Function
	Supports IEEE 802.3at/af End-Span, Alternative A mode
	PoE (V+): RJ-45 pin 1, 2, 4, 5
	PoE (V-): RJ-45 pin 3, 6, 7, 8
	Data (1, 2, 3, 6, 4, 5, 7, 8)
LED	Per Unit: Power 1 (Green), Power 2 (Green)
	Fiber LNK/ACT: 1000 Link/Act (Amber), 100 Link/Act (Green), BLK: Networking is active
	RJ-45 Port: Speed: LNK/Act 1000 (Amber), LNK/Act 10/100 (Green)
	PoE Status (Green): ON : PoE normal working
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Removable Terminal Blo k	Provides 2 redundant power PWR1 and PWR2, 4 Pin
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	-20°C ~ 70°C
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	80 x 30 x 115mm (D x W x H)
Weight	340g
Installation	DIN Rail mounting, or wall mounting (Optional)
Power Supply	48VDC (44~57VDC), Redundant power with polarity reverse protect function and removable terminal block Below recommend is for difference PoE application: 55~57VDC VDC for 90W (4 Pairs) 52~57VDC for 60W (4 Pairs) 52~57VDC for 30W (2 Pairs) 44~57VDC for 15.4W (2 Pairs)
PoE Power Budget	90W
Power Consumption	

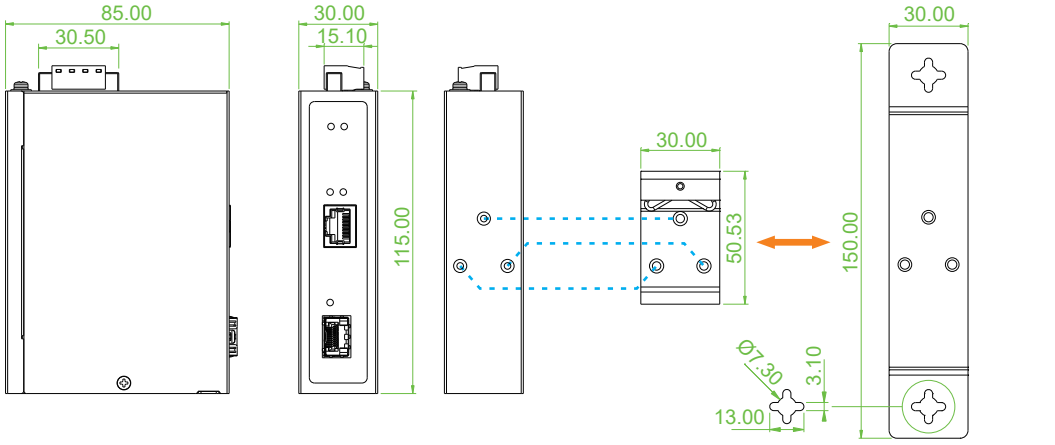
Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
54VDC	94.5W	3.8W	90W

MTBF	1,432,119 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMC	CE (EN55035, EN55032)
EMI	FCC Part 15 Subpart B Class A, CE
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	RJ45	Fiber	PoE		Power Input	Certification		Operating Temperature
	10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE803.3af/at/bt	Power Budget	Redundant	CE	FCC	
IMC-1000S-PB-E	1	1 SFP	1	90W	48VDC	V	V	-20~70°C

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C

IMC-1000S-PH12

100/1000Base-T to 100/1000Base-X SFP with PoE+ (PSE) Fiber Converter (30W, 12V Booster)

Industrial unmanaged media converter with 1 Gigabit UTP port and 1 100/1000 SFP slot for copper and fiber interface conversion, Not only it supports the PoE+ standard IEEE802.3af/at to inject up to 30 watts of power into PoE devices, but it also supports 12Vdc boost. IMC-1000S-PH12 converter is designed for harsh environments, such as IP surveillance, industrial networking, intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Conversion between 10/100/1000Base-T and 100/1000Base-X Fiber cable interface
- Supports dual rate (100/1000) SFP for selectable Fast or Gigabit speed on fiber
- 12/24/48VDC (9.6~57VDC) redundant dual input power with built-in very high efficiency booster (97~99%) to rise up 55 VDC for PoE output
- Regulate PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides IEEE802.3at PoE output (30Watts)
- Supports Remote PD reset by fiber port link down
- Supports LFPT (Link Fault Pass Through)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75° C
- CE, FCC, Railway traffic EN50121-4 certification
- Heavy industrial grade EMS,EMI EN61000-6-2, EN61000-6-4 certification
- Supports Jumbo frame 9K bytes packet

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 802.3x	Flow Control and Back pressure
	IEEE 802.3at	PoE+ (Power over Ethernet enhancement)
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE802.1q	Tag VLAN
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function Supports UTP CAT.5e Twisted Pair cable	
Fiber Ports	100Base-X or 1000Base-X SFP slot 100Base-X or 1000Base-X set by DIP SW	
Data Process Architecture	Store and Forward mode or Pass Through mode Set by DIP SW	
Jumbo Frame	9K bytes	

Link Fault Pass Through (LFPT)	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down
DIP Switch	ON: Disable Alarm For Power Loss / OFF: Enable Alarm For Power Loss
	ON: Disable Alarm For Port Link-Failure / OFF: Enable Alarm For Port Link-Failure
	ON: LFPT Enable / OFF: LFPT Disable
	Data Process Architecture ON : Pass through mode / OFF : Store and Forward switch mode
	Fiber Speed OFF: 1000Base-X / ON: 100Base-X
	PoE Output OFF: Enable PoE output / ON: Disable PoE output
	Remote PD reset OFF : Disable Remote PD reset / ON: Enable Remote PD reset by fiber port link down
Connector and Pin Assignment	SFP Slot
	RJ-45 Socket: CAT.5e (10/100/1000Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto negotiation Function
	RJ-45 Port supports IEEE 802.3at/af End-Span, Alternative A mode.
	PoE (V+): RJ-45 pin 1, 2. / PoE (V-): RJ-45 pin 3, 6. / Data (1, 2, 3, 6, 4, 5, 7, 8)
LED	Per Unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	Fiber LNK/ACT (Green): ON: Connected to network / OFF: Not connected to network, BLK: Receive /Transmit Data
	Fiber Speed: Yellow : 1000Base-X, Green : 100 Base- X
	RJ-45 Port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)
	LNK/ACT for RJ45(Green): ON: Connected to network, OFF: Not connected to network, BLK: Networking is active
	PoE Status (Green): Flash: PoE Fault (Over-load or short), ON: PoE normal working / OFF : PoE No Power output
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	12/24/48VDC (9.6~57VDC), Redundant power with polarity reverse protect function and removable terminal block
	Built-in very high efficiency booster(97~99%) to rise up 55 VDC for PoE output
	Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
PoE Power Budget	30W

Power Consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
12VDC	34.2W	3.9W	30W	99.0%
24VDC	34.7W	4.4W	30W	99.0%
48VDC	35.4W	4.7W	30W	97.7%

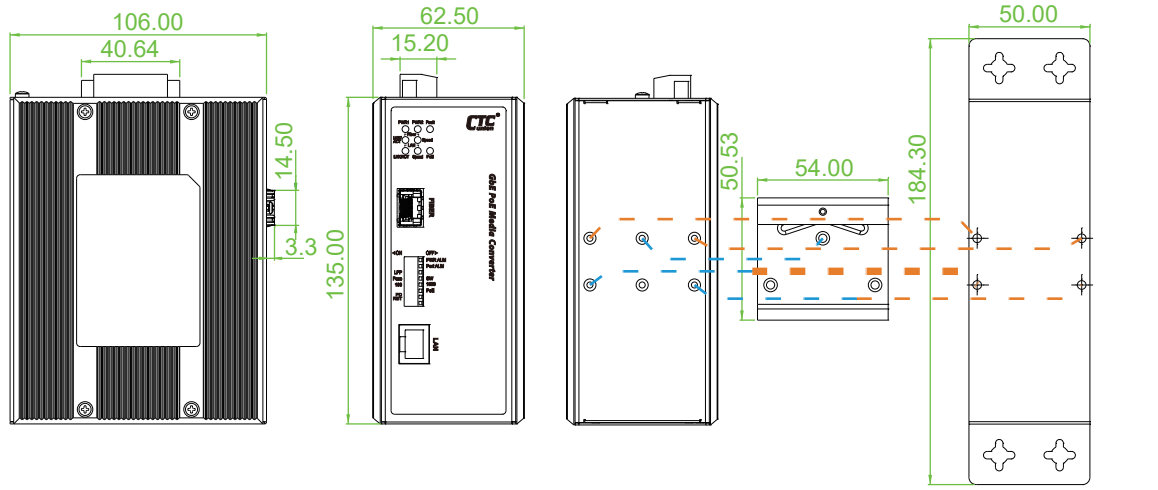
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	-20°C ~ 75°C
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142 mm (D x W x H)
Weight	650g
Installation	DIN Rail mounting, or wall mounting (Optional)
MTBF	881,372 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4

Immunity for Heavy Industrial Environment	EN 61000-6-2
Emission for Heavy Industrial Environment	EN 61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	RJ45	Fiber	PoE		Power Input	Certification				Operating Temperture
	10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE802.3af/at (PSE)	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-1000S-PHE12	1	1 SFP	1	30W	12/24/48VDC	V	V	V	V	-20~75°C

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-1001C & IMC-1001CS

- 1x GbE RJ45 to 1x 1000Base Fiber (SC) (Compact, Size)
- 1x GbE RJ45 to 1x 100/1000Base SFP (Compact, Size)

- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- 12/24/48VDC (9.6~60VDC) Redundant input power
- CE and FCC certified

These compact models are unmanaged industrial grade gigabit Ethernet media converters that support conversion between electrical 10/100/1000Base-T and optical 1000Base-X Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these converters are designed for harsh environments, such as industrial networking and intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 70° C
- Store-and-Forward mode and Pass through mode (set by DIP SW)
- Conversion between 10/100/1000Base-T and 1000Base-X Fiber cable interface

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 802.3x	Flow Control and Back pressure
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto negotiation Function	
Fiber Ports	1000Base-SX/LX SC (IMC-1001C) 100/1000Base-X SFP Slot (IMC-1001CS)	
Data Process Architecture	Store and Forward Switch mode or Pass through mode set by DIP SW	
Jumbo Frame	16K Bytes (For Store and Forward Switch mode)	
Fiber Parameters	Fiber Cable (Multi-mode): 50/125um, 62.5/125um	
	Fiber Cable (Single-mode): 9/125um Wavelength: 1310nm (Multi-mode/Single-mode)	
	Available distance: (IMC-1001C) 500M (Multi-mode SX) / 20KM (Single-mode) / 40KM (Single-mode)	
	Distance depend on SFP Fiber Tranceiver (IMC-1001CS)	
Link Fault Pass Through (LFPT)	TX-Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	

DIP Switch	Data Process Architecture OFF: Store and forward switch mode, ON: Pass through mode
	LFPT OFF: LFPT Disable, ON: LFPT Enable
	SFP Fiber Speed (IMC-1001CS) OFF: 1000Base-X, ON: 100Base-FX
Connector	Fiber SC Multi-mode, 500M/ SC Single-mode, 20KM, 40KM (IMC-1001C) SFP Slot (IMC-1001CS)
	RJ-45 Socket Auto MDI/MDI-X and Auto negotiation Function
LED	Per Unit: Power 1 (Green), Power 2 (Green)
	SFP Fiber port Speed & LinK/Act (IMC-1001CS) 100Base-X (Green), 1000Base-X (Amber) SC/ST Fiber port Speed & LinK/Act (IMC-1001C) 1000Base-X (Amber)
	RJ-45 port: Speed & Link/Act: 10/100 (Green), 1000 (Yellow)
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
Power Supply	12/24/48VDC (9.6~60VDC) Redundant input power with polarity reverse protect function and removable terminal block
Power Consumption	

Input Voltage	12V	24V	48V
IMC-1001CS	1.8W	2W	2.4W
IMC-1001C	1.8W	2W	2.4W

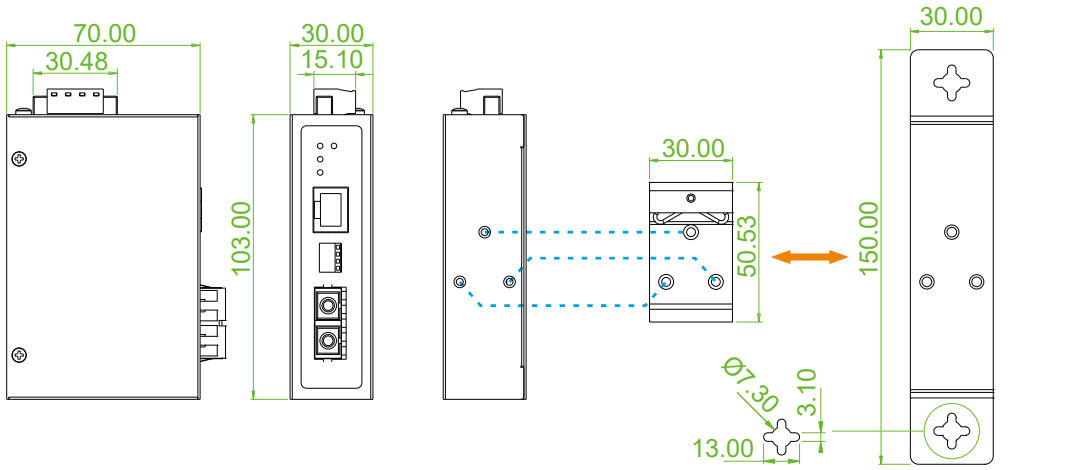
Removable Terminal Block	Provides for dual input power, 4 Pin
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-20~70°C (IMC-1001C-E, IMC-1001CS-E)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	70x 30x 103 mm (D x W x H)
Weight	230g (IMC-1001C) 225g (IMC-1001CS)
Installation	DIN Rail, or wall mounting (Optional)
MTBF	1,278,798 Hours (IMC-1001C) 1,940,623 Hours (IMC-1001CS) (MIL-HDBK-217)
Warranty	5 years

Certifications

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

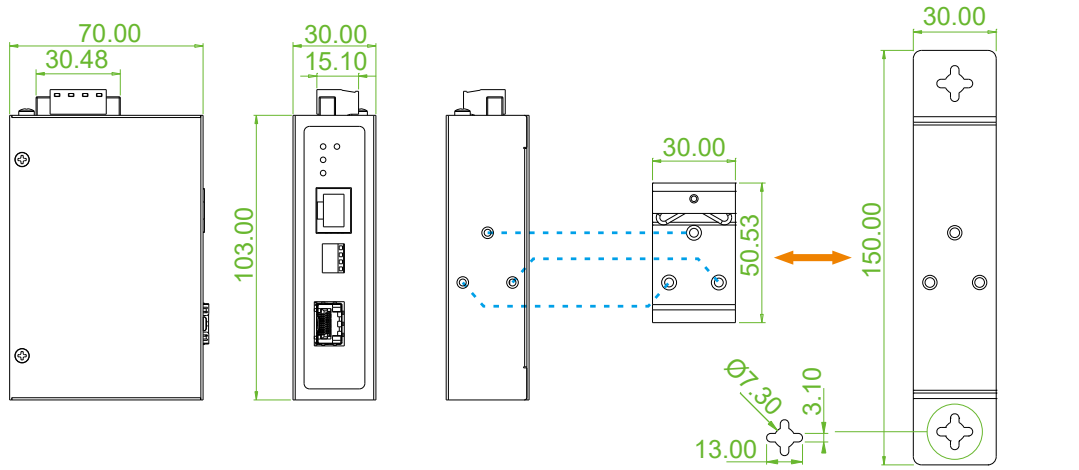
Dimensions

▶ IMC-1001C



Side View　Front View　Rear View　DIN-Rail Kit View　Wall-Mount Kit View (Optional Accessory)

▶ IMC-1001CS



Side View　Front View　Rear View　DIN-Rail Kit View　Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	RJ45	Fiber		Power Input	Certification	Operating Temperature
	10/100/1000Base-T	1000Base-X	Dual Speed 100/1000Base-X	Redundant Power	CE, FCC	
IMC-1001C-E	1	SC		12/24/48VDC	V	-20~70°C
IMC-1001CS-E	1		1 SFP	12/24/48VDC	V	-20~70°C

Connector Type	Connectivity Distance
SC (IMC-1001C-E only)	001:500M (M/M)　002 : 2km (M/M)　020:20km (S/M)　040:40km (S/M)
	020A: WDM 20km A type (TX:1310nm)
	020B: WDM 20km B type (TX: 1550nm)type

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

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-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -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)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-100C

1x 10/100Base RJ45 to 1x 100Base Fiber (ST/SC), Compact Size

- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial grade compact size unmanaged 100M Ethernet media converter that supports conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet. Housed in rugged DIN rail or wall mountable enclosures, the converter is designed for harsh environments, such as industrial networking and intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. Wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- DC input power 12/24/48VDC (9.6 ~ 60VDC) or 24VAC (18~36VAC)
- IP30 rugged metal housing, compact size and fanless
- Wide operating temperature -40 ~ 75° C
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3x	Flow Control
RJ45 Ports	10/100Base-TX Auto MDI/MDI-X and Auto negotiation Supports UTP CAT.5e Twisted Pair cable	
Fiber Ports	100Base-FX (SC/ST connectors)	
Switch Architecture	Store and Forward in switch mode	
	Supports 1024 MAC addresses in switch mode	
Ethernet Packet length	2046Byte (Max) in Switch mode	
Jumbo Frame	9K bytes in Pass through (Converter mode)	
Fiber Parameters	Fiber Cable (Multi-mode): 50/125um,62.5/125um	
	Fiber Cable (Single-mode): 9/125um	
	Wavelength: 1310nm (Multi-mode/Single-mode)	
	Available distance: 2KM (Multi-mode) / 30KM (Single-mode) / 50KM (Single-mode)	
Link Fault Pass Through (LFPT)	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	

DIP Switch	Force Fiber port Duplex OFF: Full Duplex / ON: Half Duplex
	LFPT ON: Enables LFPT (Link Fault Pass Through) / OFF: Disables LFPT
	Architecture OFF: Switching mode / ON: Pass through converter mode
Connector	Fiber SC (Multi-mode, 2km), SC (Single-mode, 30km, 50KM) ST (Multi-mode, 2km), ST (Single-mode, 30km, 50KM)
	RJ-45 Socket CAT.5e (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto negotiation Function
LED	PWR (Green): ON: Power active / OFF: Power is inactive
	Fiber (Green): LNK/Act (Green) : Link & Active, Duple (Green) : Fiber port Full or Half duplex
	LAN: 100 (Green): 100M Link & Active / 10 (Green): 10M Link & Active
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
Power Supply	12/24/48VDC (9.6~60VDC) or 24VAC (18~36VAC), polarity reverse protect function and removable terminal block
Power Consumption	

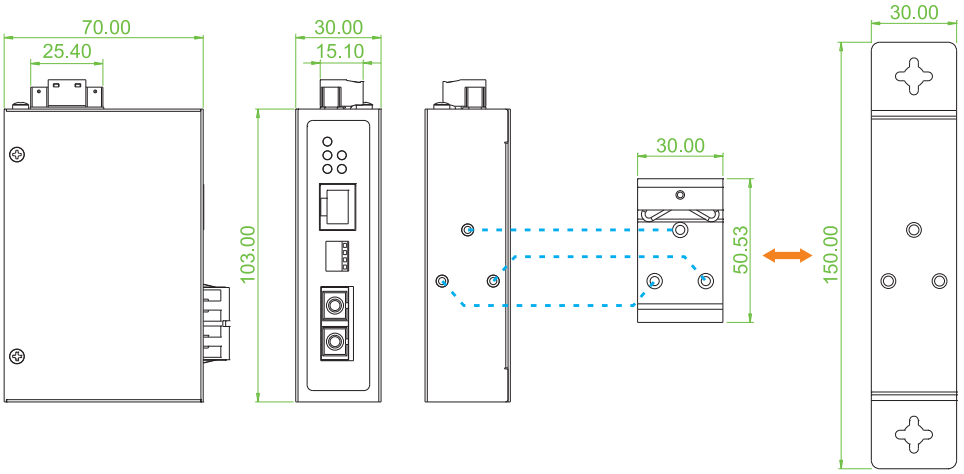
Input Voltage	Watt(W)
12VDC	1.8W
24VDC	1.8W
48VDC	2.1W

Removable Terminal Block	Provide for 1x DC input power (2 Pin)
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40 ~ 75°C
Storage Temperature	-40 ~ 85°C
Housing	IP30 rugged metal housing ,compact size and fanless
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	215g
Installation	DIN Rail mounting, Wall Mounting (Optional)
MTBF	1,558,180 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN 61000-6-2
Emission for Heavy Industrial Environment	EN 61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	RJ45	Fiber	Power Input	Certification				Operating Temperature
	10/100Base-TX	100Base-FX	Single Power	EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-100C-E	1	1 SC	12/24/48VDC	V	V	V	V	-40~75°C

Connector Type	Connectivity Distance
SC, ST	002:2km (M/M) 030:30km (S/M) 050:50km (S/M)
	020A: WDM 20km A type (TX:1310nm)
	020B: WDM 20km B type (TX: 1550nm)

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IMC-100

1x 10/100Base RJ45 to 1x 100Base-FX Fiber (ST/SC)

- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- UL60950-1, EN50121-4, EN61000-6-2,EN61000-6-4, CE and FCC certified

The industrial grade unmanaged 100M Ethernet media converter that supports conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet. Housed in rugged DIN rail or wall mountable enclosures, the converter is designed for harsh environments, such as industrial networking and intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. Wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75° C
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface

Specifications

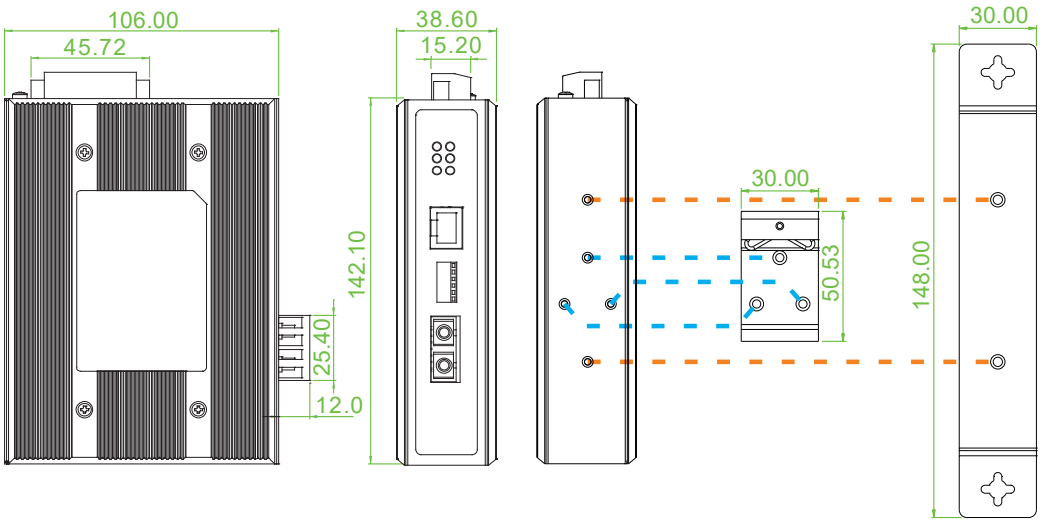
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3x	Flow Control
RJ45 Ports	10/100Base-TX Auto MDI/MDI-X and Auto-Negotiation Function Supports UTP CAT.5e Twisted Pair Cable	
Fiber Ports	100Base-FX (SC/ST connectors)	
Switch Architecture	Store and Forward in Switch mode	
	Supports 1024 MAC addresses in Switch mode	
Ethernet Packet length	2046Byte (Max) in Switch mode	
Jumbo Frame	9K bytes in Pass through (Converter mode)	
Fiber Parameters	Fiber Cable (Multi-mode): 50/125um,62.5/125um	
	Fiber Cable (Single-mode): 9/125um	
	Wavelength: 1310nm (Multi-mode/Single-mode)	
	Available distance: 2KM (Multi-mode) / 30KM (Single-mode) / 50KM (Single-mode)	
Link Fault Pass Through (LFPT)	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down	
	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	
Far-End Fault (FEF)	Work with LFPT to prevents data loss	
DIP Switch	**TP Auto Negotiation** OFF: Auto Mode / ON: Force Mode	
	Force TP Speed OFF: 100 Mbps / ON: 10 Mbps	
	Force TP Duplex OFF: Full Duplex / ON: Half Duplex	
	LFPT ON: Enables LFPT (Link Fault Pass Through) / OFF: Disables LFPT (Link Fault Pass through)	
	Flow control ON: Flow control enable / OFF: Flow control disable	
	Mode OFF: Switching mode / ON: Pass through converter mode	

Connector	Fiber SC (Multi-mode, 2km), SC (Single-mode, 30km, 50KM) ST (Multi-mode, 2km), ST (Single-mode, 30km, 50KM)
	RJ-45 Socket: CAT.5e (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function
LED	PWR 1 (Green): ON: Power1 active / OFF: Power1 is inactive
	PWR 2 (Green): ON: Power2 active / OFF: Power2 is inactive
	Fault (Red): ON: Fiber or TP has failed / OFF: TP are functional
	Fiber (Green): ON : Connected to network / OFF: Not connected to network, BLK: Receive/Transmit data
	100 (Amber): ON: 100Mbps / OFF: 10Mbps
	LAN (Green): ON : Connected to network / OFF: Not connected to network, BLK: Networking is active
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
Power Supply	12/24/48VDC(9.6~60VDC), Redundant power with polarity reverse protect function and removable terminal block
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact
Power Consumption	2.9 W
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40 ~ 75°C
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142.1mm (D X W X H)
Weight	0.62kg
Installation	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,199,572 Hours (MIL-HDBK-217)
Warranty	5 years

Certifications

EMI	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN 61000-6-2
Emission for Heavy Industrial Environment	EN 61000-6-4
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 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	RJ45	Fiber	Power Input	Certification				Operating Temperature
	10/100Base-TX	100Base-FX	Redundant	UL60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IMC-100-E	1	1 SC	12/24/48VDC	V	V	V	V	-40~75°C

Connector Type	Connectivity Distance
SC, ST	002:2km (M/M) 030:30km (S/M) 050:50km (S/M)
	020A: WDM 20km A type (TX:1310nm)
	020B: WDM 20km B type (TX: 1550nm)

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

GW211W-MQ

NEW

Modbus to MQTT Gateway

- Both Ethernet and WiFi for communication
- 15KV ESD protection for all signals
- RS422, RS485 surge protection
- High range operating temperature -20~70° C

The MQTT Wi-Fi / Ethernet / Serial Gateway, GW211W-MQ provides an easy to deploy device to send RS-232/RS-485 Serial Modbus RTU Data communications to MQTT TCP networks on hard-wired Ethernet or over wireless WiFi networks.. The MQTT Gateway works with standard Modbus Slave device, such as PLCs, IoT Sensors, Energy meters (AMRs), Solar Inverters, Wind Turbines, IO Modules, Flow Meters and more. The MQTT Gateway is built for use in light industrial environments and features a compact wall-mount design. It operates from 9-32VDC power supply voltages with terminal block connectors and is easy to configure through its web GUI interface.

Features

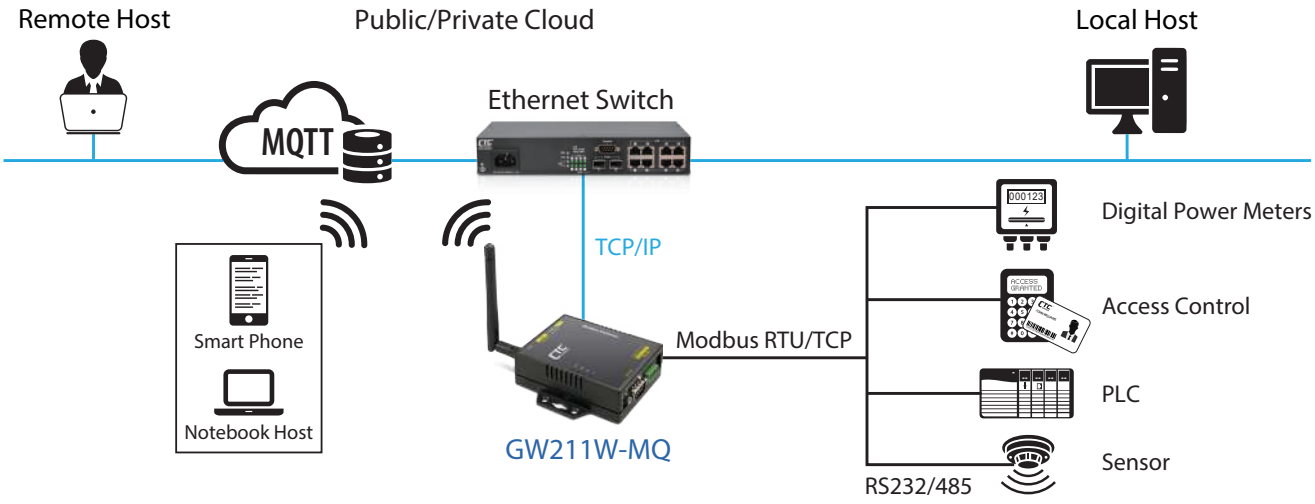
- Supports Modbus RTU to MQTT
- Supports 802.11b/g/n and Ethernet, 2 IPs
- Supports 32 Topics, register length adjustable
- Supports to query 4 remote TCP devices
- Easy MQTT settings by web browser configuration
- Easy installation with Windows IP utility
- On line F/W upgrade
- Watch Dog Function

Specifications

Ethernet	Port Type	RJ-45 Connector
	Speed	10/100 M bps (Auto Detecting)
	Protocol	ARP, IP, ICMP, UDP, TCP, HTTP, DHCP, DNS, NTP
	Mode	Modbus TCP
	Setup	HTTP Browser Setup (IE, Chrome, Firefox)
	Security	Setup Password
	Protection	Built-in 1.5KV Magnetic Isolation
Serial Ports *2	Port	RS-232
	Port	RS-422 / 485 (Surge Protect)
	Speed	300 bps ~ 921.6 K bps
	Parity	None, Odd, Even
	Data Bit	5, 6, 7, 8
	Stop Bit	1, 2
	RS-232 Pins	Rx , Tx , GND
	RS-422	Rx+, Rx-, Tx+, Tx- (Surge Protect)
	RS-485	Data+, Data- (Surge Protect)
	15KV ESD for All Signals	

WiFi	Standard	802.11b/g/n
	Data Rate	11/54/72.2 Mbps @ 20Mhz Band Width
	Modulation	DSSS; OFDM
	Frequency	2.4GHz
	Tx Power 11b	Max. 22dBm
	Tx Power 11g/n	Max. 19dBm
	Rx Sensitivity	-76dBm@54Mbps; -89.5dBm@11Mbps
	Tx Rate	Max. 54Mbps with auto fallback
	Tx Distance	Up to 100 Meters
	Security	WEP 64-bit / 128-bit data encryption, WPA / WPA2
	Antenna	2 dBi ; RP-SMA connector
	Network Mode	Infrastructure; Soft AP (for Setup)
LED	SYS, WiFi, RX, TX, LAN	
Power	DC 9~32V, supports DC Jack & Terminal Input	
Power Consumption	2W	
MTBF	60,000 hours (MIL-HDBK-217)	
Mechanical	Dimensions	110 x 90 x 26 mm (W x D x H)
	Weight	110g
	Housing	plastic
Installation Mounting	Wall Mounting	
Environment	Operating Temperature	-20°C ~ 70°C
	Storage Temperature	-25°C ~ 80°C
Certification	FCC, CE	

Application



Ordering Information

Model Name	Description
GW211W-MQ	1x RS232, 1x RS422/485 Modbus to MQTT Wireless Gateway with Power Adapter

GW211W-MB

Modbus RTU to Modbus TCP Gateway

- Both Ethernet and WiFi for communication
- 15KV ESD protection for all signals
- RS422, RS485 surge protection
- High range operating temperature -20~70° C

The Modbus Wi-Fi / Ethernet / Serial Gateway, GW211W-MB provides an easy to deploy device to send Modbus serial data communications over a packet network such as Ethernet or TCP/IP on a hard-wired network or via WiFi. The Modbus Gateway works with standard Modbus Slave devices, such as PLCs, IoT Sensors, Energy meters (AMRs), Solar Inverters, Wind Turbines, IO Modules, Flow Meters and more. The Modbus Gateway is built for use in light industrial environments and features a compact wall-mount design. It operates from 9-32VDC power supply voltages with terminal block connectors and each Modbus Gateway is easily configure through its web GUI interface.

Features

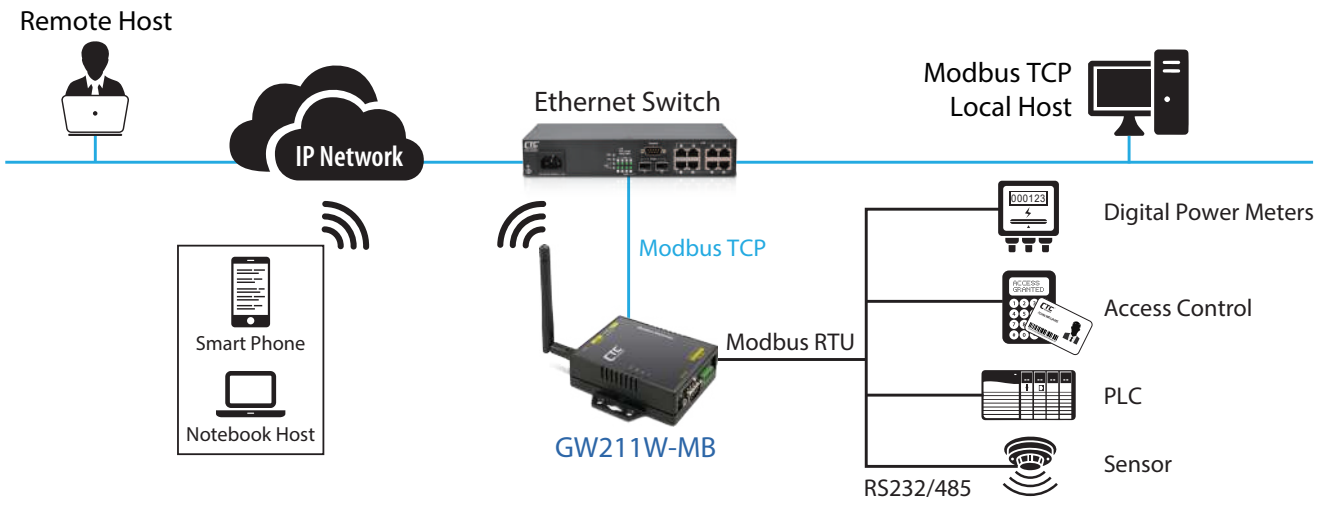
- TCP to RTU support 8 simultaneous TCP Master
- RTU to TCP support 8 TCP Slaves on each port.
- Software support : TCP to RTU Slaves, RTU to TCP Slaves, TCP to ASCII Slaves, ASCII to TCP Slaves
- Supports 802.11b/g/n and Ethernet, 2 IPs
- Web browser configuration
- Easy installation Windows utility
- On line F/W upgrade
- Watch Dog Function

Specifications

Ethernet	Port Type	RJ-45 Connector
	Speed	10/100 M bps (Auto Detecting)
	Protocol	ARP, IP, ICMP, UDP, TCP, HTTP, DHCP, DNS, NTP
	Mode	Modbus TCP
	Setup	HTTP Browser Setup (IE, Chrome, Firefox)
	Security	Setup Password
	Protection	Built-in 1.5KV Magnetic Isolation
Serial Ports *2	Port	RS-232*1
	Port	RS-422 / 485*1 (Surge Protect)
	Speed	300 bps ~ 921.6 K bps
	Parity	None, Odd, Even
	Data Bit	5, 6, 7, 8
	Stop Bit	1, 2
	RS-232 Pins	Rx , Tx , GND
	RS-422	Rx+, Rx-, Tx+, Tx- (Surge Protect)
	RS-485	Data+, Data- (Surge Protect)
	15KV ESD for All Signals	

WiFi	Standard	802.11b/g/n
	Data Rate	11/54/72.2 Mbps @ 20Mhz Band Width
	Modulation	DSSS; OFDM
	Frequency	2.4GHz
	Tx Power 11b	Max. 22dBm
	Tx Power 11g/n	Max. 19dBm
	Rx Sensitivity	-76dBm@54Mbps; -89.5dBm@11Mbps
	Tx Rate	Max. 54Mbps with auto fallback
	Tx Distance	Up to 100 Meters
	Security	WEP 64-bit / 128-bit data encryption, WPA / WPA2
	Antenna	2 dBi ; RP-SMA connector
	Network Mode	Infrastructure; Soft AP (for Setup)
LED	SYS, WiFi, RX, TX, LAN	
Power	DC 9~32V, supports DC Jack & Terminal Input	
Power Consumption	2W	
MTBF	60,000 hours (MIL-HDBK-217)	
Mechanical	Dimensions	110 x 90 x 26 mm (W x D x H)
	Weight	110g
	Housing	plastic
Installation Mounting	Wall Mounting	
Environment	Operating Temperature	-20°C ~ 70°C
	Storage Temperature	-25°C ~ 80°C
Certification	FCC, CE	

Application



Ordering Information

Model Name	Description
GW211W-MB	1x RS232, 1x RS422/485 Modbus RTU to Modbus TCP Wireless Gateway with Power Adapter

STE211W & STE211

- 2-port Serial to Ethernet Wireless Device Server
- 2-port Serial to Ethernet Device Server

- Both Ethernet and WiFi for communication
- 15KV ESD protection for all signals
- RS422, RS485 surge protection
- High range operating temperature -20~70° C

The serial to Ethernet wireless device server (STE211W) and serial to Ethernet device server (STE211) provide a bridging device to connect RS-232/RS-485 Serial Data communications to hardwired Ethernet networks or WiFi wireless networks. It connects serial devices such as PLC, alarm sensors and PTZ camera control to IP networks. Applications include industrial/factory automation, public safety, and surveillance systems. The Serial converter is built for use in light industrial environments, featuring a compact wall-mount design. It operates from 9-32VDC power supply voltages with terminal block connectors and is easy to configure through its web GUI interface.

Features

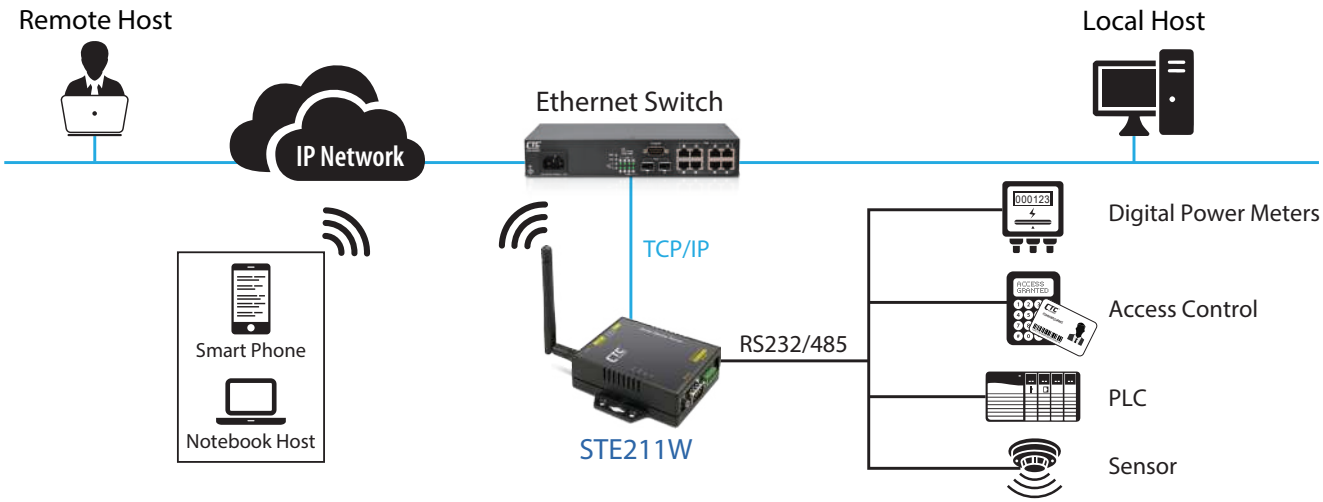
- 1-port RS-232 + 1-port RS-422/485
- As a Server, supports 4 TCP Clients connection simultaneously.
- As a Client, supports connecting with 4 TCP Servers.
- Easy installation with Windows IP Search utility
- Web browser configuration
- Supports 802.11b/g/n and Ethernet, 2 IPs (STE211W)
- Watch Dog Function

Specifications

Ethernet	Port Type	RJ-45 Connector
	Speed	10/100 M bps (Auto Detecting)
	Protocol	ARP, IP, ICMP, UDP, TCP, HTTP, DHCP, DNS, NTP
	Mode	TCP Server/TCP Client/UDP/Virtual Com
	Setup	HTTP Browser Setup (IE, Chrome, Firefox)
	Security	Setup Password
	Protection	Built-in 1.5KV Magnetic Isolation
Serial Ports *2	Port	RS-232 (RX/TX only)
	Port	RS-422 / 485 (Surge Protect)
	Speed	300 bps ~ 921.6 K bps
	Parity	None, Odd, Even
	Data Bit	5, 6, 7, 8
	Stop Bit	1, 2
	RS-232 Pins	Rx , Tx , GND
	RS-422	Rx+, Rx-, Tx+, Tx- (Surge Protect)
	RS-485	Data+, Data- (Surge Protect)
	15KV ESD for All Signals	

WiFi (STE211W)	Standard	802.11b/g/n
	Data Rate	11/54/72.2 Mbps @ 20Mhz Band Width
	Modulation	DSSS; OFDM
	Frequency	2.4GHz
	Tx Power 11b	Max. 22dBm
	Tx Power 11g/n	Max. 19dBm
	Rx Sensitivity	-76dBm@54Mbps; -89.5dBm@11Mbps
	Tx Rate	Max. 54Mbps with auto fallback
	Tx Distance	Up to 100 Meters
	Security	WEP 64-bit / 128-bit data encryption, WPA / WPA2
	Antenna	2 dBi ; RP-SMA connector
	Network Mode	Infrastructure; Soft AP (for Setup)
LED	SYS, RX, TX, LAN and WiFi (STE211W)	
Power	DC 9~32V, supports DC Jack & Terminal Input	
Power Consumption	2W	
MTBF	60,000 hours (MIL-HDBK-217)	
Mechanical	Dimensions	110 x 90 x 26 mm (W x D x H)
	Weight	110g
	Housing	plastic
Installation Mounting	Wall Mounting	
Environment	Operating Temperature	-20°C ~ 70°C
	Storage Temperature	-25°C ~ 80°C
Certification	FCC, CE	

Application



Ordering Information

Model Name	Description
STE211W	1x RS232, 1x RS422/485 Serial to Ethernet Wireless Device Server with Power Adapter
STE211	1x RS232, 1x RS422/485 Serial to Ethernet Device Server with Power Adapter

IFC-Serial-PRO

1x RS485 to 1-port Fiber (SC/ST) Media Converter, support PROFIBUS

- 2.5KV isolation for serial port (RS485)
- Supports fiber port for extend transmission distance
- Baud Rate up to 9.6K~12Mbps for Profibus application
- Supports Auto Baud Rate mode, or manual mode for setting Baud Rate

IFC-Serial-PRO is a serial over fiber converter that is capable of selecting interface modes for connection to RS-485 2-wire half duplex and supports high-speed data rates of PROFIBUS. Fiber optical cabling extends distances and isolates from EMC/noise to reduce interference between PROFIBUS devices. The terminal block offers an alarm relay contact and two redundant DC power inputs. IFC -Serial-PRO is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range, making it is reliable and an ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. IFC-Serial-PRO is protocol transparent, and can be applied to PROFIBUS and other networks using RS485 interfaces (See Figure 1).

Features

- Supports 1x Fiber and 1x RS485
- Extend serial transmission distance up to 500m, 2km, 20km
- Supports fiber port point to point (Figure 3)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent. These products can be applied to the PROFIBUS, but also can be applied to other network using RS485 interface
- CE, FCC, heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

Specifications

FieldBus Protocol	Protocol Transparent	PROFIBUS and all operations available on RS485
Problem isolation	Isolate EMC/noise to reduce mutual interference between PROFIBUS device (Figure 1) Isolate the PROFIBUS side of the failure, to avoid the impact of the other side (See Figure 2)	
Fiber Port Interface	Connector	SC, ST
	Fiber Port	1 fiber port
	Fiber Type	M/M 500M, M/M 2KM, S/M 20KM Bidi 20KM
	Wavelength	M/M 850nm or 1310nm, S/M 1310nm Bidi: Mode A : TX1310nm/RX1550nm Mode B : TX1550nm/RX1310nm
Fiber port Topology	Point to Point (Figure 3)	

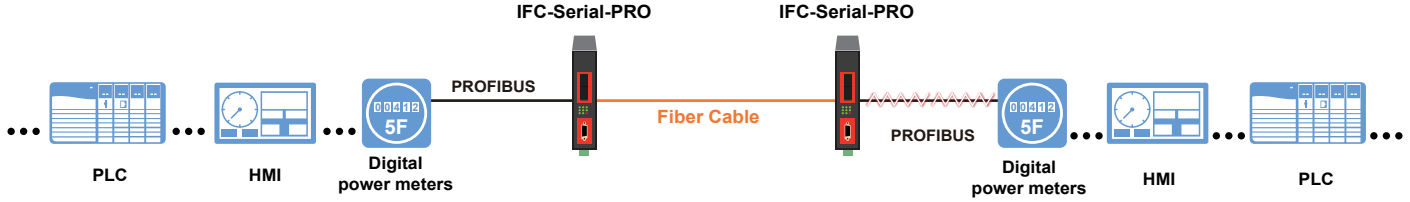
Serial port Interface	Serial Port Connector	DB9 Female
		RS-485 : 2 wires, Half duplex
	RS-485 Direction	Automatically detection
	Serial Port Baudrate	9.6K to 12Mbps Auto mode : Auto sense Baudrate, no need to set Baudrate Manual Mode : Baudrate Set by DIP SW
	Serial Port Isolation	2.5KVrms isolation for serial signals EMC/noise isolation, to reduce mutual interference between serial port device
Environmental	Operating emperature	-10 ~ 60°C (IFC-Serial-PRO) -40 ~ 75°C (IFC-Serial-PRO-E)
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR1, PWR2, Alarm, Master, TD, RD, Fiber Link, System	
Alarm Relay	Alarm exists for power, fiber link or ring protection, Relay output with carry capacity 1A @ 24VDC	
Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 60VDC)
	Power Consumption	<6W
	Power Reversal Protection	Yes
	Over Current Protection: Signal Short Together Protected	
Terminal Block	For Power and Alarm	
	V1+, V1-, V2+, V2-, Alarm NC, Alarm COM	
Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Dimensions	85x 30x 115mm (D x W x H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	295g

Certification

EMC	CE (EN55032, N55035)
EMI	FCC Part 15 Subpart B Class A, CE (EN55032)
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 ESD Level 3
	EN61000-4-3 RS Level 3
	EN61000-4-4 EFT Level 3
	EN61000-4-5 Surge Level 3
	EN61000-4-6 CS Level 3
Free Fall	IEC 60068-2-31
Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27
Green	RoHS
MTBF	1,137,875 Hours (MIL-HDBK-217)
Warranty	5 years

Application & Topology

Figure 1 : IFC-Serial-PRO Application for PROFIBUS



Benefit:
1. EMC/noise isolation, to reduce mutual interference between serial port device
2. Extend distance by fiber
3. Isolate PROFIBUS failure
4. Achieve a reliable network environment

Figure 2 : Isolate PROFIBUS Failure

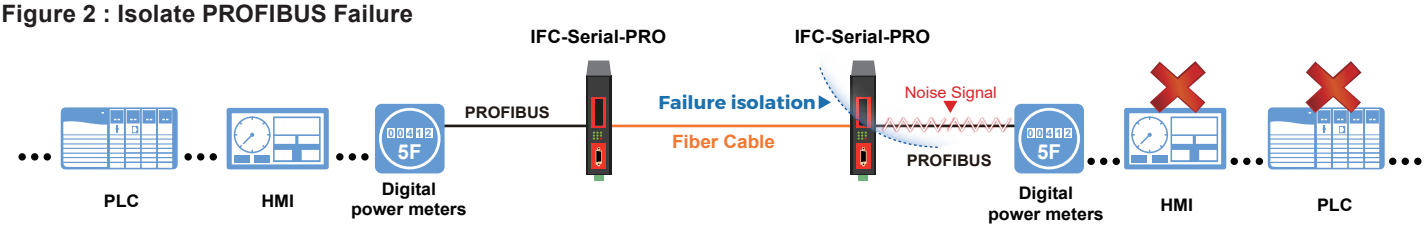
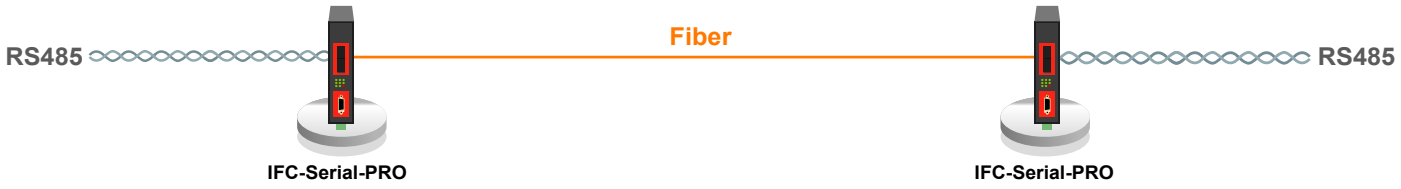
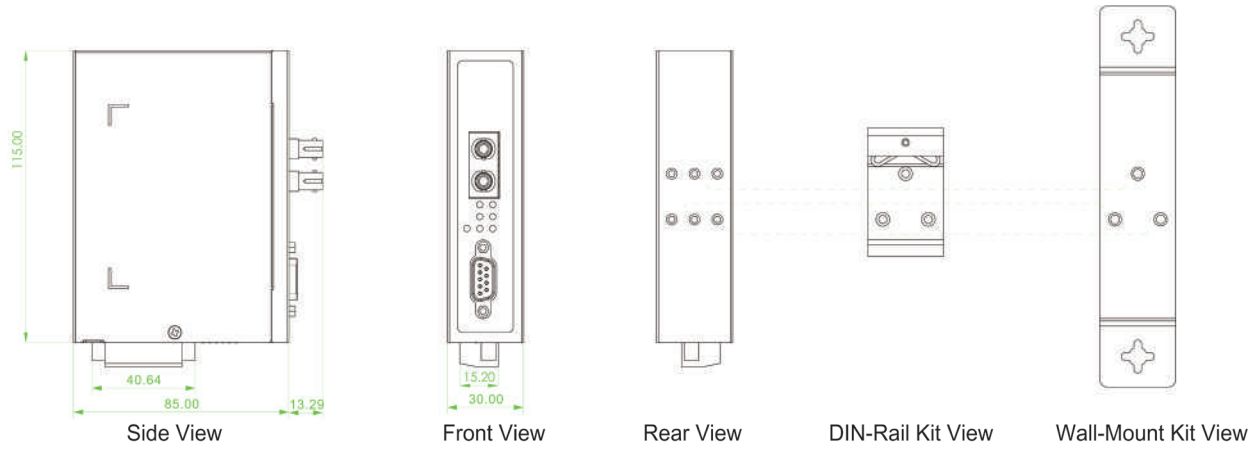


Figure 3 : Fiber Point to Point topology & application



Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Serial (ProfiBus)		Fiber	Power Input	Certification		Operating Temperature
	RS485	Isolation 2.5KV	SC/ST	Redundant	CE	FCC	
IFC-Serial-PRO	1	V	1	12/24/48VDC	V	V	-10~60°C
IFC-Serial-PRO-E	1	V	1	12/24/48VDC	V	V	-40~75°C

Connector Type	Connectivity Distance
SC, ST	001: M/M 500meter 002: M/M 2km 020: S/M 20km
	020A: 20km Bidi mode A
	020B: 20km Bidi mode B
	Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

Optional Accessories

■ Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFC-Serial

1x RS232/422/485 to 1-port Fiber (SC/ST) Media Converter

- 2.5KV isolation for serial port (RS485/422/232)
- Auto Baud Rate, no need to set BaudRate
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission
- UL60950-1, EN61000-6-2, EN61000-6-4, CE and FCC certified

The IFC-Serial media converter is a capable of selecting interface mode for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and features a three-way communication plus a second independent RS-232 communication channel. Additionally, the terminal block offers an alarm relay contact and two redundant DC power inputs. IFC-Serial is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range. With all these specifically designed features, IFC-Serial is a reliable and ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The product is protocol transparent that can be applied to RS485/422/232 networks, such as MODBUS to achieve reliable network (See Figure 2).

Features

- Supports 1 fiber link
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 50km
- Supports fiber port point to point (Figure 3)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent, suitable for all serial (RS485/422/232) transmission protocol, such as Modbus...
- Baudrate up to 1024kbps for serial port
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

Specifications

FieldBus Protocol	Protocol Transparent	Protocol applicable to all operations available on RS485/422/232, such as Modbus,…
Data Flow	Dual Channel Communication	Both of Triple-Way and Two-Way Communication Way (Figure 1)
Optical Interface	Connector	SC, ST
	Fiber Port	1 fiber port
	Fiber Type	MM 2km, SM 30km, 50km Bidi 20KM
	Wavelength	MM 1310nm, SM 1310nm Bidi: Mode A : TX1310nm/RX1550nm, Mode B : TX1550nm/RX1310nm
	Point to Point Transmission	Full duplex
	Rin Transmission	self-healing operation
Fiber port Topology	Point to Point (Figure3)	

Electrical Interface	Serial Port Connector	RS-232 (DB9), RS-422/RS-485 (5 pin terminal block)
		RS-485 : 4, 2 wires, RS-422 : 4 wires
	RS-485 Direction	Automatically detection
	Serial Port Baudrate	50 to 1024kbps, Auto baudrate, no need to set baudrate
	Serial Port Isolation	2.5KV isolation for serial signals EMC/noise isolation, to reduce mutual interference between serial port device
	Pull High Resistor	Selected by 10 position rotary switch
	Pull Low Resistor	Selected by 10 position rotary switch
	120 Ohm Terminator	Built-in 120 ohm terminator (Selected by Dip Switch)
Environmental	Operating Temperature	-10 ~ 60°C (IFC-Serial), -40 ~ 75°C (IFC-Serial-E)
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR1, PWR2, Alarm, Master, TD, RD, Fiber Link	
Alarm Relay	Alarm exists for power, fiber link or ring protection Relay output with carry capacity 1A @ 24VDC	
Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 58VDC)
	Power Consumption	5W
	Power Reversal Protection	Yes
	Over Current Protection : Signal Short Together Protected	
	Terminal Block for Power and Alarm : Terminal Block : V1+, V1-, V2+, V2-, Alarm NC, Alarm COM, Alarm NO	
Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Dimensions	106 x 38.6 x 142.1mm (D x W x H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	0.63kg
Certification	EMC	CE
	EMI	FCC Part 15 Subpart B Class A, CE
	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
		EN61000-4-3 RS Level 3
		EN61000-4-4 EFT Level 3
		EN61000-4-5 Surge Level 3
		EN61000-4-6 CS Level 3
	Safety	UL60950-1
	Free Fall	IEC 60068-2-32
	Vibration	IEC 60068-2-6
	Shock	IEC 60068-2-27
	Green	RoHS
MTBF	847,029 Hours (MIL-HDBK-217)	
Warranty	5 years	

Application & Topology

Figure 1 : Dual Channel Data Flow

Channel 1 : Triple Way
Channel 2 : Two Way

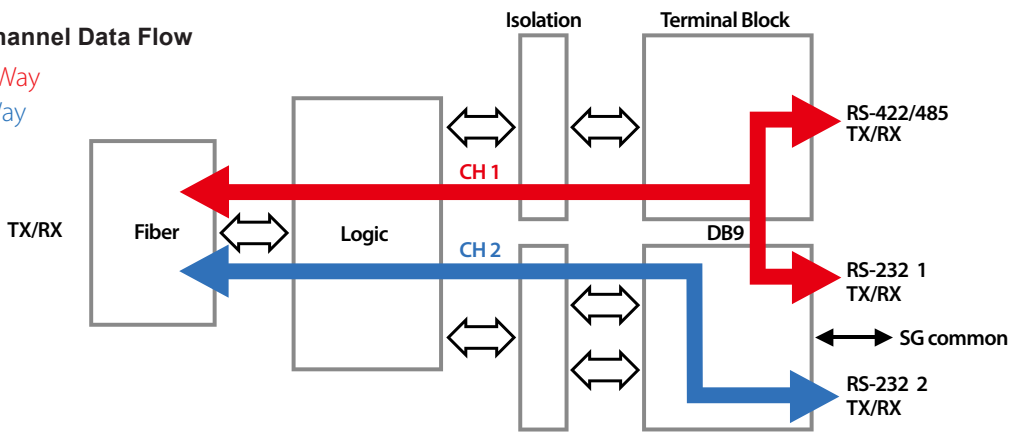
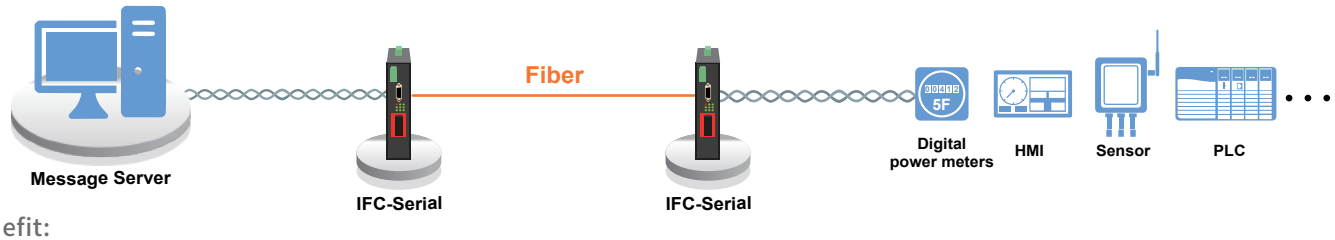
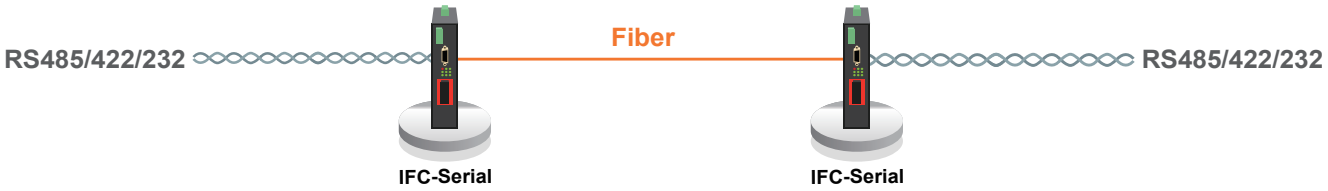


Figure 2 : Application for Modbus Network

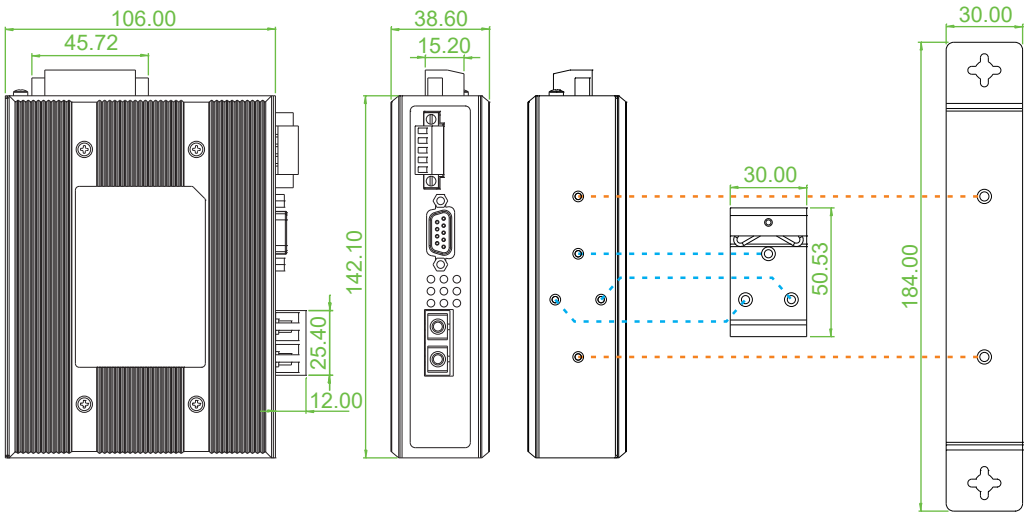


Benefit:
1. EMC/noise isolation, to reduce mutual interference between serial port device
2. Extend distance by fiber
3. Achieve a reliable network environment

Figure 3 : Fiber Point to Point topology & application



Dimensions



Ordering Information

Model Name	Dual Channel	Serial Port (Modbus or others, Field Bus transparent)			Fiber	Power Input	Certification			Operating Temperature
		RS232	RS422/485	Isolation 2.5KV	SC/ST	Redundant	UL60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IFC-Serial	V	2	1	V	1	12/24/48VDC	V	V	V	-10~60°C
IFC-Serial-E	V	2	1	V	1	12/24/48VDC	V	V	V	-40~75°C

Connector Type	Connectivity Distance
SC, ST	002:M/M 2km 030: S/M 30km 050: S/M 50km
	020A: 20km Bidi mode A
	020B: 20km Bidi mode B
	Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFC-FDC

1x RS232/422/485 to 2-ports Fiber (SC/ST) Media Converter

- 2.5KV isolation for serial port (RS485/422/232)
- Supports fiber port several topology, cable redundancy, ring redundancy, daisy chain, point to point
- Auto Baud Rate, no need to set Baud Rate
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission
- UL60950-1, EN61000-6-2, EN61000-6-4, CE and FCC certified

The IFC-FDC converter is a capable of selecting interface mode for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and features a three-way communication plus a second independent RS-232 communication channel. Additionally, the terminal block offers an alarm relay contact and two redundant DC power inputs. IFC-FDC is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range. With all these specifically designed features, IFC-FDC is a reliable and ideal solutions for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The product is protocol transparent that can be applied to RS485/422/232 networks, such as MODBUS to achieve reliable network.

Features

- Supports 2 fiber link
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 50km
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent, suitable for all serial (RS485/422/232) transmission protocol, such as Modbus...
- Baudrate up to 1024kbps for serial port
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

Specifications

FieldBus Protocol	Protocol Transparent	Protocol applicable to all operations available on RS485/422/232, such as Modbus,…
Data Flow	Dual Channel Communication	Both of Triple-Way and Two-Way Communication Way (Figure 1)
Optical Interface	Connector	SC, ST
	Fiber Port	2 fiber ports
	Fiber Type	MM 2km, SM 30km, 50km Bidi 20KM
	Wavelength	MM 1310nm, SM 1310nm Bidi: Mode A : TX1310nm/RX1550nm, Mode B : TX1550nm/RX1310nm
	Point to Point Transmission	Full duplex
	Ring Transmission	Full duplex
Fiber port Topology	Cable redundancy (Figure 2), ring redundancy (Figure 3), daisy chain (Figure 4), point to point (Figure 5)	

Electrical Interface	Serial Port Connector	RS-232 (DB9), RS-422/RS-485 (5 pin terminal block)
		RS-485 : 4, 2 wires, RS-422 : 4 wires
	RS-485 Direction	Automatically detection
	Serial Port Baudrate	50 to 1024kbps, Auto baudrate, no need to set baudrate
	Serial Port Isolation	2.5KV isolation for serial signals EMC/noise isolation, to reduce mutual interference between serial port device
	Pull High Resistor	Selected by 10 position rotary switch
	Pull Low Resistor	Selected by 10 position rotary switch
	120 Ohm Terminator	Built-in 120 ohm terminator (Selected by Dip Switch)
Environmental	Operating Temperature	-10 ~ 60°C (IFC-FDC), -40 ~ 75°C (IFC-FDC-E)
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR1, PWR2, Alarm, Master, TD, RD, Fiber Link, Fiber 2 Link, Ring	
Alarm Relay	Alarm exists for power, fiber link or ring protection Relay output with carry capacity 1A @ 24VDC	
Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 58VDC)
	Power Consumption	6W
	Power Reversal Protection	Yes
	Over Current Protection : Signal Short Together Protected	
	Terminal Block for Power and Alarm : Terminal Block : V1+, V1-, V2+, V2-, Alarm NC, Alarm COM, Alarm NO	
Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Dimensions	106 x 38.6 x 142.1mm (D x W x H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	0.64kg
Certification	EMC	CE
	EMI	FCC Part 15 Subpart B Class A, CE
	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
		EN61000-4-3 RS Level 3
		EN61000-4-4 EFT Level 3
		EN61000-4-5 Surge Level 3
		EN61000-4-6 CS Level 3
	Safety	UL60950-1
	Free Fall	IEC 60068-2-32
	Vibration	IEC 60068-2-6
	Shock	IEC 60068-2-27
	Green	RoHS
MTBF	739,886 Hours (MIL-HDBK-217)	
Warranty	5 years	

Application & Topology

Figure 1 : Dual Channel Data Flow (IFC-FDC)

Channel 1 : Triple Way
Channel 2 : Two Way

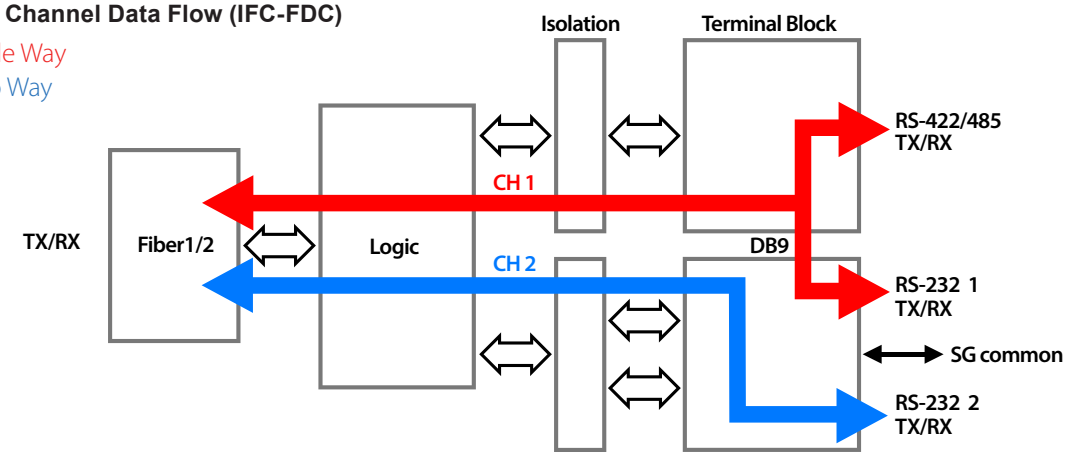


Figure 2 : Redundant Fiber Point to Point topology & application

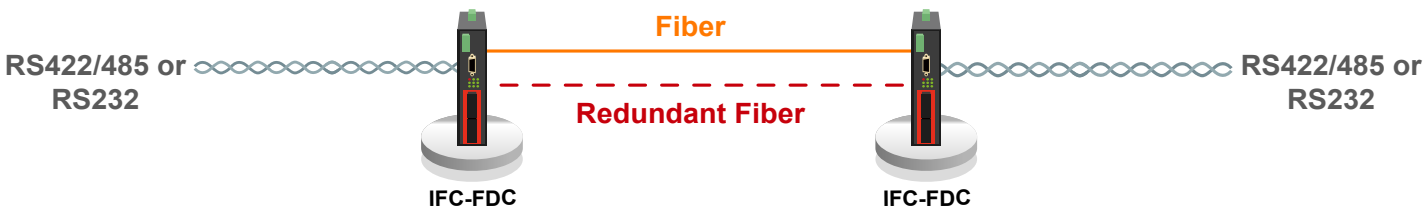


Figure 3 : Fiber Ring Redundancy topology & application

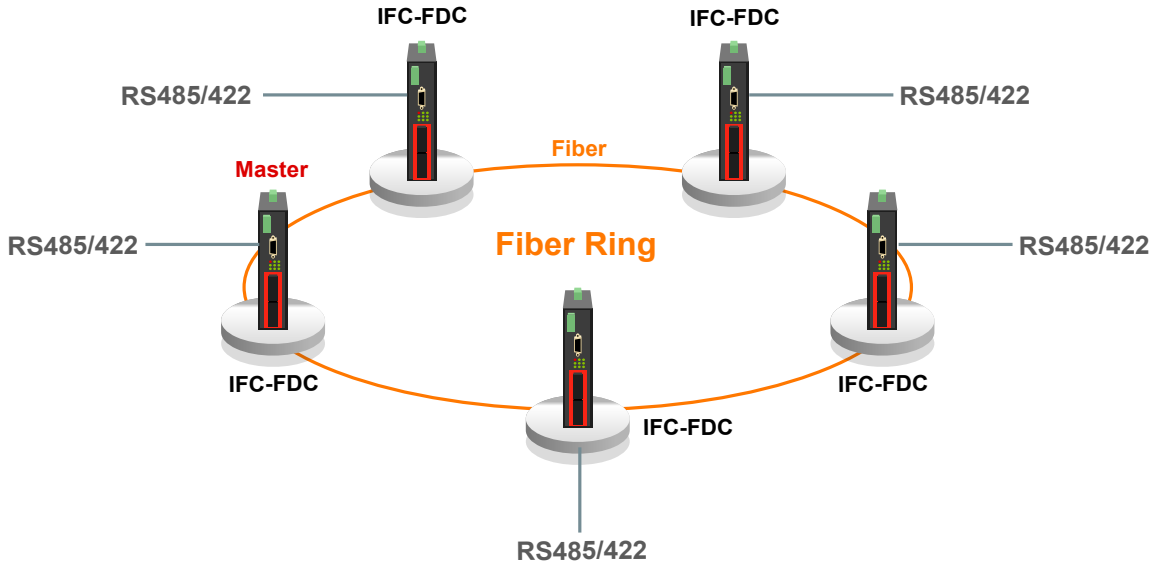


Figure 4 : Fiber Daisy Chain topology & application

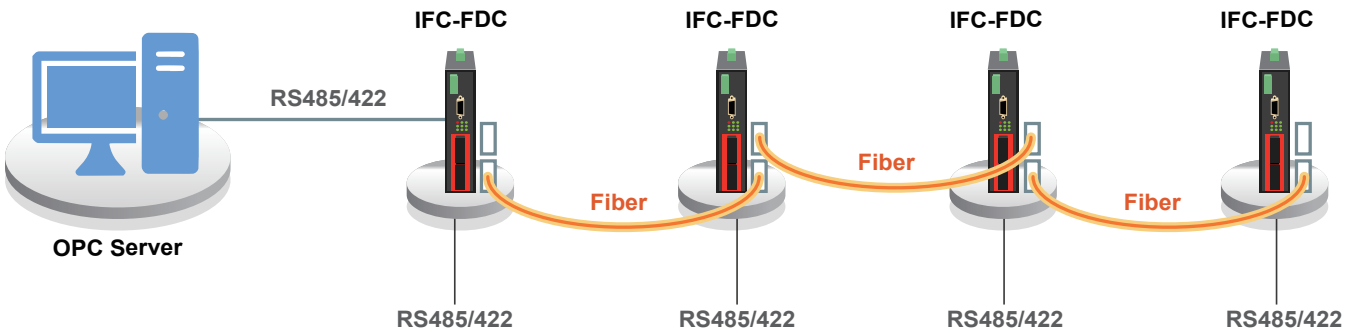
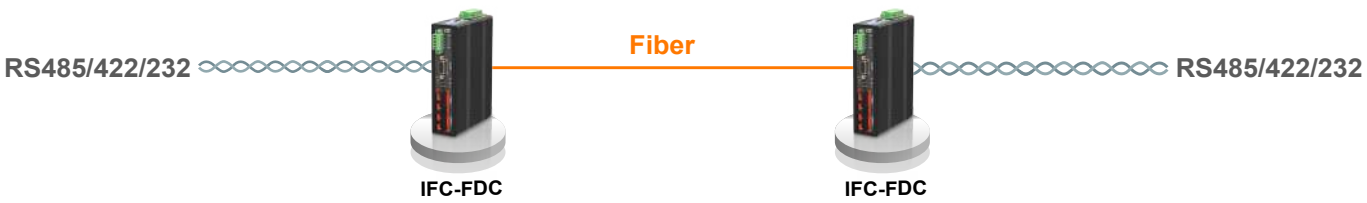
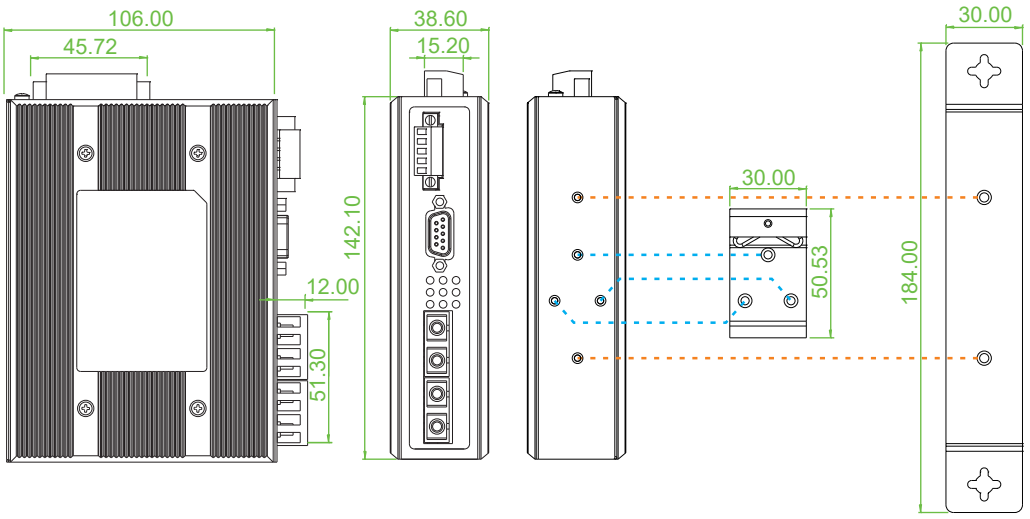


Figure 5 : Fiber Point to Point topology & application



Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Dual Channel	Serial (ModBus or others)			Fiber	Power Input	Certification			Operating Temperature
		RS232	RS422/485	Isolation 2.5KV	SC/ST	Redundant	UL60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IFC-FDC	V	2	1	V	2	12/24/48VDC	V	V	V	-10~60°C
IFC-FDC-E	V	2	1	V	2	12/24/48VDC	V	V	V	-40~75°C

Connector Type	Connectivity Distance
SC, ST	002:M/M 2km 030: S/M 30km 050: S/M 50km
	020AB: 20km Bidi (20km 1x mode A + 1x Mode B)
	Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm

Industrial Power Supply

MDR-20-24	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 24W, -20 ~ +70°C
MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C

IFC-BT40

4 Channel Binary Transducer, 4 binary input ,4 high power MSR Relay output , fiber transmission

- 4 binary input
- 4 MSR high power relay output, maximum breaking capacity 2000VAC load
- M/M 2km, S/M 30km, or BiDi 20km single fiber for transmit
- EN61000-6-2, EN61000-6-4, CE and FCC certified

IFC-BT40 is a four channel, binary transducer, which registers binary information from contacts via its binary inputs and forwards it, interference-free, to the other side transducer via fiber-optic cable. The remote site transducer will output the indications/signals via its relay contacts and vice versa. The transducer is equipped with four independent and bidirectional binary inputs and four contact outputs. The four contacts can be used as trip contacts. Available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range, the IFC-BT40 is reliable and an ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The IFC-BT40 transducer has been designed for usage in substations, water treatment, metallurgical and material engineering application. It is an ideal solution for use in critical environments.

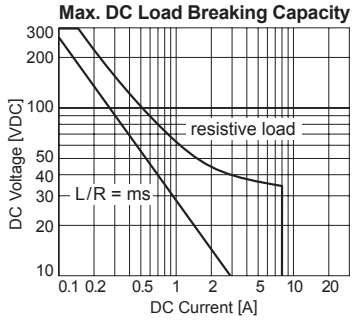
Features

- 4 isolated binary input (BI-1, BI-2, BI-3, BI-4)
- Selectable binary input threshold level by DIP Switch (18V or 70V)
- Maximum 2.5ma input current for binary input channel
- 4 MSR contact relay output (K1, K2, K3, K4), maximum breaking capacity 2000VA for AC load , 50~280W for DC resistive load, or 30W for DC inductive load
- Supports multi mode fiber 2KM or single mode 30KM fiber for transmit distances
- Supports duplex fiber, or single fiber BiDi to save cabling
- AC or DC wide range power input (60~300VDC or 60~264VAC)
- Removable terminal block connector for Power input, Alarm, Binary input and MSR Relay output
- CE, FCC, heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Supports relay output for power or failure warning
- Hardened housing with IP40 protection
- Fanless and DIN-Rail design for harsh industrial environment

Specifications

Binary Input	4x channel Binary Input (BI-1, BI-2, BI-3, BI-4) Binary input threshold level select by DIP Switch, 18V or 70V threshold Maximum input current 2.5ma per channel

Contact Relay output	Channel: 4xMSR contact relay (K1, K2, K3, K4) Contact rated voltage: 250VAC Contact maximum switching voltage: 400VAC Contact rated current: 8A AC breaking capacity: Max 2000VA DC resistive load breaking capacity: max. 50~280W (see below diagram for detail) DC inductive load breaking capacity: max. 30W @L/R=50ms (see below diagram for detail) MSR Relay responds time: 10/5ms max. (Operate/Release)	



Fiber transmission	Connector type: ST/SC, M/M, S/M or Bidi Optional distance: 2KM (M/M) 30KM (S/M), 20KM (Bidi) Fiber cable M/M : Dual fiber 50/125um, 62.5/125um S/M: Dual fiber 9/125um, 10/125um Bidi: Single fiber cable 9/125um, 10/125um	
Removable terminal block connector	Support for Binary input, MSR Relay output, Power input and Alarm	
DIP Switch	SW1: BI-1, BI-2 threshold SW2: BI-3, BI-4 threshold SW3: Debounce SW4: Loopback test	
Environmental	Operating Temperature	-40 ~ 75°C
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR (Green): Power on SYS (Green): Normal operation LNK (Green): Fiber link Test / Alarm: ON: Link down, system loss or Power Error, Flash: Local loopback test, OFF: Normal operation BI-1~BI-4 (Green): Active K-1~K-4 (Green) : Active	
Alarm Relay	Alarm exists for power, fiber link, Relay output with carry capacity 1A @ 24VDC	
Power	Power Input	AC or DC wide range input power 60~300VDC or 60~264VAC input range
	Power Consumption	3.6W
	Power Reversal Protection	Supported for power input
	Removable terminal block connector for power input	
Mechanical	Water & Dust Proof	IP40 Protection, Fanless
	Dimensions	106 x 62.5 x 135mm (Dx Wx H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	815g

Certification

EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
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
	EN61000-4-3 RS Level 3
	EN61000-4-4 EFT Level 3
	EN61000-4-5 Surge Level 3
	EN61000-4-6 CS Level 3
Free Fall	IEC 60068-2-31

Vibration	IEC 60068-2-6
Shock	IEC 60068-2-27
Green	RoHS
MTBF	165,680 Hours (MIL-HDBK-217)
Warranty	5 years

Application & Topology

Figure 1 : Application connection diagram

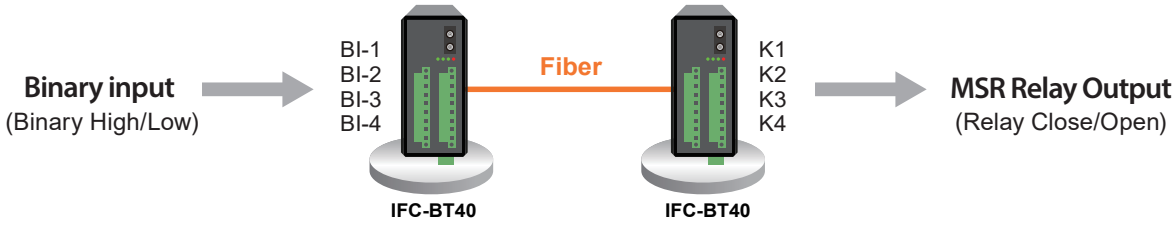
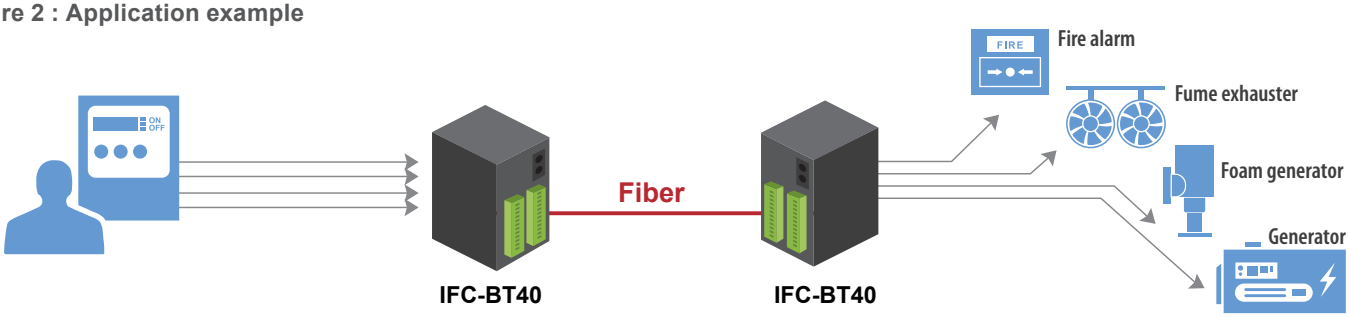
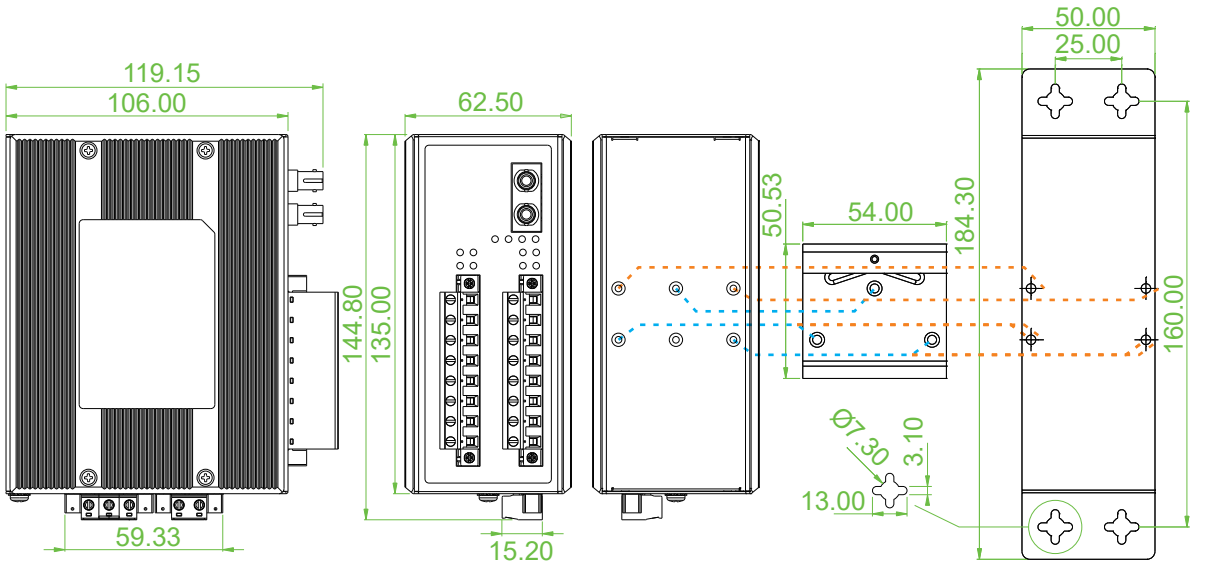


Figure 2 : Application example



Application: High power Gate control Heavy industry automation factory Substation

Dimensions



Related Product


◀ **FRM220-CCF40:** 4ch Contact Closure Fiber Converter, In-Band Managed
▶ **FRM220-CCF20:** 2ch Contact Closure Fiber Converter, In-Band Managed

Ordering Information

Model Name	Input	Output	Fiber transmission	Power Input	Certification		
					EN61000-6-2 EN61000-6-4	CE	FCC
IFC-BT40	4x Channel Binary	4x MSR Contact Relay	1x SC/ST/Bidi	60~264VAC or 60~300VDC	V	V	V

Connector Type	Connectivity Distance	
SC, ST	Dual fiber	002: M/M 2km
		030: S/M 30km
	Single fiber	020A: 20KM Bidi mode A
		020B: 20KM Bidi mode B
		Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

Optional Accessories

Wall Mount Kit

IND-WMK02	Wall Mount kit for Industrial product, 184 x 50mm

IEXT101-PH

Long Reach Ethernet & PoE Extender

- Transmission and remote power feeding up to 800 meters
- PoE power budget up to 30W
- 4KV surge protection for PoE, UTP
- Wide operating temperature range, -40~75° C, for use in harsh environments
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

IEXT101-PH-L IEXT101-PH-R

Industrial-grade PoE extenders IEX101-PH extend Ethernet transmission distance and IEEE802.3af/at PoE+ output beyond the 100-meter limit of standard Ethernet. Paired devices, local and remote unit, operate in a point-to-point topology over 2- or 4-pair unshielded UTP cables up to 800 meters long. The remote unit is powered by the local unit and is then able to provide PoE output for standard or passive applications. This is the ideal solution to solve the problem of no electricity and save costs, it is designed for harsh environments and can be used in Industrial networks, traffic monitoring, safety automation applications and urban security, smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- Long distance data transmission and remote power feeding up to 800 meter on 2/4 pair UTP cable (see figure 1)
- Supports standard IEEE802.3af/at or passive PoE devices
- Eliminates the need for any power supply at the remote side
- Quick deployment and easy maintenance

Specifications

Hardware Standard Interfaces	IEEE 802.3	10Base-T
	IEEE 802.3u	100Base-TX
	IEEE 802.3af	PoE
	IEEE 802.3at	PoE+
Network Connector	IEXT101-PH-L (Local unit) 2-pin Terminal Block for power input connector, 1x RJ45 for LAN 10/100Base-TX Ethernet port, 1x RJ-45 for extension distance and delivery power and communication data to remote unit	
	IEXT101-PH-R (Remote unit) 1x RJ45 for LAN 10/100Base-TX Ethernet and PoE PD, 1x RJ-45 for long distance receiving power and communication data from local unit	
Dip Switch	IEXT101-PH-L (Local unit)	
	SW 1: Power over line	OFF: Enable, ON: Disable
	SW 2 : Link Fault Pass Through (LFPT)	OFF: Disable, ON: Enable
	SW 3 : Line Speed	OFF: Auto, ON: 10M
	IEXT101-PH-R (Remote unit)	
	SW 1: PoE for PD	OFF: Enable, ON: Disable
	SW 2 : Link Fault Pass Through (LFPT)	OFF: Disable, ON: Enable
	SW 3 : PoE PD mode	OFF: Standard PoE, ON: Passive PoE
LED	IEXT101-PH-L (Local unit)	Power (Green), Delivery Power Range <15W (Amber), Delivery Power Range >15W (Green), LFPT (Amber), LAN Link Active (Green), Line Speed/Link Active 10M (Amber), 100M (Green)
	IEXT101-PH-R (Remote unit)	Power (Green), PoE Power Range for PD <15W (Amber), PoE Power Range for PD >15W (Green), LFPT (Amber), LAN Link Active (Green), Line Speed/ Link Active 10M (Amber), 100M (Green)

Data rate	The line speed between IEXT101-PH-L and IEXT101-PH-R will be 10M or 100M that depend on extension length or set by DIP SW. The LAN speed of IEXT101-PH-R is same with line speed (extension port). (Please ref figure 1)
Cable	2 or 4 pair UTP cable Cat.5e, Cat. 6 (See Table 1 for Transmitting rate and PoE power budget by difference length) (Please ref figure 1)
Operating Temperature	-40°C to 75°C
Storage Temperature	-40°C to 85°C
Humidity	10% - 95% (non-condensing)
Power Supply	55~57VDC Input power (2pin Removable Terminal Block)
Power Consumption	IEXT101-PH-L : < 3W (Without PoE); 34.5W (With PoE @ 30W)
	IEXT101-PH-R: < 1.5W (Without PoE); 32.5W (With PoE @ 30W)
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	102.5 x 52 x 25 mm (D x W x H)
Weight	175g
Installation Mounting	Wall Mounting
MTBF	1.561.636Hours (IEXT101-PH-L) 1.591.281Hours (IEXT101-PH-R) (MIL-HDBK-217)

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
4KV Surge Protection	Supported for PoE, UTP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Extension Distance vs Speed /PoE Power Budget

Cat5e UTP cable

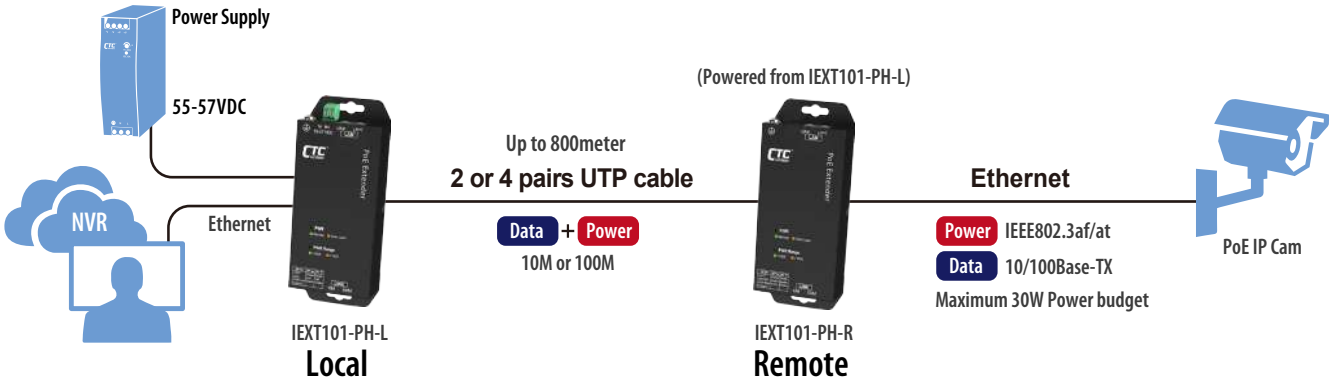
Extension Distance (Meter)	Link Speed (Mbps)	Deliver PoE Power Budget (Maxium Watt)	
		4 Pair UTP	2 Pair UTP
100	100	31.4	28
200	100	29.6	22.4
300	100	27.6	15.2
400	100	24.7	12.2
500	100	20.3	9.8
600	100	17.2	7.9
700	10	15	7.1
800	10	13.2	6.1

Cat6 UTP cable

Extension Distance (Meter)	Link Speed (Mbps)	Deliver PoE Power Budget (Maxium Watt)	
		4 Pair UTP	2 Pair UTP
100	100	32.2	28.8
200	100	30.5	25.5
300	100	28.7	16.7
400	100	27	14.7
500	100	24.1	11.8
600	100	20.5	9.9
700	10	17.7	8.7
800	10	16	7.5

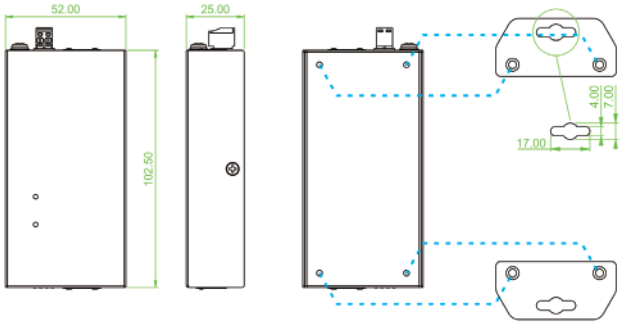
Application

Figure1 : PoE Extending Solution for IP Surveillance Systems



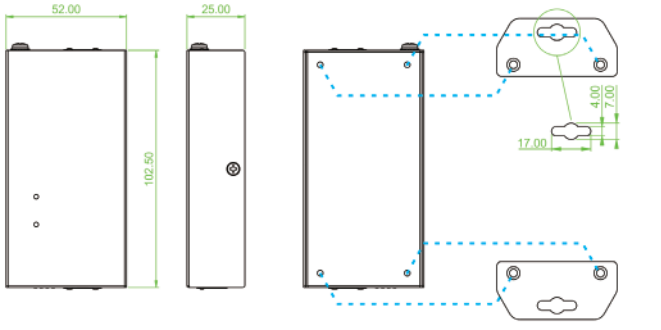
Dimensions

IEXT101-PH-L



Front View Side View Rear View Wall-Mount Kit View

IEXT101-PH-R



Front View Side View Rear View Wall-Mount Kit View

Ordering Information

Model Name	Ethernet port (Local unit)	Line Port (Extension port)	Ethernet port With PoE (Remote unit)		Power Input	Certification		
	10/100 Base-TX	10/100M (Upto 800meter)	10/100Base-TX	Power Budget for PD		EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC
IEXT101-PH-L	1	1			55~57VDC	V	V	V
IEXT101-PH-R		1	1	5W~30W	Powered from IEXT101-PH-L	V	V	V

Optional Accessories

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C

Note: Please adjust the NDR-120-48 output voltage to 55VDC for better performance.

IEXT101

Long Reach Ethernet Extender

- Data transmission up to 800 meters
- 4KV surge protection for UTP
- Wide operating temperature range, -40~75° C, for use in harsh environments
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

Industrial-grade PoE extenders IEX101 extend Ethernet transmission distance beyond the 100-meter limit of standard Ethernet. Paired devices, local and remote unit, operate in a point-to-point topology over 2- or 4-pair unshielded UTP cables up to 800 meters long. This is an ideal solution to solve long-distance transmission problems and save costs, it is designed for harsh environments and can be used in Industrial networks, traffic monitoring, safety automation applications and urban security, smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- Long distance data transmission up to 800 meter on 1/2 pair UTP cable (see figure 1)
- Quick deployment and easy maintenance

Specifications

Hardware Standard Interfaces	IEEE 802.3	10Base-T
	IEEE 802.3u	100Base-TX
Network Connector	2-pin Terminal Block for power input connector, 1x RJ45 for LAN 10/100Base-TX Ethernet port, 1x RJ-45 for extension distance and communication data to remote unit	
Dip Switch	SW 1:Link Fault Pass Through (LFPT)	Off: Disable, On: Enable
	SW 2 : Line Speed	Off: Auto, On: 10M
LED	Power (Green), LFPT (Amber), LAN Link Active (Green), Line Speed/Link Active 10M(Amber), 100M(Green)	
Data rate	The line speed between 2 IEXT101 will be 10M or 100M that depend on extension length or set by DIP SW. (Please ref. figure 1)	
Cable	1 or 2 pair UTP cable Cat.5e, Cat. 6 (See Table 1 for Transmitting rate by difference length) (Please ref. figure 1)	
Operating Temperature	-40°C to 75°C	
Storage Temperature	-40°C to 85°C	
Humidity	10% - 95% (non-condensing)	
Power Supply	12/24/48VDC (9.6~60VDC) Input power (2pin Removable Terminal Block)	
Power Consumption	< 3W	
Housing	Rugged Metal, IP30 Protection and fanless	
Dimensions	102.5 x 52 x 25 mm (D x W x H)	
Weight	170g	
Installation Mounting	Wall Mounting	
MTBF	2,016,859 Hours (MIL-HDBK-217)	

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	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
4KV Surge Protection	Supported for UTP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

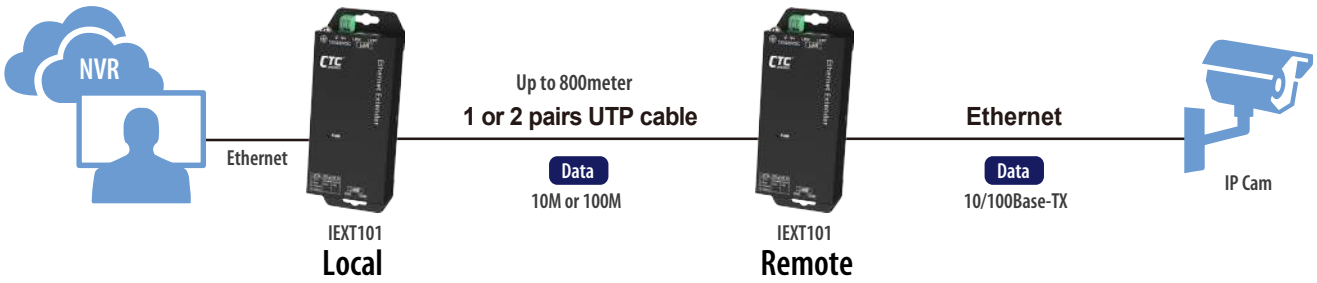
Extension Distance vs Speed

Cat5e /Cat6 UTP cable

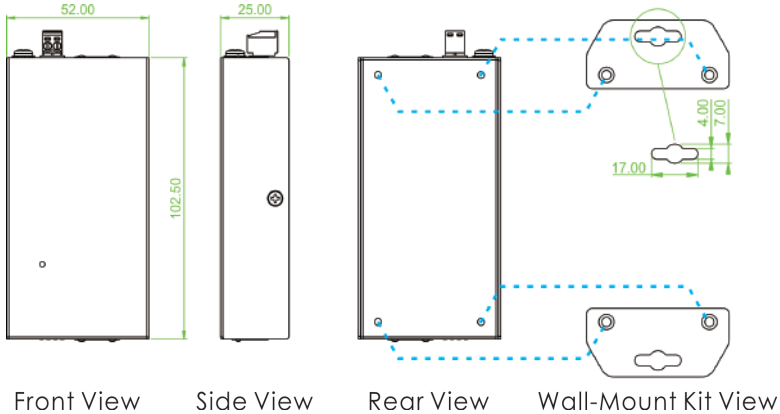
Extension Distance (Meter)	Link speed (Mbps)	
	2 pairs	1 pairs
100	100	100
200	100	100
300	100	100
400	100	10
500	100	10
600	100	10
700	10	10
800	10	10

Application

Figure1 : Long distance data transmission application



Dimensions



Ordering Information

Model Name	Ethernet Port	Line Port (Extension port)	Power Input	Certification		
	10/100 Base-TX	10/100M (Upto 800meter)		EN50121-4	EN61000-6-2, EN61000-6-4	CE, FCC
IEXT101	1	1	12/24/48VDC	V	V	V

Optional Accessories

■ Industrial Power Supply

MDR-20-24	Industrial Power, Input 85~264VAC/120~370VDC, Output 48 VDC, 24W, -20 ~ +70°C

INJ-IG03-PH

Industrial Gigabit IEEE802.3af/at Active to Passive PoE Converter

- Converts 48V IEEE802.3af/at PoE Input to 12/19/24V Passive PoE Output
- Compliant with 10/100/1000Base-T(X)
- Supports PoE input IEEE802.3af/at A mode and B mode
- Selectable passive PoE output voltage
- Selectable passive PoE output mode, A mode or B mode
- CE and FCC certified

The industrial-grade Gigabit Ethernet active-to-passive PoE converter INJ-IG03-PH can be powered by PoE power source equipment that passing the IEEE802.3af/at standard and converted into a 12/19/24Vdc 30W direct power output suitable for passive types PoE equipment. Plug and play, easy to use, no tools required, high reliability, suitable for deploying non-standard PoE devices, such as entry-level PoE cameras or wireless APs, as well as devices that require direct power supply through Ethernet but no protocol negotiation.

Features

- Converts 48V IEEE802.3af/at PoE Input to 12/19/24V Passive PoE Output (Figure 1)
- Supports input PoE IEEE802.3af/at A mode (1,2,3,6) or B mode (4,5,7,8)
- Selectable passive PoE output voltage, 12/19/24VDC select by slide SW
- Selectable passive PoE output mode, A mode (1,2,3,6,) or B mode (4,5,7,8) select by slide SW
- Compliant with 10/100/1000Base-T(X)
- CE, FCC, Railway traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Wide operating temperature -40 ~ 75° C (INJ-IG03-PHE)
- IP30 rugged metal housing and fanless

Specifications

Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE802.3af	PoE (Power over Ethernet)
	IEEE802.3at	PoE+ (Power over Ethernet enhancements)
PoE In	PoE Standard	PoE Standard IEEE 802.3af, IEEE802.3at
	RJ45 Pin Assignments	Supports both PoE A mode or B mode (don't need select) A mode: Positive (V+): RJ-45 pin 1, 2; Negative (V-): RJ-45 pin 3, 6 B mode: Positive (V+): RJ-45 pin 4,5; Negative (V-): RJ-45 pin 7,8
		Supports 10/100/1000Base-T(X); Data (1, 2, 3, 6, 4, 5, 7, 8)
Passive PoE out	PoE Pin assignment	A mode or B mode select by slide switch A mode : Positive (V+): RJ-45 pin 1, 2; Negative (V-): RJ-45 pin 3, 6 B mode : Positive (V+): RJ-45 pin 4,5; Negative (V-): RJ-45 pin 7, 8
	Output voltage	12, 19, 24VDC select by slide switch
Network Cable	UTP/STP above Cat. 5e cable , upto 100meter (see Figure 1)	
	EIA/TIA-568 100-ohm (100m)	
LED	PoE in (Green)	
Power Supply	Powered from PoE in, IEEE802.3af/at, 44~57VDC, 30W Max	
Passive PoE out	12VDC, 0.8A (max); 19VDC, 0.8A (max); 24VDC, 0.8A (max)	
Operating Temperature	-10 ~ 60°C (INJ-IG03-PH)	
	-40 ~ 75°C (INJ-IG03-PHE)	

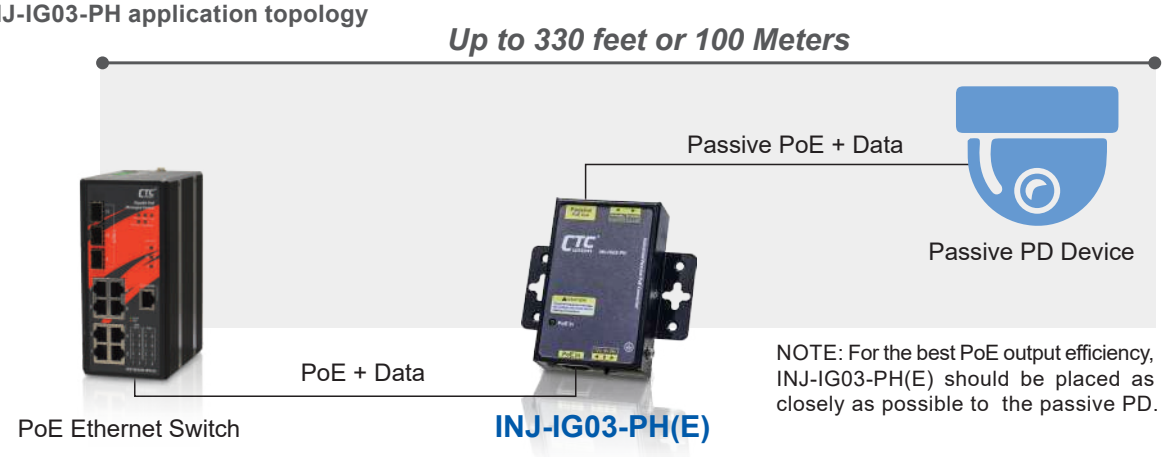
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	22 x 84.2 x 80.7 mm (D x W x H)
Weight	85g
Installation Mounting	Wall Mounting
MTBF	2,531,635 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

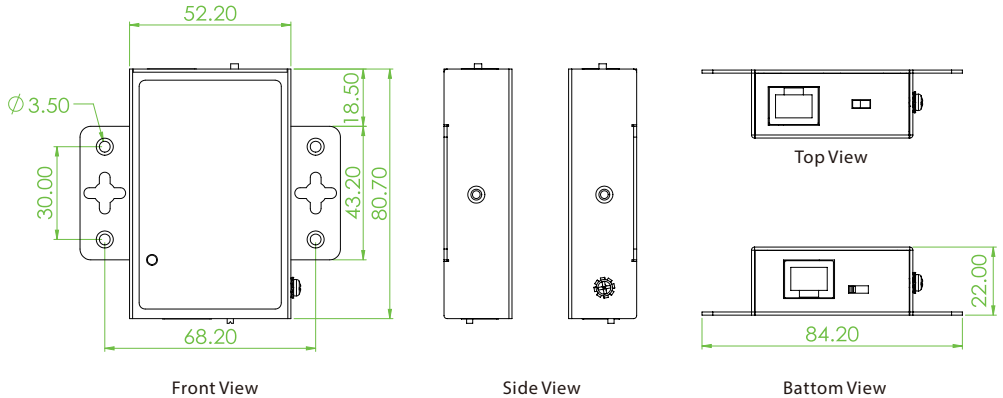
EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Application

Figure : INJ-IG03-PH application topology



Dimensions



Ordering Information

Model Name	PoE In		Passive PoE Out			Certification	Operating Temperature
	10/100/1000 Base-T	IEEE802.3 af/at	10/100/1000 Base-T(X)	Output Voltage Selectable 12/19/24VDC	PoE Pin Selectable A mode /B mode	CE, FCC	
INJ-IG03-PH	1	1	1	V	V	V	-10~60°C
INJ-IG03-PHE	1	1	1	V	V	V	-40~75°C

INJ-IX01-PB & INJ-IX01-2PB

- 1x port Industrial 10M/100M/1G/2.5G/5G/10G IEEE802.3af/at/bt PoE type 4 Injector (90W/port)
- 2x port Industrial 10M/100M/1G/2.5G/5G/10G IEEE802.3af/at/bt PoE type 4 Injector (180W, 90W/port)

- PoE power budget maximum 90W/port
- Compliant with 10/100/1G/2.5G/5G/10GBase-T(X) & IEEE802.3af/at/bt type 4 PoE
- EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

These industrial grade PoE injectors, the INJ-IX01-PB and INJ-IX01-2PB feature 1/2x port(s) PoE PSE over 10M/100M/1G/2.5G/5G/10G Ethernet. PoE describes a system to pass electrical power safely, along with data, on Ethernet cabling. These injectors support the IEEE802.3bt PoE standard, provides up to 90W of DC power to each PD device, while still maintaining backward compatibility with 802.3af/at PoE standards. Housed in a rugged DIN rail or wall mountable enclosure, this product is designed for harsh environments, such as industrial networking, security, intelligent transportation systems (ITS) and is also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- Provides 1x port IEEE 802.3at/af/bt type 4 PoE Injector (INJ-IX01-PB)
- Provides 2x port IEEE 802.3at/af/bt type 4 PoE Injector (INJ-IX01-2PB)
- Wide operating temperature -40 ~ 75° C
- IP30 rugged metal housing and fanless

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3bz	2.5GBase-T, 5GBase-T
	IEEE 802.3an	10GBase-T
PoE Standard	IEEE803.3bt, IEEE 802.3at, IEEE802,3af	
PoE & RJ-45 Pin Assignment	Provides 2/4 pairs PoE Positive (V+): RJ-45 pin 1, 2, 4, 5 Negative (V-): RJ-45 pin 3, 6, 7, 8 Ethernet Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	Per port provides 1x RJ-45 for Ethernet data, and 1x RJ-45 for Ethernet data with PoE output power	
Network Cable	Supports 100 meter for below cable: Above Cat.5e UTP/STP cable for 10/100/1G/2.5GBase-T, Above Cat.6 UTP/STP cable for 5GBase-T, Above Cat.6A UTP/STP cable for 10GBase-T	
LED	System: PWR1, PWR2 (Green) for Power status PoE (Green) per port: ON : PoE on / Blinking : PoE off	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual 48V (44~57VDC) Input Power (Removable Terminal Block) Below recommended is for different PoE application: 54~57VDC for 90W (4 Pairs) PoE application, 52~57VDC for 60W (4 Pairs) PoE application, 52~57VDC for 30W (2 Pairs) PoE application, 44~57VDC for 15.4W (2 Pairs) PoE application.	

PoE Power Budget	90W/port ,total 90W (INJ-IX01-PB) 90W/port ,total 180W (INJ-IX01-2PB)
Power Consumption	

Model	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Power Budget
INJ-IX01-PB	54 VDC	94.5W	1.5W	90W
INJ-IX01-2PB	54 VDC	188W	1.6W	180W

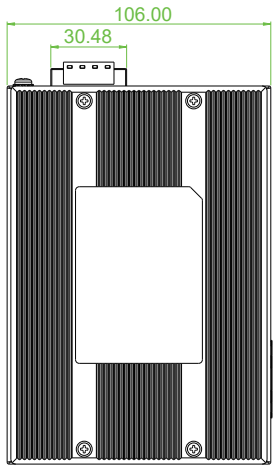
Removable Terminal Block	Provides 4 Pin for redundant power 1 and Power 2 input connection
Operating Temperature	-10 ~ 60°C (INJ-IX01-PB, INJ-IX01-2PB)
	-40 ~ 75°C (INJ-IX01-PBE, INJ-IX01-2PBE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 152 mm (D x W x H)
Weight	555g (INJ-IX01-PB(E)), 565g (INJ-IX01-2PB(E))
Installation Mounting	DIN Rail mounting, and Wall Mounting (Optional)
MTBF	3,150,660 Hours (INJ-IX01-PB), 2,165,510 Hours (INJ-IX01-2PB) (MIL-HDBK-217)
Warranty	5 years

Certification

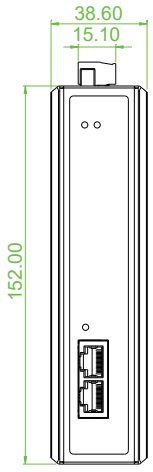
EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Surge Protection	4KV for PoE and UTP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions

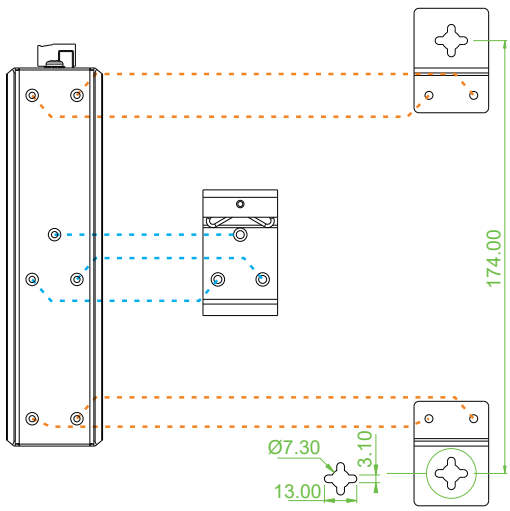
▶ INJ-IX01-PB



Side View

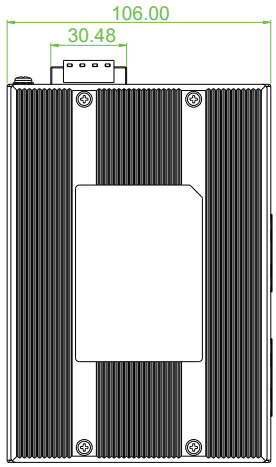


Front View

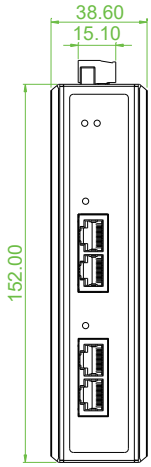


Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

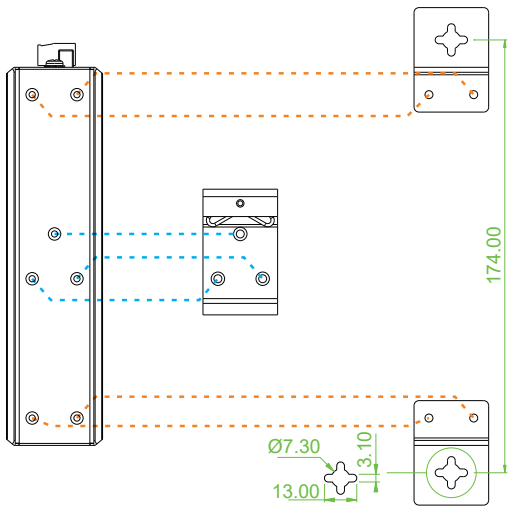
▶ INJ-IX01-2PB



Side View



Front View



Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

Ordering Information

Model Name	Ethernet port	Ethernet with PoE port		Power Input	Certification			Operating Temperature
	10/100M/1G/2.5G/5G/10G Base-T(X)	IEEE802.3af/at/bt (PSE)	Power Budget	Redundant	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
INJ-IX01-PB	1	1	90W	48VDC	V	V	V	-10~60°C
INJ-IX01-PBE	1	1	90W	48VDC	V	V	V	-40~75°C
INJ-IX01-2PB	2	2	180W (90W/port)	48VDC	V	V	V	-10~60°C
INJ-IX01-2PBE	2	2	180W (90W/port)	48VDC	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK05	Wall Mount kit for Industrial product (2pcs in 1 set, 42x30mm)

Industrial Power Supply

NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ +70°C (For INJ-IX01-2PB)
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For INJ-IX01-PB)

INJ-IG01-PH

Industrial Gigabit IEEE802.3af/at Compact Size PoE Injector (15.4/30/36/60W, 48VDC)

- Power output 15.4W, 30W, 36W, 60W select by DIP SW
- Compliant with 10/100/1000Base-T(X) & IEEE802.3af/at PoE
- PoE Mode A/B Select by DIP SW
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial-grade compact size single-port Gigabit PoE injector INJ-IG01-PH securely provides power and data transmission through Ethernet cables, compliant with the original IEEE 802.3af-2003 and updated IEEE 802.3at-2009 PoE standards, providing up to 15.4 W and 30W DC power per port. In addition, the INJ-IG01-PH can provide up to 60W of power through a special design using 4 pairs of Cat5e cables. It is designed for harsh environments and can be used in industrial networks, traffic monitoring, safety automation applications, urban security, and smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 1 port IEEE 802.3at/af PoE Injector
- 4 Pairs PD handshake mode select by DIP SW (Such as AXIS® IP cam)
- Wide operating temperature -40 ~ 75° C (INJ-IG01-PHE)
- IP30 rugged metal housing and fanless

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3at	IEEE802.3af
PoE Standard	IEEE 802.3at, IEEE802,3af	
PoE Standard & RJ-45 Pin Assignment	RJ-45 supports IEEE 802.3at/af Middle-Span Alternative B mode or End-Span Alternative A mode, set by DIP SW	
	End-Span, Alternative A mode Positive (V+): RJ-45 pin 1, 2. Negative (V-): RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
	Middle-Span, Alternative B mode Positive (V+): RJ-45 pin 4,5 Negative (V-): RJ-45 pin 7,8 Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	1 RJ-45 for 10/100/1000Base-T Data, and 1 RJ-45 for 10/100/1000Base-T Data with PoE Output power	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
LED	System: Power (Green)	
	Alt A/PoE, Alt B/PoE (Green) ON: when a PD device is connected to the GbE+PoE RJ-45 connector and the Injector is feeding power in Alt A or B mode. Blinking: One of the Injector faults (overload, short circuit or over-temperature) occurs.	

DIP SW	SW1	ON: Alternative B mode, PoE Power Pin 4, 5, 7, 8 (When DIP SW 3 Off) OFF: Alternative A mode, PoE Power Pin 1, 2, 3, 6 (When DIP SW 3 Off)
	SW2	ON: Hi Power 36W, 36W PoE output OFF: Standard PoE, 802.3af (15.4W), 802.3at (30W)
	SW3	ON: 4 Pair PoE Pin Ultra-High Power 60W PoE Output OFF: 2 Pair PoE Pin depand on DIP SW 1,2
	SW4	60W PD handshake mode OFF: General PD at ether 2 or 4 pairs mode ON: Compatible with some particular PD devices at high power mode (4 Pair mode), such as AXIS® Q60
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
Power Supply	(44~57VDC) Input power (Removable Terminal Block)	
PoE Power Output	Maximum Ultra High Power 60W, IEEE 802.3at 30W, IEEE 802.3at High power 36W, IEEE 802.3af 15.4W	

Power Consumption

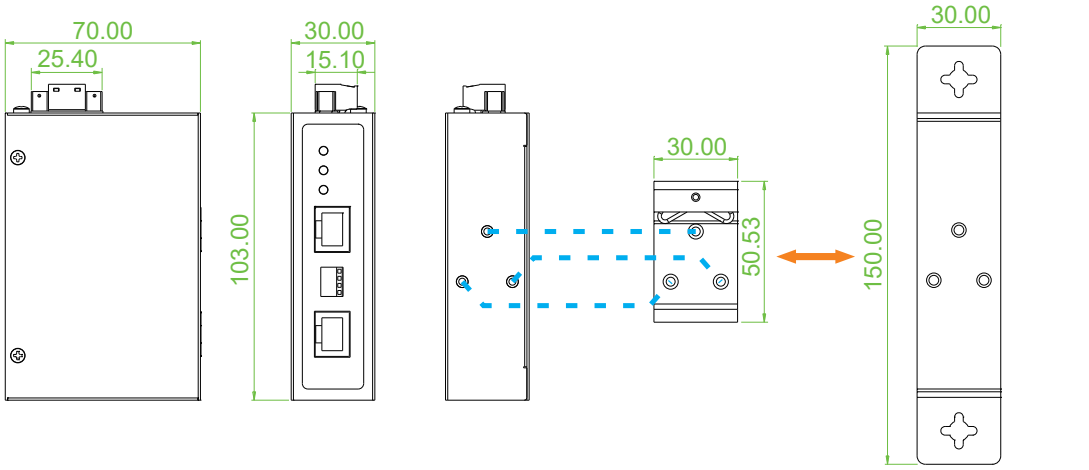
	In 30W mode (2 Pairs)	In 60W mode (4 Pairs)
Input Power Consumption (Input 48VDC)	31.1W	62.8W
PoE Output Power	30W	60W

Removable Terminal Block	Provides 2 Pin for power input connectorn
Operating Temperature	-10 ~ 60°C (INJ-IG01-PH) -40 ~ 75°C (INJ-IG01-PHE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	215g
Installation Mounting	DIN Rail mounting, and Wall Mounting (Optional)
MTBF	409,994 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Ethernet	PoE Port		Power Input	Certification				Operating Temperature
	10/100/1000 Base-T	IEEE 802.3at (PSE)	Power Budget	Single Power	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
INJ-IG01-PH	1	1	15/30/36/60	48VDC	V	V	V	V	-10~60°C
INJ-IG01-PHE	1	1	15/30/36/60	48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C (For 30W@2pair application)
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For 60W@4pair application)

INJ-IG02-PH

Industrial Gigabit Passive PoE Injector (60W)

- Supports Passive PoE, Power output 15.4W, 30W, 60W
- Supports 2 pairs PoE Mode A/B or 4 pairs
- Passive PoE output voltage 24V or 48VDC
- Compliant with 10/100/1000Base-T(X)
- EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial grade Gigabit Passive PoE injector INJ-IG02-PH securely provides power and data transmission through Ethernet cables, it operates on 24/48VDC power input, supports alternative A and B mode, and provides 30Watts output for passive-type PoE devices, and in addition, it can provide up to 60W of power through a special design using 4-pairs of Cat5e cables. It does not run the standard PoE IEEE802.3af/at protocol, injects power directly and is always on when powered. It is designed for harsh environments and can be used in industrial networks, traffic monitoring, safety automation applications, urban security, and smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- 1 port Passive PoE Injector
- 24 or 48VDC Power input
- Maximum PoE budget 30W (2-pair), 60W (4-pair)
- Wide operating temperature -40 ~ 75° C (INJ-IG02-PHE)
- IP30 rugged metal housing and fanless

Specifications

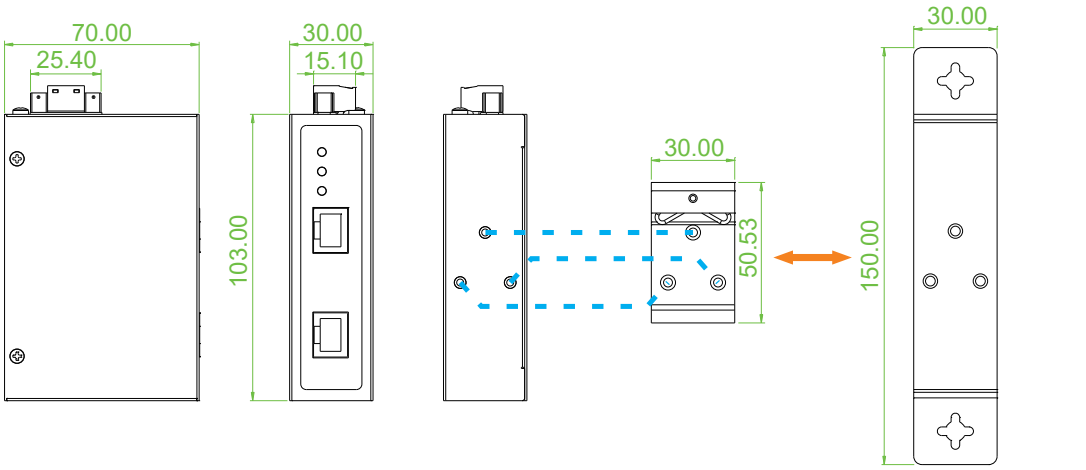
IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
PoE RJ-45 Pin Assignment	Positive (V+): RJ-45 pin 1, 2. Negative (V-): RJ-45 pin 3, 6.	
	Positive (V+): RJ-45 pin 4,5 Negative (V-): RJ-45 pin 7,8 Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	1 RJ-45 for 10/100/1000Base-T Data, and 1 RJ-45 for 10/100/1000Base-T Data with PoE Output power	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
LED	System: Power (Green), Alt A/PoE, Alt B/PoE (Green)	
Reserve Polarity Protection	Present	
Overload Current Protection	Present	
Power Supply	24 or 48VDC Input power (Removable Terminal Block)	
PoE output voltage	48VDC (for 48VDC input power), 24VDC (for 24VDC input power)	
PoE Power Budget	Maximum 60W for 4-pair PoE (48VDC input power) Maximum 30W for 2-pair PoE (48VDC input power) Maximum 30W for 4-pair PoE (24VDC input power) Maximum 15.4W for 2-pair PoE (24VDC input power)	
Power Consumption	<2W (not include PoE output)	
Removable Terminal Block	Provide 2 Pin for power input connectorn	
Operating Temperature	-10 ~ 60°C (INJ-IG02-PH) -40 ~ 75°C (INJ-IG02-PHE)	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	

Housing	Rugged Metal, IP30 Protection
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	210g
Installation Mounting	DIN Rail mounting and, Wall Mounting (Optional)

Certification

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A
	CE EN55022 Class A
Railway Traffic	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	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
MTBF	463,016 Hours (MIL-HDBK-217)
Warranty	5 years

Dimensions



Ordering Information

Model Name	Ethernet	PoE Port		Power Input	Certification				Operating Temperature
	10/100/1000Base-T	IEEE 802.3at	Power Budget	Single Power	EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
INJ-IG02-PH	1	1	15/30/60W	24/48VDC	V	V	V	V	-10~60°C
INJ-IG02-PHE	1	1	15/30/60W	24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK03	Wall Mount kit for Industrial product (Compact, 150 x 30mm)

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C (For 48VDC /30W output application)
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For 48VDC /60W@4 pair output application)

INJ-IG60-24

Industrial Gigabit IEEE802.3af/at PoE Injector (15.4/30/36/60/72W, 12/24/48VDC)

- 12/24/48VDC redundant dual input power with booster for PoE output
- Regulate PoE output voltage
- Power output 15.4W/30W/36W/60W72W select by DIP SW
- Compliant with 10/100/1000Base-T(X) & IEEE802.3af/at PoE
- EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC certified

The industrial-grade single-port Gigabit PoE injector INJ-IG60-24 securely provides power and data transmission through Ethernet cables, it operates on 24/48VDC power input and compliant with the original IEEE 802.3af-2003 and updated IEEE 802.3at-2009 PoE standards, providing up to 15.4 W and 30W DC power per port. In addition, it can provide up to 60W of power through a special design using 4 pairs of Cat5e cables. It is designed for harsh environments and can be used in industrial networks, traffic monitoring, safety automation applications, urban security, and smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- Provides 1 port IEEE 802.3at/af PoE Injector
- PoE Mode A/B Select by DIP SW
- 4 Pairs (60W/72W) PD handshake mode select by DIP SW (Such as AXIS® IP cam)
- Wide operating temperature -40 ~ 75° C (INJ-IG60-E24)
- IP30 rugged metal housing and fanless

Specifications

IEEE Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE 802.3at	Power over Ethernet+, PoE+
	IEEE 802.3af	Power over Ethernet, PoE
PoE Standard & RJ-45 Pin Assignment	RJ-45 supports IEEE 802.3at/af Middle-Span Alternative B mode or End-Span Alternative A mode, set by DIP SW	
	End-Span, Alternative A mode Positive (V+): RJ-45 pin 1, 2. Negative (V-): RJ-45 pin 3, 6. Data (1, 2, 3, 6, 4, 5, 7, 8)	
	Middle-Span, Alternative B mode Positive (V+): RJ-45 pin 4,5 Negative (V-): RJ-45 pin 7,8 Data (1, 2, 3, 6, 4, 5, 7, 8)	
Network Connector	1 RJ-45 for 10/100/1000Base-T Data, and 1 RJ-45 for 10/100/1000Base-T Data with PoE Output power	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
LED	System: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	4/2 Pairs (Green) ON: 4 Pairs PoE Power output for 60/72W PoE / OFF: 2 Pairs PoE Power output	

DIP SW	SW1	ON: Alt B mode (4, 5, 7, 8), OFF: Alt A mode (1, 2, 3, 6)
	SW2	ON: Hi Power PoE 36W(in 2 pair), or 72W (in 4 pair) OFF: Standard PoE 15.4W/30W (in 2 pair), or 60W (in 4 pair)
	SW3	ON: 4 Pair PoE Pin Ultra-High Power 60W/72W PoE Output OFF: 2 Pair PoE Pin depand on DIP SW 1,2
	SW4	ON: For Particular PD in 4 pair mode, PoE Handshake by pin 1, 2, 3, 6, 4, 5, 7, 8 (Such as AXIS® Q60 series) OFF: General PD
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
Power Supply	Redundant Dual DC 12/24/48V (10~57VDC) Input power (Removable Terminal Block)	
	Built-in very high efficiency booster(91~96%) to rise up 52VDC for PoE output	
	Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter	
PoE Power Budget	Maximum Ultra High Power 60W, IEEE 802.3at 30W, IEEE 802.3at High power 36W, IEEE 802.3af 15.4W	

Power Consumption

INJ-IG60-24 in 30W mode (2 Pair)

Input Voltage	Input Power Consumption	Device Power Consumption	PoE Power Budge	Boost Efficiency
12VDC	33.9W	1.1W	30W	91.46%
24VDC	33W	1.4W	30W	94.90%
48VDC	33.2W	1.9W	30W	95.80%

INJ-IG60-24 in 60W mode (4 Pair)

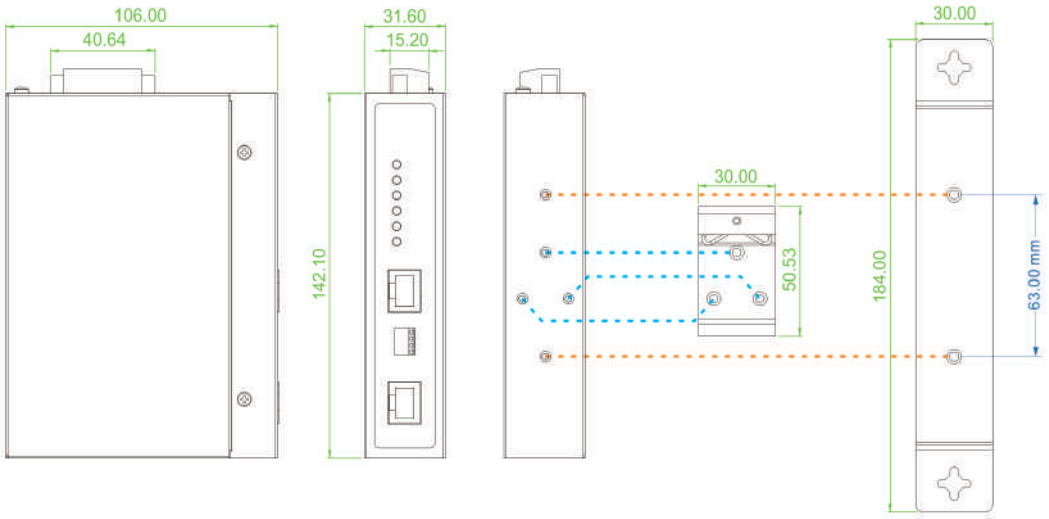
Input Voltage	Input Power Consumption	Device Power Consumption	PoE Power Budge	Boost Efficiency
12VDC	67.1W	1.1W	60W	90.90%
24VDC	65.2W	1.4W	60W	94.10%
48VDC	64.7W	1.9W	60W	95.50%

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (INJ-IG60-24) -40 ~ 75°C (INJ-IG60-E24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 31.6 x 142 mm (D x W x H)
Weight	0.425kg
Installation Mounting	DIN Rail mounting, or Wall Mounting (Optional)
MTBF	1,403,339 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Safety	EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	Ethernet	PoE Port		Power Input	Certification				Operating Temperature
	10/100/1000 Base-T	IEEE 802.3at (PSE)	Power Budget	Redundant	EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
INJ-IG60-24	1	1	15/30/36/60/72W	12/24/48VDC	V	V	V	V	-10~60°C
INJ-IG60-E24	1	1	15/30/36/60/72W	12/24/48VDC	V	V	V	V	-40~75°C

Optional Accessories

Wall Mount Kit

IND-WMK01	Wall Mount kit for Industrial product, 184 x 30mm

Industrial Power Supply

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C (For 30W@2pair application)
NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ +70°C (For 60W@4pair application)

INJ-SPL01

GbE, IEEE802.3af/at PoE Splitter, output voltage 12/19/24VDC selectable

- Splits power and data from PoE Input
- Supports PoE IEEE802.3af/at A mode (1, 2, 3, 6) or B mode (4, 5, 7, 8)
- Selectable output voltage, 12/19/24VDC select by slide SW
- Compliant with 10/100/1000Base-T(X)
- IP30 rugged metal housing and fanless
- EN50121-4, EN61000-6-2,EN61000-6-4, CE and FCC certified

The industrial-grade Gigabit Ethernet PoE splitter INJ-SPL01 can be powered by PoE power source equipment passing the IEEE802.3af/at standard, separating data transmission and 12/19/24Vdc power to non-PoE equipment. It is designed for harsh environments and can be used in industrial networks, traffic monitoring, safety automation applications, urban security, and smart transportation systems. It is also suitable for many military or utility market applications where environmental conditions exceed commercial product specifications.

Features

- Splits power and data from PoE Input
- Supports PoE IEEE802.3af/at A mode (1, 2, 3, 6) or B mode (4, 5, 7, 8)
- Selectable output voltage, 12/19/24VDC select by slide SW
- Supports output power upto 12VDC/1.4A, 19VDC/1.05A, or 24VDC/0.85A
- Compliant with 10/100/1000Base-T(X)
- CE, FCC, Railway traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Wide operating temperature -40 ~ 75° C (INJ-SPL01-E)
- IP30 rugged metal housing and fanless

Specifications

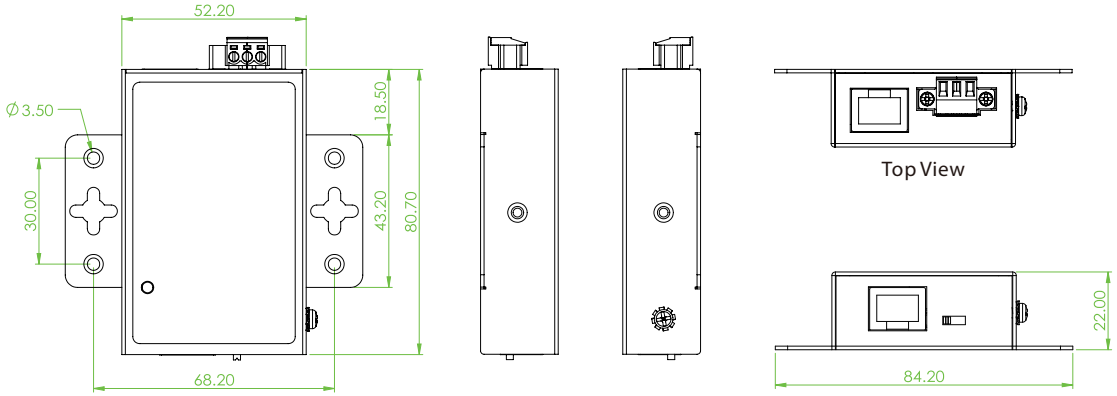
Standard	IEEE 802.3	10Base-T Ethernet
	IEEE 802.3u	100Base-TX Fast Ethernet
	IEEE 802.3ab	1000Base-T Gigabit Ethernet
	IEEE802.3af	PoE (Power over Ethernet)
	IEEE802.3at	PoE+ (Power over Ethernet enhancements)
PoE In	PoE Standard	PoE Standard IEEE 802.3af, IEEE802.3at
	RJ45 Pin Assignments	Supports both PoE A mode or B mode (don't need select) A mode: Positive (V+): RJ-45 pin 1, 2; Negative (V-): RJ-45 pin 3, 6 B mode: Positive (V+): RJ-45 pin 4, 5; Negative (V-): RJ-45 pin 7, 8
		Supports 10/100/1000Base-T(X); Data (1, 2, 3, 6, 4, 5, 7, 8)
Output voltage & power	12, 19, 24VDC select by slide switch 12VDC: 1.4A, 19VDC: 1.05A, 24VDC: 0.85A with Removable terminal block	
Data out	RJ45 10/100/1000Base-T(X)	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
LED	PoE in (Green)	
Power Supply	Powered from PoE in, IEEE802.3af/at, 44~57VDC, 30W Max	

Output Power	12VDC, 1.4A (max); 19VDC, 1.05A (max); 24VDC, 0.85A (max)
Operating Temperature	-10 ~ 60°C (INJ-SPL01) -40 ~ 75°C (INJ-SPL01-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	22 x 84.2 x 80.7 mm (D x W x H)
Weight	85g
Installation Mounting	Wall Mounting
MTBF	3,371,427 Hours (MIL-HDBK-217)
Warranty	5 years

Certification

EMC	CE (EN55032, EN55035)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	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 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Dimensions



Ordering Information

Model Name	PoE In		Power & Data Out		Certification			Operating Temperature
	10/100/1000 Base-T(X)	IEEE802.3 af/at	10/100/1000 Base-T(X)	Output Voltage selectable 12/19/24VDC	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
INJ-SPL01	1	1	1	V	V	V	V	-10~60°C
INJ-SPL01-E	1	1	1	V	V	V	V	-40~75°C

Industrial SFP Transceiver

- Fully tested with CTC industrial grade product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications
- Eye safety compliant with Class 1 laser product standard IEC825-1
- CE, FCC class B certification

CTC Union's Industrial SFP Transceivers are highly reliable, for serial optical data communications applications specified for single mode fiber operation at 1.25G/155M bps. They operate with +3.3V power supplies and are intended for single mode or multi-mode fiber, operating at a nominal wavelength of 1310nm/1550nm/850nm. Each SFP Transceiver consists of a transmitter optical subassembly (TOSA), a receiver optical subassembly (ROSA) and an electrical subassembly. CTC Union's industrial SFP transceivers ensure your networks operate with maximum reliability, performance, and flexibility.

Features

- Single 3.3V power supply
- Duplex or Simplex LC receptacle connector
- Hot Pluggable
- Lower power dissipation
- All 10G SFP+ compliant to IEEE 802.3ae 10GBase-X Ethernet over fiber
- All Gigabit SFP compliant to IEEE 802.3z 1000Base-X and IEEE 802.3ab 100/1000Base-T
- All Fast Ethernet SFP Compliant to IEEE 802.3u 100Base-FX
- Industrial standard small form pluggable (SFP) package
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- RoHS compliant

10Gbps 10GBase-X Fiber SFP+

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-M9000-85-D	MM	300m (OM3)	850	-6.5 ~ -1	-9.9	3.4	-1	1W	V	-10 ~ 70°C
ISFP-M9000-85-DE	MM	300m (OM3)	850	-6.5 ~ -1	-9.9	3.4	-1	1W	V	-40 ~ 85°C
ISFP-S9010-31-D	SM	10km	1310	-8 ~ 0.5	-14.4	6.4	0.5	1W	V	-10 ~ 70°C
ISFP-S9010-31-DE	SM	10km	1310	-8 ~ 0.5	-14.4	6.4	0.5	1W	V	-40 ~ 85°C
ISFP-S9040-31-D	SM	40km	1310	0.5 ~ 5	-15.5	16	0.5	1W	V	-10 ~ 70°C
ISFP-S9040-31-DE	SM	40km	1310	0.5 ~ 5	-15.5	16	0.5	1W	V	-40 ~ 85°C
ISFP-S9040-55-D	SM	40km	1550	-2 ~ 4	-15.8	13.8	0.5	1W	V	-10 ~ 70°C
ISFP-S9040-55-DE	SM	40km	1550	-2 ~ 4	-15.8	13.8	0.5	1W	V	-40 ~ 85°C

10Gbps 10GBase-T UTP SFP

Model Name	Cable Type	Typical Distance	Operating Temperture	Power Consumation
ISFP-T9T00-00-E	UTP Cat 6A	30m	-40 ~ 85°C	3.1W

1.25Gbps 1000Base-X Fiber SFP

Gigabit Duplex LC

Gigabit BiDi LC

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-M7000-85-D	MM	550m	850	-9.5 ~ -4	-17	7.5	-3	1W	V	-10 ~ 70°C
ISFP-M7000-85-DE	MM	550m	850	-9.5 ~ -4	-17	7.5	-3	1W	V	-40 ~ 85°C
ISFP-M7002-31-D	MM	2km	1310	-9 ~ -1	-19	10	-1	1W	V	-10 ~ 70°C
ISFP-M7002-31-DE	MM	2km	1310	-9 ~ -1	-19	10	-1	1W	V	-40 ~ 85°C
ISFP-S7020-31-D	SM	20km	1310	-8 ~ -2	-23	15	-1	1W	V	-10 ~ 70°C
ISFP-S7020-31-DE	SM	20km	1310	-8 ~ -2	-23	15	-1	1W	V	-40 ~ 85°C
ISFP-S7040-31-D	SM	40km	1310	-2 ~ 3	-23	21	-3	1W	V	-10 ~ 70°C
ISFP-S7040-31-DE	SM	40km	1310	-2 ~ 3	-23	21	-3	1W	V	-40 ~ 85°C
ISFP-S7020-WA-D	SM (BiDi)	20km	T1310 / R1550	-8 ~ -2	-23	15	-2	1W	V	-10 ~ 70°C
ISFP-S7020-WB-D	SM (BiDi)	20km	T1550 / R1310	-8 ~ -2	-23	15	-2	1W	V	-10 ~ 70°C
ISFP-S7020-WA-DE	SM (BiDi)	20km	T1310 / R1550	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C
ISFP-S7020-WB-DE	SM (BiDi)	20km	T1550 / R1310	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C
ISFP-S7040-WA-D	SM (BiDi)	40km	T1310 / R1550	-3 ~ 2	-23	20	-3	1W	V	-10 ~ 70°C
ISFP-S7040-WB-D	SM (BiDi)	40km	T1550 / R1310	-3 ~ 2	-23	20	-3	1W	V	-10 ~ 70°C
ISFP-S7040-WA-DE	SM (BiDi)	40km	T1310 / R1550	-3 ~ 2	-23	20	-3	1W	V	-40 ~ 85°C
ISFP-S7040-WB-DE	SM (BiDi)	40km	T1550 / R1310	-3 ~ 2	-23	20	-3	1W	V	-40 ~ 85°C
ISFP-S7060-WA-D	SM (BiDi)	60km	T1310 / R1550	0 ~ 5	-24	24	-1	1W	V	-10 ~ 70°C
ISFP-S7060-WB-D	SM (BiDi)	60km	T1550 / R1310	0 ~ 5	-24	24	-1	1W	V	-10 ~ 70°C
ISFP-S7060-WA-DE	SM (BiDi)	60km	T1310 / R1550	0 ~ 5	-24	24	-1	1W	V	-40 ~ 85°C
ISFP-S7060-WB-DE	SM (BiDi)	60km	T1550 / R1310	0 ~ 5	-24	24	-1	1W	V	-40 ~ 85°C

1.25Gbps 1000Base-X Fiber SC Type SFP

SC-WA

SC-WB

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-S7020-WA-SC-DE	SM (BiDi)	20km	T1310 / R1550	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C
ISFP-S7020-WB-SC-DE	SM (BiDi)	20km	T1550 / R1310	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C

1.25Gbps 100/1000Base-T UTP SFP

Model Name	Cable Type	Typical Distance	Power Consumption	Operating Temperature
ISFP-T7T00-00	UTP Cat 5e	100m	1.1W	-10 ~ 70°C
ISFP-T7T00-00-E	UTP Cat 5e	100m	1.1W	-40 ~ 85°C

155Mbps 100Base-FX Fiber SFP

Duplex LC

BiDi LC

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-M5002-31-D	MM	2km	1310	-20 ~ -14	-32	12	-8	1W	V	-10 ~ 70°C
ISFP-M5002-31-DE	MM	2km	1310	-20 ~ -14	-32	12	-8	1W	V	-40 ~ 85°C
ISFP-S5030-31-D	SM	30km	1310	-15 ~ -8	-34	19	-5	1W	V	-10 ~ 70°C
ISFP-S5030-31-DE	SM	30km	1310	-15 ~ -8	-34	19	-5	1W	V	-40 ~ 85°C
ISFP-S5050-31-D	SM	50km	1310	-5 ~ 0	-35	30	-5	1W	V	-10 ~ 70°C
ISFP-S5050-31-DE	SM	50km	1310	-5 ~ 0	-35	30	-5	1W	V	-40 ~ 85°C
ISFP-S5020-WA-D	SM (BiDi)	20km	T1310 / R1550	-14 ~ -8	-32	18	-3	1W	V	-10 ~ 70°C
ISFP-S5020-WB-D	SM (BiDi)	20km	T1550 / R1310	-14 ~ -8	-32	18	-3	1W	V	-10 ~ 70°C
ISFP-S5020-WA-DE	SM (BiDi)	20km	T1310 / R1550	-14 ~ -8	-32	18	-3	1W	V	-40 ~ 85°C
ISFP-S5020-WB-DE	SM (BiDi)	20km	T1550 / R1310	-14 ~ -8	-32	18	-3	1W	V	-40 ~ 85°C

NDR-480-48 NDR-240-48 NDR-120-24 NDR-120-48
DR-120-24 MDR-40-24 MDR-40-48 MDR-20-24

UL62368-1 UL60950-1 UL508

Having reliable and stable power for your industrial grade switches or converters is the best way to improve reliability and keep any down time to a minimum. CTC Union's safety certified AC to DC power supplies that are 100% compatible with all of our industrial grade switches and converters.

Features

- The series of industrial grade power supply have been fully tested with our industrial product for guaranteed compatibility and performance
- Universal AC input voltage range
- Protections: Short circuit / Overload / Over voltage/Over temperature
- Cooling by free air convection
- UL508, TUV, CB, CE safety approved
- Heavy industry grade EMS EN61000-6-2 approved
- 3 years warranty

Specifications

Model Name		NDR-480-48	NDR-240-48	NDR-120-24 & NDR-120-48
Output	Dc Voltage	48V	48V	24V / 48V
	Rated Current	10A	5A	5A / 2.5A
	Current Range	0~5A	0~5A	0~5A / 0~2.5A
	Rated Power	480W	240W	120W
	Output Voltage Adj. Range	48~55VDC	48~55VDC	24~28V / 48~55V
Input	Voltage Range	90 ~ 264VAC / 127 ~ 370VDC	90 ~ 264VAC / 127 ~ 370VDC	90~264VAC / 127~370VDC
	Frequency Range	47 ~ 63Hz	47 ~ 63Hz	47 ~ 63Hz
	Efficiency (Typ.)	92.5%	90%	89%
Protection	Overload	105 ~ 130% rated output power	105 ~ 130% rated output power	105 ~ 130% rated output power
		Protection type : Constant current limiting, , unit will shut down after 3 sec, re-power on to recover	Protection type : Constant current limiting, recovers automatically after fault condition is removed	Protection type : Constant current limiting, recovers automatically after fault condition is removed
	Over Voltage	56 ~ 65V	56 ~ 65V	29 ~ 33V / 56~65V
		Protection type : Shut down o/p voltage, re-power on to recover	Protection type : Shut down o/p voltage, re-power on to recover	Protection type : Shut down o/p voltage, re-power on to recover
	Over Temperature	Shut down o/p voltage, recovers automatically after temperature goes down	Shut down o/p voltage, recovers automatically after temperature goes down	Shut down o/p voltage, re-power on to recover

Model Name		NDR-480-48	NDR-240-48	NDR-120-24 & NDR-120-48
Indicator	LED	DC OK	DC OK	DC OK
Housing	Dimension	128.5 x 85.5 x 125.2mm (D x W x H)	113.5 x 63 x 125.2 mm (D x W x H)	113.5 x 40 x 125.2mm (D x W x H)
	Installation Mounting	DIN Rail	DIN Rail	DIN Rail
Environment	Working Temp	-20 ~ 70°C	-20 ~ 70°C	-20 ~ 70°C
	Working Humidity	20 ~ 95% RH non-condensing	20 ~ 95% RH non-condensing	20 ~ 95% RH non-condensing
	Storage Temp., Humidity	-40 ~ 85°C , 10 ~ 95% RH	-40 ~ 85°C , 10 ~ 95% RH	-40 ~ 85°C , 10 ~ 95% RH
	Vibration	Compliance to IEC60068-2-6	Compliance to IEC60068-2-6	Compliance to IEC60068-2-6
Safety & EMC	Safety Standards	UI508, TUV BS EN/EN62368-1	UI508, TUV BS EN/EN62368-1	UI508, TUV BS EN/EN62368-1
	Withstand Voltage	I/P-O/P:3KVAC, I/P-FG:2KVAC, O/P-FG: 0.5KVAC	I/P-O/P:3KVAC, I/P-FG:2KVAC, O/P-FG: 0.5KVAC	I/P-O/P:3KVAC, I/P-FG:2KVAC, O/P-FG: 0.5KVAC
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG >100M Ohm /500VD@25°C/ 70% RH	I/P-O/P, I/P-FG, O/P-FG >100M Ohm /500VD@25°C/ 70% RH	I/P-O/P, I/P-FG, O/P-FG >100M Ohm /500VD@25°C/ 70% RH
	EMC Emission	Compliance to EN55032 (CISPR32), EN61204-3 Class B, EN61000-3-2, -3	Compliance to EN55032 (CISPR32), EN61204-3 Class B, EN61000-3-2, -3	Compliance to EN55032 (CISPR32) Class B, EN61000-3-2,-3
	EMC Immunity	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55035, EN61000-6-2, EN61204-3, heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55035, EN61000-6-2, EN61204-3, heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55035, EN61000-6-2, (EN50082-2), heavy industry level, criteria A
Others	PFC	PF>0.98/115VAC, PF>0.94/230VAC at full load	Built in Active PFC	
	MTBF	146.8K Hours MIL-HDBK-217F (25°C)	230.2K Hours MIL-HDBK-217F (25°C)	453.3K Hours MIL-HDBK-217F (25°C)
	Waranty	3 Years	3 Years	3 Years

Model Name		DR-120-24	MDR-40-24 & MDR-40-48	MDR-20-24
Output	Dc Voltage	24V	24V / 48V	24V
	Rated Current	5A	1.7A / 0.83A	1A
	Current Range	0~5A	0~1.5A / 0~0.83A	0~1A
	Rated Power	120W	39.8W	24W
	Output Voltage Adj. Range	24~28VDC	24~30V / 48~56VDC	21.6~26.4VDC
Input	Voltage Range	85 ~ 132VAC / 176~264VAC	85 ~ 264VAC / 120 ~ 370VDC	85 ~ 264VAC / 120 ~ 370VDC
	Frequency Range	47 ~ 63Hz	47 ~ 63Hz	47 ~ 63Hz
	Efficiency (Typ.)	84%	88%	84%
Protection	Overload	105 ~ 150% rated output powe	105 ~ 150% rated output power	105 ~ 160% rated output power
		Protection type : Constant current limiting, recovers automatically after fault condition is removed	Protection type : Constant current limiting, recovers automatically after fault condition is removed	Protection type : Constant current limiting, recovers automatically after fault condition is removed
	Over Voltage	29 ~ 33V	31.2 ~ 36V / 57.6~64.8V	27.6~32.4V
		Protection type : Shut down o/p voltage, re-power on to recover	Protection type : Shut off o/p voltage, re-power on to recover	Protection type : Shut down o/p voltage, re-power on to recover
Alarm Relay	DC OK Relay		DC OK Relay will Close In Normal, Relay contact rating(max.) : 30V/1A resistive	DC OK Relay will Close In Normal, Relay contact rating(max.) : 30V/1A resistive
Indicator	LED		DC OK	DC OK
Housing	Dimension	100 x 65.5 x 125.2mm (D x W x H)	100 x 40 x 90mm (D x W x H)	100 x 22.5 x 90mm (D x W x H)
	Installation Mounting	DIN Rail	DIN Rail	DIN Rail
Environment	Working Temp	-10 ~ 60°C	-20 ~ 70°C	-20 ~ 70°C
	Working Humidity	20 ~ 90% RH non-condensing	20 ~ 90% RH non-condensing	20 ~ 90% RH non-condensing
	Storage Temp., Humidity	-20 ~ +85 , 10 ~ 95% RH	-20 ~ 85°C , 10 ~ 95% RH	-40 ~ 85°C , 10 ~ 95% RH
	Vibration	Compliance to IEC60068-2-6	Compliance to IEC60068-2-6	Compliance to IEC60068-2-6

Model Name		DR-120-24	MDR-40-24 & MDR-40-48	MDR-20-24
Safety & EMC	Safety Standards	UL508, UL60950-1, TUV EN60950-1 approved	UL508, UL62368-1, TUV EN62368-1, Class I, Div. 2 Group A, B, C, D Hazardous Locations T4	UL508, TUV EN62368-1
	Withstand Voltage	I/P-O/P:3KVAC, I/P-FG:1.5KVAC, O/P-FG:0.5KVAC	I/P-O/P:3KVAC, I/P-FG:2KVAC, O/P-FG:0.5KVAC	I/P-O/P:3KVAC, I/P-FG:2KVAC, O/P-FG:0.5KVAC
	Isolation Resistance	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH	I/P-O/P, I/P-FG, O/P-FG >100M Ohm /500VD@25°C/ 70% RH	I/P-O/P, I/P-FG, O/P-FG >100M Ohm /500VD@25°C/ 70% RH
	EMC Emission	Compliance to EN55011,EN55022 (CISPR22) Class B, EN61000-3-2,-3	Compliance to EN55032 (CISPR32), EN61204-3 Class B, EN61000-3-2, -3	Compliance to EN55011, EN55032 (CISPR32), EN61204-3 Class B, EN61000-3-2,-3
	EMC Immunity	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55035, EN61000-6-2 (EN50082-2), heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55035, EN61000-6-2, EN61204-3, heavy industry level, criteria A
Others	PFC			
	MTBF	136.8Khrs min MIL-HDBK-217F (25°C)	301.7K hrs MIL-HDBK-217F (25°C)	236.9K Hours MIL-HDBK-217F (25°C)
	Waranty	3 Years	3 Years	3 Years

Ordering Information

Model Name	Input Voltage Range	Output Voltage	Output Voltage Adj. Range	Output Power	Operating Temperature
NDR-480-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	480W	-20 ~ 70°C
NDR-240-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	240W	-20 ~ 70°C
NDR-120-24	90 ~ 264VAC / 127 ~ 370VDC	24VDC	24~28VDC	120W	-20 ~ 70°C
NDR-120-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	120W	-20 ~ 70°C
DR-120-24	88 ~ 132VAC / 176 ~ 264VAC	24VDC	24~28VDC	120W	-10 ~ 60°C
MDR-40-24	85 ~ 264VAC / 120 ~ 370VDC	24VDC	24~30VDC	40W	-20 ~ 70°C
MDR-40-48	85 ~ 264VAC / 120 ~ 370VDC	48VDC	48~56VDC	40W	-20 ~ 70°C
MDR-20-24	85 ~ 264VAC / 120 ~ 370VDC	24VDC	21.6~26.4VDC	24W	-20 ~ 70°C