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2015 Industrial Ethernet

Chapter 1 Management Software

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EMS SmartView™

Superior Design with Real-Time Monitor and Control

Fault Management

- Trap Collection
- Active Alarm
- Alarms sent by E-mail & SMS

Configuration Management

- Network Topology
- Network Element Discovery
- Network Element Configuration

Accounting Management

- Location, status and serial numbers of all assets can be managed and exported

Performance Management

- Device Performance is plotted over time using standard PM data such as ES UAS, etc.

Security Management

- User Privilege
- User Activity

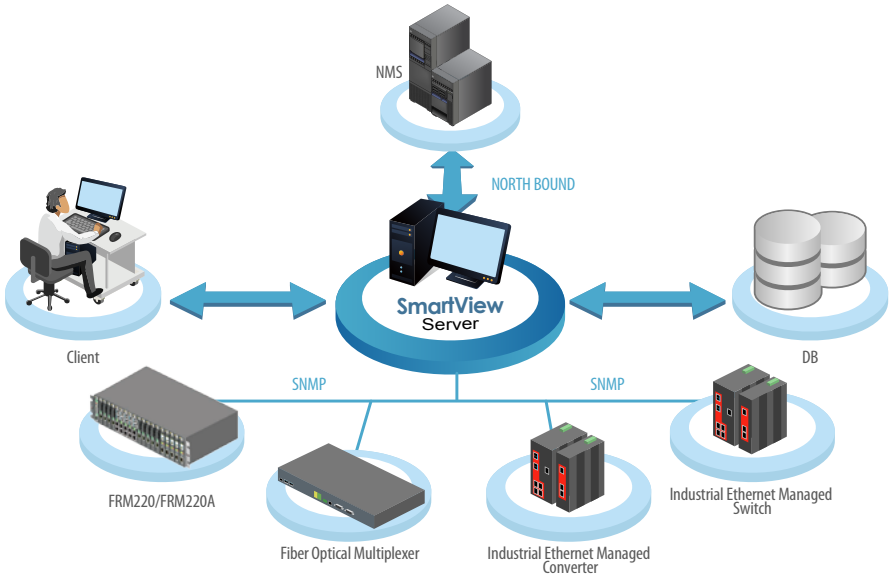
EMS SmartView™

Element Management System

- Centralized Network Management Platform
- Real-time visual representations and processing of alarms
- Easy and User-Friendly Operation Interface
- Long term event storage

- Remote access control for efficient configuration
- Traffic / Performance monitoring and management
- Alarm Trap and event log management
- Auto Discovery and Device Viewer
- Allow up to 25 administrators to login
- Applied to CTC Union's Main Products

Network Scheme Diagram



Polled Network Elements

- User- Friendly Operation Interface
- Robust Client / Server architecture
- Network Monitoring and Management
- Database for persistent event storage
- Security Access Management

Agents

All of CTC Union's SNMP enabled products, such as FRM220/220A platform, FMUX series of fiber multiplexers and Industrial series L2 managed switch are manageable by CTC Union SmartView™ EMS management Platform.

SmartView™ Server

The server handles connection with the network devices using SNMP protocol, and is responsible for communication of requests from management clients. SmartView™ Server collects the information data from specific SNMP agents, stores the information into a persistent database and updates that information to the management clients.

Microsoft® SQL Server for Persistent Storage

SQL Server is the place where the SmartView™ collected data, such as alarms, traps and user actions is stored for long term retrieval. SmartView™ requires Microsoft® SQL Server and is compatible with SQL Server 2005, SQL 2005 Express, SQL 2008 Server, SQL 2008 Express, SQL 2012 Server and SQL 2012 Express. (The EMS installer will install the free version Microsoft® SQL 2008 Express by default.)

Workstation-Clients

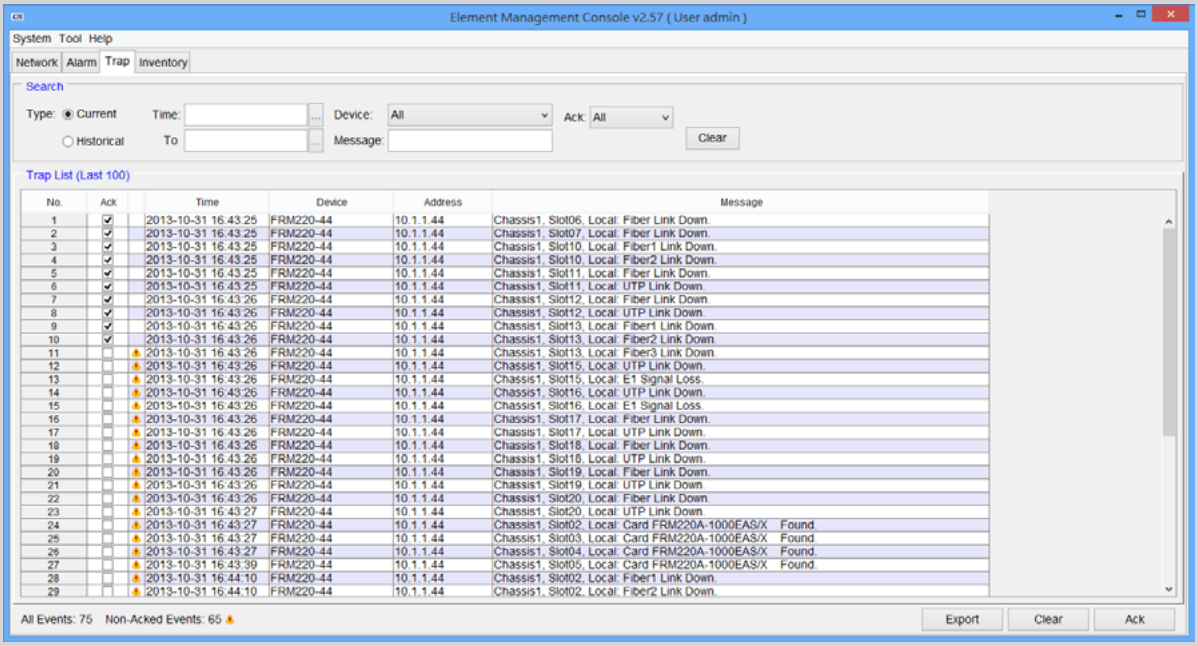
Management clients are provided with the JAVA applet GUI to monitor and control the agents at far end. They also receive the Alarm and Traps from the corresponding SNMP Agents. Multiple workstations are allowed, with a maximum of 25 concurrent logged in users.

Features at a Glance

Fault Management

Trap Collection

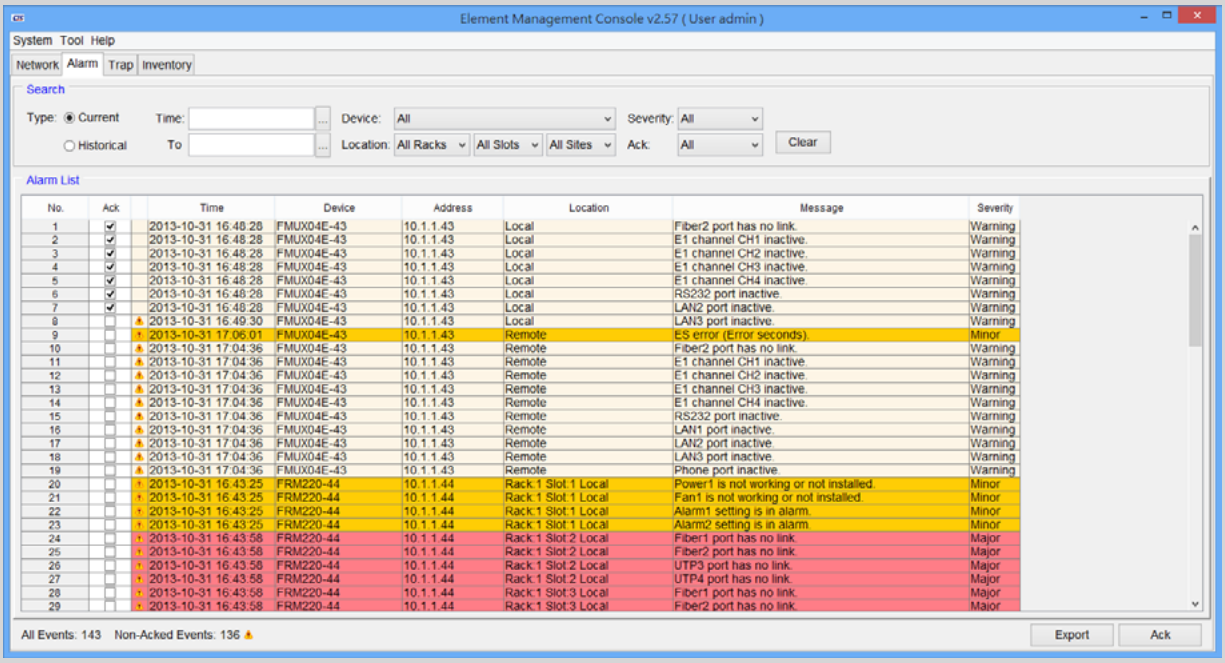
All traps will be stored in SQL database. When an SNMP agent experiences an abnormal condition it will send an SNMP trap message to SmartView™ which then receives the message, and records it in the database. Depending on preset conditions, SmartView™ may sound an audible alarm, send an email or SMS alert message or just simply flash the trap message on the administrative console screen.



Trap Messgages

Active Alarm

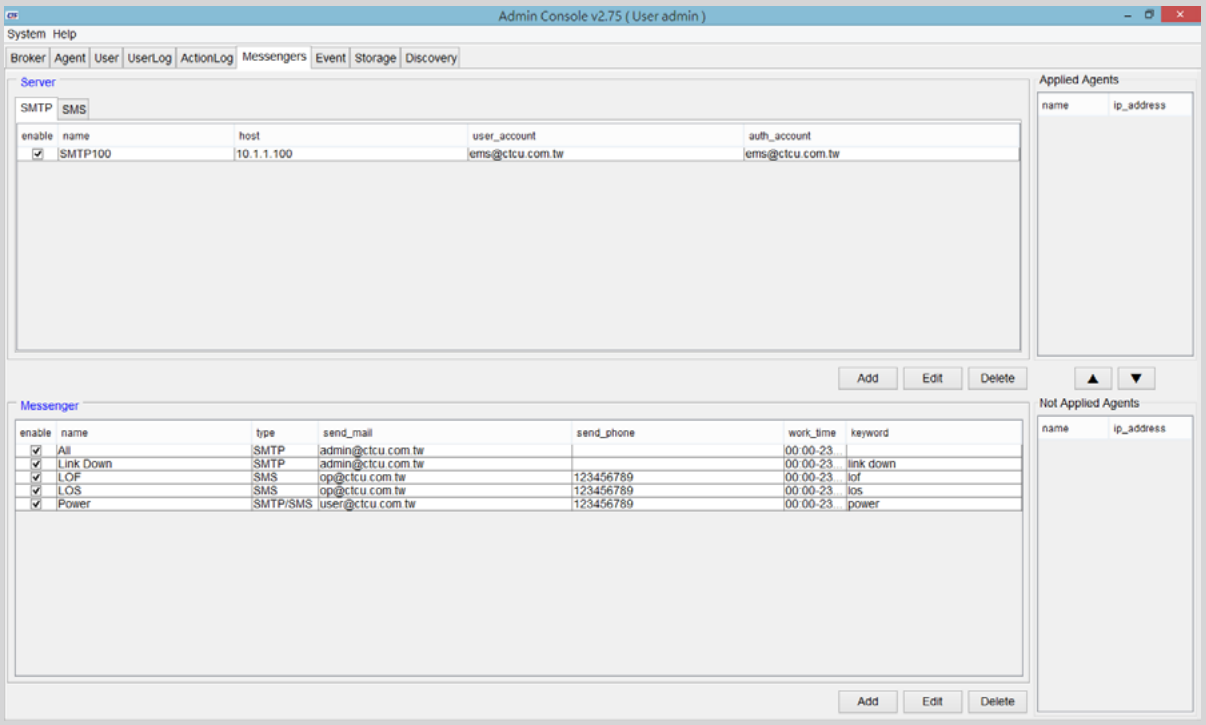
SmartView™ continuously polls all network devices under its management and will visually display all alarm conditions found. Alarms will be categorized as Major, Minor or Warning, depending on severity. Although alarms may be acknowledged, they remain actively displayed on the alarm page until they no longer have an alarm condition.



Active Warnings

Alarms sent by E-mail & SMS

The SmartView™ is capable of sending emails and or SMS text messages to selected administrators when critical alarms occur. Prompt notification of system problems aid in getting problems in the network fixed in the shortest time possible.

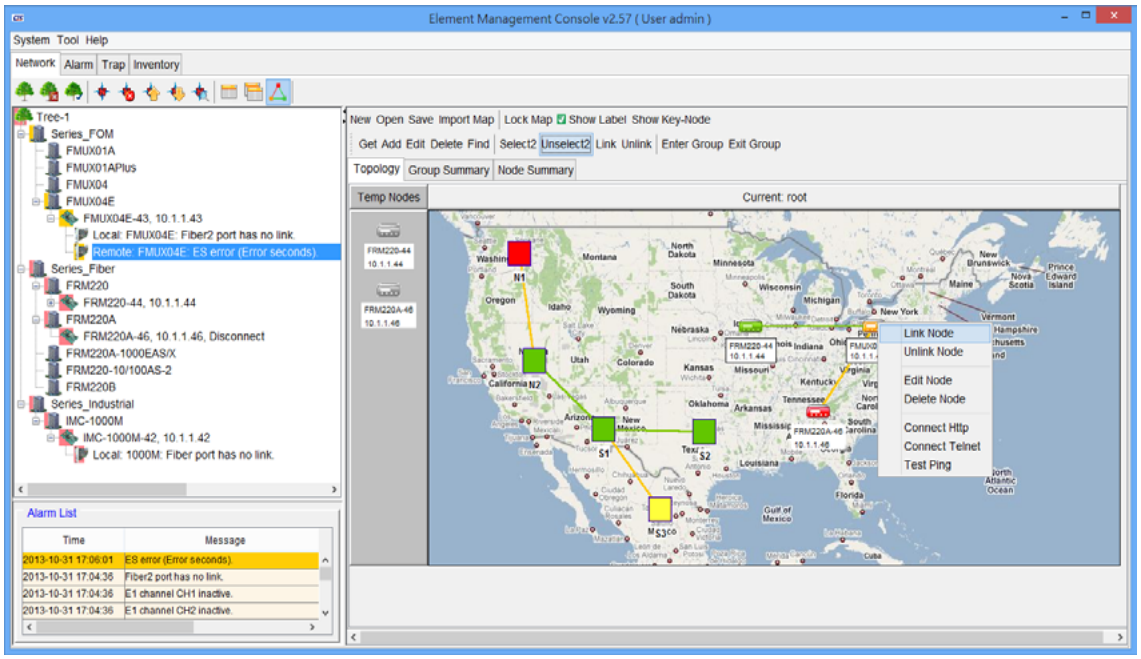


Alarms Sent by Email & SMS

Configuration Management

Network Topology

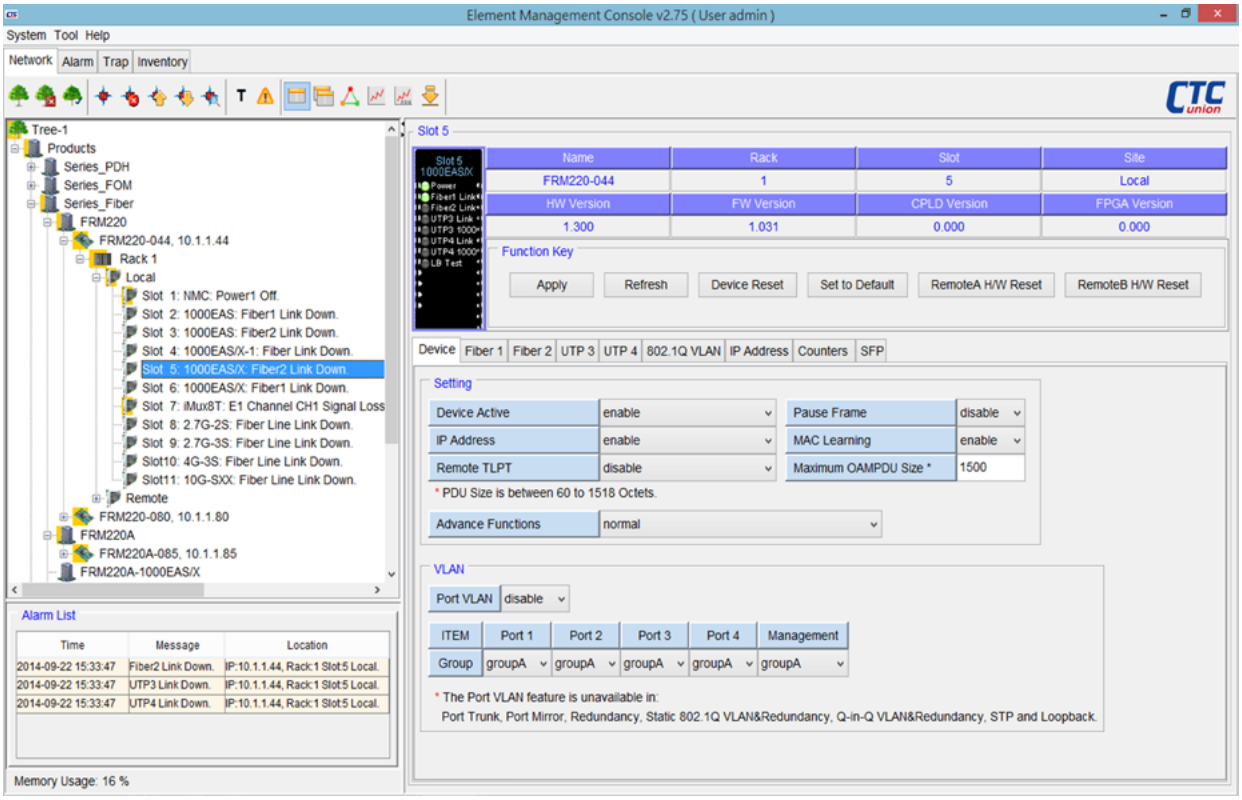
User can load maps to SQL server, load maps from SQL server or delete attached maps. Download procedure is very simple. Map area may be used to layout any objects from Root and Node panel.
Using drag-and-drop, put any object to map area. Any label or network element location name may be added to object. Objects in red color indicate some alarm condition is present in the device. Right clicking an object brings a popup window to select Telnet or http management directly.



Network Topology

Network Element Configuration

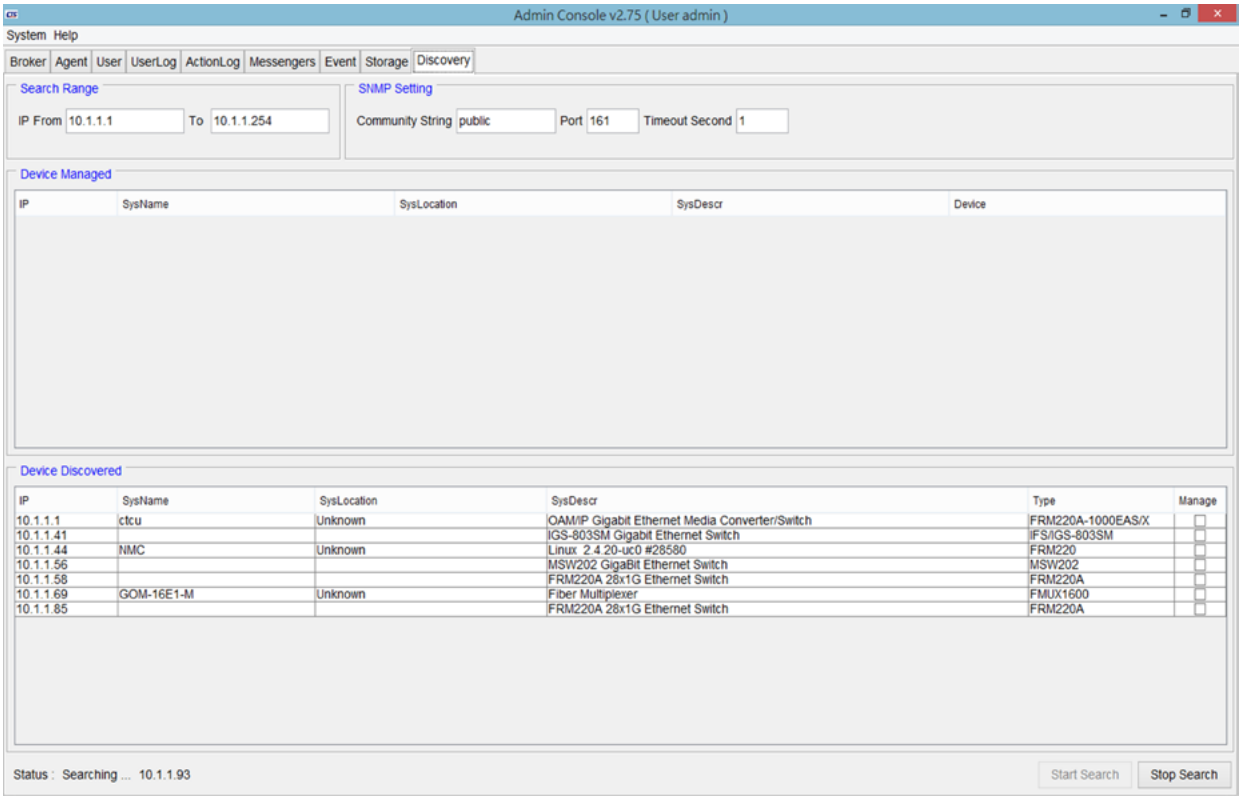
SmartView™ is able to provide a single point of configuration for the network elements. Most settings only require mouse clicks and by using a tab format, most scrolling is eliminated. Current settings and status are displayed along with hardware and firmware versions for each element.



Network Element Configuration

Network Element Discovery

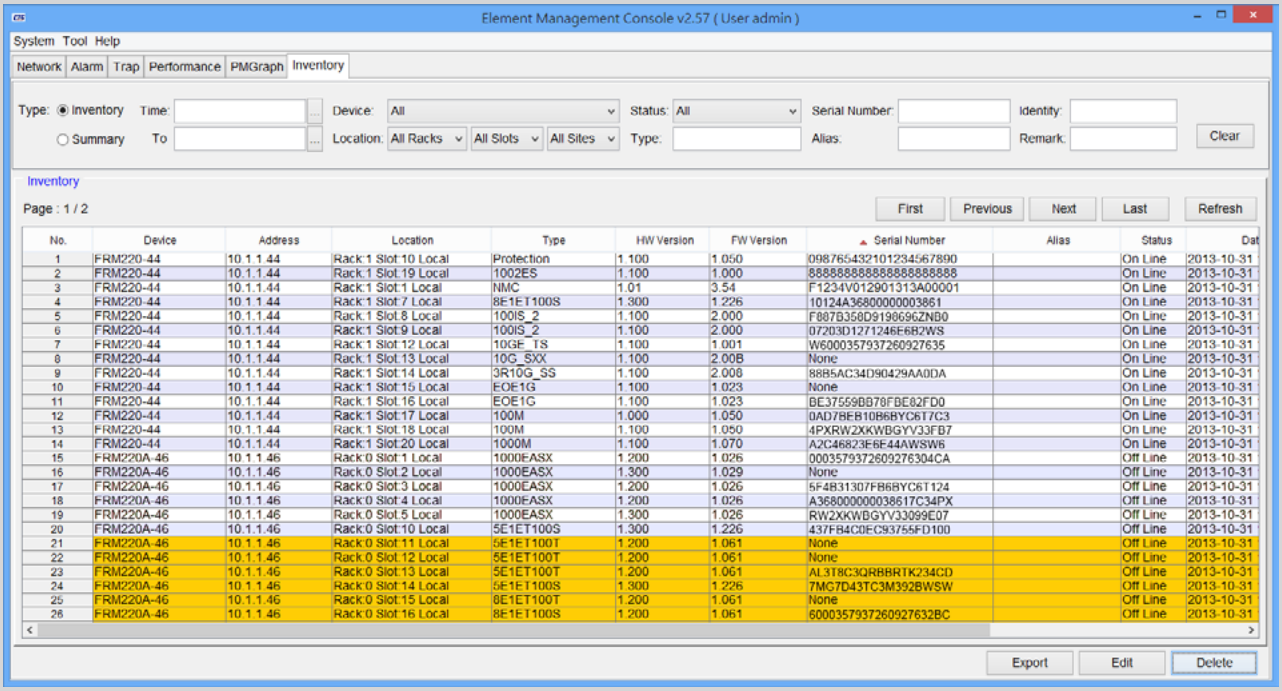
SmartView™ has a tool for automatically discovering SNMP agents on the network. Simply enter an IP address range and the discovery program will ping every IP address looking for SNMP agents. Once discovered, the agents can be selected and brought into the broker for polling.



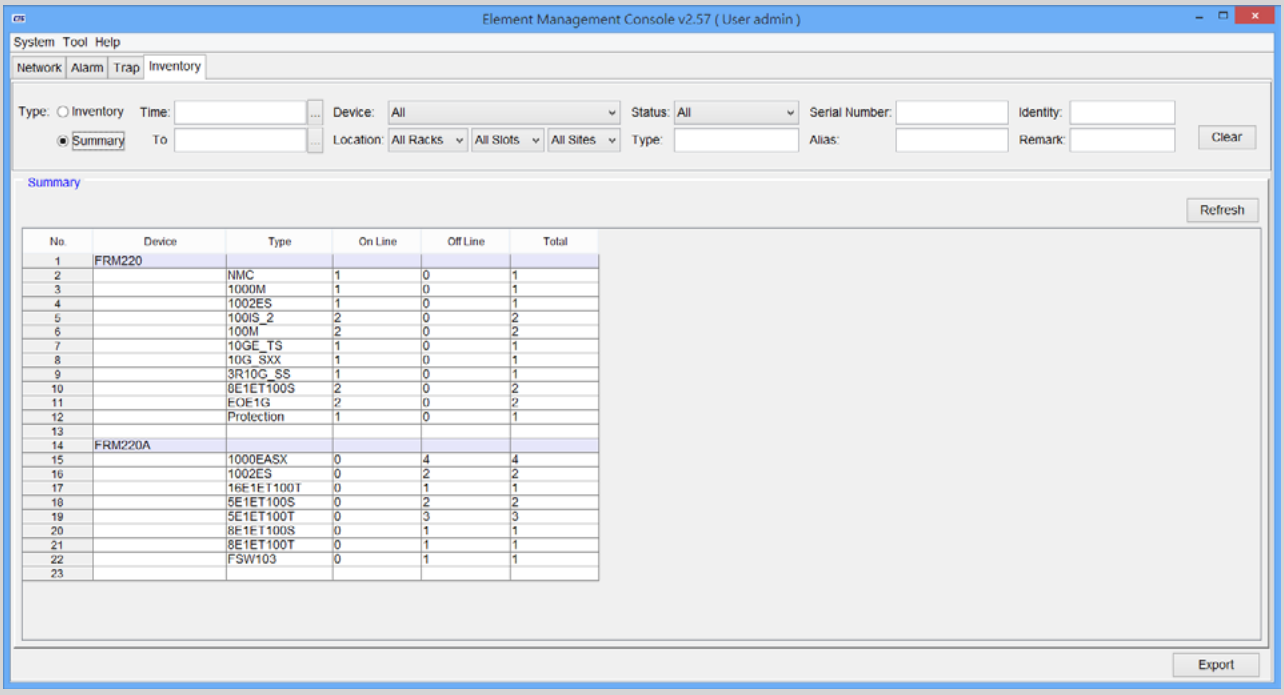
Network Element Discovery

Accounting Management

The accounting management supports reading a factory programmed serial number specific for each line card. The location, status and serial numbers of all assets can be managed and exported.



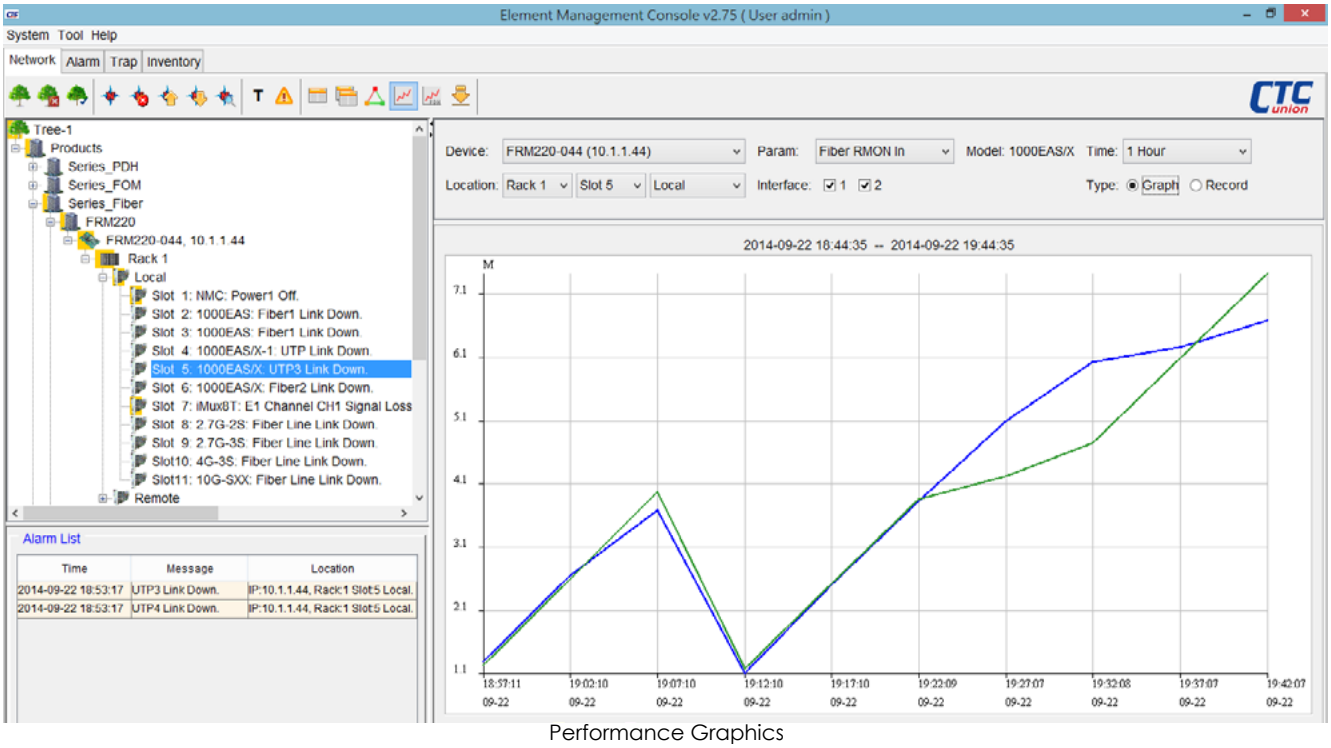
Inventory List



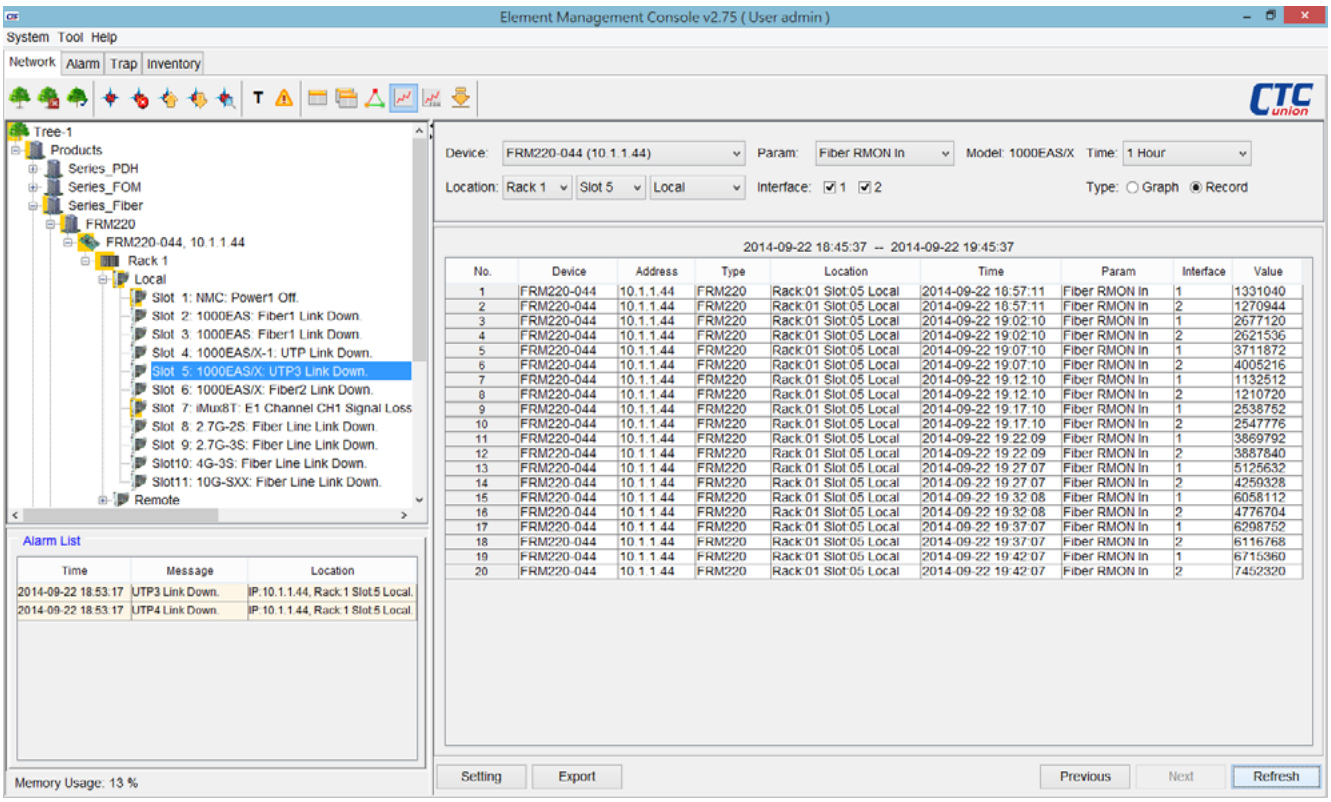
Inventory Summary

Performance Management

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



Performance Graphics

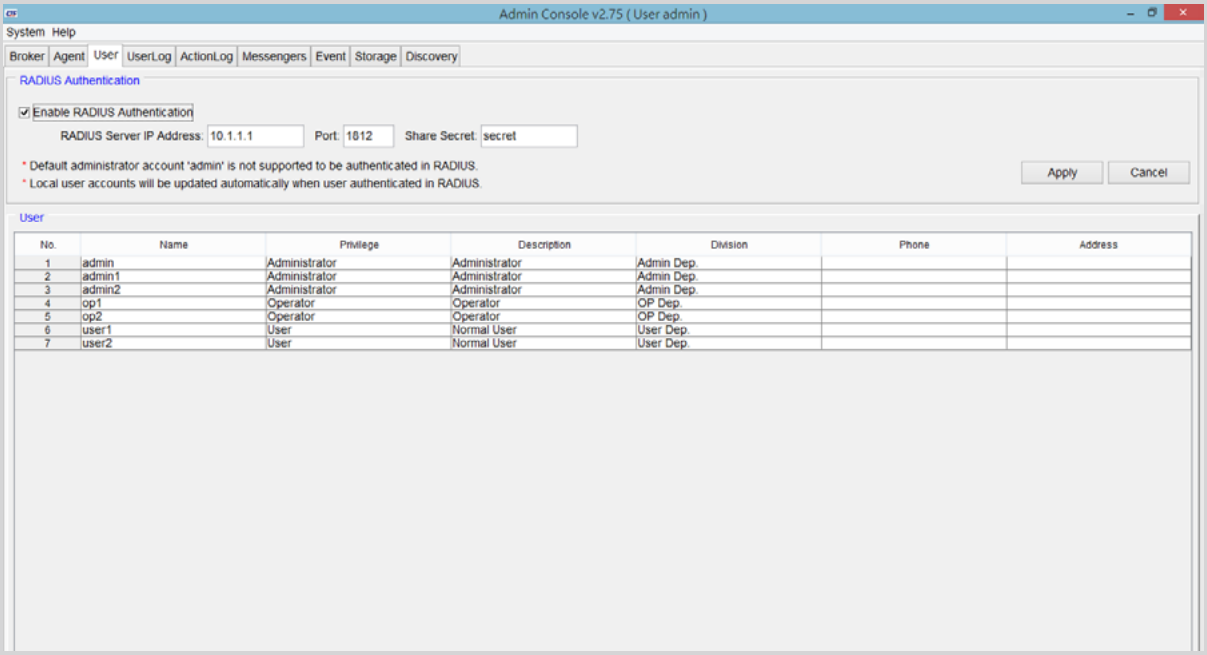


Performance Records

Security Management

User Privilege

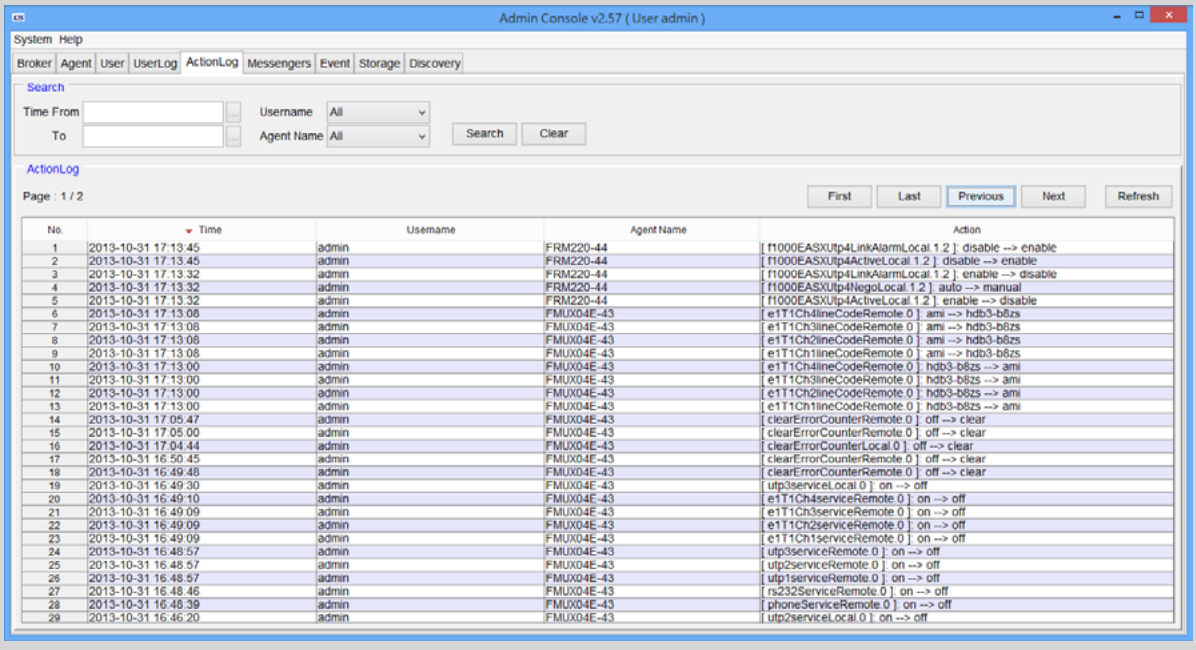
- The administrator can add necessary user logins with specific privileges, from Administrator to Operator and lastly to normal user.
- Radius Authentication. Supports authentication login provided by credentials stored on RADIUS server.



User Privilege

User Activity

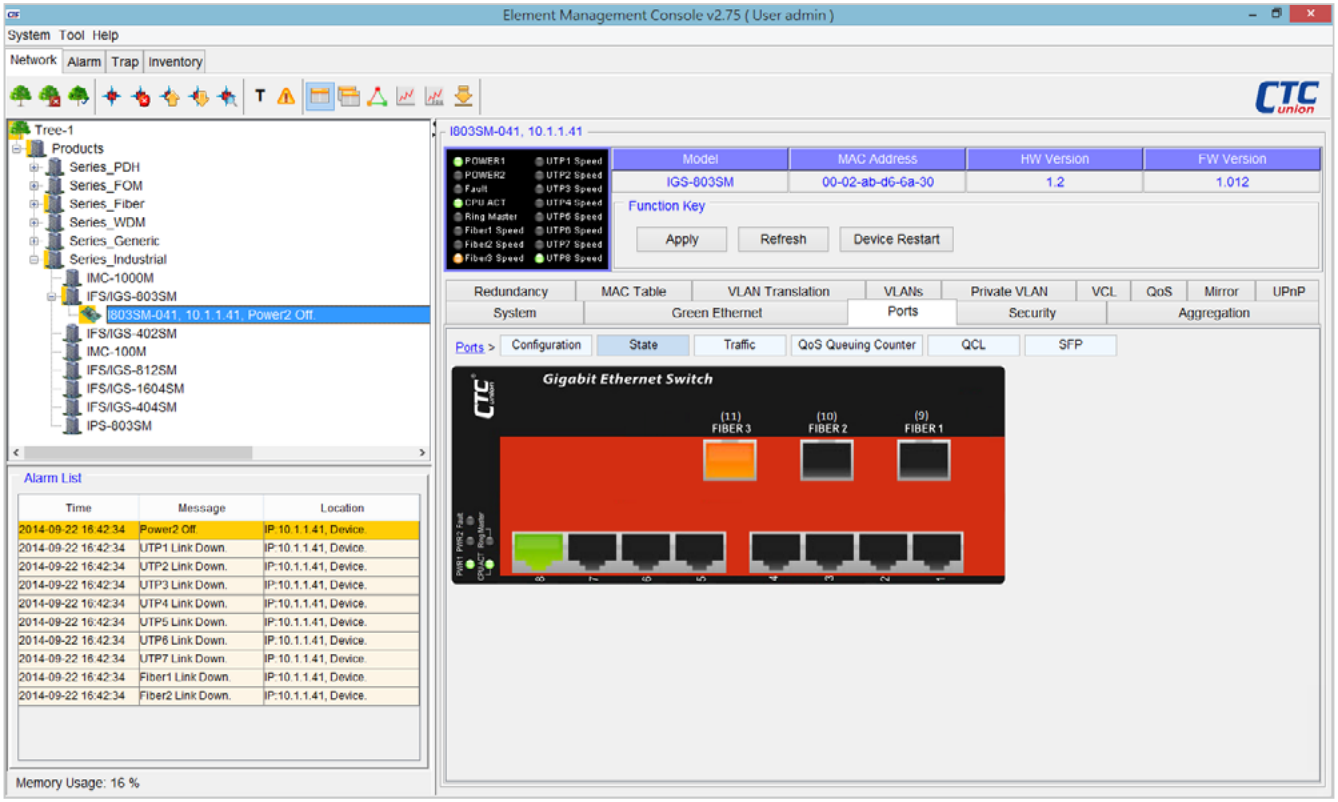
Provides viewing and clearing of the user login and configuration action logs.
User client login & logouts is recorded including the client's source IP address. All activities performed on any Network Element are logged with time-stamping, the user making changes and the changes made.



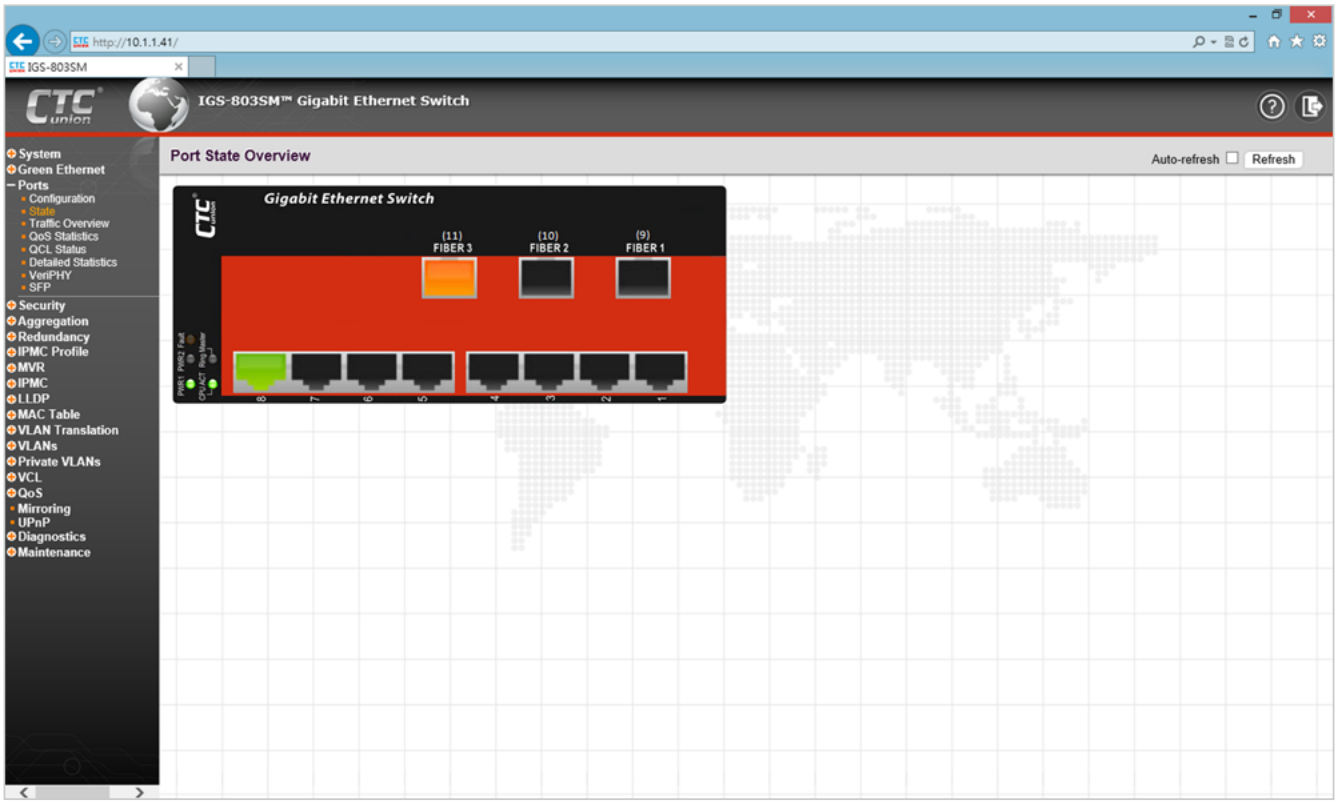
User Activity

Available Models :

Industrial Ethernet Switch & Media Converter



EMS Interface



Web Interface

Requirements

SmartView™	Hardware (minimum)	Software	Operating System
SmartView™ Server	Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).	JAVA JRE. SmartView™ Kit.	Windows 2008/2012 Server, Windows Vista, Win 7/8
SQL Database Server	Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).	MS-SQL Server 2008/2012	Windows 2008/2012 Server, Windows Vista, Win 7/8
Workstation-Clients	Intel Core2 or higher processor, 4GB RAM, HD >2GB (free).	JAVA JRE. SmartView™ Kit.	Windows Vista, Win 7/8
All-In-One	Intel Core2 or higher processor, 8GB RAM, HD >20GB (free).	JAVA JRE. MS-SQL Server 2008/2012. SmartView™ kit.	Windows 2008/2012 Server, Windows Vista, Win 7/8

SmartView™ Supported Industrial Product List

Product Series	Model List
Industrial Managed Ethernet Switch	IGS-404SM, IGS-803SM, IGS-812SM, IGS-1604SM, IFS-402GSM, IFS-803GSM, IFS-1604GSM
Industrial Managed PoE Switch	IGS-402SM-4PH24, IGS-803SM-8PH24, IFS-402GSM-4PH24, IFS-803GSM-8PH24
Industrial Managed GbE Converter	IMC-1000M, IMC-1000MS, IMC-100M
Industrial Managed PoE Converter	IMC-1000M-PH12, IMC-1000MS-PH12, IMC-100M-PH12
IEC61850-3 Ethernet Switch	IPS-G803SM, IPS-803GSM
EN50155 Ethernet Switch	ITP-G802SM, ITP-G800M, ITP-802GSM, ITP-802GTM, ITP-800M
EN50155 Ethernet Switch with PoE	ITP-G802SM-8PH24, ITP-G800M-8PH24, ITP-802GSM-8PH24, ITP-802GTM-8PH24, ITP-800M-8PH24
Industrial Core Switch	ICS-24S4XM, ICS-24S2XM

Ordering Information

SmartView™ Platform Server with Device Agents

Model Name	Description
SV-AGT-50	SmartView™ Platform with 50 device agents
SV-AGT-100	SmartView™ Platform with 100 device agents
SV-AGT-200	SmartView™ Platform with 200 device agents
SV-AGT-500	SmartView™ Platform with 500 device agents

SV – □□□ – □□□

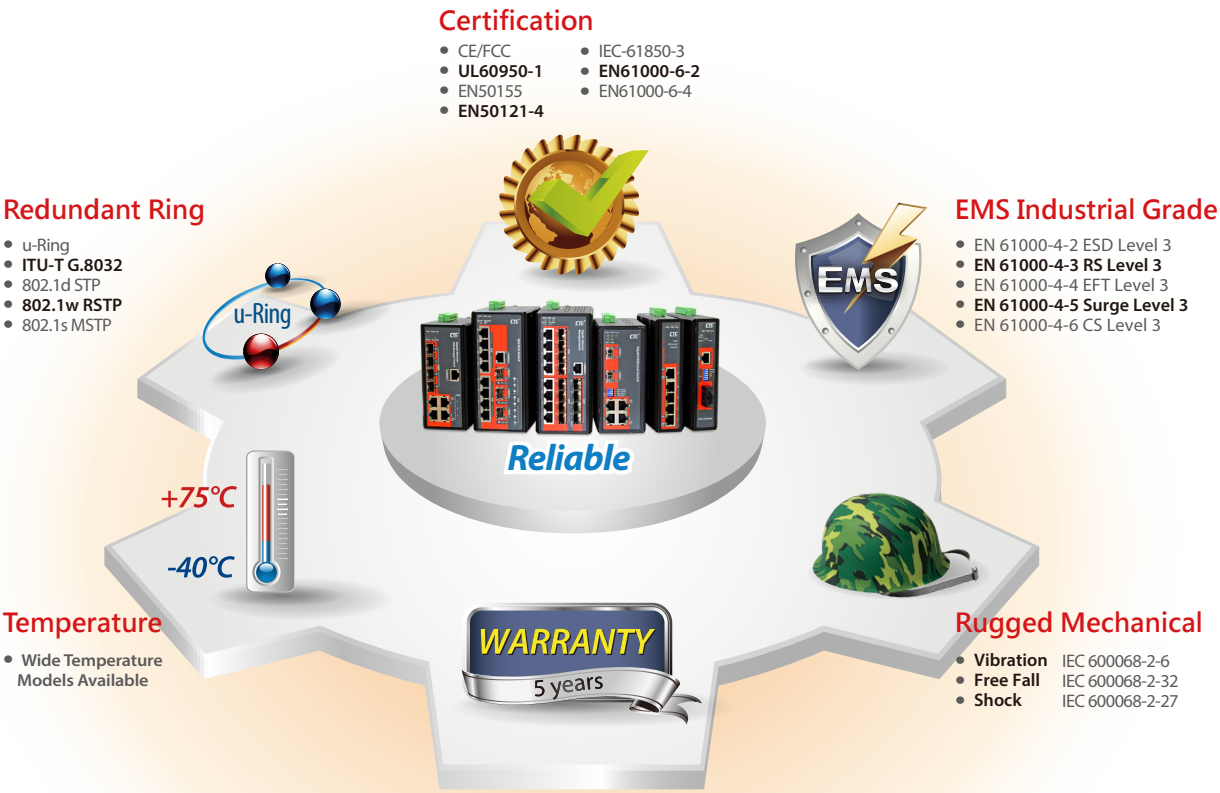
Example: SV – AGT – 100

Reliable Industrial Ethernet Networks

- Certified Industrial Standards
- Managed by Centralized SmartView™
- Quick & Easy SmartConfig™ for Mass Configuration
- Flexible u-Ring Network Redundancy
- Standard ITU G.8032
- IEEE 1588 v.2 P2P Precision Time Protocol
- Rugged & Fanless Design with Wide Operating Temperature
- Redundant & Wide Range Power Inputs
- IEEE 802.3 az Green Power
- 5 Years Warranty

Industrial networking switches, designed and manufactured by CTC Union, are to deliver high performance and reliable solutions in fields such as automation, railway transmission, power substation and so on. The products have passed strict tests and are certified to UL60950-1 safety standard, railway traffic EN50121-4 & EN50155 and EN61000-6-2 & EN61000-6-4 standards. With wide operating temperature, IP30 rugged housing, redundant wide range power inputs features, CTC Union's industrial networking devices are able to provide uninterrupted and stable services for mission-critical projects especially carried out in harsh environments. SmartView™ centralized management, friendly and flexible u-Ring redundancy and real-time alarm notifications make CTC Union's industrial networking devices even more resilient in connecting your network. To demonstrate confidence in our products, we offer a 5-Year warranty on industrial networking products to our customers.

Reliability Elements



Key Certificates

CTC Union's industrial networking products are UL listed and certified. UL-certified products are intended to reduce risks of electric shocks, fire, energy related hazards, heat related hazards, mechanical hazards, radiation, and chemical hazards for operator, layman or service personnel.

For Trackside and Railway Applications

CTC Union's industrial networking products are certified to the EN50121-4 EMC (Electromagnetic compatibility standard) for emission and immunity and EMS (Electromagnetic Susceptibility Protection) for surge, EFT, ESD requirements and so on.

EN50121-4

For Heavy Industrial Ethernet Applications

CTC Union's industrial networking products are certified to the EN61000-6-2 & EN61000-6-4 Immunity & Emission for Heavy Industrial Environment and EMS (Electromagnetic Susceptibility Protection) for surge, EFT, ESD requirements and so on.

EN61000-6-2
EN61000-6-4

For Power Substation Applications

CTC Union's industrial networking products are certified to the IEC 61850-3 standard that meets the EMC (Electromagnetic compatibility standard) requirements and EMS (Electromagnetic Susceptibility Protection) for surge, EFT, ESD requirements and so on.

IEC 61850-3

For Railway, Buses and Moving Machine Applications

CTC Union's industrial networking products are certified to the EN50155 standard that meets the EMC (Electromagnetic compatibility standard) requirements and EMS (Electromagnetic Susceptibility Protection) for surge, EFT, ESD requirements and so on. The devices can also withstand environmental disturbances including vibration and shock variations.

EN50155

Comparison of CE & EN50121-4 Compliant Standards for Trackside

Compared with general CE compliant products, our EN50121-4 products meet a range of demanding standards, including EMC, vibration and power. For trackside applications, surge, EFT, ESD indicators are also important to successful installations. See below for a comparison between genernal CE compliant and EN50121-4 (Trackside) test levels:

	CE Compliant	EN50121-4 Compliant (Trackside)
Surge		
Signal L-E	1kV	2kV
Signal L-L	N/A	2kV
DC Power L-E	0.5kV	2kV
DC Power L-L	0.5kV	2kV
ESD (Contact)	4kV	6kV
Radio frequency magnetic field	10V/m	20V/m
EFT (fast transient)	0.5kV Criteria B*	2kV Criteria A*
Power magnetic field	10 A/meter	300 A/meter
Pulse magnetic field	N/A	300 A/meter

* Criteria A: During the test storage devices shall maintain normal operation both in read/write and in stand-by conditions.
* Criteria B: During and after the test failures which can be recovered by read and write retires are permissible (temporary delay in processing caused by this process is acceptable).

Managed by Centralized SmartView™

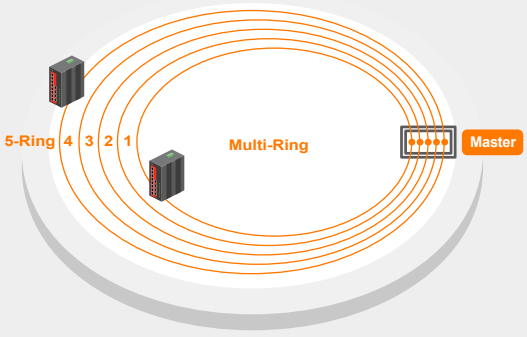
SmartView is a centralized network management platform that offers visual representations of connected devices. Users can remotely access and manage devices and upgrade Firmware image for a group of member devices at the far end via user-friendly and easy-to-use operation interface. So far, Smartview contains Fault management, Configuration Management, Accounting management, Performance Management and Security management.

Quick & Easy SmartConfig™ for Mass Configuration

CTC Union’ s SmartConfig is an intuitive and convenient network configuration tool that enables users to access multiple and discovered industrial networking products at a time to perform mass configuration tasks. Compared with one-to-one configuration, SmartConfig can complete a task automatically and simultaneously even faster and effortlessly. For large network deployments, SmartConfig is a useful configuration tool to not only help users save time and cost, but also improve operational efficiency and security. SmartConfig provides functions like Account Management, Auto Discovery, Auto Grouping/Create/Modify Group, Device Configuration, u-Ring Configuration, IP Address Assignment, Firmware Upgrade, Export/Import Configuration, Connectivity Test and so on.

The Most User-Friendly & Flexible u-Ring Network Redundancy

u-Ring is a proprietary redundancy protocol developed by CTC Union that supports flexible networking topologies and provides faster recovery time (10ms) when a point of failure occurs on the network. u-Ring that outperforms other network redundancy protocols can support 5 rings and up to 250 devices in a ring. It also provides the best flexibility for various network applications to users when structuring their rings by offering three u-Ring types (u-Ring, u-Chain, Sub-Ring). Additionally, u-Ring configuration page is easy-to-use and user-friendly. Users can set up a ring instance quickly as long as they select the suitable u-Ring type and the port numbers participating in redundancy operation.



- 5-Ring(Max.)
- 250 nodes expansion pre ring

u-Ring configuration

Delete	Instance	Type	Master	East		West	
				Port	Edge	Port	Edge
Delete	1	u-Ring	☐	1		2	
Delete	2	u-Ring	☐	4		3	
Delete	3	u-Ring	☐	10 (Fiber2)		11 (Fiber3)	
Delete	4	Sub-Ring	☐	6			
Delete	5	u-Chain	☐	5	☐	9 (Fiber1)	☐

User-Friendly Configuration Web Interface

Standard ITU G.8032, IEEE 802.1W RSTP, IEEE 802.1s MSTP Supported

Other than the proprietary u-Ring redundancy protocol, standard ring redundancy protocols such as ITU G.8032, RSTP and MSTP are also supported. Among standard redundancy protocols, ITU G.8032 achieves the fastest recovery time (<50ms) than others. Users can choose the most suitable ring redundancy protocol based on their actual networking needs.

IEEE1588v2 PTP Supported.

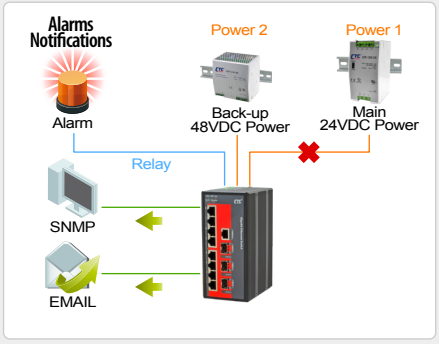
CTC Union's IEEE 1588v2 PTP (Precision Time Protocol) feature provides timestamp for receive and transmit frames to synchronize clocks in a network. Our IEEE 1588v2 PTP-enabled products support a hierarchical master-slave structure for clock distribution and each port provides Master, Slave, and Ordinary mode. Through continuous message exchanges between the master and slave clock, our products can achieve synchronization accuracy in sub-microsecond range.

5-Year Warranty and High MTBF Values

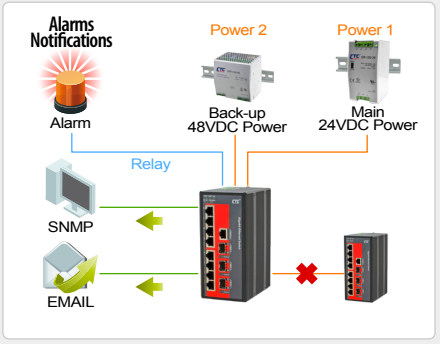
Before the industrial networking products are delivered to customers, they were undergone reliability tests that meet rigorous standards in our lab and various strict quality checks in our factory. Our products using specially-chosen parts such as industrial-grade IC, PCB, transformers, screws and specially-installed method for heatsink have been approved to achieve high MTBF values. EMC and EMS certificates we received are further to approve that our products can function stably and safely even in harsh environments. To demonstrate our confidence in our products, we offer a 5-Year warranty on our industrial networking products to customers.

Diverse & Immediate Alarm Notifications

The industrial networking products offer several ways of notifying alarms in response to a particular abnormal event. One way is to send an Email warning or to trigger a SNMP trap when a fault is automatically detected. These faulty events can also be recorded in system log for further analysis. The other way is to use alarm relay contacts on the terminal block. When the selected alarm events (power failure, link up & down, etc.) occur, the alarm relay contacts will be open and the FAULT LED will be lit in amber color to alert the user. The industrial networking products allow users to use one or more notification actions for a specific abnormal event. Users can take advantage of alarm notification feature and select the most appropriate alarm actions for their own application.

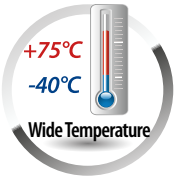


Alarms for Main Power Failure



Alarms for Main Port Link Down

Rugged & Fanless Design with Wide Operating Temperature



CTC Union's industrial networking products are all fanless and protected in a rugged metal housing to endure extreme and rapidly changing conditions such as shock, vibration, moisture, etc. They can also operate at standard (-10 ° C~60 ° C) and wide (-40°C~75°C) operating temperature range, making them suitable for harsh environments like railways, roadside, factory, warehouse, dock, parking lot, electrical poles and so on.

IP67 Rated & M12 Connection

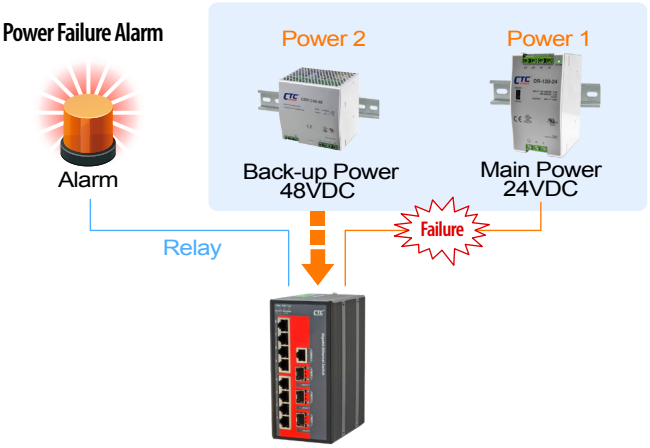
Our ITP series is EN50155 compliant and provides solutions for rugged and long life usage in industrial and harsh environments. When exposing in outdoor, offshore or railways environments, ITP series equipped with M12 connectors is able to withstand vibration, shock, extreme temperature, and humidity. Additionally, our EN50155 compliant switches are IP67 rated to protect against dust, oil and submission in water and to meet the most rigorous standards for extreme temperature, vibration, shock, humidity and others. ITP products with M12 connectors and IP67 rating are purpose-built for automotive, manufacturing, oil, gas, mining and other industrial environments, requiring no extra housing protection.

Waterproof

Anti-vibration

Redundant & Wide Range Power Inputs

The industrial networking products use a removable terminal block to offer two separate and wide range DC power (12/24/48V) connections. Basically, one pair of power connection is enough to power up the system. However, if two power inputs are connected, the back-up power supply will take over to provide the entire power when the main power supply fails. The power redundancy is enabled automatically; no software configuration is required.

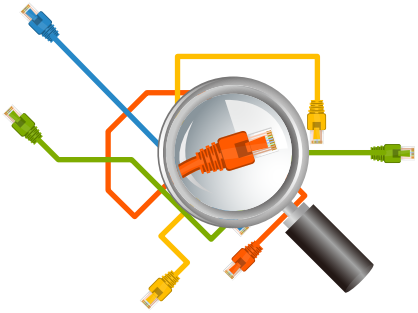


IEEE 802.3az Green Power

802.3az Less Power Consumption GREEN

IEEE 802.3az EEE (Energy Efficient Ethernet) is intended to reduce power consumption during periods of low data activity. CTC Union's industrial networking products that comply with IEEE 802.3az standard can reduce consumption in two ways. One is to reduce power usage when ports are in idle state. The other way is to reduce power usage according to cable length meaning that the shorter the cable length, the less power it consumes. Both ways can save power consumption and achieve the goal of energy efficiency without affecting the entire network.

Cable Diagnostics



Cable Diagnostics feature is useful to troubleshoot Ethernet cabling problems especially for Ethernet cables buried or hidden underground. The diagnostic results reveal cable states (shorts or open connections), the length of cable and distances to the faults. When a cabling problem has been detected, an appropriate recovery action can be taken according to information (the pairs of the cable and the location of the fault) obtained without interrupting unaffected network.

Industrial Ethernet Product Comparison Table

Industrial Ethernet Switches

Model Name	Managed	Total Port	UTP		Fiber			Certification			
			10/100 Base-TX	10/100/1000 Base-T	100Base-FX	1000Base-X	Dual Speed 100/1000Base-X	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC
IFS-500		5	5					✓		✓	✓
IFS-800		8	8					✓		✓	✓
IFS-401F		5	4		1 SC/ST			✓		✓	✓
IFS-402F		6	4		2 SC/ST			✓		✓	✓
IFS-500C		5	5					✓		✓	✓
IGS-500		5		5				✓		✓	✓
IGS-501S		6		5			1 SFP	✓		✓	✓
IGS-800		8		8				✓		✓	✓
IGS-401F		5		4		1 SC		✓	✓	✓	✓
IGS-402F		6		4		2 SC		✓	✓	✓	✓
IGS-402S		6		4			2 SFP	✓	✓	✓	✓
IFS-402GSM	✓	6	4				2 SFP	✓	✓	✓	✓
IFS-803GSM	✓	11	8				3 SFP	✓	✓	✓	✓
IFS-1604GSM	✓	20	16				4 SFP	✓	✓	✓	✓
IGS-404SM	✓	8		4			4 SFP	✓	✓	✓	✓
IGS-803SM	✓	11		8			3 SFP	✓	✓	✓	✓
IGS-812SM	✓	20		8			12 SFP	✓	✓	✓	✓
IGS-1604SM	✓	20		16			4 SFP	✓	✓	✓	✓

Industrial Ethernet Converters

Model Name	Managed	UTP		Fiber Port			Certification			
		10/100 Base-TX	10/100/1000 Base-T	100Base-FX	1000Base-X	Dual Speed 100/1000Base-X	Railway EN50121-4	UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC
IMC-100C		1		1 SC/ST			✓		✓	✓
IMC-100		1		1 SC/ST			✓	✓	✓	✓
IMC-1000C			1		1 SC		✓		✓	✓
IMC-1000			1			1 SC	✓	✓	✓	✓
IMC-1000CS			1			1 SFP	✓		✓	✓
IMC-1000S			1			1 SFP	✓	✓	✓	✓
IMC-1000MS	✓		1			1 SFP	✓	✓	✓	✓
IMC-1000M	✓		1			1 SC	✓	✓	✓	✓
IMC-100M	✓	1		1 SC/ST			✓	✓	✓	✓

Industrial Serial Fiber Converters

Model Name	Dual Channel	Serial			Fiber		Certification			
		RS232	RS422/485	Isolation 2.5KV	SC/ST	Daisy Chain	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC
IFC-FDC	✓	2	1	✓	2	✓	✓	✓	✓	✓
IFC-Serial	✓	2	1	✓	1		✓	✓	✓	✓

Industrial Ethernet PoE Switches

Model Name	Managed	Total Port	UTP		Fiber		PoE Port IEEE802.3at	Certification			
			10/100 Base-TX	10/100/1000 Base-T	1000Base-X	Dual Speed 100/1000Base-X		Railway EN50121-4	UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC
IGS-600-4PH24		6		6			4	✓	✓	✓	✓
IGS-401F-4PH24		5		4	1 SC		4	✓	✓	✓	✓
IGS-402F-4PH24		6		4	2 SC		4	✓	✓	✓	✓
IGS-402S-4PH24		6		4		2 SFP	4	✓	✓	✓	✓
IFS-402GSM-4PH24	✓	6	4			2 SFP	4	✓	✓	✓	✓
IFS-803GSM-8PH24	✓	11	8			3 SFP	8	✓	✓	✓	✓
IGS-803SM-8PH24	✓	11		8		3 SFP	8	✓	✓	✓	✓
IGS-402SM-4PH24	✓	6		4		2 SFP	4	✓	✓	✓	✓

Industrial Ethernet PoE Converters

Model Name	Managed	UTP		Fiber Port		PoE		Input Voltage (Boost)	Certification		
		10/100 Base-TX	10/100/1000 Base-T	100 Base-FX	Dual Speed 100/1000Base-X	IEEE802.3 at /af (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC
IMC-1000-PH12			1		1 SC	1	30W	12/24/48VDC	✓	✓	✓
IMC-1000S-PH12			1		1 SFP	1	30W	12/24/48VDC	✓	✓	✓
IMC-100-PH12		1		1 SC/ST		1	30W	12/24/48VDC	✓	✓	✓
IMC-1000M-PH12	✓		1		1 SC	1	30W	12/24/48VDC	✓	✓	✓
IMC-1000MS-PH12	✓		1		1 SFP	1	30W	12/24/48VDC	✓	✓	✓
IMC-100M-PH12	✓	1		1 SC/ST		1	30W	12/24/48VDC	✓	✓	✓

Industrial PoE Gigabit Ethernet Injector

Model Name	Network	PoE		Input Voltage	Certification		
	10/100/1000 Base-T (UTP)	IEEE802.3 at /af (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
INJ-IG60-24	1	1	15/30/36/60/72W	"24/48VDC (Boost)"	✓	✓	✓
INJ-IG01-PH	1	1	15/30/60W	48VDC	✓	✓	✓

PoE LAN Extenders

Model Name	UTP	Long Distance		PoE Port IEEE802.3at	Certification			
	10/100	RJ11	Coaxial		Rail Way EN50121-4	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC
IEXT224-4PH	4	1	1	24/48VDC	✓	✓	✓	✓
IEXT204-4PH	4	1		48VDC	✓	✓	✓	✓

EN50155 Ethernet Switches

Model Name	Managed	IP67	Total Port	UTP M12		Fiber Port	PoE Port IEEE802.3at	Certification					Shock/ Vibration
				10/100 Base-TX	10/100/1000 Base-T	Dual Speed 100/1000Base-X		EN50155	EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	IEC61377
ITP-500		✓	5	5				✓	✓		✓	✓	✓
ITP-800		✓	8	8				✓	✓		✓	✓	✓
ITP-800M	✓	✓	8	8				✓	✓	Plan	✓	✓	✓
ITP-802GTM	✓	✓	10	8	2			✓	✓	Plan	✓	✓	✓
ITP-802GSM	✓	✓	10	8		2 SFP		✓	✓	Plan	✓	✓	✓
ITP-G800M	✓	✓	8		8			✓	✓	Plan	✓	✓	✓
ITP-G802SM	✓	✓	10		8	2 SFP		✓	✓	Plan	✓	✓	✓
ITP-800M-8PH24	✓	✓	8	8			8	✓	✓	Plan	✓	✓	✓
ITP-802GTM-8PH24	✓	✓	10	8	2		8	✓	✓	Plan	✓	✓	✓
ITP-802GSM-8PH24	✓	✓	10	8		2 SFP	8	✓	✓	Plan	✓	✓	✓
ITP-G802SM-8PH24	✓	✓	10		8	2 SFP	8	✓	✓	Plan	✓	✓	✓
ITP-G800M-8PH24	✓	✓	8		8		8	✓	✓	Plan	✓	✓	✓

IEC61850-3 Ethernet Switches

Model Name	Managed	Total Port	UTP		Fiber Port	Certification			
			10/100 Base-TX	10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEC-61850-3	Safety UL60950-1	Railway EN50121-4	CE, FCC
IPS-G803SM	✓	✓		8	3 SFP	✓	✓	✓	✓
IPS-803GSM	✓	✓	8		3 SFP	✓	✓	✓	✓

Industrial Core Switches

Model Name	Managed	Total Port	GbE Port		10GbE	Input Power		Certification			
			100/1000 Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP	IEEE 802.3ae SFP+	DC (Low Volt) isolated 24/48VDC	AC (High Volt) 110/240V AC	Safety UL60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC
ICS-G24S4X-AA	V	28	20	4 Combo	4		2	V	V	V	V
ICS-G24S4X-DD	V	28	20	4 Combo	4	1	1	V	V	V	V
ICS-G24S4X-AD	V	28	20	4 Combo	4	2		V	V	V	V
ICS-G24S2X-AA	V	26	20	4 Combo	2		2	V	V	V	V
ICS-G24S2X-DD	V	26	20	4 Combo	2	1	1	V	V	V	V
ICS-G24S2X-AD	V	26	20	4 Combo	2	2		V	V	V	V

Ethernet Device Servers

Model Name	LAN UTP Port	WAN Port		Certification
	10/100Base-TX	RS-232	RS232/422/485	CE, FCC
STE100A-232	✓	✓		✓
STE100A-Serial	✓		✓	✓

IGS-401F
4x 10/100/1000Base-T+ 1x 1000Base-SX/LX

IGS-402F
4x 10/100/1000Base-T+ 2x 1000Base-SX/LX

IGS-402S
4x 10/100/1000Base-T+ 2x 100/1000Base-X SFP

The series models are 4-port 10/100/1000Base-T Ethernet non-managed Gigabit switches, with 1 or 2 fiber ports, that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, 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. 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

- 4x 10/100/1000Base-T RJ45 + 1x 1000Base-SX/LX Fiber (IGS-401F)
- 4x 10/100/1000Base-T RJ45 + 2x 1000Base-SX/LX Fiber (IGS-402F)
- 4x 10/100/1000Base-T RJ45 + 2x 100/1000Base-X SFP (IGS-402S)
- 12/24/48VDC redundant dual input power design
- Wide operating temperature -40 ~ 75°C ("-E" model)
- Provides broadcast storm protection
- Supports DIP SW for alarm setting and broadcast storm protection
- Supports power failure alarm message by relay
- Supports flow control
- UL60950-1, CE, FCC, EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- IP30 rugged metal housing and fanless

Specifications

IEEE Standard	IEEE 802.3 10Base-T 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
Switch Architecture	Back-plane (Switching Fabric): 10Gbps (IGS-401F)
	Back-plane (Switching Fabric): 12Gbps (IGS-402S, IGS-402F)
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
	1 or 2 1000Base-X Fiber SC connector (IGS-401F, IGS-402F) 2 100/1000Base-X SFP connector (IGS-402S)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um
	Fiber Cable (Single-mode): 9/125um
Protocols	CSMA/CD
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	RJ-45 port : Link/Active (Green), Speed 10 (OFF), 100 (Green), 1000 (Yellow)
	Fiber Per port: 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 3	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)
Reserve Polarity Protection	Present	
Overload current protection	Present	
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)	
	Provide DC Power JACK adapter cable for external power supply	
Power Consumption	7.9W (IGS-402F)	
	7.8W (IGS-401F)	
	7.9W (IGS-402S)	
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-402S, IGS-401F, IGS-402F)	
	-40 ~ 75°C (IGS-402S-E, IGS-401F-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) 0.67kg (IGS-401F) 0.68kg (IGS-402F)	
Installation Mounting	DIN Rail mounting or wall mounting	
MTBF	438,031 Hours (IGS-402S) 407,596 Hours (IGS-401F) 391,633 Hours (IGS-402F) (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
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

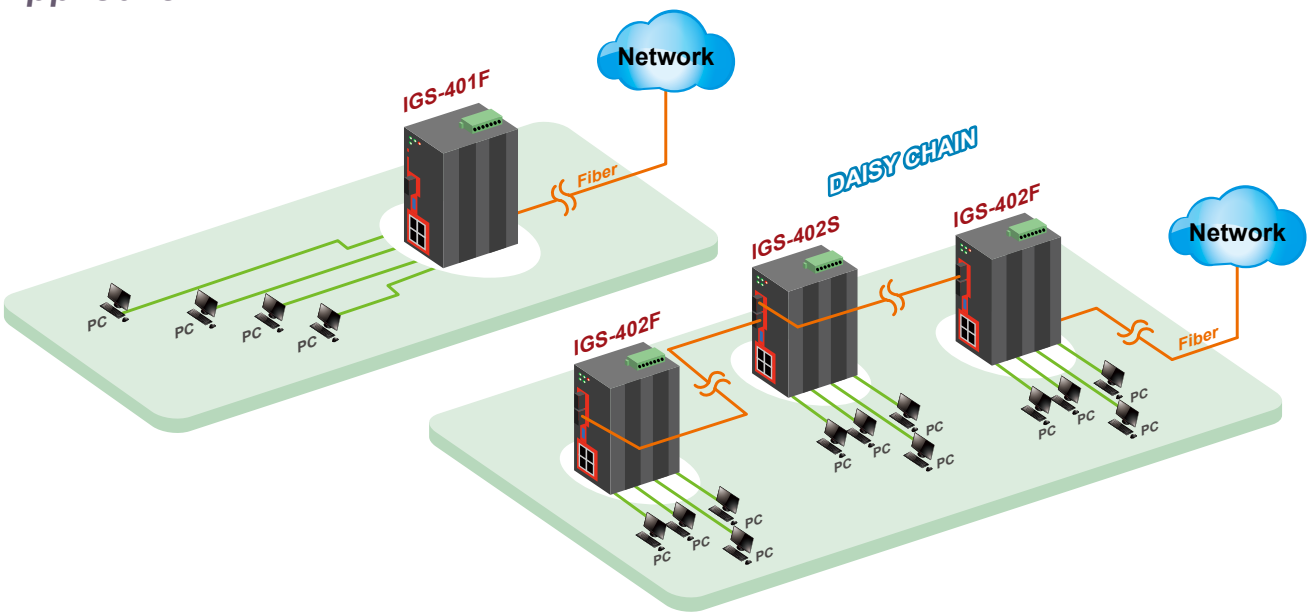
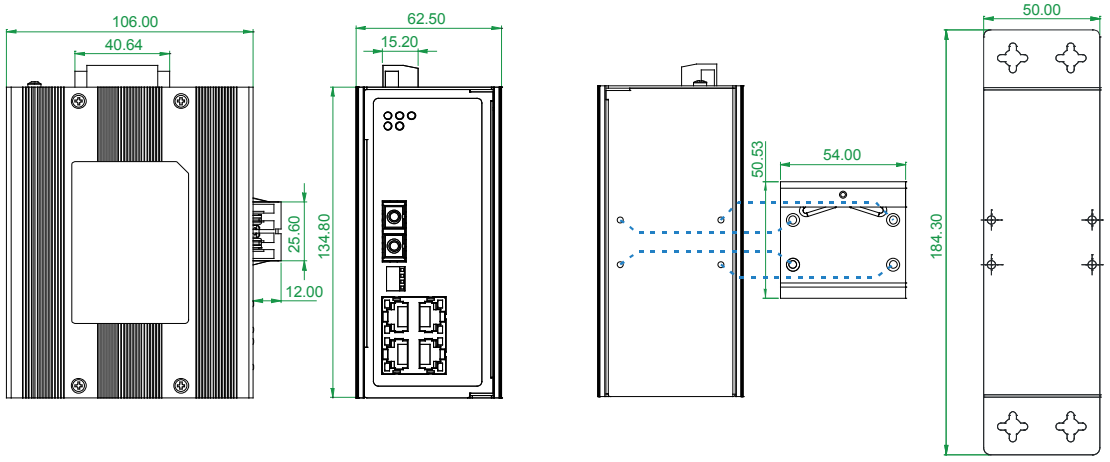


Figure : IGS-402S, IGS-401F & IGS-402F Gigabit Ethernet Switch Transmission

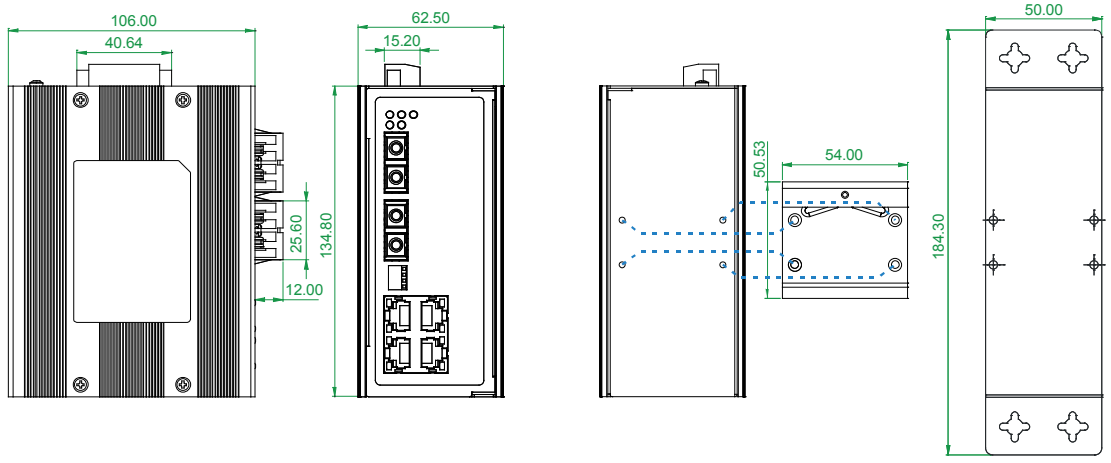
Dimensions

IGS-401F



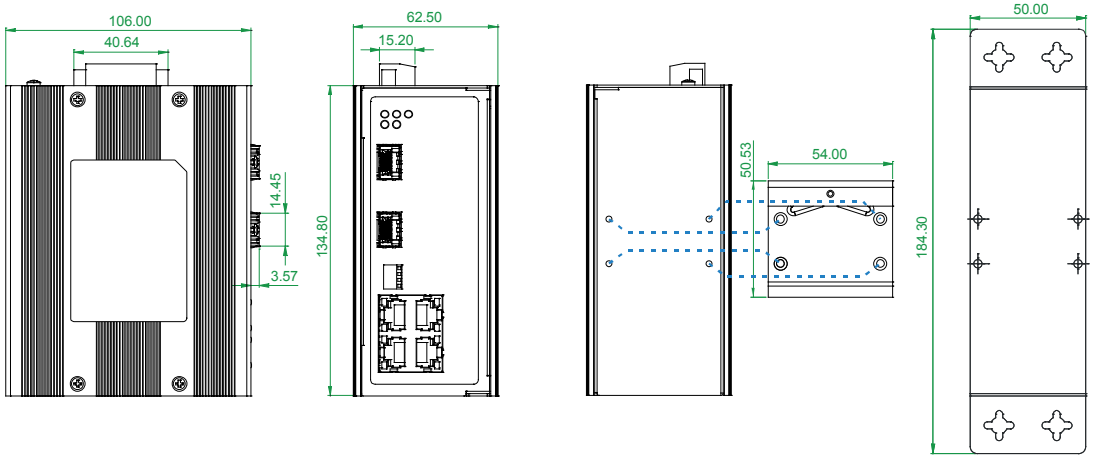
Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IGS-402F



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IGS-402S

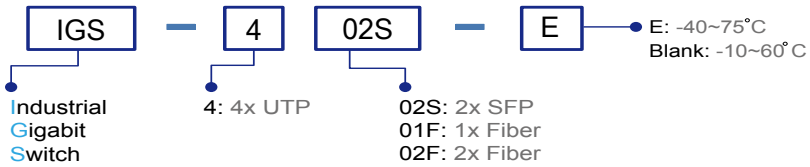


Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Total Port	UTP Port	Fiber Port		Certification					Operating Temperture
		10/100/1000 Base-T	1000Base-X	100/1000Base-X	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IGS-401F	5	4	1 SC	—	V	V	V	V	V	-10~60 C
IGS-401F-E	5	4	1 SC	—	V	V	V	V	V	-40~75 C
IGS-402F	6	4	2 SC	—	V	V	V	V	V	-10~60 C
IGS-402F-E	6	4	2 SC	—	V	V	V	V	V	-40~75 C
IGS-402S	6	4	—	2 SFP	V	V	V	V	V	-10~60 C
IGS-402S-E	6	4	—	2 SFP	V	V	V	V	V	-40~75 C

Model Naming Rule



Fiber Connector	Connectivity Distance
SC (IGS-401F & 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)

Port Number | Temperature | Connector Type | Connectivity Distance

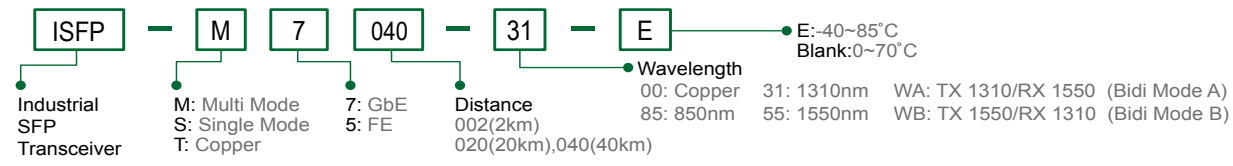
IGS – 40□ F – □ – □□□□□

Example: IGS – 401F – E – SC002

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule



NEW

EN50121-4 EN61000-6-2 EN61000-6-4

IGS-501S
5x 10/100/1000Base-T + 1x 100/1000Base-X SFP

IGS-500
5x 10/100/1000Base-T

IGS-800
8x 10/100/1000Base-T

The series models are 5/8-port 10/100/1000Base-T Ethernet non-managed Gigabit switches, with either 1 or 0 port 1000Base-X SFP port, that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, 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. 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

- 5x 10/100/1000Base-T RJ-45 + 1x100/1000Base-X SFP (IGS-501S)
- 5x 10/100/1000Base-T RJ-45 (IGS-500)
- 8x 10/100/1000Base-T RJ-45 (IGS-800)
- Supports broadcast storm protection
- Supports power failure alarm message by relay
- Supports flow control
- Jumbo frame support
- Supports auto-negotiation and auto-MDI/MDI-X
- Redundant dual DC input power 12/24/48VDC (9.6~60VDC)
- IP30 rugged metal housing, Fanless
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40~75°C (-E model)
- EN50121-4, CE, FCC Certification
- 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, 100Base-FX, Fast Ethernet	
	IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair	
	IEEE802.3x Flow Control	
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic	
Switch Architecture	Back-plane (Switching Fabric): 12Gbps (IGS-501S) 10Gbps (IGS-500) 16Gbps (IGS-800)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x flow control for Full duplex , back pressure for half duplex	
Provides Broadcast Storm Protection	Present	
Jumbo Frame	9.6KBytes	
MAC Address Table	8K	
Packet Buffer Size	128KByte	
Network Connector	5 x 10/100/1000Base-T RJ-45 (IGS-500,IGS-501S)	
	8 x 10/100/1000Base-T RJ-45 (IGS-800)	
	1x 100/1000Base-X SFP connector (only for IGS-501S)	
	10/100/1000Base-TX auto negotiation speed, Auto MDI/MDI-X function, 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)	
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um (only for IGS-501S)	
	Fiber Cable (Single-mode): 9/125um (only for IGS-501S)	
Protocols	CSMA/CD	
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	Per RJ45 Link/Act 1000 (Yellow) Link/Act 10/100 (Green)	
	Fiber LED Link/Act (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
	DIP 4	SFP speed (only for IGS-501S)
		ON : 100M OFF : 1000M
Reserve Polarity Protection	Present for Power Input	
Overload Current Protection	Present	

Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC), or AC 24V (18~36VAC) Input power (Removable Terminal Block)
	Provide DC Power JACK adapter cable for external power supply

Power Consumption

Input	IGS-500	IGS-501S	IGS-800
12VDC	3.3W	3.9W	7.0W
24VDC	3.4W	3.9W	7.0W
48VDC	4.8W	5.3W	8.7W

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°C~60°C (IGS-501S, IGS-500, IGS-800)
	-40°C~75°C (IGS-501S-E, IGS-500-E, 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	0.415kg (IGS-501S) 0.41kg (IGS-500) 0.44kg (IGS-800)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	569,039hrs (IGS-501S) 612,034hrs (IGS-500) 301,121hrs (IGS-800) (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

Application

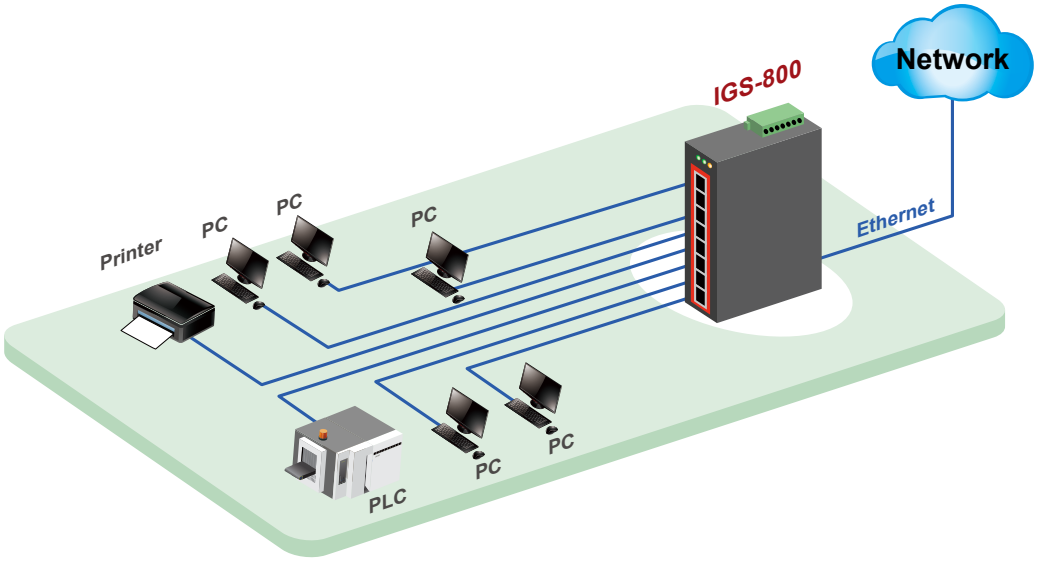
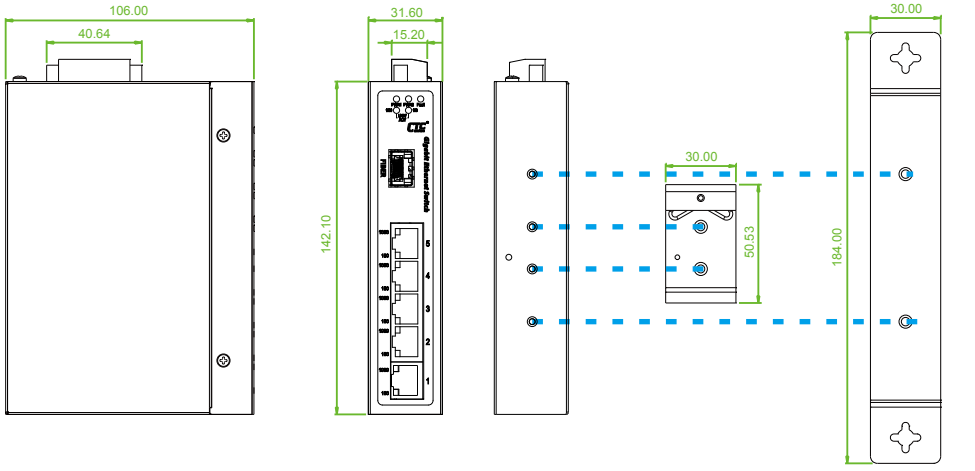


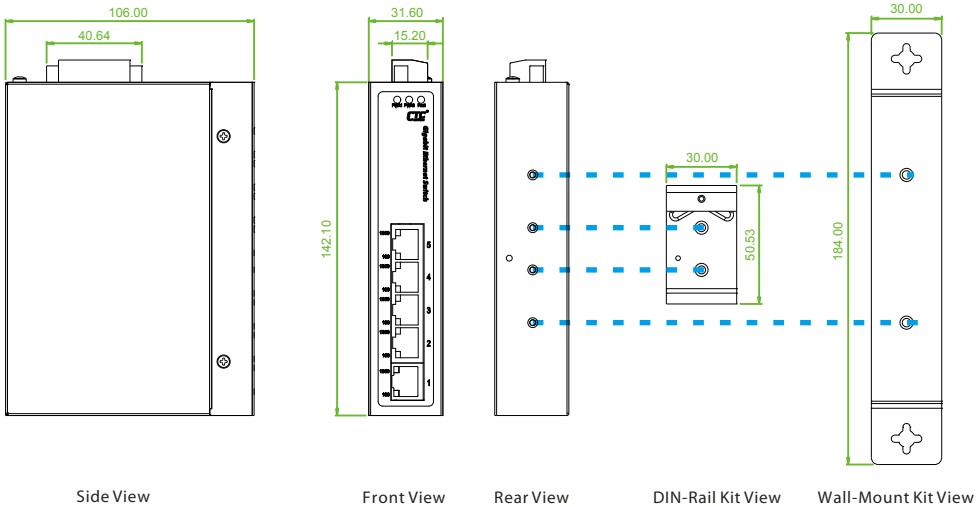
Figure : IGS-800 Gigabit Ethernet Switch Transmission

Dimensions

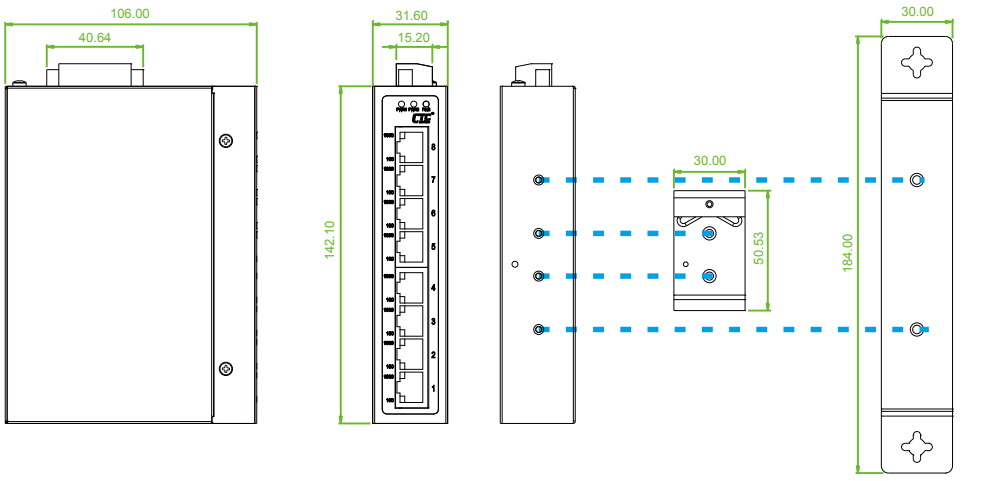
IGS-501S



IGS-500



IGS-800



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Total Port	UTP Port	Fiber Port	Certification				Operating Temperture
		10/100/1000 Base-T	100/1000Base-X	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IGS-501S	6	5	1x SFP	V	V	V	V	-10~60 C
IGS-501S-E	6	5	1x SFP	V	V	V	V	-40~75 C
IGS-500	5	5	—	V	V	V	V	-10~60 C
IGS-500-E	5	5	—	V	V	V	V	-40~75 C
IGS-800	8	8	—	V	V	V	V	-10~60 C
IGS-800-E	8	8	—	V	V	V	V	-40~75 C

Model Naming Rule

IGS – 5 – 01S – E → E: -40~75°C, Blank: -10~60°C

- IGS: Industrial Gigabit Switch
- 5: 5x UTP; 8: 8x UTP
- 01S: 1x SFP; 00: 0x SFP

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
SFP	Transceiver Compatible, Reliable, 5-year Warranty

Temperature

IGS – 500 – ☐

Example: IGS – 500 – E

SFP Naming Rule

ISFP – M – 7 – 040 – 31 – E → E:-40~85°C, Blank:0~70°C

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- Distance: 002(2km), 020(20km), 040(40km)
- 31: Wavelength

EN50121-4 EN61000-6-2 EN61000-6-4

IFS-401F
4x10/100Base-TX + 1x100Base-FX

IFS-500
5x10/100Base-TX

IFS-402F
4x10/100Base-TX + 2x100Base-FX

IFS-800
8x10/100Base-TX

The series models are 4~8 ports 10/100Base-TX Ethernet unmanaged Fast Ethernet switches, with 0~2x 100Base-FX fiber port, that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, 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. 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 dual DC input power 12/24/48VDC (9.6~60VDC)
- IP30 rugged metal housing and Fanless
- Wide operating temperature -40 ~ 75°C (-E model)
- Provides broadcast storm protection
- Supports DIP SW for alarm setting and broadcast storm protection
- Supports power failure alarm message by relay
- Supports flow control
- CE, FCC,and EN50121-4 certification
- 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 and 100Base-FX Fast Ethernet	
	IEEE 802.3x Flow Control and Back Pressure	
Switch Architecture	Back-plane (Switching Fabric) : 1.0 Gbps (IFS-401F) 1.2Gbps (IFS-402F) 1.0 Gbps (IFS-500) 1.6Gbps (IFS-800)	
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	
Provides Broadcast Storm Protection	Present	
MAC Address Table	2K	
Packet Buffer Size	448Kbits	
Network Connector	4X RJ-45, 1 Fiber (IFS-401F)	
	4X RJ-45, 2 Fiber (IFS-402F)	
	5x RJ-45 (IFS-500)	
	8x RJ-45 (IFS-800)	
	RJ-45 Port:	Auto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplex
	100Base-FX Fiber Port : SC/ST, Muti Mode/Single Mode	
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)	
	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	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)	
	Fiber Per port: Link/Active (Green) (IFS-401F, IFS-402F)	
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)
	Provide DC Power JACK adapter cable for external power supply
Power Consumption	4.4W (IFS-401F) 5.8W (IFS-402F) 2.9W (IFS-500) 3.9W (IFS-800)
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-401F, IFS-402F, IFS-500, IFS-800)
	-40 ~ 75°C (IFS-401F-E, IFS-402F-E, IFS-500-E, 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 38 x 142mm (D x W x H) (IFS-401F, IFS-402F) 106 x 31.6 x 142mm (D x W x H) (IFS-500, IFS-800)
Weight	0.625Kg (IFS-401F) 0.63kg (IFS-402F) 0.42kg (IFS-500) 0.43kg (IFS-800)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	587,670Hrs (IFS-401F) 509,883Hrs (IFS-402F) 650,473Hrs (IFS-500) 552,587Hrs (IFS-800) (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
Safety	UL60950-1 (Pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

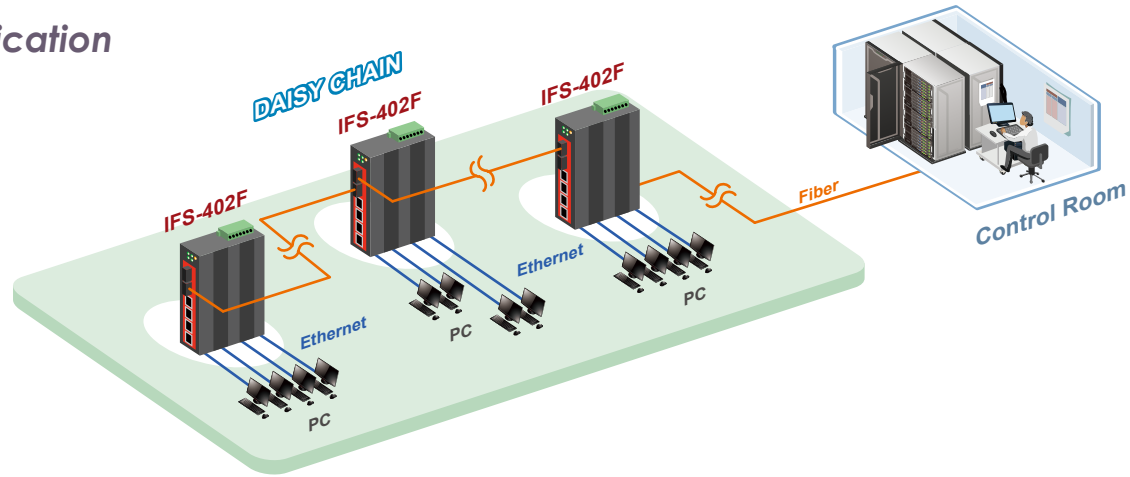


Figure 1 : IFS-402F Fast Ethernet Switch Transmission with Daisy Chain

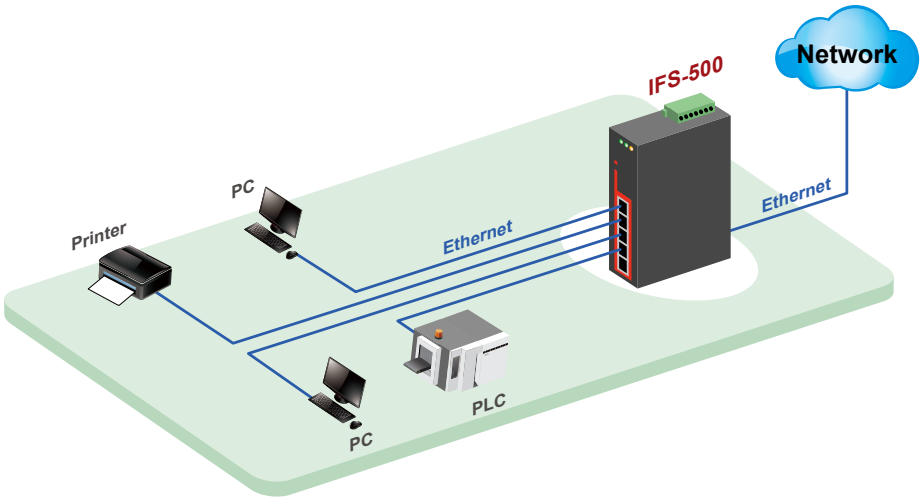
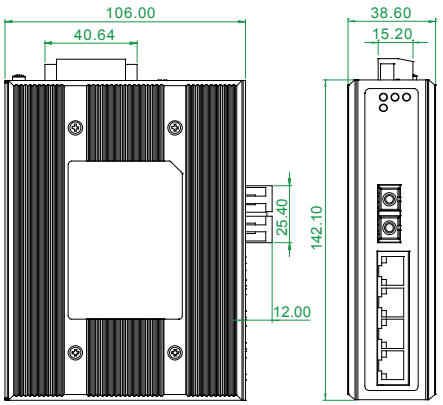


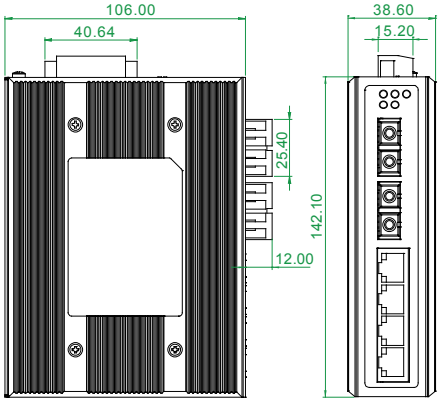
Figure 2 : IFS-500 Fast Ethernet Switch Transmission

Dimensions

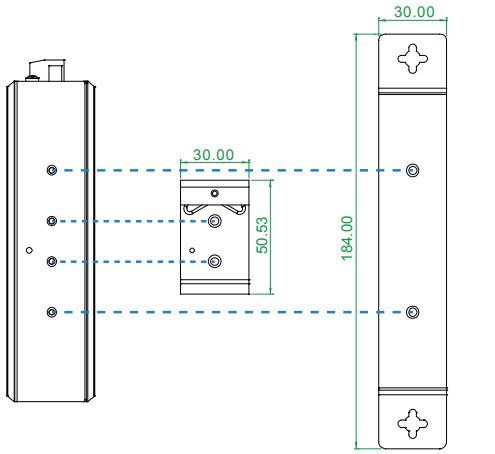
IFS-401F



IFS-402F

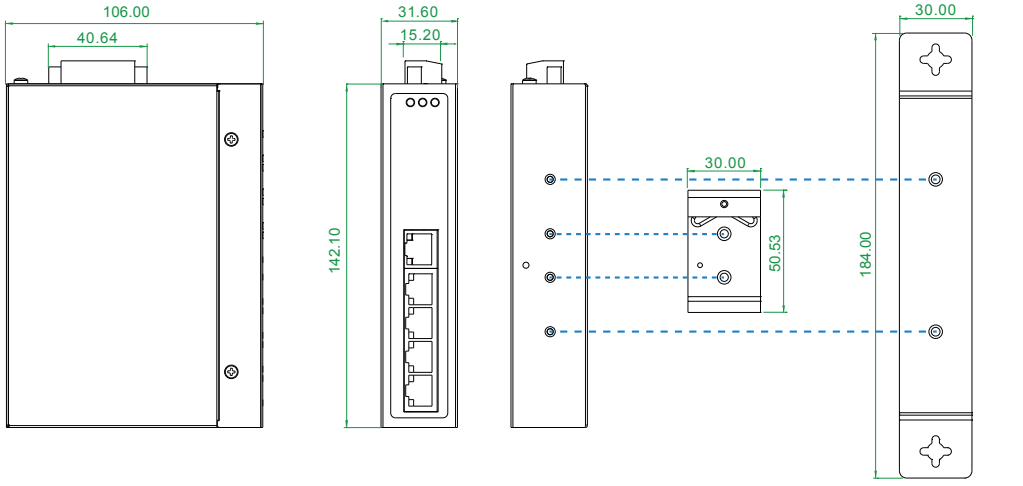


Side View Front View



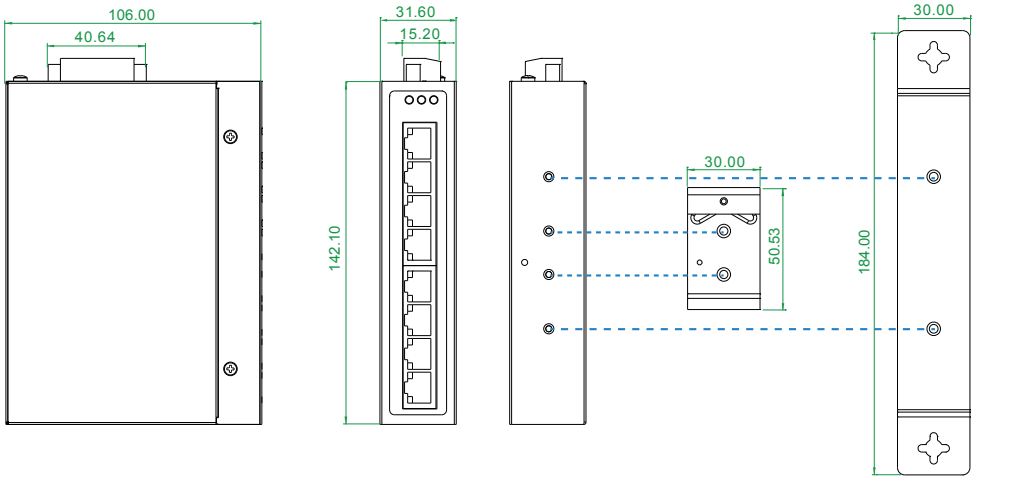
Rear View DIN-Rail Kit View Wall-Mount Kit View

IFS-500



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IFS-800



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Total Port	UTP Port	Fiber Port	Certification				Operating Temperture
		10/100Base-TX	100Base-FX	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IFS-401F	5	4	1 SC/ST	V	V	V	V	-10~60˚C
IFS-401F-E	5	4	1 SC/ST	V	V	V	V	-40~75˚C
IFS-402F	6	4	2 SC/ST	V	V	V	V	-10~60˚C
IFS-402F-E	6	4	2 SC/ST	V	V	V	V	-40~75˚C
IFS-500	5	5	—	V	V	V	V	-10~60˚C
IFS-500-E	5	5	—	V	V	V	V	-40~75˚C
IFS-800	8	8	—	V	V	V	V	-10~60˚C
IFS-800-E	8	8	—	V	V	V	V	-40~75˚C

Model Naming Rule

IFS – 4 – 02F – E → E: -40~75˚C, Blank: -10~60˚C

- IFS: Industrial Fast Ethernet Switch
- 4: 4x UTP; 5: 5x UTP; 8: 8x UTP
- 02F: 2x Fiber; 01F: 1x Fiber; 00: 0x Fiber

Fiber Option Type	Connectivity Distance
SC, ST (only for IFS-401F ,IFS-402F)	002: 2km 030: 30km 050: 50km 020A: WDM 20km A type (TX:1310nm) 020B: WDM 20km B type (TX: 1550nm)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃

Temperature | Connector Type | Connectivity Distance

IFS – 401F – □ – □□□□□

Example: IFS – 401F – E – SC002

NEW

CE FC EN50121-4 EN61000-6-2 EN61000-6-4

IFS-500C

5x10/100Base-TX Switch

The IFS-500C is 5 ports 10/100Base-TX Ethernet unmanaged Fast Ethernet switches, that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, 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. 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

- Wide range input power 12/24/48VDC (9.6~60VDC), or AC24V (18~36VAC)
- IP30 rugged metal housing and Fanless
- Compact size for easy installation
- Wide operating temperature -40 ~ 75°C (-E model)
- Provides broadcast storm protection
- Very low power consumption
- Supports flow control
- CE, FCC,and EN50121-4 for railway traffic certification
- 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 and 100Base-FX Fast Ethernet
	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
Flow Control	IEEE 802.3x flow control, back pressure flow control
Provides Broadcast Storm Protection	Present
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	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	Per unit: Power (Green)
	RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)
Reverse Polarity Protection	For DC input power protection
Overload Current Protection	Present
Power Supply	DC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)
Power Consumption	Input Voltage: Power Consumption(Watt)
	DC 12V: 0.9W
	DC 24V: 1.2W
	DC 48V: 2W
Removable Terminal Block	Provide 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	1,013,759 Hours (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

Application

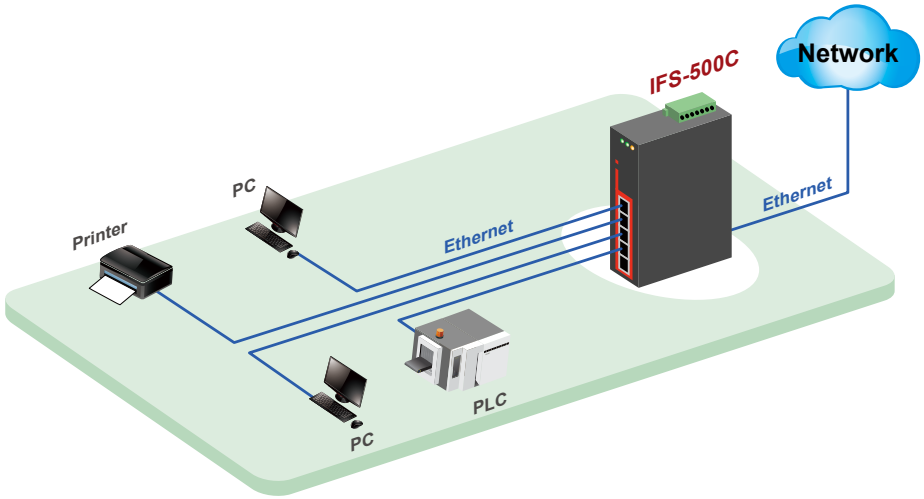


Figure : IFS-500C Fast Ethernet Switch Transmission

Ordering Information

Model Name	Total Port	UTP Port	Certification				Operating Temperture
		10/100Base-TX	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IFS-500C	5	5	V	V	V	V	-10~60°C
IFS-500C-E	5	5	V	V	V	V	-40~75°C

Model Naming Rule

IFS - 5 00 C - E

- IFS: Industrial Fast Ethernet Switch
- 5: 5x UTP
- 00: 0x Fiber
- C: Compact Size
- E: -40~75°C
- Blank: -10~60°C

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

IGS-404SM
4x 10/100/1000Base-T+ 4x 100/1000Base-X SFP

IGS-803SM
8x 10/100/1000Base-T+ 3x 100/1000Base-X SFP

IGS-812SM
8x 10/100/1000Base-T+ 12x 100/1000Base-X SFP

IGS-1604SM
16x 10/100/1000Base-T+ 4x 100/1000Base-X SFP

The series models are managed industrial grade Gigabit switches with 4~16 ports 10/100/1000Base-T ports and 3~12 ports SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. The Ethernet switches support a variety of management functions, including STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling , layer 2 Ethernet IGMP, VLAN, QoS ,Security ,IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking, security automation applications, 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

- 4x 10/100/1000Base-T RJ-45 and 4x 100/1000Base-X SFP Fiber (IGS-404SM)
- 8x 10/100/1000Base-T RJ-45 and 3x 100/1000Base-X SFP Fiber (IGS-803SM)
- 8x 10/100/1000Base-T RJ-45 and 12x 100/1000Base-X SFP Fiber (IGS-812SM)
- 16x 10/100/1000Base-T RJ-45 and 4x 100/1000Base-X SFP Fiber (IGS-1604SM)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable normal or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (see Figure 3). Supports up to 5 rings in one device (see Figure 2).
- u-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 16Gbps (IGS-404SM) 22Gbps (IGS-803SM) 40Gbps (IGS-812SM, IGS-1604SM)	
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 connector (IGS-404SM) 8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFP connector (IGS-803SM) 8x 10/100/1000Base-T RJ-45+ 12x 100/1000Base-X SFP connector (IGS-812SM) 16x 10/100/1000Base-T RJ-45+ 4x 100/1000Base-X SFP connector (IGS-1604SM) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support dual speed with DDMI
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	Present
Overload Current Protection	Present
CPU Watch Dog	Present
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption	(see table below)
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

Power Consumption

Input Voltage	IGS-404SM	IGS-803SM	IGS-812SM	IGS-1604SM
12VDC	8.2W	8.5W	14.3W	14.5W
24VDC	8.1W	9.1W	14.2W	14.4W
48VDC	9.6W	10.6W	15.8W	16.3W

MAC Address Table	8K
Memory Buffer	256K 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-404SM, IGS-803SM, IGS-812SM, IGS-1604SM) -40 ~ 75°C (IGS-404SM-E, IGS-803SM-E, IGS-812SM-E, IGS-1604SM-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) (IGS-404SM) 106 x 72 x152 mm (D x W x H) (IGS-803SM, IGS-812SM, IGS-1604SM)
Weight	0.725kg (IGS-404SM) 0.78kg (IGS-803SM) 0.795kg (IGS-812SM) 0.82kg (IGS-1604SM)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	302,826hrs (IGS-404SM) 404,589hrs (IGS-803SM) 204,078hrs (IGS-812SM) 145,967hrs (IGS-1604SM) (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
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), 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	Present
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	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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
DHCP	Client, Relay, Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4

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

Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring cable normal or broken point distance

Application

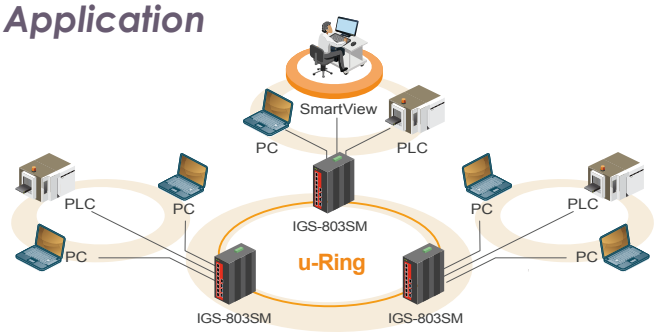


Figure 1 : Application Example

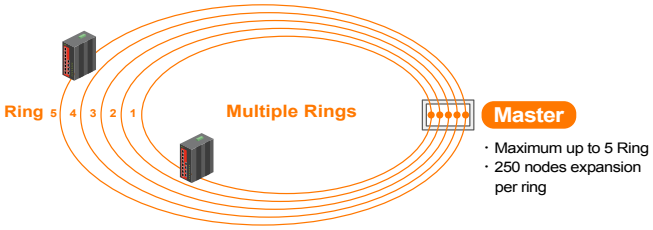


Figure 2 : Multiple Rings

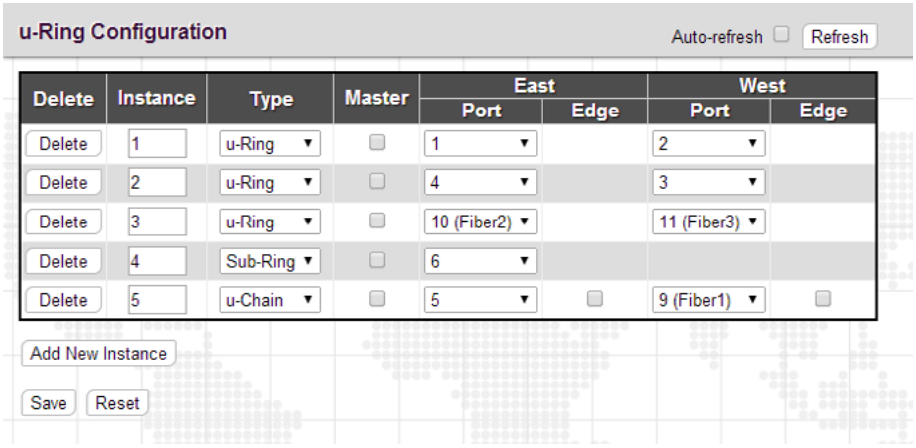
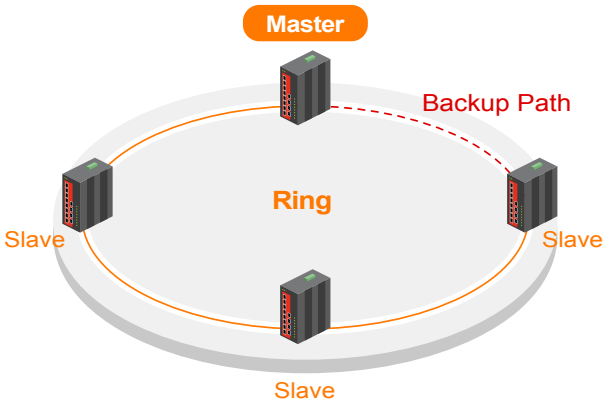
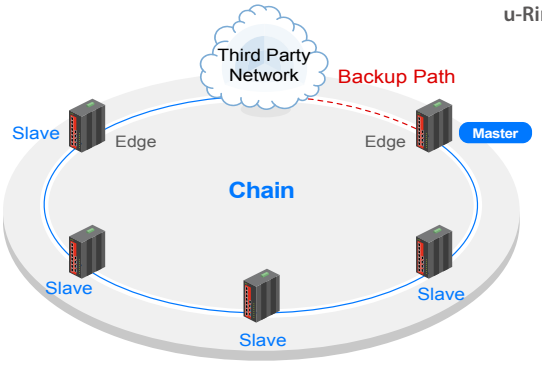


Figure 3 : User-Friendly Configuration In Web Interface

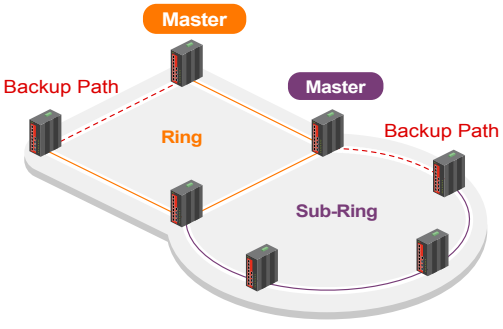
Figure 4 : u-Ring Type



u-Ring Type

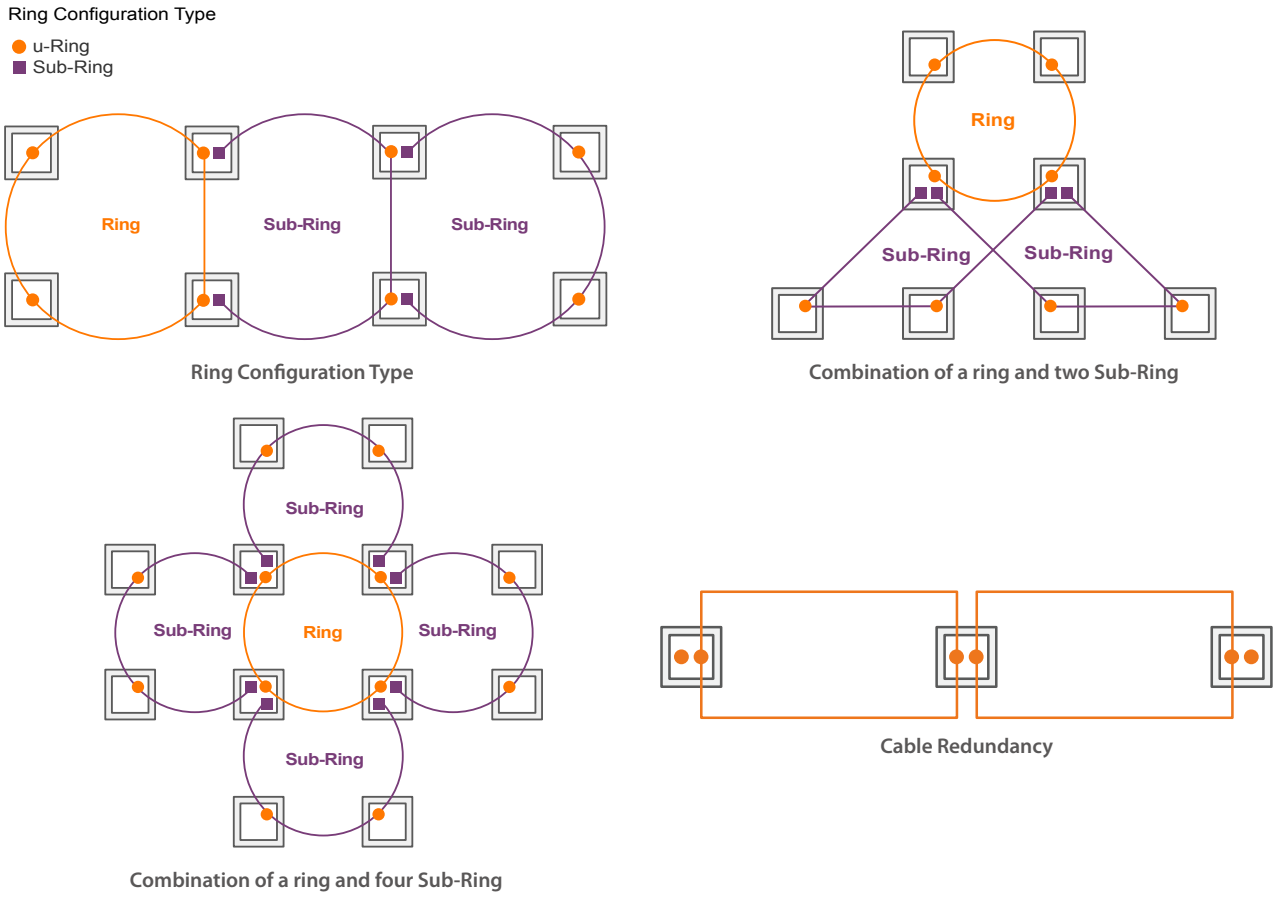


Determining the backup path (u-Chain type)



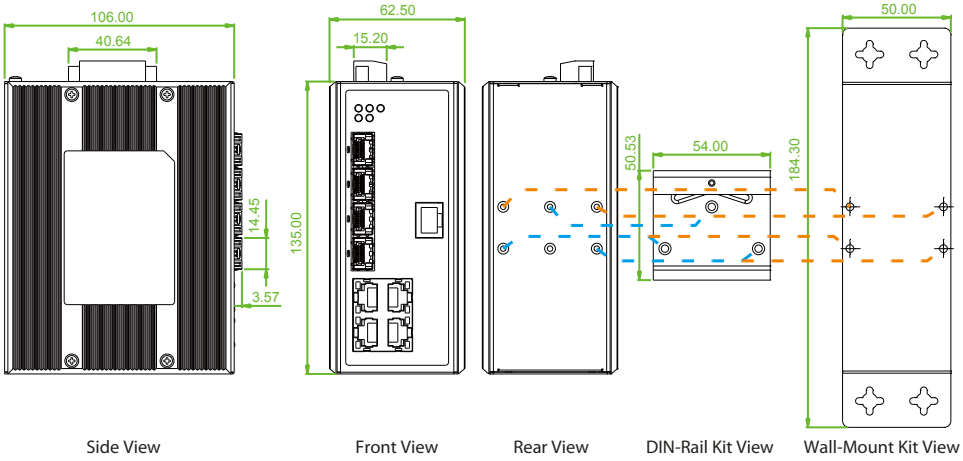
A major ring and a Sub-Ring topology

Figure 5 : Ring Configuration Example

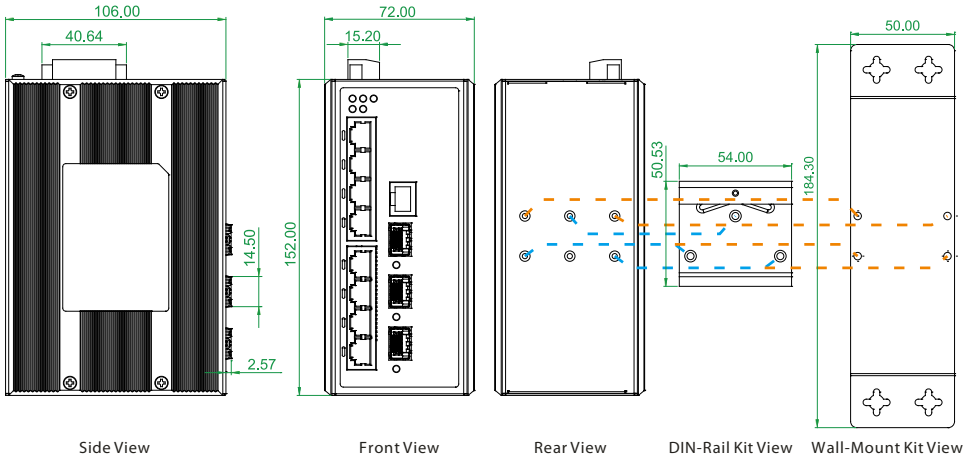


Dimensions

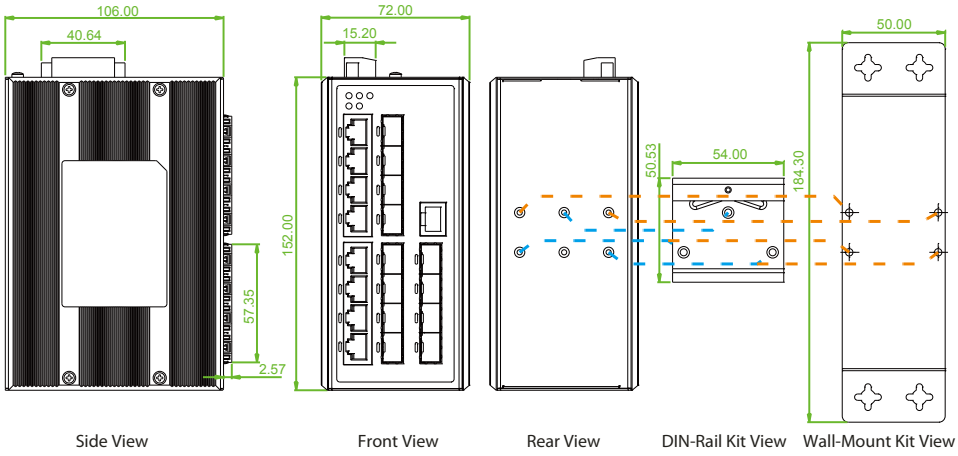
IGS-404SM



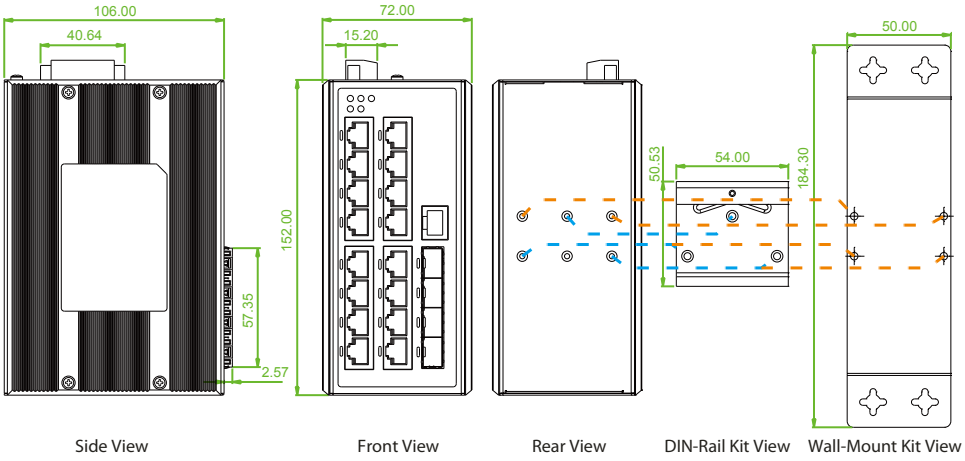
IGS-803SM



IGS-812SM



IGS-1604SM



Ordering Information

Model Name	Managed	Total Port	UTP Port	Fiber Port	Certification				Operating Temperture
			10/100/1000 Base-T	100/1000 Base-X	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	
IGS-404SM	V	8	4	4 SFP	V	V	V	V	-10~60℃
IGS-404SM-E	V	8	4	4 SFP	V	V	V	V	-40~75℃
IGS-803SM	V	11	8	3 SFP	V	V	V	V	-10~60℃
IGS-803SM-E	V	11	8	3 SFP	V	V	V	V	-40~75℃
IGS-812SM	V	20	8	12 SFP	V	V	V	V	-10~60℃
IGS-812SM-E	V	20	8	12 SFP	V	V	V	V	-40~75℃
IGS-1604SM	V	20	16	4 SFP	V	V	V	V	-10~60℃
IGS-1604SM-E	V	20	16	4 SFP	V	V	V	V	-40~75℃

Model Naming Rule

IGS – 16 04S M – E

- IGS: Industrial Gigabit Switch
- 16: 4: 4x UTP; 8: 8x UTP; 16: 16x UTP
- 04S: 03S: 3x SFP; 04S: 4x SFP; 12S: 12x SFP
- M: Managed
- E: E: -40~75˚C; Blank: -10~60˚C

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M 7 040 – 31 – E

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- 040: Distance 002(2km); 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85˚C; Blank:0~70˚C

IFS-402GSM
4x 10/100Base-TX+ 2x 100/1000Base-X SFP

IFS-803GSM
8x 10/100Base-TX+ 3x 100/1000Base-X SFP

IFS-1604GSM
16x 10/100Base-TX+ 4x 100/1000Base-X SFP

The series models are managed industrial grade Ethernet switches with 4~16 ports 10/100Base-TX ports and 2~4 ports SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. The Ethernet switches support a variety of management functions, including STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling , layer 2 Ethernet IGMP, VLAN, QoS ,Security ,IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking, security automation applications, 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

- 4x 10/100Base-TX RJ-45 and 2x 100/1000Base-X SFP Fiber (IFS-402GSM)
- 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber (IFS-803GSM)
- 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Fiber (IFS-1604GSM)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable normal or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (see Figure 3). Supports up to 5 rings in one device (see Figure 2).
- u-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Support SmartView for Centralized 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)
	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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 4.8Gbps (IFS-402GSM) 7.6Gbps (IFS-803GSM) 11.2Gbps (IFS-1604GSM)	
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 Fiber connector (IFS-402GSM) 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber connector (IFS-803GSM) 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Fiber connector (IFS-1604GSM) 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 above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present
Overload Current Protection	Present
CPU Watch Dog	Present
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)

Power Consumption

Input Voltage	IFS-402GSM	IFS-803GSM	IFS-1604GSM
12VDC	5.7W	6.5W	10.8W
24VDC	5.8W	7W	10.6W
48VDC	8.5W	8.6W	12.5W

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) SFP Fiber Per port: Link/Active (Green)

Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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 (IFS-402GSM, IFS-803GSM, IFS-1604GSM) -40 ~ 75°C (IFS-402GSM-E, IFS-803GSM-E, IFS-1604GSM-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) (IFS-402GSM) 106 x 72 x152 mm (D x W x H) (IFS-803GSM, IFS-1604GSM)
Weight	0.715kg (IFS-402GSM) 0.79kg (IFS-803GSM) 0.82kg (IFS-1604GSM)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	321,556Hrs (IFS-402GSM) 409,312Hrs (IFS-803GSM) 145,967Hrs (IFS-1604GSM)
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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

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	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	Present
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	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
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
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	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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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
DHCP	Client
	Relay
	Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4

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

Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring cable Normal or broken point distance

Application

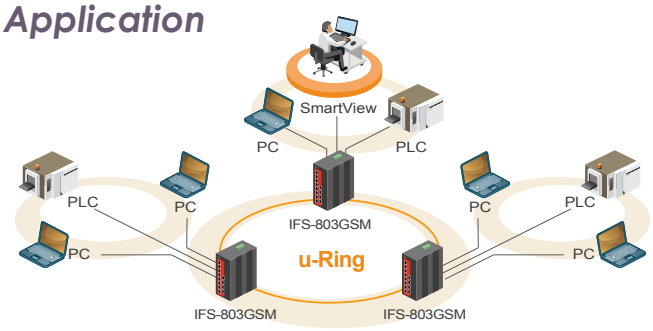


Figure 1 : Application Example

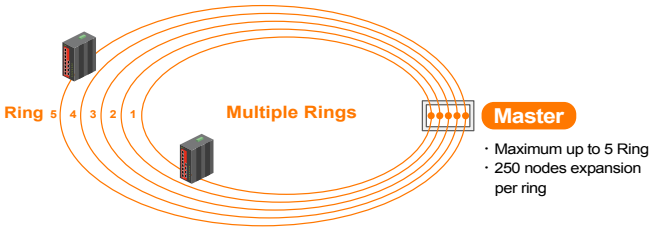


Figure 2 : Multiple Rings

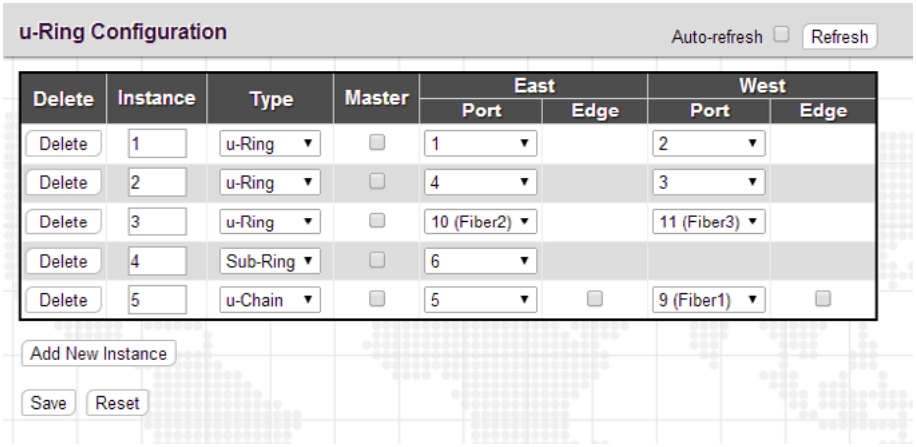
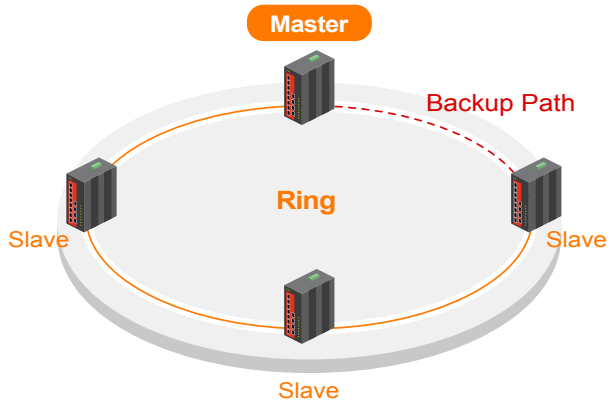
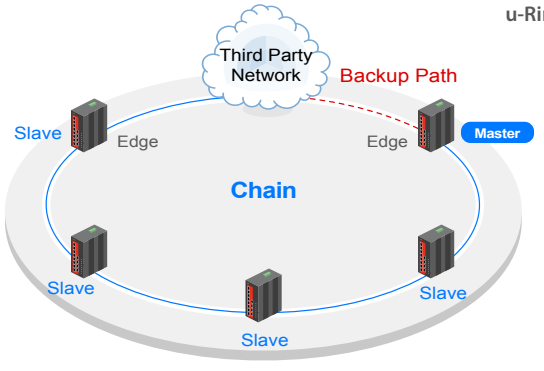


Figure 3 : User-Friendly Configuration In Web Interface

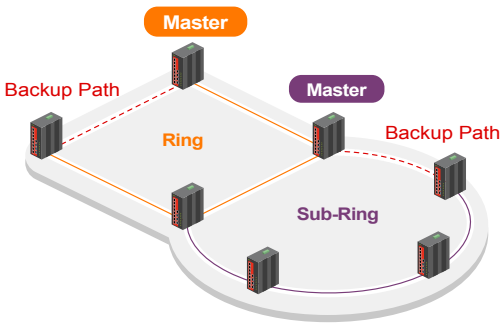
Figure 4 : u-Ring Type



u-Ring Type

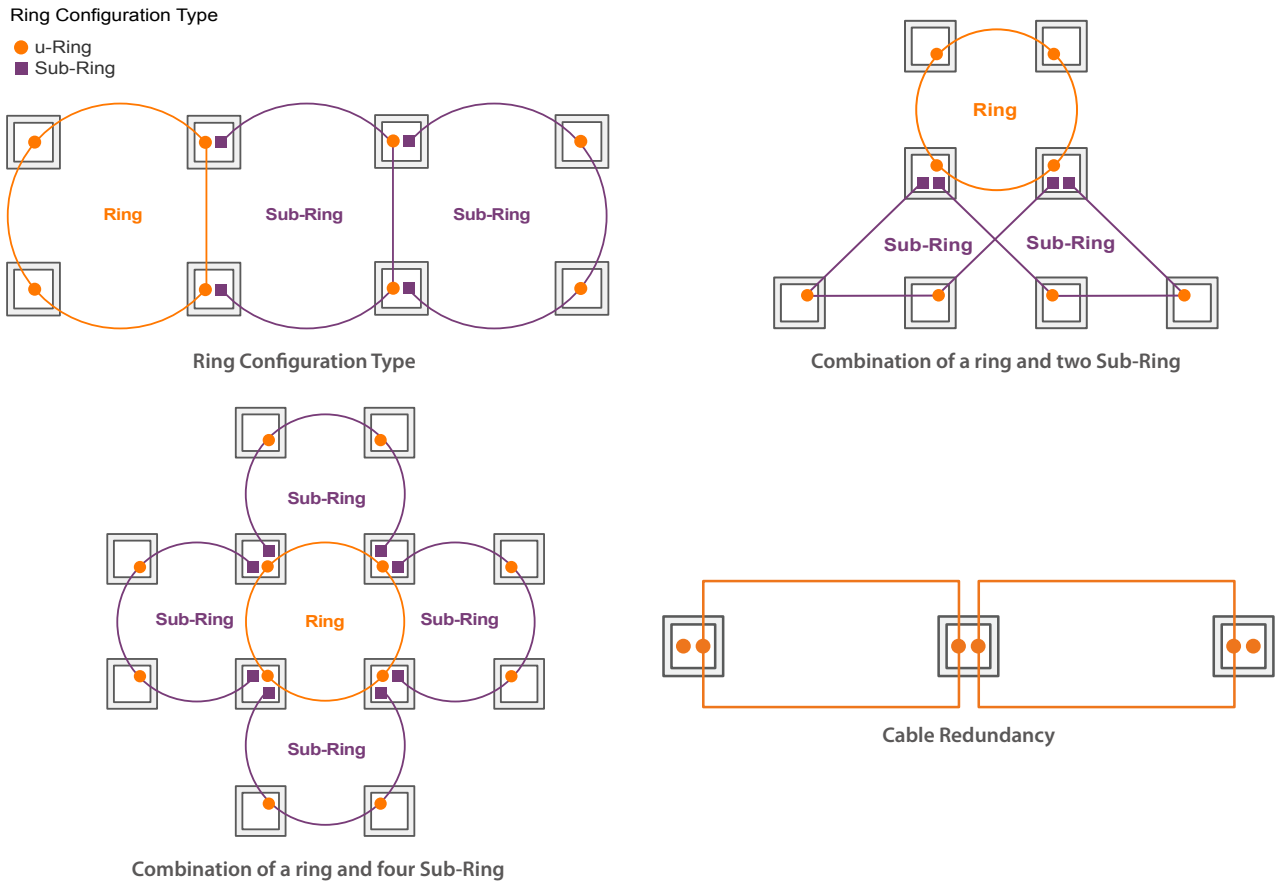


Determining the backup path (u-Chain type)



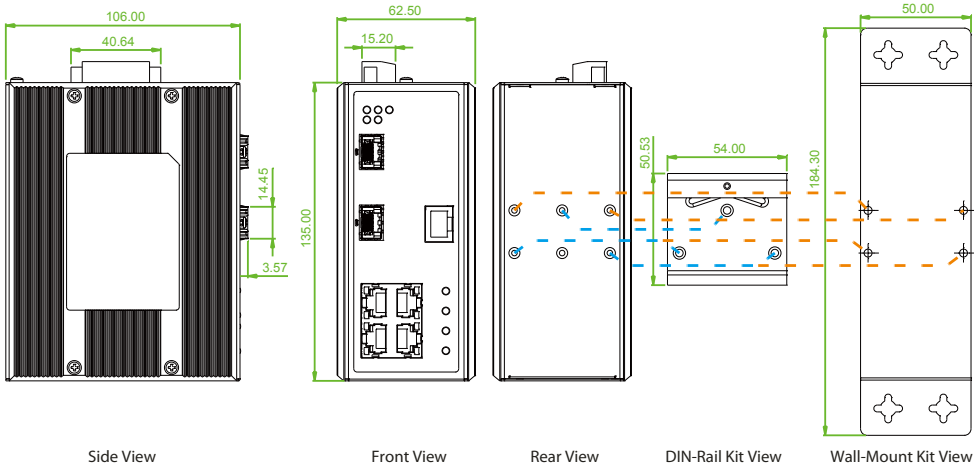
A major ring and a Sub-Ring topology

Figure 5 : Ring Configuration Example

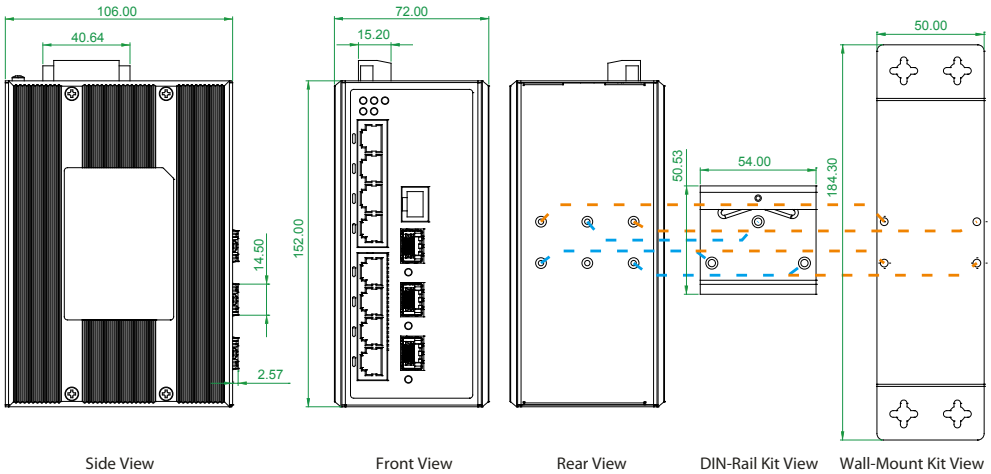


Dimensions

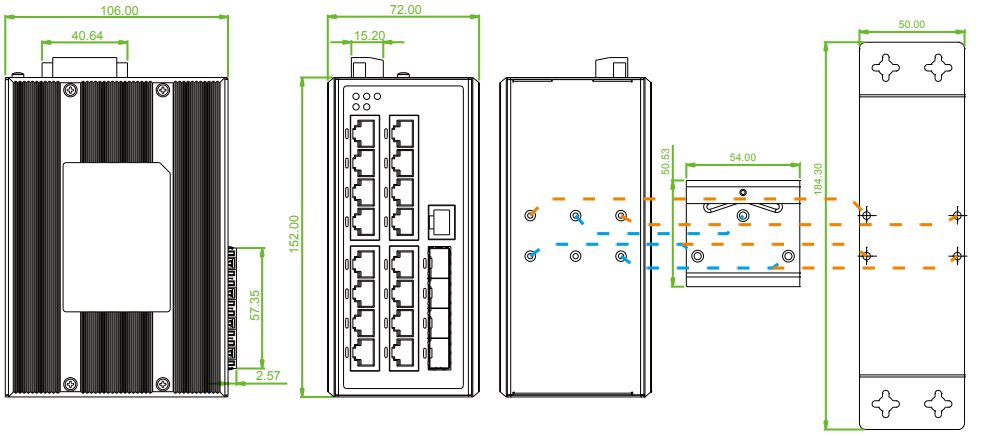
IFS-402GSM



IFS-803GSM



IFS-1604GSM



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	Total Port	UTP Port	Fiber Port	Certification				Operating Temperture
			10/100 Base-TX	100/1000 Base-X	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	
IFS-402GSM	V	6	4	2 SFP	V	V	V	V	-10~60°C
IFS-402GSM-E	V	6	4	2 SFP	V	V	V	V	-40~75°C
IFS-803GSM	V	11	8	3 SFP	V	V	V	V	-10~60°C
IFS-803GSM-E	V	11	8	3 SFP	V	V	V	V	-40~75°C
IFS-1604GSM	V	20	16	4 SFP	V	V	V	V	-10~60°C
IFS-1604GSM-E	V	20	16	4 SFP	V	V	V	V	-40~75°C

Model Naming Rule

IFS - 16 04GS M - E

- IFS: Industrial Fast Ethernet Switch
- 16: 4: 4x UTP; 8: 8x UTP; 16: 16x UTP
- 04GS: 02GS: 2x GbE SFP; 03GS: 3x GbE SFP; 04GS: 4x GbE SFP
- M: Managed
- E: E: -40~75°C; Blank: -10~60°C

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP - M 7 040 - 31 - E

- ISFP: Industrial SFP Transceiver
- M: M: Multi Mode; S: Single Mode; T: Copper
- 7: 7: GbE; 5: FE
- 040: Distance 002(2km); 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85°C; Blank:0~70°C

IFC-FDC

RS-232/422/485 Daisy Chain Fiber Converter

IFC-Serial

RS-232/422/485 Fiber Converter

IFC Series are industrial grade serial/fiber converters that provide a single fiber or dual fiber connections to extend asynchronous RS-232, RS-485 or RS-422 serial transmissions over a distance of up to 2km using multi-mode fiber or up to 60km using single-mode fiber. The single duplex fiber provides point-to-point connections and allows connecting multiple devices in a cascaded or "daisy chain" fashion. However, no redundancy is provided for the model with a single fiber and any single port failure can disable the entire ring. On the other hand, the dual fiber inputs not only allow connecting multiple devices in a cascade or "daisy chain" fashion but also can create ring architecture for fiber redundancy and auto recovery.

IFC Series converters are capable of selecting interface modes for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and feature 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 Series converters are 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 Series are reliable and ideal solutions for keeping your industrial automation applications running smoothly and continuously even in harsh environments.

Features

- Supports 2 fiber link (IFC-FDC)
- Supports 1 fiber link (IFC-Serial)
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 60km
- Supports several topology , cable redundancy(Figure 2), ring connections (Figure 3), fiber daisy chain (Figure 4) ,point to point (IFC-FDC)
- Supports half-duplex ring application(Figure 6), point to point (Figure 7) (IFC-Serial)
- Redundant dual power inputs (12/24/48VDC)
- Supports RS-232, RS-422, RS-485(2/4 wire) transmission to dual fiber connections
- Enhanced serial baudrate up to 1024kpbs
- 2.5KV isolation for serial signal
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission

Specifications

Data Flow	Dual Channel Communication	Both of Triple-Way and Two-Way Communication Way (Figure 1 or 6)
Optical Interface	Connector	SC, ST
	Fiber Optical rate	36.864Mbps
	Fiber Port	2 fiber ports (IFC-FDC) 1 fiber port (IFC-Serial)
	Fiber Type	MM 2km, SM 30km/60km
	Wavelength	MM 1310nm, SM 1310, 1550nm
	Point to Point Transmission	Half or Full duplex
	Ring Transmission	Half / Full duplex, self-healing operation
Optical Topology	Cable redundancy(Figure 2), ring connections (Figure 3), fiber daisy chain (Figure 4), point to point (IFC-FDC)	
	Half-duplex ring application(Figure 7), point to point(Figure 6) (IFC-Serial)	
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
	Copper Baud rate	50 up to 1024Kbps
	Serial Isolation	2.5KV for serial signals
	Surge Protection	8KV ESD for serial signals
	Pull High	Selected by 10 position rotary switch
	Pull Low	Selected by 10 position rotary switch
	120 ohm terminator	Built-in 120 ohm terminator (Option by Dip Switch)
Environmental	Operating Temperature	-10 ~ 60°C (IFC-FDC, IFC-Serial) -40 ~ 75°C (IFC-FDC-E, IFC-Serial-E)
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR1, PWR2, Alarm, Master, TD, RD, Fiber Link, Fiber2 Link (IFC-FDC only), Ringg	

Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 58VDC)
	Power Consumption	6W (IFC-FDC) 5W (IFC-Serial)
	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, wall mount
	Weight	0.64kg (IFC-FDC) 0.63kg (IFC-Serial)
Certification	Safety	UL60950-1
	EMC	CE, FCC
	EMI	EN55022 Class A
		EN61000-6-4 – Emission for heavy industrial environment
	EMS	EN61000-6-2 – Immunity for heavy industrial environment
		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 60068-2-32
	Vibration	IEC 60068-2-6
	Shock	IEC 60068-2-27
	Green	RoHS
	MTBF	687,418 Hrs (IFC-FDC) 797,101 Hrs (IFC-Serial) (MIL-HDBK-217)

IFC-FDC Topology & Application

Figure 1 : Dual Channel Data Flow

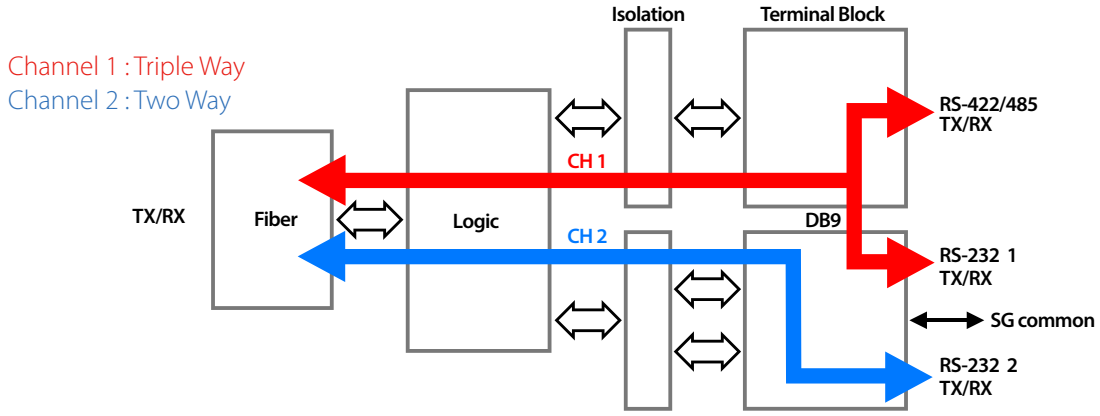


Figure 2 : Dual Fiber for Cable Redundancy

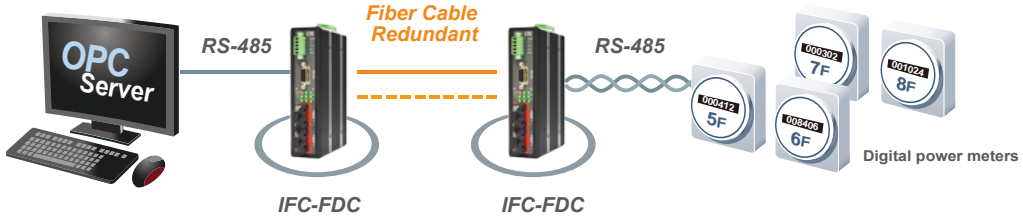


Figure 3 : Fiber Ring for Cable Redundancy

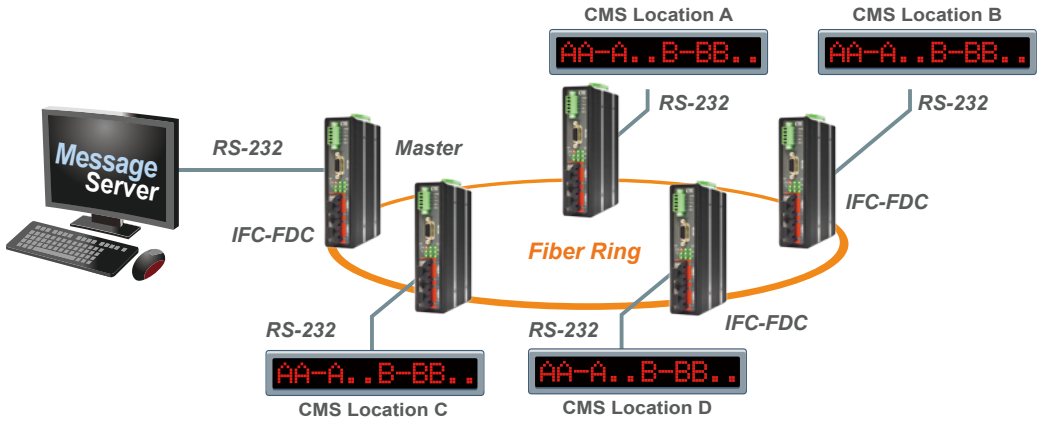
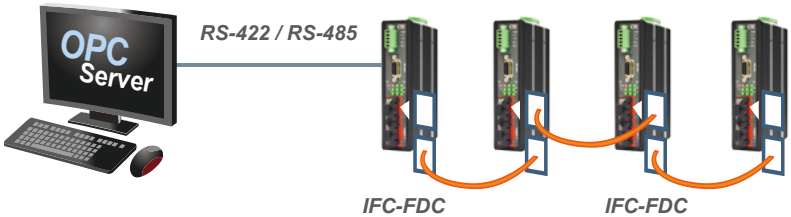


Figure 4 : Dual Fiber for Daisy Chain



IFC-Serial Topology & Application

Figure 5 : Dual Channel Data Flow

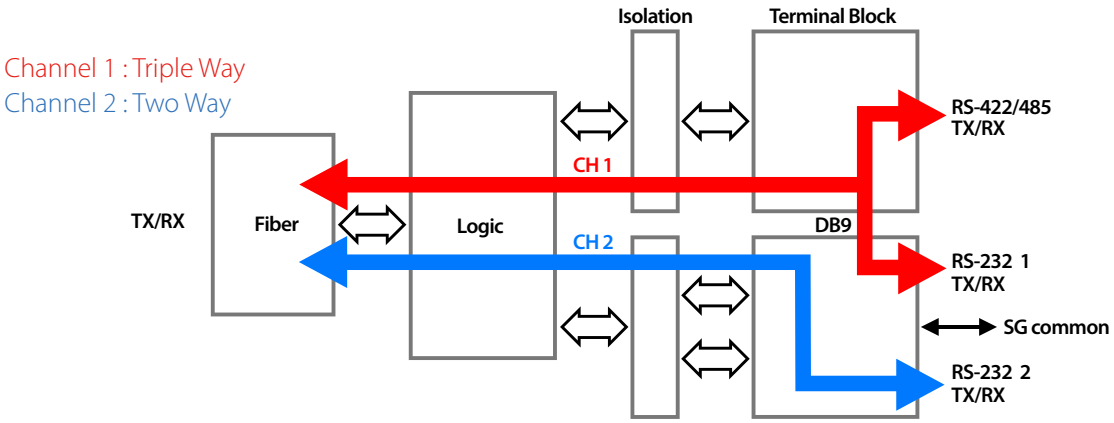


Figure 6 : Point to Point

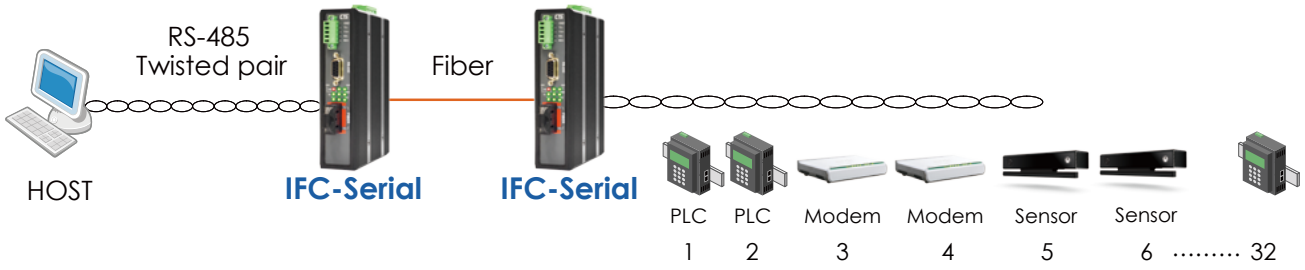
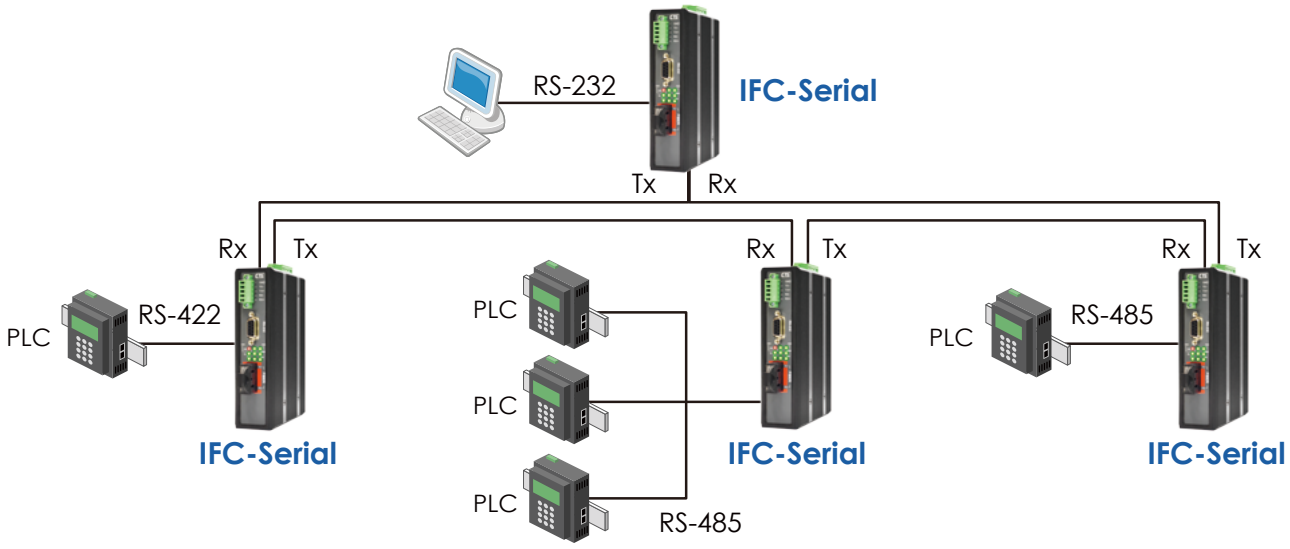
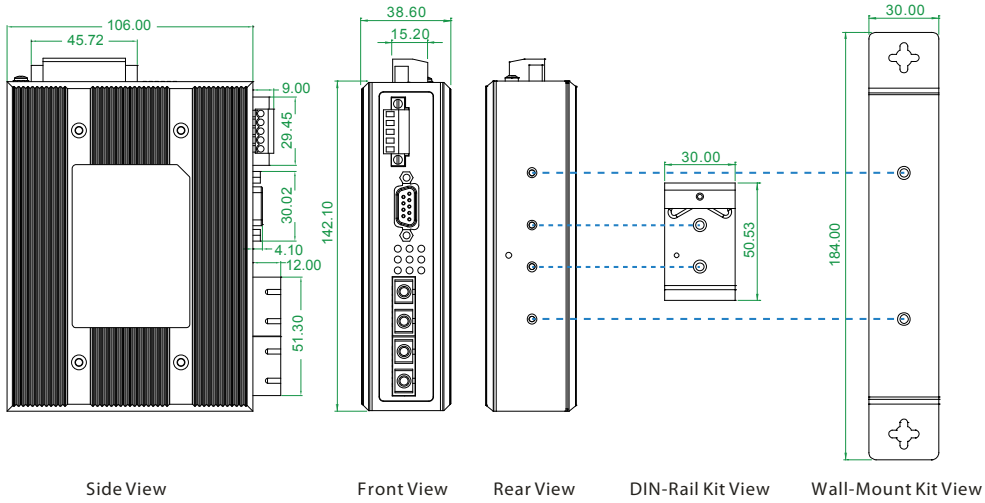


Figure 7 : Ring (Half duplex)



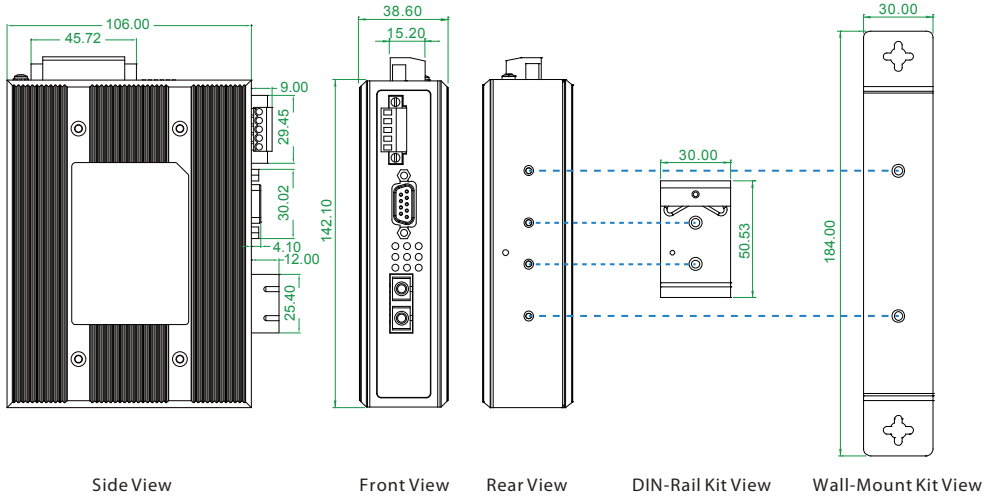
Dimensions

IFC-FDC



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IFC-Serial



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Dual Channel	Serial			Fiber		Certification				Operating Temperature
		RS232	RS422/485	Isolation 2.5KV	SC/ST	Daisy Chain	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC	
IFC-FDC	V	2	1	V	2	V	V	V	V	V	-10~60°C
IFC-FDC-E	V	2	1	V	2	V	V	V	V	V	-40~75°C
IFC-Serial	V	2	1	V	1	—	V	V	V	V	-10~60°C
IFC-Serial-E	V	2	1	V	1	—	V	V	V	V	-40~75°C

Model Naming Rule

IFC – FDC – E

- IFC: Industrial Serial Fiber Converter
- FDC: FDC Serial
- E: -40~75°C; Blank: -10~60°C

Connector Type	Connectivity Distance
SC, ST	002: 2km 030: 30km 060: 60km

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C

Temperature / Connector Type / Connectivity Distance

IFC – FDC – □ – □□□□□

Example: IFC – FDC – E – SC002

NEW

EN50121-4 EN61000-6-2 EN61000-6-4

IMC-1000C

10/100/1000Base-T to 1000Base-SX/LX Fiber Converter

IMC-1000CS

10/100/1000Base-T to 100/1000Base-X SFP Fiber Converter

IMC-1000C(S) is a family of Gigabit Ethernet non-managed media converters that support conversion between electrical 10/100/1000Base-T and optical 1000Base-X Ethernet. Simple DIP switch settings allow configuring the UTP port for auto-negotiation or for forced 10/100/1000 speed and half/full duplex as well as for enabling LFPT (Link Fault Pass Through), Ethernet flow control(802.3x) and selecting Switch Mode (store & forward) or Converter Mode (Jumbo frame Pass-through). 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

- DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 75°C (IMC-1000C-E, IMC-1000CS-E)
- CE, FCC, Railway traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Store-and-Forward mode and Pass through mode (set by DIP SW)
- Conversion between 10/100/1000Base-T and 1000Base-X Fiber cable interface
- Provides a DIP-Switch to set functions
- Supports LFPT (Link Fault Pass Through)

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3ab 1000Base-T Gbit/s Ethernet over twisted pair
	IEEE802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE802.3x Flow Control
RJ45 Ports	10/100/1000Base-TX
Fiber Ports	1000Base SX/LX, SC (IMC-1000C) 100/1000Base-X SFP Slot (IMC-1000CS)
Data Process Architecture	Store and Forward mode or Pass through mode set by DIP SW
Jumbo Frame	9K bytes
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-1000C) 500M (Multi-mode SX) 20KM (Single-mode) 40KM (Single-mode)
	SFP (IMC-1000CS), Distance depend on SFP Fiber Tranceiver
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	Data process architecture OFF: Switch Mode ON: Converter Mode
	LFPT OFF:LFPT Disable ON: LFPT Enable
	Fiber Duplex OFF: Auto ON: Force
	Fiber Speed (Only for IMC-1000CS) OFF: 1000Base-X ON: 100Base-FX
Connector	Fiber: SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000C) SFP Slot (IMC-1000CS)
	RJ-45 Socket: CAT 5e Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Supports
LED	Per Unit: Power (Green)
	SFP/Fiber port Link/Act (Yellow)
	RJ-45 port: Speed & Link/Act 10/100 (Green), 1000 (Yellow)
Reserve Polarity Protection	Present
Overload Current Protection	Present

Power Supply	12/24/48VDC (9.6~60VDC) or 24VAC (18~36VAC) with polarity reverse protect function and removable terminal block
Power Consumption	

Input Voltage	IMC-1000C	IMC-1000CS
12VDC	2.1W	1.8W
24VDC	2.2W	2W
48VDC	3.4W	2.9W

Removable Terminal Block	Provide for input power (2 Pin)
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-10 ~ 60°C (IMC-1000C, IMC-1000CS) -20 ~ 75°C (IMC-1000C-E, IMC-1000CS-E)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	70x 30x 103 mm (D x W x H)
Weight	220g (IMC-1000C) 215g (IMC-1000CS)
Installation	DIN Rail, or wall mounting (Optional)
MTBF	325,508 (IMC-1000C) 326,287 (IMC-1000CS) (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	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

Application & Topology

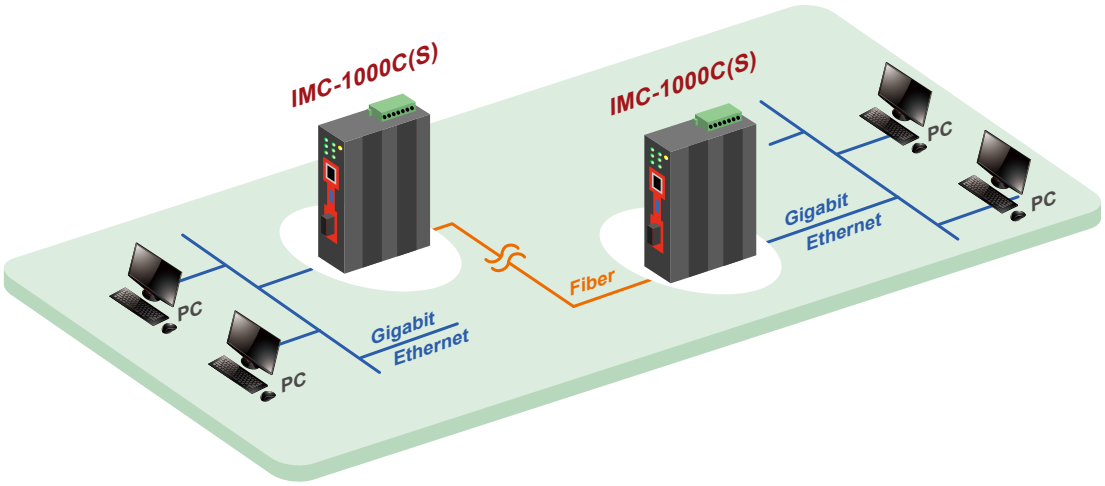
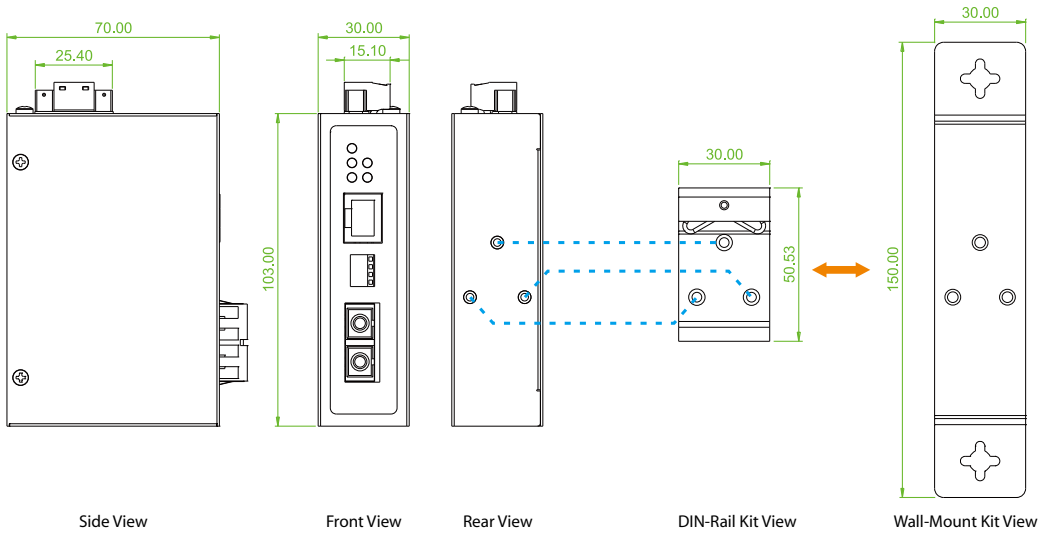


Figure : IMC-1000C(S) Media Converter Transmission

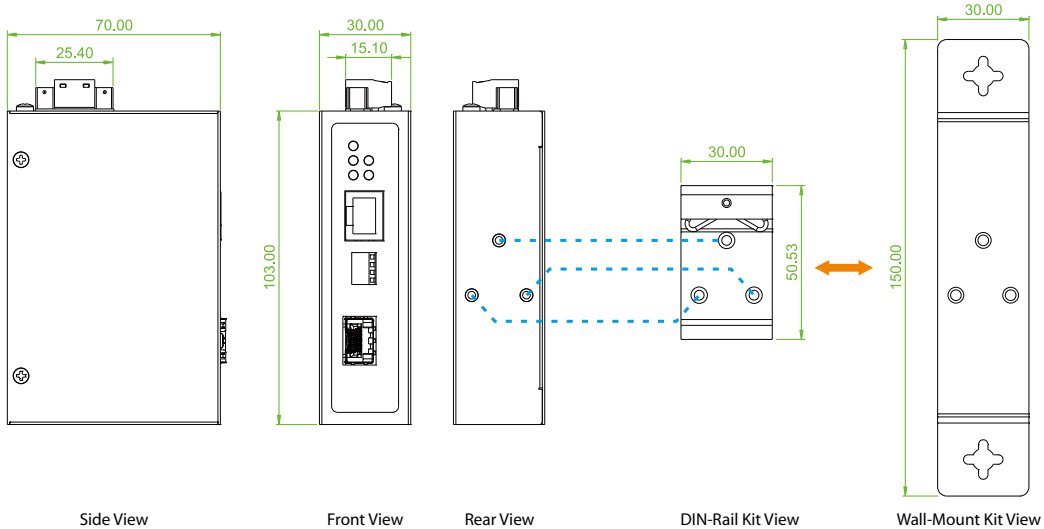
Dimensions

IMC-1000C



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IMC-1000CS

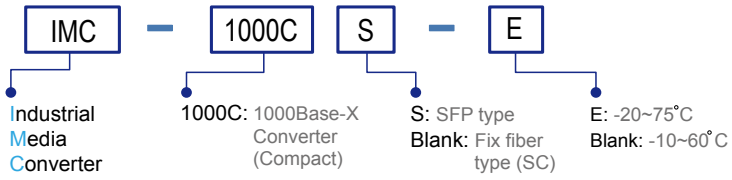


Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber		Certification				Operating Temperature
	10/100/1000Base-T	1000Base-X	Dual Speed 100/1000Base-X	Railway EN50121-41	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-1000C	1	1 SC	—	V	V	V	V	-10~60°C
IMC-1000C-E	1	1 SC	—	V	V	V	V	-20~75°C
IMC-1000CS	1	—	1 SFP	V	V	V	V	-10~60°C
IMC-1000CS-E	1	—	1 SFP	V	V	V	V	-20~75°C

Model Naming Rule



Connector Type	Connectivity Distance
SC (IMC-1000 & IMC-1000-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

Temperature / Connector Type / Connectivity Distance

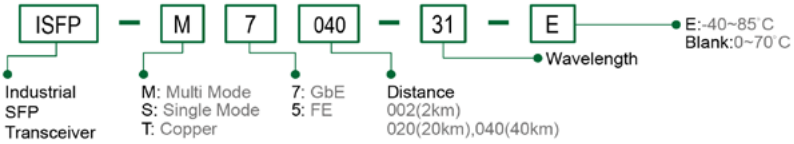
IMC – 1000C – □ – □□□□□

Example: IMC – 1000C – E – SC002

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

SFP Naming Rule



NEW

EN50121-4 EN61000-6-2 EN61000-6-4

IMC-100C

10/100Base-TX to 100Base-FX Fiber Converter

IMC-100C is a compact size of Fast Ethernet non-managed industrial media converters that support conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet.Simple DIP switch settings allow configuring fiber port to half or full duplex, enabling LFPT (Link Fault Pass Through), and selecting Switch Mode (store & forward) or Converter Mode (Jumbo frame Pass-through). 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

- 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 (IMC-100C-E)
- CE, FCC, railway traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Support LFPT (Link Fault Pass Through)
- Conversion between 10/100Base-TX and 100Base-FX cable interface
- Provide a 4 pin DIP-Switch to set functions

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
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
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-3/5 (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Support
LED	PWR (Green): ON: Power active / OFF: Power is inactive
	Fiber (Green): LNK/Act (Green) : Link & Active Dup (Green) : Fiber port Full or Half duplex
	LAN:100 (Green): 100M Link & Active 10 (Green): 10M Link & Active
Reserve Polarity Protection	Present
Overload Current Protection	Present

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	-10 ~ 60°C (IMC-100C) -40 ~ 75°C (IMC-100C-E)
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	319,971Hours (MIL-HDBK-217)
Warranty	5 years
Certifications	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN 55022 Class A
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
	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

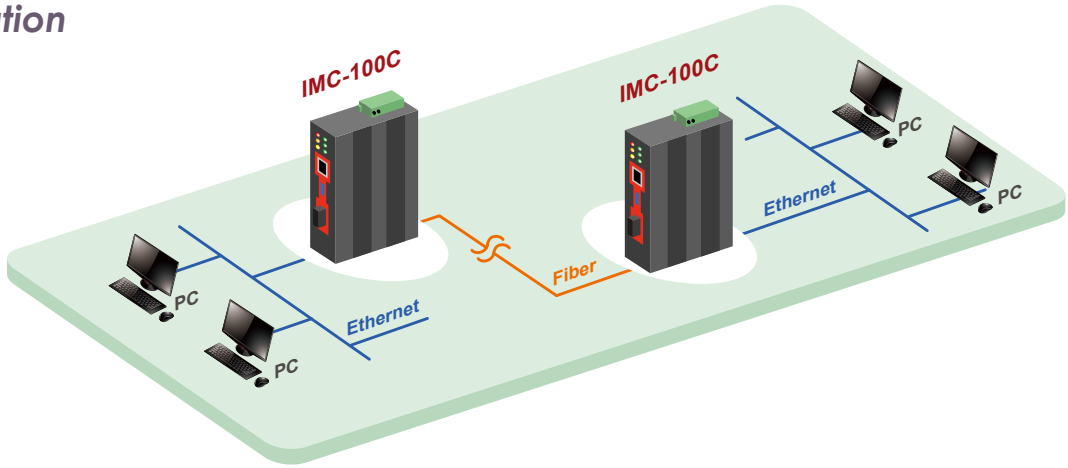
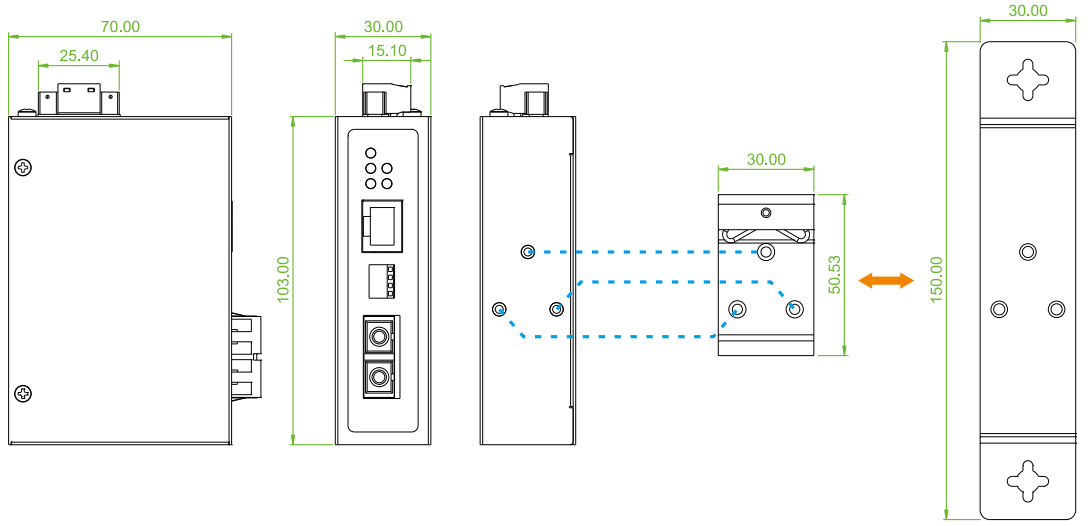


Figure : IMC-100C Media Converter Transmission

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber	Certification				Operating Temperature
	10/100Base-TX	100Base-FX	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-100C	1	1 SC	V	V	V	V	-10~60°C
IMC-100C-E	1	1 SC	V	V	V	V	-40~75°C

Model Naming Rule

IMC – 100C – E

- IMC: Industrial Media Converter
- 100C: 100Base-X Converter (Compact)
- E: -40~75°C
- Blank: -10~60°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)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

Temperature / Connector Type / Connectivity Distance

IMC – 100C – □ – □□□□□

Example: IMC – 100C – E – SC002

IMC-1000

10/100/1000Base-T to 100/1000Base-SX/LX Fiber Converter

IMC-1000S

10/100/1000Base-T to 100/1000Base-X SFP Slot Fiber Converter

IMC-1000(S) is a family of Gigabit Ethernet non-managed media converters that support conversion between electrical 10/100/1000Base-T and optical 100/1000Base-X Ethernet. Simple DIP switch settings allow configuring the UTP port for auto-negotiation or for forced 10/100/1000 speed and half/full duplex as well as for enabling LFPT (Link Fault Pass Through), Ethernet flow control(802.3x) and selecting Switch Mode (store & forward) or Converter Mode (Jumbo frame Pass-through). 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

- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 75°C (IMC-1000-E, IMC-1000S-E)
- UL60950-1, CE, FCC, Railway traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Store-and-Forward mode and Pass through mode (set by DIP SW)
- Conversion between 10/100/1000Base-T and 100/1000Base-X Fiber cable interface
- Provides a DIP-Switch to set functions
- Supports LFPT (Link Fault Pass Through)

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3ab 1000Base-T Gbit/s Ethernet over twisted pair
	IEEE802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE802.3x Flow Control
RJ45 Ports	10/100/1000Base-TX
Fiber Ports	1000Base SX/LX,100Base-FX SC (IMC-1000, IMC-1000-E) SFP Slot (IMC-1000S, IMC-1000S-E)
Data Process Architecture	Store and Forward mode or Pass through mode set by DIP SW
Jumbo Frame	9K bytes
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-1000, IMC-1000-E) 500M (Multi-mode SX) 20KM (Single-mode) 40KM (Single-mode)
	SFP (IMC-1000S, IMC-1000S-E), Distance depend on Fiber Tranceiver
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	Off: Alarm For Power Enable On: Alarm For Power Disable
	Off: Alarm For Port Enable On: Alarm For Port Disable
	Off: LFPT Disable On: LFPT Enable
	Off: Switch Mode On: Converter Mode
	Off: 1000Base-X On: 100Base-FX
Connector	Fiber: SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000, IMC-1000-E) SFP Slot (IMC-1000S, IMC-1000S-E)
	RJ-45 Socket: CAT 5e Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Supports
LED	Per Unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	LNK/ACT for Fiber(Green): ON : Connected to network/ OFF : Not connected to network/ BLK : Receive /Transmit Data
	SFP Fiber speed: Yellow : 1000Base-X Green : 100Base-FX
LED	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
Reserve Polarity Protection	Present
Overload Current Protection	Present

Power Supply	12/24/48VDC (9.6~60VDC) , Redundant power with polarity reverse protect function and removable terminal block
	Provide DC Power JACK adapter cable for external Power adapter
Power Consumption	4.2W
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 Redundant power, Alarm relay contact
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-10 ~ 60°C (IMC-1000, IMC-1000S)
	-20 ~ 75°C (IMC-1000-E ,IMC-1000S-E)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38 x 142 mm (D x W x H)
Weight	630g (IMC-1000, IMC-1000-E)
	620g (IMC-1000S, IMC-1000S-E)
Installation	DIN Rail or wall mounting
MTBF	563,813Hrs (IMC-1000, IMC-1000-E)
	578,980Hrs (IMC-1000S, IMC-1000S-E)
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	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

Application & Topology

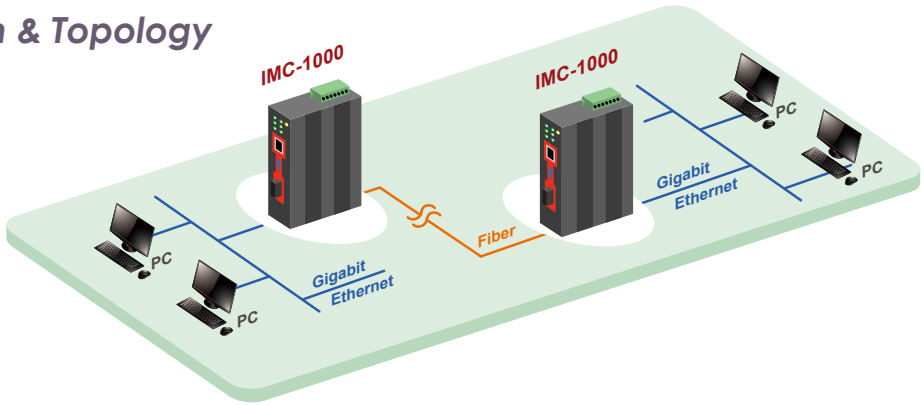
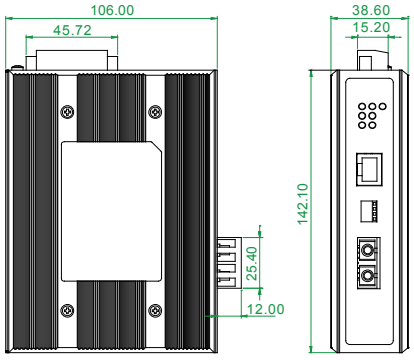


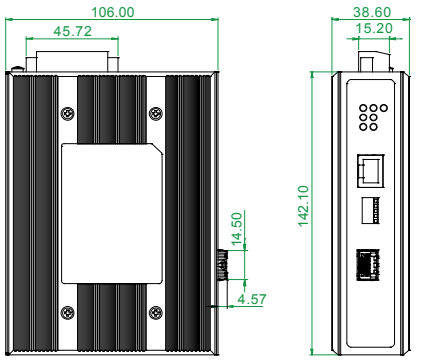
Figure : IMC-1000 Media Converter Transmission

Dimensions

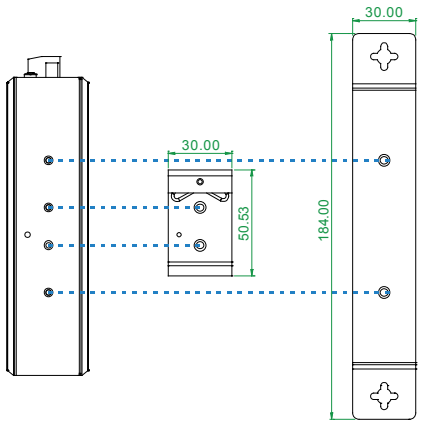
IMC-1000(E)



IMC-1000S(E)



Side View Front View



Rear View DIN-Rail Kit View Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber	Certification					Operating Temperature
	10/100/1000 Base-T	Dual Speed 100/1000Base-X	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-1000	1	1 SC	V	V	V	V	V	-10~60°C
IMC-1000-E	1	1 SC	V	V	V	V	V	-40~75°C
IMC-1000S	1	1 SFP	V	V	V	V	V	-10~60°C
IMC-1000S-E	1	1 SFP	V	V	V	V	V	-40~75°C

Model Naming Rule

IMC – 1000 S – E → E: -20~75°C, Blank: -10~60°C

- IMC: Industrial Media Converter
- 1000: 1000Base-X Converter
- S: SFP type; Blank: Fix fiber type (SC)

Connector Type	Connectivity Distance
SC (IMC-1000 & IMC-1000-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

Temperature / Connector Type / Connectivity Distance

IMC – 1000 – □ – □□□□□

Example: IMC – 1000 – E – SC002

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M 7 040 – 31 – E → E:-40~85°C, Blank:0~70°C; Wavelength

- ISFP: Industrial SFP Transceiver
- M: Multi Mode, S: Single Mode, T: Copper
- 7: GbE, 5: FE
- Distance: 002(2km), 020(20km),040(40km)

IMC-100

10/100Base-TX to 100Base-FX Fiber Converter

IMC-100 is a family of Fast Ethernet non-managed media converters that support conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet. Simple DIP switch settings allow configuring the UTP port for auto-negotiation or for forced 10/100 speed and half/full duplex as well as for enabling LFPT (Link Fault Pass Through), Ethernet flow control(802.3x) and selecting Switch Mode (store & forward) or Converter Mode (Jumbo frame Pass-through). 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

- Redundant dual DC input power 12/24/48VDC (9.6 ~ 58VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75°C (IMC-100-E)
- UL60950-1, CE, FCC, Rail traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface
- Provides a DIP-Switch to set functions
- Supports LFPT (Link Fault Pass Through)

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
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
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
	DIP Switch: ON: Enables LFPT (Link Fault Pass through) OFF: Disables LFPT (Link Fault Pass through)
	DIP Switch: ON: Flow Control Enable OFF: Flow Control Disable
	DIP Switch: 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-3/5 (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Support
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
Reserve Polarity Protection	Present
Overload Current Protection	Present

Power Supply	12/24/48VDC(9.6~58VDC), Redundant power with polarity reverse protect function and removable terminal block
	Provide DC Power JACK adapter cable for external power adapter
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact
Power Consumption	2.9 W
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-10 ~ 60°C (IMC-100)
	-40 ~ 75°C (IMC-100-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 and Wall Mounting
MTBF	852,727 Hrs
Warranty	5 years
Certification	
EMI	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
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

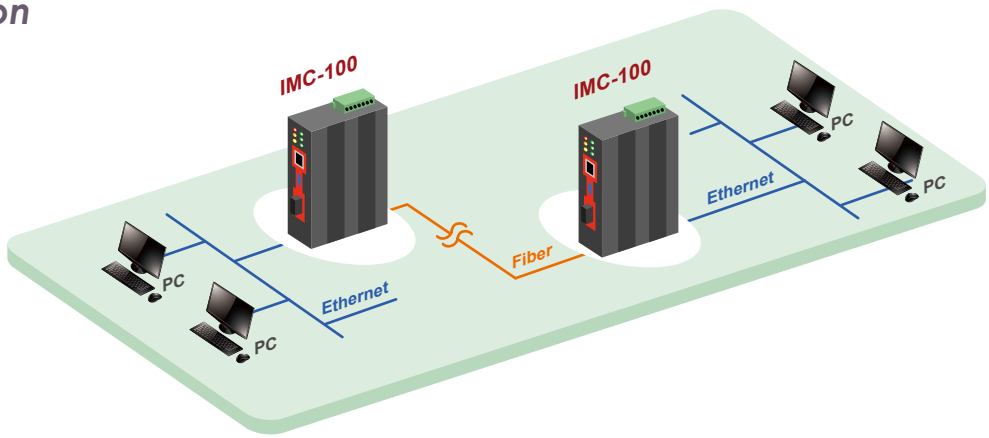
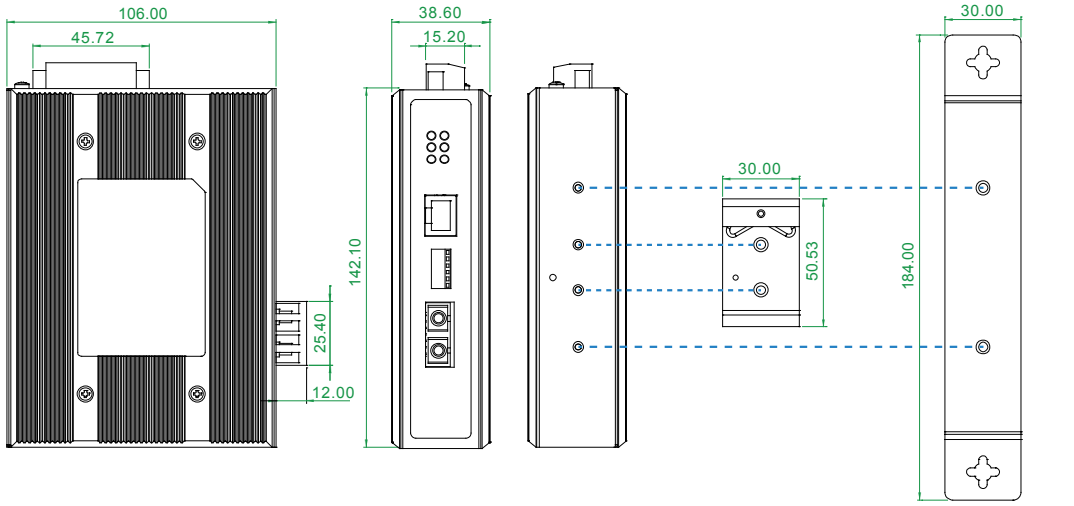


Figure : IMC-100 Media Converter Transmission

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber	Certification					Operating Temperature
	10/100Base-TX	100Base-FX	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-100	1	1 SC	V	V	V	V	V	-10~60 C
IMC-100-E	1	1 SC	V	V	V	V	V	-40~75 C

Model Naming Rule

IMC – 100 – E → E: -40~75°C, Blank: -10~60°C

- IMC: Industrial Media Converter
- 100: 100Base-X Converter

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)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃

Temperature | Connector Type | Connectivity Distance

IMC – 100 – □ – □□□□□

Example: IMC – 100 – E – SC002

IMC-1000M

10/100/1000Base-T to 100/1000Base-SX/LX Managed Fiber Converter

IMC-1000MS

10/100/1000Base-T to 100/1000Base-X SFP Managed Fiber Converter

IMC-1000M(S) models are managed Gigabit media converters that support conversion between electrical 10/100/1000Base-T and optical 100/1000Base-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. The converters are Web, SNMP or In-Band managed with an easy to use user interface for Operation, Administration, Maintenance & Provisioning, including bandwidth control, speed, VLAN, Diagnostic, storm filter or converter configurations. The network administrator can manage IMC-1000M(S) via standard SNMP manager such as SmartView. It also provide loop-back test and dying gasp, and can be monitored from a centrally located OAM-enabled FRM220-1000MS converter via remote in-band management.

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-1000M(S)-E)
- UL60950-1, CE, FCC, RailWay traffic EN50121-4 certification
- Industrial grade EMS, EMI EN61000-6-2, EN61000-6-4 certification
- MIB counters
- Supports LFPT (Link Fault Pass Through)
- Auto Laser Shutdown (ALS)
- Supports SmartView for centralized management (Figure 1)
- Web management (Figure 3)
- SNMP management (Figure 1)
- Supports 16 IEEE 802.1Q Tag VLAN Group
- SNMP alarm trap for power loss and port link down
- Supports in-band management from FRM220 Chassis With FRM220-1000MS (Figure 2)
- Remote loop-back test
- Dying gasp (remote power failure detection)

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3ab 1000Base-TX Gbit/s Ethernet over twisted pair
	IEEE802.3z 1000Base-X Gbit/s Ethernet over Fiber-optic
	IEEE802.3x Flow Control and Back pressure
	IEEE802.3ah OAM management
Fiber Ports	100Base-X or 1000Base-X set by Web Supports Auto Laser Shutdown (ALS)
RJ45 Ports	10/100/1000Base-T
CPU watch dog	Present
Push Button	Reset, Load default seting
Jumbo Frame	9K bytes
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: 500M (Multi-mode SX) 20KM (Single-mode) 40KM (Single-mode) (IMC-1000M, IMC-1000M-E)
	SFP, Distance depend on plug-in Fiber Tranceiver (IMC-1000MS, IMC-1000MS-E)
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
Connector	Fiber: SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000M, IMC-1000M-E) SFP Slot (IMC-1000MS, IMC-1000MS-E)
	RJ-45: CAT 5e (10/100/1000Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Supports
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

LED	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	Present for power Input
Overload Current Protection	Present
Power Supply	12/24/48VDC (9.6~60VDC) , Redundant power with polarity reverse protect function and removable terminal block
	Provide DC Power JACK adapter cable for external power adapter
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	Provide 2 redundant power, alarm relay contact, 7 Pin
Power Consumption	4.8 W
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperatur	-10° ~ 60°C (IMC-1000M, IMC-1000MS)
	-20 ~ 75°C (IMC-1000M-E, 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	0.63kg (IMC-1000M, IMC-1000M-E)
	0.62kg (IMC-1000MS, IMC-1000MS-E)
Installation	DIN Rail mounting or wall mounting
MTBF	544,905 hrs (IMC-1000MS, IMC-1000MS-E) (MIL-HDBK-217) 559,059 hrs (IMC-1000MS, IMC-1000MS-E) (MIL-HDBK-217)
Warranty	5 years

Certification	
EMI	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
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

SNMP or Web management Mode (Figure 1, 3)

Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports DHCP client for automatic IP configuration
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuation	IP configuration, password setting, converter configuration, port configuration, MIB counter, SNMP configuration, VLAN group configuration, 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 (Figure 2)

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
Diagnostic & Monitor	Remote loop-back test
	Dying gasp (remote power failure detection)
	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter

Application

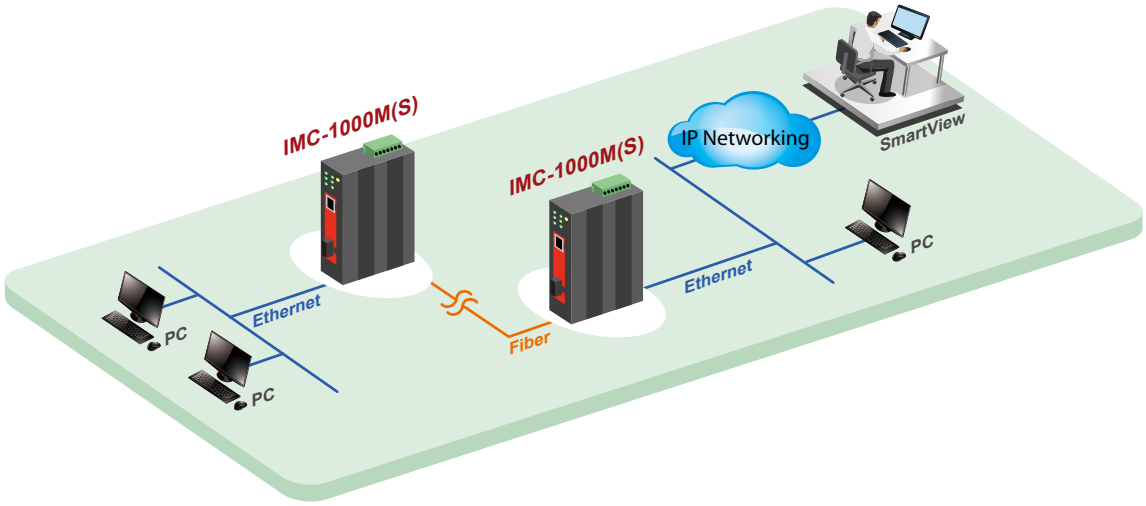


Figure 1 : IMC-1000M(S) Management by SNMP, SmartView

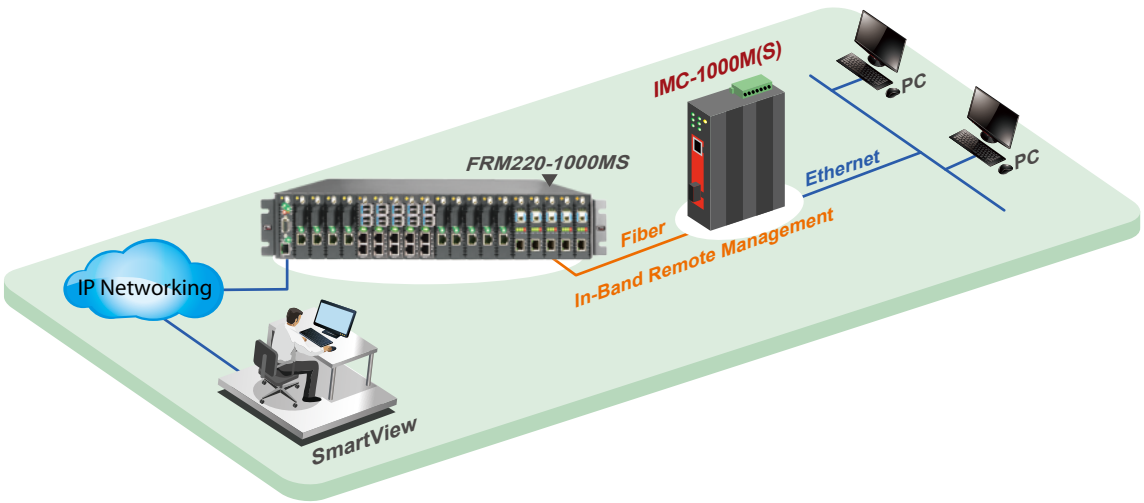


Figure 2 : IMC-1000M(S) Application in Remote, in-Band Management

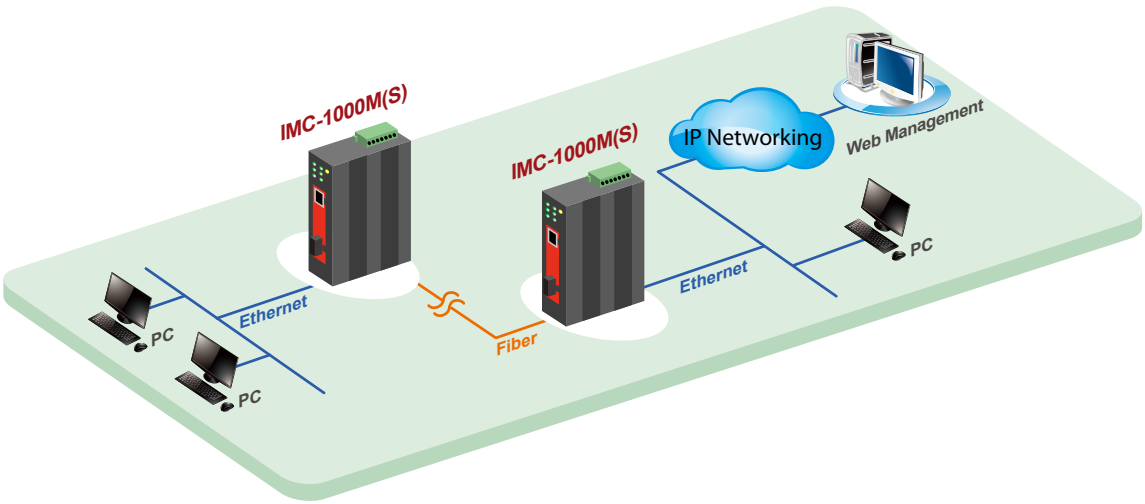
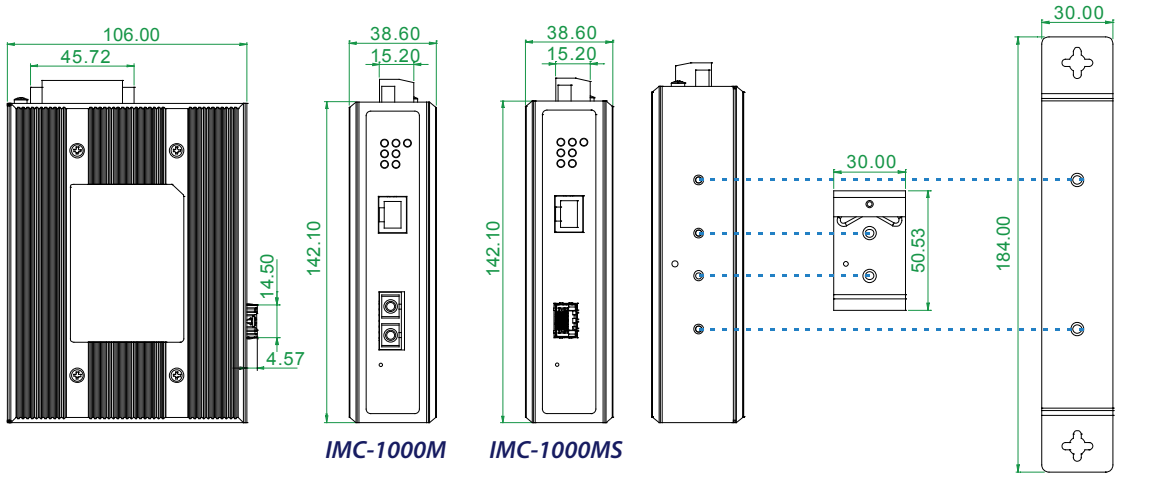


Figure 3 : IMC-1000M(S) Application in Web Management

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	UTP	Fiber	Certification					Operating Temperature
		10/100/1000 Base-T	Dual Speed 100/1000Base-X	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-1000M	V	1	1 SC	V	V	V	V	V	-10~60 C
IMC-1000M-E	V	1	1 SC	V	V	V	V	V	-20~75 C
IMC-1000MS	V	1	1 SFP	V	V	V	V	V	-10~60 C
IMC-1000MS-E	V	1	1 SFP	V	V	V	V	V	-20~75 C

Model Naming Rule

IMC – 1000 M S – E
- IMC: Industrial Media Converter
- 1000: 1000Base-X Converter
- M: Managed
- S: SFP type; Blank: Fix fiber type (SC)
- E: -20~75°C; Blank: -10~60°C

Connector Type	Connectivity Distance
SC (IMC-1000M, IMC-1000M-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)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M 7 040 – 31 – E
- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- Distance: 002(2km); 020(20km),040(40km)
- Wavelength
- E:-40~85°C; Blank:0~70°C

Temperature / Connector Type / Connectivity Distance

IMC – 1000M – □ – □□□□□

Example: IMC – 1000M – E – SC002

LISTED EN50121-4 EN61000-6-2 EN61000-6-4 SmartView

IMC-100M

10/100Base-TX to 100Base-FX Managed Fiber Converter

IMC-100M is a family of managed Fast Ethernet media converters that support conversion between electrical 10/100Base-TX and optical 100Base-FX 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. The converter is Web, SNMP or In-Band managed with an easy to use user interface for Operation, Administration, Maintenance & Provisioning, including bandwidth control, speed, and VLAN, Diagnostic, storm filter or converter configurations. It also provide loop-back test and dying gasp, and can be monitored from a centrally located OAM-enabled FRM220-1000MS converter via remote in-band management.

Features

- Conversion between 10/100Base-TX and 100Base-FX Fiber cable interface
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C
- UL60950-1, CE, FCC, Railway traffic EN50121-4 certification
- Industry grade EMS, EMI EN61000-6-2, EN61000-6-4 certification
- Supports jumbo frame 9K bytes packet
- Ingress/Egress bandwidth control
- MIB counters
- Supports LFPT (Link Fault Pass Through)
- Auto Laser Shutdown (ALS)
- Supports SmartView for centralized management (Figure 1)
- SNMP management (Figure 1)
- Web management (Figure 3)
- Supports 16 IEEE 802.1Q Tag VLAN Group
- SNMP alarm trap for power loss and port link down
- Supports in-band management from FRM220 Chassis With FRM220-1000MS (Figure 2)
- Remote loop back test
- Dying gasp (remote power failure detection)

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3x Flow Control and Back pressure
	IEEE802.1q Tag VLAN
Fiber Ports	100Base-FX Supports Auto laser shutdown (ALS)
RJ45 Ports	10/100Base-TX
Push Button	Reset, Load default seting
Jumbo Frame	9K bytes
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: 2 KM (Muti-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
Connector	Fiber: SC/ST (Multi-mode, 2KM), SC/ST (Single-mode, 30KM, 50KM)
	RJ-45: CAT 5e (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Supports
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
	RJ-45 port: Speed: 10 (OFF), 100 (Green)
	LNK/ACT for RJ45(Green): ON : Connected to network/ OFF: Not connected to network/ BLK: Networking is active
Reverse Polarity Protection	Present for Power Input
Overload Current Protection	Present
Power Supply	12/24/48VDC (9.6~60VDC), Redundant power with polarity reverse protect function and removable terminal block
Power Suppl	Provide DC Power JACK adapter cable for external power adapter

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
	Relay Alarm Output for Power Fail or Port link down
Power Consumption	4.8W
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 7 Pin
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperatur	-10 ~ 60°C (IMC-100M)
	-20 ~ 75°C (IMC-100M-E)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142 mm (D x W x H)
Weight	630g
Installation	DIN Rail mounting or wall mounting
Warranty	5 years
MTBF	778,604 hrs (MIL-HDBK-217)
Certification	
EMI	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
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

SNMP or Web management Mode (Figure 1, 3)

Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports DHCP client for automatic IP configuration
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuation	IP configuration, password setting, converter configuration, port configuration, MIB counter, SNMP configuration, VLAN group configuration, 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 (Figure 2)

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
Diagnostic & Monitor	Remote loop-back test
	Dying gasp (remote power failure detection)
	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter

Application

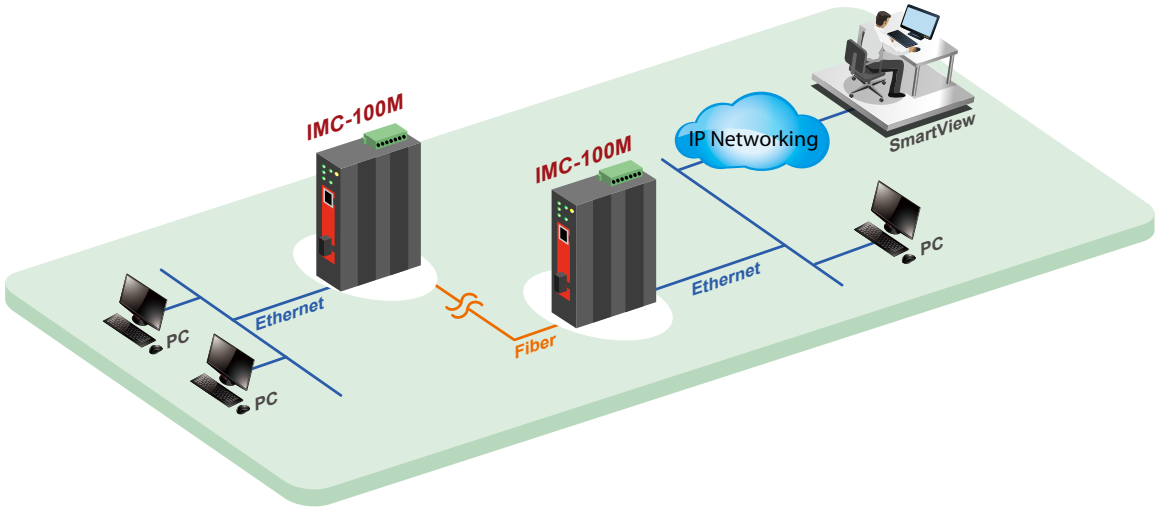


Figure 1 : IMC-100M Management by SNMP, SmartView

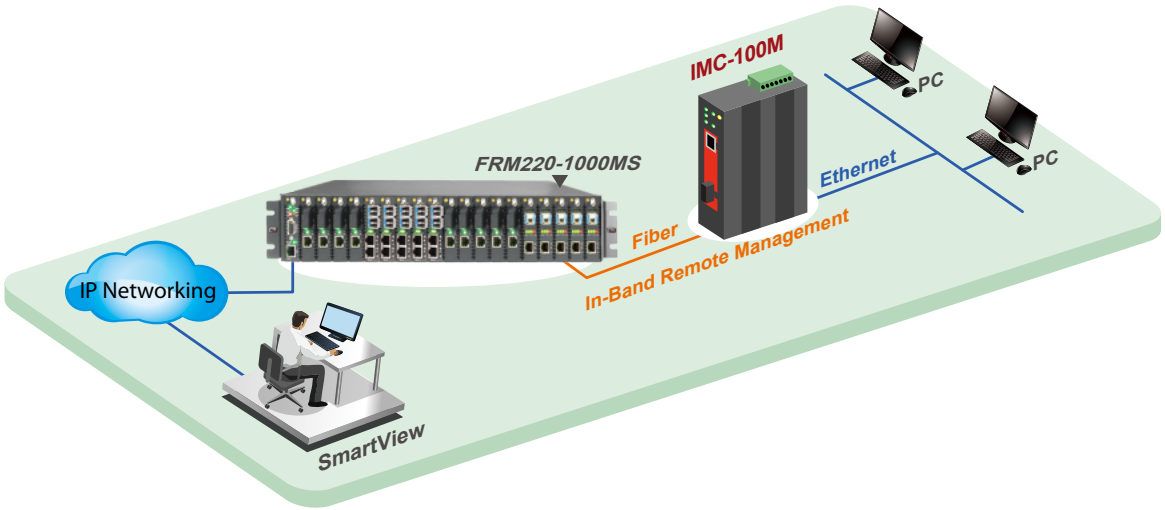


Figure 2 : IMC-100M Application in Remote, in-Band Management

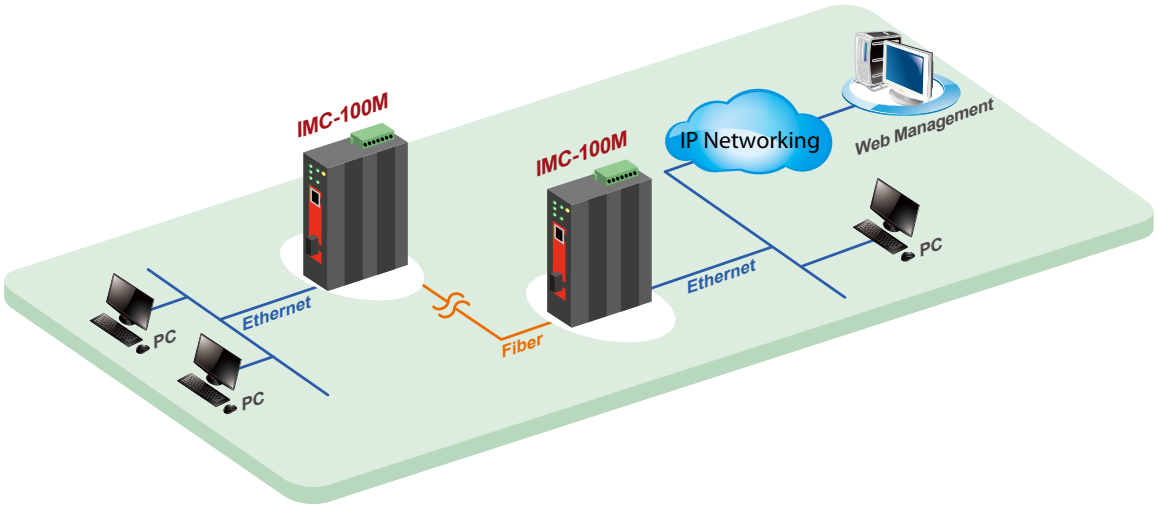
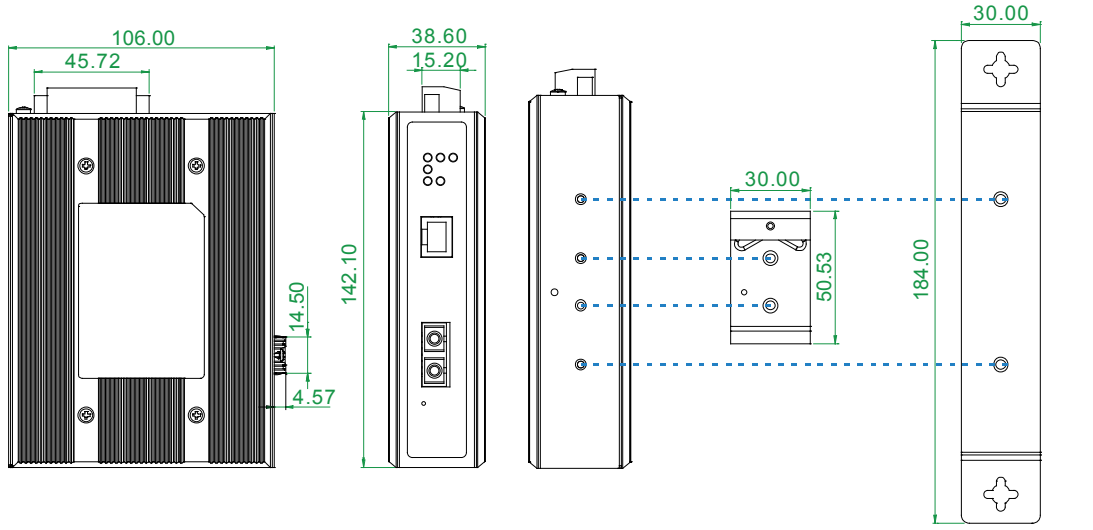


Figure 3 : IMC-100M Application in Web Management

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	UTP	Fiber	Certification					Operating Temperature
		10/100Base-TX	100Base-FX	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-100M	V	1	1 SC/ST	V	V	V	V	V	-10~60 C
IMC-100M-E	V	1	1 SC/ST	V	V	V	V	V	-20~75 C

Model Naming Rule

IMC – 100 – M – E → E: -20~75°C, Blank: -10~60°C

- IMC: Industrial Media Converter
- 100: 100Base-X Converter
- M: Managed

Connector Type	Connectivity Distance
SC, ST	002: 2KM (M/M) 030k : 30km (S/M) 050: 50km (S/M) 020A: WDM 20km A type (TX:1310nm) 020B: WDM 20km B type (TX: 1550nm)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃

Temperature / Connector Type / Connectivity Distance

IMC–100M – □ – □□□□□

Example: IMC–100M – E – SC002

PoE Series

Stability and Efficiency in IP Surveillance Networks

Industrial PoE Managed Switch

Advanced PoE Management- Auto Test & Auto Reset PD, Scheduling
Boost and Regulated for PoE Output Voltage
SmartView™ Management System
SmartConfig™ Tool for Quick & Easy Setting
u-Ring, Sub-Ring, u-Chain for Flexible Redundancy
5-Ring, 250 nodes expansion
Recovery Time < 10ms

PoE (Power over Ethernet) capability enables PD devices such as surveillance cameras or wireless access points to be powered over standard twisted-pair Ethernet cable, eliminating the needs for requiring external power for PD devices. CTC Union provides a variety of PoE products, ranging from injectors, converters to managed switches so as to fulfill different application needs. All PoE models are fanless and designed in robust IP30 housing that make them ideal for din rail installation or wall mounting. Additionally, PoE models support IEEE 802.3af/802.3at standards which are able to provide up to 30W (use 50VDC or above) power supply per port. With power boost and regulation technology, PoE devices can offer 24~48V to 55V power supply for applications that require more power inputs.

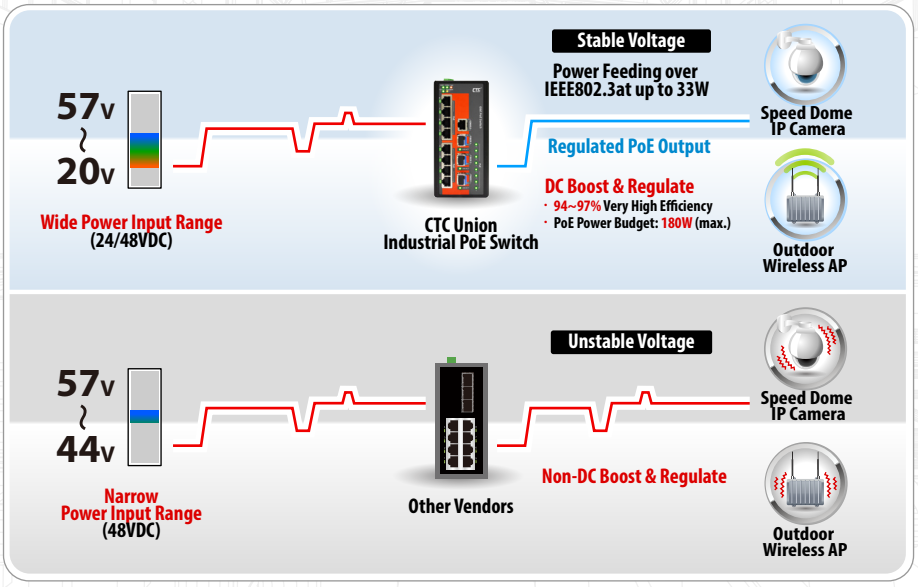
Remote PD Auto Test & Reset

The PoE application is generally used in places where power is not easily accessible. Using remote PD auto test function, our PSE devices can regularly send test packets to the connected PD devices so that users can know the real-time condition of the remote PD devices without paying on-site visits. If PSE devices do not receive responses from the connected PD devices for a certain period, then PSE devices can initiate a reset action automatically to power down and power up the connected PD devices. With both auto test and reset function, network administrators can remotely monitor the condition of the connected PDs and initiate a power reset to bring PD devices back to normal state before paying on-site visits. Eventually, these two features help the company saves truck rolls and reduce operational expenses.

PD Auto Test & Reset Process

Boost DC Power & Regulate Power Voltage

All CTC Union's PoE/PoE+ switches, injectors or converters are equipped with PoE Power Booster & Regulation technology. With built-in power booster feature, PoE devices can be powered up by 24/48V to deliver 15.4W per port and by 50V to deliver 30W per port for IEEE 802.3at applications. The boost efficiency is able to reach 94%~97% high and the maximum PoE power budget can be raised up to 180W for applications like power-hungry PTZ cameras or wireless access points on buses, railcars, ships, etc. Output power is also able to be regulated and stabilized at 55V output voltage so as to enhance the stability of your connected PD devices.



Weekly PoE ON/OFF Scheduling

For PSE devices, power usage can be allocated manually or automatically to PoE ports by users based on actual application needs. Besides, PoE switches and converters offer PoE ON/OFF scheduling function on a weekly basis to provide PoE to the connected devices based on the planned schedule.

PoE Application Scenarios

120 Watts, 24V Booster

IGS-402S-4PH24
4x 10/100/1000Base-T and 2x100/1000Base-X SFP with 4x PoE+

IGS-401F-4PH24
4x 10/100/1000Base-T and 1x 1000Base-X Fiber with 4x PoE+

IGS-402F-4PH24
4x 10/100/1000Base-T and 2x 1000Base-X Fiber with 4x PoE+

IGS-600-4PH24
6x 10/100/1000Base-T with 4x PoE+

The series models are 5~6 Ports unmanaged industrial grade Gigabit PoE switches with 4x 10/100/1000Base-T PoE that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are 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 IEEE802.3at/af PoE output (30W/Per Port)
- Maximum PoE output power budget 120W
- 24/48VDC (20~57VDC) redundant dual input power, and built-in 94~97% Very High Efficiency power booster
- Regulated PoE output voltage at 55VDC
- Wide operating temperature -40 ~ 75°C ("E" model)
- UL60950-1, CE, FCC, EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 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 802.3z 1000Base-X Gigabit Ethernet
	IEEE 802.3x Flow Control and Back Pressure
	IEEE 802.3at, IEEE802.3af
Switch Architecture	Back-plane (Switching Fabric): 10Gbps (IGS-401F- 4PH24) 12Gbps (IGS-402S- 4PH24, IGS-402F-4PH24, IGS-600-4PH24)
	Back-plane (Switching Fabric): 10Gbps (IGS-401F- 4PH24) 12Gbps (IGS-402S- 4PH24, IGS-402F- 4PH24, IGS-600-4PH24)
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
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	4 x RJ-45 (IGS-402S-4PH24, IGS-401F-4PH24, IGS-402F-4PH24) 6 x RJ-45 (IGS-600-4PH24) 10/100/1000Base-T auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex
	2x 100/1000Base-X SFP (IGS-402S-4PH24) 1 or 2x1000Base-X Fiber connector: SC Muti Mode or Single Mode (IGS-401F-4PH24, IGS-402F-4PH24)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
	Fiber Cable (Multi-mode): 50/125um, 62.5/125um Fiber Cable (Single-mode): 9/125um
Protocols	CSMA/CD

LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)	
	Per RJ-45 port : Link/Active (Green), Speed 10 (OFF), 100 (Green), 1000 (Yellow)	
	Fiber Per port: Link/Active (Green)	
	PoE Port LED : • Active : ON • Inactive : OFF • Fault : Flash (Over Load, Short Circuit, Port failed at Startup)	
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
		(Only for IGS-402S-4PH24)
	DIP 4	ON : Fiber 1 for 100Base-FX SFP
		OFF : Fiber 1 for Gigabit SFP
		(Only for IGS-402S-4PH24)
Reserve Polarity Protection	Present	
Overload Current Protection	Present	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	

Power Consumption

Input Voltage	IGS-402S-4PH24	IGS-401F-4PH24	IGS-402F-4PH24	IGS-600-4PH24
24VDC	143.3W	142.1W	143.2W	142.9W
48VDC	138.2W	137.4W	138.2W	139.6W

PoE Power Output	Maximum PoE Output power budget 120W (30W/ Per Port)
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC
Removable Terminal Block	Provide 2 Redundant power, Alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-402S-4PH24, IGS-401F-4PH24, IGS-402F-4PH24, IGS-600-4PH24)
	-40 ~ 75°C (IGS-402S-4PHE24, IGS-401F-4PHE24, IGS-402F-4PHE24, IGS-600-4PHE24)
Operating Humidity	5% to 95% (Non-condensing)

Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106 x 62.5 x 134.8mm (D X W X H)
Weight	0.84kg (IGS-402S-4PH24) 0.67kg (IGS-401F-4PH24) 0.68kg (IGS-402F-4PH24) 0.84kg (IGS-600-4PH24)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	334,448 Hours (IGS-402S-4PH24) 316,408 Hours (IGS-401F-4PH24) 306,704 Hours (IGS-402F-4PH24) 296,517 Hours (IGS-600-4PH24) (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
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

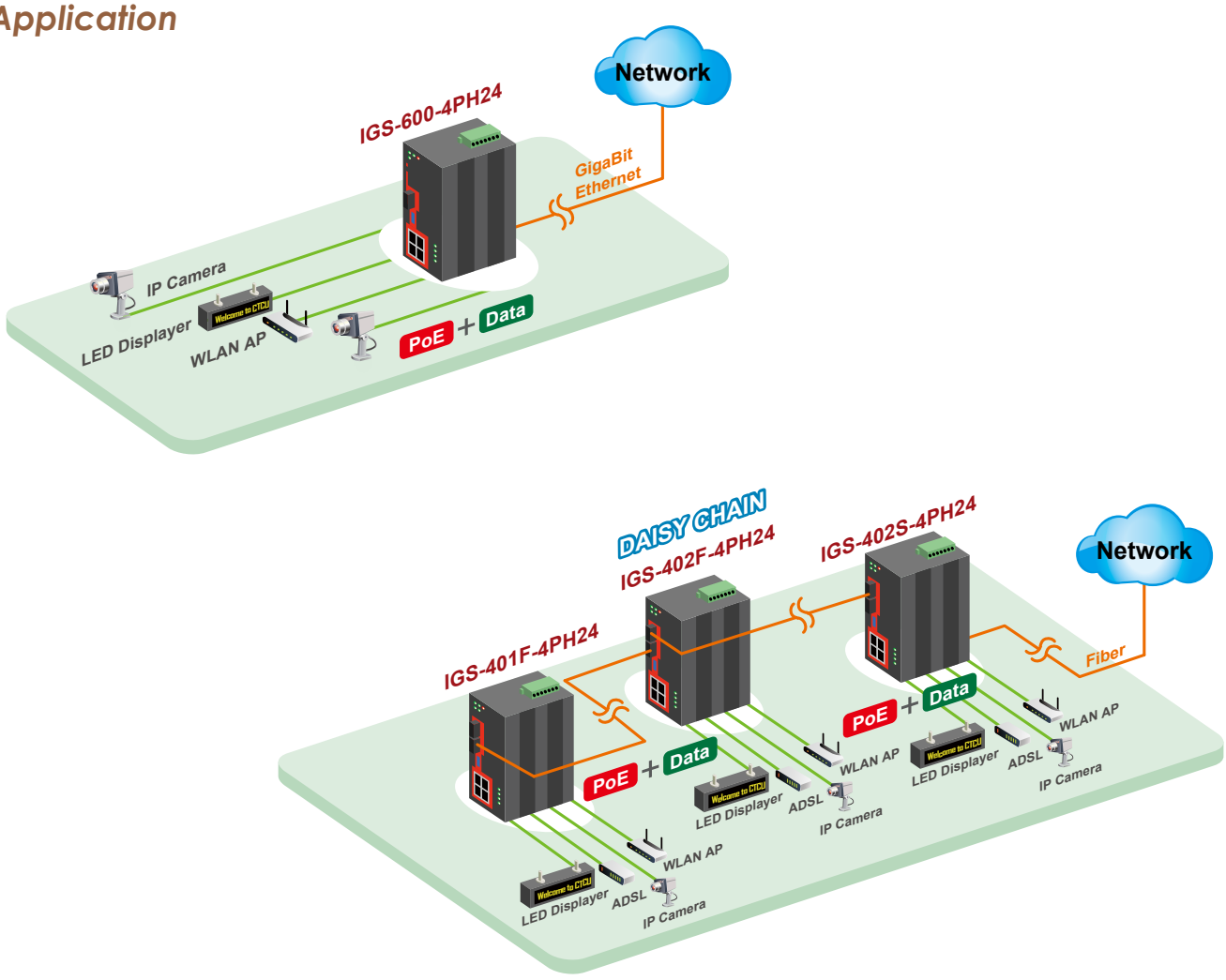
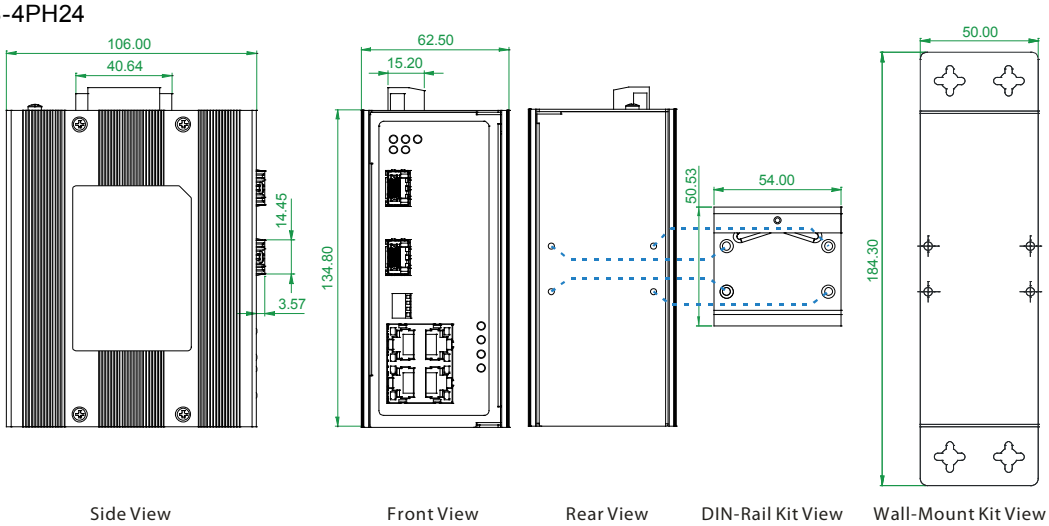


Figure : IGS-402S-4PH24, IGS-401F-4PH24, IGS-402F-4PH24, IGS-600-4PH24 PoE Gigabit Ethernet Switch Transmission

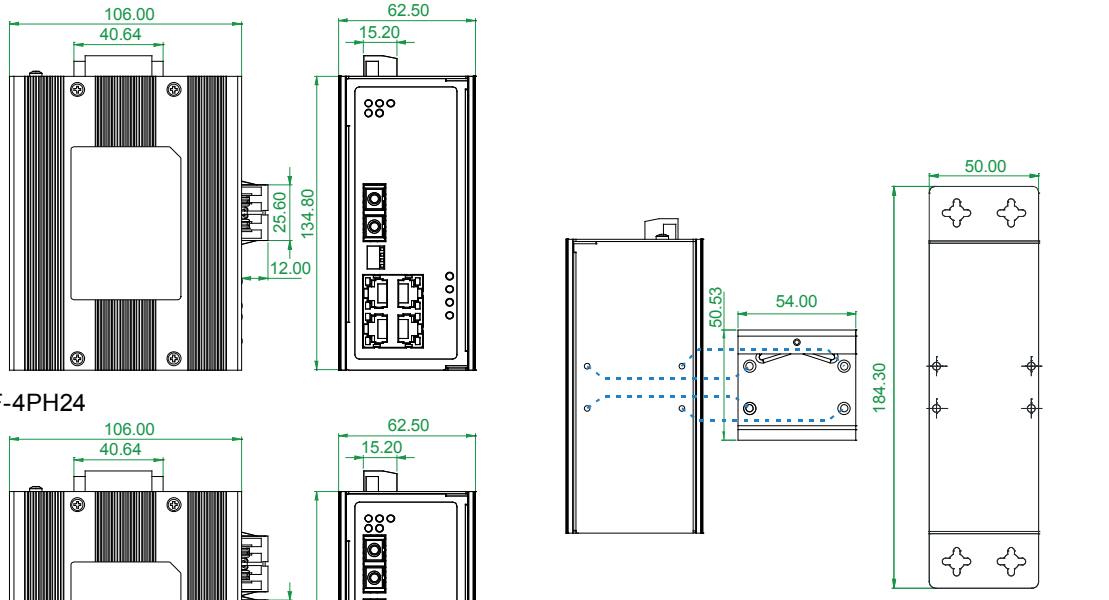
Dimensions

IGS-402S-4PH24



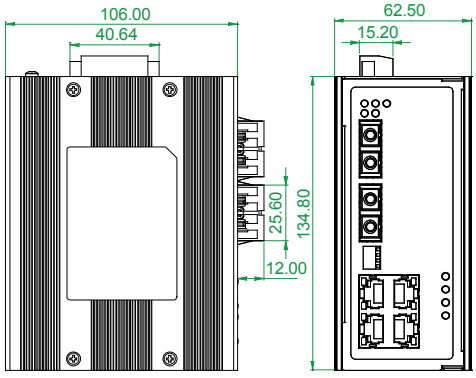
Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IGS-401F-4PH24



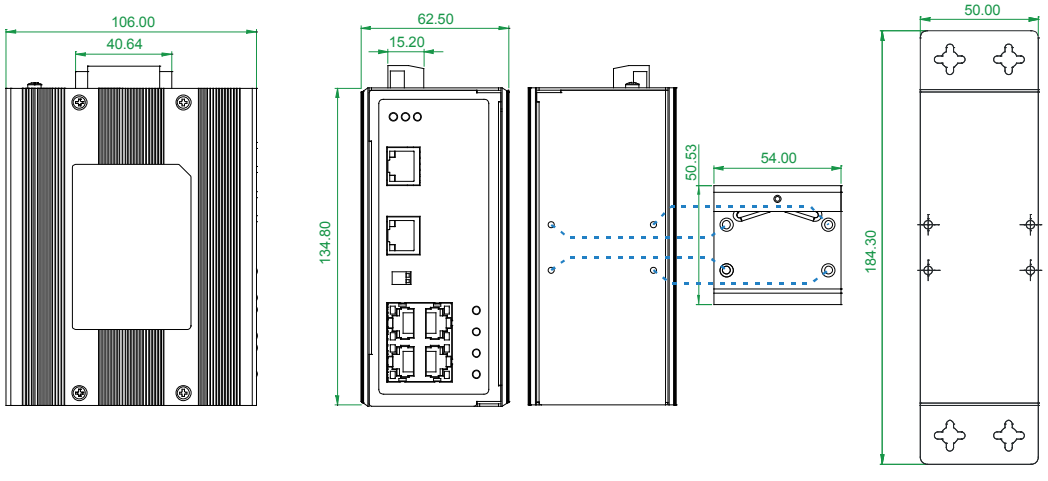
Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IGS-402F-4PH24



Side View | Front View

IGS-600-4PH24

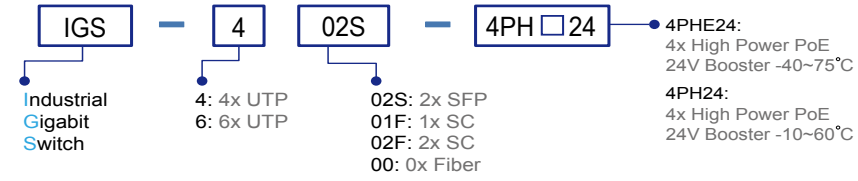


Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Port	UTP Port	Fiber Port		Certification				Operating Temperture
		10/100/1000 Base-T(X)	1000 Base-X	100/1000 Base-X	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402S-4PH24	6	4	—	2 SFP	V	V	V	V	-10~60°C
IGS-402S-4PHE24	6	4	—	2 SFP	V	V	V	V	-40~75°C
IGS-401F-4PH24	5	4	1 SC	—	V	V	V	V	-10~60°C
IGS-401F-4PHE24	5	4	1 SC	—	V	V	V	V	-40~75°C
IGS-402F-4PH24	6	4	2 SC	—	V	V	V	V	-10~60°C
IGS-402F-4PHE24	6	4	2 SC	—	V	V	V	V	-40~75°C
IGS-600-4PH24	6	6	—	—	V	V	V	V	-10~60°C
IGS-600-4PHE24	6	6	—	—	V	V	V	V	-40~75°C

Model Naming Rule

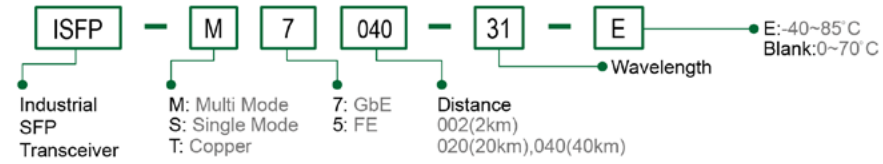


Fiber Connector Type	Connectivity Distance
SC (Only for IGS-401F-4PH24, IGS-402F-4PH24)	SC001: 500m (SC, M/M) SC002: 2km (SC, M/M) SC020: 20km (SC, S/M) SC040: 40km (SC, S/M) SC020A: WDM 20km A type (TX: 1310nm) SC020B: WDM 20km B type (TX: 1550nm)

Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60°C
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C

SFP Naming Rule



120 or 180 Watts, 24V Booster

IGS-402SM-4PH24

4x10/100/1000Base-T + 2x100/1000Base-X SFP with 4xPoE+

IGS-803SM-8PH24

8x10/100/1000Base-T + 3x100/1000Base-X SFP with 8xPoE+

The series models are managed industrial grade Gigabit PoE (Power over Ethernet) switches with 4/8 ports 10/100/1000Base-T PoE ports and 2/3 ports Fast/Gigabit Ethernet SFP ports that provide stable and reliable Ethernet transmission. With dual power input design, the series models can provide redundancy mechanism for critical applications that need always-on connections. These switches can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) so as to fulfill the special needs of industrial automation applications. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, 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.

Apart from specially-designed outlook and hardware features, the Ethernet switches also support a wide variety of management functions, including STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, advanced PoE management functions such as PoE device auto-checking and auto reset, PoE power on/off weekly scheduling, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostics and Green Ethernet. Additionally, these switches can work with CTC Union's proprietary SmartView that offers user-friendly and centralized network management platform and provides to network administrators to monitor and configure these connected switches remotely.

Features

- 4x10/100/1000Base-T RJ-45+ 2x100/1000Base-X SFP with 4xPoE+, total 120W power budget (IGS-402SM-4PH24)
- 8x10/100/1000Base-T RJ-45+ 3x100/1000Base-X SFP with 8xPoE+, total 180W power budget (IGS-803SM-8PH24)
- 24/48VDC redundant dual input power with built-in very high efficiency booster(94~97%) to rise up 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- Provides 4/8 port IEEE802.3af / 802.3at PoE output (30W per Port)
- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset when PD fail, PoE port on/off weekly scheduling, PoE configuration for power planning
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostics, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 ring instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (Figure 3). Supports up to 5 rings in one device (Figure 2).
- u-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP 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
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for centralized 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 802.3ad	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 (IGS-402SM-4PH24) 22Gbps (IGS-803SM-8PH24)
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 connector (IGS-402SM-4PH24) 8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFP connector (IGS-803SM-8PH24) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE RJ-45 Pin Assignment	4x IEEE 802.3af /IEEE 802.3at PoE+ (IGS-402SM-4PH24) 8x IEEE 802.3af /IEEE 802.3at PoE+ (IGS-803SM-8PH24) 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 above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present

Overload Current Protection	Present
CPU Watch Dog	Present
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 55 VDC for PoE output
Power Consumption	IGS-402SM-4PH24 Power consumption & Booser efficiency

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%

IGS-803SM-8PH24 Power consumption & Booser efficiency

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%

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 Fault (Over Load, Short Circuit,Port failed at Startup) : Flash 1times /sec (Green) • PoE Output Power Off : Off
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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-402SM-4PH24, IGS-803SM-8PH24) -40 ~ 75°C (IGS-402SM-4PHE24, IGS-803SM-8PHE24)
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) (IGS-402SM-4PH24) 106 x 72 x 152 mm (D x W x H) (IGS-803SM-8PH24)
Weight	0.715kg (IGS-402SM-4PH24) 0.96kg (IGS-803SM-8PH24)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	276,161Hrs (IGS-402SM-4PH24) 311,376Hrs (IGS-803SM-8PH24) (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
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)
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 (Figure 2,3,4,5). Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
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	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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

DHCP	Client
	Relay
	Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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
Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring 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 Total PoE Power budge limitation (maximum 120W for IGS-402SM-4PH24 ,180W for IGS-803SM-8PH24) Power feeding priority

Application

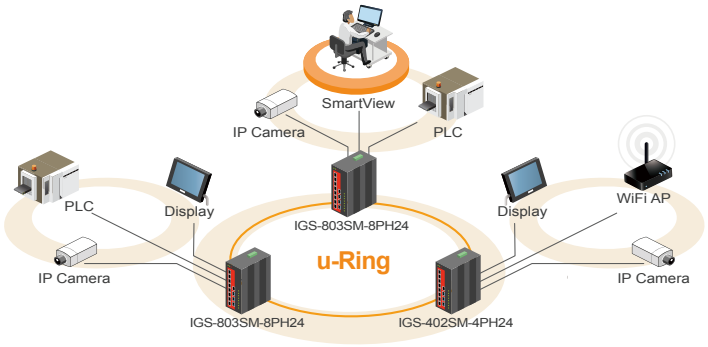


Figure 1 : Application Example

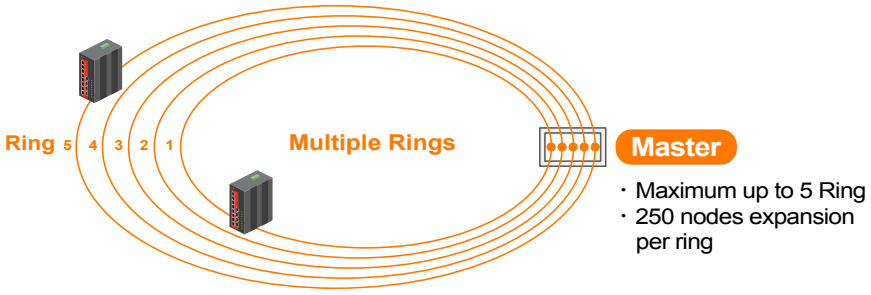


Figure 2 : Multiple Ring

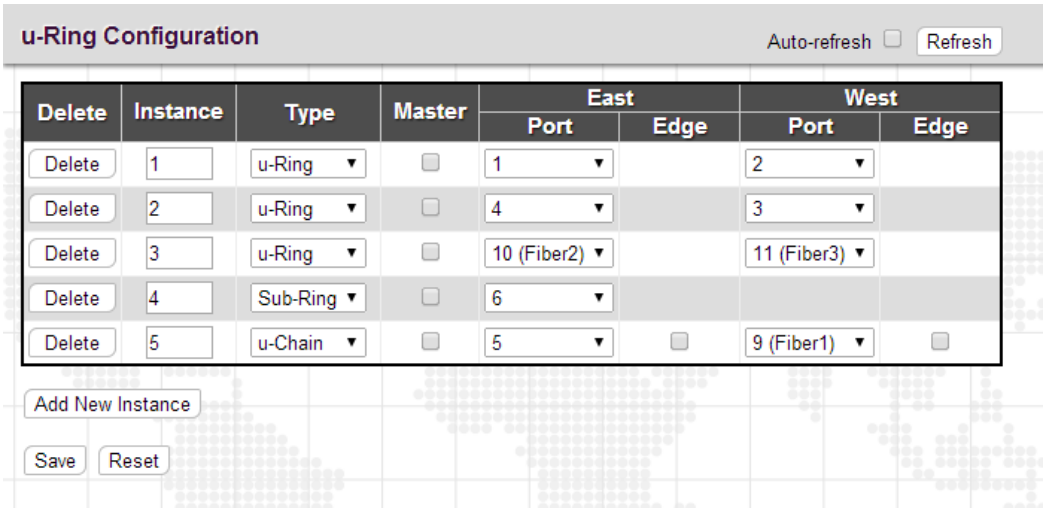
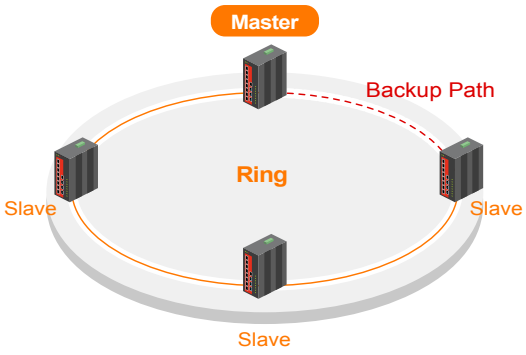
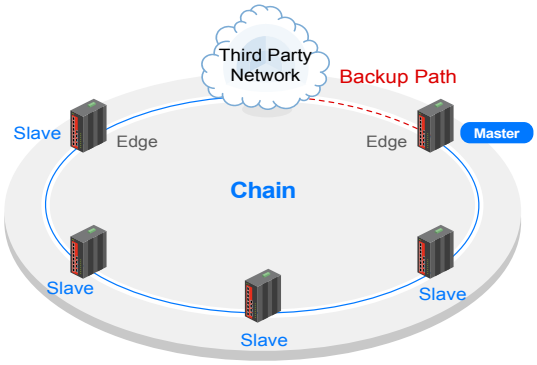


Figure 3 : Friendly to set u-Ring configuration in Web

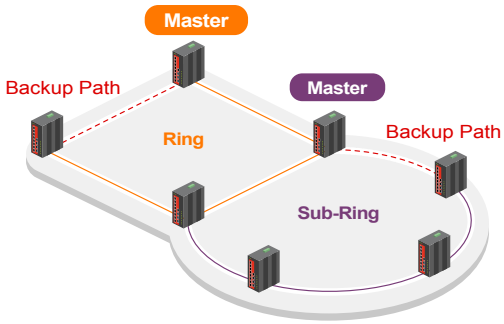
Figure 4 : u-Ring Type



u-Ring Type

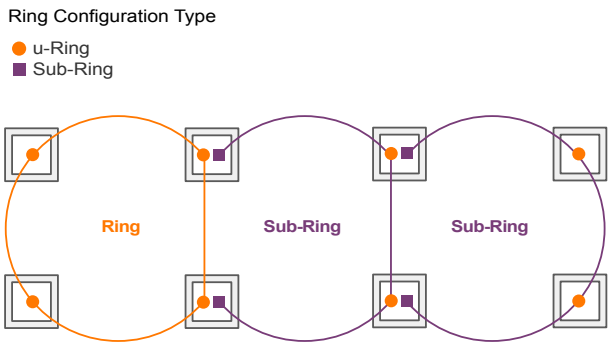


Determining the backup path (u-Chain type)

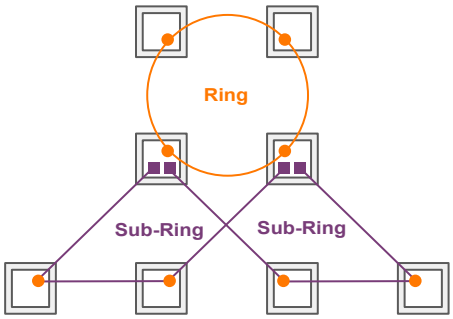


A major ring and a Sub-Ring topology

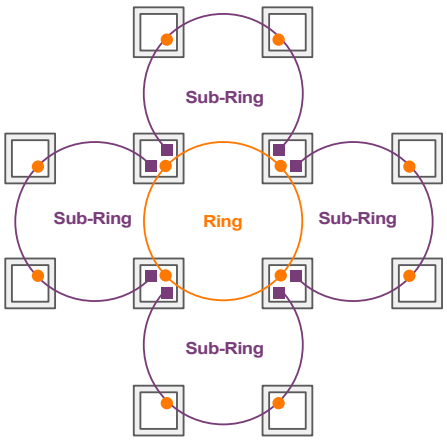
Figure 5 : Ring Configuration Example



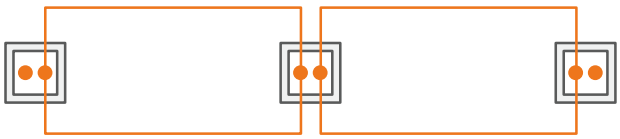
Ring Configuration Type



Combination of a ring and two Sub-Ring



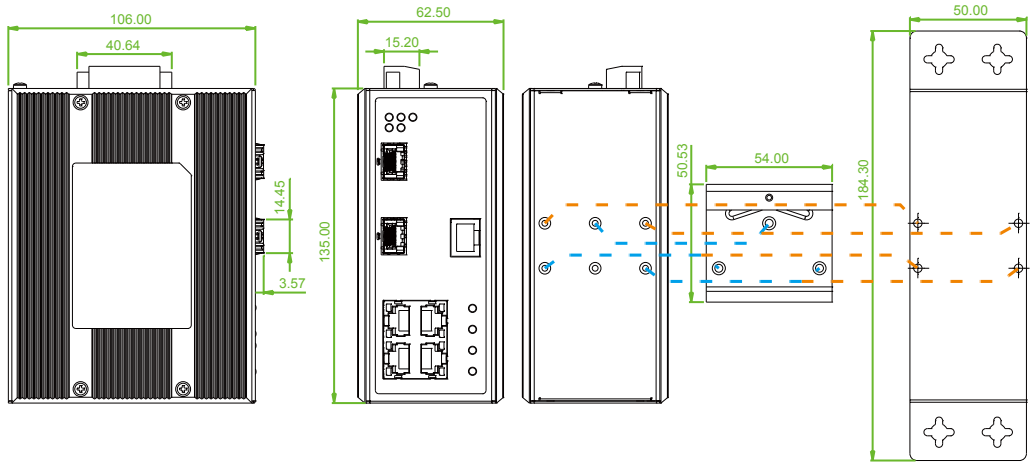
Combination of a ring and four Sub-Ring



Cable Redundancy

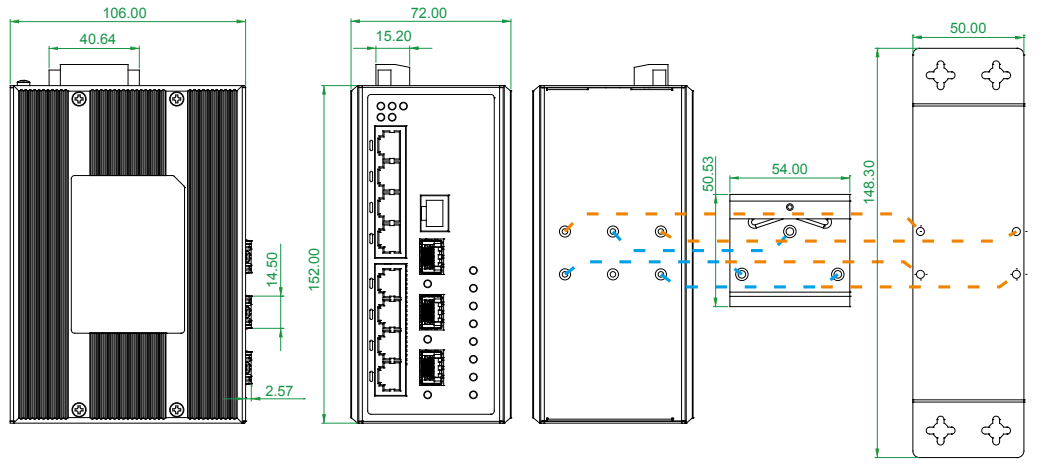
Dimensions

IGS-402SM-4PH24



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IGS-803SM-8PH24



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE Port		Certification				Operating Temperture
			10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3at	Power Budget	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IGS-402SM-4PH24	V	6	4	2 SFP	4	120W	V	V	V	V	-10~60 C
IGS-402SM-4PHE24	V	6	4	2 SFP	4	120W	V	V	V	V	-40~75 C
IGS-803SM-8PH24	V	11	8	3 SFP	8	180W	V	V	V	V	-10~60 C
IGS-803SM-8PHE24	V	11	8	3 SFP	8	180W	V	V	V	V	-40~75 C

Model Naming Rule

IGS - 8 | 03S | M - 8PH | E24

- IGS: Industrial Gigabit Switch
- 8: 4: 4x UTP; 8: 8x UTP
- 03S: 02S: 2x SFP; 03S: 3x SFP
- M: Managed
- 8PH: 4PH: 4x High Power PoE; 8PH: 8x High Power PoE
- E24: E24: 24V Booster -40~75℃; 24: 24V Booster-10~60℃

Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP - M | 7 | 040 - 31 - E

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- 040: Distance 002(2km) 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85°C; Blank:0~70°C

120 or 180 Watts, 24V Booster

IFS-402GSM-4PH24

4x10/100Base-TX + 2x100/1000Base-X SFP with 4xPoE+

IFS-803GSM-8PH24

8x10/100Base-TX + 3x100/1000Base-X SFP with 8xPoE+

The series models are managed industrial grade Ethernet PoE (Power over Ethernet) switches with 4/8 ports 10/100Base-TX PoE ports and 2/3 ports Fast/Gigabit Ethernet SFP ports that provide stable and reliable Ethernet transmission. With dual power input design, the series models can provide redundancy mechanism for critical applications that need always-on connections. These switches can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) so as to fulfill the special needs of industrial automation applications. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, 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.

Apart from specially-designed outlook and hardware features, the Ethernet switches also support a wide variety of management functions, including STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, advanced PoE management functions such as PoE device auto-checking and auto reset, PoE power on/off weekly scheduling, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostics and Green Ethernet. Additionally, these switches can work with CTC Union's proprietary SmartView that offers user-friendly and centralized network management platform and provides to network administrators to monitor and configure these connected switches remotely.

Features

- 4x 10/100Base-TX RJ-45+ 2x 100/1000Base-X SFP with 4x PoE+, total 120W power budget (IFS-402GSM-4PH24)
- 8x 10/100Base-TX RJ-45+ 3 x100/1000Base-X SFP with 8x PoE+, total 180W power budget (IFS-803GSM-8PH24)
- 24/48VDC redundant dual input power with built-in very high efficiency booster(94~97%) to rise up 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- Provides 4/8 port IEEE802.3af / 802.3at PoE output (30W per Port)
- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset when PD fail, PoE port on/off weekly scheduling, PoE configuration for power planning
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostics, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 ring instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (Figure 3). Supports up to 5 rings in one device (Figure 2).
- u-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP 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
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for centralized 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 802.3ad	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 (IFS-402GSM-4PH24) 7.6Gbps (IFS-803GSM-8PH24)
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 connector (IFS-402GSM-4PH24) 8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP connector (IFS-803GSM-8PH24) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE RJ-45 Pin Assignment	4x IEEE 802.3af /IEEE 802.3at PoE+ (IFS-402GSM-4PH24) 8x IEEE 802.3af /IEEE 802.3at PoE+ (IFS-803GSM-8PH24) 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 Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present

Overload Current Protection	Present
CPU Watch Dog	Present
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 55 VDC for PoE output
Power Consumption	IFS-402GSM-4PH24 Power consumption & Booser efficiency

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%

IFS-803GSM-8PH24 Power consumption & Booser efficiency

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%

LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) Per RJ-45 port: Link/Active (Green) SFP Fiber Per port: Link/Active (Green) PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit,Port failed at Startup) : Flash 1times /sec (Green) • PoE Output Power Off : Off
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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 (IFS-402GSM-4PH24, IFS-803GSM-8PH24) -40 ~ 75°C (IFS-402GSM-4PHE24, IFS-803GSM-8PHE24)
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) (IFS-402GSM-4PH24) 106 x 72 x 152 mm (D x W x H) (IFS-803GSM-8PH24)
Weight	0.715kg (IFS-402GSM-4PH24) 0.96kg (IFS-803GSM-8PH24)
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	276,161Hrs (IFS-402GSM-4PH24) 314,064Hrs (IFS-803GSM-8PH24) (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
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)
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 (Figure 2,3,4,5). Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
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	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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

DHCP	Client
	Relay
	Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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
Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring 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 Total PoE Power budge limitation (maximum 120W for IFS-402GSM-4PH24 ,180W for IFS-803GSM-8PH24) Power feeding priority

Application

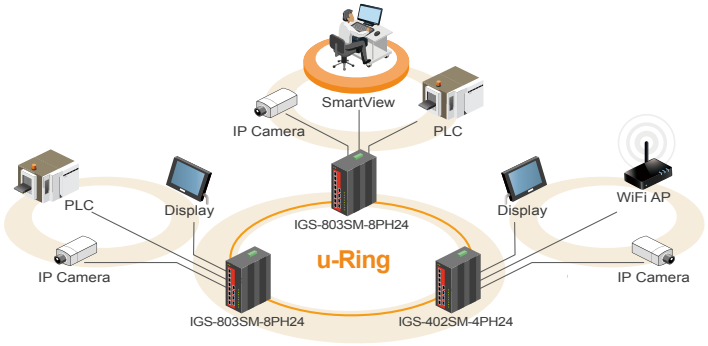


Figure 1 : Application Example

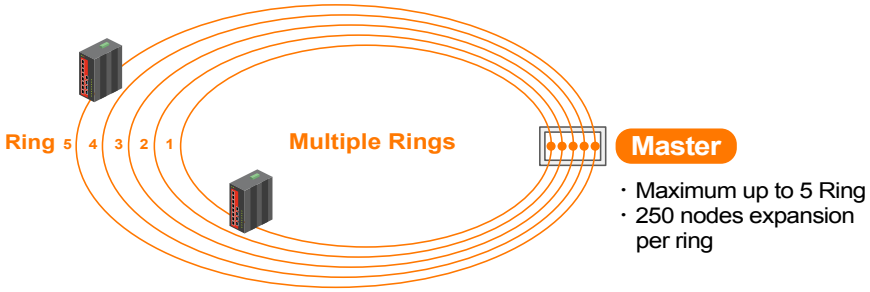


Figure 2 : Multiple Ring

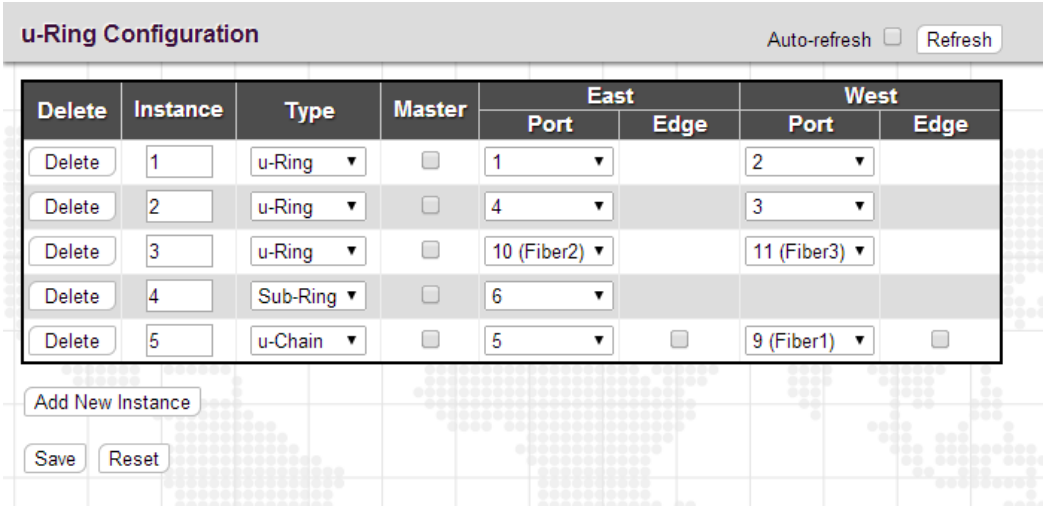


Figure 3 : An illustration of u-Ring instances configured in Web interface

Figure 4 : u-Ring Type

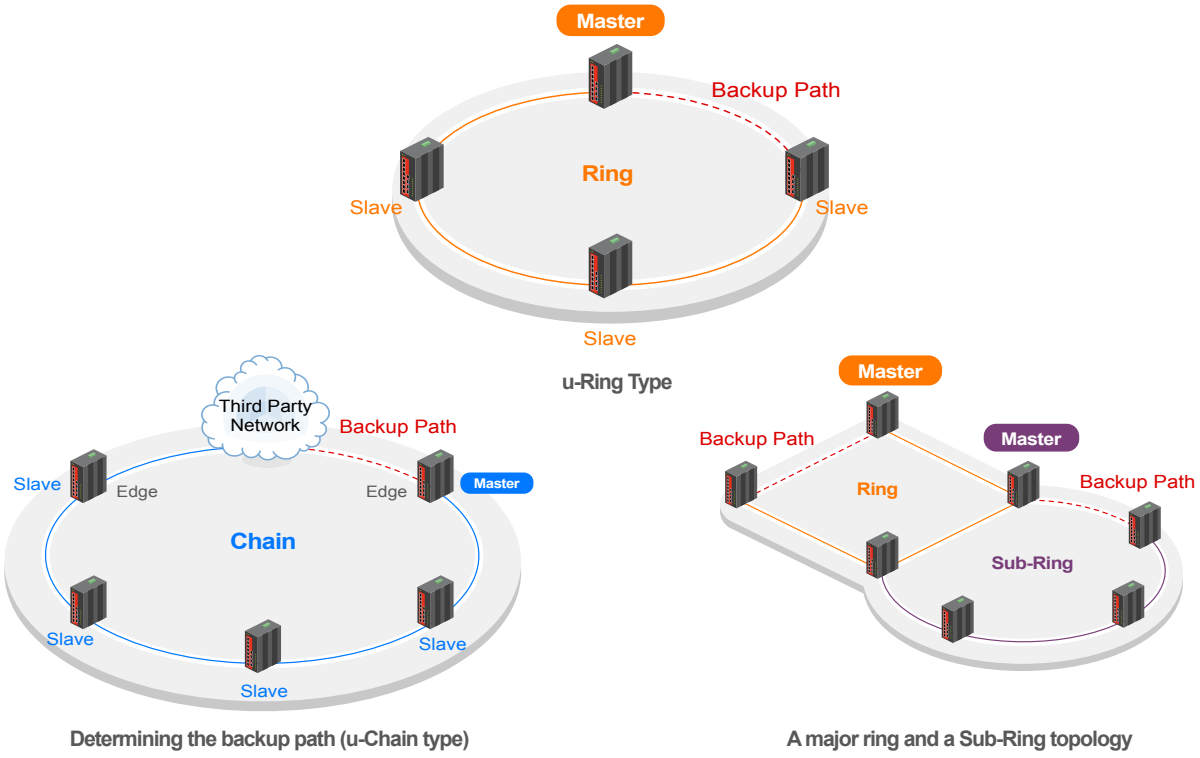
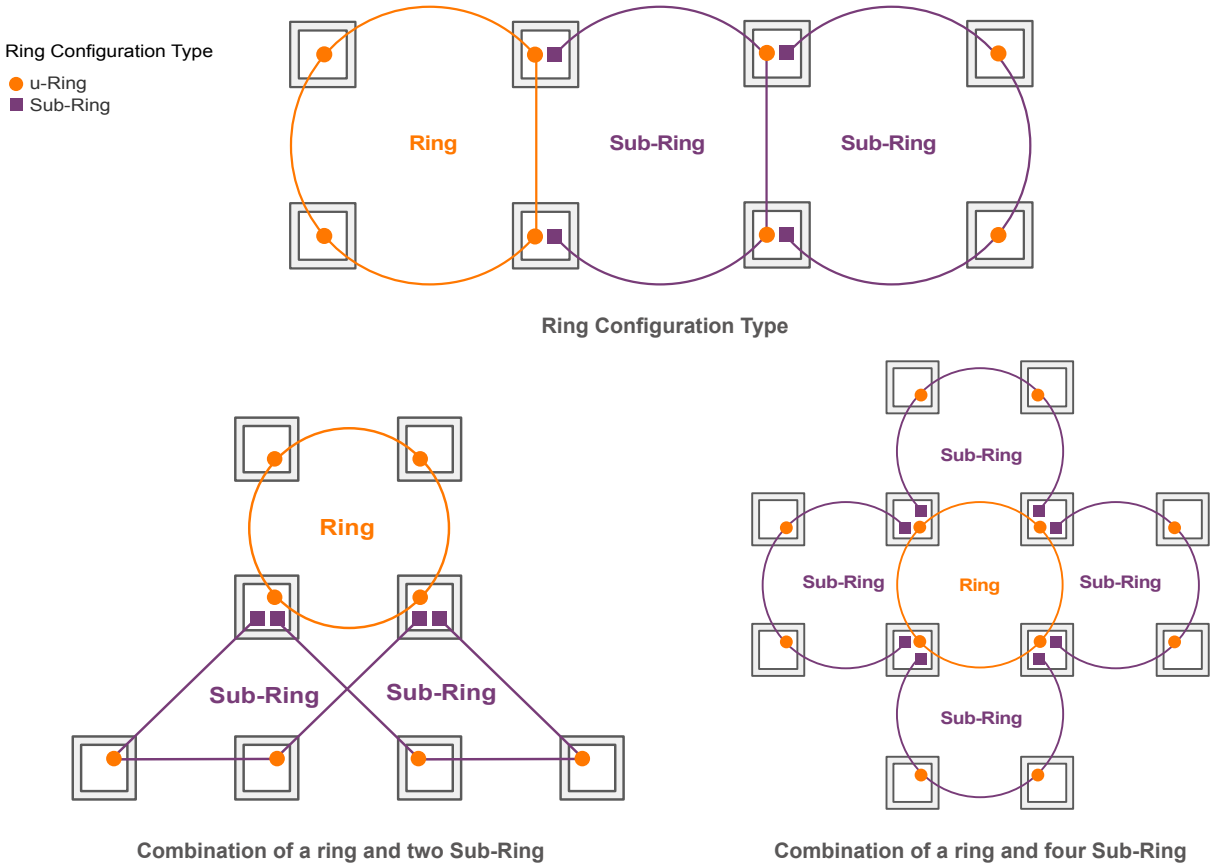
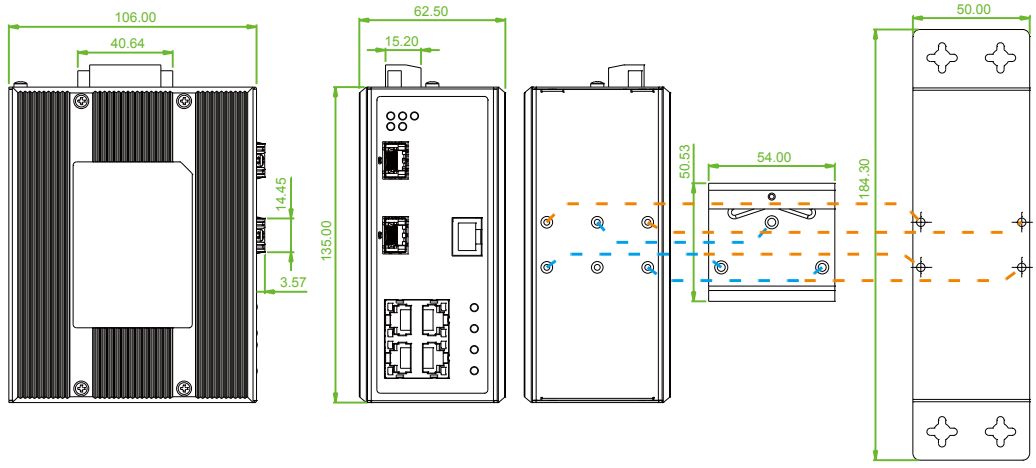


Figure 5 : Ring Configuration Example



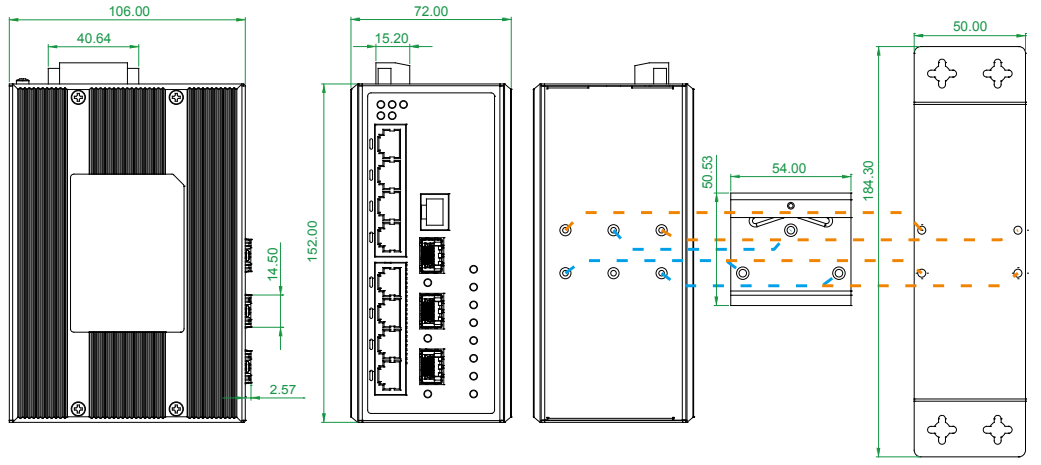
Dimensions

IFS-402GSM-4PH24



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

IFS-803GSM-8PH24



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	Total Port	UTP	Fiber	PoE Port		Certification				Operating Temperture
			10/100 Base-TX	100/1000 Base-X	IEEE 802.3at	Power Budget	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-402GSM-4PH24	V	6	4	2 SFP	4	120W	V	V	V	V	-10~60 C
IFS-402GSM-4PHE24	V	6	4	2 SFP	4	120W	V	V	V	V	-40~75 C
IFS-803GSM-8PH24	V	11	8	3 SFP	8	180W	V	V	V	V	-10~60 C
IFS-803GSM-8PHE24	V	11	8	3 SFP	8	180W	V	V	V	V	-40~75 C

Model Naming Rule

IFS - 8 03GS M - 8PH E24

- IFS: Industrial Fast Ethernet Switch
- 8: 4: 4x FE UTP; 8: 8x FE UTP
- 03GS: 02GS: 2xGbE SFP; 03GS: 3xGbE SFP
- M: M: Managed
- 8PH: 4PH: 4x High Power PoE; 8PH: 8x High Power PoE
- E24: E24: 24V Booster -40~75℃; 24: 24V Booster-10~60℃

Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP - M 7 040 - 31 - E

- ISFP: Industrial SFP Transceiver
- M: M: Multi Mode; S: Single Mode; T: Copper
- 7: 7: GbE; 5: FE
- 040: Distance 002(2km) 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85°C; Blank:0~70°C

30 Watts,
12V Booster

CE FC EN50121-4 EN61000-6-2 EN61000-6-4 PoE Regulated

IMC-1000-PH12

10/100/1000Base-T to 100/1000Base-FX/SX/LX with PoE + (PSE) Fiber Converter

IMC-1000S-PH12

10/100/1000Base-T to 100/1000Base-X SFP with PoE + (PSE) Fiber Converter

IMC-1000(S)-PH12 is a family of non-managed Gigabit Ethernet media converters that support conversion between electrical 10/100/1000Base-T and optical 1000Base-X Ethernet and as PSE (Power Source Equipment) provide PoE+ power over Ethernet. Two options are available for optical interfaces, the IMC-1000-PH12 uses a fixed optical transceiver operating at 1000Base-X, while the IMC-1000S-PH12 provides an SFP cage for 100/1000Base-X compatible SFP modules. Housed in rugged DIN rail or wall mountable enclosures, these converters are designed for harsh environments, 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

- 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
- Constant and regulated PoE output voltage at 55VDC
- 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 (IMC-1000-PHE12, IMC-1000S-PHE12)
- CE, FCC, Railway traffic EN50121-4 certification
- Industrial grade EMS,EMI EN61000-6-2, EN61000-6-4 certification
- Supports Jumbo frame 9K bytes packet

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3ab 1000Base-T Gbit/s Ethernet over twisted pair
	IEEE802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE802.3x Flow Control and Back pressure
	IEEE802.3at Power over Ethernet+, PoE+
	IEEE802.3af Power over Ethernet, PoE
	IEEE802.1q Tag VLAN
RJ45 Ports	10/100/1000Base-T
Fiber Ports	100/1000Base-SX/LX (IMC-1000-PH12, IMC-1000-PHE12)
	100/1000Base-X SFP (IMC-1000S-PH12, IMC-1000S-PHE12)
Data Process Architecture	Store and Forward mode or Pass Through mode Set by DIP SW
Jumbo Frame	9K bytes
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: • 500M (Multi-mode SX), 20KM (Single-mode), 50KM(Single-mode) (IMC-1000-PH12, IMC-1000-PHE12) • SFP, Distance depend on plug-in Fiber Transceiver (IMC-1000S-PH12, IMC-1000S-PHE12)
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	Fiber: SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000-PH12, IMC-1000-PHE12) SFP Slot (IMC-1000S-PH12, IMC-1000S-PHE12)

Connector and Pin Assignment	RJ-45 Socket: CAT-3/5 (10/100/1000Mbps) Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Support 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 : 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	Present for Power Input
Overload Current Protection	Present
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
Power Consumption	IMC-1000-PH12 Power consumption & Booser efficiency

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
12VDC	34.4W	3.9W	30W	98.4%
24VDC	34.9W	4.5W	30W	98.7%
48VDC	35.4W	4.7W	30W	97.7%

IMC-1000S-PH12 Power consumption & Booser 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%

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 Humidity	5%~95% (Non-condensing)
Operating Temperature	-10°C~60°C (IMC-1000-PH12, IMC-1000S-PH12) -20°C~75°C (IMC-1000-PHE12, IMC-1000S-PHE12)
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	655g (IMC-1000-PH12, IMC-1000-PHE12) 650g (IMC-1000S-PH12, IMC-1000S-PHE12)
Installation	DIN Rail mounting or wall mounting
Certification	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN 55022 Class A
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
Safety	UL60950-1 (pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
MTBF	419,822Hrs (IMC-1000-PH12, IMC-1000-PHE12) 432,104Hrs (IMC-1000S-PH12, IMC-1000S-PHE12) MIL-HDBK-217
Warranty	5 years

Application

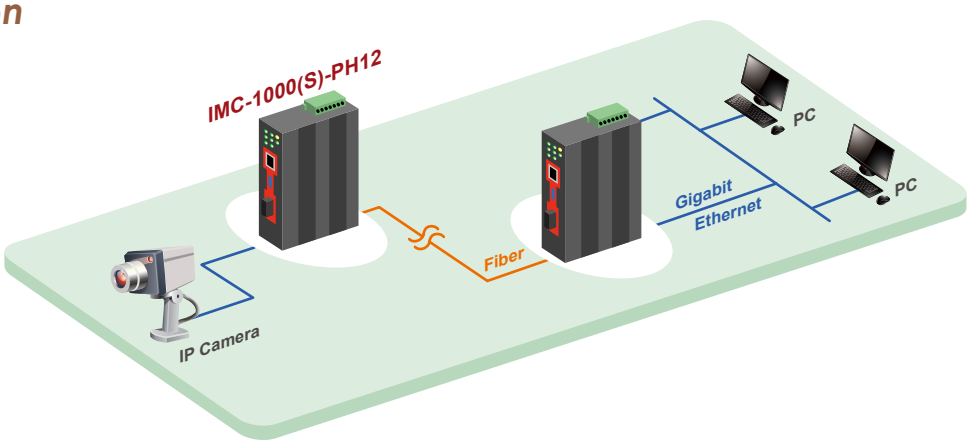
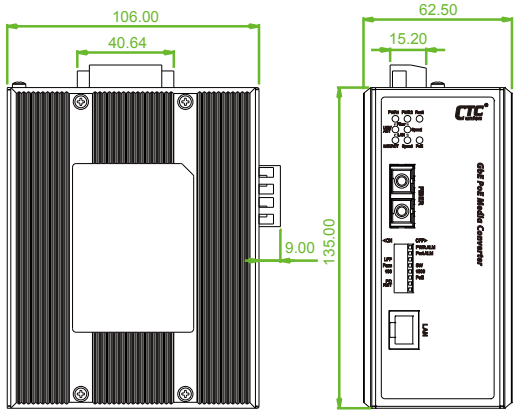


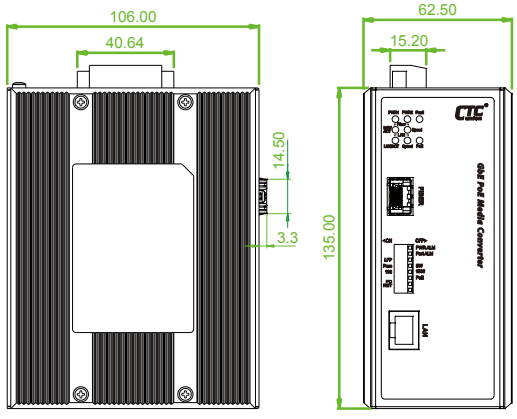
Figure : IMC-1000(S)-PH12 Industrial PoE Transmission

Dimensions

IMC-1000-PH12

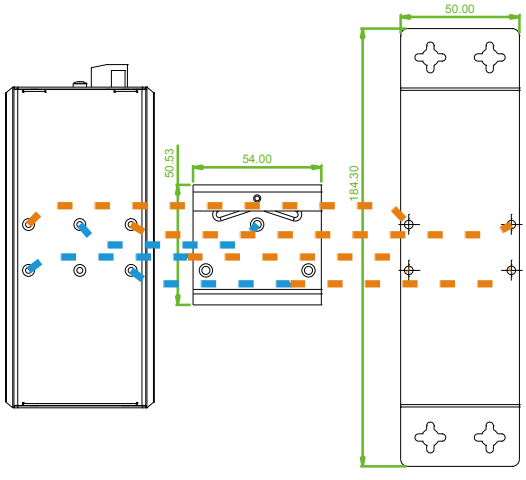


IMC-1000S-PH12



Side View

Front View



Rear View

DIN-Rail Kit View

Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber	PoE Port		Input Voltage (Boost)	Certification				Operating Temperture
	10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE802.3at (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-1000-PH12	1	1 SC	1	30W	12/24/48VDC	V	V	V	V	-10~60℃
IMC-1000-PHE12	1	1 SC	1	30W	12/24/48VDC	V	V	V	V	-20~75℃
IMC-1000S-PH12	1	1 SFP	1	30W	12/24/48VDC	V	V	V	V	-10~60℃
IMC-1000S-PHE12	1	1 SFP	1	30W	12/24/48VDC	V	V	V	V	-20~75℃

Model Naming Rule

IMC – 1000 – S – PH – E12

- IMC: Industrial Media Converter
- 1000: 1000Base-X Converter
- S: SFP type; Blank: Fix fiber type
- PH: 1x High Power PoE
- E12: 12V Booster-20~75℃; 12: 12V Booster-10~60℃

Fiber Connector Type	Connectivity Distance
SC (IMC-1000-PH12 & IMC-1000-PHE12 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)

Temperature / Connector Type / Connectivity Distance

IMC-1000 –PH □12 - □□□□□

Example: IMC-1000 – PHE12 – SC001

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M – 7 – 040 – 31 – E

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- Distance: 002(2km); 020(20km),040(40km)
- Wavelength: 00: Copper; 85: 850nm; 31: 1310nm; 55: 1550nm; WA: TX 1310/RX 1550 (Bidi Mode A); WB: TX 1550/RX 1310 (Bidi Mode B)
- E: -40~85℃; Blank: 0~70℃

30 Watts,
12V Booster

IMC-100-PH12

10/100Base-TX to 100Base-FX with PoE + (PSE) Fiber Converter

CE FC EN50121-4 EN61000-6-2 EN61000-6-4 PoE Regulated

IMC-100-PH12 is a family of non-managed Ethernet media converters that support conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet and as PSE (Power Source Equipment) provide PoE+ power over Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these converters are designed for harsh environments, 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

- Conversion between 10/100Base-TX and 100Base-FX SC or ST Fiber interface
- 12/24/48VDC (9.6~57VDC) redundant dual input power with built-in very high efficiency booster (98~99%) to rise up 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- 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 (IMC-100-PHE12)
- CE, FCC, Railway traffic EN50121-4 certification
- Industrial grade EMS,EMI EN61000-6-2, EN61000-6-4 certification
- Supports Jumbo frame 9K bytes packet

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3x Flow Control and Back pressure
	IEEE802.3at Power over Ethernet+, PoE+
	IEEE802.3af Power over Ethernet, PoE
	IEEE802.1q Tag VLAN
RJ45 Ports	10/100Base-TX
Fiber Ports	100Base-FX with SC or ST connector
Data Process Architecture	Store and Forward mode or Pass Through mode (Set by DIP SW)
Jumbo Frame	9K bytes
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
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
	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
Fiber Connector	Fiber: SC / ST (Multi-mode, 2KM), SC / ST (Single-mode, 30KM, 50KM)
RJ45 Connector and Pin Assignment	RJ-45 Socket: CAT-3/5 (10/100Mbps) Twisted Pair cable Auto MDI/MDI-X and Auto-Negotiation Function Support 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)

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 :Green : 100 Base- X RJ-45 Port: Speed: 10 (OFF), 100 (Green) LNK/ACT for RJ45(Green): ON: Connected to network OFF: Not connected to network BLK: Networking is active PoE States (Green) Flash: PoE Fault (Over-load or short) ON: PoE normal working, OFF : PoE No Power output
Reverse Polarity Protection	Present for Power Input
Overload Current Protection	Present
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
Power Consumption	See table below
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 Humidity	5%~95% (Non-condensing)
Operating Temperature	-10°C~60°C (IMC-100-PH12) -20°C~75°C (IMC-100-PHE12)
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	655g
Installation	DIN Rail mounting or wall mounting
MTBF	419,822hrs
Warranty	5 years

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
12VDC	34W	3.5W	30W	98.4%
24VDC	34.4W	4.1W	30W	99.0%
48VDC	34.9W	4.3W	30W	98.0%

Certifications	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN 55022 Class A
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 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
Safety	UL60950-1 (pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

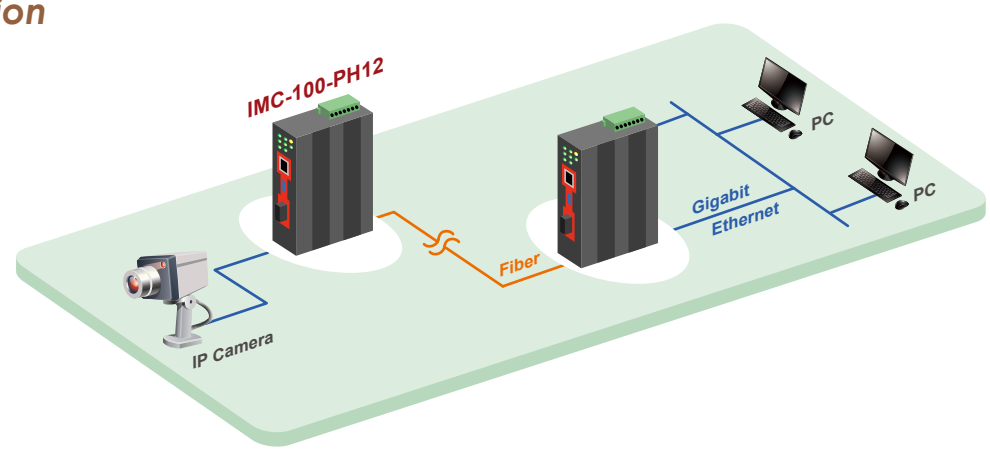
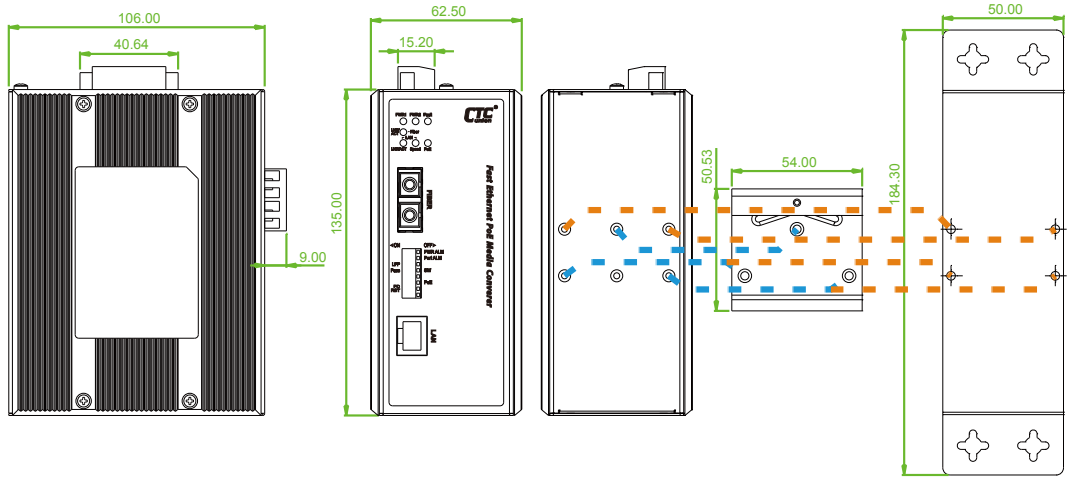


Figure : IMC-100-PH12 Industrial PoE Transmission

Dimensions



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	UTP	Fiber	PoE Port		Input Voltage (Boost)	Certification				Operating Temperture
	10/100 Base-TX	100Base-FX	IEEE802.3at (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
IMC-100-PH12	1	1 SC/ST	1	30W	12/24/48VDC	V	V	V	V	-10~60 C
IMC-100-PHE12	1	1 SC/ST	1	30W	12/24/48VDC	V	V	V	V	-20~75 C

Model Naming Rule

IMC – 100 – PH – E12

- IMC: Industrial Media Converter
- 100: 100Base Converter
- PH: 1x High Power PoE
- E12: 12V Booster-20~75°C
  12: 12V Booster-10~60°C

Fiber 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)

Temperature | Connector Type | Connectivity Distance

IMC-100 –PH □12 - □□□□□

Example: IMC-100 – PHE12 – SC002

LISTED EN50121-4 EN61000-6-2 EN61000-6-4

IMC-100-PD

10/100Base-TX to 100Base-FX Fiber Converter with PoE PD

IMC-100-PD are industrial media converters designed for conversion between electrical 10/100Base-TX and optical 100Base-FX transmission medium, which also provide PoE (Power over Ethernet) PD (Power Device) function. Simple DIP switch settings allow configuring the UTP port for auto-negotiation or for forced 10/100 speed and half/full duplex as well as for enabling LFPT (Link Fault pass through), Ethernet Flow Control (802.3x) and selecting Switch Mode (store & forward) or Converter Mode (Pass-through). Industrial designed converters feature rugged design with metal housings for DIN Rail mounting, highly reliable electrical design to support very long MTBF (mean time between failure), enhanced safety and surge protection, better EMS (Electro Magnetic Susceptibility), as well as expanded operating temperature ranges.

Features

- Redundant dual DC input power 12/24/48VDC (9.6~58VDC) with additional power input capability via PoE
- Complies with 802.3af PoE/PD standard
- IP30 rugged metal housing
- Wide operating temperature -40 ~75°C (IMC-100-PDE)
- UL60950-1, CE, FCC, Rail traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Store-and-Forward mode and Pass-through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface
- Provides a 6 Pole DIP-Switch to set functions

Specifications

Standard	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX/100BASE-FX
	IEEE 802.3x Flow Control and Back pressure
	IEEE 802.3af PoE (Power Device PD)
RJ45 Ports	10/100Base-TX
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
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
	DIP Switch: ON: Enables LFPT(Link Fault Pass through) OFF: Disables LFPT(Link Fault Pass through)
	DIP Switch: ON: Flow Control Enable OFF: Flow Control Disable
	DIP Switch: 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-3/5 (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Support
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: Fiber and 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
	PoE (Green) : ON: PSE Connect OFF: PSE Disconnect

Reserve Polarity Protection	Present
Overload Current Protection	Present
Power Supply	12/24/48VDC(9.6~58VDC), Redundant power with polarity reverse protect function and removable terminal block
	Provide DC Power JACK adapter cable for external power adapter
	Supports IEEE 802.3af Power over Ethernet (PoE) Power Device (PD)
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 Redundant power, Alarm relay contact
Power Consumption	2.9 W
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-10 ~ 60°C (IMC-100-PD), -40 ~ 75°C (IMC-100-PDE)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142mm (D X W X H)
Weight	0.63 kg
Installation Mounting	DIN Rail mounting and Wall Mounting
Certifications	
EMI	FCC Part 15 Subpart B Class A
	EN 55022 Class A
	EN 61000-6-4 – Emission for industrial environment
EMS	EN 61000-6-2 – Immunity for Industrial environment
	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 (Magnetic Field) Level 3, Criteria A
Safety	UL60950-1
Rail traffic	EN50121-4
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6 (Operating, Packing)
MTBF	755,114 Hrs
Warranty	5 years

Application

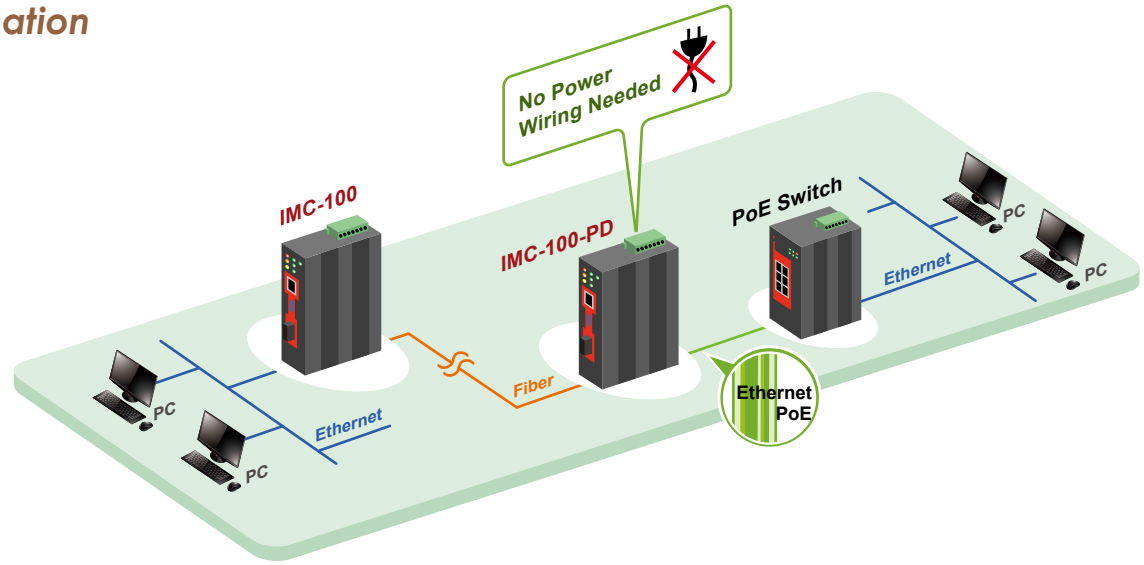
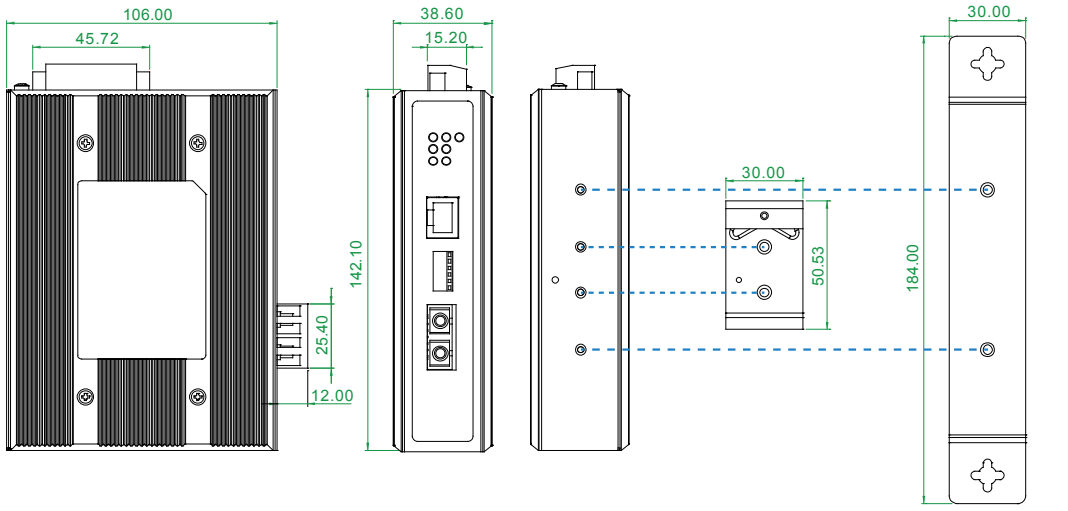


Figure : IMC-100-PD Industrial PoE Transmission

Dimensions



Ordering Information

Model Name	Description
IMC-100-PD	10/100-TX to 100-FX Fiber Converter with PoE PD ; Temperature Range : -10 ~ 60°C
IMC-100-PDE	10/100-TX to 100-FX Fiber Converter with PoE PD ; Temperature Range : -40 ~ 75°C

Fiber 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)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70°C

Temperature / Connector Type / Connectivity Distance

IMC-100-PD □ – □□□□□

Example: IMC-100-PDE – SC002

30 Watts, 12V Booster

CE FC EN50121-4 EN61000-6-2 EN61000-6-4 SmartView PoE Regulated

IMC-1000M-PH12

10/100/1000Base-T to 100/1000Base-FX/SX/LX with PoE + (PSE) Managed Fiber Converter

IMC-1000MS-PH12

10/100/1000Base-T to 100/1000Base-X SFP with PoE + (PSE) Managed Fiber Converter

IMC-1000M(S)-PH12 is a 10/100/1000Base-T to 100/1000Base-X Gigabit Ethernet Media converter which not only offers dual-speed fixed fiber transceiver and SFP cage module options for the optical interface, but also injects PoE+ power through the electrical RJ-45 port. Housed in rugged DIN rail or wall mountable enclosures, IMC-1000M(S)-PH12 converters are designed for harsh environments, such as IP surveillance, industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

IMC-1000M(S)-PH12 also provides many advanced L2 functions (VLAN, storm filter, ingress/egress bandwidth control, etc.) and can be managed via easy-to-use GUI or standard SNMP manager such as CTC SarmtView. With built-in OAM (Operation, Administration, Maintenance & Provisioning) functions such as loop-back test and dying gasp, IMC-1000M(S)-PH12 can be monitored from a centrally located OAM-enabled FRM220-1000MS via remote in-band management which helps to reduces operational expenditures by keeping truck rolls to a minimum.

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 port
- 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
- Constant and regulated PoE output voltage at 55VDC
- Provides IEEE802.3at PoE output (30W)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C (IMC-1000M-PHE12, IMC-1000MS-PHE12)
- CE, FCC, Railway traffic EN50121-4 certification
- Industrial grade EMS, EMI EN61000-6-2, EN61000-6-4 certification
- Supports Jumbo frame 9K bytes packet
- Ingress/Egress bandwidth control with 64K granularity
- PoE configuration and monitor
- Auto Laser Shutdown (ALS)
- Supports LFPT (Link Fault Pass Through)
- Supports Digital Diagnostic Monitor Interface (DDMI) for SFP
- Supports 16 IEEE802.1Q Tag VLAN Group
- MIB counters
- SNMP alarm trap for power loss and port link down
- Web based and SNMP for management (Figure 1, 3)
- Remote Loop-Back test
- Supports in-band management from FRM220 Chassis With FRM220-1000MS (Figure 2)
- Supports SmartView for centralized management

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3ab 1000Base-T Gbit/s Ethernet over twisted pair
	IEEE802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE802.3x Flow Control and Back pressure
	IEEE802.3at Power over Ethernet+, PoE+
	IEEE802.3af Power over Ethernet, PoE
	IEEE802.1q Tag VLAN
Fiber Ports	100/1000Base-FX/SX/LX, 100M /1000M Speed set by Web (IMC-1000M-PH12, IMC-1000M-PHE12)
	SFP slot for 100Base-X or 1000Base-X, 100M/1000M speed set by Web (IMC-1000MS-PH12, IMC-1000MS-PHE12)
RJ45 Ports	10/100/1000Base-T
Push Button	Reset, Load default setting
Data Process Architecture	Pass through mode
Jumbo Frame	9K bytes
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: 500M (Multi-mode SX), 20KM (Single-mode), 40KM (Single-mode) (IMC-1000M-PH12, IMC-1000M-PHE12)
	SFP, Distance depending on plugged-in Fiber Tranceiver (IMC-1000MS-PH12 , IMC-1000MS-PHE12)
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

Connector and Pin Assignment	Fiber: SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000M-PH12, IMC-1000M-PHE12) SFP Slot (IMC-1000MS-PH12, IMC-1000MS-PHE12)
	RJ-45 Socket: CAT-3/5 (10/100/1000Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Support
	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 Status (Green): Flash : PoE Fault (Over-load or short), ON : PoE normal working, OFF : PoE No Power output
Reverse Polarity Protection	Present for Power Input
Overload Current Protection	Present
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 Humidity	5%~95% (Non-condensing)
Operating Temperature	-10°C~60°C (IMC-1000M-PH12, IMC-1000MS-PH12)
	-20°C~75°C (IMC-1000M-PHE12, IMC-1000MS-PHE12)

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	655g (IMC-1000M-PH12, IMC-1000M-PHE12) 650g (IMC-1000MS-PH12, IMC-1000MS-PHE12)
Installation	DIN Rail mounting or wall mounting
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
Power Consumption	IMC-1000M-PH12 & IMC-1000M-PHE12

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
12VDC	34.4W	3.9W	30W	98.4%
24VDC	34.9W	4.5W	30W	98.7%
48VDC	35.4W	4.7W	30W	97.7%

IMC-1000MS-PH12 & IMC-1000MS-PHE12

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	401235 (IMC-1000M-PH12, IMC-1000M-PHE12) 331689 (IMC-1000MS-PH12, IMC-1000MS-PHE12) MIL-HDBK-217
Warranty	5 years
Certifications	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN 55022 Class A
Rail Way 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 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
Safety	UL60950-1 (pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

SNMP or Web Mode (figure 1, 3)	
Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports DHCP client for automatic IP configuration
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuation	IP configuration, password setting, converter configuration
	port configuration, MIB counter, SNMP configuration
	VLAN group configuration, alarm configuration
	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
	PoE Status

In-Band Remote mode (Figure 2)	
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, PoE Configuration
Diagnostic & Monitor	Remote loop-back test
	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter
	PoE Status

Application

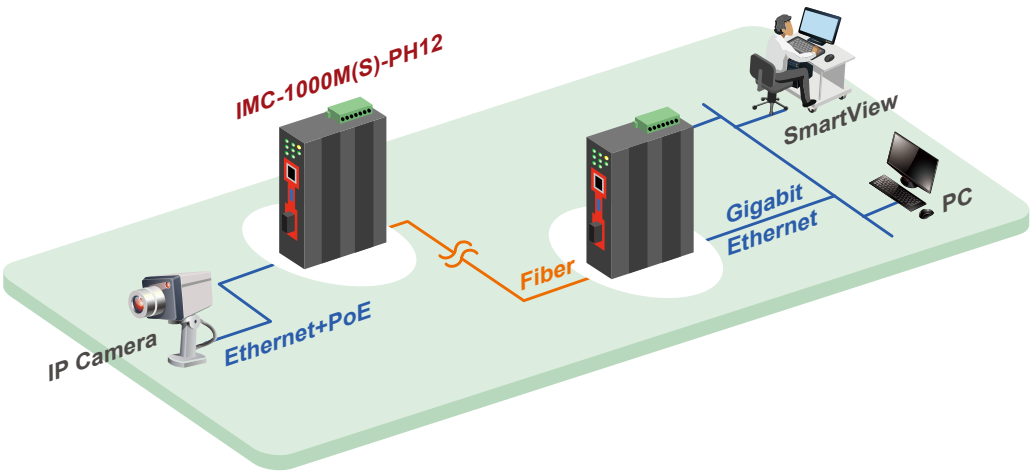


Figure 1 : IMC-1000M(S)-PH12 Management by SNMP, SmartView

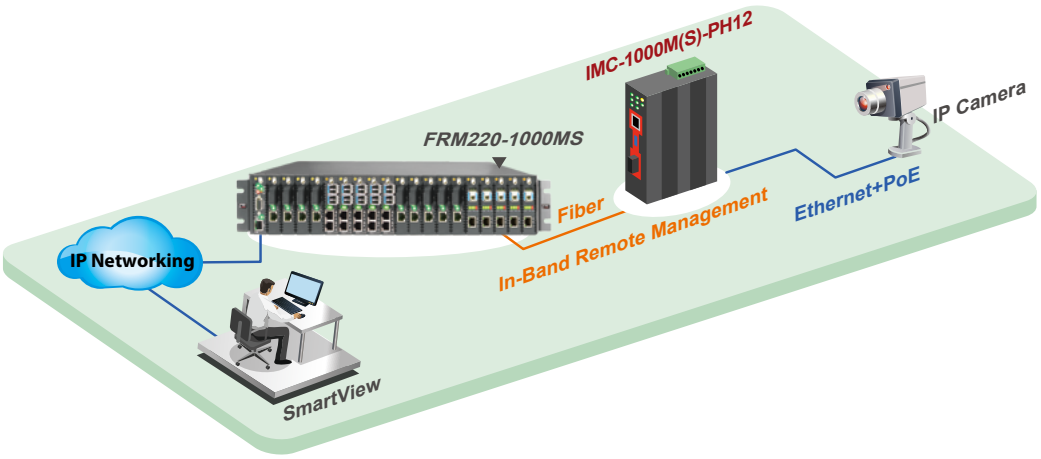


Figure 2 : IMC-1000M(S)-PH12 Application in Remote, In-Band Managment

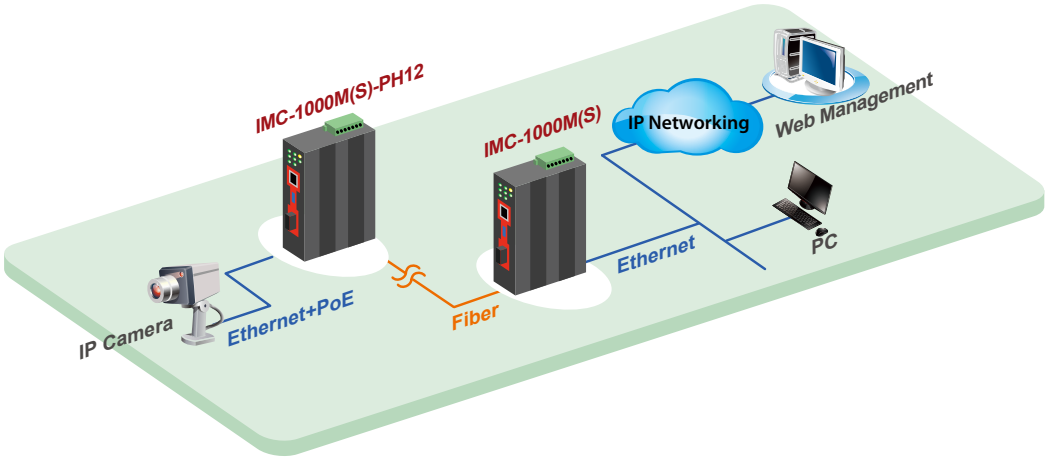
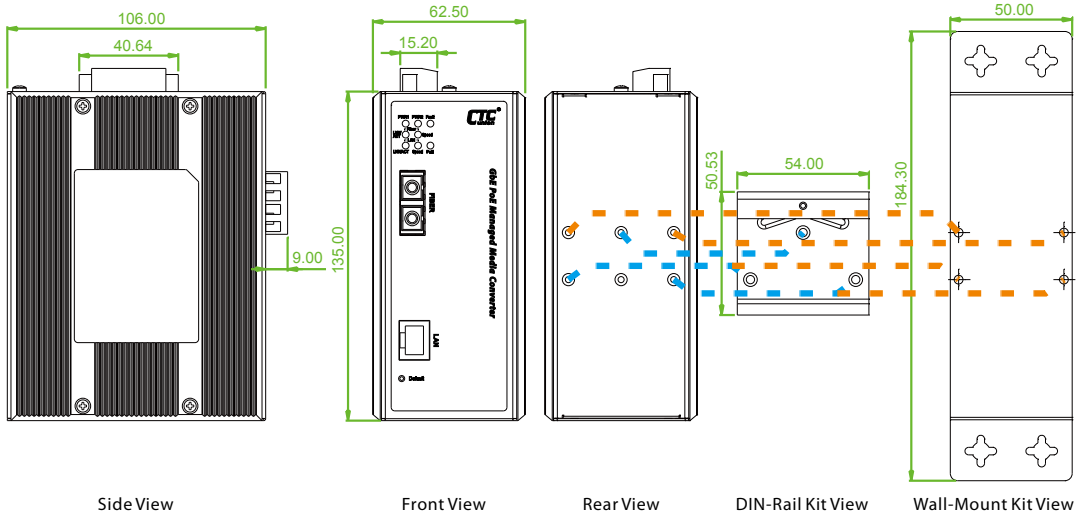


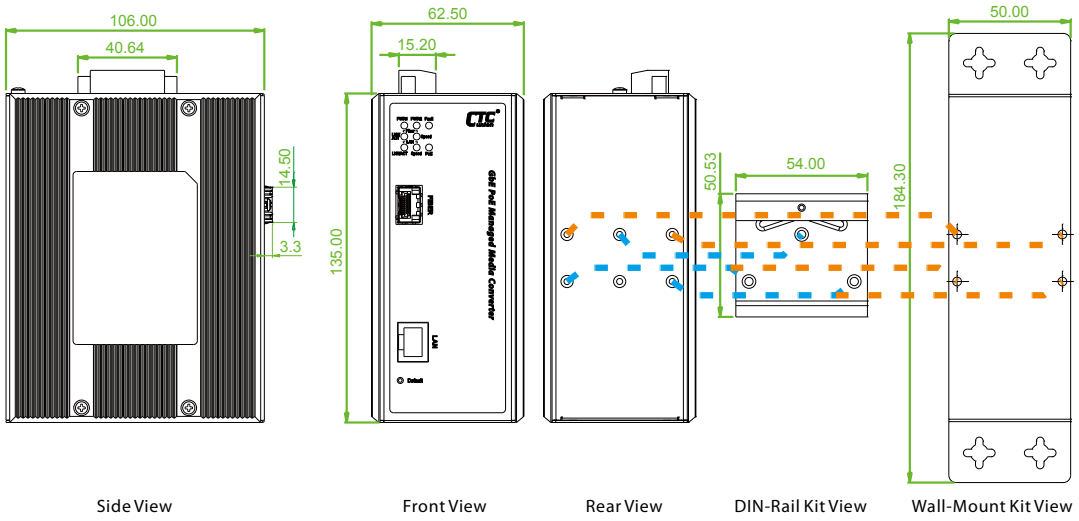
Figure 3 : IMC-1000M(S)-PH12 Application in Web Management

Dimensions

IMC-1000M-PH12



IMC-1000MS-PH12



Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View

Ordering Information

Model Name	Managed	UTP	Fiber	PoE Port		Input Voltage (Boost)	Certification			Operating Temperture
		10/100/1000 Base-T	Dual Speed 100/1000Base-X	IEEE802.3at (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IMC-1000M-PH12	V	1	1 SC	1	30W	12/24/48VDC	V	V	V	-10~60°C
IMC-1000M-PHE12	V	1	1 SC	1	30W	12/24/48VDC	V	V	V	-20~75°C
IMC-1000MS-PH12	V	1	1 SFP	1	30W	12/24/48VDC	V	V	V	-10~60°C
IMC-1000MS-PHE12	V	1	1 SFP	1	30W	12/24/48VDC	V	V	V	-20~75°C

Model Naming Rule

IMC – 1000 M S – PH E12

- E12: 12V Booster-20~75°C
  12: 12V Booster-10~60°C

- IMC: Industrial Media Converter
- 1000: 1000Base-X Converter
- M: Managed
- S: SFP type
  Blank: Fix fiber type
- PH: 1x High Power PoE

Fiber Connector Type	Connectivity Distance
SC (IMC-1000M-PH12 & IMC-1000M-PHE12 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)

Temperature | Connector Type | Connectivity Distance

IMC-1000M –PH □ 12 – □□□□

Example: IMC-1000M – PHE12 – SC001

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M 7 040 – 31 – E

- E:-40~85°C
  Blank:0~70°C

- ISFP: Industrial SFP Transceiver
- M: Multi Mode
  S: Single Mode
  T: Copper
- 7: GbE
  5: FE
- Distance
  002(2km)
  020(20km),040(40km)
- Wavelength
  00: Copper
  85: 850nm
  31: 1310nm
  55: 1550nm
  WA: TX 1310/RX 1550 (Bidi Mode A)
  WB: TX 1550/RX 1310 (Bidi Mode B)

30 Watts,
12V Booster

IMC-100M-PH12

10/100Base-TX to 100Base-FX with PoE + PSE Managed Fiber Converter

IMC-100M-PH12 is a 10/100Base-TX to 100Base-FX Ethernet Media converter which not only offers 100M fixed fiber transceiver for the optical interface, but also injects PoE+ power through the electrical RJ-45 port. Housed in rugged DIN rail or wall mountable enclosures, IMC-100M-PH12 converters are designed for harsh environments, such as IP surveillance, industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. IMC-100M-PH12 also provides many advanced L2 functions (VLAN, storm filter, ingress/egress bandwidth control, etc.) and can be managed via easy-to-use GUI or standard SNMP manager such as CTC SarmtView. With built-in OAM (Operation, Administration, Maintenance & Provisioning) functions such as loop-back test and dying gasp, IMC-100M-PH12 can be monitored from a centrally located OAM-enabled FRM220-1000MS via remote in-band management which helps to reduces operational expenditures by keeping truck rolls to a minimum.

Features

- Conversion between 10/100Base-TX and 100Base-FX fiber cable interface
- 12/24/48VDC (9.6~57VDC) redundant dual input power with built-in very high efficiency booster(97~98%) to rise up 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- Provides IEEE802.3at PoE output (30W)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C (IMC-100M-PHE12)
- CE, FCC, Railway traffic EN50121-4 certification
- Industrial grade EMS, EMI EN61000-6-2, EN61000-6-4 certification
- Supports Jumbo frame 9K bytes packet
- Ingress/Egress bandwidth control with 64K granularity
- PoE configuration and monitor
- Auto Laser Shutdown (ALS)
- Supports LFPT (Link Fault Pass Through)
- Supports Digital Diagnostic Monitor Interface (DDMI) for SFP
- Supports 16 IEEE802.1Q Tag VLAN Group
- MIB counters
- SNMP alarm trap for power loss and port link down
- Web based and SNMP for management (Figure 1, 3)
- Remote Loop-Back test
- Supports in-band management from FRM220 Chassis With FRM220-1000MS (Figure 2)
- Supports SmartView for centralized management

Specifications

Standard	IEEE802.3 10Base-T 10Mbit/s Ethernet
	IEEE802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE802.3x Flow Control and Back pressure
	IEEE802.3at Power over Ethernet+, PoE+
	IEEE802.3af Power over Ethernet, PoE
	IEEE802.1q Tag VLAN
Fiber Ports	100Base-FX , 100M Speed
RJ45 Ports	10/100Base-TX
Push Button	Reset, Load default setting
Data Process Architecture	Pass through mode
Jumbo Frame	9K bytes
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 ,50KM(Single-mode) ,20KM (WDM Bidi)
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
Connector and Pin Assignment	Fiber: SC/ST (Multi-mode, 2km), SC/ST (Single-mode, 30km, 50km)
	RJ-45 Socket: CAT-3/5 (10/100Mbps) Twisted Pair cable
	Auto MDI/MDI-X and Auto-Negotiation Function Support
	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)

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: Green : 100Base-X
	RJ-45 port: Speed: 10 (OFF), 100 (Green)
	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	Present for Power Input
Overload Current Protection	Present
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 Humidity	5%~95% (Non-condensing)
Operating Temperature	-10°C~60°C (IMC-100M-PH12) -20°C~75°C (IMC-100M-PHE12)
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	655g
Installation	DIN Rail mounting or wall mounting
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

Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
	12VDC	34.4W	3.9W	30W	98.4%
	24VDC	34.9W	4.5W	30W	98.7%
	48VDC	35.4W	4.7W	30W	97.7%
MTBF	410,235 Hrs (IMC-100M-PH12, IMC-100M-PHE12)				
Warranty	5 years				
Certifications					
EMC	CE				
EMI	FCC Part 15 Subpart B Class A, CE EN 55022 Class A				
Rail Way 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 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
Safety	UL60950-1 (pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

SNMP or Web Mode (figure 1, 3)	
Management	Ingress/Egress bandwidth control with 64K granularity
	Web management, Firmware upgrade via Web
	Supports SNMP, MIB for management
	Supports DHCP client for automatic IP configuration
	Supports 802.1Q tag VLAN, 16 Tag VLAN group, MIB counters display
Configuation	IP configuration, password setting, converter configuration
	port configuration, MIB counter, SNMP configuration
	VLAN group configuration, alarm configuration
	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
	PoE Status

In-Band Remote mode (Figure 2)	
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, PoE Configuration
Diagnostic & Monitor	Remote loop-back test
	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter
	PoE Status

Application

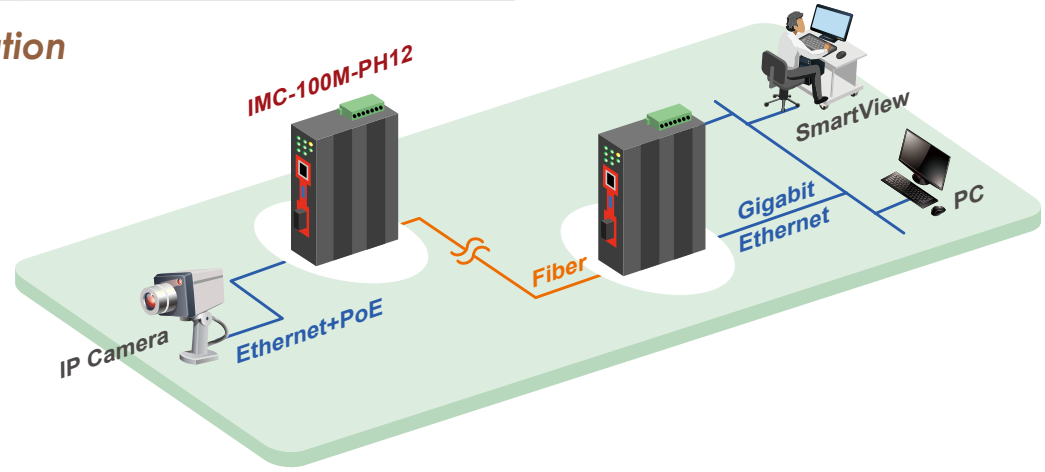


Figure 1 : IMC-100M-PH12 Management by SNMP, SmartView

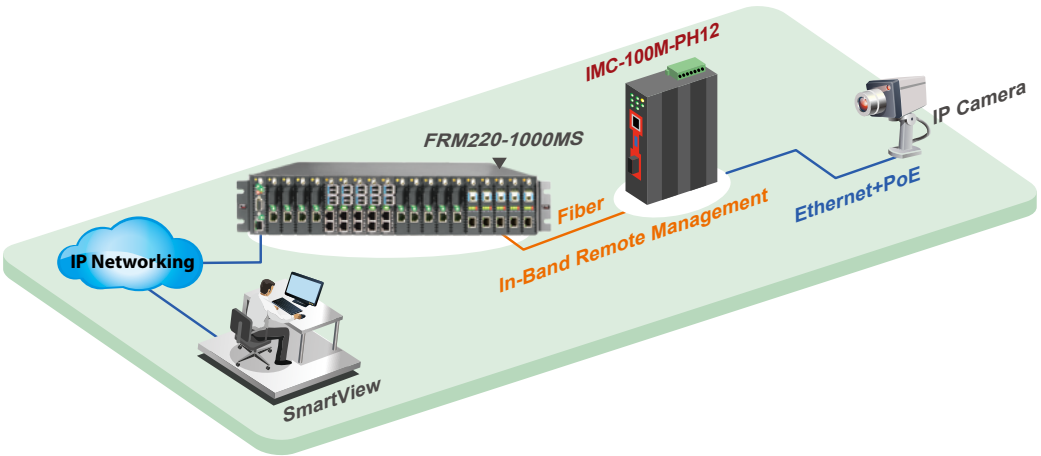


Figure 2 : IMC-100M-PH12 Application in Remote, In-Band Managment

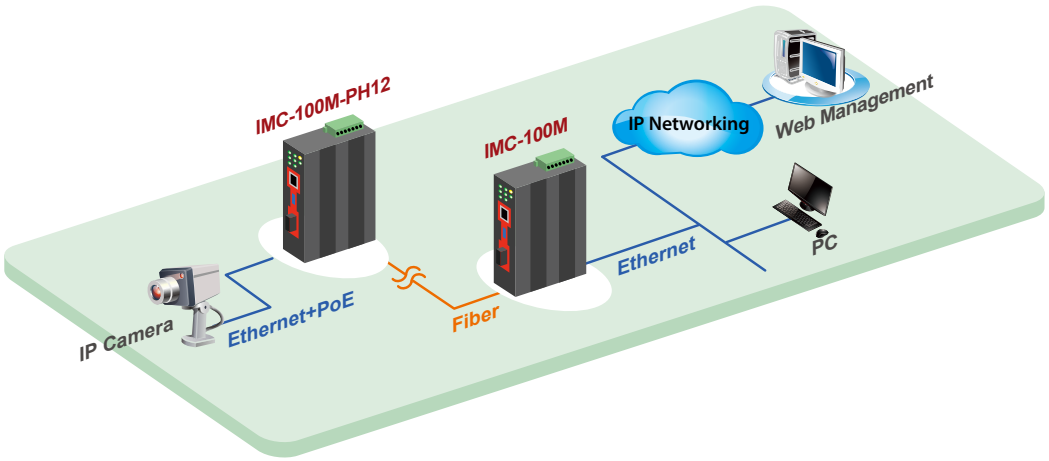
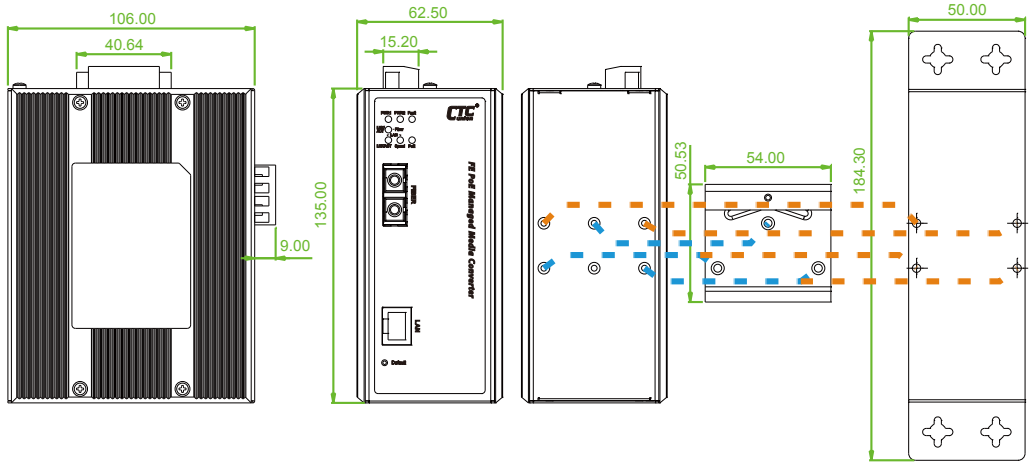


Figure 3 : IMC-100M-PH12 Application in Web Management

Dimensions



Ordering Information

Model Name	Managed	UTP	Fiber	PoE Port		Input Voltage (Boost)	Certification			Operating Temperture
		10/100 Base-TX	100Base-FX	IEEE802.3at (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
IMC-100M-PH12	V	1	1 SC	1	30W	12/24/48VDC	V	V	V	-10~60 C
IMC-100M-PHE12	V	1	1 SC	1	30W	12/24/48VDC	V	V	V	-20~75 C

Model Naming Rule

IMC – 100 – M – PH – E12

- IMC: Industrial Media Converter
- 100: 100Base Converter
- M: Managed
- PH: 1x High Power PoE
- E12: 12V Booster-20~75°C
- 12: 12V Booster-10~60°C

Fiber Connector Type	Connectivity Distance
SC	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)

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70°C

Temperature / Connector Type / Connectivity Distance

IMC-100M -PH □ 12 - □□□□□

Example: IMC-100M -PHE12 - SC002

NEW

Up to 1.2KM

IEXT224-4PH
IEXT204-4PH

Long Reach PoE Extenders

(Phone line and Coaxial cable)

CE FC EN50121-4

IEXT224-4PH & IEXT204-4PH series are intended to extend the reach of Ethernet Data and IEEE 802.3at Power over Ethernet beyond its natural limitations of 100 m for the network infrastructure. The solution works in pairs for point-to-point connectivity. The unit at the local site can transmit data and power over a single pair of telephone grade UTP wire or Coaxial cable up to 1,200 m. The unit at the remote side provides four 10/100Base-TX IEEE 802.3at PoE ports for total power budget of 30W that can receive power supply from the local unit when power is unavailable at the remote side.

These products are particularly designed for harsh environments, such as industrial networking, traffic surveillance, security automation applications, IP surveillance, city security, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

Features

- Long transmission data and power feeding distance up to 1200 meter
- Complies to IEEEE 802.3at PoE
- Simultaneous transmission of Ethernet data and PoE Power over Phone line wire or coaxial cable
- Centralized management of power supply
- Eliminated the need for power supply at remote sites
- Easy cabling for quick installation
- Quick deployment and easy maintenance.
- Flexible and efficient power management
- Dip Switch to option the remote unit that can be powered by remote-side power or local power.
- Display data rate by LED
- Display real power loading by LED

Specifications

Hardware Interfaces	**Standard**	
	IEEE802.3	10Base-T
	IEEE802.3u	100Base-TX
	IEEE802.3af	PoE
	IEEE802.3af	PoE+
	ITU-T G.993.2	VDSL2
Power over Copper PoE Extender with 4x 10/100Base-TX IEEE 802.3at PoE Ports		
Network Connector	Terminal Block for Copper Port BNC Female for Coaxial Port (IEXT204-4PH24) 4 x RJ-45 10/100Base-TX IEEE 802.3at PoE Port	
Dip Switch	SW 1: Selectable Asy (30a) or Sym(17a) (VDSL2 Profile)	
	SW 2 : Selectable target SNR margin 6dB or 9dB	
	SW 3 : Selectable Remote Power: ON: Feeding power by remote power (See Figure 1) OFF: Feeding power by local power (See Figure 2)	
Performance	Phone line distance vs Rate and Power	

Distance	Line Rate	Total PoE power (Watt) (Remote power mode)
300m	100Mbps	30W
600m	65Mbps	15W
700m	50Mbps	10W
800m	45Mbps	7W
1000m	35Mbps	5W

(Power over Copper, 24AWG copper wire)

LED	Active: System Status
	Local PWR : Local Power mode (See Figure 2)
	Remote PWR: Remote Power (See Figure 1)
LED	PoE: PoE Port Status for per PoE Port
	PoE Output: 5/15/30 Watts (Display total PoE loading) (Remote power mode)
	Line Speed: Link/20/40/60/80/100 Mbps
Standards Support	VDSL2 ITU-T G.993.2
	VDSL2 Profiles: 17a and 30a
Protocol Support	Transparent bridging to higher layer protocols
Dimension	106 x 62.5 x 135mm (D x W x H)
Operating Environment	Operating Temperature: -40°C to 75°C
	Storage Temperature: -40°C to 85°C
	Humidity: 10% - 95% (non-condensing)
Physical/Electrical	Hardened aluminum case, IP30
	Dimensions: 62 x 135 x 106.5 mm
	Input Voltage: 40 to 60 VDC
	Power Consumption: 65 Watts maximum
	Installation: DIN-Rail, Panel Rack Mounting
	Over current protection
	Automatic short protection
Warranty	5 Years
Certification	
EMS	CE, FCC
Railway Traffic	EN50121-4
Safety	EN60950-1
Shock	IEC60068-2-27
Freefall	IEC60068-2-32
Vibration	IEC60068-2-6

Application

Figure 1 : When Remote Power Active

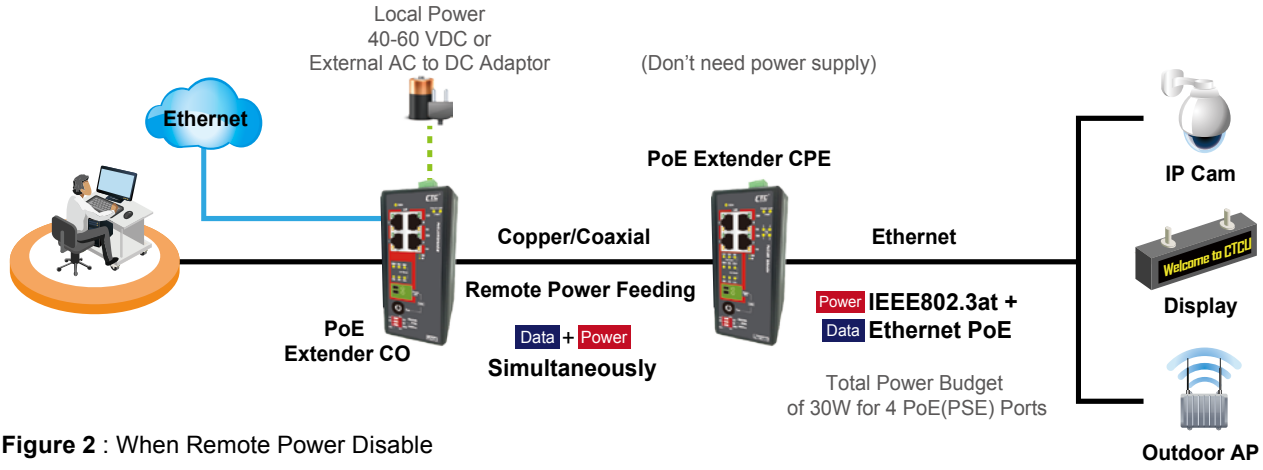
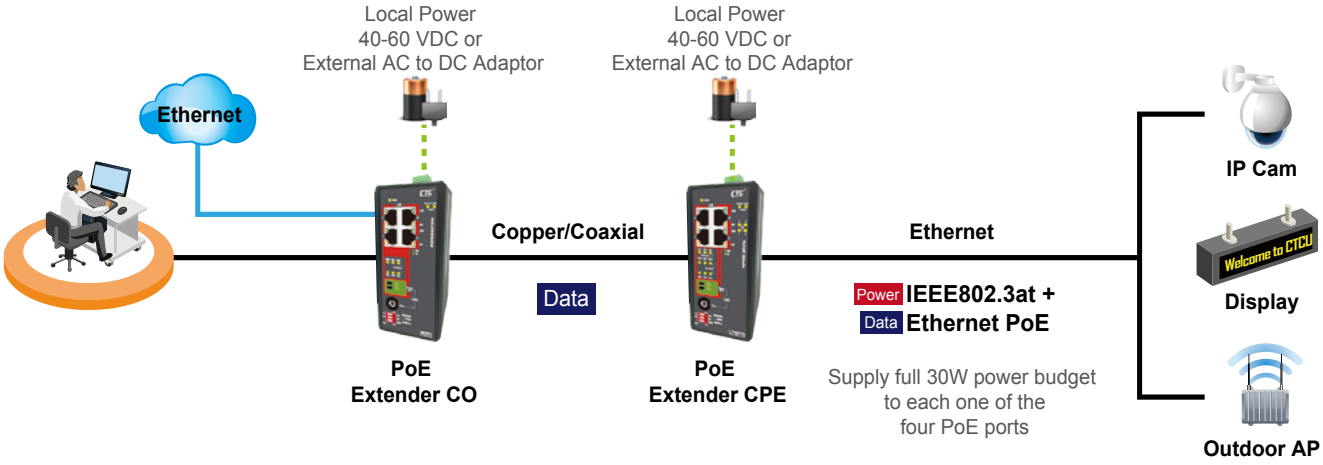
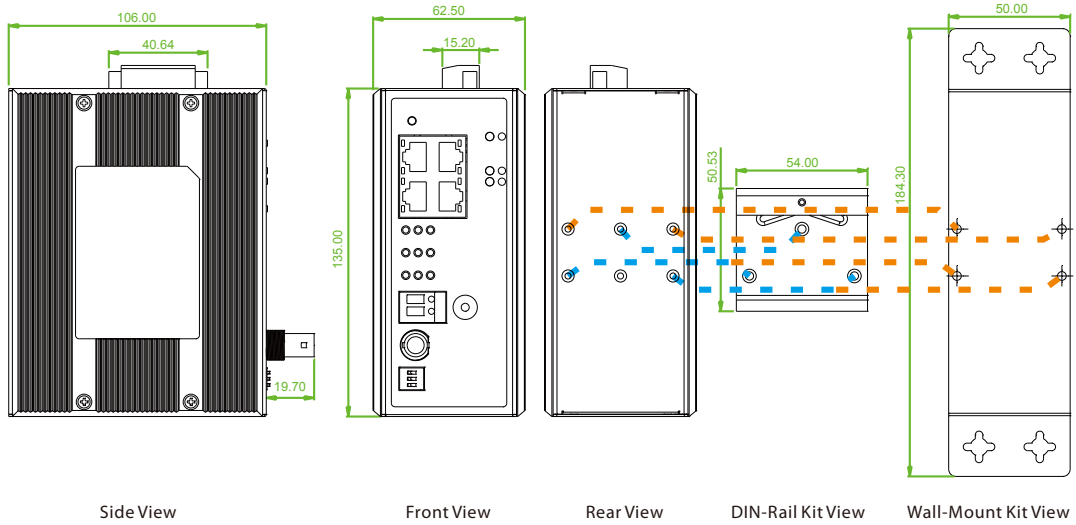


Figure 2 : When Remote Power Disable



Dimensions



Ordering Information

Model Name	Description
IEXT224-4PH	Industrial LAN Extender with 4 Ports PoE (1.2km, Phone line or Coaxial)
IEXT204-4PH	Industrial LAN Extender with 4 Ports PoE (1.2km, Phone line)

24V Booster

INJ-IG60-24

Gigabit Ethernet PoE + Injector
IEEE802.3at/af, 15.4/30/36/60/72W

CE FC EN50121-4 EN61000-6-2 EN61000-6-4 PoE Regulated

INJ-IG60-24 is an industrial grade, single port, gigabit Ethernet PoE (Power over Ethernet) injector. PoE technology describes a system to pass electrical power safely, along with data, on Ethernet cabling. The original IEEE 802.3af-2003 PoE standard provides up to 15.4 W of DC power to each device. The updated IEEE 802.3at-2009 PoE standard also known as PoE+ or PoE plus, provides up to 30 W of power. Additionally, INJ-IG60-24 can provide up to 36/60/72W through the non-standard use of all 4 pairs of category 5 cable. 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 1 port IEEE802.3at/af PoE Injector
- Power output 15.4W, 30W, 36W, 60W, 72W select by DIP SW
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster (94~96%) to rise up 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- 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)
- UL60950-1, CE, FCC, Railway traffic EN50121-4 certification
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 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	IEEE802.3at, IEEE802,3af
PoE RJ-45 Pin Assignment	RJ-45 support 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	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	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)
	4/2 Pairs (Green) ON: 4 Pairs PoE Power output for 60W PoE OFF: 2 Pairs PoE Power output
DIP SW	SW1 Reserved 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/72W PoE Output OFF: 2 Pair PoE Pin depand on DIP SW 1,2 SW4 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)
Reserve Polarity Protection	Present
Overload Current Protection	Present

Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)
	Built-in very high efficiency booster(97~99%) to rise up 55 VDC for PoE output
PoE Power Output	Maximum Ultra High Power 60W, IEEE802.3at 30W, IEEE802.3at High power 36W, IEEE802.3af 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
24VDC	33W	1.4W	30W	94.90%
48VDC	33.2	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
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	Provide 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 and Wall Mounting
MTBF	763,725Hrs
Warranty	5 years

Certification	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN55022 Class A
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
Safety	UL60950-1 (pending)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Application

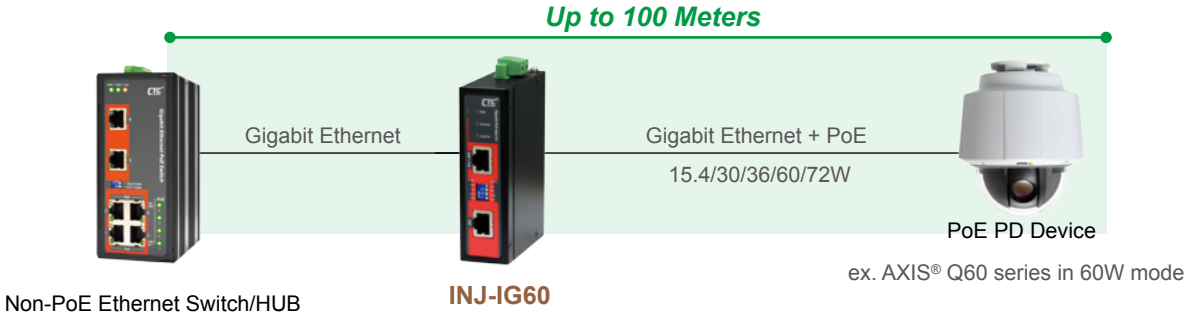
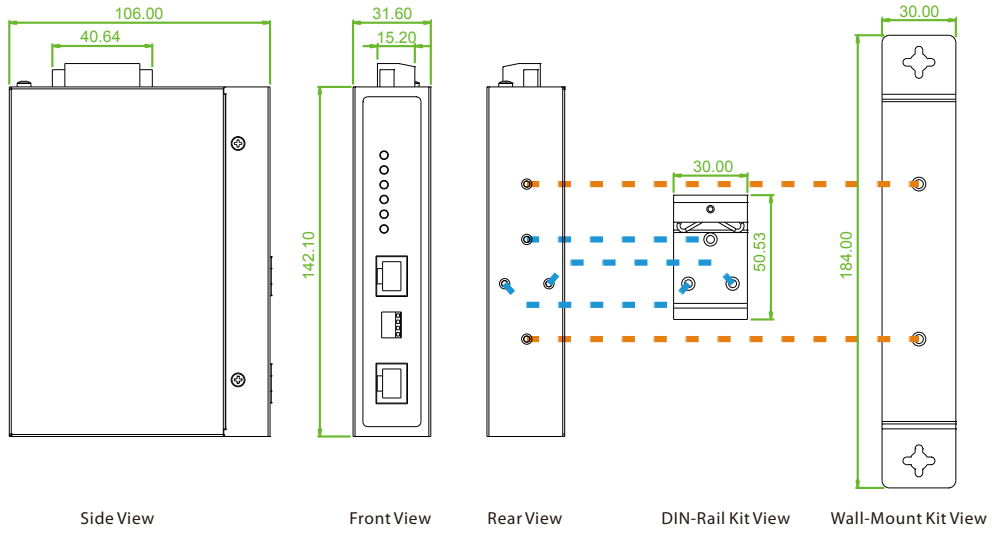


Figure : INJ-IG60-24 Gigabit Ethernet PoE Injector

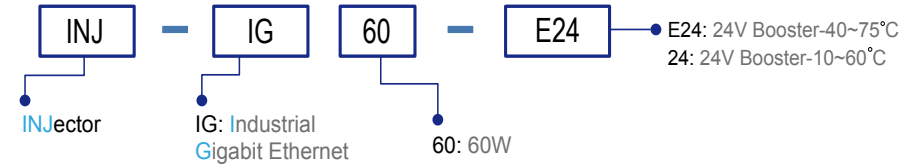
Dimensions



Ordering Information

Model Name	Ethernet	PoE Port		Input Voltage (Boost)	Certification			Operating Temperture
	10/100/1000 Base-T	IEEE802.3at (PSE)	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	
INJ-IG60-24	1	1	15/30/36/60/72W	24/48VDC	V	V	V	-10~60 C
INJ-IG60-E24	1	1	15/30/36/60/72W	24/48VDC	V	V	V	-40~75 C

Model Naming Rule



Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃
DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70℃

NEW

CE FC EN50121-4 EN61000-6-2 EN61000-6-4

INJ-IG01-PH

Gigabit Ethernet PoE+ Injector IEEE802.3at/af, 15.4/30/36/60W

INJ-IG01-PH is an industrial grade, single port, gigabit Ethernet PoE (Power over Ethernet) injector. PoE technology describes a system to pass electrical power safely, along with data, on Ethernet cabling. The original IEEE 802.3af-2003 PoE standard provides up to 15.4 W of DC power to each device. The updated IEEE 802.3at-2009 PoE standard also known as PoE+ or PoE plus, provides up to 30 W of power. Additionally, INJ-IG01-PH can provide up to 36/60W through the non-standard use of all 4 pairs of category 5 cable. 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 1 port IEEE802.3at/af PoE Injector
- Power output 15.4W, 30W, 36W, 60W select by DIP SW
- PoE Mode A/B Select by DIP SW
- 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	IEEE802.3at, IEEE802,3af
PoE RJ-45 Pin Assignment	RJ-45 support 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	Per unit: 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
Reserve Polarity Protection	Present
Overload Current Protection	Present
Power Supply	(44~57VDC) Input power (Removable Terminal Block)
PoE Power Output	Maximum Ultra High Power 60W, IEEE802.3at 30W, IEEE802.3at High power 36W, IEEE802.3af 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	Provide 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	409,994Hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE EN55022 Class A
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

Application

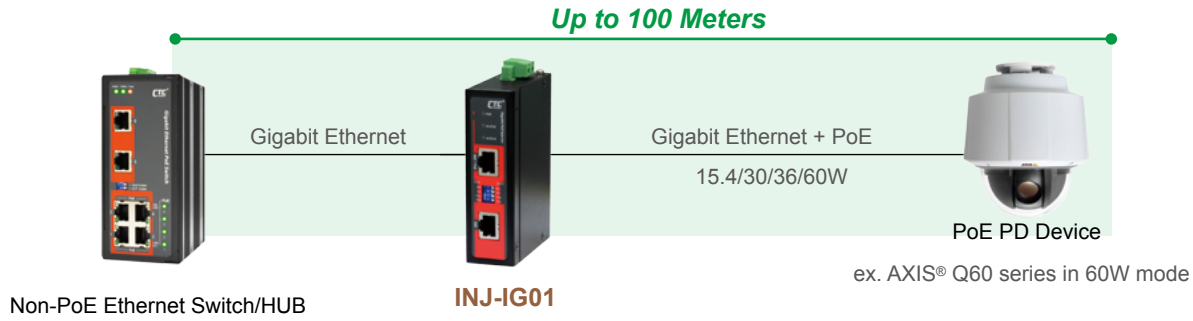
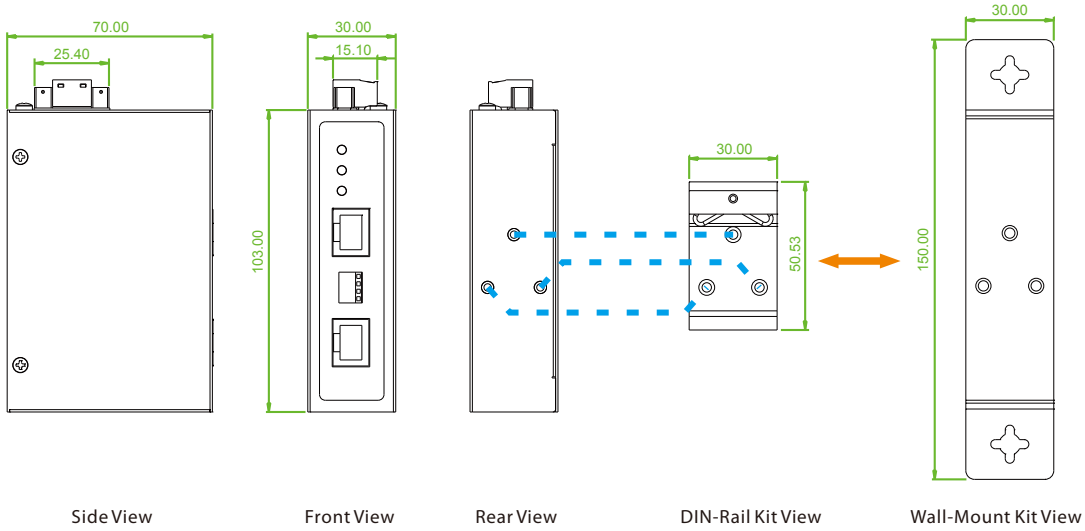


Figure : INJ-IG01-PH Gigabit Ethernet PoE Injector

Dimensions



Ordering Information

Model Name	Ethernet	PoE Port		Certification				Operating Temperture
	10/100/1000 Base-T	IEEE802.3at (PSE)	Power Budget	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	
INJ-IG01	1	1	15/30/36/60	V	V	V	V	-10~60°C
INJ-IG01-E	1	1	15/30/36/60	V	V	V	V	-40~75°C

Model Naming Rule

INJ - IG - 01 - PHE

- INJ: INJector
- IG: IG: Industrial Gigabit Ethernet
- 01: 01: Model 1
- PHE: PHE: 1x High Power PoE -40~75°C
- PH: PH: 1x High Power PoE -10~60°C

Accessories

MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C
DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60°C
IND-WMK03	Wall Mount kit for Industrial product (Compact, 150x 30mm)

NEW

IPS-G803SM

IEC 61850-3 8x10/100/1000Base-T+ 3x100/1000Base-X SFP

The series of managed Gigabit Ethernet switch are designed to meet the demands of power substation systems and is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provide a variety of redundant functions to increase the reliability of your communications system, including redundant and isolated power supplies (24/48 VDC) and 110/220 VDC/VAC), STP/RSTP/MSTP/ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS , Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as power substation networking. The series product can be managed centrally and conveniently by CTC Union's SmartView Element Management System.

Features

- 8x 10/100/1000Base-T RJ-45 and 3x 100/1000Base-X SFP Fiber
- UL60950-1, CE, FCC, and EN50121-4, certification
- IEC 61850-3, IEEE1613 certified for power substation
- Redundancy 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
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS), and u-Ring for cabling redundant
- Provides 5 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (see Figure 3). Supports up to 5 rings in one device (see Figure 2).
- u-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1Q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and Mac based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- Supports RMON, MIB II, Private MIB, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized Management

Specifications

IEEE 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 Access Control, Authentication
	IEEE 802.3ad Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE802.3x Flow Control and Back Pressure
	ITU-T G.8032/ Y.1344 ERPS (Ethernet Ring 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
Data Processing	Store and Forward
Flow Control:	IEEE 802.3x flow control, back pressure flow control
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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, with DDMI

Console	RS-232 (RJ-45)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
LED	Per unit : Power 1 (Green), Power 2 (Green), Fault (Amber) (-LL model) Per unit : Power 1 (Green), Power 2 (Green), Power 3(Green), Fault (Amber) (-HL model)
	Per RJ-45 port :10/100Link/Act: Green, 1000Link/Act: Amber
	SFP Fiber Per port : Link/Active (Green)
Reverse Polarity Protection	Present for Power Input
Overload Current Protection	Present
CPU Watch Dog	Present
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 (88VAC~264VAC) or 110/220VDC (85~300VDC), 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	106x82x152mm (D x W x H)
Weight	0.885kg (IPS-G803SM-LL) 1.085kg (IPS-G803SM-HL)
Installation mounting	DIN Rail mounting or wall mounting
Warranty	5 years

Certification	
EMC/EMS	CE, FCC
EMI	FCC Part 15 Subpart B Class A
	EN 55022 Class A
EMS	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
Power Substation	IEC 61850-3, IEEE 1613
Railway Traffic	EN50121-4
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 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)
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 (see Figure 2, Figure 3) Recovery time <10ms Maximum 250 devices in a Ring
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Convergence time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps : 1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
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
	support 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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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	MIB II RFC1213, Private MIB
DHCP	Client
	Relay
	Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master ,Boundary, Slave Operating mode Operating in each port of these switch
NTP /SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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 cable is normal or broken point distance

Application for Power Substation

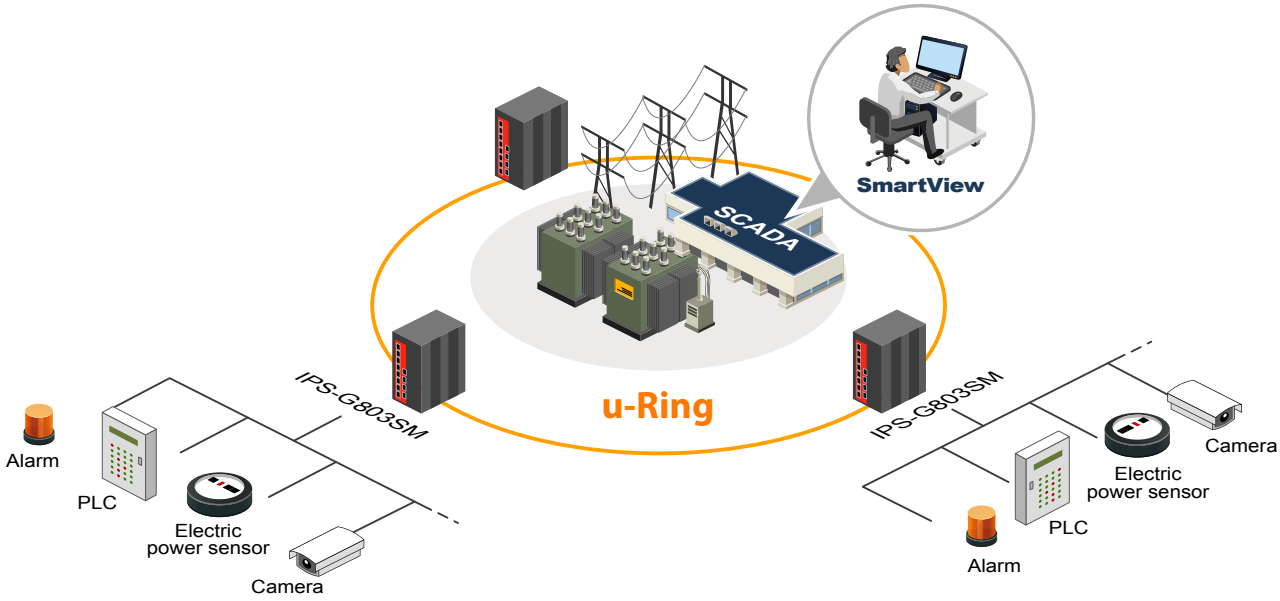


Figure 1 : IPS Series in Power Substation Application

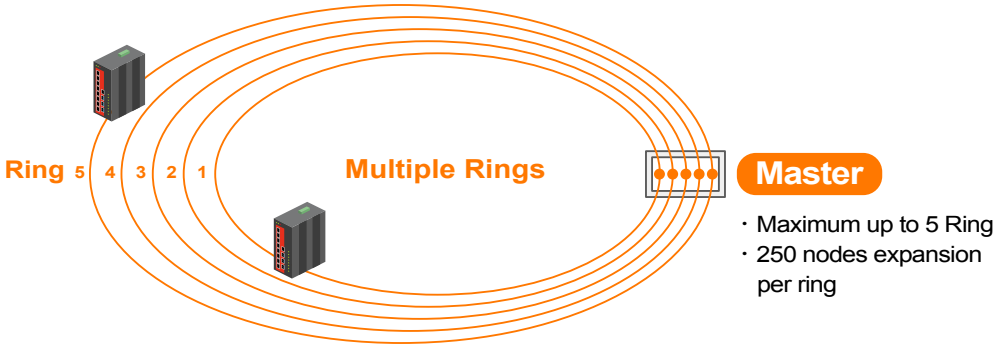


Figure 2 : Multiple Rings

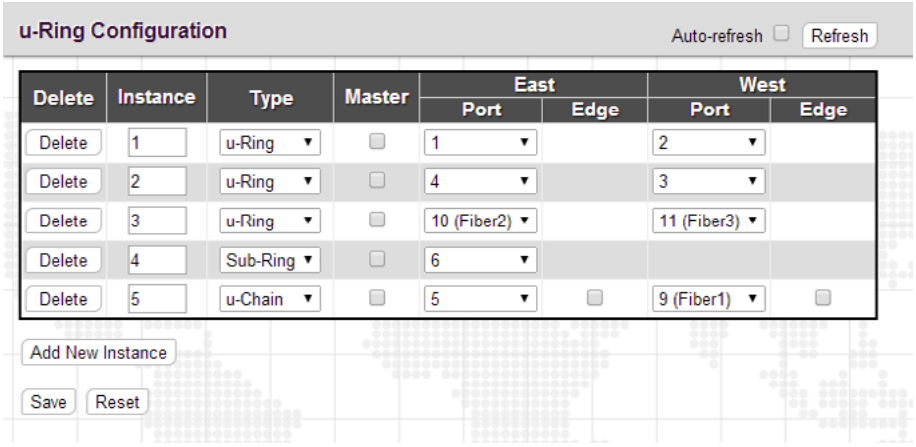
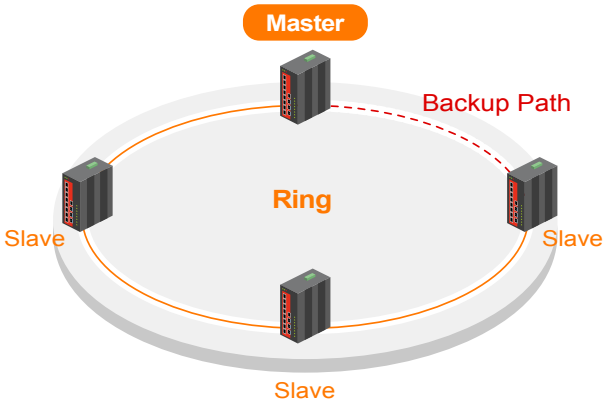
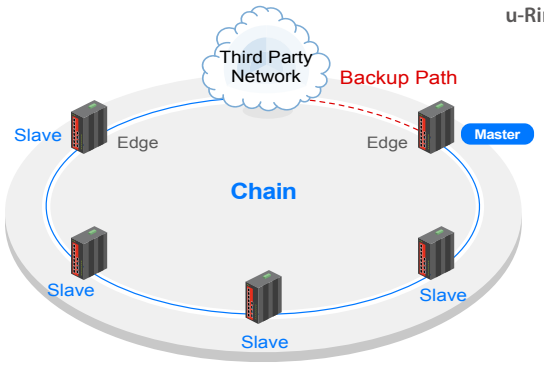


Figure 3 : User-Friendly Configuration In Web Interface

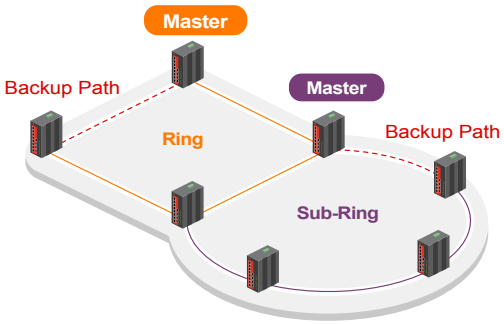
Figure 4 : u-Ring Type



u-Ring Type

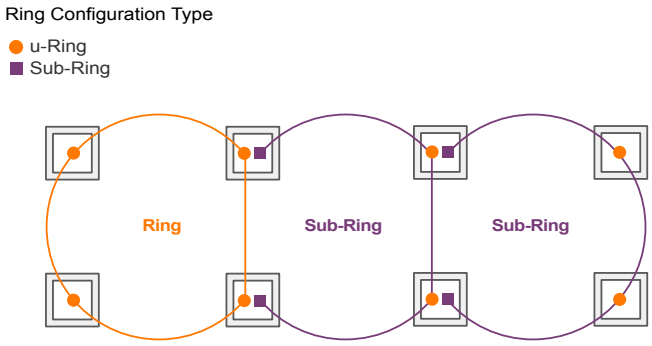


Determining the backup path (u-Chain type)

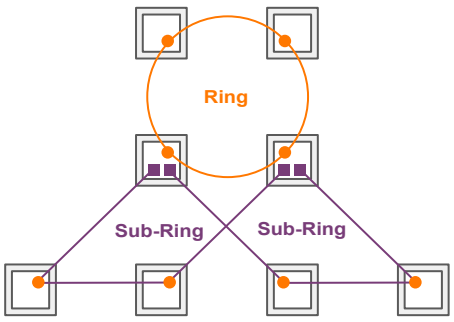


A major ring and a Sub-Ring topology

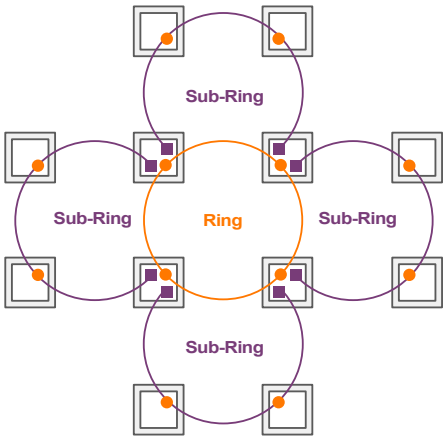
Figure 5 : Ring Configuration Example



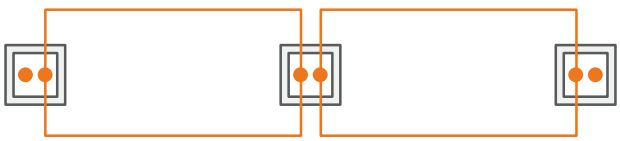
Ring Configuration Type



Combination of a ring and two Sub-Ring

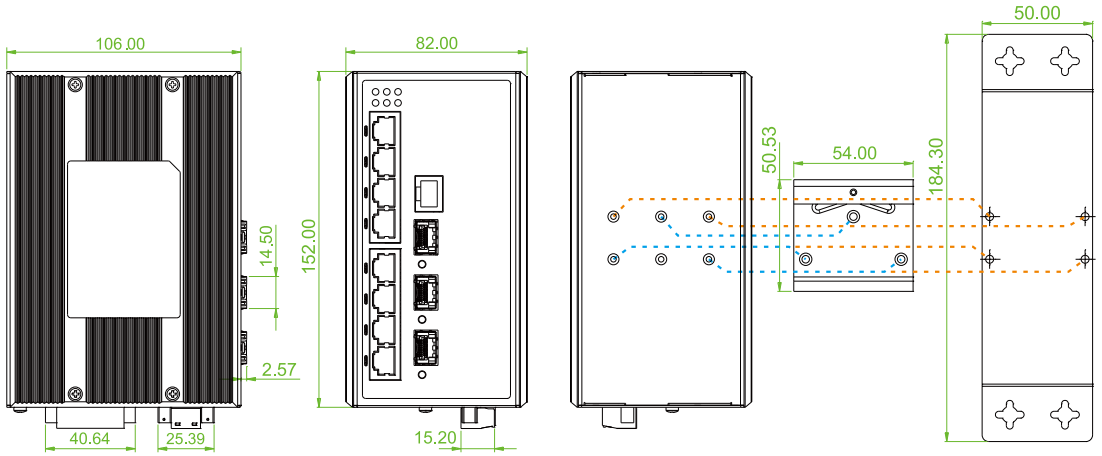


Combination of a ring and four Sub-Ring



Cable Redundancy

Dimensions



Ordering Information

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

Model Naming Rule

IPS – G 8 03S M – HL

- IPS: Industrial Power Substation
- G: Gigabit Switch
- 8: 8x UTP
- 03S: 3x SFP
- M: Managed
- HL: LL: Dual isolated Low voltage Input power; HL: High voltage & Low voltage Input power

Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M 7 040 – 31 – E

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- 040: Distance 002(2km) 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85°C Blank:0~70°C

NEW

IPS-803GSM

IEC 61850-3 8x10/100Base-TX+ 3x100/1000Base-X SFP

The series of managed Ethernet switch are designed to meet the demands of power substation systems and is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provide a variety of redundant functions to increase the reliability of your communications system, including redundant and isolated power supplies (24/48 VDC) and 110/220 VDC/VAC), STP/RSTP/MSTP/ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS , Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as power substation networking. The series product can be managed centrally and conveniently by CTC Union's SmartView Element Management System.

Features

- 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber
- UL60950-1, CE, FCC, and EN50121-4, certification
- IEC 61850-3, IEEE1613 certified for power substation
- Redundancy 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
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS), and u-Ring for cabling redundant
- Provides 5 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (see Figure 3). Supports up to 5 rings in one device (see Figure 2).
- u-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1Q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and Mac based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- Supports RMON, MIB II, Private MIB, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized Management

Specifications

IEEE 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 Access Control, Authentication
	IEEE 802.3ad Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE802.3x Flow Control and Back Pressure
	ITU-T G.8032/ Y.1344 ERPS (Ethernet Ring 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): 7.6 Gbps
Data Processing	Store and Forward
Flow Control:	IEEE 802.3x flow control, back pressure flow control
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K 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, with DDMI

Console	RS-232 (RJ-45)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
LED	Per unit : Power 1 (Green), Power 2 (Green), Fault (Amber) (-LL model) Per unit : Power 1 (Green), Power 2 (Green), Power 3(Green), Fault (Amber) (-HL model)
	Per RJ-45 port Link/Act: Green
	SFP Fiber Per port : Link/Active (Green)
Reverse Polarity Protection	Present for Power Input
Overload Current Protection	Present
CPU Watch Dog	Present
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 (88VAC~264VAC) or 110/220VDC (85~300VDC), Removable Terminal Block
Power consumption	
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC

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

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	106x82x152mm (D x W x H)
Weight	0.885kg (IPS-803GSM-LL) 1.085kg (IPS-803GSM-HL)
Installation mounting	DIN Rail mounting or wall mounting
Warranty	5 years

Certification	
EMC/EMS	CE, FCC
EMI	FCC Part 15 Subpart B Class A
	EN 55022 Class A
EMS	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
Power Substation	IEC 61850-3, IEEE 1613
Railway Traffic	EN50121-4
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 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)
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 (see Figure 2, Figure 3) Recovery time <10ms Maximum 250 devices in a Ring
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Convergence time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps : 1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
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
	support 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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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	MIB II RFC1213, Private MIB
DHCP	Client
	Relay
	Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP /SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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 cable is normal or broken point distance

Application for Power Substation

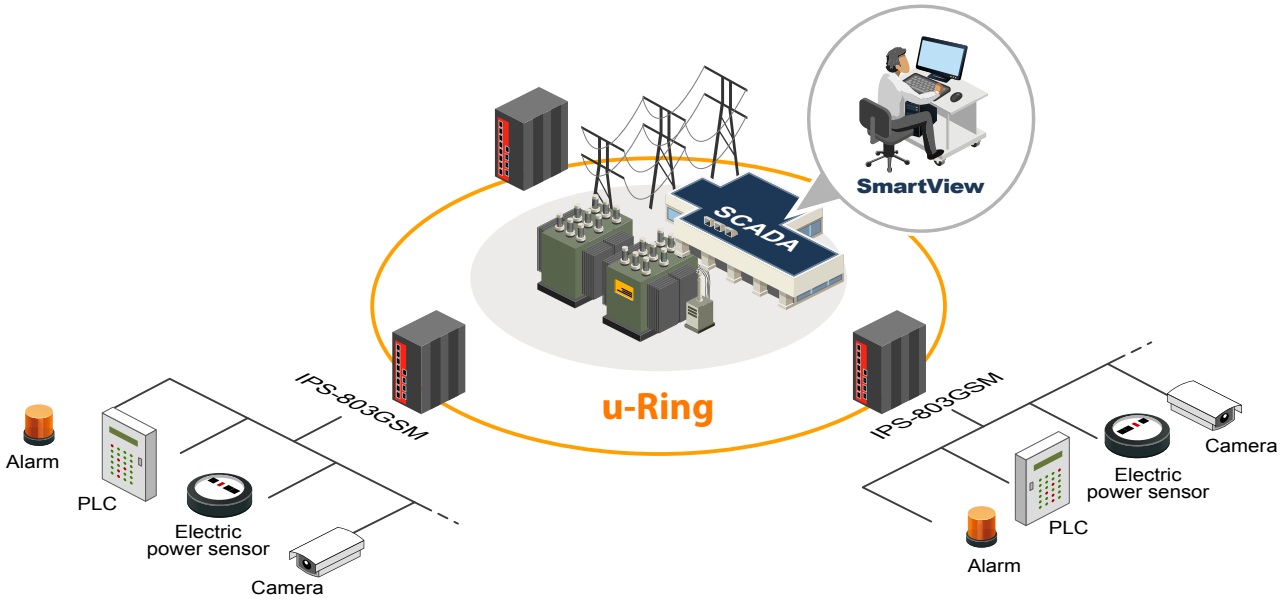


Figure 1 : IPS Series in Power Substation Application

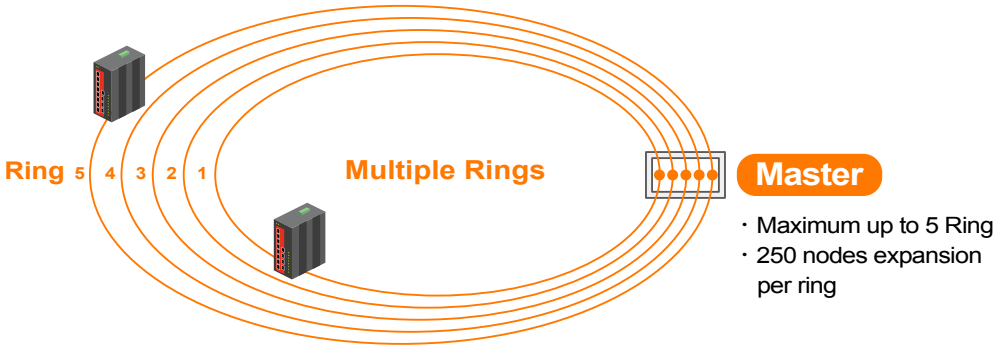


Figure 2 : Multiple Rings

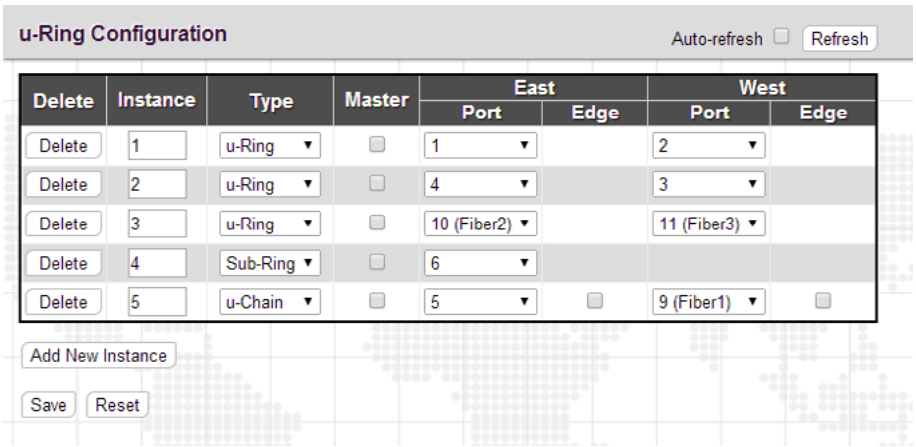
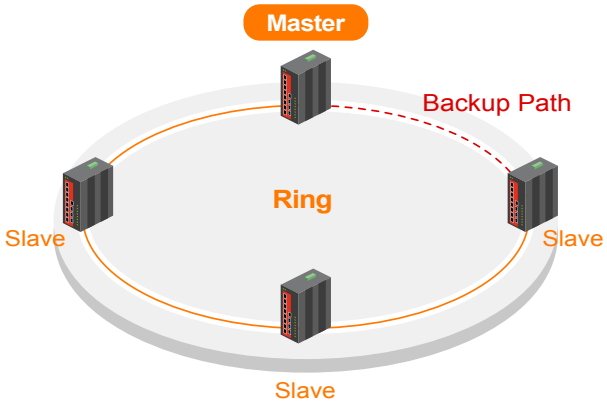
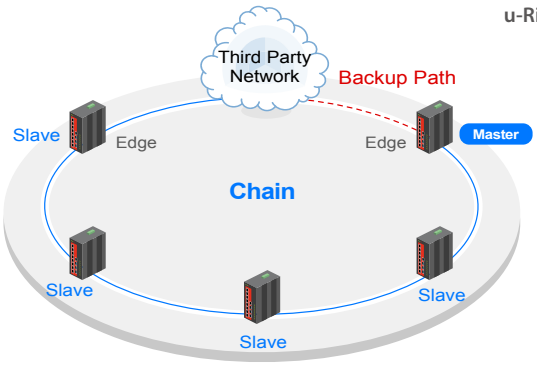


Figure 3 : User-Friendly Configuration In Web Interface

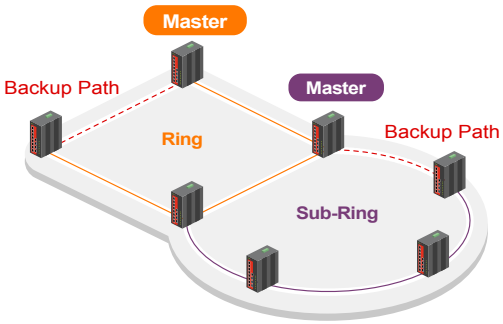
Figure 4 : u-Ring Type



u-Ring Type

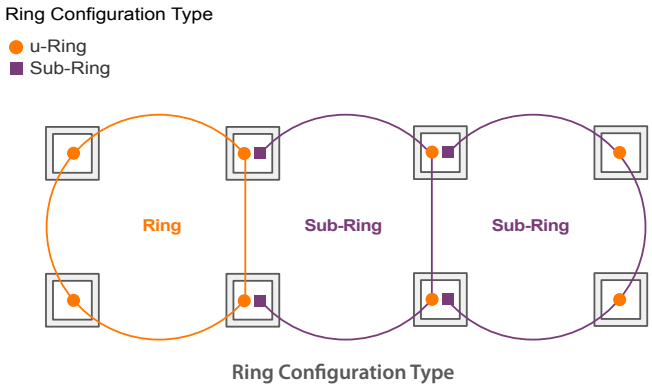


Determining the backup path (u-Chain type)

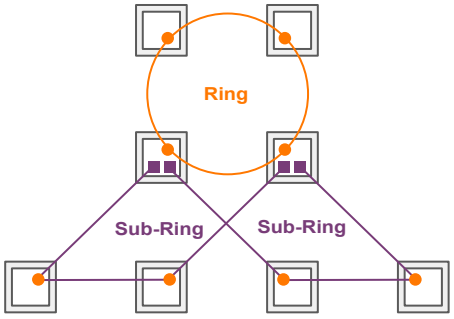


A major ring and a Sub-Ring topology

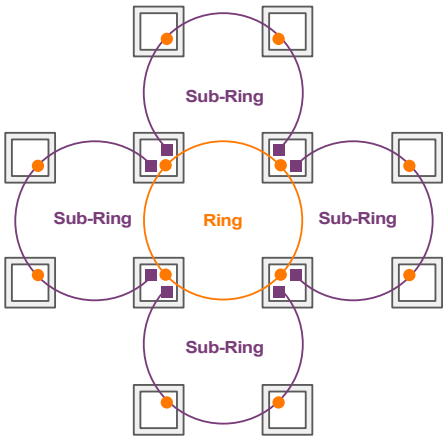
Figure 5 : Ring Configuration Example



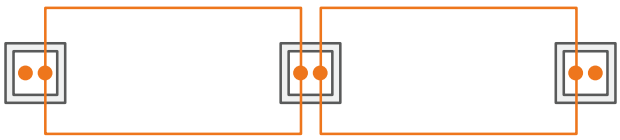
Ring Configuration Type



Combination of a ring and two Sub-Ring

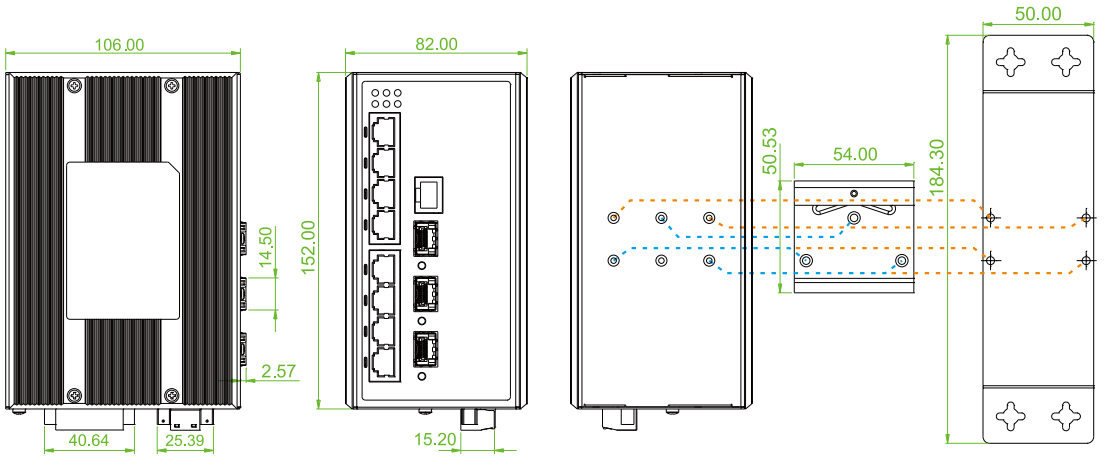


Combination of a ring and four Sub-Ring



Cable Redundancy

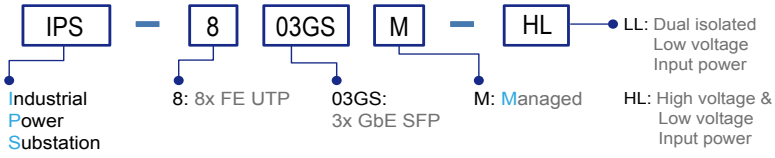
Dimensions



Ordering Information

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

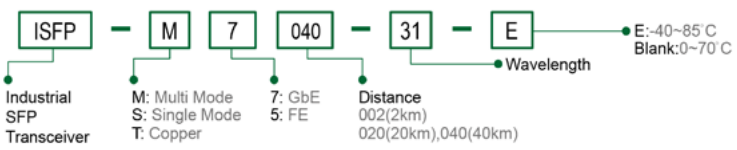
Model Naming Rule



Accessories

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50℃
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70℃
MDR-60-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 60W, -20 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule



EN50155 Industrial Ethernet Switches

CTC Union's ITP series has obtained EN50155 certification that meets EMC (Electromagnetic compatibility standard) requirements and EMS (Electromagnetic Susceptibility Protection) for surge, EFT, ESD, PFMF, DIP and other requirements. It is worth mentioning that the input voltage specification contains a requirement to deal with power interruptions. Conforming to EN61000-4-11 Voltage DIPs & Interrupts requirements, ITP's power supply can provide steady power without functional failures at interruptions of up to 10 ms. Additionally, ITP series can withstand environmental disturbances including vibration and shock variations (IEC-61373). Equipped with these features, ITP series is ideal for deployments in railways, buses, subways, high speed rails and other industrial environments.

Employing Rugged M12 Connectors

ITP series adopts compact and rugged M12 industry standard connectors for connectivity to ensure reliable operation for industrial applications especially exposing in environments with higher levels of vibration and shock. ITP series' M12 connectors are vibration, shock (IEC-61373) resistant and able to withstand extreme temperature and humidity. Therefore, they are popular for applications such as railways, buses or subways. The installation of M12 connectors is relatively easy and simple, just requiring direct M12 connection to vehicle systems. This quick and simple installation reduces installation and learning efforts to minimum.


Anti-vibration




Using IP67-Rated Housing to Protect against Dust, Oil and Water

CTC Union's EN50155 compliant Products are designed to be used in industrial and the harshest environments. With higher protection level - IP67 rating, they are able to protect against dust, oil and submission in water and to meet the most rigorous standards for extreme temperature, vibration, shock or humidity. EN50155 compliant products with M12 connectors and IP67 rating are purpose-built for automotive, manufacturing, oil, gas, mining and other industrial environments, requiring no extra housing protection.


IP67 Waterproof

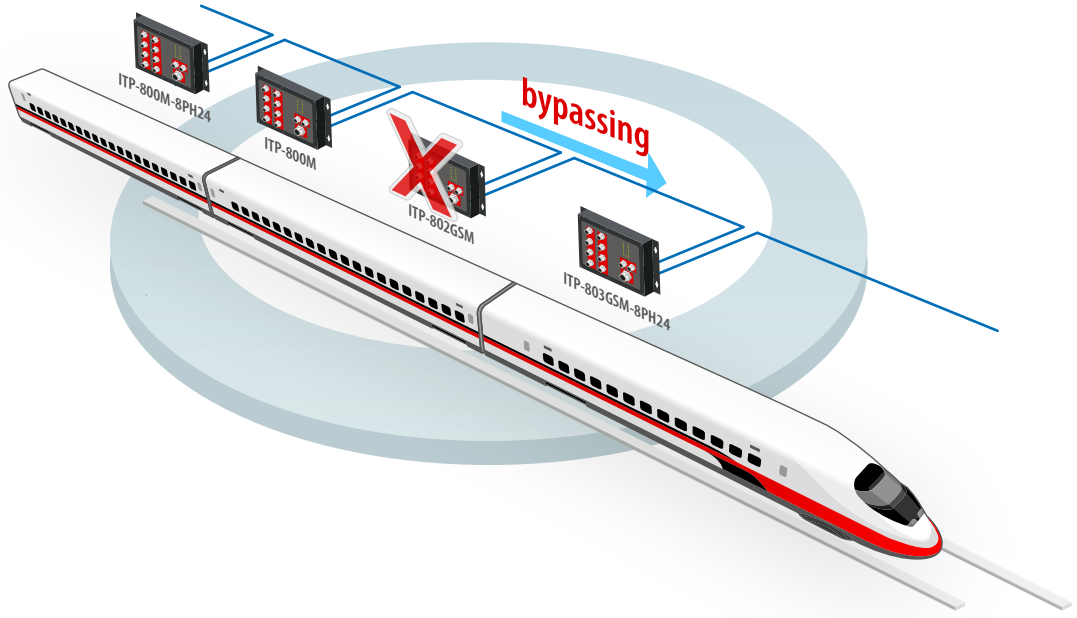



Supporting Power over Ethernet (PoE)

PoE capability enables PD devices such as surveillance cameras or wireless access points to be powered over standard twisted-pair Ethernet cable, eliminating the needs for requiring external power for PD devices. ITP products with PoE function are all fanless and designed in robust IP67 housing that make them suitable for din rail installation or wall mounting. Moreover, PoE models support IEEE 802.3af/802.3at standards which are able to provide up to 30W (use 50VDC or above) power supply per port. With power boost and regulation technology, PoE devices can offer 24~48V to 55V power supply for applications that need more power inputs.

Copper Interface Bypass Relay Function in Daisy Chain Topology

EN50155 compliant products offer two copper interfaces with auto bypass relay function in the event of sudden power loss particularly in daisy chain or linear topology structure. When power failure occurs in one of the switches on a train, bypass relay function can activate bypassing mechanism by interconnecting internal circuits automatically to ensure that links between carriages operate uninterruptedly and continuously. With this function, secure data transmission from terminals to backbone and higher network availability can be guaranteed.



NEW

ITP-500

EN50155 IP67 5x10/100Base–TX Ethernet Switch

ITP-800

EN50155 IP67 8x10/100Base–TX Ethernet Switch

The ITP-500 (ITP-800) Series non-managed Fast Ethernet switches provide 5(8)x 10/100Base-TX Fast Ethernet ports. This series of unmanaged Ethernet switches is designed for industrial applications in harsh environments. The ITP-500 (ITP-800) series switches Ethernet ports utilize M12 connectors to ensure tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock. The ITP-500 (ITP-800) series Ethernet switches are compliant with EN 50155, covering operating temperature, power input voltage, surge, ESD, vibration, and shock, thus making these switches suitable for industrial applications in vehicle, rolling stock and railways.

Features

- 8-Port 10/100Base-TX Ethernet Switch (ITP-800)
- 5-Port 10/100Base-TX Ethernet Switch (ITP-500)
- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Supports flow control
- DIN rail or wall mounting installation
- Supports broadcast storm protection
- Supports auto-negotiation and auto-MDI/MDI-X
- Built in 2 bypass port (ITP-800)
- Redundant dual DC input power 12/24/48VDC (8.4~60VDC) (ITP-800)
- DC input power 12/24/48VDC (8.4~60VDC) (ITP-500)
- IP67 grade rugged housing for against water, dust, and oil
- Wide operating temperature -40~75°C (ITP-500-E, 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
	IEEE802.3x Flow Control and Back Pressure
Switch Architecture	Back-plane (Switching Fabric): 1Gbps (ITP-500) Back-plane (Switching Fabric): 1.6Gbps (ITP-800)
Data Processing	Store and Forward
Flow Control	IEEE 802.3x flow control, back pressure flow control
Provides Broadcast Storm Protection	Present
MAC Address Table	1 K
Packet Buffer Size	448Kbits
Network Connector	5x M12 D-code Female (ITP-500)
	8x M12 D-code Female (ITP-800)
	10/100Base-TX auto negotiation speed
	Auto MDI/MDI-X function
	Full/Half duplex
	Built in 2 bypass port (ITP-800)
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) (ITP-800) Per unit: Power (Green) (ITP-500)
	Per port: Link/Active (Green)
Reverse Polarity Protection	Present for power input
Overload Current Protection	Present
Power Supply	Redundant Dual DC 12/24/48V (8.4~60VDC) Input power (ITP-800)
	DC 12/24/48V (8.4~60VDC) Input power (ITP-500)
Power	5 Pin Male A-Code M12

Power Consumption

Input Voltage	ITP-500	ITP-800
12VDC	0.8W	1.8W
24VDC	1.0W	2.2W
48VDC	1.9W	3.4W

Operating Temperature	-10°C~60°C (ITP-500, ITP-800)
	-40°C~75°C (ITP-500-E, ITP-800-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C~85°C
Housing	IP67 water-proof grade rugged housing, and fanless
Dimensions	43 x 30 x 206.5 mm (D x W x H) (ITP-500) 39 x 65.1 x 191.5 mm (D x W x H) (ITP-800)
Weigth	260g (ITP-500) 410g (ITP-800)
Installation Mounting	DIN rail or wall mounting
MTBF	309,668 Hours (ITP-500) 303,728 Hours (ITP-800) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI	FCC, FCC Part 15 Subpart B Class A
	CE EN 55022 Class A
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 B
	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
	EN 61000-4-12
Safety	UL60950-1 (Pending)
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

Application

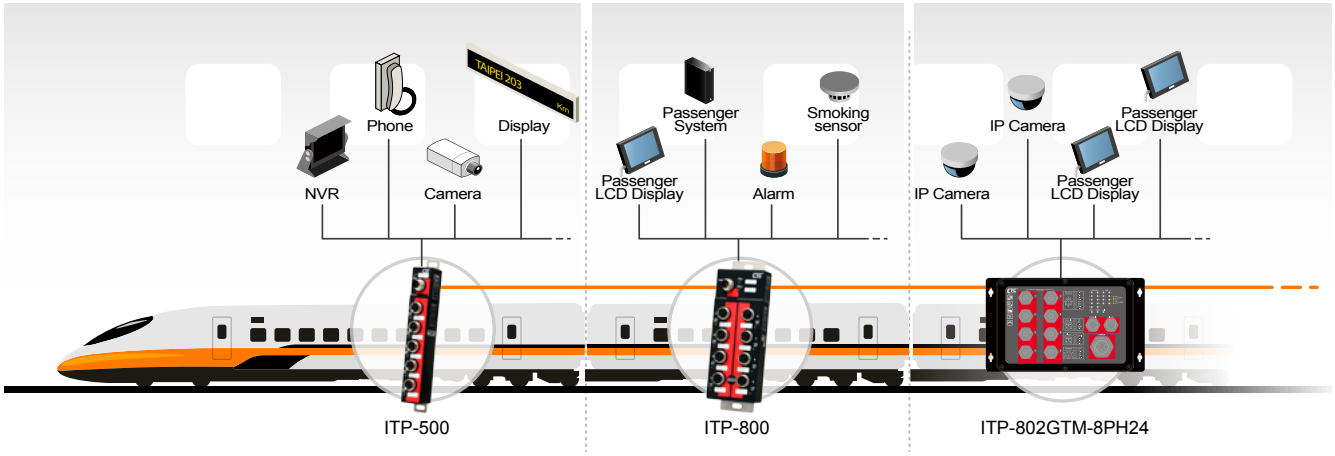


Figure 1 : ITP Series in Railway Application

Figure 2 : IP67 Protection

Figure 3 : Wide Range Temperature

Figure 4 : ITP Series for Industrial Automation

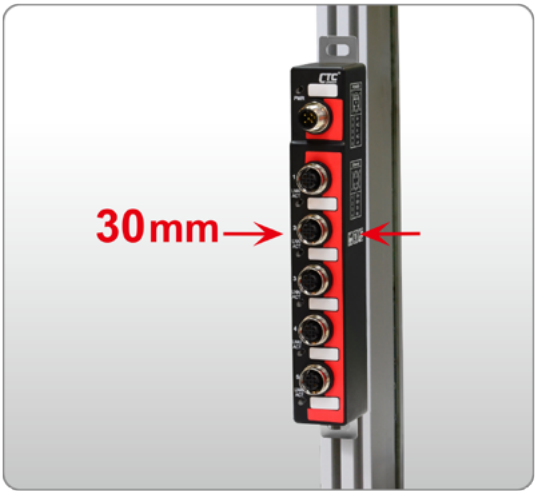
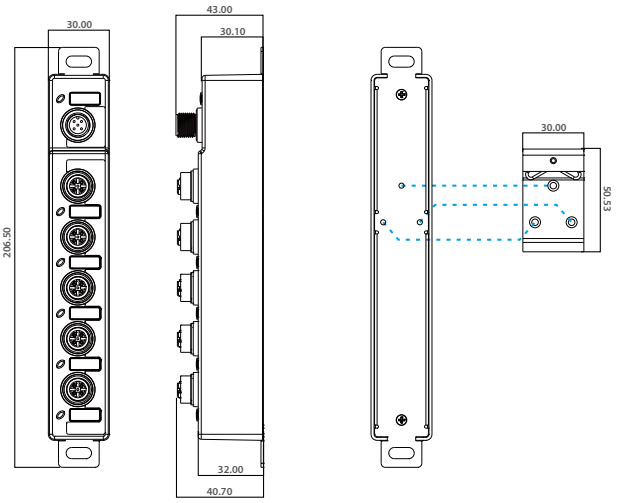


Figure 5 : Slim and Compact Size

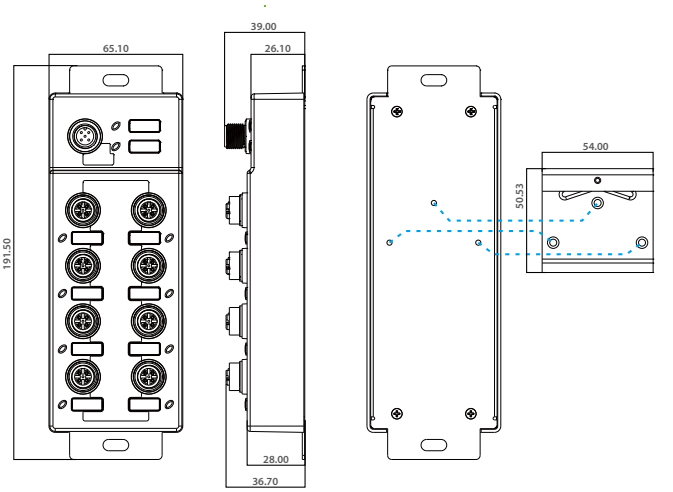
Dimensions

ITP-500



Side View Front View Rear View DIN-Rail Kit View

ITP-800

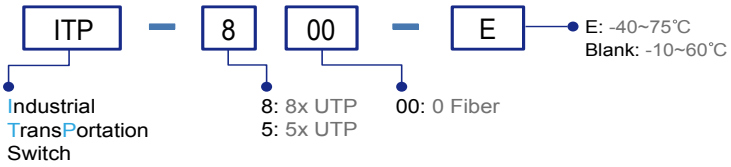


Side View Front View Rear View DIN-Rail Kit View

Ordering Information

Model Name	IP67	Total Port	UTP Port M12	Power Supply	Certification				Shock Vibration	Operating Temperture
			10/100 Base-TX	12/24/48VDC (8.4~60VDC)	EN50155	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-500	V	5	5	1	V	V	V	V	V	-10~60 C
ITP-500-E	V	5	5	1	V	V	V	V	V	-40~75 C
ITP-800	V	8	8	2	V	V	V	V	V	-10~60 C
ITP-800-E	V	8	8	2	V	V	V	V	V	-40~75 C

Model Naming Rule



Accessories

Power Supply

DR-4524	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 48W, -10 ~ +50°C
MDR-40-24	Industrial Power, Input 85 ~ 264VAC, Output 24VDC, 40W, -20 ~ +70°C

M12 Cable

IND-M12DM4-Cable
M12 D-code Male (4-Pin) to RJ-45 socket ,300cm cable, IP67

For UTP Port

IND-M12AF5-Cable
M12 A-code Female (5-Pin) +100cm cable , IP67

For Power

M12 Connector

IND-M12DM4-Connector
M12 D-code Male (4-Pin) connector, IP67

For UTP Port

IND-M12AF5-Connector
M12 A-code Female (5-Pin) connector, IP67

For Power

Preliminary

ITP-G802SM

EN50155 IP67 Managed 8x10/100/1000Base–T + 2x100/1000Base–X SFP Ethernet Switch

ITP-G800M

EN50155 IP67 Managed 8x10/100/1000Base–T Ethernet Switch

ITP-G802SM series are managed industrial grade Gigabit switches and/or 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission.The ITP-G802SM series provide L2 management functions supported include STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS ,Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.

Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Especially, ITP-G802SM series switches use M12 connectors to ensure tight, robust connections and to guarantee reliable and anti environmental disturbances operation, such as vibration and shock. ITP-G802SM series are compliant with EN 50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.

ITP-G802SM series are IP67 rated to protect against dust and water submersion. They are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as automation, city security. ITP-G802SM series can also work with CTC Management platform SmartView to provide convenient, real-time and centralized network management.

Features

- 8x 10/100/1000Base-T M12 and 2x100/1000Base-X SFP Fiber (Total 10 Por) (ITP-G802SM)
- 8x 10/100/1000Base-T M12 (ITP-G800M)
- M12 and M23 connector against vibration and shock
- IP67 water proof design against dust and water
- Redundant and wide input range voltage, Low voltage (12/24/48VDC) and High Voltage (110/220VDC or 110/220VAC)
- UL60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security: Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE802.1Q VLAN VID	

Switch Architecture	Back-plane (Switching Fabric): 20Gbps (ITP-G802SM) 16Gbps (ITP-G800M)
Data Processing	Store and Forward
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
Network Connector	8xM12 (8-Pin, Female,A-Code) 10/100/1000Base-T auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex Water proof Fiber Cable Gland support for 2 X 100/1000 Base-X dual speed mode SFP slot, with DDMI (for ITP-G802SM)
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present
Overload Current Protection	Present
CPU Watch Dog	Present
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) Per UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber) SFP Fiber Per port: Link/Active (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K Bytes for packet buffer

Power Supply	Provide 1x M23 (5-Pin, male) for redundant dual input, optional Low or High voltage. Low voltage 12/24/48V (8.4~60VDC) , High voltage 110/220VDC (88~300VDC) , or 110/220VAC (88~265VAC)
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-10 ~ 60°C (ITP-G802SM, ITP-G800M) -40 ~ 75°C (ITP-G802SM-E, ITP-G800M-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP67 water proof protection, Fanless
Dimensions	70x240x168mm (D x W x H)
Weight	TBD
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	TBD (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	EN50155, EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1 (Pending)
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

Software Specifications

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN,up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
IGMP / MLD Snooping	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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 CL
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
DHCP	Client, Relay, Snooping,
	Snooping option 82, Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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
Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring cable OK or broken point distance

Application

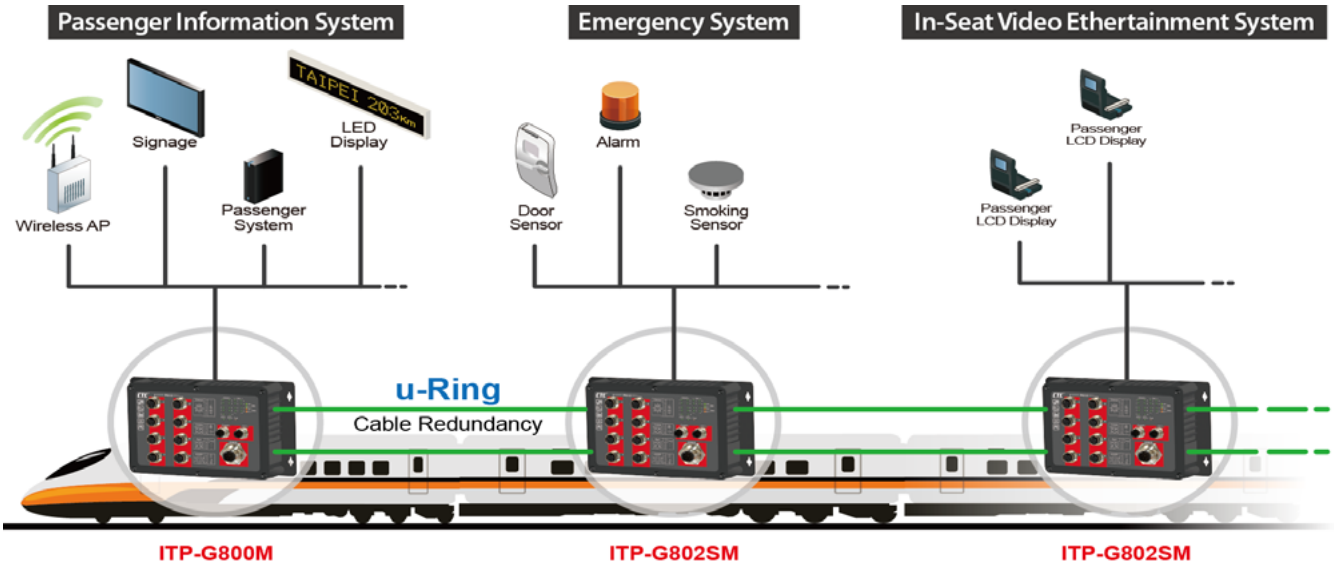


Figure 1 : ITP Series in Onboard Train Application

Figure 2 : ITP Series for Industrial Automation

u-Ring Configuration

Auto-refresh ☐ Refresh

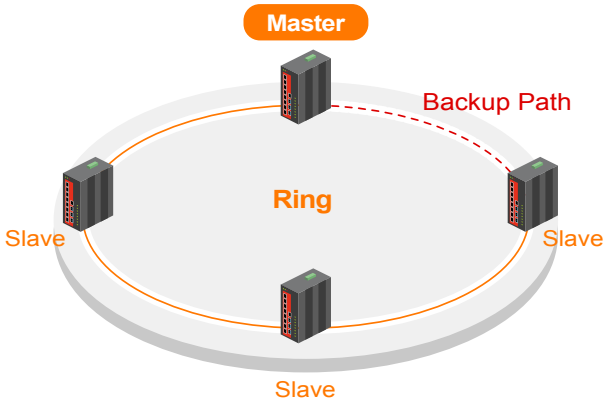
Delete	Instance	Type	Master	East		West	
				Port	Edge	Port	Edge
Delete	1	u-Ring	☐	1		2	
Delete	2	u-Ring	☐	4		3	
Delete	3	u-Ring	☐	10 (Fiber2)		11 (Fiber3)	
Delete	4	Sub-Ring	☐	6			
Delete	5	u-Chain	☐	5	☐	9 (Fiber1)	☐

Add New Instance

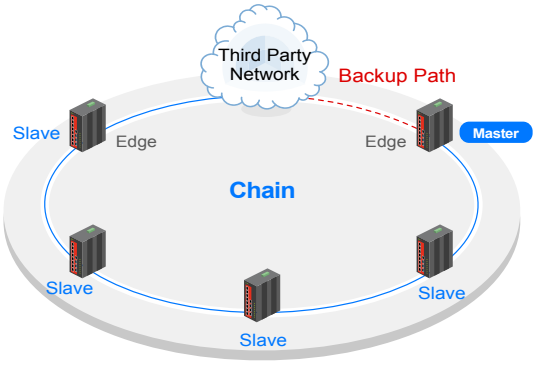
Save Reset

Figure 3 : An illustration of u-Ring instances configured in Web interface

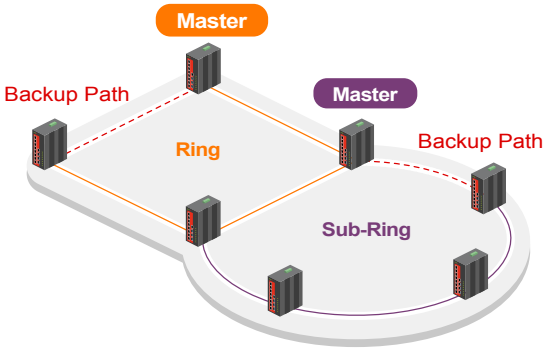
Figure 4 : u-Ring Type



u-Ring Type

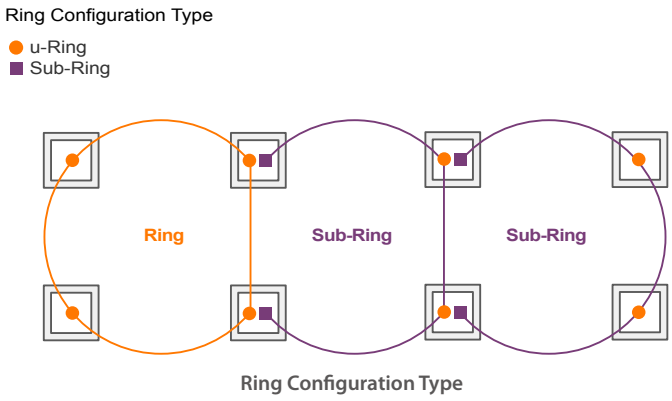


Determining the backup path (u-Chain type)

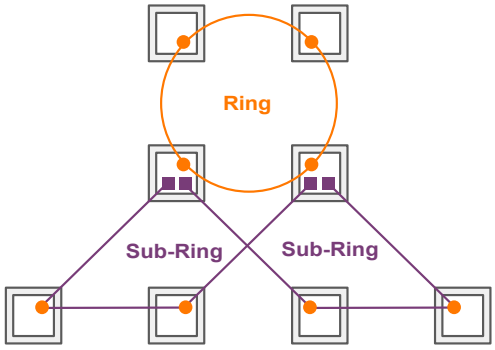


A major ring and a Sub-Ring topology

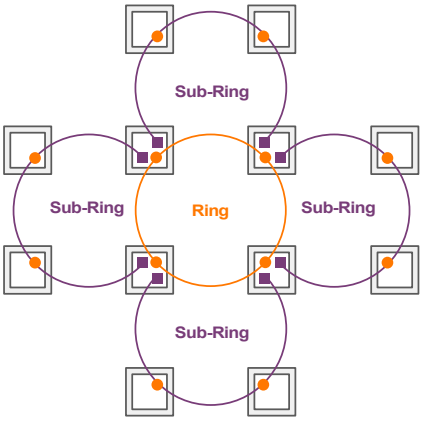
Figure 5 : Ring Configuration Example



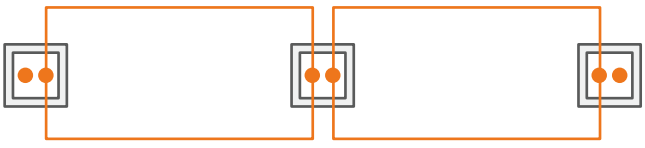
Ring Configuration Type



Combination of a ring and two Sub-Ring



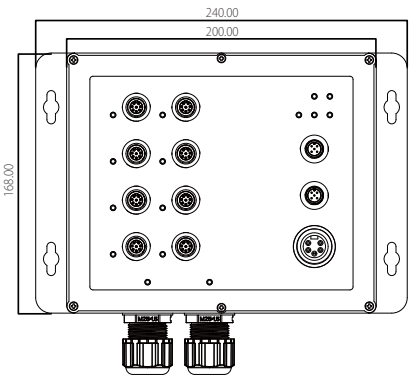
Combination of a ring and four Sub-Ring

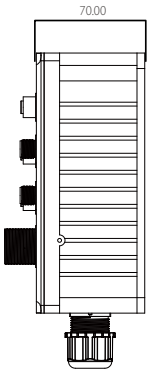


Cable Redundancy

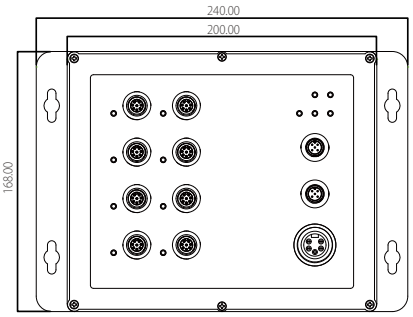
Dimensions

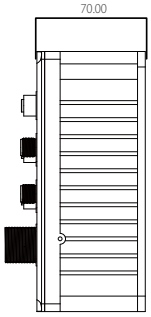
ITP-G802SM





ITP-G800M

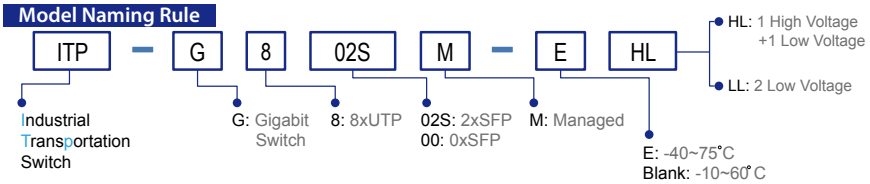




Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Fiber Port	Power Supply		Certification				Shock Vibration	Operating Temperture
				10/100/1000 Base-T	100/1000 Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	High Volt 110/220 VDC 110/220 VAC	EN50155 EN50121-4	UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-G802SM-LL	V	V	10	8	2 SFP	2	—	V	Plan	V	V	V	-10~60°C
ITP-G802SM-HL	V	V	10	8	2 SFP	1	1	V	Plan	V	V	V	-10~60°C
ITP-G802SM-ELL	V	V	10	8	2 SFP	2	—	V	Plan	V	V	V	-40~75°C
ITP-G802SM-EHL	V	V	10	8	2 SFP	1	1	V	Plan	V	V	V	-40~75°C
ITP-G800M-LL	V	V	8	8	—	2	—	V	Plan	V	V	V	-10~60°C
ITP-G800M-HL	V	V	8	8	—	1	1	V	Plan	V	V	V	-10~60°C
ITP-G800M-ELL	V	V	8	8	—	2	—	V	Plan	V	V	V	-40~75°C
ITP-G800M-EHL	V	V	8	8	—	1	1	V	Plan	V	V	V	-40~75°C

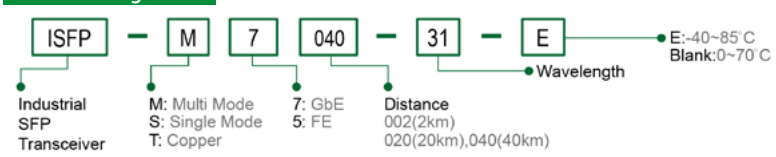
Model Naming Rule



Accessories

DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule



Preliminary

ITP-802GSM

EN50155 IP67 Managed 8x 10/100Base-TX + 2x100/1000Base-X SFP Ethernet Switch

ITP-802GTM

EN50155 IP67 Managed 8x 10/100Base-TX + 2x100/1000Base-X Ethernet Switch

ITP-800M

EN50155 IP67 Managed 8x 10/100Base-TX Eth, Switch

The ITP-802GSM series are managed industrial grade Gigabit switches and/or 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission.The ITP-802GSM series provide L2 management functions supported include STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS ,Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.

Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Especially, ITP-802GSM series switches use M12 connectors to ensure tight, robust connections and to guarantee reliable and anti environmental disturbances operation, such as vibration and shock. ITP-802GSM series are compliant with EN 50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.

ITP-802GSM series are IP67 rated to protect against dust and water submersion. They are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as automation, city security.

ITP-802GSM series can also work with CTC Management platform SmartView to provide convenient, real-time and centralized network management.

Features

- 8x 10/100Base-TX M12 and 2x 100/1000Base-X SFP Fiber (Total 10 Port) (ITP-802GSM)
- 8x 10/100Base-TX M12 and 2x 100/1000Base-X UTP (Total 10 Port) (ITP-802GTM)
- 8x 10/100Base-TX M12 (Total 8 Port) (ITP-800M)
- M12 and M23 connector against vibration and shock
- IP67 water proof design against dust and water
- Redundant and wide input range voltage,Low voltage (12/24/48VDC) and High Voltage (110/220VDC or 110/220VAC)
- UL60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (ITP-802GSM, ITP-802GTM) 1.6Gbps (ITP-800M)	
Data Processing	Store and Forward	

Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
Network Connector	8xM12 (4-Pin, Female,D-Code) 10/100Base-TX UTP , Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex. 2x M12 (8-Pin, Female,A-Code) 10/100/1000Base-T UTP (ITP-802GTM) Water proof Fiber Cable Gland support for 2 X 100/1000 Base-X dual speed mode SFP slot, with DDMI (ITP-802GSM) Build-in 2 bypass port (ITP-802GTM)
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present
Overload Current Protection	Present
CPU Watch Dog	Present
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)
	SFP Fiber Per port: Link/Active (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K Bytes for packet buffer

Power Supply	Provide 1x M23 (5-Pin, male) for redundant dual input, optional Low or High voltage. Low voltage 12/24/48V (8.4~60VDC) , High voltage 110/220VDC (88~300VDC) , or 110/220VAC (88~265VAC)
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-10 ~ 60°C (ITP-802GSM, ITP-802GTM, ITP-800M) -40 ~ 75°C (ITP-802GSM-E, ITP-802GTM-E, ITP-800M-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP67 water proof protection, Fanless
Dimensions	70x240x168mm (D x W x H)
Weight	TBD
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	TBD (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	EN50155, EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1 (Pending)
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

Software Specifications

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN,up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN,up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries GVRP (GARP VLAN Registration Protocol) MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile, Throttling
IGMP / MLD Snooping	Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based MAC-Based
ACL	Number of rules : up to 256 entries for L2 / L3 / L4
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
User Name Password Authentication	Local Authentication Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
DHCP	Client, Relay, Snooping Snooping option 82, Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master ,Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries L2 / L3 / L4
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
Green Ethernet	Lower the power for a port when there is no link LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring cable OK or broken point distance

Application

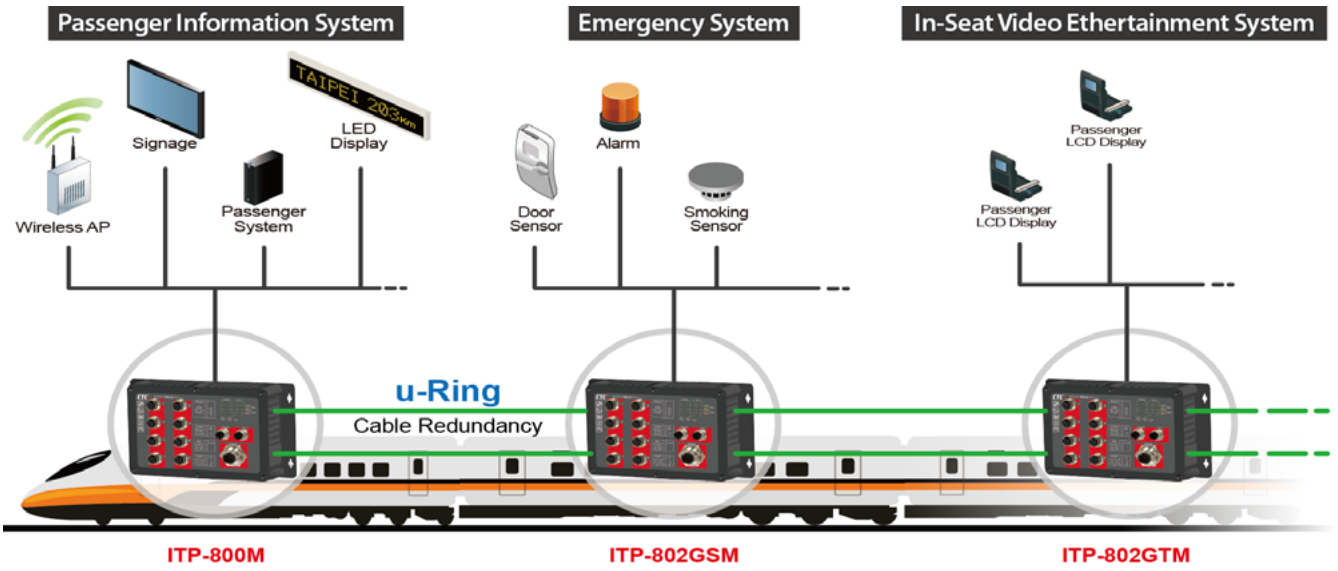


Figure 1 : ITP Series in Onboard Train Application

Figure 2 : ITP Series for Industrial Automation

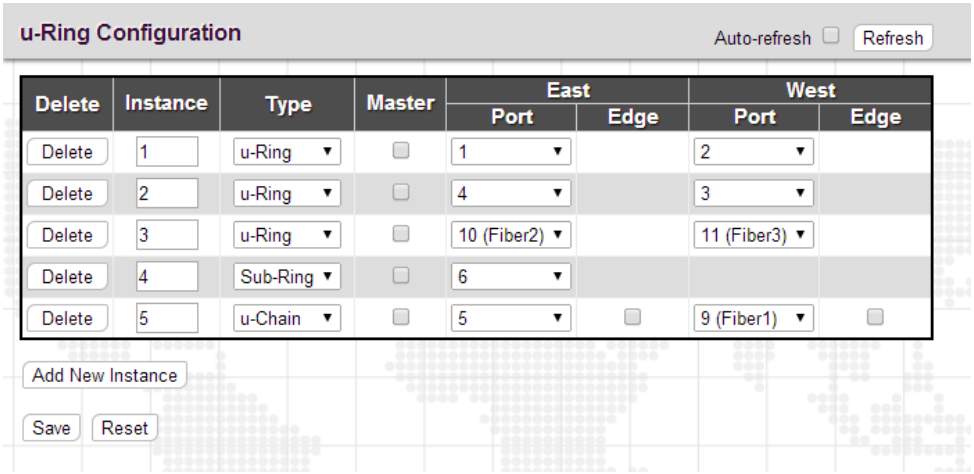
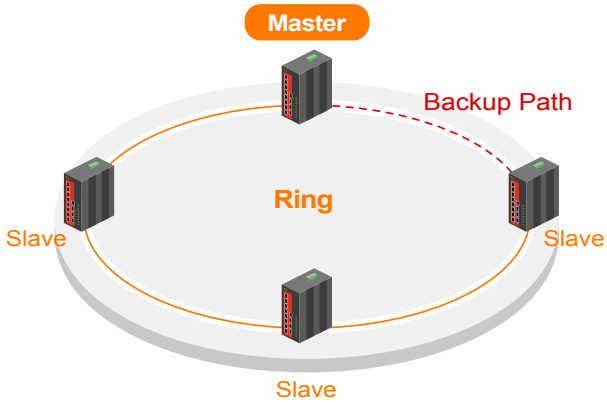
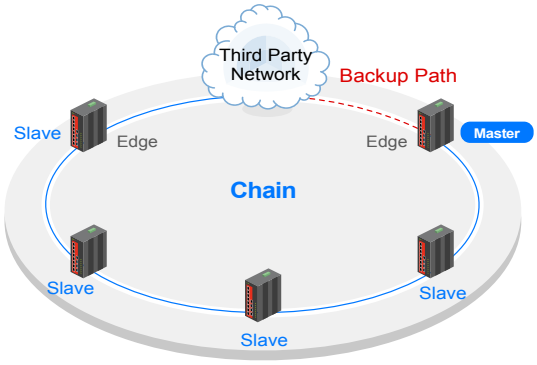


Figure 3 : An illustration of u-Ring instances configured in Web interface

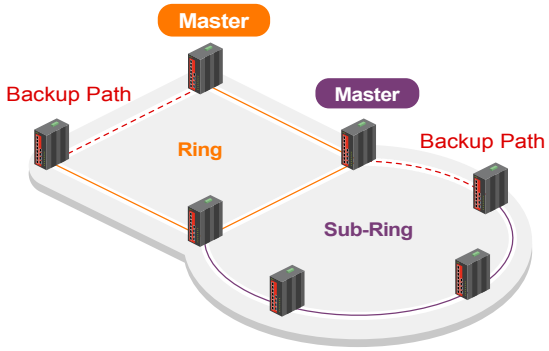
Figure 4 : u-Ring Type



u-Ring Type

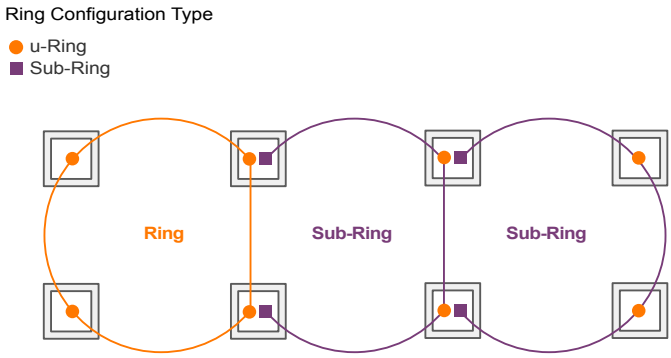


Determining the backup path (u-Chain type)

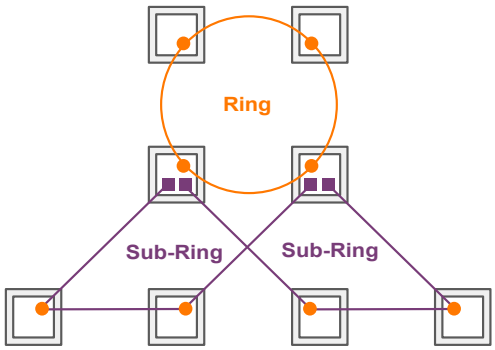


A major ring and a Sub-Ring topology

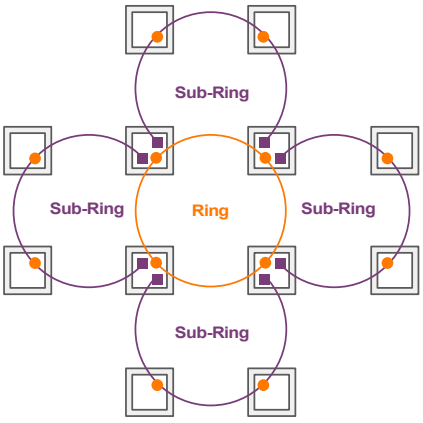
Figure 5 : Ring Configuration Example



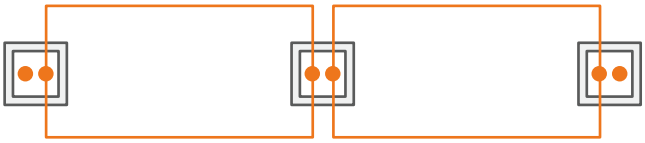
Ring Configuration Type



Combination of a ring and two Sub-Ring



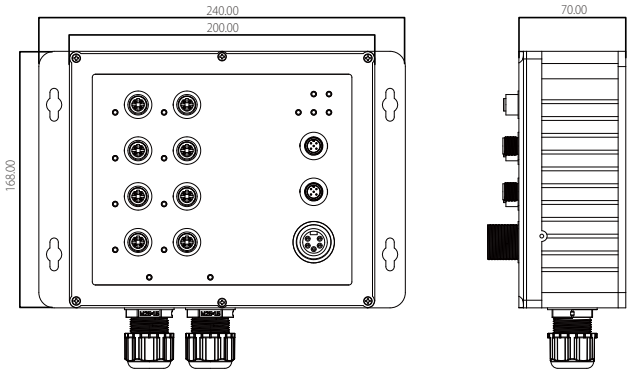
Combination of a ring and four Sub-Ring



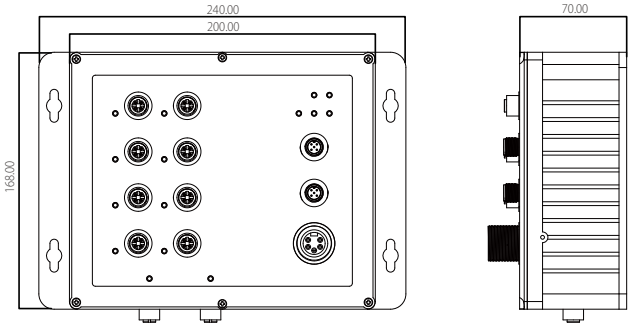
Cable Redundancy

Dimensions

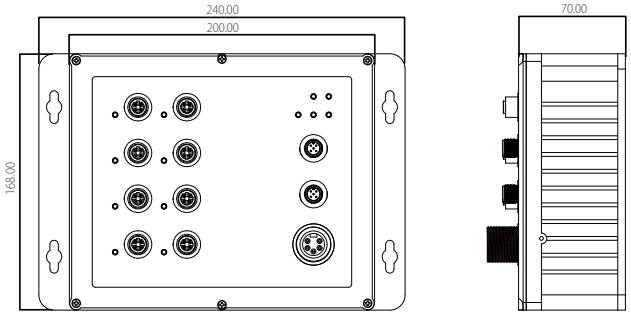
ITP-802GSM



ITP-802GTM



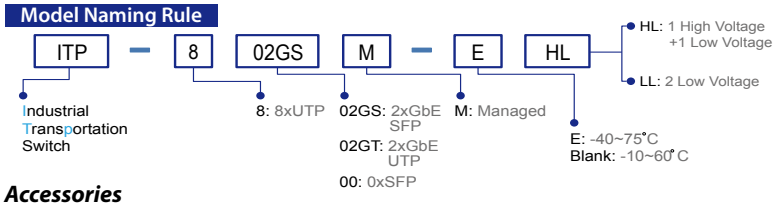
ITP-800M



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Gigabit Port	Power Supply		Certification				Shock Vibration	Operating Temperture
				10/100 Base-TX		Low Volt 12/24/48VDC (8.4~60VDC)	High Volt 110/220 VDC 110/220 VAC	EN50155 EN50121-4	UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-802GSM-LL	V	V	10	8	2 SFP	2	—	V	Plan	V	V	V	-10~60°C
ITP-802GSM-HL	V	V	10	8	2 SFP	1	1	V	Plan	V	V	V	-10~60°C
ITP-802GSM-ELL	V	V	10	8	2 SFP	2	—	V	Plan	V	V	V	-40~75°C
ITP-802GSM-EHL	V	V	10	8	2 SFP	1	1	V	Plan	V	V	V	-40~75°C
ITP-802GTM-LL	V	V	10	8	2 UTP	2	—	V	Plan	V	V	V	-10~60°C
ITP-802GTM-HL	V	V	10	8	2 UTP	1	1	V	Plan	V	V	V	-10~60°C
ITP-802GTM-ELL	V	V	10	8	2 UTP	2	—	V	Plan	V	V	V	-40~75°C
ITP-802GTM-EHL	V	V	10	8	2 UTP	1	1	V	Plan	V	V	V	-40~75°C
ITP-800M-LL	V	V	10	8	—	2	—	V	Plan	V	V	V	-10~60°C
ITP-800M-HL	V	V	10	8	—	1	1	V	Plan	V	V	V	-10~60°C
ITP-800M-ELL	V	V	10	8	—	2	—	V	Plan	V	V	V	-40~75°C
ITP-800M-EHL	V	V	10	8	—	1	1	V	Plan	V	V	V	-40~75°C

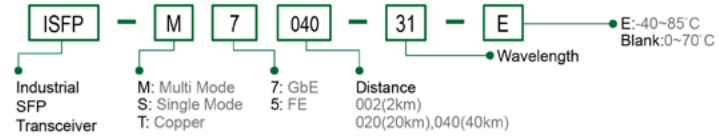
Model Naming Rule



Accessories

DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule



Preliminary

180 Watts, 24V Booster

ITP-G802SM-8PH24

EN50155 IP67 Managed 8x10/100/1000Base–T + 2x100/1000Base–X SFP with 8x PoE+ Ethernet Switch

ITP-G800M-8PH24

EN50155 IP67 Managed 8x10/100/1000Base–T with 8x PoE+ Ethernet Switch

CE FC EN50121-4 EN61000-6-2 EN61000-6-4 EN50155 SmartView u-Ring IP67 IEEE 1588

ITP-G802SM-8PH24 series are managed industrial grade Gigabit PoE (Power over Ethernet) switches with 8x 10/100/1000Base-T PoE ports and/or 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. ITP-G802SM-8PH24 series equipped with PoE feature enable power and data to be transferred via a single cable, hereby considerably reducing cabling expense. ITP-G802SM-8PH24 series also provide a variety of functions to manage PoE operation including PoE device auto-checking, auto reset, PoE power weekly scheduling. Other L2 management functions supported include STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS ,Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.

Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Especially, ITP-G802SM-8PH24 series switches use M12 connectors to ensure tight, robust connections and to guarantee reliable and anti environmental disturbances operation, such as vibration and shock. ITP-G802SM-8PH24 series are compliant with EN 50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.

ITP-G802SM-8PH24 series are IP67 rated to protect against dust and water submersion. They are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as IP surveillance, city security. ITP-G802SM-8PH24 series can also work with CTC Management platform SmartView to provide convenient, real-time and centralized network management.

Features

- 8x 10/100/1000Base-T M12 and 2x 100/1000Base-X SFP Fiber (Total 10 Port) (ITP-G802SM-8PH24)
- 8x 10/100/1000Base-T M12 (ITP-G800M-8PH24)
- M12 and M23 connector against vibration and shock
- IP67 water proof design against dust and water
- 24/48VDC redundant dual input power, and built-in power booster design upto 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- Provides 8-port IEEE802.3af / 802.3at PoE output (30W per Port)
- Maximum PoE output power budget 180W
- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset, PoE configuration for power planning, weekly scheduling
- UL60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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 802.3af	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 (ITP-G802SM-8PH24) 16Gbps (ITP-G800M-8PH24)
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.
	Positive (V+) : M12 pin 4,6 Negative (V-) : M12 pin 5,7. Data (1,2,3,4,5,6,7,8)
Network Connector	8xM12 (8-Pin, Female,A-Code) 10/100/1000Base-T auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex Water proof Fiber Cable Gland support for 2 X 100/1000 Base-X dual speed mode SFP slot, with DDMI (for ITP-G802SM-8PH24)
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present

Overload Current Protection	Present
CPU Watch Dog	Present
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per UTP 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 Fault (Over Load, Short Circuit, Port failed at Startup) : Flash 1times /sec (Green) • PoE Output Power Off : Off (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K Bytes for packet buffer
PoE Standard	IEEE802.3af, IEEE802.3at
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 55VDC
Power Supply	Provide 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power Built-in power booster design up to 55 VDC for PoE output
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-10 ~ 60°C (ITP-G802SM-8PH24 , ITP-G800M-8PH24) -40 ~ 75°C (ITP-G802SM-8PHE24 , ITP-G800M-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C

Housing	Rugged Metal, IP67 water proof protection, Fanless
Dimensions	70x240x168mm (D x W x H)
Weight	TBD
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	TBD (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	EN50155, EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1 (Pending)
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

Software Specifications

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN,up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling

IGMP / MLD Snooping	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
User Name Password Authentication	Local Authentication
	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
DHCP	Client, Relay, Snooping
	Snooping option 82, Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	

IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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

Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring 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

Application

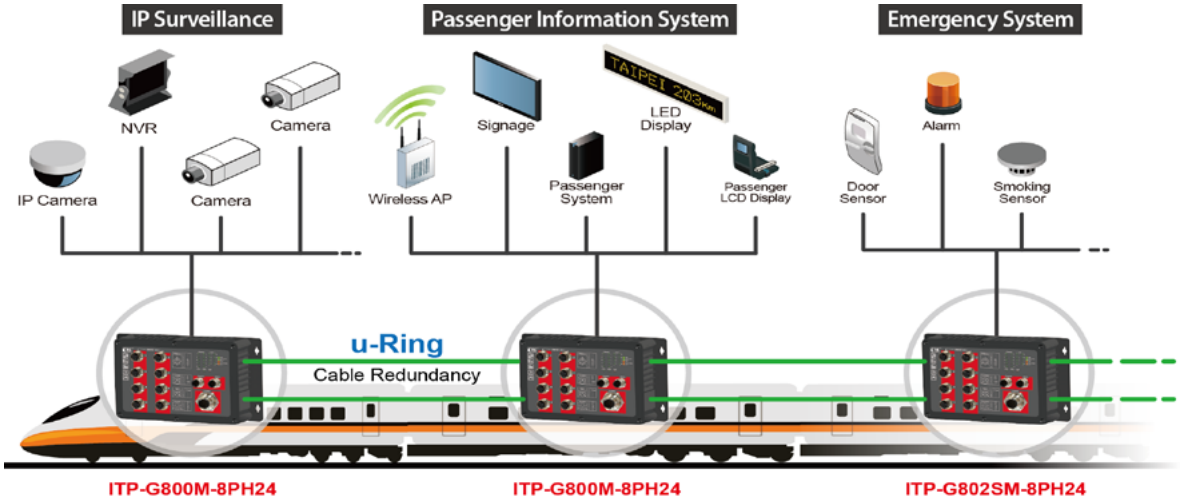


Figure 1 : ITP Series in Onboard Train Application

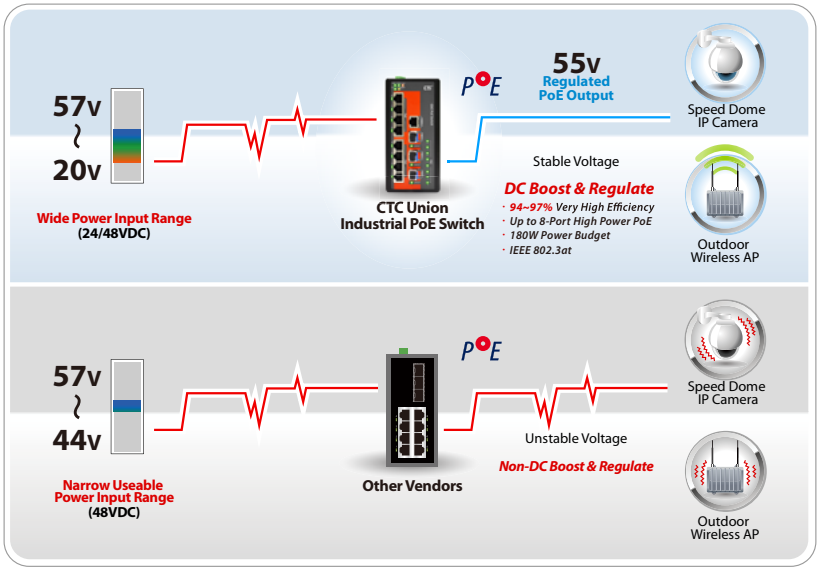


Figure 2 : PoE Core Technology

Figure 3 : ITP Series for Industrial Automation

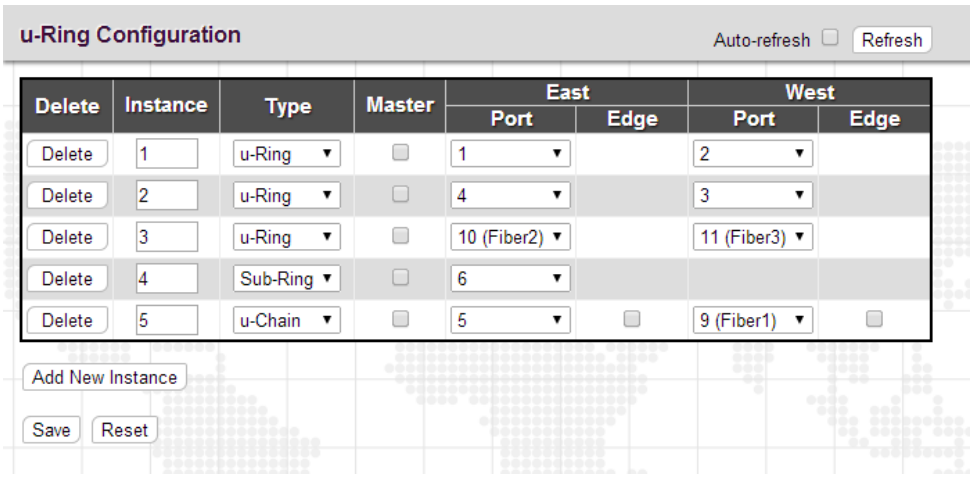
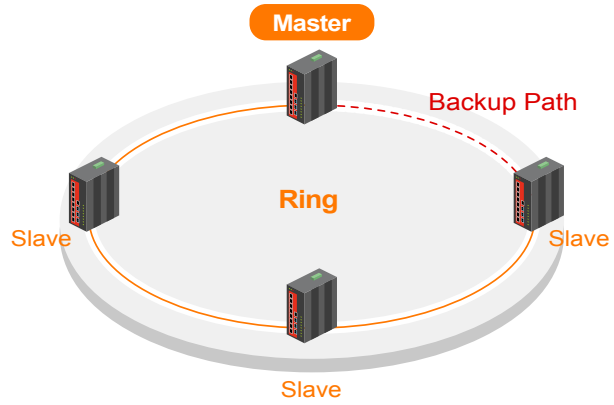
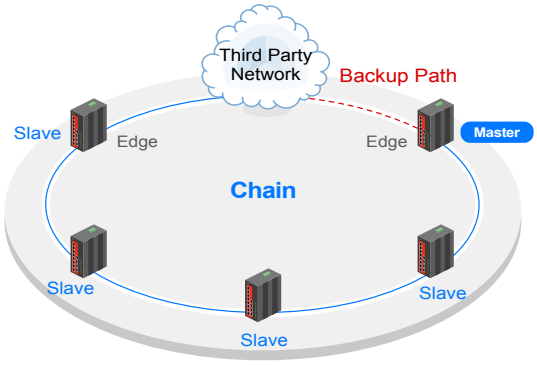


Figure 4 : An illustration of u-Ring instances configured in Web interface

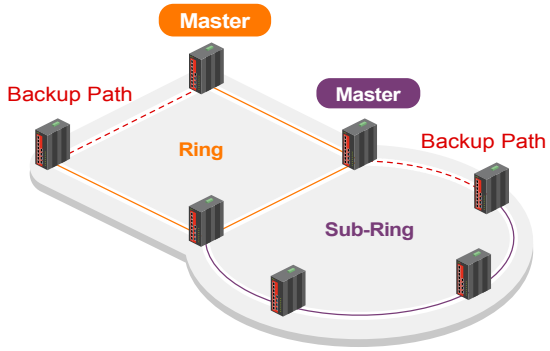
Figure 5 : u-Ring Type



u-Ring Type

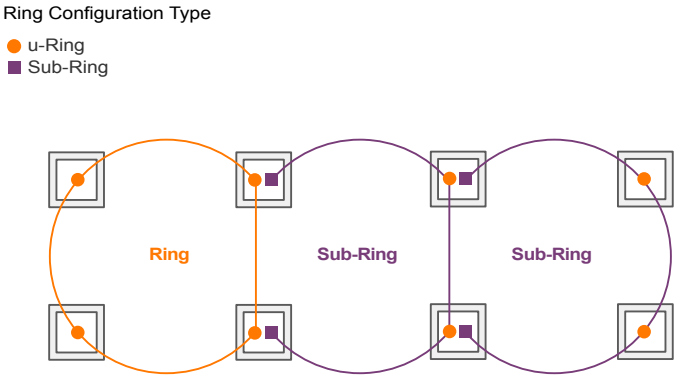


Determining the backup path (u-Chain type)

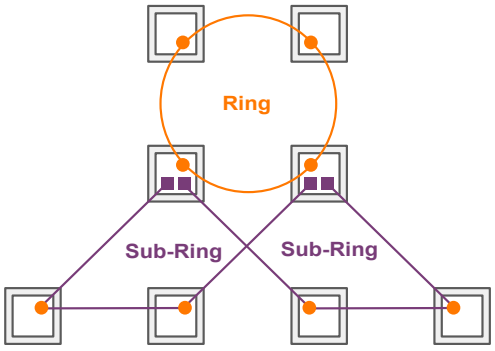


A major ring and a Sub-Ring topology

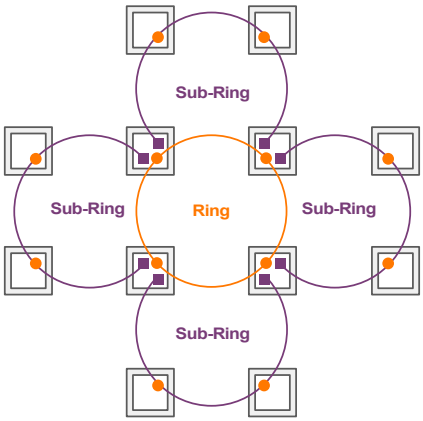
Figure 6 : Ring Configuration Example



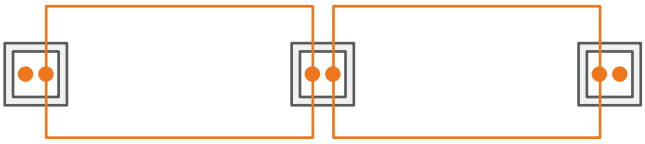
Ring Configuration Type



Combination of a ring and two Sub-Ring



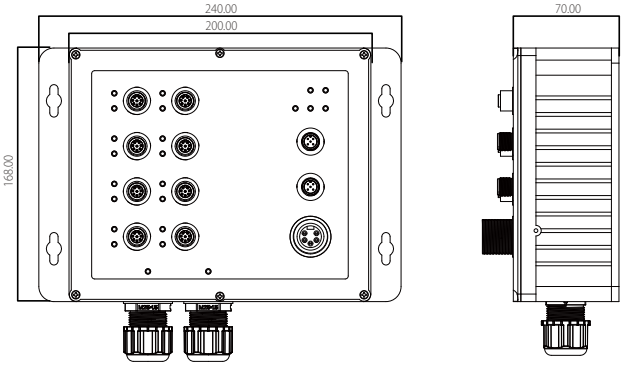
Combination of a ring and four Sub-Ring



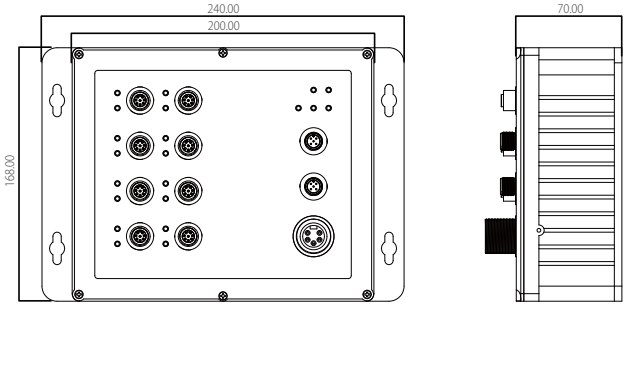
Cable Redundancy

Dimensions

ITP-G802SM-8PH24



ITP-G800M-8PH24



Ordering Information

Model Name	Managed	IP67	Total Port	UTP Port M12	Fiber Port	PoE Port	PoE Total Power Budge	Input Voltage	Certification				Shock Vibration	Operating Temperture
				10/100/1000 Base-T	100/1000 Base-X	IEEEE 802.3at		24/48 VDC (20~57 VDC)	EN50155 EN50121-4	UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	
ITP-G802SM-8PH24	V	V	10	8	2 SFP	8	180W	V	V	Plan	V	V	V	-10~60°C
ITP-G802SM-8PHE24	V	V	10	8	2 SFP	8	180W	V	V	Plan	V	V	V	-40~75°C
ITP-G800M-8PH24	V	V	8	8	—	8	180W	V	V	Plan	V	V	V	-10~60°C
ITP-G800M-8PHE24	V	V	8	8	—	8	180W	V	V	Plan	V	V	V	-40~75°C

Model Naming Rule

ITP – G – 8 – 02S – M – 8PH E 24

- ITP: Industrial Transportation Switch
- G: GbE Switch
- 8: 8xUTP
- 02S: 2xSFP
- M: Managed
- E: 8PHE24: 8x High Power PoE 24V Booster -40~75°C
- 24: 8PH24: 8x High Power PoE 24V Booster -10~60°C

Accessories

DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule

ISFP – M – 7 – 040 – 31 – E

- ISFP: Industrial SFP Transceiver
- M: Multi Mode; S: Single Mode; T: Copper
- 7: GbE; 5: FE
- 040: Distance 002(2km) 020(20km),040(40km)
- 31: Wavelength
- E: E:-40~85°C; Blank:0~70°C

Preliminary

180 Watts, 24V Booster

ITP-802GSM-8PH24

EN50155 IP67 Managed 8x10/100Base–T + 2x100/1000Base–X SFP with 8xPoE+ Ethernet Switch

ITP-802GTM-8PH24

EN50155 IP67 Managed 8x10/100Base–T + 2x10/100/1000Base–X Switch with 8xPoE+ Ethernet Switch

ITP-800M-8PH24

EN50155 IP67 Managed 8x10/100Base–T with 8xPoE+ Ethernet Switch

ITP-802GSM-8PH24 series are managed industrial grade Ethernet PoE (Power over Ethernet) switches with 8x 10/100Base-TX PoE ports and/or 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. ITP-802GSM-8PH24 series equipped with PoE feature enable power and data to be transferred via a single cable, hereby considerably reducing cabling expense. ITP-802GSM-8PH24 series also provide a variety of functions to manage PoE operation including PoE device auto-checking, auto reset, PoE power weekly scheduling. Other L2 management functions supported include STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS ,Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet.

Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for the harshest environments. Especially, ITP-802GSM-8PH24 series switches use M12 connectors to ensure tight, robust connections and to guarantee reliable and anti environmental disturbances operation, such as vibration and shock. ITP-802GSM-8PH24 series are compliant with EN 50155, covering power input voltage, surge, EFT, ESD, vibration, shock, thus making the switches suitable for industrial applications, such as vehicle, rolling stock, ship, vessel.

ITP-802GSM-8PH24 series are IP67 rated to protect against dust and water submersion. They are particularly used in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications such as IP surveillance, city security. ITP-802GSM-8PH24 series can also work with CTC Management platform SmartView to provide convenient, real-time and centralized network management.

Features

- 8x 10/100Base-TX M12 and 2x 100/1000Base-X SFP Fiber (Total 10 Port) (ITP-802GSM-8PH24)
- 8x 10/100Base-TX M12 and 2x 10/100/1000Base-X (Total 10 Port) (ITP-802GTM-8PH24)
- 8x 10/100Base-TX M12 (ITP-800M-8PH24)
- M12 and M23 connector against vibration and shock
- IP67 water proof design against dust and water
- Build-in 2 bypass port (ITP-802GTM-8PH24)
- 24/48VDC redundant dual input power, and built-in power booster design upto 55 VDC for PoE output
- Constant and regulated PoE output voltage at 55VDC
- Provides 8-port IEEE802.3af / 802.3at PoE output (30W per Port)
- Maximum PoE output power budget 180W
- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset, PoE configuration for power planning, weekly scheduling
- UL60950-1, CE, FCC, Rail Traffic EN50155,EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Support IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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 802.3af	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): 5.6 Gbps (ITP-802GSM-8PH24, ITP-802GTM-8PH24) 1.6 Gbps (ITP-800M-8PH24)
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 (4-Pin D-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode. Positive (V+) : M12 pin 2,4 Negative (V-) : M12 pin 1,3. Data (1,2,3,4)
Network Connector	8xM12 (4-Pin, Female,D-Code) 10/100Base-TX , Auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex 2x M12 (8-Pin, female,A-Code) 10/100/1000Base-T (ITP-802GTM-8PH24) Water proof Fiber Cable Gland support for 2 X 100/1000 Base-X dual speed mode SFP slot, with DDMI (for ITP-802GSM-8PH24) Build-in 2 bypass port (ITP-802GTM-8PH24)
Console	RS-232 (5-pin A-Code M12 male)
Network Cable	UTP/STP above Cat. 5e cable, EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Present

Overload Current Protection	Present
CPU Watch Dog	Present
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per UTP port: 10/100 Link/Active (Green)
	SFP Fiber Per port: Link/Active (Green)
	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit, Port failed at Startup) : Flash 1times /sec (Green) • PoE Output Power Off : Off (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	256K Bytes for packet buffer
PoE Standard	IEEE802.3af, IEEE802.3at
PoE Power Output	Maximum PoE output power budget 180W (30W/per port) Regulated PoE output voltage at 55VDC
Power Supply	Provide 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power Built-in power booster design up to 55 VDC for PoE output
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-10 ~ 60°C (ITP-802GSM-8PH24, ITP-802GTM-8PH24, ITP-800M-8PH24) -40 ~ 75°C (ITP-802GSM-8PHE24, ITP-802GTM-8PHE24, ITP-800M-8PHE24)
Operating Humidity	5% to 95% (Non-condensing)

Software Specifications

Topology	
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	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN,up to 256 entries
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	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
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	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	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS, IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling

Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP67 water proof protection, Fanless
Dimensions	70x240x168mm (D x W x H)
Weight	TBD
Installation Mounting	DIN Rail mounting or wall mounting
MTBF	TBD (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	EN50155, EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1 (Pending)
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

IGMP / MLD Snooping	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
User Name Password Authentication	Local Authentication
	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
DHCP	Client, Relay, Snooping
	Snooping option 82, Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	

IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4
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

Green Ethernet	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring 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

Application

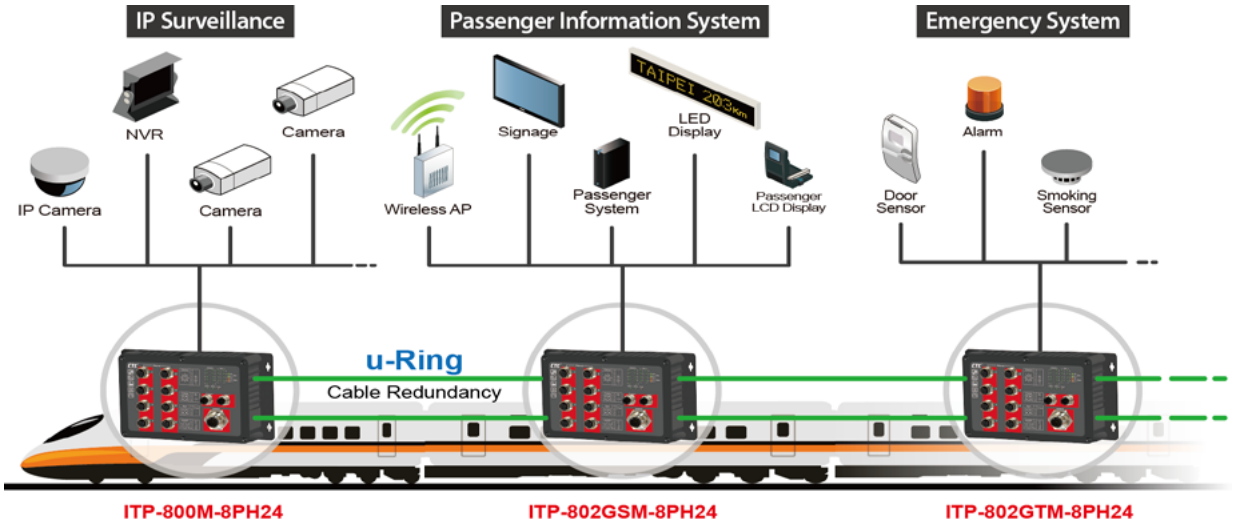


Figure 1 : ITP Series in Onboard Train Application

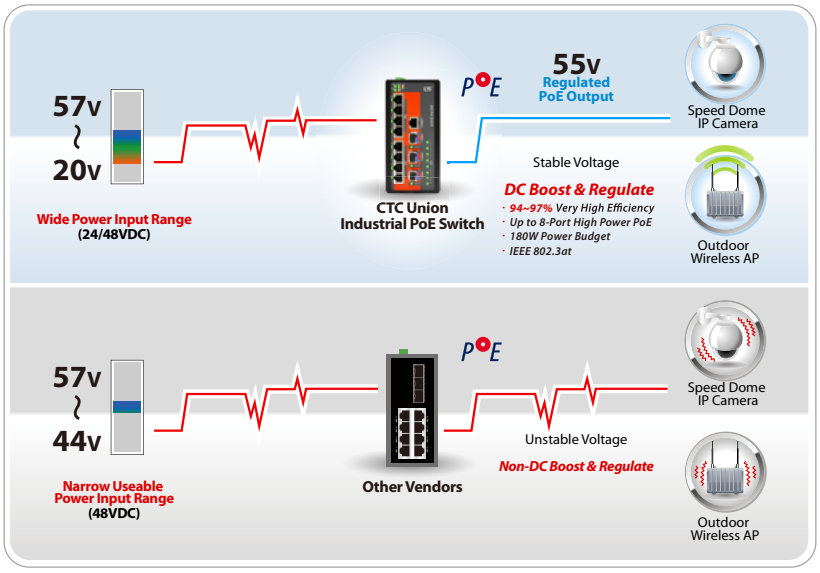


Figure 2 : PoE Core Technology

Figure 3 : ITP Series for Industrial Automation

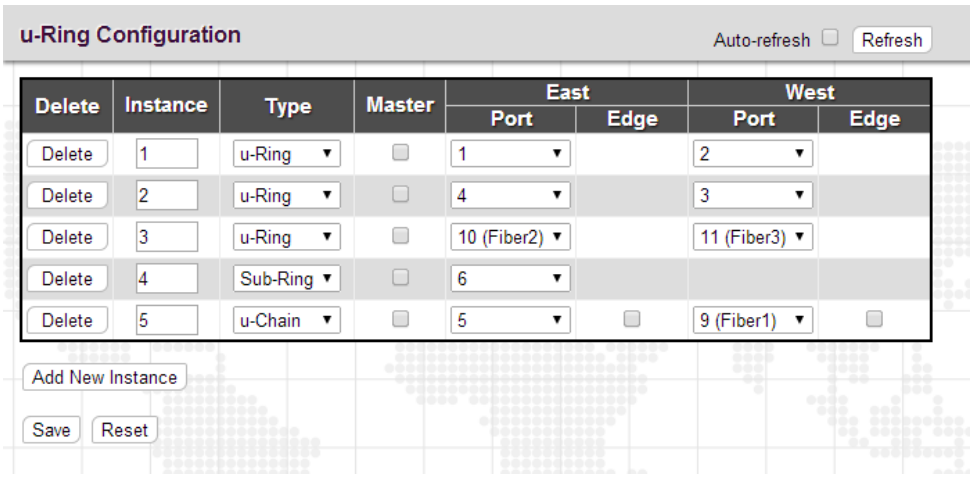
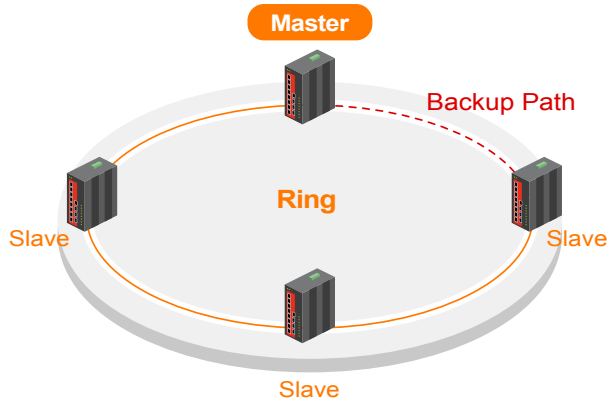
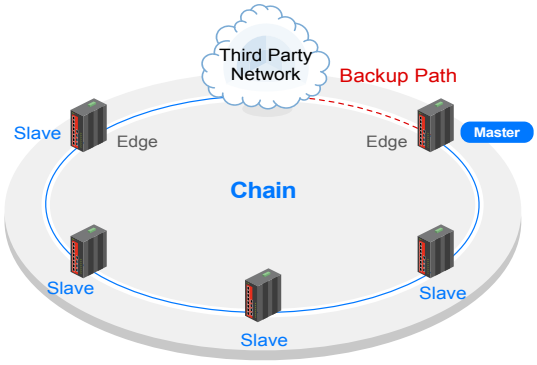


Figure 4 : An illustration of u-Ring instances configured in Web interface

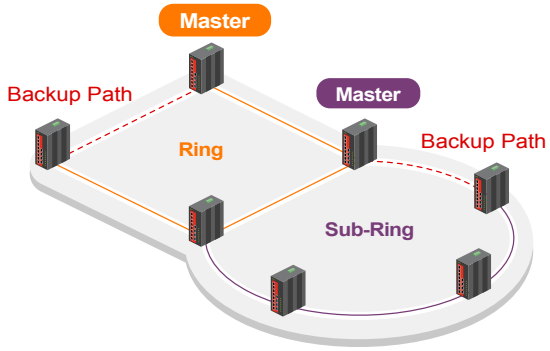
Figure 5 : u-Ring Type



u-Ring Type

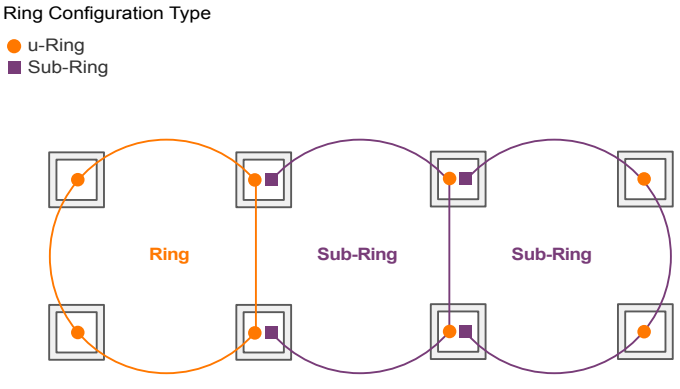


Determining the backup path (u-Chain type)

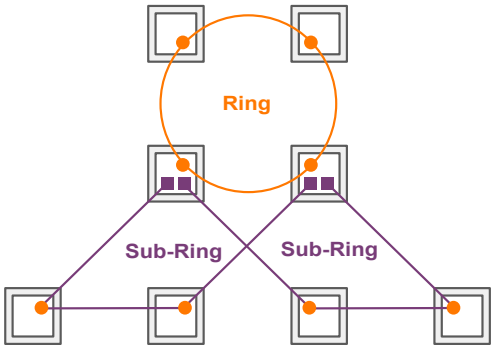


A major ring and a Sub-Ring topology

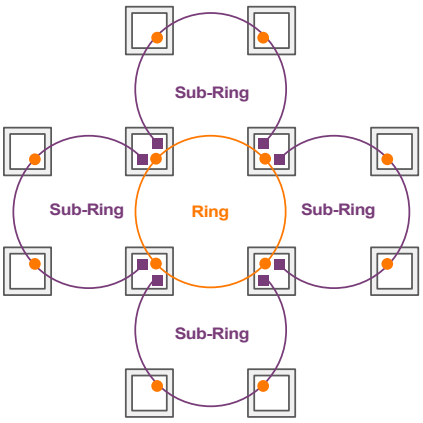
Figure 6 : Ring Configuration Example



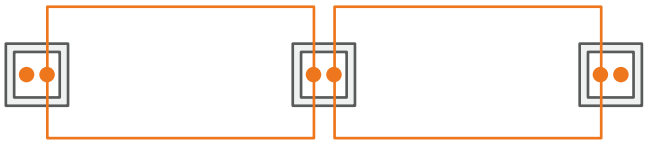
Ring Configuration Type



Combination of a ring and two Sub-Ring



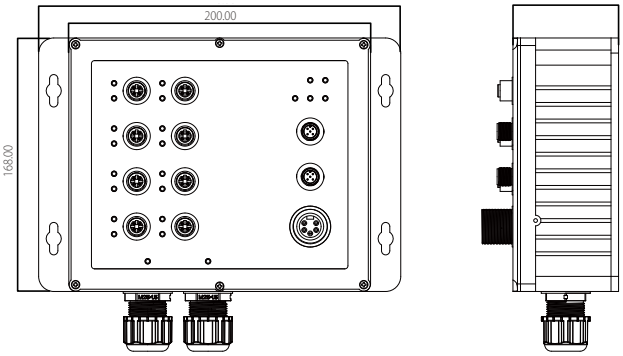
Combination of a ring and four Sub-Ring



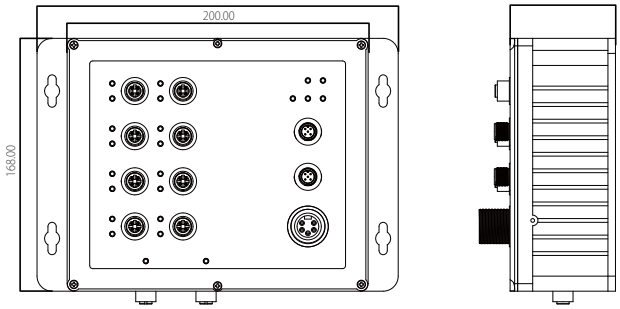
Cable Redundancy

Dimensions

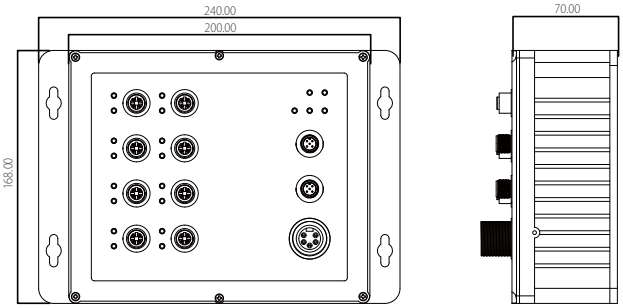
ITP-802GSM-8PH24



ITP-802GTM-8PH24



ITP-800M-8PH24



Ordering Information

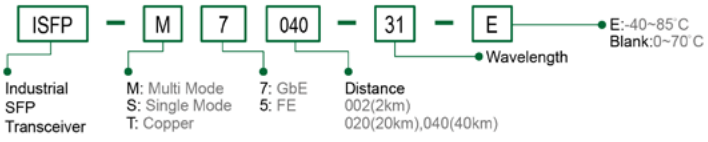
Model Name	Managed	IP67	Total Port	UTP Port M12 10/100 Base-TX	Gigabit Port	PoE Port IEEE 802.3at	PoE Total Power Budge	Input Voltage 24/48 VDC (20~57 VDC)	Certification EN50155 EN50121-4	Certification UL60950-1	Certification EN61000-6-2 EN61000-6-4	Certification CE FCC	Shock Vibration IEC61373	Operating Temperture
ITP-802GSM-8PH24	V	V	10	8	2 SFP	8	180W	V	V	Plan	V	V	V	-10~60°C
ITP-802GSM-8PHE24	V	V	10	8	2 SFP	8	180W	V	V	Plan	V	V	V	-40~75°C
ITP-802GTM-8PH24	V	V	10	8	2 UTP	8	180W	V	V	Plan	V	V	V	-10~60°C
ITP-802GTM-8PHE24	V	V	10	8	2 UTP	8	180W	V	V	Plan	V	V	V	-40~75°C
ITP-800M-8PH24	V	V	8	8	—	8	180W	V	V	Plan	V	V	V	-10~60°C
ITP-800M-8PHE24	V	V	8	8	—	8	180W	V	V	Plan	V	V	V	-40~75°C

Model Naming Rule

Accessories

DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70°C
SFP Transceiver	Compatible, Reliable, 5-year Warranty

SFP Naming Rule



Preliminary

ICS-G24S4X

Industrial 24x100/1000Base-X SFP with 4x Combo, and 4x 10GbE SFP+ Core Switch

ICS-G24S2X

Industrial 24x100/1000Base-X SFP with 4x Combo, and 2x 10GbE SFP+ Core Switch

ICS-G24S4X & ICS-G24S2X are Ethernet Core Switches that are equipped with 24 Gigabit SFP ports with 4 combo ports plus 2 or 4 10G SFP+ ports. ICS series models are all fanless with redundant isolated power supplies (2 AC, 2 DC, AC + DC) and can be mounted in 19 inch standard rack. They not only offer various layer 2 management functions (IGMP, VLAN, QoS , Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet) but also support u-Ring redundancy protocol that can establish 14 independent rings for flexible applications, especially employed in backbone infrastructure. ICS switches can also be managed centrally and conveniently by CTC Union's SmartView Element Management System and mass configured by SmartConfig.

Housed in rugged rack mountable enclosures, ICS Series complies with many industrial-grade standards and are ideal for deployments in harsh environments to deliver mission-critical network services. Additionally, with high port density and Gigabit or 10 Gigabit high-speed feature on each port, ICS-G24S4X & ICS-G24S2X are a reliable and scalable solution for core layer or backbone applications.

Features

- 24x 100/1000Base-X SFP with 4xCombo (SFP+RJ-45) and 4x 10GBase-X SFP+ (ICS-G24S4X)
- 24x 100/1000Base-X SFP with 4xCombo (SFP+RJ-45) and 2x 10GBase-X SFP+ (ICS-G24S2X)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Redundancy isolated low voltage 24/48VDC, or/and isolated High voltage AC (110/240 VAC) power inputs
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable normal or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet), management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 14 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses (see Figure 3). Supports up to 14 rings in one device (see Figure 1).
- u-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security: Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports IEEE1588 PTP V2 for precise time synchronization to operate in Master, Boundary, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration
- Supports SmartView for Centralized 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	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)
	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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 128Gbps (ICS-G24S4X) 88Gbps (ICS-G24S2X)	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	

Network Connector	24x 100/1000Base-X SFP with 4x GbE Combo (UTP/SFP)+ 4x 10GBase-X SFP+ (ICS-G24S4X) 24x 100/1000Base-X SFP with 4x GbE Combo (UTP/SFP)+ 2x 10GBase-X SFP+ (ICS-G24S2X) RJ-45 UTP port support 10/100/1000Base-T(X) , Auto negotiation speed,Auto MDI/MDI-X function GbE port SFP support dual speed (100M/1000M) with DDMI 10GbE port SFP+ support dual speed (1000M/10G) with DDMI
Console	RS-232 (RJ-45)
Network Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Timing synchronization	ITU-T G.8262 SyncEthernet (-SE model) IEEE 1588 PTP v2
Reverse Polarity Protection	Present
Overload Current Protection	Present
CPU Watch Dog	Present
Power Supply	Redundant 2x Isolated Low Voltage DC Input power (-DD model) Redundant 1x isolated Low Voltage DC and 1x High Voltage AC input power (-AD model) Redundant 2x isolated High Voltage AC input power (-AA model) Low Voltage DC: Isolated 24/48V (18~60VDC), Removable Terminal Block High voltage AC: isolated 110/240VAC (88VAC~264VAC)
Power Consumption	TBD

LED	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Red), Ring Master (Green)
	Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Yellow)
	SFP (P1~24) Fiber Per port: 100Base-X Link/Active (Green) 1000Base-X Link/Active (Yellow) SFP+ (P25~P28) Fiber Per port: 1000Base-X Link/Active (Amber) 10GBase-X Link/Active (Blue)
Jumbo Frame	10K
MAC Address Table	32K
Memory Buffer	4M 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, 2-Pin removable terminal block
Operating Temperature	-10 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	250 x 440 x 44 mm (D x W x H)
Weight	TBD

Installation Mounting	19" rack mount
MTBF	TBD
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
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), 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 14 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 14 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
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	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	
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
DHCP	Client, Relay, Snooping
	Snooping option 82
	Relay option 82
IP Source Guard	
Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Master, Boundary, Slave Operating mode Operating in each port of these switch
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries
	L2 / L3 / L4

Application

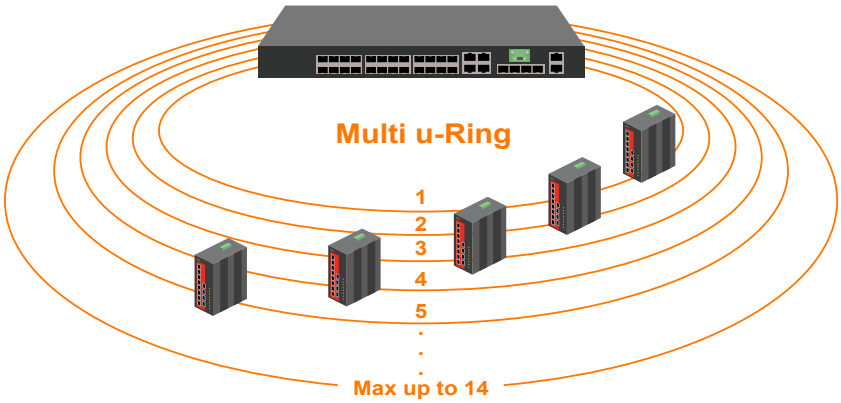


Figure 1 : Multiple Rings

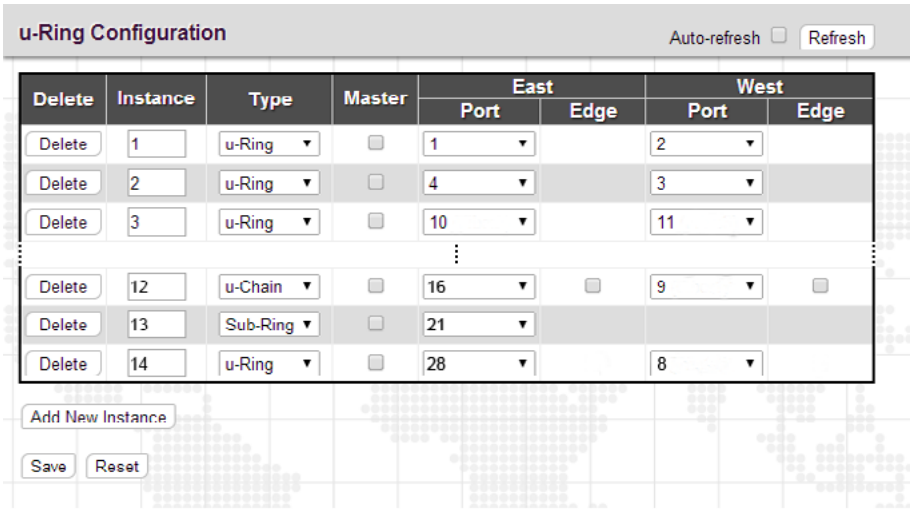
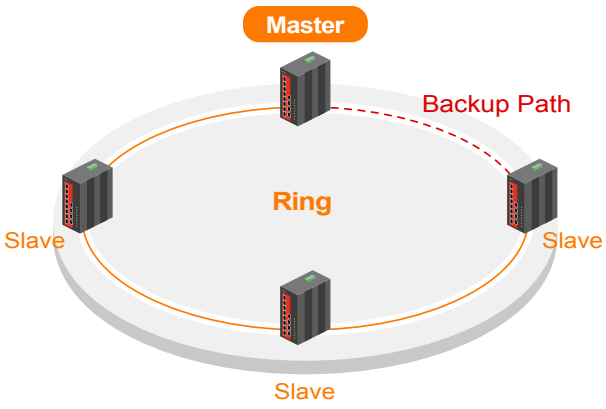
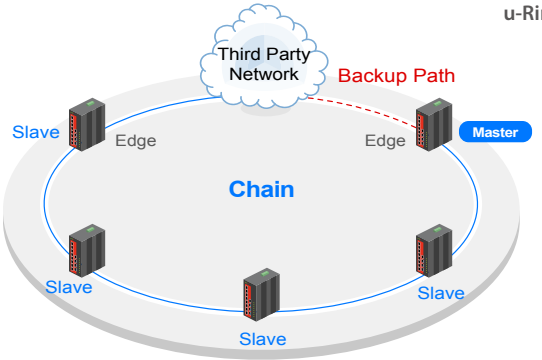


Figure 2 : User-Friendly Configuration In Web Interface

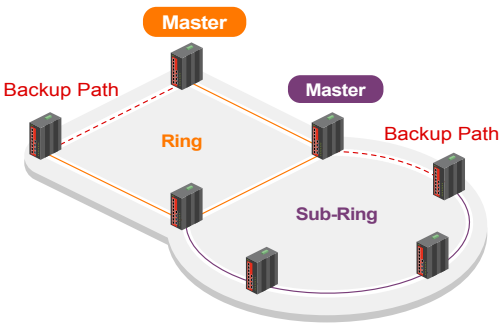
Figure 3 : u-Ring Type



u-Ring Type

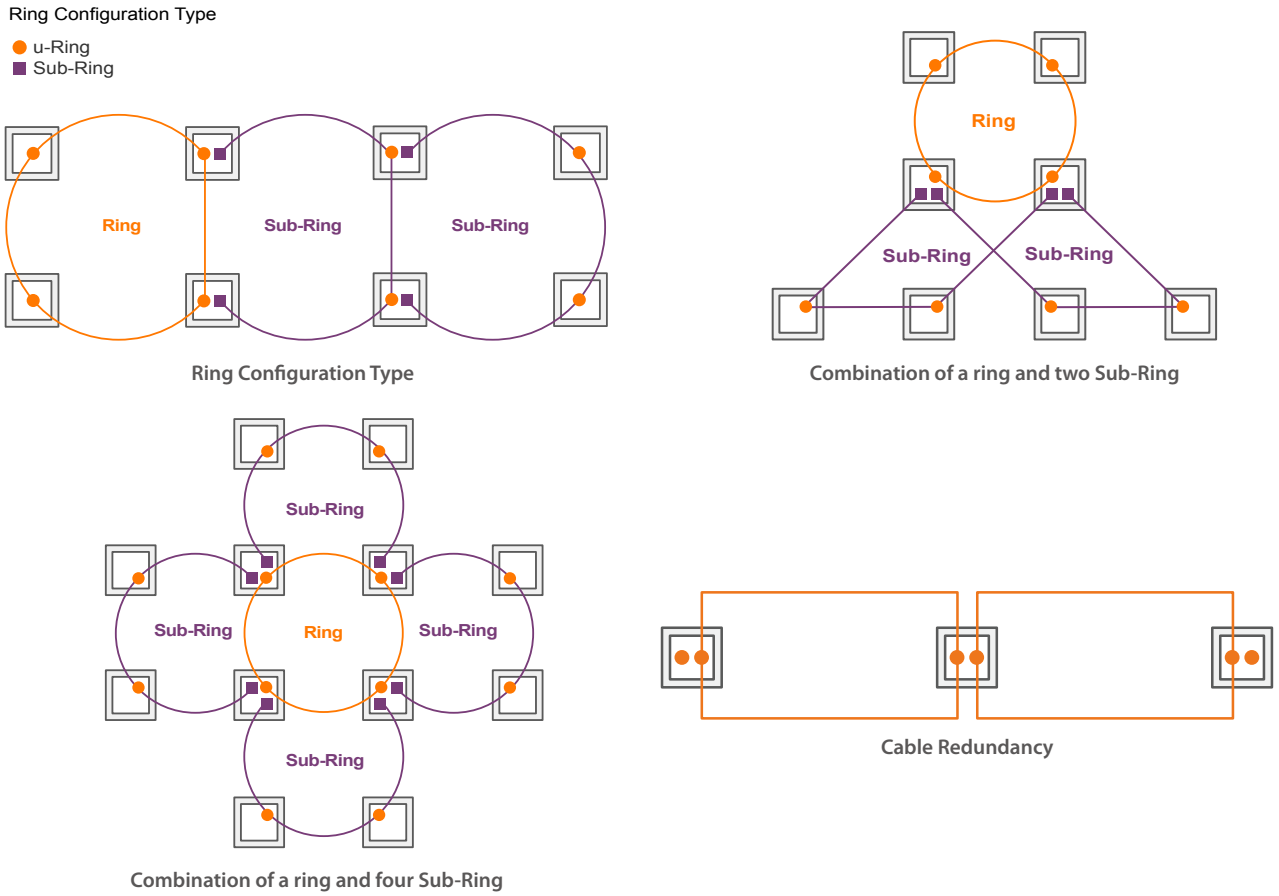


Determining the backup path (u-Chain type)



A major ring and a Sub-Ring topology

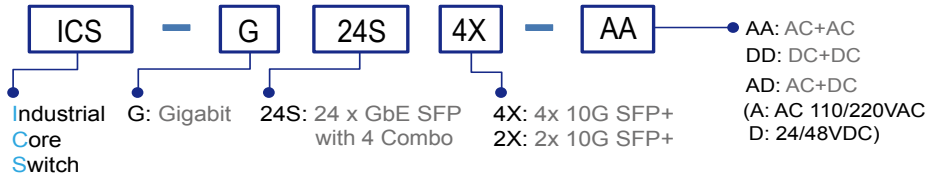
Figure 4 : Ring Configuration Example



Ordering Information

Model Name	Managed	Total Port	GbE Port		10GbE	Input Power		Certification			
			100/1000 Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP	IEEE 802.3ae SFP+	DC (Low Volt) isolated 24/48VDC	AC (High Volt) 110/240V AC	Safety UL60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC
ICS-G24S4X-AA	V	28	20	4 Combo	4		2	V	V	V	V
ICS-G24S4X-DD	V	28	20	4 Combo	4	1	1	V	V	V	V
ICS-G24S4X-AD	V	28	20	4 Combo	4	2		V	V	V	V
ICS-G24S2X-AA	V	26	20	4 Combo	2		2	V	V	V	V
ICS-G24S2X-DD	V	26	20	4 Combo	2	1	1	V	V	V	V
ICS-G24S2X-AD	V	26	20	4 Combo	2	2		V	V	V	V

Model Naming Rule



Optional Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70℃

STE100A-232

1-Port RS-232 IP Device Server

STE100A-Serial

1-Port RS-232/422/485 IP Device Server

The IP Device Server provides the serial device server for hosts to control RS-232, 2 or 4 wire asynchronous RS-422/485 serial devices located virtually anywhere through a TCP/IP or UDP/IP connection. The Device Server has the DB9 port connection on one side, and a 10/100 Mbps Ethernet connection on the other side. 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 IP Device Server Windows driver is designed to control the IP Serial Server devices. The driver installs a virtual COM on Windows which maps the virtual COM port to the IP address of the IP Serial Server device across the network, enabling the Windows applications to access remote serial devices over Ethernet. IP Device Server can function as a UDP or a server or client for TCP connection. The application scenarios are direct IP mode, virtual COM mode, and paired mode.

Features

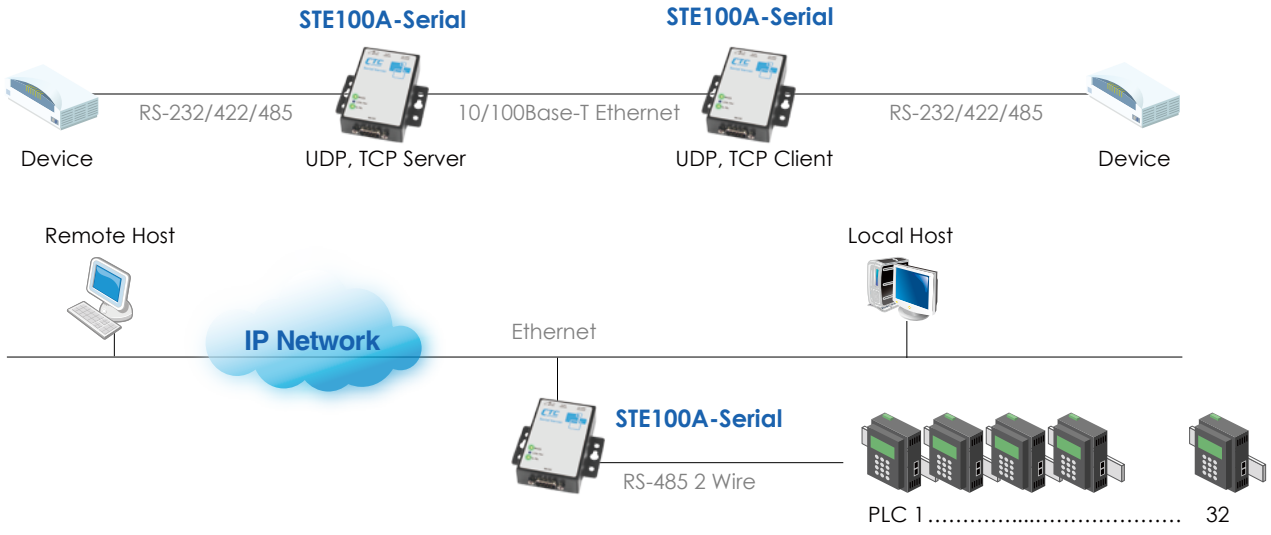
- 10/100Mbps Ethernet port
- 230.4kbps serial interface
- TCP Server, TCP client, Virtual com mode, UDP
- Supports for DHCP, HTTP, ICMP, ARP, IP, UDP, TCP
- Easy to use with Windows utility
- 2 Wire(half duplex) or 4 Wire(full duplex)RS-422/485 (STE100A-Serial)
- Configuration by web browser
- Flexible RS-232/422/485 Interface (STE100A-Serial)
- Low power consumption with single + 12V to +48V input

Specifications

General	LED	Ready, TP Link/Act, Data TX/RX
	OS supported	Windows XP / 2000 / 2003 / 2008 / VISTA / WIN7 / WIN8
Serial Interface	STE100A-Seria l : RS-232/422/485 STE100A-232 : RS-232	
Serial Connector	DB9 Male	
Baudrate	110 to 230.4Kbps	
Data bits	5, 6, 7, 8	
Stop bits	1, 1,5 for Data bits 5 mode; 1, 2 for data bits 6, 7, 8 mode	
Parity	None, Even, Odd	
Flow Control	None or RTS / CTS for RS-232 Full Duplex(4-Wire) or Half Duplex(2-Wire) for RS-422/485	
Data Packing Delimiter	1,2	
LAN Interface	RJ-45 connector, IEEE802.3 10/100Base-TX	

Communication Modes	TCP Server, TCP Client, Virtual COM mode, UDP
Protocols	TCP, UDP, IP, ARP, ICMP, HTTP, DHCP
Management	Web pages, Firmware upgrade
Security	Password Access
Power	12VDC
Operating Temperature	0 ~ 60°C
Storage Temperature	-10 ~ 70°C
Humidity	0 – 90% non-condensing
DIN rail mount	Yes
Panel mount	Yes
Dimensions	80.7 x 84.2 x 22mm (D x W x H) with DIN-Rail Mounting Kit
Certifications	CE, FCC

Application

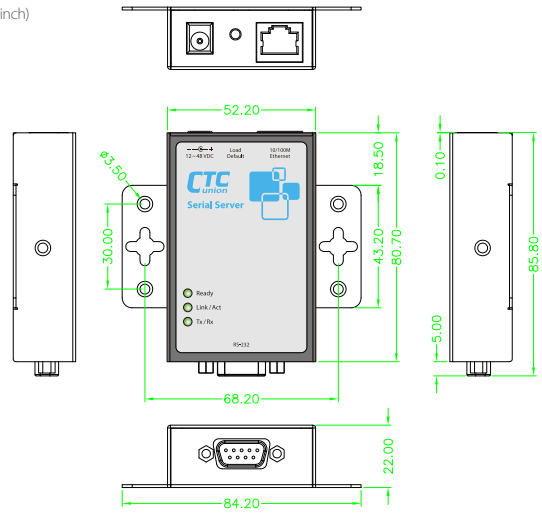


Appearance

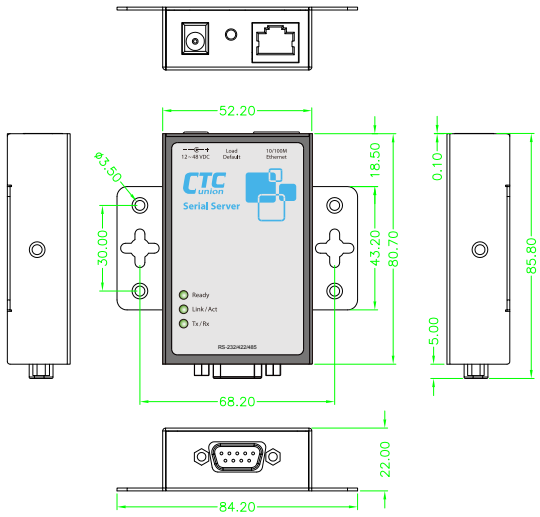
Dimensions

STE100A-232

Unit: mm (inch)



STE100A-Serial



Ordering Information

Model Name	Description
STE100A-232	1-port RS232 device server with AC power adapter
STE100A-Serial	1-port RS232/422/485 device server with AC power adapter
Optional accessories	
STE100A-Serial-WT	STE100A-Serial DB9 wiring terminal
STE100A/DRK01	STE100A/RS232,STE100A/Serial DIN-Rail Mounting Kit
Optional Power	
DC-APT/12V	-48VDC to 12VDC Adapter - 0.83 Amp, 10 Watts , Output 12 VDC, Input -48VDC

Din-Rail Mounting Kit
STE100A/DRK01

DB9 Wiring Terminal
STE100A-Serial-WT
(only for STE100A-Serial)

DR-4524 Output 24VDC, 45W
MDR-40-24 Output 24VDC, 40W
MDR-60-24 Output 24VDC, 60W
DR-120-24 Output 24VDC, 120W
DRP-240-48 Output 48VDC, 240W

Having reliable and stable power for your industrial grade 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

- Protections: Short circuit / Overload / Over voltage
- LED indicator for power on
- Cooling by free air convection
- Installation mounting by Din Rail
- UL508, UL60950-1, CE approved
- Heavy industry grade EMS approved
- 3 years warranty

Specifications

Model Name		DRP-240-48	DR-120-24	DR-4524
Output	Dc Voltage	48V	24V	24V
	Rated Current	5A	5A	2A
	Current Range	0~5A	0 ~ 5A	0 ~ 2A
	Rated Power	240W	120W	48W
	Output Voltage Adj. Range	48~53V	24 ~ 28V	21.6 ~ 26.4V
Input	Voltage Range	85 ~ 264VAC / 120 ~ 370VDC	88 ~ 132VAC / 176 ~ 264VAC, 248 ~ 370VDC by switch	85 ~ 264VAC / 120 ~ 370VDC
	Frequency Range	47 ~ 63Hz	47 ~ 63Hz	47 ~ 63Hz
	Efficiency (Typ.)	85%	84%	80%
Protection	Overload	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed
	Over Voltage	54 ~ 60V Protection type : Shut down o/p voltage, re-power on to recover	29 ~ 33V Protection type : Shut down o/p voltage, re-power on to recover	27.6 ~ 32.4V Protection type : Shut off o/p voltage, clamping by zener diode
Alarm Relay	DC OK Relay			
Indicator	LED	Power On	Power On	Power On
Housing	Dimension	100 x 125.5 x 125.2 mm (D x W x H)	100 x 65.5 x 125.2mm (D x W x H)	67 x 78 x 93 mm (D x W x H)
	Installation Mounting	DIN Rail	DIN Rail	DIN Rail
Environment	Working Temp	-10 ~ 70°C	-10 ~ 60°C	-10 ~ 50°C
	Working Humidity	20 ~ 90% RH non-condensing	20 ~ 90% RH non-condensing	20 ~ 90% RH non-condensing
	Storage Temp., Humidity	-20 ~ 85°C , 10 ~ 95% RH	-20 ~ 85°C , 10 ~ 95% RH	-20 ~ 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	UL508, UL60950-1 approved	UL508, UL60950-1 approved	UL508 approved
	EMC Emission	Compliance to EN55011, EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2, -3	Compliance to EN55011, EN55022 (CISPR22) Class B, EN61000-3-2,-3	Compliance to EN55011, EN55022 (CISPR22) Class B, EN61000-3-2,-3
	EMC Immunity	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2 heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A
Others	PFC	Built in Active PFC		
	MTBF	289.9K hrs min. MIL-HDBK-217F (25°C)	136.8Khrs min. MIL-HDBK-217F (25°C)	364.6K hrs min. MIL-HDBK-217F (25°C)
	Waranty	3 Years	3 Years	3 Years

Model Name		MDR-40-24	MDR-60-24
Output	Dc Voltage	24V	24V
	Rated Current	1.7A	2.5A
	Current Range	0 ~ 1.7A	0~2.5A
	Rated Power	40.8W	60W
	Output Voltage Adj. Range	24 ~ 30V	24~30V
Input	Voltage Range	85 ~ 264VAC / 120 ~ 370VDC	85 ~ 264VAC / 120 ~ 370VDC
	Frequency Range	47 ~ 63Hz	47 ~ 63Hz
	Efficiency (Typ.)	88%	88%
Protection	Overload	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed
	Over Voltage	31.2 ~ 36V Protection type : Shut down o/p voltage, re-power on to recover	31.2 ~ 36V 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 Relay contact rating(max.): 30V/1A resistive
Indicator	LED	DC OK	Power On
Housing	Dimension	100 x 40 x 90 mm (D x W x H)	100 x 40 x 90 mm (D x W x H)
	Installation Mounting	DIN Rail	DIN Rail
Environment	Working Temp	-20 ~ 70°C	-20 ~ 70°C
	Working Humidity	20 ~ 90% RH non-condensing	20 ~ 90% RH non-condensing
	Storage Temp., Humidity	-40 ~ 85°C , 10 ~ 95% RH	-40 ~ 85°C , 10 ~ 95% RH
	Vibration	Compliance to IEC60068-2-6	Compliance to IEC60068-2-6
Safety & EMC	Safety Standards	UL508, UL60950-1 approved	UL508, UL60950-1 approved
	EMC Emission	Compliance to EN55011, EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2,-3	Compliance to EN55011, EN55022 (CISPR22), 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, EN61204-3, heavy industry level, criteria A	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A
Others	PFC		
	MTBF	301.7K hrs min. MIL-HDBK-217F (25°C)	299.2K hrs min. MIL-HDBK-217F (25°C)
	Waranty	3 Years	3 Years

Ordering Information

Model Name	Input AC Voltage Range	Output Voltage	Output Voltage Adj. Range	Output Power	Operating Temperture
DR-4524	85~264VAC	24VDC	21.6 ~ 26.4V	45W	-10 ~ +50 C
MDR-40-24	85~264VAC	24VDC	24 ~ 30V	40W	-20 ~ +70 C
MDR-60-24	85~264VAC	24VDC	24~30V	60W	-20 ~ +70 C
DR-120-24	"88~132VAC 176~264VAC"	24VDC	24 ~ 28V	120W	-10 ~ +50 C
DRP-240-48	85~264VAC	48VDC	48~53V	240W	-10 ~ +70 C

Industrial SFP Transceiver

1.25G 1000Base-X for Optic
1.25G 1000Base-T for Copper
155Mbps 100Base-FX for Optic

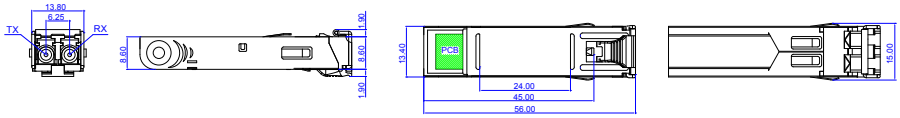
CTC Union's industrial SFP Transceivers are highly reliable, for serial optical data communications applications specified for single mode fiber operation at 1.25G/155M bps. They operate with +3.3V power supplies and are intended for single mode or multi-mode fiber, operating at a nominal wavelength 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.

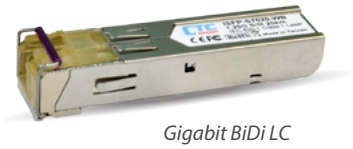
Features

- All SFPs have been tested with the best operating performance on CTC Union's Industrial switches
- Single 3.3V power supply
- Duplex or Simplex LC receptacle connector
- Hot Pluggable
- Lower power dissipation
- All Gigabit SFP compliant to IEEE802.3z 1000Base-X and IEEE802.3ab 1000Base-T
- All Fast Ethernet SFP Compliant to IEEE802.3u 100Base-FX
- Industrial standard small form pluggable (SFP) package
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Eye safety compliant with Class 1 laser product standard IEC825-1
- CE, FCC class B certification
- RoHS compliant
- 5 years warranty

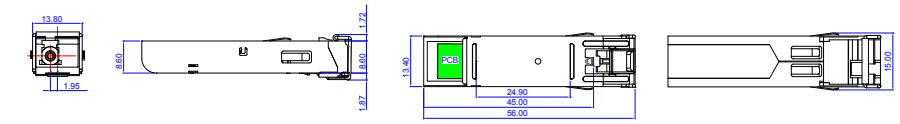
Gigabit Ethernet SFP

Gigabit Duplex LC





Gigabit BiDi LC

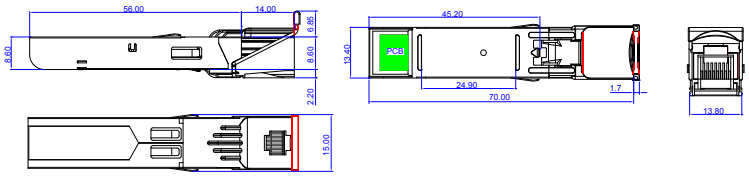


1.25G 1000Base-X

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Operating Temperture
ISFP-M7000-85	MM	550m	850	-9.5~-4	-17	7.5	-3	-10~70℃
ISFP-M7002-31	MM	2km	1310	-9~-1	-19	10	-1	-10~70℃
ISFP-S7020-31	SM	20km	1310	-8~-2	-23	15	-1	-10~70℃
ISFP-S7040-31	SM	40km	1310	-2~3	-23	21	-3	-10~70℃
ISFP-S7080-55	SM	80km	1550	0~5	-24	24	-3	-10~70℃
ISFP-S7020-WA	SM	20km	T1310 / R1550	-8~-2	-23	15	-2	-10~70℃
ISFP-S7020-WB	SM	20km	T1550 / R1310	-8~-2	-23	15	-2	-10~70℃
ISFP-S7040-WA	SM	40km	T1310 / R1550	-3~2	-23	20	-1	-10~70℃
ISFP-S7040-WB	SM	40km	T1550 / R1310	-3~2	-23	20	-1	-10~70℃
ISFP-M7000-85-E	MM	550m	850	-9.5~-4	-17	7.5	-3	-40~85℃
ISFP-M7002-31-E	MM	2km	1310	-9~-1	-19	10	-1	-40~85℃
ISFP-S7020-31-E	SM	20km	1310	-8~-2	-23	15	-1	-40~85℃
ISFP-S7040-31-E	SM	40km	1310	-2~3	-23	21	-3	-40~85℃
ISFP-S7080-55-E	SM	80km	1550	0~5	-24	24	-3	-40~85℃
ISFP-S7020-WA-E	SM	20km	T1310 / R1550	-8~-2	-23	15	-2	-40~85℃
ISFP-S7020-WB-E	SM	20km	T1550 / R1310	-8~-2	-23	15	-2	-40~85℃
ISFP-S7040-WA-E	SM	40km	T1310 / R1550	-3~2	-23	20	-1	-40~85℃
ISFP-S7040-WB-E	SM	40km	T1550 / R1310	-3~2	-23	20	-1	-40~85℃

Gigabit Ethernet SFP

Gigabit Copper

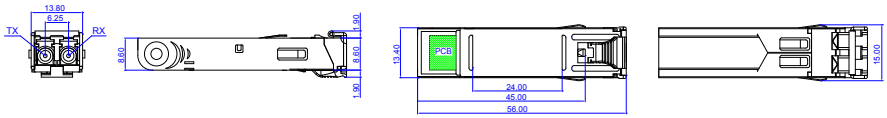


1.25G 1000Base-T

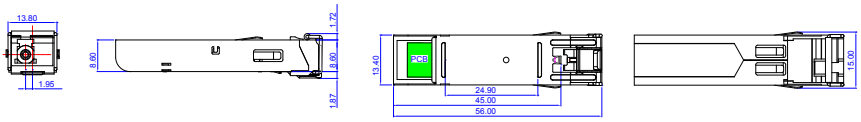
Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Operating Temperture
ISFP-T7T00-00	Copper	100m	——	——	——	——	——	-10~70°C
ISFP-T7T00-00-E	Copper	100m	——	——	——	——	——	-40~85°C

Fast Ethernet SFP

Duplex LC



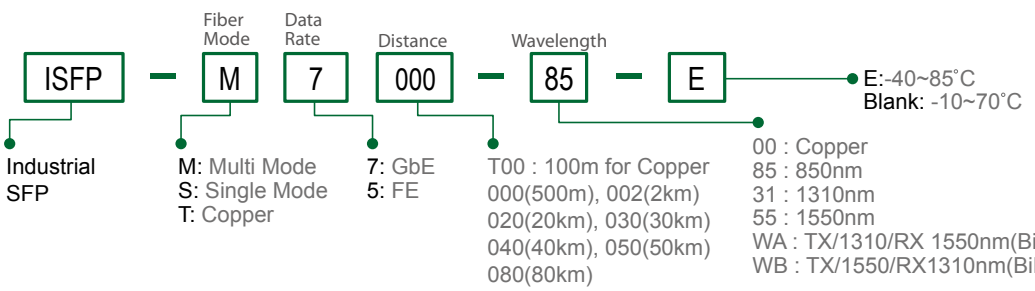
BiDi LC



155Mbps 100Base-FX

Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Operating Temperture
ISFP-M5002-31	MM	2km	1310	-20~-14	-32	12	-8	-10~70°C
ISFP-S5030-31	SM	30km	1310	-15~-8	-34	19	-5	-10~70°C
ISFP-S5050-31	SM	50km	1310	-5~0	-35	30	-5	-10~70°C
ISFP-S5020-WA	SM	20km	T1310 / R1550	-14~-8	-32	18	-3	-10~70°C
ISFP-S5020-WB	SM	20km	T1550 / R1310	-14~-8	-32	18	-3	-10~70°C
ISFP-S5040-WA	SM	40KM	T1310 / R1550	-8~0	-34	26	0	-10~70°C
ISFP-S5040-WB	SM	40KM	T1550 / R1310	-8~0	-34	26	0	-10~70°C
ISFP-M5002-31-E	MM	2km	1310	-20~-14	-32	12	-8	-40~85°C
ISFP-S5030-31-E	SM	30km	1310	-15~-8	-34	19	-5	-40~85°C
ISFP-S5050-31-E	SM	50km	1310	-5~0	-35	30	-5	-40~85°C
ISFP-S5020-WA-E	SM	20km	T1310 / R1550	-14~-8	-32	18	-3	-40~85°C
ISFP-S5020-WB-E	SM	20km	T1550 / R1310	-14~-8	-32	18	-3	-40~85°C
ISFP-S5040-WA-E	SM	40KM	T1310 / R1550	-8~0	-34	26	0	-40~85°C
ISFP-S5040-WB-E	SM	40KM	T1550 / R1310	-8~0	-34	26	0	-40~85°C

Industrial SFP naming rule



Ordering Information

ISFP – □□□□□ – □□ – □

Example: ISFP – M7000 – 85 – E