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# 2020 **INDUSTRIAL PRODUCT CATALOG**



Railway





SMART. CITŶ

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SyncE







**CTC Union** Technologies Co. Ltd., founded in 1993, proactively designs and manufactures telecommunications, data communications and industrial networking products for a global market. With technologies based on Ethernet and Optical transmission, CTC Union can effectively meet the requirements of voice and data carriers, enterprises, as well as industrial grade Ethernet users.

Using the latest technologies, CTC Union has stormed into the "Industrial Ethernet" marketplace with a wide range of rugged Ethernet products for public utilities, transportation and power substation deployment. With a heavy focus on reliability, certifications and new standards, this proactive thinking will allow CTC Union to continue developing solutions for today and tomorrow's industrial markets.

CTC Union's global alliance is a network of worldwide branch offices, partners and distributors on every continent. By forming partnerships with major telecom operators, Internet Service providers, and value-added resellers, CTC Union reduces costs and improves services for customers. This alliance covers Europe, Asia, the Middle East, Africa, plus North and South America. This global partnership receives direct engineering and technical support from our company headquarters, located in Taipei, Taiwan.

# Environmental Policy



As a socially responsible manufacturer, CTC Union is concerned with the environment and has taken active measures to reduce carbon emissions and eliminate hazardous materials in their products. None of CTC Union products use chlorofluorocarbons (CFC) in their production process and since 2007 all electronics use non-lead soldering according to RoHS 2.0 and WEEE directives.

# Our Mission & Vision

- Provides innovative last-mile optical access solutions for telecommunication markets.
- Provides customers with "on time" solutions, quick and effective customer support, and valuable products with extended service life.
- We still ensure honesty and fairness in all our actions, we will always do the right thing.
- To be a trusted in providing creative connectivity products and solutions
- To be a leading communication transmission solution provider meets our customer's needs



# Chapter 1 Management Software

 $\mathsf{SmartView}^{\mathsf{TM}}\,\mathsf{EMS}$ SmartConfig<sup>™</sup>

1-1 1-4

# Chapter 2 Cellular LTE & WiFi Connectivity

NEW	WiFi IEEE802.11 a/b/g/n/ac, 4x GbE RJ45 + 1x 1000Base SFP Router	IWA-AR114	2-1
	4G LTE, WiFi IEEE802.11 b/g/n/ac, 3x GbE RJ45, Cellular Router	ICR-W403	2-2
	4G LTE, WiFi IEEE802.11b/g/n, 2x 10/100Base RJ45, Compact Size Cellular Router	ICR-W401	2-6
	4G LTE, 4x 10/100Base RJ45, Cellular Router	ICR-4103	2-9

# **Chapter 3** Industrial SyncE Switch

16x GbE RJ45 + 8x 100/1000Base SFP with 8x PoE, SyncE Managed Switch (240W/48VDC)	IGS-1608SM-SE-8PH	3-1
8x GbE RJ45 + 4x 100/1000Base SFP with 8x PoE, SyncE Managed Switch (240W/48VDC)	IGS-804SM-SE-8PH	3-1
16x GbE RJ45 + 8x 100/1000Base SFP, SyncE Managed Switch	· IGS-1608SM-SE	3-5
8x GbE RJ45 + 4x 100/1000Base SFP, SyncE Managed Switch	- IGS-804SM-SE	3-5

# **Chapter 4** Industrial Rackmount Ethernet Switch

#### **10G Ethernet Core Switch**

NEW	Layer 3, 24x GbE RJ45 + 4x 100/1000Base SFP + 4x 1G/2.5G/10G SFP, Ethernet Core Switch	ICS-RG24044X	4-1
NEW	Layer 3, 16x GbE RJ45 + 12x 100/1000Base SFP + 4x 1G/2.5G/10G SFP, Ethernet Core Switch	ICS-RG16124X	4-1
NEW	Layer 3, 8x GbE RJ45 + 20x 100/1000Base SFP + 4x 1G/2.5G/10G SFP, Ethernet Core Switch	ICS-RG8204X	4-1
	48x GbE RJ45 + 4x 1G/2.5/10G SFP, Ethernet Core Switch	ICS-G4804X	4-4
	24x GbE RJ45 + 4x 100/1000Base SFP + 4x 1G/2.5G/10G SFP, Ethernet Core Switch	ICS-G24044X	4-4
	24x 100/1000Base SFP with 4x Combo (RJ45/SFP) + 4x 1G/10G SFP, Ethernet Core Switch	ICS-G24S4X	4-8
	24x 100/1000Base SFP with 4x Combo (RJ45/SFP) + 2x 1G/10G SFP, Ethernet Core Switch	ICS-G24S2X	4-8
	24x GbE RJ45 + 4x 100/1000Base SFP + 4x 1G/2.5G/10G SFP with 24x PoE, Ethernet Core Switch (400W,48VDC)	ICS-G24044X-24PH	4-13
(	Gigabit Ethernet Switch		
NEW	Layer 3, 24x GbE RJ45 + 8x 100/1000Base SFP, Managed Switch	IGS-R2408SM	4-17
NEW	Layer 3, 16x GbE RJ45 + 16x 100/1000Base SFP, Managed Switch	IGS-R1616SM	4-17
NEW	Layer 3, 8x GbE RJ45 + 24x 100/1000Base SFP, Managed Switch	IGS-R824SM	4-17
	48x GbE RJ45 + 4x 100/1000Base SFP, Managed Switch	IGS-4804SM	4-20
	24x GbE RJ45 + 8x 100/1000Base SFP, Managed Switch	IGS-2408SM	4-20
	28x 100/1000Base SFP with 4x Combo (RJ45/SFP), Managed Ethernet Switch	IGS-S2804TM	4-24
	24x GbE RJ45 + 8x 100/1000Base SFP with 24x PoE, Managed Switch (400W, 48VDC)	IGS-2408SM-24PH	4-28

# **Chapter 5** EN50155 Ethernet Switch

#### Managed PoE Switch

NEW	16x 10/100Base M12 + 2x GbE M12 + 2x GbE Fiber with 16x PoE, Managed Switch (120W, 24/48/72/110VDC)	ITP-1622GTFM-16PH	5-1
NEW	16x 10/100Base M12 + 4x GbE M12 with 16x PoE, Managed Switch (120W, 24/48/72/110VDC)	ITP-1604GTM-16PH	5-1
	8 x GbE M12 + 2x 100/1000Base SFP with 8x PoE, IP67 Managed Switch (180W, 24/48VDC)	ITP-G802SM-8PH24	5-4
	10x GbE M12 with 8x PoE, IP67 Managed Switch (180W, 24/48VDC)	ITP-G802TM-8PH24	5-4
	22x 10/100Base M12 + 4x GbE M12 with 16x PoE, IP54 Managed Switch (120W, 24/48/72/110VDC)	ITP-2204GTM-16PH	5-9
	12x 10/100Base M12 + 4x GbE M12 with 12x PoE, IP54 Managed Switch (120W, 24/48/72/110VDC)	ITP-1204GTM-12PH	5-9
	8x 10/100Base M12 + 2x 100/1000Base SFP with 8x PoE, IP67 Managed Switch (180W, 24/48VDC)	ITP-802GSM-8PH24	5-13
	8x 10/100Base M12 + 2x GbE M12 with 8x PoE, IP67 Managed Switch (180W, 24/48VDC)	ITP-802GTM-8PH24	5-13
Ν	Ianaged Ethernet Switch		
NEW	16x 10/100Base M12 + 2x GbE M12 + 2x GbE Fiber, Managed Switch	ITP-1622GTFM	5-18
NEW	16x 10/100Base M12 + 4x GbE M12, Managed Switch	ITP-1604GTM	5-18
	8 x GbE M12 + 2x 100/1000Base SFP, IP67 Managed Switch	ITP-G802SM	5-21
	8x GbE M12 + 2x GbE M12, IP67 Managed Switch	ITP-G802TM	5-21
	22x 10/100Base M12 + 4x GbE M12, IP54 Managed Switch	ITP-2204GTM	5-26
	12x 10/100Base M12 + 4x GbE M12, IP54 Managed Switch	ITP-1204GTM	5-26

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

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

... ITP-802GSM

..... ITP-802GTM

5-30

5-30

#### **Unmanaged PoE Switch**

NEW	8x 10/100Base M12 with 8x PoE, IP40 Ethernet Switch (120W, 24/48VDC, Metal Housing)	ITP-800A-8PH24	5-35
NEW	8x 10/100Base M12 with 8x PoE, IP56 Ethernet Switch (120W, 24/48VDC)	ITP-800-8PH24	5-38
NEW	6x 10/100Base M12 with 4x PoE, IP56 Ethernet Switch (90W, 24/48VDC)	ITP-600-4PH24	5-38
ι	Inmanaged Ethernet Switch		
NEW	8x 10/100Base M12, IP40 Ethernet Switch (Metal Housing)	ITP-800A	5-41
NEW	8x 10/100Base M12, IP56 Ethernet Switch	ITP-800	5-43
NEW	5x 10/100Base M12, IP56 Ethernet Switch	ITP-500	5-43

# **Chapter 6** Industrial PoE Switch & Media Converter

#### Managed PoE Switch

NEW	16x GbE RJ45 + 8x 100/1000Base SFP with 16x PoE, Managed Switch (400W, 48VDC)	IGS-1608SM-16PH	6-1
	16x GbE RJ45 + 8x 100/1000Base SFP with 8x PoE, Managed Switch (240W, 48VDC)	IGS-1608SM-8PH	6-1
	8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE, Managed Switch (240W, 48VDC)	IGS+803SM-8PH	6-1
	8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE, Managed Switch (180W, 24/48VDC)	IGS+803SM-8PH24	6-6
	4x GbE RJ45 + 2x 100/1000Base SFP with 4x 60W PoE, Managed Switch (240W, 48VDC)	IGS-402SM-4PU	6-10
	8x GbE RJ45 + 1x 100/1000Base SFP + 2x 100M/1G/2.5G SFP with 8x PoE, Managed Switch (180W, 24/48VDC)	IGS-803SM-8PH24	6-14
	4x GbE RJ45 + 1x 100/1000Base SFP + 1x 100M/1G/2.5G SFP with 4x PoE, Managed Switch (120W, 24/48VDC)	IGS-402SM-4PH24	6-14
NEW	16x 10/100Base RJ45 + 8x 100/1000Base SFP with 16x PoE, Managed Switch (400W, 48VDC)	IFS-1608GSM-16PH	6-19
	16x 10/100Base RJ45 + 8x 100/1000Base SFP with 8x PoE, Managed Switch (240W, 48VDC)	IFS-1608GSM-8PH	6-19
	8x 10/100Base RJ45 + 3x 100/1000Base SFP with 8x PoE, Managed Switch (180W, 24/48VDC)	IFS+803GSM-8PH24	6-23
	4x 10/100Base RJ45 + 2x 100/1000Base SFP with 4x 60W PoE, Managed Switch (240W, 48VDC)	IFS-402GSM-4PU	6-27
	8x 10/100Base RJ45 + 3x 100/1000Base SFP with 8x PoE, Managed Switch (180W, 24/48VDC)	IFS-803GSM-8PH24	6-31
	4x 10/100Base RJ45 + 2x 100/1000Base SFP with 4x PoE, Managed Switch (120W, 24/48VDC)	IFS-402GSM-4PH24	6-31
	Ianaged PoE Media Converter		
	1x GbE RJ45 to 1x 100/1000Base SFP with PoE PSE, Managed Media Converter (30W, 12/24/48VDC)	IMC-1000MS-PH12	6-36
ι	Inmanaged PoE Switch		
NEW	8x GbE RJ45 with 8x PoE, Compact Size Ethernet Switch (240W,48VDC)	IGS-800C-8PH	6-39
	6x GbE RJ45 with 4x PoE, Ethernet Switch (120W,48VDC)	IGS-600-4PH24	6-41
	4x GbE RJ45 + 2x 100/1000Base SFP with 4x PoE, Ethernet Switch (120W, 24/48VDC)	IGS-402S-4PH24	6-41
	4x GbE RJ45 + 2x 1000Base Fiber (SC) with 4x PoE, Ethernet Switch (120W, 24/48VDC)	IGS-402F-4PH24	6-41
	4x GbE RJ45 + 2x 100/1000Base SFP with 4x 60W PoE, Ethernet Switch (240W, 48VDC)	IGS-402S-4PU	6-41
	16x 10/100Base RJ45 + 2x 1000Base SFP with 8x PoE, Ethernet Switch (240W, 48VDC)	IFS-1602GS-8PH	6-45
	8x 10/100Base RJ45 + 2x 1000Base SFP with 8x PoE, Ethernet Switch (240W, 48VDC)	IFS-802GS-8PH	6-45
ι	Inmanaged PoE Media Converter		
	1x GbE RJ45 to 1x 100/1000Base SFP with PoE PSE, Media Converter (30W, 12/24/48VDC)	IMC-1000S-PH12	6-48
	1x 10/100Base RJ45 to 1x 100Base Fiber (SC/ST) with PoE PSE, Media Converter (30W,12/24/48VDC)	IMC-100-PH12	6-51

# **Chapter 7** Industrial Ethernet Switch & Media Converter

#### **Managed Ethernet Switch**

16x GbE RJ45 + 4x 100/1000Base SFP, Managed Switch	IGS-1604SM	7-1
8x GbE RJ45 + 12x 100/1000Base SFP, Managed Switch	IGS-812SM	7-1
8x GbE RJ45 + 3x 100/1000Base SFP, Managed Switch	IGS+803SM	7-5
4x GbE RJ45 + 4x 100/1000Base SFP, Managed Switch	IGS+404SM	7-5
8x GbE RJ45 + 1x 100/1000Base SFP + 2x 100M/1G/2.5G SFP, Managed Switch	IGS-803SM	7-9
4x GbE RJ45 + 2x 100/1000Base SFP + 2x 100M/1G/2.5G SFP, Managed Switch	IGS-404SM	7-9
8x 10/100Base RJ45 + 3x 100/1000Base SFP, Managed Switch	IFS <sup>+</sup> 803GSM	7-13
16x 10/100Base RJ45 + 4x 100/1000Base SFP, Managed Switch	IFS-1604GSM	7-16
8x 10/100Base RJ45 + 3x 100/1000Base SFP, Managed Switch	IFS-803GSM	7-16
4x 10/100Base RJ45 + 2x 100/1000Base SFP, Managed Switch	IFS-402GSM	7-16



#### Managed Media Converter

NEW

1x GbE RJ45 to 1x 100/1000Base SFP, Managed Media Converter	IMC-1000MS	7-20
Unmanaged Ethernet Switch		
8x GbE RJ45, Compact Size Ethernet Switch	IGS-800C	7-22
8x GbE RJ45, Ethernet Switch	IGS-800	7-24
5x GbE RJ45 + 1x 100/1000Base SFP, Ethernet Switch	IGS-501S	7-24
5x GbE RJ45, Ethernet Switch	IGS-500	7-24
4x GbE RJ45 + 2x 100/1000Base SFP, Ethernet Switch	IGS-402S	7-27
4x GbE RJ45 + 2x 1000Base Fiber (ST/SC), Ethernet Switch	IGS-402F	7-27
16x 10/100Base RJ45 + 2x 1000Base SFP, Ethernet Switch	IFS-1602GS	7-30
8x 10/100Base RJ45 + 2x 1000Base SFP, Ethernet Switch	IFS-802GS	7-30
8x 10/100Base RJ45, Ethernet Switch	IFS-800	7-30
4x 10/100Base RJ45 + 2x 100Base Fiber (ST/SC), Ethernet Switch	IFS-402F	7-30
4x 10/100Base RJ45 + 1x 100Base Fiber (ST/SC), Ethernet Switch	IFS-401F	7-30
5x10/100Base RJ45, Compact Size Ethernet Switch	IFS-500C	7-34
5x10/100Base RJ45, Ethernet Switch	IFS-500	7-36
Unmanaged Media Converter		
1x GbE RJ45 to 1x 100/1000Base SFP, Compact Size Media Converter	IMC-1000CS	7-38
1x GbE RJ45 to 1x 1000Base Fiber (ST/SC), Compact Size Media Converter	IMC-1000C	7-38
1x GbE RJ45 to 1x 100/1000Base SFP, Media Converter	IMC-1000S	7-41
1x 10/100Base RJ45 to 1x 100Base Fiber (ST/SC),Compact Size Media Converter	IMC-100C	7-43
1x 10/100Base RJ45 to 1x 100Base Fiber (ST/SC), Media Converter	IMC-100	7-45
Optical Fiber Bypass Switch		
Optical Fiber Bypass Switch		7-47

# **Chapter 8** Industrial Serial Connectivity Series

#### Serial to Fiber Media Converter

	1x RS232/422/485 to 2-ports Fiber (SC/ST) Support PROFIBUS, Media Converter	IFC-FDC-PRO	8-1
	1x RS232/422/485 to 1-port Fiber (SC/ST) Support PROFIBUS, Media Converter	IFC-Serial-PRO	8-4
	1x RS232/422/485 to 1-port Fiber (SC/ST) Media Converter	IFC-Serial	8-7
	1x RS232/422/485 to 2-ports Fiber (SC/ST) Media Converter	IFC-FDC	8-10
	4 Channel Binary Transducer		
	4 Channel Binary Transducer	IFC-CCF40	8-14
ę	Serial Device Server		
NEW	2 port (1x RS232 + 1xRS422/RS485, isolation) serial to 1x Ethernet	IDS-i241	8-17
NEW	2 port RS422/RS485 (isolation) serial to 1x Ethernet	IDS-i211	8-17
NEW	1 port RS422/RS485 (isolation) serial to 1x Ethernet	IDS-i111	8-17
NEW	1 port RS232 serial to 1x Ethernet	IDS-121	8-17

# Chapter 9 Industrial PoE LAN Extender, Injector & Splitter

#### PoE LAN Extender with PoE

	4x 100Mbps RJ45 + 4x PoE LAN Extender	IEXT224-4PH	9-1
F	PoE Injector / Splitter		
NEW	Industrial Gigabit Passive PoE Injector (60W)	. INJ-IG02-PH	9-3
	Industrial Gigabit IEEE802.3af/at PoE Injector (15.4/30/36/60W, 48VDC)	. INJ-IG01-PH	9-5
	Industrial Gigabit IEEE802.3af/at PoE Injector (15.4/30/36/60/72W, 12/24/48VDC)	INJ-IG60-24	9-7
	Gigabit IEEE802.3af/at PoE Injector (15/30/36W)	· INJ-G30	9-9
NEW	Industrial Gigabit IEEE802.3af/at PoE Splitter (12/19/24VDC)	INJ-SPL01	9-10
NEW	Industrial Gigabit IEEE802.3af/at PoE to Passive PoE Converter	INJ-IG03-PH	9-12



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# Chapter 10 IEC61850-3 Ethernet Switch

8x GbE RJ45+ 3x 100/1000Base SFP, Managed Switch	. IPS-G803SM	10-1
8x 10/100Base RJ45+ 3x 100/1000Base SFP, Managed Switch	. IPS-803GSM	10-5

# Chapter 11 Industrial SFP Transceiver

10Gbps SFP+ Fiber Module	. 10GbE SFP	11-1
1.25Gbps Fiber/1000Base RJ45, SFP Module	. GbE SFP	11-2
155Mbps Fast Ethernet SFP Fiber Module	Fast Ethernet SFP	11-2

## APPENDIX

Selection Table.....





- EMC Certified for Industrial Standards
- Flexible µ-Ring Redundant Cabling
- 4KV Surge Protection

- High MTBF
   Long Life Parts
   Rigorous Standards
- Strict Quality Checks in Factory
- 5 Years Warranty
- Fan-less and Rugged Design

Industrial network switches, designed and manufactured by CTC Union, 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 standards, railway traffic EN50121-4 & EN50155, EN45545-2 Standard fire testing and EN61000-6-2 & EN61000-6-4 standards. With wide operating temperatures, IP30 rugged housings, and 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<sup>™</sup> centralized management, friendly and flexible µ-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.



#### Brief Comparison between general CE & EN50121-4

	CE Compliant	EN50121-4 Compliant (Trackside)
Surge		
Signal L-E	1kV	2kV
Signal L-L	N/A	2kV
DČ 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).



# Digital Diagnostic Monitor (DDM)



CTC Industrial Ethernet Switch Series support SFP-DDM (digital diagnostic monitor) function that greatly helps network administrator to easily monitor real-time parameters of the SFP and SFP+ transceivers, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

## Reverse Polarity Protection



#### UTP Cable Diagnostics



- The feature is useful in troubleshooting Ethernet UTP 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.

**Rugged & Fanless Design with** Wide Operating Temperature

Fanless





+75℃ 40°C

Wide Temperature

#### **Rugged Design**

Fanless

 Rugged housing Wide temperature (-40°C~75°C)

Visual representations

monitoring and management.

• Alarm trap and event log management

• Long term event storage (over 1 year)

Suitable for harsh environments like railways, roadside, factory, warehouse, dock, parking lot, electrical poles,..

SmartView<sup>™</sup> for central management

• Fault, Configuration, Accounting, Performance and Security

#### 5-Year Warranty and Long MTBF



- Specially-chosen parts such as industrial-grade IC, PCB, capacitor, transformers, screws and specially-installed method for heat-sink.
- High MTBF and Long life parts
- Rigorous standards in our lab and various strict quality checks in factory
- Fanless

## SmartConfig<sup>™</sup> for quick & easy mass configuration

- A convenient configuration tool
- Multiple device auto discovery
- Group configuration, access
- Group firmware upgrade



# • IP Address Assignment

- Export/Import Configuration



# **μ**-Ring Network Redundancy

The µ-Ring is a proprietary redundancy protocol developed by CTC Union that supports flexible ring topologies.



- Recovery time < 10ms
- User Friendly configuration GUI

#### μ-Chain topology

Benefit: Mix CTC and third party device in a ring topology



Other than the proprietary µ-Ring

redundancy protocol, standard ring

redundancy protocols such as

ITU-T G.8032 ERPS, STP, RSTP and

MSTP are also supported. Among

standard redundancy protocols,

G.8032 ERPS, achieves the fastest

recovery time (<50ms) over others.

#### Friendly µ-Ring configuration

Delete	Instance	Tune	Master	Eas	st	West		
Delete	instance	Type	Waster	Port	Edge	Port	Edge	
Delete	1	u-Ring 🔻		1 •		2 🔻		
Delete	2	u-Ring 🔻		4 🔻		3 🔻		
Delete	3	u-Ring 🔻		10 (Fiber2) •		11 (Fiber3) <b>▼</b>		
Delete	4	Sub-Ring ▼		6 🔹				
Delete	5	u-Chain 🔻		5 🔻		9 (Fiber1) ▼		

#### Sub-Ring topology



#### Supports Standard ITU-T G.8032 ERPS, MSTP, RSTP, STP for Network Redundancy

#### Synchronous Ethernet (SyncE)



IGS-804SM-SE/IGS-1608SM-SE switch series provide hardware support for Synchronous Ethernet (ITU-T G.8262). SyncE allows a synchronization signal to be carried over Ethernet networks and is used for time critical transmissions such as in cellular networks, for video and voice streams, as well as in Smart Grid applications, where control timing is critical.

## IEEE1588 PTP v2

**G**.8032

Ethernet equipment has become a widely accepted commodity as it replaces traditional and expensive legacy technology. The multitude of nodes needed to be synchronized as precisely as possible over the network are ever increasing. IEEE1588 PTP V2 is a packet based network protocol that carries time stamps in Ethernet format. The applications requiring this technology fall within the major markets for smart grids and telecommunication networks.



- Ordinary-Boundary
- Peer to Peer Transparent Clock
- End to End Transparent Clock
- Master
- Slave



# SmartView<sup>™</sup>EMS



# Manage 2,000 Devices

- Remote Access and Centralized Device Management
- Real-time visual representations & processing of alarms
- Long term event storage (up to 1 year)
- Easy, User-Friendly GUI Operation Interface

CTC Union's SmartView<sup>™</sup> Element Management System (EMS) is a comprehensive management solution that monitors device performance, enables remote configuration and provisioning, and provides fault notification status.

# Functions

- Main Functions (FCAPS):
- Fault Management, Configuration Management Accounting Management, Performance Management Security Management
- Remote access control for efficient configuration
- Alarm Trap and event log management
- Auto Discovery and Device Viewer
- Allow up to 25 administrators to login



#### SmartView<sup>™</sup> 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. SmartView<sup>™</sup> server requires 64bit Microsoft<sup>®</sup> Windows<sup>™</sup> O.S.

#### **Multi-Administrators**

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.

#### Microsoft<sup>®</sup> MS-SQL Server for Persistent Storage

SQL Server is the place where SmartView™ stores collected data, such as alarms, traps and user actions, for long term retrieval. SmartView™ requires Microsoft® SQL Server and is compatible with SQL 2008 Server, SQL 2008 Express, SQL 2014 Server and SQL 2014 Express. (The EMS installer will install the free version Microsoft® SQL 2008 Express or SQL 2014 Express under Windows 10 by default).



#### FaultManagement

#### 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<sup>™</sup> which then receives the message, and records it in the database. Depending on preset conditions, SmartView<sup>™</sup> may sound an audible alarm, send an email or SMS alert message or just simply flash the trap message on the administrative console screen.

#### Active Alarm

SmartView<sup>™</sup> 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 there is no longer an alarm condition.

#### Alarm Selection

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

#### Alarms sent by E-mail & SMS

The SmartView<sup>™</sup> 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 devices fixed in the shortest time possible.

#### Trap Forwarding and Syslog messages

The SmartView is capable of forwarding received traps to upper network management and sending event messages to a syslog server.

#### Configuration Management

#### Network Topology

User can load maps to SQL server, load maps from SQL server or delete attached maps. 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.

#### Network Element Configuration

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

#### Network Element Firmware Upgrade

SmartView<sup>™</sup> is able to download firmware to device elements and perform configuration backup/restore.

#### Network Element Time Synchronization

SmartView<sup>™</sup> is able to trigger a command to network elements to perform time synchronization with Smartview or a NTP server.

#### Network Element Discovery

SmartView<sup>™</sup> 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.

#### 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.

#### Performance Management

SmartView<sup>™</sup> 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.

1-2



## Management Software

## 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 Role

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

#### User Activity

Provides viewing and clearing of the user login and configuration action logs. User client login & logouts are recorded, including the client's source IP address.





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2			2015-10-22 15:40:00	109.40	510.042	10 1 1 43	Device		-	NIZ Co	Minor
1			2015-10-22 15:49:09	108-40	SAL043	10 1 1 43	Device		E	ber5 Link Down	Warning
4			2015-10-22 15:49:09	K35-40	SM-043	10 1 1 43	Device		P	patriz Off	Mnor
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6			2015-10-22 15:49:09	IGS-40	SM-043	10.1.1.43	Device		U	TP4 Link Down.	Warning
7			2015-10-22 15 49:10	133-80	ISM-034	10.1.1.34	Device		F	ber1 Link Down.	Warning
8			2015-10-22 15:49:10	IGS-80	SM-034	10.1.1.34	Device		Fi	ber2 Link Down.	Warning
9			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		FI	ber3 Link Down.	Warning
10			2015-10-22 15:49:10	IGS-80	SM-034	10.1.1.34	Device		U	TP1 Link Down.	Warning
11			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		U	TP2 Link Down.	Warning
12			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		U	TP3 Link Down.	Warning
13			2015-10-22 15 49 10	IGS-80	SM-034	10.1.1.34	Device		U	TP4 Link Down.	Warning
14			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		U	TP5 Link Down.	Warning
15			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		U	TP6 Link Down	Warning
16			2015-10-22 15:49:10	IGS-80	ISM-034	10.1.1.34	Device		U	TP8 Link Down.	Warning
17			2015-10-22 15:49:11	IGS-80	ISM-042	10.1.1.42	Device		E	aut On.	Major
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- 10			2015-10-22 15:50-58	109.00	SNL041	10.1.1.41	Device			bart Link Down	Warning
20	1 8		2015-10-22 15 50 58	103.80	SM.041	10 1 1 41	Device		6	ber2 Link Down	Warning
30			2015-10-22 15 50 58	135-00	SM-041	10 1 1 41	Device		1	ber3 Link Down	Warning
31	- H		2015-10-22 15:50:58	K38-80	ISM-041	10.1.1.41	Device		P	ower2 Off	Minor
32			2015-10-22 15 50 58	K3S-80	SM-041	10 1 1 41	Device		L.	TP3 Link Down	Warning
33			2015-10-22 15 50 58	IGS-80	ISM-041	10.1.1.41	Device		Û	TP4 Link Down.	Warning
34			2015-10-22 15 50 58	KGS-80	SM-041	10.1.1.41	Device		Ŭ	TP5 Link Down	Warning
			2015 40 22 45 40 55				100 C				Manajara

# System Requirements

SmartView™	Hardware (minimum)	Software	Operating System
SmartView <sup>™</sup> Server	Intel Core2 or higher processor, 2GB RAM, 40GB HD	JAVA JRE. SmartView™ Kit. MS-SQL Server	Windows Server 2012/2016, Win 7/8/10 Pro (64 bit)
SmartView™ Clients	Intel Core2 or higher processor, 2GB RAM, 20GB HD	JAVA JRE. SmartView™ Kit.	Windows 7/8/10 Pro (64 bit)
All-In-One	Intel Core2 or higher processor, 4GB RAM, 80GB HD	JAVA JRE. MS-SQL Server. SmartView™ Kit. SmartView™ Server/Client	Windows Server 2012/2016, Win 7/8/10 Pro (64 bit)
SmartConfig™	Hardware (minimum)	Software	Operating System
SmartConfig <sup>™</sup>	CPU : 2 GHz or faster Dual core RAM : 1GB, Hard Disc : 1GB		Windows 7/8/10 Pro (64 bit)

# Ordering Information (Industrial)

SmartView<sup>™</sup> EMS Server for Max 2,000 IP address nodes

Model Name	Description
SV2-AGT-50	SmartView™ management software with 50 nodes
SV2-AGT-100	SmartView™ management software with 100 nodes
SV2-AGT-200	SmartView™ management software with 200 nodes
SV2-AGT-500	SmartView™ management software with 500 nodes
SV2-AGT-1000	SmartView™ management software with 1000 nodes
SV2-AGT-1500	SmartView™ management software with 1500 nodes
SV2-AGT-2000	SmartView <sup>™</sup> management software with 2000 nodes

# **SmartConfig**



# **Quick & Easy for Mass Configuration**

- Multiple device auto discovery
- Group configuration, access
- Group firmware upgrade
- Backup / restore device configuration
- IP address assignment
- Connectivity testing

SmartConfig<sup>™</sup> is a convenient configuration tool for mass deployment of CTC Union's managed industrial switch products. SmartConfig<sup>™</sup> is designed for field engineers, to aid in mass deployments but can just as easily be used for initial configuration of a small group of switches or even a single device. It is portable, so it can easily be included on a network tools pen drive, it has been tested on all versions of Windows and the GUI is both simple and intuitive.

Different configurations can be saved and recalled for later use, saving valuable time in the field and minimizing downtime when expanding networks or doing field replacements.

# ■ SmartConfig<sup>™</sup> Application & Topology

- Quick & Easy for mass configuration
- Multiple device auto discovery
- Group configuration, access
- Group firmware upgrade
- Export/Import Configuration



SmartConfig<sup>™</sup> is a convenient configuration tool for mass deployment of switch product

# Main Features

#### Multiple device auto discovery

SmartConfig<sup>™</sup> can discover all inter-connected devices (no initial IP setting required) using broadcast or SNMP discovery methods. The results will show a list of discovered devices on the network including their IP address, MAC address, Model name, Firmware version.

#### · Group Firmware Upgrade

SmartConfig<sup>™</sup> supports firmware upgrade for one device or multiple devices at a time. This function helps to increase firmware upgrade efficiency and convenience.

#### Group Configuration & Access

For quick access and configurations, SmartConfig<sup>™</sup> provide an efficient way to access and configure functions of one or multiple devices.

#### · Backup / Restore device Configuration

Running-config, startup-config and default config can be both stored to your local PC and restored to the devices via SmartConfig™





The IWA-AR114 is a compact, lightweight and cost-effective Industrial Grade Router with 3 10/100/1000Base-T LAN ports plus 1 100/1000Base-TWAN/LAN and a 100/1000Base-X WAN SFP interface. It also equips with four Virtual WANs that can be used for various IP applications and provides IEEE 802.11 a/b/g/n/ac dual band(2.4G/5G selectable) wireless connections for optimal coverage. Built for harsh environments, the router equips features such as NAT, port forwarding, VPN Tunneling, Firewall and management capability via TR-069 and SNMP. All in all, the IWA-AR114 provides highly secure authentication, encryption and management to protect your data between public and private networks and to simplify your complicated solutions for SoHo, smart city and industrial networking.

#### Features

- WiFi IEEE 802.11 a/b/g/n/ac (2.4G/5G selectable) + 3 x GbE LAN + 1x WAN/LAN GbE + 1x GbE SFP WAN Router
- Compact and easy to be integrated into IP network solutions.
- Rich VPN tunnel technology to build VPN tunnel between IP network/network device with remote centers.
- Both IPv4/IPv6 protocol stack meet ISP requirements.
- Gateway based on IP pass through or DHCP-based NAT with Port Forwarding.
- Rich Routing function covers static, dynamic and OSPF compatible with most IP networks.

UTP Ethernet

1x GbE SFP 3x GbE (LAN) + 1x GbE (LAN or WAN)

• Web UI, CLI and Command Script for basic and advanced configurations.

# **Specifications**

Device	Ethernet	4x RJ45 GbE, 1x GbE SFP				
Interface	WiFl	802.11a/b/g/n/ac 2T2R				
		(2.4G/5GHz Selectable)				
	Log Storage	1x USB 2.0				
	Power Input	12V (DC Jack)				
WAN & Uplink	WAN	Ethernet UTP and SFP, for WAN Failover, Load Balancing				
	Ether-WAN	Dynamic IP, Static IP, PPPoE, PPTP,L2TP				
	Network Monitor	ICMP/DNS Query				
WiFi	Standard	802.11 Industry Compliance				
	Mode	AP Router, WDS, WDS Hybrid Modes				
	Function	Multi-SSID, WMM				
	Security	WEP, WPA, WPA2, WPA-PSK, WPA2-PSK, 802.1x, WPA-Enterprise, WPA2-Enterprise				
	Captive Portal	External & Internal web portal				
Protocol	LAN & VLAN	DHCP Server/Relay, Port/Tag based VLAN				
	IPv6	Static IPv6, DHCPv6, PPPoEv6				
	Port Forward	Virtual Server, Virtual Computer, DMZ, VPN Pass-through				
	Routing	Static, Dynamic - RIP1/RIP2, OSFP, BGP				
	QoS	Policy-based Bandwidth Control and Packet Flow Prioritization				
Security	VPN Tunneling	IPSec, OpenVPN, PPTP, L2TP, GRE				
•	Scenario	Site/Host to Site/Host : Dynamic VPN				
	VPN Capability	IPSec: Up to 16 tunnels				
	Firewall	SPI Firewall with Stealth Mode IPS				
	Access Control	Packet Filter, URL Blocking, MAC Filter, IP. TCP. UDP				

Object	Scheduling	Time Schedule List
-	Grouping	Host Grouping List
	Ext. Server	Email, Syslog, SCEP
	Certificate	My Certificate, Trusted Certificate, Issue Certificate
Administration	Configuration	Web UI, CLI, Command Script
	Management	SNMPv3 Std. MIB, TR-069
	System	Upgrade, Backup & Restore, Reboot & Reset, Syslog
	Software Upgrade	TFTP / Web
	Diagnostic	Packet Analyzer, Diagnostic Tools, Ethernet port setup
Service	Event Handling	User Defind Manage/Notify Event ; SMS, Mail, Syslog, SNMP Trap
Environment	OP/Store Temp.	-30°C ~ 60°C ; -40°C ~ 85°C
	Humidity	10%~95% (non-condensing)
	Enclosure	Metal, Bracket / DIN-Rail
	Dimension	50.8 x 125 x 160mm
Certificate-CE	Standard & Re	gulation
	EMI	EN 55032: 2015 +AC: 2016 ClassB, EN61000-3-6
	EMS	EN 55024, IEC 61000, EN61000-6
	Radio	EN 301 489, EN 300 328, EN 301 893, EN50385
	Safety	EN 60950-1
Package List	1x Device	
	2x WiFi Anteni	าล
	Power Adapte	r DC12V/2A
	1 V DIN Rail Kit	

CF



IWA-AR114

IEEE802.11 a/b/g/n/ac 2.4G/5G selectable



#### 

The ICR-W403 is a high-performance industrial grade wireless router. It combines IEEE 802.11b/g/n/ac WLAN and 4G LTE cellular technologies to provide flexible wireless network connectivity for industrial applications. ICR-W403 provides 3 Ethernet ports and dual SIM cards for failover redundancy, to ensure uninterrupted connectivity. ICR-W403 has support for secure VPN communications, GPS, static and dynamic IP routing of RIP1/2 and OSPF, NAT, port forwarding, Firewall, built-in DI/DO and Serial port services. In addition, ICR-W403 uses the highest level of industrial grade design for connection in the most demanding environments, and is an ideal solution for Industrial Internet of Things (IIOT) and M2M (Machine-to-Machine) applications, such as remote control and monitoring, fleet management, bus ticketing collection systems, CCTV, SCADA, digital signage, KIOSK and intelligent traffic systems.

## **Features**

- IEEE 802.11 ac/b/g/n, multiple SSID, captive portal for WiFi hotspot
- Web, CLI ,SNMP, TR069, SMS for management and configuration
- Events triggered by pre-defined, and notification sent by SMS, SNMP trap, or e-mail
- Supports USB for log storage
- EN-60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Rugged metal, IP30 protection & Fanless design

# **Specifications**

-								
Standard WiFi Standard Interface	Cellular Mobi information for 4G LTE: FDD-I 3G: WCDMA 2G: GSM/EDC GNSS: GPS IEEE 802.3 IEEE 802.3u	IComm standard: (Please see order or optional band) .TE, TDD-LTE IE 10Base-T 10Mbit/s Ethernet 100Base-TX Fast Ethernet	Connector	2x 2.3dBi LTE Antenna and connector 2x 5dBi WiFi Antenna and connector 1x SMA Female connector for GPS antenna (Antenna optional) 2 SIM card sockets 1x USB 2.0 socket 3 RJ45 for GbE LAN/WAN 1x Removable Terminal block (Input power, 1x IGN, 2x DL 1x DO, R5232)				
	IEEE 802.3ab	1000Base-1 Gbit Ethernet over twisted pair	4G LTE data rate	Cat 4 , Maxium 150Mbps download, upload 50Mbps				
	IEEE 802 10	Virtual LANs (VLAN)	Power Supply	12/24VDC (9~36VDC)				
	IEEE 802.3x	Flow control for Full Duplex	Power	<1/1/\/				
		LAN Layer 2 QoS for Traffic	consumption	× V V V				
	1EEE 802.1p	Prioritization	LED	Power (Green), GPS (Green)				
	IEEE 802 1X	Port based and MAC based Network		2.4G (Green), 5G (Green)				
	Access Control, Authentication			SIM 1 (Green), SIM 2 (Green)				
ViFi Standard nterface	IEEE802.11ac,	IEEE802.11b, IEEE802.11g, IEEE802.11n		LIE signal High (Green), LIE signal Low (Green)				
WiFi Standard Interface	WAN	1x 3G/4G LIE		WAN/LAN LNK/ACT (Green)				
		(Please see order information for detail optional mobil band)	Alarm message Handling	Events triggered by pre-defined, and notification sent by SMS, SNMP trap, or e-mail				
		Built-in dual SIM card slots for network redundancy / failover/	Operation Temperature	-40~ 75°C				
		IEEE 802.11ac (5G Hz)	Operating Humidity	5% to 95% (Non-condensing)				
		1x GbE UTP (WAN or LAN configureable)	Storage Temperature	-40 ~ 85°C				
	LAN	Concurrent WiFi 2.4G/5G with	Housing	Rugged Metal, IP30 Protection, Fanless				
		IEEE 802.11ac 2T2R (5GHz), and IEEE 802.11b/g/n 2T2R (2.4GHz)	Dimensions (D x W x H)	120 x 200 x 39.5 mm (Dx Wx H)				
		3x 10/100/1000Base-T UTP port, port	Weight	975g				
		1 could be WAN or LAN configurable	Installation	Wall mounting				
	COM port	1x RS232	MTBF	394,330 Hours				
	DI/DO	2x DI, 1x DO, 1x IGN (Ignition Sense for Vehicle)		(MIL-HDBK-217)				
	GNSS	1x GPS receiver	Warranty	5 years				
	Log Storage	1x USB 2.0						
	20g Storage							

# 4G LTE Router

Certification	
EMC	CE (EN55024, EN55032)
EMI	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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility) Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Routing	Static routing , Dynamic routing, RIP1/RIP2, OSPF, BGP	Others	
Security	Firewall: SPI Firewall with Stealth Mode, IPS VPN Tunneling: IPSec, OpenVPN, PPTP, L2TP, GRE;	System Time Information	NTP client
	Tunneling with Full Tunnel, Tunnel	DHCP	Server and Client
	Failover	Cellular toolkit	SIM PIN, USSD, Network Scan, SMS, Data Usage
	VPN Scenario: Site to Site, Site to Host, Host to Site, Host to Host, Hub and Spoke, Dynamic	Alarm message Handling	DI, DO, SMS, Syslog, SNMP Trap, Email Alert, Reboot
	VPN Deut Fernandia a Mintuel Camera (Camera Anno DMZ	Location Tracking	GPS
	Port Forwarding: Virtual Server/ Computer, DMZ Host Special AP & APG, VPN Pass-	Diagnostic	Packet Analyzer, Diagnostic tools
	through	Power Control	Ignition Sense for delay OFF
	Access control: Packet Filter, URL Blocking, MAC Filter, Content Filter, Application Filter	MobilComm Connectivity	Two SIM for muti ISP failover/ back up Seamless
	Authentication: Captive Portal, MAC Authentication	Multi WAN	4G LTE , 1xWiFi IEEE 802.11ac and 1x Ethernet WAN for
VLAN	Port-based VLAN, Tag-based VLAN	WiFi mode	AP Router WDS WDS Hybrid
QoS	Policy-based Bandwidth Control and Packet Flow	WiFi Security	WEP, WPA, WPA2, WPA-PSK, WPA2-PSK, IEEE 802.1X
Management	Web CLI Telpet SNMP V3 TR069	Virtual COM	TCP Client, TCP Server, UDP, RFC2217
IPV6	Dual Stack	Others DDNS, UPn	P, QoS
IF VO	Cuepert	Remote managem	ent via Telnet, SSH v2, HTTPS
opgrade F/W	Support	Local managemen	t via Telnet, SSH v2, HTTP/HTTPS
Backup & Restore	Support	Syslog monitor	

# Application

Figure 1 : Application of Wireless Transmission in Logistics Center



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**CTC** union

4G LTE Router ICR-W403

Figure 2 : Application of Vehicle Location Tracking System



# Dimensions



to change without prior notice. Please visit CTC Union website for more details. www

# **Ordering Information**

ModelName	WAN		WAN/LA	N	LAN		Certification			
	Cellular Mobil Band (2 Sim for Redundant)	GPS (Ant.Optional)	WiFi	UTP 10/100/1000Base-T	DI, DO	RS232	Safety EN60950-1	RailWay EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
ICR-W403-EU	see Region code table EU	1x GNSS	IEEE 802.11ac/b/g/n (LAN) or IEEE 802.11ac (WAN)	2x(LAN) +1x (LAN or WAN)	2xDl, 1xDO	1	V	V	V	V
ICR-W403-A	see Region code table A	1x GNSS	IEEE 802.11ac/b/g/n (LAN) or IEEE 802.11ac (WAN)	2x(LAN) +1x (LAN or WAN)	2xDI, 1xDO	1	V	V	V	V
ICR-W403-AU	see Region code table AU	1x GNSS	IEEE 802.11ac/b/g/n (LAN) or IEEE 802.11ac (WAN)	2x(LAN) +1x (LAN or WAN)	2xDI, 1xDO	1	V	V	V	V
ICR-W403-J	see Region code table J	1x GNSS	IEEE 802.11ac/b/g/n (LAN) or IEEE 802.11ac (WAN)	2x(LAN) +1x (LAN or WAN)	2xDl, 1xDO	1	V	V	V	V
Model Na	Model Naming Rule									
100										



# MobilComm Region Code Options

	4G L	TE	3G	2G	GNSS	Perion
<b>Region Code</b>	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	01000	Region
EU	B1(2100) , B3(1800), B7(2600), B8(900), B20(800)		B1(2100), B8(900)	B3(1800), B8(900)	Yes	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		Yes	USA (AT&T, T-Mobile)
AU	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	Yes	ANZ, South America, Taiwan
J	B1(2100), B3(1800), B8(900), B18(850), B19(850), B26(850)	B41(2500)	B1(2100), B6(850), B8(900), B19(850)		Yes	China

# **Optional Accessories**

#### Antenna accessories

ANT-GPS-01	Antennas for GNSS
ANT-BASE-01	Antennas Base with Magnetic, SMA (Male) connector, 1.5meter for 4G LTE extension







A LTE, GPS, WiFi IEEE 802.11 b/g/n 2T2R and DI/DO Router WiFi IEEE 802.11 b/g/n 2T2R and DI/DO Router • Utili-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4 • EE 802.11b/g/n WiFi 2T2R • Inhance security and encryption for authentication and transmission • 30 ~ +70°C for use in harsh environments • 30 ~ +70°C for use in harsh environments • Compact

The ICR-W401 is a compact, lightweight and cost-effective Industrial grade 4G LTE Router that has 1 LAN plus 1 WAN Fast Ethernet connection and supports uplink to 2G/3G/4G mobile data networks. Built for harsh environments, the router is equipped with a DI/DO interface. The ICR-W401 is simple to configure through its embedded Web user interface applications. The ICR-W401's WiFi is compliant with IEEE 802.11b/g/n wireless connectivity. The Router features VPN Tunneling with Firewall and management capability via TR069 and SNMP. The ICR-W401 provides highly secure authentication, encryption and management, to protect your data between public and private networks and simplify your complicated solutions for smart city and industrial networking.

#### **Features**

- Highly reliable and secure for mission-critical cellular communications
- Compact and lightweight design with 1 LAN and 1 WAN Ethernet interfaces
- Supports multi-band connectivity with FDD LTE/ TDD LTE/ WCDMA/ GSM/ LTE Cat 4
- Provides IEEE 802.11b/g/n WiFi 2T2R
- Micro SIM connector and DI/DO interfaces
- LED indicators for connection and data transmission status
- Industrial temperature rated from -30 ~ +70°C for use in harsh environments
- IPv6/IPv4 dual stack and all applications are IPv6 ready
- Enhance security and encryption for authentication and transmission

# **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	Installation	DIN Rail mo	unting, or wall mounting (optional)		
	IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.1Q Virtual LANs (VLAN) IEEE 802.3x Flow control for Full Duplex IEEE 802.1p LAN Layer 2 QoS for Traffic Prioritization	LED Display	1 x Power LE 2 x Ethernet 1x LTE LED 1 x Function	D LED for each port (LAN/WAN) LED (User define by Web)		
	IEEE 802.1X Port based and MAC based Network Access Control, Authentication	Power Supply	Power Consumptic	7 Watt(Max)		
LTE Interface	Cellular MobilComm standard: (Please see order		Power Input	12/24/48VDC (9.6~60VDC)		
	information for optional area and band) 4G LTE: FDD-LTE, TDD-LTE 3G: WCDMA	Operating Temperature	-30 ~ 70°C			
	2G: GSM/EDGE GNSS: GPS	Storage Temperature	-40 ~ 85°C			
	LTE Data rate: Cat 4, 150Mbps (Down load) 50Mbps (up load)	Operating Humidity	10 ~ 95% (no	on-condensing)		
WiFi Interface	1 x micro SIM Connector (push-push type) IEEE 802.11b/g/n WiFi Standards Support AP or Station mode	MTBF	271,952 Hours (MIL-HDBK-217)			
(ICR-W401)		Warranty	5 Years	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	2 x RP-SMA for WiFi Antenna	Certification	EMC	CE		
	212R 300Mbps wireless operation rate		EMI	EN301 489, FCC		
Hardware	1 x Micro SIM Connector (push-push type)		EMS	EN301 489		
Interface	1 x LAN 10/100 Mbps Ethernet port 1 x LAN 10/100 Mbps Ethernet port 1 x WAN 10/100 Mbps Ethernet port Reset Button for device reset 1x RS232 for console configuration (TXD/RXD/GND) 1 x DI (Non-Isolated), 1 x DO (Non-Isolated) 2 x SMA connectors for detachable LTE Antenna 2 x RP-SMA for WiFi Antenna		Radio	EN301511 EN301908-1 EN301908-1 EN301908-13 EN300328 EN303413 EN62311		
	1 x GPS detachable Antenna		Shock	IEC 60068-2-27		
Housing	Rugged metal, Fanless, IP30 protection		Freefall	IEC 60068-2-32		
Dimensions (W x H x D)	30x 92 x 75 mm		Vibration	IEC 60068-2-6		
Weight	400g					

# **Software Specifications**

CTC union

Network Protocols	IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and client, PPPoE, Static IP, SNTP, GPS sync time, DNS Proxy, VRRP, OSPF, Message Queue Telemetry Transport (MQTT Broker), BGP
Routing/Firewall	NAT, Virtual Server, DMZ, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing, RIP 1, RIP 2, IPS, Policy Route
VPN	OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256), GRE, PPTP, L2TP
WiFi	Security with WPA2-PSK (AES) Multiple SSID Wireless Mac Filtering Wireless client isolation Wireless Connectivity: WAN WiFi Client

Others	DDNS, QoS, UPnP, SMS action, GPS track Drawing, GPS TCP Push
Alarm	DI, DO, SMS, VPN/WAN Disconnect, SNMP Trap, Email, TR069
Management	Web GUI for remote and local management, CLI Syslog monitor SNMP, TR069
	Remote management via SSH v2, HTTPS Local management via Telnet, SSH v2, HTTP/HTTPS

# Application

The vending machine logistics system application



# Dimensions







Front View

Side View

Rear View

**DIN-Rail Kit View** 

Wall-Mount Kit View

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# **Ordering Information**

		WAN		LAN			Certification		
Model Name	Managed	"Cellular Mobile Band"	"10/100 Base-TX"	"WiFi IEEE 802.11 b/g/n"	"10/100 Base-TX"	DI/DO	CE	FCC	Shock, Freefall, Vibration
ICR-W401-EU	V	see Region code table EU	1	1	1	1	V	V	V
ICR-W401-A	V	see Region code table A	1	1	1	1	V	V	V
ICR-W401-AU	V	see Region code table AU	1	1	1	1	V	V	V
ICR-W401-J	V	see Region code table J	1	1	1	1	V	V	V

#### Model Naming Rule



EU, A, AU, J : Region Code (see below table for more detail)

# **MobilComm Region Code Options**

	4G L'	TE	3G	2G	Decion
Region Code	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	Region
EU	B1(2100), B3(1800), B5(850), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B5(850), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		USA (AT&T, T-Mobile)
AU	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America, Taiwan
ſ	B1(2100), B3(1800), B8(900), B18(850), B19(850), B26(850)	B41(2500)	B1(2100), B6(850), B8(900), B19(850)		Japan

# **Optional Accessories**

#### Antenna accessories

ANT-BASE-01 Antennas Base with Magnetic, SMA (Male) connector, 1.5 meter for 4G LTE extension

#### Wall mount kit accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150x 30mm)



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# ICR-4103

#### 4G LTE, 2x SIM, 4x FE + 2x DI/1x DO, 1x RS485, 2x RS232



- Multi-band connectivity with FDD 4G LTE/ TDD 4G LTE/ 3G WCDMA/2G GSM
- 4G LTE/ UTP to configure WAN port for failover redundant
- NAT/Port Forward/Routing/IPv6 are compatible with existing IP networks
- Supports 3x Serial port (1x RS484, 2x RS232) for IoT and automation application, ModBus RTU and ModBus/TCP gateway, MQTT
- Various VPN protocols for security, Firewall & IPS, Authentication to enhance access security



The ICR-4103 is a high-performance, industrial grade, 4G-LTE cellular router which is designed to offer fast connectivity over cellular networks for industrial applications. ICR-4103's Ethernet ports can allow up to 3 Ethernet devices to link to the cellular network. It provides dual SIM card slots and one Ethernet WAN port which can automatically re-connect and auto-switch to offer cellular network redundancy and ensure uninterrupted connectivity. The ICR-4103 cellular router is integrated with WAN, LAN, SIM, VPN, Firewall, built-in DI/DO and Serial port services. In addition, ICR-4103 uses the highest level of industrial grade design for connection in the most demanding environments and is an ideal solution for Industrial Internet of Things (IIoT) and M2M (Machine-to-Machine) applications, such as remote control and monitoring, bus ticketing collection system, CCTV, SCADA, digital signage, kiosk and intelligent traffic systems.

#### **Features**

- Supports multi-band connectivity with FDD 4G LTE/ TDD 4G LTE/ 3G WCDMA/2G GSM/ LTE Cat4
- 2 SIM card slots 4G LTE antenna, 1x WAN (10/100Base-TX) + 3x LAN (10/100Base-TX UTP), 2x DI + 1x DO, 3x Serial COM port (2x RS232, 1x RS485)
- Highly reliable and secure for mission-critical cellular communications
- Provide flexible options to configure LAN/ WAN ports
- Built-in dual SIM for network redundancy / failover/ roaming over/ back up
- Integrated dual detachable antenna against radio interference
- 4G LTE and WAN port for seamless connection and redundancy
- Supports 3x Serial port (1x RS484, 2x RS232) for IoT and automation application, ModBus RTU and ModBus/TCP gateway, MQTT
- Supports Routing/Firewall, NAT, Virtual Server, DMZ, Port filtering, MAC Filter, URL Filter, IP Filter, VLAN, Static Routing and RIP 1 & 2, VRRP, OSPF V2 & V3, BGP
- Supports VPN, OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5, SHA-1, SHA256)
- IPv6/IPv4 dual stack and all applications are IPv6 ready
- Supports DHCP server and client, PPPoE, Static IP, SNTP, DNS Proxy, DDNS, QoS, Virtual Com, UPnP
- Supports Alarm message : DO, SNMP Trap, E-mail
- Supports SNMP, TR069, Web, Telnet, CLI for management
- Supports dual Image firmware upgrade by Web
- CE, FCC, Rail Traffic EN50121-4 certified
- Safety EN60950-1 certified
- Radio RED ETSI EN301 489-1/-19/-52, EN301 908-1, EN303 413, NCC certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Rugged metal, IP30 protection & Fanless design
- Wide operating temperature -20 ~ 75°C

## **Specifications**

Standard	Cellular MobilComm standard: (Please see order	LED	System status (Green)
	information for optional band)		VPN (Green), SIM 1 (Green), SIM 2 (Green)
	4G LTE: FDD-LTE, TDD-LTE		Cell signal Strong / Weak: H/L (Green)
	3G: WEDMA 2G: GSM/EDGE	DIP SW for RS485	DIP 1 Pull Low :
	IEEE 802.3 10Base-T 10Mbit /s Ethorpot	port	OFF: Disable, ON: Enable
	IEEE 802.3 100Base-TV Fact Ethernet		DIP 2 Pull High :
			OFF: Disable, ON: Enable
	IEEE 802.3x Elow control for Full Duplex		DIP 3 120 ohm terminal resistor :
Connector	Cellular MobilComm and WAN:	A.I	OFF: Disable, ON: Enable
connector	Built-in dual SIM card slots for network redundancy	Alarm message	DO for alarm message, with current capacity of 500mA/50VDC maximum
	/ failover/ roaming over/ back up		SNMP trap, E-mail, SMS, Alarm trigger by DI, VPN or
	2 SMA (female) connector for Antenna (Please see		WAN disconnection
	ordering information for optional accessories)	Operation	-20~75°C
	I AN: 3x 10/100Base-TX RJ45 101 WAN port	Temperature	-20-473 C
	Serial: 1x RS485 and 2x RS232 (one of RS232 could	Operating	5% to 95% (Non-condensing)
	be configured for console)	Humidity	
	Programmable DI/DO: 2xDI and 1x DO	Storage	-40 ~ 85°C
LTE data rate	Cat 4 ,Max download 150Mbps, Max upload 50 Mbps	Housing	Puggod Motal Eaplace, ID20 grade housing
Removable	Provides for Power input, DO, DI1, DI2, COM2 (RS232),	Housing	protection
terminal block	COM3 (RS485)	Dimensions	
Power Supply	Input 10-32VDC removable terminal block	$(D \times W \times H)$	106 x 62.5 x 135mm
Power	<7W	Weight	0.74kg
consumption		Installation	Mounting : DIN Rail mounting or Wall mounting (Optional)

4G LTE Router

EN61000-4-5 (Surge) Level 3, Criteria B

EN61000-4-8 (PFMF, Magnetic Field) Field Strength:

EN61000-4-6 (CS) Level 3, Criteria A

300A/m, Criteria A

RED ETSI EN301 908-1

RED ETSI EN301 489-1

RED ETSI EN301 489-19 RED ETSI EN301 489-52

RED ETSI EN303 413

EN60950-1

NCC

CH

SNMP

IEC 60068-2-27

IEC 60068-2-32

IEC 60068-2-6

DDNS, UPnP, QoS

Syslog monitor

TR069: TR098 model

Virtual COM for serial COM port

Sent by DO, SMS, SNMP Trap, E-mail

Web GUI for remote and local management

Dual Image firmware upgrade by Web GUI

Remote management via Telnet, SSH v2, HTTPS

Local management via Telnet, SSH v2, HTTP/HTTPS



Application

MTBF

EMC

EMI

Warranty

Industrial

Network

VPN

Protocols

Modbus TCP,

Modbus RTU

MobilComm

Connectivity

Routing/Firewall

EMS

Environment

Certification

**Railway Traffic** Immunity for Heavy Industrial Environment

**Emission for Heavy** 

(Electromagnetic

Susceptibility Protection Level)

**Software Specifications** 

Figure 1 : Application for Outdoor Digital Signage

OSPF V3, BGP, MQTT

SHA-1, SHA256)

1x Ethernet WAN)

296,306 Hours

(MIL-HDBK-217)

CE (EN55024, EN55032)

FCC Part 15 Subpart B Class A, CE

EN61000-4-2 (ESD) Level 3, Criteria B

EN61000-4-4 (Burst) Level 3, Criteria A

IPv4, IPv6, IPv4/IPv6 dual stack, DHCP server and

Gatway between Ethernet and COM3 (RS485) port

URL Filter, IP Filter, VLAN, Static Routing and RIP 1, RIP 2

OpenVPN, IPSec (3DES, AES128, AES196, AES256, MD5,

Two SIM for failover/ roaming over/ back up Seamless multi WAN connections switch (2x SIM and

NAT, Virtual Server, DMZ, Port filtering, MAC Filter,

client, DNS Proxy, PPPoE, Static IP, SNTP, VRRP, OSPF V2,

EN61000-4-3 (RS) Level 3, Criteria A

5 years

EN50121-4

EN61000-6-2

EN61000-6-4



EMS

Safety

Radio

Shock

Freefall

Others

Alarm message

Management

Vibration

(Electromagnetic

Protection Level)

Susceptibility

Figure 2 : Application for Transportation/Bus Communication



2-10

#### 4G LTE Router

# Dimensions



# **Ordering Information**

		WAN		LAN		Certification				
ModelName	Managed	Cellular MobilComm band (2 SIM for Redundancy)	10/100Base-TX	10/100Base-TX	RS232	RS485 (ModBus)	Radio	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
ICR-4103-EU	V	see Region code table EU	1	3	2	1	RED	V	V	V
ICR-4103-A	V	see Region code table A	1	3	2	1	RED	V	V	V
ICR-4103-AU	V	see Region code table AU	1	3	2	1	RED	V	V	$\vee$
ICR-4103-TW	V	see Region code table TW	1	3	2	1	NCC	V	V	V
ICR-4103-J	V	see Region code table J	1	3	2	1	RED	V	V	V

#### Model Naming Rule



EU, A, AU, TW, J: Region code (see below table for more detail)

# **MobilComm Region Code Options**

	4G L	TE	3G	2G	Region
<b>Region Code</b>	FDD LTE	TDD LTE	WCDMA	GSM / EDGE	negion
EU	B1(2100), B3(1800), B5(850), B7(2600), B8(900), B20(800)	B38(2600), B40(2300), B41(2500)	B1(2100), B5(850), B8(900)	B3(1800), B8(900)	Europe, Africa, Middle East, Korea,Thailand, India
A	B2(1900), B4(1700), B12(700)		B2(1900), B4(1700), B5(850)		USA (AT&T, T-Mobile)
AU	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	ANZ, South America
TW	B1(2100), B2(1900), B3(1800), B4(1700), B5(850), B7(2600), B8(900), B28(700)	B40(2300)	B1(2100), B2(1900), B5(850), B8(900)	B2(1900), B3(1800), B5(850), B8(900)	Taiwan
ſ	B1(2100), B3(1800), B8(900), B18(850), B19(850), B26(850)	B41(2500)	B1(2100), B6(850), B8(900), B19(850)		Japan (KDDI, Docomo, Softbank)

# **Optional Accessories**

#### Antenna accessories

ANT-BASE-01 Antennas Base with Magnetic, SMA (Male) connector, 1.5 meter for 4G LTE extension

# Wall mount kit accessories

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





# IGS-1608SM-SE-8PH & IGS-804SM-SE-8PH

▲ 16x GbE RJ45 + 8x 100/1000Base SFP with SyncE and 8x PoE (240W, 48VDC)
 ▶ 8x GbE RJ45 + 4x 100/1000Base SFP with SyncE and 8x PoE (240W, 48VDC)



- Supports Sync Ethernet & IEEE1588 PTP v2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- PoE PD failure auto checking, and auto reset when PD fail
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for UTP and Fiber ports



These Gigabit Ethernet switch models are managed industrial grade L2+ switches with 8/16 10/100/1000Base-T ports and 4/8 GbE/ Fast SFP ports that provide stable and reliable transmission. They also support timing synchronization features (SyncE & IEEE 1588 PTP v2) that allow operators to deliver services with optimal stability and continuity in end to end connectivity. 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 (See Figure). 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**

- Cable diagnostic, Measuring cable normal or broken point distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports Sync Ethernet allow operators to deliver service with optimal stability and continuity in end-to-end connectivity
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

# **Specifications**

-		
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancements)
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )_
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE 802.3ac	Max frame size extended to 1522Bytes.
Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094 IEEE 802.	1Q VLAN VID

Switch Architecture	Back-plane (Switching Fabric): 24Gbps (IGS-804SM-SE-8PH) 48Gbps (IGS-1608SM-SE-8PH) Full wire-speed
Data Processing	Store and Forward
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
Network Connector	8x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP connector (IGS-804SM-SE-8PH) 16x 10/100/1000Base-T RJ-45+ 8x 100/1000Base-X SFP connector (IGS-1608SM-SE-8PH) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support dual speed with DDMI
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af/at PoE <sup>+</sup> 2 pairs PoE, PoE <sup>+</sup> , 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Console	RS-232 (RJ-45)
Network Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported



# Industrial GbE Switch w/ SyncE, IEEE 1588v2 & PoE

Power Supply	Redundant Dua Removable Tern (50~57V input is in 30W applicati	l DC 48 ninal Blo s recom ions)	VDC (44~5 ock for inpu mended fo	7VDC) Inpu ut power co or IEEE 802.	ut power onnector 3at PoE <sup>+</sup>
Power Consumption	Model	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Power Budget
	IGS-804SM-SE-8PH	50VDC	253.5W	13.5W	240W
	IGS-1608SM-SE-8PH	50VDC	260.8	20.8W	240W
LED	Per unit: Power (Amber), CPU Ad	1 (Greer ct (Gree	n), Power 2 n), Ring Ma	(Green), Fa aster (Yellov	iult vv)
	Per RJ-45 port: 1	10/100 L 1000 Lir	.ink/Active hk/Active (/	(Green) Amber)	
	SFP Fiber Per po	rt: Link,	/Active (Gr	een)	
	PoE Port LED, 1 I	LED /pe	r Port :		
		PoÉ ( PoE (	Dutput Pov Dutput Pov	ver On : ON ver OFF : O	l (Green) FF
Jumbo Frame	9.6KB				
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)				
MAC Address Table	8K				
Memory Buffer	512K Bytes for packet buffer				
Warning Message	System Syslog, SN	NTP/e-r	nail event n	nessage, ala	rm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC				
Removable Terminal Block	Provide 2 redun Pin	dant po	ower, alarm	n relay cont	act, 6
Operating Temperature	-10 ~ 60°C (IGS-804SM-SE-8PH, IGS-1608SM-SE-8PH) -40 ~ 75°C (IGS-804SM-SE-8PHE, IGS-1608SM-SE-8PHE)				
Operating Humidity	5% to 95% (Non-condensing)				
Storage Temperature	-40 ~ 85°C				
Housing	Rugged Metal, I	P30 Pro	tection, Fa	nless	
Dimensions	106 x 72 x152 m 116 x 91 x 157 m	m (D x \ m (Dx \	N x H) (IGS Nx H) (IGS-	-803SM-SE 1608SM-SE	-8PH) -8PH)

Weight	0.76kg (IGS-803SM-SE-8PH) 1.375g (IGS-1608SM-SE-8PH)
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	564,484 Hours (IGS-803SM-SE-8PH) 403,331 Hours (IGS-1608SM-SE-8PH) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI	
(Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	EN61000-4-4 (Burst) Level 3, Criteria A
Protection Level	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1 (IGS-1608SM-SE-8PH) EN60950-1 (IGS-804SM-SE-8PH)
Surge protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
	· · · · · · · · · · · ·

# **Software Specifications**

#### Topology VLAN IEEE 802.1g VLAN,up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN,up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN,up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries GVRP (GARP VLAN Registration Protocal) MVR (Multicast VLAN Registration) Link Aggregation (Port Trunk) Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 6group (IGS-804SM-SE -8PH), 12group (IGS-1608SM-SE-8PH) Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 6group (IGS-804SM-SE8PH), 12group (IGS-1608SM-SE8PH) Per group up-to 8 port Spanning Tree IEEE 802.1d STP IEEE 802.1w RSTP IEEE 802.1s MSTP Multiple µ-Ring up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC Union µ-Ring white paper for more details and more topology applications) Loop Protection Supported ITU-T G.8032 / Recovery time <50ms Y.1344 ERPS (Ethernet Ring Single Ring, Sub-Ring, Multiple ring topology network Protection) **QoS Features Class of Service** IEEE 802.1p 8 active priorities queues for per port Traffic IEEE 802.1p based CoS Classification QoS 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	Rate in steps :1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	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 Fea	atures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L4: TCP/UDP
<b>RADIUS</b> authentic	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web Telnet / SSH_CLLRS-232 console
Filtering	
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
EtherNet/IP	supported
Ma diana TCD	aurora arte a





0

3

SW &	TFTP, HTTP, FTP client	IPv6 Telnet	Supported
Configuration	Redundant firmware in case of upgrade failure	IPv6 NTP, SNTP	Client / Server
Upgrade		IPv6 TFTP	Supported
RMON	RMON I (1, 2, 3, 9 group), RMON II	IPv6 QoS	Supported
MIB	RFC1213 MIB II, Private MIB	IPv6 ACL	Number of rules: up to 256 entries
UPnP	Supported		for L2 / L3 / L4
BootP	Bootstrap Protocol Supported		L2 : Mac address SA/DA/VLAN
RARP	Reverse Address Resolution Protocol Supported		L3: IP address SA/DA, Subnet
DHCP	Server, Client, Relay, Relay option 82 , Snooping		L4: TCP/UDP
IP Source Guard	Supported	Others Features	
Port Mirroring	Supported	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
Event Syslog	Syslog server (RFC3164) (Support 1 server )		Determine the cable length and lowering the newer
Warning Message	System syslog, e-mail, alarm relay		for ports with short cables
DNS	Client, Proxy		Lower the power for a port when there is no link
SyncE	ITU-T G.8262 Sync Ethernet		LED Power Management Adjustment LEDs intensity
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master Slave	Cable Diagnostic	Measuring UTP cable normal or broken point distance
NTP, SNTP	Client / Server	Advanced PoE	PoE PD failure auto checking, and auto reset when PD fail
LLDP (IEEE	Link Layer Discovery Protocol	wanagement	POE Configuration
802.1ab)	LLDP-MED		PoE Enable/Disable
IPv6 Features			Power limit by classification
IPv6 Management	Telnet Server/ICMP v6		Power feeding priority
SNMP over IPv6	Supported		Iotal Poe Power budge limitation: Maximum 240W for ICS-1608SM-SE-8PH ICS-804SM-SE-8PH
HTTP over IPv6	Supported		1/10/11/12/10/10/10/10/10/10/20/01/10/20/01/10/20/01/10/20/01/10/20/01/20/20/01/20/20/20/20/20/20/20/20/20/20/2
SSH over IPv6	Supported		

# **Application**

Figure : Application for mobile fronthaul



# **Dimensions**

► IGS-804SM-SE-8PH



3-3

#### ► IGS-1608SM-SE-8PH



Industrial GbE Switch IGS-1608SM-SE-8PH & IGS-804SM-SE-8PH



# **Ordering Information**

			UTP Port	<b>Fiber Port</b>	P	oE	Input Power		Certifica	tion		
ModelName	Managed	Total Port	10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3af/at	Power Budget	Redundant	Railway EN50121-4	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Operating Temperature
IGS-804SM-SE-8PH	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-10~60°C
IGS-804SM-SE-8PHE	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-40~75°C
IGS-1608SM-SE-8PH	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-10~60°C
IGS-1608SM-SE-8PHE	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-40~75°C

#### Model Naming Rule



# Package List

Switch

- One device of the series
- Terminal blockProtective caps for SFP ports
- Console cable (RJ-45 to DB9)
- Din Rail with screws
- **Optional Accessories**

Wall mount kit accessories				
IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm) (For IGS-804SM-SE-8PH)			
IND-WMK04	Wall Mount kit for Industrial product (2 pcs in 1 set, 76mm x 75mm x 2pcs) (For IGS-1608SM-SE-8PH)			

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

-	
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





# IGS-1608SM-SE & IGS-804SM-SE

▲ 16x GbE RJ45 + 8x 100/1000Base SFP with Synce & IEEE 1588v2
 ▶ 8x GbE RJ45 + 4x 100/1000Base SFP with Synce & IEEE 1588v2



- Supports Sync Ethernet & IEEE1588 PTP v2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports



These Gigabit Ethernet models are managed industrial grade L2+ switches with 8/16 10/100/1000Base-T ports and 4/8 GbE/Fast SFP ports that provide stable and reliable transmission. They also support timing synchronization features (SyncE & IEEE 1588 PTP v2) that allow operators to deliver services with optimal stability and continuity in end to end connectivity. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networks, 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 (See Figure). 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**

- Cable diagnostic, measuring cable normal or broken point distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports Sync Ethernet allow operators to deliver service with optimal stability and continuity in end-to-end connectivity
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Flow Control
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair	Network
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Connector
	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)	Console Network Cable
	IEEE 802.1Q	Virtual LANs (VLAN)	Network Cable
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Protocols
	IEEE 802.3ac	Max frame size extended to 1522Bytes.	Reverse Polarity Protection
Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Overload Current Protection
	IEEE 802.3x	Flow control for Full Duplex	CPU Watch Dog
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Power
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Consumption
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Power Supply
VLAN ID	4094 IEEE 802.	1Q VLAN VID	
Switch	Back-plane (Sw	vitching Fabric):	
Architecture	24Gbps (IGS-80 48Gbps (IGS-16 Full wire-speed	04SM-SE) 508SM-SE) 1	LED
Data Processing	Store and Forw	vard	

Flow Control	IEEE 802.3x for half duplex m	IEEE 802.3x for full duplex mode Back pressure for half duplex mode				
Network Connector	8x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X SFP connector (IGS-804SM-SE) 16x 10/100/1000Base-T RJ-45+ 8x 100/1000Base-X SFP connector (IGS-1604SM-SE) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SEP port support dual speed with DDMI					
Console	RS-232 (RJ-45)					
Network Cable	UTP/STP abov EIA/TIA-568 10	e Cat. 5e cable 00-ohm (100m)				
Protocols	CSMA/CD					
Reverse Polarity Protection	Supported					
Overload Current Protection	Supported					
CPU Watch Dog	Supported					
Power Consumption	Input Voltage 12 VDC 24 VDC 48 VDC	IGS-804SM-SE 11W 12.4W 12.9W	IGS-16085M-SE 17W 17.8W 20.2W			
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power Removable Terminal Block for input power connector					
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)					

SFP Fiber Per port: Link/Active (Green)

Jumbo Frame

9.6KB

# Industrial GbE Switch with SyncE & IEEE 1588v2

Freefall

Vibration



IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-804SM-SE, IGS-1608SM-SE) -40 ~ 75°C (IGS-804SM-SE-E, IGS-1608SM-SE-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 72 x152 mm (D x W x H) (IGS-804SM-SE) 116 x 91 x 157 mm (Dx Wx H) (IGS-1608SM-SE)
Weight	0.74kg (IGS-804SM-SE) 1.35kg (IGS-1608SM-SE)
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	593,726 Hours (IGS-803SM-SE) 431,610 Hours (IGS-1608SM-SE) (MIL-HDBK-217)
Warranty	5 years

# **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN.up to 256 entries
	IP Subnet-based VI AN, up to 128 entries
	Protocol-based VI AN(Ethernt_SNAP LLC) up to 128 entries
	VI AN Translation up to 256 entries
	GVRP (GARP VI AN Registration Protocal)
	MVR (Multicast VI AN Registration)
(Port Aggregation	group : 6group (IGS-804SM-SE), 12group (IGS-1608SM-SE)
ITUTIK)	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 6group (IGS-8045M-SE ), 12group (IGS-1608SM-SE)
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Multiple μ-Ring	up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC Union $\mu$ -Ring white paper for more details and more topology applications)
Loop Protection	Supported
ITU-T G.8032 /	Pacavary time <50ms
Y.1344 ERPS	Recovery time < 30ms
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
Classification QoS	IP Precedence based CoS
	IP DSCP based CoS
	Destination MAC VI AN ID PCP DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment DSCP TCP/UDP port number
Bandwidth	Rate in steps :1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
D:{{C	Per queue / Per port shaper
DiffServ (RF 2474)	кеmarкing

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	EN61000-4-4 (Burst) Level 3, Criteria A
Protection Level	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1 (IGS-1608SM-SE) EN60950-1 (IGS-804SM-SE)
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27

IEC 60068-2-32

IEC 60068-2-6

IP Multicasting Fea	itures			
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2			
shooping	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			
	tor L2 / L3 / L4			
	L2 : Mac address SA/DA/VLAN			
	L4: TCP/UDP			
<b>RADIUS</b> authentica	ation & accounting			
TACACS+ authenti	cation & accounting, TACACS+ 3.0			
HTTPS, HTTP	Supported			
SSL / SSH v2	Supported			
User Name	Local Authentication			
Password	Remote Authentication (via RADIUS / TACACS+)			
Authentication				
Management	Wah Talpat / SSH CLERS 222 cancele			
Filtering	Web, Teillet / SSIT, CLIRS-252 CONSOLE			
Management Feat	ures			
CLI	Cisco® like CLI			
Web Based Manag	ement			
Telnet	Server			
SNMP	V1, V2c, V3			
EtherNet/IP	Supported			
Modbus TCP	Supported			
SW &	TFTP, HTTP, FTP client			
Configuration	Redundant firmware in case of ungrade failure			
Upgrade				
RMON	RMONT (1, 2, 3, 9 group), RMONT			
MIR	RFC1213 MIB II, Private MIB			
UPNP De etD	Supported			
BOOTP	Bootstrap Protocol Supported			
RAKP	Reverse Address Resolution Protocol Supported			
DHCP	Server, Client, Relay, Relay option 82 , Shooping			
IP Source Guard	Supported			
Fuent Sycles	Suslag server (PEC2164) (Support 1 server)			
Warning Massage	System system a mail alarm relay			
DNIS	Client Provy			
Sunce	LTLLTC 9262 Sunc Ethorpot			
IEEE 1599 DTD V2	Support 5 operating mode in each port -			
ILLE IJOOFIF VZ	Ordinary-Boundary, Peer to Peer Transparent Clock,			
	Client / Server			
INTE, SINTE	Client / Server			



LLDP (IEEE	Link Layer Discovery Protocol	Others Features	
802.1ab)	LLDP-MED	<b>Green Ethernet</b>	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
IPv6 Features			Management to optimize the power consumption
IPv6 Management	Telnet Server/ICMP v6		Determine the cable length and lowering the power
SNMP over IPv6	Supported		for ports with short cables
HTTP over IPv6	Supported		Lower the power for a port when there is no link
SSH over IPv6	Supported		LED Power Management :Adjustment LEDs intensity
IPv6 Telnet	Supported	Cable Diagnostic	Measuring UTP cable normal or broken point
IPv6 NTP, SNTP	Client / Server		distance
IPv6 TFTP	Supported		
IPv6 QoS	Supported		
IPv6 ACL	Number of rules: up to 256 entries		
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet		

# **Application**

Figure : Application for mobile fronthaul



# **Dimensions**

#### ► IGS-1608SM-SE



► IGS-804SM-SE





(Optional accessory)

# **Ordering Information**

	Managed	Total Port	UTP Port	Fiber Port			Certification			Operating
ModelName			10/100/1000 Base-T	100/1000 Base-X	Railway EN50121-4	Safety UL60950-1	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Temperature
IGS-804SM-SE	V	12	8	4 SFP	V		V	$\vee$	V	-10~60°C
IGS-804SM-SE-E	V	12	8	4 SFP	V		V	V	V	-40~75°C
IGS-1608SM-SE	$\vee$	24	16	8 SFP	V	V	V	V	V	-10~60°C
IGS-1608SM-SE-E	V	24	16	8 SFP	V	V	V	$\vee$	V	-40~75°C

#### Model Naming Rule



#### Package List

- One device of the series
- Terminal block
- Console cable (RJ-45 to DB9)Din Rail with screws
- Protective caps for SFP ports

# **Optional Accessories**

#### Wall mount kit accessories

IND-WMK02

Wall Mount kit for Industrial product (Wide) (184 x 50mm) (For IGS-804SM-SE)

IND-WMK04 Wall Mount kit for Industrial product (2 pcs in 1 set, 76mm x 75mm x 2pcs) (For IGS-1608SM-SE)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





# ICS-RG24044X & ICS-RG16124X & ICS-RG8204X

▲L3 24x GbE RJ45 + 4x100/1000Base SFP + 4x 1G/2.5G/10G SFP

L3 16x GbE RJ45 + 12x 100/1000Base SFP + 4x 1G/2.5G/10G SFP

L3 8x GbE RJ45 + 20x 100/1000Base SFP + 4x 1G/2.5G/10G SFP



- Static Routing, RIP v1, RIP v2, IS-IS, BGP v4, OSPF v2, OSPF v3, PIM-SM, PIM-DM, PIM-SSM, DVMRP, VRRP v3
- Support u-Ring, ERPS, MSTP, RSTP, STP, MRP for redundant cabling
- UL62368-1, EN62368-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input



CTC Industrial Rackmount Ethernet Core Switch family are hardened design, Layer 3 / Layer 2, managed core switches, for rigorous demands of centralize and critical applications. The rackmount Ethernet core switch supports 4-ports 10GbE SFP+ and 24/16/8 GbE (10/100/1000BaseTX) RJ-45 ports plus 4/12/20 dual speed (100/1000Base-X) SFP fiber optical slots, thus providing 32 ports total for Ethernet connectivity. This family of switches is ideal for Smart City, surveillance, Intelligent traffic control systems and production automation applications. Redundant power input increases system reliability and the availability of your network backbone.

#### **Features**

- Redundant isolated 24/48VDC, or/and isolated 110/220VAC power inputs
- Rugged metal, IP30 protection & Fanless design
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Provides 14 instances each can support μ-Ring, u-Chain or Sub-Ring for flexible networking applications
- μ-Ring redundancy, recovery time <50ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network	10GbE SFP+ :				
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet Connect		4x 1G/2.5G/10G SFP socket				
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		GbE SFP: 4x 100/1000Base-X SFP socket (ICS-RG24044X)				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		12x 100/1000Base-X SFP socket (ICS-RG16124X) 20x 100/1000Base-X SFP socket (ICS-RG8204X) Support DDM				
	IEEE 802.1d	STP (Spanning Tree Protocol)		RJ45:				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)		24x 10/100/1000Base-T RJ-45 (ICS-RG24044X)				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		16X 10/100/1000Base-T RJ-45 (ICS-RG16124X) 8x 10/100/1000Base-T R I-45 (ICS-RG8204X)				
	IEC 62439-2	Media Redundancy Protocol (MRP)		Support Auto negotiation speed, Auto MDI/MDI-X				
	ITU-T G.8032 /	ERPS (Ethernet Ring Protection	Coursels Dout	function				
	Y.1344	Switching)	Console Port	USB-serial console (Type B connector)				
	IEEE 802.1Q	Virtual LANs (VLAN)	Storage Port	USB storage for upload (Type A connector)				
	IEEE 802.1X	Port based and MAC based Network	Network Cable	EIA/TIA-568 100-ohm (100m)				
		Max frame size extended to	Protocols	CSMA/CD				
	IEEE 802.3ac	1522Bytes	Reverse Polarity Protection Overload Current Protection	For input power				
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		Supported				
	IEEE 802.3X	Flow control for full duplex	CPU Watch Dog	Supported				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Power Supply	Redundant 2x AC input power (-AA model)				
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		model) Redundant 2x DC input power (-DD model)				
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)						
VLAN ID	4094 IEEE 802	.1Q VLAN VID		AC input power (A) : Isolated 110/220VAC				
Switch Architecture	Back-plane (Switching Fabric): 64Gbps (Full wire-speed)			DC input power (D) : Isolated 24/48VDC (18~60VDC), Removable Terminal Block				
Data Processing	Store and Forv	vard	-	Supports negative voltage power input				
			Power Consumption	TBD				

LED

# Industrial Layer 3 10G Ethernet Core Switch

LED	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)
	Per SFP Fiber port: 100 /1000Base-X Link/Active (Amber)
	Per SFP+ Fiber port: 1000Base-X Link/Active (Amber) 10GBase-X/2.5G Link/Active (Blue)
Jumbo Frame	10K Byte
MAC Address Table	16K
Memory Buffer	3M Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Digital Inputs	1x input -30 to +1 voltage for state "0" +13 to +30 voltage for state "1"
Operating Temperature	-10 ~ 60°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	TBD
Weight	TBD
Installation Mounting	19" rack mount
MTBF	TBD (MIL-HDBK-217)
Warranty	5 years

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	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
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection Lével	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN62368-1, UL62368-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Topology	
Layer 3 Routing	Static Routing ,RIP v1, RIP v2, IS-IS, BGP v4, OSPF v2, OSPF v3, PIM-SM, PIM-DM, PIM-SSM, DVMRP
Layer 3 redundancy	VRRP v3
VLAN	IEEE 802.1g VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g VLAN, up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN
	IP Subnet-based VLAN
	Protocol-based VLAN(Ethernt, SNAP, LLC)
	port base-VLAN
	Port isolation
	VLAN Translation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration) MVRP GMRP
Link Aggregation (Port Trunk)	Static Dynamic (IEEE 802.3ad LACP), Maximum trunk group: 8 groups
	Dynamic Dynamic (IEEE 802.3ad LACP), Maximum trunk group: 8 groups
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP, IEC 62439-2 MRP
Multiple µ-Ring	Up to 14 instances each support $\mu$ -Ring, $\mu$ -Chain or Sub-Ring for flexible networking applications. Recovery time <50ms The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 /	Recovery time <50ms
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
Classification QoS	IP Precedence based CoS
	IP DSCP based CoS
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number

Bandwidth Control for Ingress	Per port based					
Bandwidth	Per port based					
Control for Egress	Per queue / Per port shaper					
DiffServ (RF 2474)	Remarking					
Storm Control	for Unicast, Broadcast, Multicast					
IP Multicasting Fea	atures					
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2					
Security Features						
IEEE 802.1X	Port-Based					
ACL	Number of rules : up to 50 entries					
	for L2 / L3 L2 : Mac address SA/DA/VLAN L3 : IP address SA/DA, Subnet					
<b>RADIUS</b> authentica	ation & accounting					
TACACS+ authenti	cation & accounting, TACACS+ 3.0					
HTTPS, HTTP	Supported					
SSL / SSH v2	Supported					
User Name	Local Authentication					
Authentication	Remote Authentication (via RADIUS / TACACS+)					
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console					
<b>Management Feat</b>	ures					
CLI	Cisco® like CLI					
Web Based Manag	ement					
Telnet	Server					
SNMP	V1, V2c, V3					
SW &	TFTP, SFTP					
Upgrade	Redundant firmware in case of upgrade failure					
RMON	RMON I (1, 2, 3, 9 group), RMON II					
MIB	RFC1213 MIB II, Private MIB					
DHCP	Server, Client, Relay, Snooping					
IP Source Guard	Supported					
Mirroring	SPAN (local), RSPAN (remote)					
Event Syslog	Client					
Warning Message	System syslog, e-mail, alarm relay					
DNS	Client					



#### IPv6 Features

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

# **Ordering Information**

	. То	Total	GbE		10GbE	10GbE Input power			Certification			
Model Name	Layer 3/2	Ports (Maximum)	10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/ 10GBase-X SFP <sup>+</sup>	24/48VDC	110/220VAC	Safety UL62368-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	
ICS-RG24044X-AA	V	32	24	4	4		2	V	V	V	V	
ICS-RG24044X-AD	V	32	24	4	4	1	1	V	V	V	V	
ICS-RG24044X-DD	V	32	24	4	4	2		V	$\vee$	V	V	
ICS-RG16124X-AA	V	32	16	12	4		2	V	$\vee$	V	V	
ICS-RG16124X-AD	V	32	16	12	4	1	1	V	V	V	$\vee$	
ICS-RG16124X-DD	V	32	16	12	4	2		V	$\vee$	V	V	
ICS-RG8204X-AA	V	32	8	20	4		2	V	$\vee$	V	V	
ICS-RG8204X-AD	V	32	8	20	4	1	1	V	V	V	V	
ICS-RG8204X-DD	V	32	8	20	4	2		V	V	V	V	

#### Model Naming Rule



# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule




# ICS-G4804X & ICS-G24044X

◀ 48x GbE RJ45 + 4x 1G/2.5G/10G SFP

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

- Support u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for RJ45 and SFP ports
- Supports negative voltage power input



ICS-G4804X & ICS-G24044X are industrial grade, hardened design, managed L2+ switches, built for the rigorous demands of centralized and critical applications. The switch supports 4-ports 10GbE SFP+ and 24 / 48 GbE (10/100/1000BaseTX) RJ-45 ports, plus 4 dual speed (100/1000Base-X) SFP fiber optical slots. ICS series models are all fan-less designs with redundant, isolated power supplies (2 AC, 2 DC, AC + DC) and can be mounted in 19-inch EIA standard rack. ICS Series are certified with many industrial-grade standards and are ideal for deployments in harsh environments to deliver mission-critical network services. This product is ideal for Smart City, surveillance, Intelligent traffic control systems and production automation applications.

### **Features**

- Redundant isolated 24/48VDC, or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- μ-Ring redundancy, recovery time <20ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*

\*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet		Network	10GbE SFP+ :		
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Connector	4x 1G/2.5G/10G SFP socket Supports DDMI <b>GbE SFP:</b> 4x 100/1000Base-X SFP socket (ICS-G24044X)		
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		Support DDMI <b>RJ45:</b> 24x 10/100/1000Pace T.P.L 45, (ICS, C24044X)		
	IEEE 802.3ae	10 Gbit/s Ethernet over fiber		48x 10/100/1000Base-T RJ-45 (ICS-G24044A)		
	IEEE 802.1d	STP (Spanning Tree Protocol)		Support Auto negotiation speed, Auto MDI/MDI-X		
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		function		
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Jumbo Frame	10K Byte		
	ITU-T G.8032 /	ERPS (Ethernet Ring Protection	MAC Address Table	e 32K		
	Y.1344	Switching)	Memory Buffer	4M Bytes for packet buffer		
	IEEE 802.1Q	Virtual LANs (VLAN)	Warning Message	System Syslog, SMTP/ e-mail event message,		
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Alarm Relay	Relay outputs with current carrying capacity of		
	IEEE 802.3ac	Max frame size extended to 1522Bytes	Operating Temperature	-10 ~ 60°C		
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Operating Humidity	5% to 95% (Non-condensing)		
	IEEE 802.3X	Flow control for full duplex	Storage Temperature	-40 ~ 85°C		
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Housing	Rugged Metal, IP30 Protection, Fanless		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Dimensions	280x 440 x 44mm (D x W x H)		
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	Weight	4,755kg (ICS-G24044X-AA)		
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		4.51kg (ICS-G24044X-AD) 4.26kg (ICS-G24044X-DD)		
VLAN ID	4094 IEEE 802	.1Q VLAN VID		TBD (ICS-G4804X)		
Switch Architecture	Back-plane (Sv 136Gbps (	vitching Fabric): (ICS-G24044X)	Installation Mounting	19" rack mount		
	156Gbps (ICS-G4804X) (Full wire-speed)		MTBF	103,057 Hours (ICS-G24044X-AA)		
Data Processing	Processing Store and Forward			103,451 Hours (ICS-024044X-AD) 103,447 Hours (ICS-G24044X-DD) TBD (ICS-G4804X) (MIL-HDBK-217)		

Warranty

5 years



CE (EN55024, EN55032)
FCC Part 15 Subpart B Class A, CE
EN50121-4
EN61000-6-2
EN61000-6-4
F

EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection Lével	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Topology	
VLAN	IEEE 802.1g VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g VLAN, up to 4094 Groups
	IEEE 802.1ad O-in-O
	MAC-based VLAN.up to 256 entries
	IP Subnet-based VI AN, up to 128 entries
	Protocol-based VI AN(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 (IEEE 802.3ad LACP), Maximum trunk group : 16group (ICS-G24044X) 26group (ICS-G4804X)
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group (ICS-G24044X) 26group (ICS-G4804X)
	Per group up-to 8 port
Spanning Tree	IEEE 802.1d STP. IEEE 802.1w RSTP. IEEE 802.1s MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications.
	The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y 1344 FRPS	Recovery time <50ms
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
Classification Qos	IP Precedence based CoS
	IP DSCP based CoS
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth	Per port based
Control for Egress	Per gueue / Per port shaper
DiffServ (RF 2474) I	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	tures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SA/DA, Subnet L4 - TCP/UDP
<b>RADIUS</b> authentica	ation & accounting

RADIUS a	utilentication e	accounting	
TACACC	authoritantion	0	TACACC

TACACS+ authentication & accounting, TACACS+ 3.0

HTTPS, HTTP	Supported				
SSL / SSH v2	Supported				
User Name	Local Authentication				
Password Authentication	Remote Authentication (via RADIUS / TACACS+)				
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console				
Management Feat	ures				
CLI	Cisco® like CLI				
Web Based Manag	ement				
Telnet	Server				
SNMP	V1, V2c, V3				
Modbus/TCP	Support for management and monitoring				
SW &	TFTP, HTTP				
Upgrade	Redundant firmware in case of upgrade failure				
RMON	RMON I (1, 2, 3, 9 group), RMON II				
MIB	RFC1213 MIB II, Private MIB				
UPnP	Supported				
DHCP	Server, Client, Relay, Relay option 82 , Snooping				
P Source Guard	Supported				
Mirroring	Local and Remote				
Event Syslog	Syslog server (RFC3164) (Support 1 server )				
Warning Message	System syslog, e-mail, alarm relay				
DNS	Client, Proxy				
EEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave				
NTP V4.0, SNTP	Client				
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol				
Pv6 Features	LLDF-IVILD				
Pv6 Management	Tolpot Sonyor/ICMD.v6				
SNMP over IPv6	Supported				
HTTP over IPv6	Supported				
SSH over IPv6	Supported				
Pv6 Telnet	Supported				
	Client				
	Supported				
	Supported				
	Number of rules: up to 256 optries				
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN				
	L3 : IP address SA/DA, Subnet L4 : TCP/UDP				
Uther Features	Green Ethernet Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link LED Power Management : Adjustment LEDs intensity				
	Cable Diagnostic				

Measuring UTP cable normal or broken point distance



#### Figure 2: 10G Backbone with µ-Ring topology



### **Dimensions**

ICS-G24044X Rear View



#### Side View

AR R RN						þ
A B	• • • • •	• • • • • • • • • • • • • • • • • • • •	• • • •	0000	0000	P

Front View Y



C<sup>T</sup>L unior 

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# **Ordering Information**

		Total	Total GbE		10GbE	Inpu	Input power		Certification		
Model Name	Managed	Ports (Maximum)	10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	1G/2.5G/ 10GBase-X SFP+	24/48VDC	110/220VAC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
ICS-G24044X-AA	V	32	24	4	4		2	V	V	V	V
ICS-G24044X-AD	V	32	24	4	4	1	1	V	V	V	V
ICS-G24044X-DD	V	32	24	4	4	2		V	V	V	V
ICS-G4804X-AA	V	52	48		4		2	V	V	V	V
ICS-G4804X-AD	V	52	48		4	1	1	V	V	V	V
ICS-G4804X-DD	V	52	48		4	2		V	V	V	V
Model Naming I	Rule			_							
Industrial Core Switch	G24: 24 ( G48: 48 (	GbE RJ45 GbE RJ45	04 4 4 04: 4 x GbE	E SFP 4X:	4x 10G SFP <sup>-</sup>	AD : 1x / DD : 2x   (A: Isolate + D: Isolate	AC + 1x DC DC ed 110/220VAC ed 24/48VDC p	C power bower)			
Package List											
<ul><li>One device of</li><li>Console cable (R.</li></ul>	the series J-45 to DB-9	• 19 1) • Pi	9" rack-mount ki rotective caps for	it (brackets an r SFP ports	nd screws)	AC Power cor	d (for AC power -/	A model)			
<b>Optional Ac</b>	cesso	ries									
Industrial SFP	Transceiv	er									
The ISFP series of ind	lustrial grade	SFP module	s have been fully	y tested with th	he series produc	t for guaranteed	l compatibility and	performance.	The best perfo	rmance can be gu	uaranteed
even in mission-critica	al applicatior	ns.				-				-	
ISFP-M9000-85-D(E)	Industri	ial SFP 10GbE	10GBase-SR, M/N	Л, 300 meter ((	OM3 fiber) ,wave	length 850nm, I	DDMI , -10~70°C (-	-40~85°C)			
ISFP-S9010-31-D(E)	Industri	ial SFP 10GbE	10GBase-LR, S/M	l, 10km, wave l	length 1310nm, [	DDMI, -10~70°C	(-40~85℃)				
ISFP-M7000-85-D(E)	Industri	ial SFP GbE 10	00Base-SX, M/M,	500 meter,wa	ive length 850nm	n, 7.5dB, LC, DDN	∕II, -10~70°C (-40~	85°C)			
ISFP-S7020-31-D(E)	Industr	ial SFP 1000B	ase-LX, S/M, 20k	km, wave lenc	gth 1310nm, 15d	IB, LC, DDMI, -10	0~70°C(-40~85℃)				
ISFP-T7T00-00-(E)	Industr	ial SFP 10/10	0/1000Base-T UT	- FP 100meter, ·	-10~70°C (-40~8	5°C)					
ISFP-M5002-31-D(E)	Industr	ial SFP 155M	100Base-FX, MM	M, 2km, wave	length 1310nm	, 12dB, LC, DDN	/II, -10~70°C (-40∼	-85℃)			
ISFP-S5030-31-D(E)	Industr	ial SFP 155M	100Base-FX, SN	1, 30km, 1310	)nm, 19dB, LC, D	DMI, -10~70°C	(-40~85°C)				
SFP Naming Rule											
ISFP	<b>-</b> S	7	040	- 31	<b>—</b> D	] [E]-	−−−−● E: Bi	-40~85°C ank:0~70°C			
						•					
Industrial	M: Multi	i Mode	9:10G Di	istance	Wavelength	D: DDN	11				
SFP	S: Singl	e Mode	7: GbE T(	00: (UTP)	00: UTP	Blank: I	Non DDMI				
Transceiver	T: UTP		5: FE 00	00: (500m)	85: 850nm						
			00	)2: (2km)	31:1310nm						
			02	20: (20km)	55:1550nm						
			04	40: (40km)	WA: TX/131	10nm (Bidi m	iode A)				

WB: TX/1550nm (Bidi Mode B)



# ICS-G24S4X & ICS-G24S2X

424x 100/1000Base SFP with 4x Combo (RJ45/SFP) + 4x 1G/10G SFP

▶ 24x 100/1000Base SFP with 4x Combo (RJ45/SFP) + 2x 1G/10G SFP



- Supports IEEE1588 PTP v2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Supports maximum up to 14 u-rings in one device
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- Supports negative voltage power input



ICS-G24S4X & ICS-G24S2X are industrial grade, hardened design, managed L2+ switches, equipped with 20 GbE SFP ports plus 4 combo GbE ports and 2 or 4 10GbE SFP+ uplink ports. ICS series models are all fan-less designs with redundant, isolated power supplies (2 AC, 2 DC, AC + DC) and can be mounted in 19-inch EIA standard rack. ICS Series are certified 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 GbE or 10 GbE high-speed uplink, ICS-G24S4X & ICS-G24S2X are a reliable and scalable solution for core layer or backbone applications (See figure 1 & 2).

### **Features**

- Redundancy isolated low voltage 24/48VDC, or/and isolated High voltage (110/220VAC) power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 14 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 14 rings in one device (Please see CTC Union μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<50ms in 250 devices</li>
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

### **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Console	RS-232 (RJ-45	i)			
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Network Cable	UTP/STP above Cat. 5e cable				
	IEEE 002 2ab	1000Base-T Gbit/s Ethernet over		EIA/TIA-568 1	00-ohm (100m)			
	IEEE 002.5dD	twisted pair	Protocols	Protocols CSMA/CD				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Reverse Polarity Protection	Supported				
	IEEE 802.3ae	10 Gbit/s Ethernet over fiber	<b>Overload</b> Current					
	IEEE 802.1d	STP (Spanning Tree Protocol)	Protection	Supported				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	CPU Watch Dog	Supported				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Power Supply	Redundant 2	x isolated High Volt	age AC input power		
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		(-AA model) Redundant 2	x Isolated Low Volta	age DC Input power		
	IEEE 802.1Q	Virtual LANs (VLAN)		(-DD model) Redundant 1x isolated Low Voltage DC and 1x High Voltage AC input power (-AD model) Low Voltage DC (D): Isolated 24/48V (18~60VDC), Removable Terminal Block High voltage AC (A): Isolated 110/220VAC				
	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 802.1ad	Stacked VLANs, Q-in-Q		(85VAC~264V	AC)	2201110		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		Supports negative voltage power input (for example in telecom system)				
	IEEE 802.ab	Link Layer Discovery Protocol (LLDP)	Power	Input Voltage	ICS-G24S4X	ICS-G24S2X		
VLAN ID	4094 IEEE 802	.1Q VLAN VID	Consumption	24VDC	33.1W	29.8W		
Switch	Back-plane (Sv	witching Fabric):		48VDC	33.4	30.1W		
Architecture	128Gbps (ICS-	G24S4X) 88Gbps (ICS-G24S2X)		110VAC	34.4W	31.1W		
	(Full wire-spee	ed)		220VAC	34.4W	31.1W		
Data Processing	Store and Forv	ward	LED	Per unit: Pow	er 1 (Green), Power	2 (Green),		
Network	24x 100/1000E	Base-X SFP with 4x GbE Combo (UTP/		Act /Alarm (Green/ Amber), Ring Master (Green) Per RJ-45 port: 10/100 Link/Active (Green)				
Connector	SEP)+ 4X TUGB	ase-X SFPT (ICS-G24S4X) Aseo-X SEP with 4x ChE Combo (LITP/						
	SEP) $+ 2y 10GBase - X SEP + (ICS-G24S2X)$			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)				
Network	RJ-45 UTP por	t support 10/100/1000Base-I(X) , Auto						
connector	GhE port SEP	support dual speed (100M/1000M)						
	with DDMI							
	10GbE port SF	P <sup>+</sup> support dual speed (1000M/10G)		10GBase-	X Link/Active (Blue)			
	with DDMI		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	315 x 440 x 44 mm (D x W x H)				
Weight	4.755kg (ICS-G24S4X-AA)         4.26kg (ICS-G24S4X-DD)           4.51kg (ICS-G24S4X-AD)         4.695kg (ICS-G24S2X-AA)           4.2kg (ICS-G24S2X-DD)         4.45kg (ICS-G24S2X-AD)				
Installation Mounting	19" rack mount				
MTBF	176,414 Hours (ICS-G24S4X-AA) 190,965 Hours (ICS-G24S4X-AD) 214,649 Hours (ICS-G24S4X-DD) 176,663 Hours (ICS-G24S2X-AA) 191,257 Hours (ICS-G24S2X-AD) 215,018 Hours (ICS-G24S2X-DD) (MIL-HDBK-217)				
Warranty	5 years				

# **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 VI AN(Ethernt_SNAP LLC) up to 128 entries				
	VI AN Translation up to 256 entries				
	GVRP (GARP VI AN Registration Protocal)				
	MVR (Multicast VI AN Registration)				
Link Aggregation	Static (Hash with SA_DA_IP TCP/LIDP port) Maximum				
(Port Trunk)	trunk group : 14group (ICS-G24S4X), 23group (ICS-G24S2X)				
	Dynamic (IEEE 802.3ad LACP),Maximum trunk group : 14group (ICS-G24S4X), 23group (ICS-G24S2X)				
	Per group up-to 8 port				
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP				
Multiple µ-Ring	up to 14 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 14 Rings. Recovery time <50ms				
	The maximum number of devices allowed in a King supported ring is 250.				
	and more topology application)				
Loop Protection	Supported				
ITU-T G.8032 / Y.1344 ERPS	Recovery time <50ms				
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network				
QoS Features					
Class of Service	IEEE 802.1p 8 active priorities queues for per port				
Traffic	IEEE 802.1p based CoS				
Classification QoS	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	Per port based				
Bandwidth	Per port based				
Control for Egress	Per queue / Per port shaper				
DiffServ (RF 2474)	Remarking				
Storm Control	for Unicast, Broadcast, Multicast				

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

<b>IP Multicasting Fea</b>	itures						
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2						
Snooping	Port Filtering Profile						
	Throttling, Fast Leave						
	Maximum Multicast Group : up to 1022 entries						
	Ouery / Static Router Port						
Security Features	,						
IEEE 802.1X	Port-Based						
	MAC-Based						
ACL	Number of rules : up to 256 entries						
	for L2 / L3 / L4						
	L2 : Mac address SA/DA/VLAN						
	L3: IP address SA/DA, Subnet						
PADILIS authoritics	L4: ICP/UDP						
TACACS+ authentic	cation & accounting $TACACS \pm 3.0$						
HTTPS, HTTP	Supported						
SSL / SSH v2	Supported						
User Name							
Password							
Authentication	Remote Authentication (via RADIUS / IACACS+)						
Management	Web Tale at / CCU - CU DC 222 assesses						
Filtering	Web, Teinel 7 SSH , CLI RS-232 COnsole						
Management Feat	ures						
CLI	Cisco® like CLI						
Web Based Manag	ement						
Telnet	Server						
SNMP	V1, V2c, V3						
Modbus/TCP	Supports for management and monitoring						
SW &	TFTP, HTTP						
Configuration	Redundant firmware in case of upgrade failure						
Upgrade							
	RFC1213 MIB II, Private MIB						
	Supported						
IP Source Guard	Server/Client/Relay/Relay option 82/Shooping						
Port Mirroring	Supported						
Fort Mirroring	Supported						
Event Syslog	Sysiog server (RFC3164) (Support 1 server )						
	System syslog, e-mail, alarm relay						
	Client, Proxy						
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave						
NTP, SNTP	Client						
LLDP	Link Layer Discovery Protocol						
(IEEE 802.1ab)							

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IPv6 Features		IPv6 TFTP	Supported
IPv6 Managemer	t Telnet Server/ICMP v6	IPv6 QoS	Supported
SNMP over IPv6	Supported	IPv6 ACL	Number of rules: up to 256 entries
HTTP over IPv6	Supported		for L2 / L3 / L4
SSH over IPv6	Supported		L2 : Mac address SA/DA/VLAN
IPv6 Telnet	Supported		L3: IP address SA/DA, Subnet
IPv6 NTP, SNTP	Client		

# **Application**

Figure 1: 10G Backbone application



#### Figure 2 : 10G Backbone with $\mu\text{-Ring}$ topology





# **Dimensions**



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# **Ordering Information**

			GbEPort		10GbE	10GbE Input Power			Certification			
Model Name	Managed	Total Port	100/1000 Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP	IEEE 802.3ae SFP <sup>+</sup>	DC (Low Volt) isolated 24/48VDC	High Volt 110/220VAC	Safety UL60950-1 EN60950-1	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	2		V	V	V	V	
ICS-G24S4X-AD	V	28	20	4 Combo	4	1	1	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	2		V	V	V	V	
ICS-G24S2X-AD	V	26	20	4 Combo	2	1	1	V	V	V	V	

#### Model Naming Rule



#### Package List

- ICS-G24S4X or ICS-G24S2X device AC Power cord (for AC power -A model)
- Console cable (RJ-45 to DB9)
- Rack mount ear with screws

# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-SX, S/M, 20km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T, UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



### **CTC** union

# ICS-G24044X-24PH

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



- Supports IEEE 1588 PTP V2
- Support u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Support maximum up to 14 u-rings in one device
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for PoE, RJ45 and SFP ports



ICS-G24044X-24PH is a hardened L2 managed core switch which also supports PoE+/PSE for rigorous demands of centralize and critical applications. ICS-G24044X-24PH supports 4 uplink ports with 10GbE SFP+ and 24 GbE (10/100/1000BaseTX) PoE+ RJ-45 ports plus 4 dual speed (100/1000Base-X) SFP fiber optical slots. ICS-G24044X-24PH is an ideal solution for Smart City, surveillance, Intelligent traffic control systems and production automation applications and supports up to 24 PoE/PoE+ (IEEE 802.3af/IEEE 802.3at) ports which can provide 15.4/30watts power output per port for connecting with heavy-duty industrial PoE devices, such as PTZ IP surveillance cameras, high-performance wireless access points, digital signage and IP phones. The ICS-G24044X-24PH is designed especially for harsh outdoor cabinet applications with 4kV surge protection to ensure the uninterrupted reliability of PoE systems.

# **Features**

- Maximum up to 24x IEEE 802.3af / 802.3at PoE<sup>+</sup> output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- Provides 14 instances each can support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications
- μ-Ring redundancy, recovery time <20ms in 250 devices</li>
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network	10GbE SFP+:
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Connector	4x 1G/2.5G/10G SFP socket
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		SED.
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		4x 100/1000Base-X SFP socket Support DDMI
	IEEE 802.3ae	10 Gbit/s Ethernet over fiber		
	IEEE 802.1d	STP (Spanning Tree Protocol)		RJ45:
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		Support Auto negotiation speed. Auto MDI/MDI-X
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		function
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		PoE:
	IEEE 802.1Q	Virtual LANs (VLAN)		24X IEEE 802.3aT /IEEE 802.3aT POE ' End-Snan, Alternative A mode
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		Maximum 30W per port, 400W PoE power budget in total
	IEEE 802.3ac	Max frame size extended to 1522Bytes		RJ45 Pin Assignment:
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6,4,5,7,8)
	IEEE 802.3af	PoE (Power over Ethernet)	Console	RS-232 (RJ-45)
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancement)	Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100m)
	IEEE 802.3X	Flow control for full duplex	Protocols	CSMA/CD
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Reverse Polarity Protection	For input power
	IEEE 802.1p	Traffic Prioritization	Overload Current Protection	Supported
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	CPU Watch Dog	Supported
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Power Supply	Redundant dual input power 48VDC (44~57VDC)
Data Processing	Store and Forv	vard		(Removable terminal block)
VLAN ID	4094 IEEE 802	.1Q VLAN VID		(50~57VDC input is recommended for IEEE 802.3at
Switch Architecture	Back-plane (Sv 136Gbps (Full wire-spee	vitching Fabric):	Power Consumption	<ul> <li>&lt; 33W @50VDC without PoE load</li> <li>&lt; 449W @50VDC with 400W PoE load</li> </ul>
Data Processing	Store and Forv	vard		

LED	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber) P25~P28
	Per SFP Fiber port: 100 /1000Base-X Link/Active (Amber) P29~P32
	Per SFP+ Fiber port: 1000Base-X Link/Active (Amber) 10GBase-X Link/Active (Blue)
	PoE port (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
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 1A @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	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount

# **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID 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)
Link Aggregation	Static (Hach with SA, DA, IR TCR/UDR part) Maximum
(Port Trunk)	trunk group : 16group Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group
Spanning Tree	
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications. Recovery time <20ms The maximum number of device is allowed 250 in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS	Recovery time <20ms
Protection)	Single Ring, Sub-Ring, Multiple ring topology
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
Classification Q05	IP Precedence based CoS
	IP DSCP based CoS
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth	Per port based
Control for Egress	Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	itures
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling, Fast Leave
	waximum wulticast Group : up to 1022 entries

MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Surge protection	4KV for PoE, RJ45 and SFP
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Security Features						
IEEE 802.1X	Port-Based					
	MAC-Based					
ACL	Number of rules : up to 256 entries					
	for L2 / L3 / L4					
	LZ : Mac address SA/DA/ VLAN					
	L4 : TCP/UDP					
<b>RADIUS</b> authentica	tion & accounting					
TACACS+ authentic	cation & accounting, TACACS+ 3.0					
HTTPS, HTTP	Supported					
SSL / SSH v2	Supported					
User Name	Local Authentication					
Authentication	Remote Authentication (via RADIUS / TACACS+)					
Management						
Interface Access	Web, Telnet / SSH , CLI RS-232 console					
Flitering	1405					
Management Feat						
	CISCO® IIKE CLI					
Web Based Manag	ement					
leinet	Server					
SNMP	V1, V2c, V3					
Modbus/TCP	Support for management and monitoring					
SW &	TFTP, HTTP					
Upgrade	Redundant firmware in case of upgrade failure					
RMON	RMON I (1, 2, 3, 9 group), RMON II					
MIB	RFC1213 MIB II, Private MIB					
UPnP	Supported					
DHCP	Server/Client/Relay/Relay option 82/Snooping					
IP Source Guard	Supported					
Mirroring	Local and Remote					
Event Syslog	Syslog server (RFC3164) (Support 1 server )					
Warning Message	System syslog, e-mail, alarm relay					
DNS	Client, Proxy					
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave					
NTP V4.0, SNTP	Client					
SNLLDP	Link Layer Discovery Protocol					
(IEEE 802.1ab)MP	LLDP-MED					
IPv6 Features						
IPv6 Management	Telnet Server/ICMP v6					
SNMP over IPv6	Supported					
HTTP over IPv6	Supported					

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Query / Static Router Port





s@ctcu.com

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# **Ordering Information**

		GbEP	GbEPort 10 GbE		10 GbE PoEport Input power			Certificat				
ModelName	Total Port	10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	G/2.5G/10GBase-X SFP <sup>+</sup>	IEEE 802.3at/af	Power Budget	48VDC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	Operating Temperature
ICS-G24044X-24PH	32	24	4	4	24	400W	2	V	V	V	V	-10~60°C
Model Naming	Rule	G24	04	4X -	24	PH —	● 24PH	I: 24 High I ■ <b>P</b>	Power Pol ackage Lis	E		
Industrial C Core Switch	<b>324</b> : 2	4 GbE RJ45	5 <b>04</b> : 4x 0	GbE SFP 4X	: 4x 10G	SFP+		•	ICS-G2404 Console ca 19" rack-m Protective	4X-24PH dev able (RJ-45 to nount kit (bra caps for SFP	vice DB-9 ckets ports	) and screws)

# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M9000-85-D(E)	Industrial SFP	10GbE 10G	Base-SR, M/M	, 300 meter (OM	I3 fiber) ,wave length 850nm, DDMI , −10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP	10GbE 10G	Base-LR, S/M,	10km, wave leng	gth 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-M7000-85-D(E)	Industrial SFP	GbE 1000Ba	ase-SX, M/M, 5	500 meter,wave l	length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP	1000Base-	-LX, S/M, 20kr	m, wave length	1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP	10/100/10	000Base-T UTF	P 100meter, -10 <sup>,</sup>	~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFF	155M 100	)Base-FX, MM	l, 2km, wave ler	ngth 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFF	155M 100	)Base-FX, SM,	30km, 1310nm	n, 19dB, LC, DDMI, -10~70°C (-40~85°C)
SFP Naming Rule	2				
ISFP Industrial SFP Transceiver	S 7 M: Multi Mode S: Single Mode T: UTP	040 9: 10G 7: GbE 5: FE	- 31 Distance T00: (UTP) 000: (500m) 002: (2km) 020: (20km) 040: (40km)	Wavelength 00: UTP 85: 850nm 31:1310nm 55:1550nm WA: TX/1310r WB: TX/1550r	E E:-40~85°C Blank:0~70°C D: DDMI Blank: Non DDMI



# IGS-R2408SM & IGS-R1616SM & IGS-R824SM

- 24x GbE RJ45 + 8x100/1000Base SFP
   16x GbE RJ45 + 16x 100/1000Base SFP
- ► 8x GbE RJ45 + 24x 100/1000Base SFP



CTC Industrial Rackmount Ethernet Switch family are hardened design, Layer 3 / Layer 2, managed switches, for rigorous demands of centralize and critical applications. The rackmount Ethernet core switch supports 24/16/8 GbE (10/100/1000BaseTX) RJ-45 ports plus 8/16/24 dual speed (100/1000Base-X) SFP fiber optical slots, thus providing 32 ports total for Ethernet connectivity. This family of switches is ideal solution for Smart City, surveillance, Intelligent traffic control systems and production automation applications. Redundant power input increases system reliability and the availability of your network backbone.

### **Features**

- Redundant isolated 24/48VDC, or/and isolated 110/220VAC power inputs
- Rugged metal, IP30 protection & Fanless design
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- $\mu$ -Ring redundancy, recovery time <50ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network	Gb E SFP:			
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Connector	8X TUU/TUUUBase-X SEP socket (IGS-R2408SM) 16x 100/1000Base-X SEP socket (IGS-R1616SM)			
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		24x 100/1000Base-X SFP socket (IGS-R8245M) Support DDMI			
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		<b>RJ45:</b> 24x 10/100/1000Base-T RJ-45 (IGS-R2408SM) 16x 10/100/1000Base-T RJ-45 (IGS-R1616SM)			
	IEEE 802.1d	STP (Spanning Tree Protocol)		8x 10/100/1000Base-T RJ-45 (IGS-R824SM)			
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)		Support Auto negotiation speed, Auto MDI/MDI-X			
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Concolo Dort	function			
	IEC 62439-2	Media Redundancy Protocol (MRP)	Storage Port	USB-senal console (Type B connector)			
	ITU-T G.8032 /	ERPS (Ethernet Ring Protection	Network Cable	LITP/STP Cat 5e cable or above			
	Y.1344	Switching)	Network Cable	EIA/TIA-568 100-obm (100m)			
	IEEE 802.1Q	Virtual LANs (VLAN)	Protocols	CSMA/CD			
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Reverse Polarity Protection	For input power			
	IEEE 802.3ac	Max frame size extended to 1522Bytes	Overload Current Protection	Supported			
		Link aggregation for parallel links	CPU Watch Dog	Supported			
	IEEE 802.3ad	with LACP(Link Aggregation Control Protocol)	Power Supply	Redundant 2x AC input power (-AA model)			
	IEEE 802.3X	Flow control for full duplex		model)			
	IEEE 802.1ad	Stacked VLANs, Q-in-Q		Redundant 2x DC input power (-DD model)			
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		AC input power (A) : Isolated 110/220VAC			
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)		DC input power (D) : Isolated 24/48VDC (18~60VDC			
VLAN ID	4094 IEEE 802	.1Q VLAN VID		Removable Terminal Block			
Switch Architecture	Back-plane (Sv (Full wire-spee	vitching Fabric): 64Gbps ed)	Power Consumption	TBD			
Data Processing	Store and Forv	ward					

4-17



LED

# Industrial Layer 3 GbE Managed Switch

Certification

Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green) Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber) Per SFP Fiber port: 100 /1000Base-X Link/Active (Amber) Jumbo Frame 10K Byte MAC Address Table 16K **Memory Buffer** 3M Bytes for packet buffer System Syslog, SMTP/ e-mail event message, alarm relay Warning Message Alarm Relay Contact Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block 1x input -30 to +1 voltage for state "0" +13 to +30 voltage for state "1" **Digital Inputs** Operating Temperature -10 ~ 60°C . Operating Humidity 5% to 95% (Non-condensing) Storage Temperature -40 ~ 85°C Housing Rugged Metal, IP30 Protection, Fanless Dimensions TBD Weight TBD Installation Mounting 19" rack mount TBD (MIL-HDBK-217) MTBF Warranty 5 years

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	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
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection Lével	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN62368-1, UL62368-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Topology			
Layer 3 Routing	Static Routing ,RIP v1, RIP v2, IS-IS, BGP v4, OSPF v2, OSPF v3, PIM-SM, PIM-DM, PIM-SSM, DVMRP		
Layer 3 redundancy	VRRP v3		
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		
	IP Subnet-based VLAN		
	Protocol-based VLAN(Ethernt, SNAP, LLC)		
	port base-VLAN		
	Port isolation		
	VLAN Translation		
	GVRP (GARP VLAN Registration Protocol)		
	MVR (Multicast VLAN Registration)		
	MVRP GMRP		
Link Aggregation (Port Trunk)	Static Dynamic (IEEE 802.3ad LACP), Maximum trunk group: 8 groups		
	Dynamic Dynamic (IEEE 802.3ad LACP), Maximum trunk group: 8 groups		
	Per group up-to 8 port		
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP, IEC 62439-2 MRP		
Multiple µ-Ring	Up to 14 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications. Recovery time <50ms The maximum number of device is allowed 250 in a Ring.		
Loop Protection	Supported		
ITU-T G.8032 /	Recovery time <50ms		
Y.1344 ERPS (Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology		
QoS Features			
Class of Service	IEEE 802.1p 8 active priorities gueues for per port		
Traffic	IEEE 802.1p based CoS		
Classification QoS	IP Precedence based CoS		
	IP DSCP based CoS		
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number		
Bandwidth Control for Ingress	Per port based		
Bandwidth _	Per port based		
Control for Egress	Per queue / Per port shaper		

DiffServ (RF 2474) Remarking					
Storm Control	rol for Unicast, Broadcast, Multicast				
P Multicasting Features					
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2				
Security Features					
IEEE 802.1X	Port-Based				
ACL	Number of rules : up to 50 entries				
	for L2 / L3 L2 : Mac address SA/DA/VLAN L3 : IP address SA/DA, Subnet				
RADIUS authentica	tion & accounting				
TACACS+ authenti	cation & accounting, TACACS+ 3.0				
HTTPS, HTTP	Supported				
SSL / SSH v2	Supported				
User Name Password	Local Authentication				
Authentication	Remote Authentication (via RADIUS / TACACS+)				
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console				
Management Feat	ures				
CLI	Cisco® like CLI				
Web Based Manag	ement				
Telnet	Server				
SNMP	V1, V2c, V3				
SW &	TFTP, SFTP				
Upgrade	Redundant firmware in case of upgrade failure				
RMON	RMON I (1, 2, 3, 9 group), RMON II				
MIB	RFC1213 MIB II, Private MIB				
DHCP	Server, Client, Relay, Snooping				
IP Source Guard	Supported				
Mirroring	SPAN (local), RSPAN (remote)				
Event Syslog	Client				
Warning Message	System syslog, e-mail, alarm relay				
DNS	Client				
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave				
NTP V4.0, SNTP	Client				
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol				

Industrial L3 GbE Managed Switch IGS-R2408SM & IGS-R1616SM & IGS-R824SM



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

# **Ordering Information**

	Layer 3/2	yer Total /2 (Maximum)	GbE		Input power		Certification			
Model Name			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	24/48VDC	110/220VAC	Safety UL62368-1 EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IGS-R2408SM-AA	V	32	24	8		2	V	V	V	V
IGS-R2408SM-AD	V	32	24	8	1	1	V	V	V	V
IGS-R2408SM-DD	V	32	24	8	2		V	V	V	V
IGS-R1616SM-AA	V	32	16	16		2	V	V	$\vee$	V
IGS-R1616SM-AD	V	32	16	16	1	1	V	V	$\vee$	V
IGS-R1616SM-DD	V	32	16	16	2		V	V	$\vee$	V
IGS-R824SM-AA	V	32	8	24		2	V	V	V	V
IGS-R824SM-AD	V	32	8	24	1	1	V	V	V	V
IGS-R824SM-DD	V	32	8	24	2		V	V	V	V

#### Model Naming Rule



# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDMI , -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)
SFP Naming Rule	







# IGS-4804SM & IGS-2408SM

- ◀ 48x GbE RJ45 + 4x 100/1000Base SFP
- ▶ 24x GbE RJ45 + 8x 100/1000Base SFP



- Supports u-Ring , ERPS, MSTP, RSTP,STP for redundant cabling
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for RJ45 and SFP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Supports negative voltage power input



IGS-4804SM & IGS-2408SM are industrial grade, hardened design, managed L2+ switches, equipped with 24/48 (10/100/1000BaseTX) RJ-45 ports plus 8/4 dual speed (100/1000Base-X) SFP fiber optical slots, thus providing up to 32 ports of Ethernet connectivity. IGS series models are available with redundant power supplies (2 AV, 2 DC, AC + DC) and can be rack mounted in 19-inch EIA standard rack. IGS Series are certified with many industrial-grade standards and are ideal for deployments in harsh environments to deliver mission-critical network services. The managed Ethernet switch is an ideal solution of Industrial automation, smart city & surveillance, Intelligent traffic control systems and production automation applications.

#### **Features**

- Redundant isolated 24/48VDC, or/and isolated 110/220VAC power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
- μ-Ring redundancy, recovery time <20ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

### **Specifications**

Standard	IEEE 802 3	10Base-T 10Mbit/s Ethernet	Console	RS-232 (RI-45)
	IEEE 802 3u	100Base-TX 100Base-FX Fast Ethernet	Network Cable	UTP/STP Cat 5e cable or above
		1000Base-T Gbit/s Ethernet over twisted pair		FIA/TIA-568 100-ohm (100m)
	IEEE 802.3ab		Protocols	CSMA/CD
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Reverse Polarity	
	IEEE 802.1d	STP (Spanning Tree Protocol)	Protection	For input power
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Overload Current	Supported
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Protection	Supported
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	CPU Watch Dog	Supported Redundant 2x AC input power (-AA model)
	IEEE 802.1Q	Virtual LANs (VLAN)		1x AC input power (-A model)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		Redundant 1x AC and 1x DC input power (-AD model)
	IEEE 802.3ac	Max frame size extended to 1522Bytes		Redundant 2x DC input power (-DD model) 1x DC input power (-D model)
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48VDC (18~60VDC) Removable Terminal Block
	IFFF 802.3X	Flow control for full duplex		
	IEEE 802.1ad	Stacked VLANs, Q-in-Q		Supports negative voltage power input
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Power Consumption	< 30W @24/48VDC, 110/220VAC (IGS-2408SM) TBD (IGS-4804SM)
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	LED	Per unit: Power 1 (Green), Power 2 (Green),
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		Act /Alarm (Green/Amber), Ring Master (Green)
VLAN ID	4094 IEEE 802	.1Q VLAN VID		P1~P24 (IGS-2408SM)
Switch Architecture	Back-plane (Switching Fabric): 64Gbps (IGS-2408SM) 104Gbps (IGS-2404SM)			P1~P48 (IGS-4804SM) Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)
	(Full wire-spee	ed)		P25~P32 (IGS-2408SM)
Data Processing	Store and Forv	ward		P49~P52 (IGS-4804SM) Par SER Eibar part: 100 /1000Pasa X Link /Activa
Network	SFP:			(Amber)
Connector	8x 100/1000Ba 4x 100/1000Ba	ase-X SFP socket (IGS-2408SM) ase-X SFP socket (IGS-4804SM)	Jumbo Frame	10K Byte
	Support DDM		MAC Address Tabl	<b>e</b> 32K
	R 145.		Memory Buffer	4M Bytes for packet buffer
	24x 10/100/10 48x 10/100/10 Support Auto function	KJ45: 24x 10/100/1000Base-T RJ-45 (IGS-2408SM) 48x 10/100/1000Base-T RJ-45 (IGS-4804SM) Support Auto negotiation speed, Auto MDI/MDI-X function		



Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C (IGS-2408SM-E, IGS-4804SM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H) (IGS-2408SM) TBD (IGS-4804SM)
Weight	4,755kg (IGS-2408SM-(E)AA) 4.51kg (IGS-2408SM-(E)AD) 4.26kg (IGS-2408SM-(E)DD) TBD (IGS-4804SM)
Installation Mounting	19" rack mount
MTBF	103,057 Hours         (IGS-2408SM-AA)           103,451 Hours         (IGS-2408SM-AD)           103,447 Hours         (IGS-2408SM-DD)           TBD         (IGS-4804SM)           (MIL-HDBK-217)         (IGS-4804SM)
Warranty	5 years

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Topology			
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID		
	IEEE 802.1q VLAN,up to 4094 Groups		
	IEEE 802.1ad Q-in-Q		
	MAC-based VLAN, up to 256 entries		
	IP Subnet-based VLAN, up to 128 entries		
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries		
	VLAN Translation, up to 256 entries		
	GVRP (GARP VLAN Registration Protocol)		
	MVR (Multicast VLAN Registration)		
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 16group (IGS-2408SM) 26group (IGS-4804SM)		
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group (IGS-2408SM) 26group (IGS-4804SM)		
	Per group up-to 8 port		
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP		
Multiple μ-Ring	Up to 5 instances each support µ-Ring, µ-Chain or Sub-Ring for flexible networking applications. Recovery time <20ms The maximum number of device is allowed 250 in a Ring.		
Loop Protection	Supported		
ITU-T G.8032 /	Recovery time <20ms		
Y.1344 ERPS (Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology		
QoS Features			
Class of Service	IEEE 802.1p 8 active priorities queues for per port		
Traffic	IEEE 802.1p based CoS		
Classification QoS	IP Precedence based CoS		
	IP DSCP based CoS		
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number		
Bandwidth Control for Ingress	Per port based		
Bandwidth	Per port based		
Control for Egress	Per queue / Per port shaper		
DiffServ (RF 2474)	Remarking		
Storm Control	for Unicast Broadcast Multicast		

IP Multicasting Fea	atures			
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2			
Snooping	Port Filtering Profile			
	Throttling, Fast Leave			
	Maximum Multicast Group : up to 1022 entries			
	Ouery / Static Router Port			
Security Features				
IEEE 802.1X	Port-Based			
	MAC-Based			
ACL	Number of rules : up to 256 entries			
	for 1 2 / 1 3 / 1 4			
	L2 : Mac address SA/DA/VLAN			
	L3 : IP address SA/DA, Subnet			
	L4 : TCP/UDP			
RADIUS authentica	ation & accounting			
TACACS+ authenti	cation & accounting, TACACS+ 3.0			
HTTPS, HTTP	Supported			
SSL / SSH v2	Supported			
User Name	Local Authentication			
Authentication	Remote Authentication (via RADIUS / TACACS+)			
Management				
Interface Access	Web, Telnet / SSH , CLI RS-232 console			
Filtering				
Management Feat	ures			
CLI	Cisco® like CLI			
Web Based Manag	ement			
Telnet	Server			
SNMP	V1, V2c, V3			
Modbus/TCP	Support for management and monitoring			
SW &	TFTP, HTTP			
Upgrade	Redundant firmware in case of upgrade failure			
RMON	RMON I (1, 2, 3, 9 group), RMON II			
MIB	REC1213 MIB II. Private MIB			
UPnP	Supported			
DHCP	Server/Client/Relay/Relay option 82/Spooping			
Warning Message	System systom e-mail alarm relay			
DNS	Client Provy			
IP Source Guard	Supported			
Mirroring	Local and Remote			
Event Syslog	Syslog server (BEC 3164) (Support 1 server )			
IEEE 1588 PTP V2	Supports 5 operating mode in each port -			
	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock Master Slave			

NTP V4.0, SNTP	Client	IPv6 ACL	Number of rules: up to 256 entries
LLDP (IEEE	Link Layer Discovery Protocol		for L2 / L3 / L4
802.1ab)	LLDP-MED		L2 : Mac address SA/DA/VLAN
IPv6 Features			L3 : IP address SA/DA, Subnet
IPv6 Managemen	t Telnet Server/ICMP v6	Other Features	Green Ethernet
SNMP over IPv6	Supported		Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
HTTP over IPv6	Supported		Management to optimize the power consumption
SSH over IPv6	Supported		Determine the cable length and lowering the power
IPv6 Telnet	Supported		Lower the power for a port when there is no link
IPv6 NTP, SNTP	Client		LED Power Management : Adjustment LEDs intensit
IPv6 TFTP	Supported		Cable Diagnostic
IPv6 QoS	Supported		Measuring UTP cable normal or broken point distance

# **Application**

Figure : Application Example



# Dimensions

### ► IGS-2408SM



485.00

Side View





44.00

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# **Ordering Information**

		_	UTP	Fiber	Input	power		Certific	ation		
Model Name	Managed	Total Port	10/100/1000 Base-T	100/1000 Base-X	24/48VDC	110/220V AC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	Operating Temperature
IGS-2408SM-E-AA	V	32	24	8		2	V	V	V	V	-40~75℃
IGS-2408SM-E-AD	V	32	24	8	1	1	V	V	V	V	-40~75℃
IGS-2408SM-E-DD	V	32	24	8	2		V	V	V	V	-40~75℃
IGS-4804SM-E-AA	V	52	48	4		2	V	V	V	V	-40~75℃
IGS-4804SM-E-AD	V	52	48	4	1	1	V	V	V	V	-40~75℃
IGS-4804SM-E-DD	V	52	48	4	2		V	V	V	V	-40~75℃
IGS Industrial Gigabit Switch	<b>24</b> : 24 GbE <b>48</b> : 48 GbE	3 UTP UTP	04S 04S: 4x GbE SFF 08S: 8x GbE SFF	M M: Manageo	E	<b></b>	AA AA : 2x AD : 1x DD : 2x (A: Isola D : Isol	AC AC + 1x D DC ated 110/22( ated 24/48\	C )VAC power /DC power)		
<ul><li>One device of the series</li><li>Console cable (RJ-45 to DB-9)</li></ul>			<ul><li> 19" rac</li><li> Protect</li></ul>	k-mount kit (b ive caps for SFF	rackets and s Ports	crews)	• AC Pow	er cord (for AC	power -A mode	)	
<b>Optional Ac</b>	cessori	es									

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M7000-85-D(E) Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C) Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C) ISFP-S7020-31-D(E) Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C) ISFP-T7T00-00-(E) ISFP-M5002-31-D(E) Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C ISFP-S5030-31-D(E) Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C) SFP Naming Rule S 7 31 ISFP 040 D Е E:-40~85°C Blank:0~70°C



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# IGS-S2804TM

### 28x 100/1000Base SFP with 4x GbE Combo (RJ45/SFP)



- Supports IEEE1588 PTP v2
- Supports u-Ring, ERPS, MSTP, RSTP,STP for redundant cabling
- UL60950-1, EN60950-1, CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- Supports negative voltage power input



IGS-S2804TM is an industrial grade, hardened design, L2 switch, equipped with 28 GbE SFP ports with 4 combo GbE ports. This model is a fanless design with redundant, isolated power supplies (2 AC, 2 DC, AC + DC) and can be mounted in 19-inch ElA standard rack. IGS Series are certified with many industrial-grade standards and are ideal for deployments in harsh environments to deliver mission-critical network services. The managed Ethernet switch is an ideal solution of Industrial automation, smart city & surveillance, Intelligent traffic control systems and production automation applications. (See figure).

# **Features**

- Redundancy isolated low voltage 24/48VDC, or/and isolated High voltage (110/220 VAC) power inputs
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC Union μ-Ring white paper for more details and more topology application)
- $\bullet$   $\mu\text{-Ring}$  for Redundant Cabling, recovery time<50ms in 250 devices
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	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 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
VLAN ID	4094 IEEE 802	1Q VLAN VID
Switch Architecture	Back-plane (Sv 56Gbps (Full wire-spee	vitching Fabric): •d)
Data Processing	Store and Forv	vard
Network Connector	28x 100/1000B (UTP/ SFP)	ase-X SFP with 4x GbE Combo
Network Connector	Port 25~28 Gb Port 21~24 Gbl 100/1000M) Port 1~20 GbE SFP support 10 RJ-45 UTP por negotiation sp	E SFP support 1000M E SFP/RJ45 UTP combo (dual speed SFP support dual speed (100/1000M) 00/1000M dual speed with DDMI t support 10/100/1000Base-T(X), Auto eed, Auto MDI/MDI-X function
Console	RS-232 (RJ-45)	
Network Cable	UTP/STP above	e Cat. 5e cable 00-ohm (100m)
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported	

Overload Current Protection	Supported				
CPU Watch Dog	Supported				
Power Supply	Redundant 2x is power (-AA moo Redundant 2x Is (-DD model)	olated High Voltage AC/DC input del) olated Low Voltage DC Input power			
Power Supply	Redundant 1x isolated Low Voltage DC and 1x High Voltage AC/DC input power (-AD model) Low Voltage DC (D): Isolated 24/48V (18~60VDC), Removable Terminal Block High voltage AC/DC (A): Isolated 110/220VAC (85VAC~264VAC) Supports negative voltage power input (for example in telecom system)				
Power	Input Voltage	IGS-52804TM			
Consumption	24VDC	33.1W			
	48VDC	33.4			
	110VAC	34.4W			
	220VAC	34.4W			
LED	Per unit: Power Act /Ala	1 (Green), Power 2 (Green), arm (Green/Red), Ring Master (Green)			
	Per RJ-45 port: 1	0/100 Link/Active (Green) 1000 Link/Active (Yellow)			
	SFP (P1~24) Fibe 100Base-X L 1000Base-X SFP+ (P25~P28) 1000Base-X	r Per port: ink/Active (Green) Link/Active (Yellow) Fiber Per port: Link/Active (Amber)			
Jumbo Frame	10K				
MAC Address Table	32K				
Memory Buffer	4M Bytes for page	cket buffer			
Warning Message	System Syslog, S alarm relay	SMTP/ e-mail event message,			
Alarm Relay Contact	Relay outputs w A @24VDC, 2-Pir	rith current carrying capacity of 1 n removable terminal block			
Operating Temperature	-10~60°C (IGS- -40~75°C (IGS-	S2804TM) S2804TM-E)			
Operating Humidity	5% to 95% (Non	-condensing)			



-40 ~ 85°C
Rugged Metal, IP30 Protection, Fanless
315 x 440 x 44 mm (D x W x H)
4.755kg (IGS-S2804TM-AA) 4.26kg (IGS-S2804TM-DD) 4.51kg (IGS-S2804TM-AD)
19" rack mount
208,975 Hours (IGS-S2804TM-AA) 230,276 Hours (IGS-S2804TM-DD) 287,541 Hours (IGS-S2804TM-AD)
5 years
CE (EN55024, EN55032)
FCC Part 15 Subpart B Class A, CE
EN50121-4
EN61000-6-2

Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

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 14 trunk group Dynamic (IEEE 802.3ad LACP), up to 14 trunk group Per group up-to 8 port
Spanning Tree Multiple µ-Ring	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <50ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring	Recovery time <50ms
Protection)	Single mild, sub mild, maniple mild topology network
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffia	IEEE 000 to beend CoC
Traffic Classification QoS	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Traffic Classification QoS Bandwidth Control for Ingress	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking for Unicast, Broadcast, Multicast
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control IP Multicasting Fea	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking for Unicast, Broadcast, Multicast atures
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking for Unicast, Broadcast, Multicast atures IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping IGMP / MLD Snooping	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking for Unicast, Broadcast, Multicast htures 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
Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping IGMP / MLD Snooping <b>Security Features</b> IEEE 802.1X	IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking for Unicast, Broadcast, Multicast itures 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 Port-Based, MAC-Based

ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
DADILIC authoritics	L4: ICP/UDP
TACACS+ authentic	ration & accounting
	Supported
	Supported
User Name	
Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	lires
CLI	Cisco <sup>®</sup> like CLL
Web Based Manag	ement
Telnet	Server
SNMP	V1. V2c. V3
SW &	TETP, HTTP
Configuration	Padundant firmulara in caca of unarada failura
Upgrade	Redundant inniware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	tor L2 / L3 / L4
	L2 . Mac address 3A/DA/ VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

4

# Application

Figure : Application Example



# Dimensions

#### Rear View

-AD Power 440.00

#### -AA Power



#### -DD Power



#### Side View



#### Front View



# Industrial Managed GbE Switch(Rack)





# **Ordering Information**

	Managed	naged Total - Port	Total	Total	SFP (1~20)	SFP (1~20) Combo Port (21~24)		Input Power		Certification				Operating
ModelName			100/1000Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP	1000 Base-X SFP	DC (Low Volt) isolated 24/48VDC	High Volt 110/240VAC	Railway EN50121-4	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Temperature		
IGS-S2804TM-AA	V	28	20	4	4 SFP		2	V	V	V	V	-10~60°C		
IGS-S2804TM-DD	V	28	20	4	4 SFP	2		V	V	V	V	-10~60°C		
IGS-S2804TM-AD	V	28	20	4	4 SFP	1	1	V	V	V	V	-10~60°C		
IGS-S2804TM-EAA	V	28	20	4	4 SFP		2	V	V	V	V	-40~75°C		
IGS-S2804TM-EDD	$\vee$	28	20	4	4 SFP	2		V	V	V	V	-40~75°C		
IGS-S2804TM-EAD	V	28	20	4	4 SFP	1	1	V	V	V	V	-40~75°C		
Model Naming Rule IGS S28 04T M E AD AA: A + A DD: D + D AD: A														
<ul><li>IGS-S2804T</li><li>Console cal</li></ul>	M device ble (RJ-45	to D	• B9) •	Rack mount ear with AC Power cord (for A	screws C power -A m	nodel)								

# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





# IGS-2408SM-24PH

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



#### 4KV Surge protection

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



IGS-2408SM-24PH is a rackmount, managed, Industrial Grade, L2 Gigabit PoE (Power over Ethernet) Switch that provides 24x 10/100/1000BaseTX PoE ports, plus 8 dual speed (100/1000Base-X) SFP ports, thus providing up to 32 ports total Ethernet connectivity. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. IGS-2408SM-24PH is an ideal solution for applications in Smart City, surveillance, Intelligent traffic control systems (ITS) and production automation applications. The IGS-2408SM-24PH is designed for harsh outdoor cabinet applications, with 4kV surge protection, to ensure the uninterrupted reliability of PoE systems. Isolated power inputs also help to increase system reliability and the availability of your network backbone.

### **Features**

- Maximum up to 24x IEEE 802.3af / 802.3at PoE<sup>+</sup> output, 30W per port, 400W PoE power budget in total
- Redundant dual input power 48VDC (44~57VDC)
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 5 instances each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring for flexible networking applications
- μ-Ring redundancy, recovery time <20ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network	SFP:			
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Connector	8x 100/1000Base-X SFP socket			
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair					
	IEEE 802.3z	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic		24x 10/100/1000Base-T RJ-45 Support Auto pogotiation speed Auto MDL/MDL X			
	IEEE 802.1d	STP (Spanning Tree Protocol)		function			
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		(aneton			
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		PoE:			
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		24x IEEE 802.3af /IEEE 802.3at PoE+ End-Span, Alternative A mode.			
	IEEE 802.1Q	Virtual LANs (VLAN)		Maximum 30W per port, 400W PoE power budget in			
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		RJ45 Pin Assignment: PoE Positive (V+) : RJ-45 pin 1, 2. PoE Negative (V-) : RJ-45 pin 3, 6.			
	IEEE 802.3ac	Max frame size extended to 1522Bytes					
		Link aggregation for parallel links		Data (1,2,3,6,4,5,7,8)			
	IEEE 802.3ad	with LACP(Link Aggregation Control	Console	RS-232 (RJ-45)			
		Protocol)	Network Cable	UTP/STP Cat.5e cable or above			
	IEEE 802.3af	PoE (Power over Ethernet)		EIA/TIA-568 100-ohm (100m)			
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancement)	Protocols	CSMA/CD For input power			
	IEEE 802.3X	Flow control for full duplex	Protection				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Overload Current				
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for	Protection	Supported			
	IEEE 002 1ab		CPU Watch Dog	Supported			
	IEEE 002.1dD	EFE (Eporaly Efficient Ethorpot)	Power Supply	Redundant dual input power 48VDC (44~57VDC)			
	1004 IEEE002			(Removable terminal block)			
Switch	Back-plane (Sw	vitching Espric):		PoE <sup>+</sup> in 30W applications)			
Architecture	64Gbps (Full wire-spee	ed)	Power Consumption	< 30W @50VDC without PoE load <445W @50VDC with 400W PoE load			
Data Processing	Store and Forward		•				

Certification



LED	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)
	P1~P24 Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber) P25~P32 Per SFP Fiber port: Link/Active (Amber)
	PoE port (P1~P24): PoE ON (Green)
Jumbo Frame	10K Byte
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 1A @24VDC, 2-Pin removable terminal block
Operating Temperature	-40 ~ 75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	280x 440 x 44mm (D x W x H)
Weight	4.26kg
Installation Mounting	19" rack mount
MTBF	97,078 Hours (MIL-HDBK-217)
Warranty	5 years

EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Surge protection	4KV for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

# **Software Specifications**

Topology								
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID							
	IEEE 802.1q VLAN,up to 4094 Groups							
	IEEE 802.1ad Q-in-Q							
	MAC-based VLAN,up to 256 entries							
	IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries							
	GVRP (GARP VLAN Registration Protocol)							
	MVR (Multicast VLAN Registration)							
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 16 trunk group							
	Dynamic (IEEE 802.3ad LACP), up to 16 trunk group							
	Per group up-to 8 port							
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP							
Multiple µ-Ring	Up to 5 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications. Recovery time <20ms							
	The maximum number of device is allowed 250 in a Ring							
	Turig.							
Loop Protection	Supported							
Loop Protection ITU-T G.8032 /	Supported Recovery time <50ms							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) QoS Features	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper							
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Per port based Per port based Per queue / Per port shaper Remarking							

<b>IP Multicasting Fea</b>	atures					
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2					
Snooping	Port Filtering Profile					
	Throttling, Fast Leave					
	Maximum Multicast Group : up to 1022 entries					
	Query / Static Router Port					
<b>Security Features</b>						
IEEE 802.1X	Port-Based					
	MAC-Based					
ACL	Number of rules : up to 256 entries					
	for L2 / L3 / L4					
	L2 : Mac address SA/DA/VLAN					
	L3 : IP address SA/DA, Subnet L4 · TCP/LIDP					
<b>RADIUS</b> authentic	ation & accounting					
TACACS+ authent	ication & accounting, TACACS+ 3.0					
HTTPS, HTTP	Supported					
SSL / SSH v2	Supported					
User Name	Local Authentication					
Password	Remote Authentication (via BADIUS / TACACS+)					
Management						
Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console					
Management Feat	ures					
CLI	Cisco® like CLI					
Web Based Manag	jement					
Telnet	Server					
SNMP	V1. V2c. V3					
Modbus/TCP	Support for management and monitoring					
SW &	TFTP, HTTP					
Configuration	Redundant firmware in case of ungrade failure					
Upgrade						
MIR						
HID	Supported					
OFIIF	Supported					
DHCP	Server, Client, Relay, Relay option 82 , Snooping					
IP Source Guard	Supported					
Mirroring	Local and Remote					
Event Syslog	Syslog server (RFC3164) (Support 1 server )					
Warning Message	System syslog, e-mail, alarm relay					
DNS	Client, Proxy					



# Industrial Managed GbE PoE Switch

IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave Client	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
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol		Power limit by management Total PoE Power budge limitation management:
IPv6 Features			Maximum 400W power budget
IPv6 Management	Telnet Server/ICMP v6	0.1 5 1	Power feeding priority
SNMP over IPv6	Supported	Other Features	Green Ethernet
HTTP over IPv6	Supported		Management to optimize the power consumption
SSH over IPv6	Supported		Determine the cable length and lowering the power
IPv6 Telnet	Supported		for ports with short cables
IPv6 NTP, SNTP	Client		Lower the power for a port when there is no link
IPv6 TFTP	Supported		Cable Diagnostic
IPv6 QoS	Supported		Measuring UTP cable normal or broken point distance
IPv6 ACL	Number of rules: up to 256 entries		
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3 : IP address SA/DA, Subnet L4 : TCP/UDP		

# **Application**



Dimensions



# Industrial Managed GbE PoE Switch





# **Ordering Information**



# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



Industrial Managed GbE PoE Switch IGS-2408SM-24PH

# Smart Transportation Transmission for Railway -Rolling Stock, Station and Trackside

With over 25 years experience as specialists in technologies based on Ethernet and Optical transmissions, CTC Union has now devoted our resources to providing network communications solutions for railway applications with the highest guality, stability, and reliability.



Car 1 Car 2

3x GbE, RJ45 Å

TTDP



Resilient Bypass



• Auto Discovery and Device Viewer Allow up to 25 administrators to login

#### TRDP

Train Real-time Data Protocol (TRDP) is a protocol for communication and control solutions on board of rolling stock. Railway industries created this new linear topology networks. When power failure occurs protocol with the aim to improve data communication on board of trains.







# ITP-1622GTFM-16PH & ITP-1604GTM-16PH

- ▲ 16x 10/100Base M12 + 2x GbE M12 + 2x GbE Fiber with 16x PoE (120W, 24/48/72/110VDC)
- ▶ 16x 10/100Base M12 + 4x GbE M12 with 16x PoE (120W, 24/48/72/110VDC)

#### Preliminary



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



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

### **Features**

- M12, Q-ODC and M23 connector against vibration and shock
- Cable diagnostics, identifies opens/shorts distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*

\*Please see Chapter 1- Software Management for more details

# **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for				
	IEEE 802.3u	100Base-TX, 100Base-TX, Fast Ethemet 1000Base-T Gbit/s Ethernet over twisted pair	PoE Port	16x M12 (4-Pin D-code Female) PoE ports, Maximum PoE output power budget 120W (30W/per				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		port), Regulated PoE output voltage at 52VDC, JEEE 802 3af / JEEE 802 3at End-Span, Alternative A				
	IEEE 802.1d	STP (Spanning Tree Protocol)		mode				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Network	16x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Connector	+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T				
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		UTP (ITP-1604GTM-16PH)				
	IEEE 802.1Q	Virtual LANs (VLAN)		16x M12 (4-Pin, Female, D-Code) 10/100Base-TX UTP				
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		+ 2x M12 (8-Pin, Female, X-Code) 10/100/1000Base UTP+ 2x Q-ODC 1000Base-X Fiber (ITP-1622GTFM-16F				
	IEEE802.3ac	Max frame size extended to 1522Bytes		LITP port provide auto pegotiation speed. Auto MDI/				
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		MDI-X, Full/Half duplex function Build-in UTP or Fiber bypass for option (For -BP model optional)				
	IEEE 802.3x	Flow control for Full Duplex	Console	RS-232 (5-pin A-Code M12 male )				
	IEEE 802.3af	PoE (Power over Ethernet)	Network Cable	UTP/STP above Cat. 5e cable				
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet ehancements)		EIA/TIA-568 100-ohm (100m)				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Protocols	CSMA/CD				
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Reverse Polarity Protection	Supported				
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	<b>Overload Current</b>	Supported				
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Protection	Supporteu				
VLAN ID	4094 IEEE802.	1Q VLAN VID	CPU Watch Dog	Supported				
Switch Architecture	20 Gbps		LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)				
Data Processing	Store and Forv	vard		UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)				
				FIDELDUIT, LINK/ACLIGIEEN/				

EN50155 PoE Switch ITP-1622GTFM-16PH & ITP-1604GTM-16PH

# EN50155 Managed PoE Switch



LED	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green)
Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power Regulated POE output voltage (52VDC) to stabilize POE device, and guarantee delivery POE power distance to 100meter
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-40 ~ 75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, Fanless, IP40 grade housing protection
Dimensions	TBD
Weight	TBD
Installation Mounting	Wall mounting
MTBF	TBD (MII-HDBK-217)
	(1112118)81(217)

# **Software Specifications**

Topology							
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID						
	IEEE 802.1q VLAN,up to 4094 Groups						
	IEEE 802.1ad Q-in-Q						
	MAC-based VLAN,up to 256 entries						
	IP Subnet-based VLAN, up to 128 entries						
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries						
	VLAN Translation, up to 256 entries						
	GVRP (GARP VLAN Registration Protocol)						
	MVR ( Multicast VLAN Registration )						
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group						
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group						
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP						
Multiple µ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring.						
	supported ring is 250.						
	(Please see CTC $\mu\text{-Ring}$ white paper for more details and						
	more topology application)						
Loop Protection	Supported						
ITU-T G.8032 / Y.1344 FRPS	Recovery time <10ms						
(Ethernet Ring Protection )	Single Ring, Sub-Ring, Multiple ring topology network						
QoS Feature							
Class of Service	IEEE802.1p 8 active priorities queues for per port						
Traffic	IEEE802.1p based CoS						
Classification QoS	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						
Dava du vi dala	Fragment, DSCP, TCP/UDP port number						
Bandwidth	Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps						
Control for	Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps						
Control for Ingress	Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame						
Control for Ingress Bandwidth	Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps						
Control for Ingress Bandwidth Control for Egress	Fragment, DSCP, TCP/UDP port numberRate in steps : 1 kbps / Mbps / fps / kfpsRange : 100 kbps to 1Gbps / 1fps to 3300kfpsRate Unit : bit or frameRate in steps : 1 kbps / MbpsRange : 100 kbps to 1Gbps						
Control for Ingress Bandwidth Control for Egress	Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper						
Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	Fragment, DSCP, TCP/UDP port numberRate in steps : 1 kbps / Mbps / fps / kfpsRange : 100 kbps to 1Gbps / 1fps to 3300kfpsRate Unit : bit or frameRate in steps : 1 kbps / MbpsRange : 100 kbps to 1GbpsRange : 100 kbps to 1GbpsRate Unit : bit Per queue / Per port shaperRemarking						

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	EN50155, EN50121-4
Fire protection of railway vehicles	EN 45545-2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for PoE and UTP port
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

#### IP Multicasting Feature

IP Multicasting Fea	ature
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile, Throttling
IGMP / MLD	Fast Leave
shooping	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subhel L4: TCP/LIDP
RADIUS authentic	ation & accounting
TACACS+ authenti	cation & accounting $TACACS + 3.0$
	Supported
	Supported
User Name	
Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH, CLI, RS-232 console
Filtering	
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
TTDP	Supported (Train Topology Discovery Protocol)
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay

DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

Others Features						
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables					
	Lower the power for a port when there is no link LED Power Management :Adjustment LEDs intensity					
<b>Cable Diagnostic</b>	Measuring UTP cable OK or broken point distance					
Advanced PoE Management	PoE PD Failure Auto Checking, and Auto reset when PD fail PoE Scheduling (On/Off schedule weekly)					
	PoE Configuration					
	PoE Enable/Disable					
	Power limit by classification					
	Power limit by management					
	Total PoE Power budge (maximum 120W) limitation					
	Power feeding priority					

# **Ordering Information**

						10/100Base- TX	GbE p	ort	Вура		PoE F	Port	Redundant Dual Input Power		Certifica	ation	
Model Name	Managed Port	D-code M12	GbE X-code M12 UTP	Q-ODC Fiber	GbE X-code M12 UTP	Q-ODC Fiber	IEEE802.3at	PoE Total Power Budge	24/48/72/96/110VDC (16.8~137.5VDC)	EN50155 EN50121-4 EN45545-2		EN61000-6-2 EN61000-6-4	CE, FCC				
ITP-1604GTM-16PHE-2BP	V	20	16	4		2		16	120W	V	V	V	V	V			
ITP-1622GTFM-16PHE-BP	V	20	16	2	2	1	1	16	120W	V	V	V	V	V			
ITP-1622GTFM-16PHE	V	20	16	2	2			16	120W	V	V	V	V	V			

#### Model Naming Rule



#### Package List

One unit device
Protective caps for UTP ports and console, alarm port

# **Optional Accessories**

#### Optional Cable/Connector

P/N: CAB-M12XM8-RJ45 M12 X-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



For GbE UTP (X-code)

P/N: CAB-M23F5-OPEN M23 Female (5-Pin) to open wire,



For Power

**P/N: CAB-M12DM4-RJ45** M12 D-code Male (4-Pin) to RJ-45, AWG 24 JP67, 1 meter

• Console cable (M12 to DB9)



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



For FE UTP

P/N: CAB-M12AF5-OPEN M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter



For Alarm

P/N: M12A-F5 M12 A-code Female (5-Pin) connector, IP67





# ITP-G802SM-8PH24 & ITP-G802TM-8PH24

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

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



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail
- Build-in 2 bypass GbE UTP ports



The ITP series models are managed, industrial grade, L2 GbE PoE (Power over Ethernet) switches that provide 8x GbE UTP plus 2x GbE SFP or 10x GbE UTP with 8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. These switches also provide a variety of functions to manage PoE operation including PoE device auto-checking, auto reset, and PoE power weekly scheduling. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

#### **Features**

- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output (Figure 2)
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters (Figure 2)
- Cable diagnostics, identifies opens/shorts distance
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*

\*Please see Chapter 1- Software Management for more details

# **Specifications**

•					
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	PoE RJ-45 Pin	8x M12 (8-Pin A-code or X-code Female) ports	
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet 1000Base-T Gbit/s Ethernet over twisted pair 1000Base-X Gbit/s Ethernet over Fiber-Optic	Assignment	support IEEE 802.3af / IEEE 802.3at End-Span,	
	IEEE 802.3ab			Alternative A mode.	
	IEEE 802.3z		Network Connector	10x M12 (8-Pin, Female, A-Code or X-code) 10/100/1000Base-T UTP (ITP-G802TM-8PH24)	
	IEEE 802.1d	STP (Spanning Tree Protocol)		8X MII2(8-Pin, Female, A-Code of X-code)	
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		(ITP_G802SM_8PH24)	
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		UTP port provide auto negotiation speed. Auto MDI/	
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		MDI-X, Full/Half duplex function Build-in 2x bypass GbF UTP ports (ITP-G802TM-8PH24)	
	IEEE 802.1Q	Virtual LANs (VLAN)		2x Water-proof cable connector 2x 100/1000Base-X	
	IEEE 802.1X	Port based and MAC based Network		SFP slot, with DDMI (ITP-G802SM-8PH24)	
	1222 002.17	Access Control, Authentication	Console	RS-232 (5-pin A-Code M12 male )	
	IEEE802.3ac	Max frame size extended to 1522Bytes	Network Cable	UTP/STP above Cat. 5e cable	
		Link aggregation for parallel links		EIA/TIA-568 100-ohm (100m)	
	IEEE 802.380	Protocol)	Protocols	CSMA/CD	
	IEEE 802.3x	Flow control for Full Duplex	Reverse Polarity	Supported	
	IEEE 802.3af	PoE (Power over Ethernet)	Overload Current		
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet ehancements)	Protection	Supported	
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	CPU Watch Dog	Supported	
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)		UTP port: 10/100 Link/Active (Green)	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		1000 Link/Active (Amber)	
VLAN ID	4094 IEEE802.	1Q VLAN VID		SFP Fiber Per port: Link/Active (Green)	
Switch Architecture	Back-plane (Switching Fabric): 20Gbps (Full wire-speed) Store and Forward			PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green)	
Data Processing				FOE Fault (Over Load, Short Circuit, Port failed at Startup) - Elash 1times (see (Green))	
Flow Control	IEEE 802.3x for half duplex mo	full duplex mode Back pressure for ode	Jumbo Frame	9.6KB	

MAC Address Table 8K

# EN50155 Managed PoE Switch

Memory Buffer	512K Byte	es for packe	et buffer		
PoE Standard	IEEE802.3	af, IEEE802.	3at		
PoE Power Output	Maximum port) Reg	n PoE outpu ulated PoE d	t power buc output volta	dget 180W ( ge at 50VD	30W/per C (Figure 2)
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power Built-in very high efficiency booster(94~97%) to rise up 50VDC for PoE output Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)				
Power	ITP-G8021	FM-8PH24			
Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
	24 VDC	200.4W	11.7W	180W	95.6%
	48 VDC	200.2W	12.5W	180W	95.9%
	ITP-G802SM-8PH24				
	TIP-G6023	SM-8PH24			
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
	Input Voltage 24 VDC	Total Power Consumption 198.5W	Device Power Consumption 9.8W	PoE Budget 180W	Boost Efficiency 95.30%
	Input Voltage 24 VDC 48 VDC	Total Power Consumption 198.5W 199.2W	Device Power Consumption 9.8W 11.5W	<b>PoE</b> Budget 180W 180W	<b>Boost</b> Efficiency 95.30% 95.80%
Warning Message	Input Voltage 24 VDC 48 VDC System Sy	Total Power Consumption 198.5W 199.2W /slog, SMTP/	Device Power Consumption 9.8W 11.5W	PoE Budget 180W 180W	Boost Efficiency 95.30% 95.80% , alarm relay
Warning Message Alarm Relay Contact	Input Voltage 24 VDC 48 VDC System Sy 5-pin A-c Relay outp	Total Power Consumption 198.5W 199.2W /slog, SMTP/ code M12 m pouts with curr	Device Power Consumption 9.8W 11.5W / e-mail ever nale rent carrying	PoE Budget 180W 180W nt message capacity of <sup>2</sup>	Boost Efficiency 95.30% 95.80% , alarm relay
Warning Message Alarm Relay Contact Operating Temperature	Input Voltage 24 VDC 48 VDC System Sy 5-pin A-c Relay outp -40 ~ 75°	Total Power Consumption 198.5W 199.2W rslog, SMTP/ code M12 m pouts with curr C	Device Power Consumption 9.8W 11.5W / e-mail ever hale rent carrying	PoE Budget 180W 180W nt message capacity of 1	Boost Efficiency 95.30% 95.80% alarm relay A @24VDC
Warning Message Alarm Relay Contact Operating Temperature Operating Humidity	Input           Voltage           24 VDC           48 VDC           System Sy           5-pin A-c           Relay outp           -40 ~ 75°           5% to 959	Tota Power Consumption 198.5W 199.2W vslog, SMTP/ code M12 m bouts with curr C	Device Power Consumption 9.8W 11.5W / e-mail even hale rent carrying	PoE Budget 180W 180W nt message capacity of 7	Boost Efficiency 95.30% 95.80% alarm relay A @24VDC
Warning Message Alarm Relay Contact Operating Temperature Operating Humidity Storage Temperature	Input Voltage 24 VDC 48 VDC System Sy 5-pin A-c Relay outp -40 ~ 75° 5% to 959 -40 ~ 85°	Total Power Consumption 198.5W 199.2W rslog, SMTP/ code M12 m outs with cun C % (Non-cor C	Device Power Consumption 9.8W 11.5W / e-mail ever nale rent carrying ndensing)	PoE Budget 180W 180W nt message capacity of 7	Boost Efficiency 95.30% 95.80% alarm relay A @24VDC
Warning Message Alarm Relay Contact Operating Temperature Operating Humidity Storage Temperature Housing	Input Voltage 24 VDC 48 VDC 5-pin A-c Relay outp -40 ~ 75° 5% to 959 -40 ~ 85° Rugged N against w	Total Power Consumption 198.5W 199.2W rslog, SMTP, ode M12 m outs with curr C % (Non-cor C Metal, Fanle rater, dust. i	Device Power Consumption 9.8W 11.5W / e-mail ever nale rent carrying ndensing) ess , IP67 gra and oil	PoE Budget 180W 180W nt message capacity of 1 ade housing	Boost Efficiency 95.30% 95.80% alarm relay A @24VDC

Weight	2.170kg (ITP-G802SM-8PH24) 2.15kg (ITP-G802TM-8PH24)
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	371,857 Hours (ITP-G802SM-8PH24) 362,429 Hours (ITP-G802TM-8PH24) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4
Fire protection of railway vehicles	EN45545-2
lmmunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

# **Software Specifications**

Topology			
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID		
	IEEE 802.1q VLAN,up to 4094 Groups		
	IEEE 802.1ad Q-in-Q		
	MAC-based VLAN,up to 256 entries		
	IP Subnet-based VLAN, up to 128 entries		
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries		
	VLAN Translation, up to 256 entries		
	GVRP (GARP VLAN Registration Protocol)		
	MVR ( Multicast VLAN Registration )		
Link Aggregation	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group		
(Port Trunk)	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group		
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP		
Multiple μ-Ring	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC $\mu$ -Ring white paper for more details and more topology application)		
Loop Protection	Supported		
ITU-T G.8032 / Y.1344 ERPS	Recovery time <50ms		
(Ethernet Ring Protection )	Single Ring, Sub-Ring, Multiple ring topology network		
QoS Feature			
Class of Service	IEEE802.1p 8 active priorities queues for per port		
Traffic	IEEE802.1p based CoS		
Classification QoS	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	Rate in steps : 1 kbps / Mbps / fps / kfps		
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps		
ingress	Rate Unit : bit or frame		
Bandwidth	Rate in steps : 1 kbps / Mbps		
Control for Egress	Range : 100 kbps to 1Gbps		
	Rate Unit : bit Per queue / Per port shaper		
DittServ (RF 2474)	Remarking		
Storm Control	for Unicast, Broadcast, Multicast		

#### IP Multicasting Feature

in manacasang i ca		
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2	
Snooping	Port Filtering Profile, Throttling	
IGMP / MLD	Fast Leave	
Snooping	Maximum Multicast Group : up to 1022 entries	
	Query / Static Router Port	
Security Features		
IEEE 802.1X	Port-Based, MAC-Based	
ACL	Number of rules : up to 256 entries	
	for L2 / L3 / L4	
	L2: Mac address SA/DA/VLAN	
	L3: IP address SA/DA, Subnet	
RADIUS authentica	ation & accounting	
TACACS+ authenti	cation & accounting, TACACS+ 3.0	
HTTPS, HTTP	Supported	
SSL / SSH v2	Supported	
User Name	Local Authentication	
Password	Pomoto Authoritication (via RADIUS / TACACS+)	
Authentication		
Management	Web Telnet / SSH_CLERS-232 console	
Filtering	Web, remety birr, cerro zoz console	
Management Feat	ures	
CLI	Cisco® like CLI	
Web Based Manag	ement	
Telnet	Server	
SNMP	V1, V2c, V3	
Modbus/TCP	Supports for management and monitoring	
EtherNet/IP	Supports for management and monitoring	
SW &	TFTP, HTTP	
Configuration Upgrade	Redundant firmware in case of upgrade failure	
FTP client	Supports for upload/download configuration	
RMON	RMON I (1, 2, 3, 9 group), RMON II	
MIB II	RFC 1213	
UPnP	Supported	
BOOTP	Supported	
DHCP	Server, Client, Relay, Relay option 82 , Snooping	
RARP	Supported	
TTDP	Supported (Train Topology Discovery Protocol)	
IP Source Guard	Supported	

# EN50155 Managed PoE Switch

**Others Features** 



Port Mirroring	Supported
-	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption	
	Determine the cable length and lowering the power for ports with short cables	
	Lower the power for a port when there is no link	
	LED Power Management :Adjustment LEDs intensity	
Cable Diagnostic	Measuring UTP cable OK or broken point distance	
Advanced PoE	PoE PD Failure Auto Checking, and Auto reset when PD fail	
Management	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 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (50VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

# Dimensions

► ITP-G802SM-8PH24



#### ► ITP-G802TM-8PH24



EN50155 PoE Switch ITP-G802TM-8PH24 & ITP-G802SM-8PH24




For GbE UTP (A-code model)

For Alarm



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



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

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



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



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

#### **Features**

- M12 and M23 connector against vibration and shock, M12 X-code for Gigabit port
- Cable diagnostics, identifies opens/shorts distance
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

# **Specifications**

-					
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for	
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet		half duplex mode	
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair	PoE Port	12x M12 (4-Pin D-code Female) PoE ports (ITP-1204GTM-12PH)	
	IEEE 802.1d	STP (Spanning Tree Protocol)		16x M12 (4-Pin D-code Female) PoE ports	
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		(TEP-2204GTM-TOPH) Maximum PoE output power budget 120W/ (30W/per	
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		port). Regulated PoF output voltage at 52VDC	
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode	
	IEEE 802.1Q	Virtual LANs (VLAN)	Network	12x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP	
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Connector	+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-1204GTM-12PH)	
	IEEE802.3ac	Max frame size extended to 1522Bytes		22y M12 (4 Pin Fomale D. Code) 10/100Pase TV LITP	
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base UTP (ITP-2204GTM-16PH)	
	IEEE 802.3x	Flow control for Full Duplex		UTP port provide auto negotiation speed, Auto MDI/	
	IEEE 802.3af	PoE (Power over Ethernet)		MDI-X, Full/Half duplex function	
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet ehancements)	Canaala	Build-In 2X bypass GDE UTP ports (For -BP model optional)	
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Console Network Coble	RS-232 (5-pin A-Code MI2 male )	
	IEEE 902 1p	LAN Layer 2 QoS/CoS Protocol for	Network Cable	UTP/STP above Cat. Se cable	
	ILLL 002.1p	Traffic Prioritization		EIA/TIA-568 100-ohm (100m)	
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	Protocols	CSMA/CD	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Reverse Polarity	Supported	
VLAN ID	4094 IEEE802.	1Q VLAN VID	Overload Current		
Switch	10.4 Gbps (ITP	-1204GTM-12PH)	Protection	Supported	
Architecture	12.4Gbps (ITP-2204GTM-16PH) (Full wire-speed)		CPU Watch Dog	Supported	
Data Processing	Store and Forv	vard	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)	
				UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)	

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# EN50155 Managed PoE Switch

CTC

LED	POE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green)							
Jumbo Frame	9.6KB							
MAC Address Table	8K	8K						
Memory Buffer	512K Bytes fo	r packet buffe	er					
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter							
Power	ITP-1204GTM-	12PH						
Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget				
	24 VDC	141.4W	13W	120W				
	48 VDC	137.9W	14W	120W				
	110VDC	136.4W	16.5W	120W				
	ITP-2204GTM-16PH							
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget				
	24 VDC	149W	17.1W	120W				
	48 VDC	141.1W	17.8W	120W				
	110VDC	140.8W	19.8	120W				
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relav							
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC							
Operating Temperature	-40 ~ 75°C							
Operating Humidity	5% to 95% (Non-condensing)							
Storage Temperature	-40 ~ 85°C							
Housing	Rugged Meta protection	al, Fanless, IP5	4 grade housi	ng				
Dimensions	113 x 260 x 132 113 x 360 x 132	2 (D x W x H) (l' 2 (D x W x H) (l	TP-1204GTM- TP-2204GTM-	12PH) •16PH)				

# **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN, up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128
	entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time < 10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC $\mu$ -Ring white paper for more details and
Loop Protoction	_more topology application)
	supported
Y 1344 FRPS	Recovery time <10ms
(Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology
	network
Class of Service	IEEE802 1p.8 active priorities queues for per port
	IEEE002.1p bacefore priorities queues for per port
Classification OoS	IR Procedence based CoS
clussification gos	
	OCL (OoS Control List): Erama Typa Source/
	Destination MAC VI AN ID PCP DEI
	OCE(OoS Control Entry): Protocol, Source IP, IP
	Fragment, DSCP, TCP/UDP port number
Bandwidth	Rate in steps : 1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
<b>Control for Egress</b>	Range : 100 kbps to 1Gbps
	Rate Unit · bit. Per queue / Per port shaper

Weight	2.8kg (ITP-1204GTM-12PH) 3.9kg (ITP-2204GTM-16PH)
Installation Mounting	Wall mounting
MTBF	238,600 Hours (ITP-1204GTM-12PH) 227,899 Hours (ITP-2204GTM-16PH) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4
Fire protection of railway vehicles	EN 45545-2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
4KV surge protection	Supported for PoE and UTP port
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	iture
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile, Throttling
IGMP / MLD	Fast Leave
Snooping	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN
	14: TCP/UDP
<b>RADIUS</b> authentica	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH, CLI, RS-232 console
<b>Management Feat</b>	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Spooping

5

# EN50155 Managed PoE Switch

RARP	Supported	IPv6 TFTP	Supported
TTDP	Supported (Train Topology Discovery Protocol)	IPv6 QoS	Supported
IP Source Guard	Supported	IPv6 ACL	Number of rules: up to 256 entries
Port Mirroring	Supported		for L2 / L3 / L4
Event Syslog	Syslog server (RFC3164) (Support 1 server )		L2: Mac address SA/DA/VLAN
Warning Message	System syslog, e-mail, alarm relay		L3: IP address SA/DA, Subnet
DNS	Client, Proxy		L4: TCP/UDP
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave	Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
NTP, SNTP	Server/Client		Determine the cable length and lowering the power for ports with short cables
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol		Lower the power for a port when there is no link
IPv6 Features			LED Power Management :Adjustment LEDs intensity
IPv6 Management	Telpet Server/ICMP.v6	Cable Diagnostic	Measuring UTP cable OK or broken point distance
SNMP over IPv6	Supported	Advanced PoE	PoE PD Failure Auto Checking, and Auto reset when PD fail
HTTP over IPv6	Supported	Management	PoE Scheduling (On/Off schedule weekly)
SSH over IPv6	Supported		PoE Configuration
IDv6 Tolpot	Supported		PoE Enable/Disable
	Sapported		Power limit by classification
IPVO INTP, SINTP	Server/Client		Power limit by management
			Total PoE Power budge (maximum 120W) limitation

Power feeding priority

## **Application**

Figure : ITP Series in Onboard Train Application



## **Dimensions**





## **Ordering Information**

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

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

#### Model Naming Rule



#### Package List

One unit device
 Protective caps for UTP ports and
 Console cable (M12 to DB9)

console, alarm port

#### **Optional Accessories**

#### Optional Cable/Connector

P/N: CAB-M12XM8-RJ45 M12 X-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



For GbE UTP (X-code)

P/N: CAB-M23F5-OPEN M23 Female (5-Pin) to open wire, (AWG 16), IP67, 1 meter



P/N: CAB-M12DM4-RJ45 M12 D-code Male (4-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



**P/N: M12D-M4** M12 D-code Male (4-Pin)



P/N: CAB-M12AF5-OPEN M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter



For Alarm

**P/N: M12A-F5** M12 A-code Female (5-Pin) connector, IP67







# ITP-802GSM-8PH24 & ITP-802GTM-8PH24

- ▶ IP67, 8x 10/100Base M12 2x GbE M12 with 8x PoE (180W, 24/48VDC)



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- Auto checking and auto reset when PoE PD fail
- Build-in 2 bypass GbE UTP ports



The ITP series models are managed, industrial grade, L2 Fast Ethernet PoE (Power over Ethernet) switches that provide 8x Fast Ethernet UTP PoE (Power over Ethernet) plus 2x GbE SFP or 8x Fast Ethernet UTP PoE (Power over Ethernet) plus 2x GbE UTP Ports. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. These switches also provide a variety of functions to manage PoE operation including PoE device auto-checking, auto reset, and PoE power weekly scheduling. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

#### Features

- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- 24/48VDC redundant dual input power, and built-in power booster design upto 50VDC for PoE output (Figure 2)
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meters (Figure 2)
- Advanced PoE Management, management, PoE PD failure, auto checking and auto reset, PoE configuration for power planning, weekly scheduling
- Cable diagnostics, identifies opens/shorts distance
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE802.3ac	Max frame size extended to 1522Bytes
	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 <sup>+</sup> (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 IEEE802.1	IQ VLAN VID

Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (Full wire-speed)
Data Processing	Store and Forward
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
PoE Port	8x M12 (4-Pin D-code Female) ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode.
Network Connector	8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x M12 (8-Pin, female,A-code or X-Code) 10/100/1000Base-T UTP (ITP-802GTM-8PH24) 8x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP + 2x 100/1000Base-X SFP (ITP-802GSM-8PH24) UTP port provide auto negotiation speed, Auto MDI/ MDI-X, Full/Half duplex function Build-in 2x bypass GbE UTP ports (ITP-802GTM-8PH24) 2x Water-proof cable connector 2x 100/1000Base-X SFP slot, with DDMI (ITP-802GSM-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	Supported
Overload Current Protection	Supported
CPU Watch Dog	Supported

EN50155 PoE Switch ITP-802GTM-8PH24 & ITP-802GSM-8PH24

### EN50155 Managed PoE Switch



LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber) UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)							
	SEP Fiber	SEP Fiber Per port: Link/Active (Green)						
	PoE Port • PoE Ou • PoE Fau	PGE Port LED 1 LED /per Port : PGE Output Power On : ON (Green) POE Fault (Over Load, Short Circuit, Port failed at						
Jumbo Frame	9.6KB	). FIdSII IUI	nes /sec (Gi	een)				
MAC Address Table	8K							
Memory Buffer	512K Byte	es for packe	t buffer					
PoE Standard	IFFE 802.3	3af. IFFF 802	2.3at					
PoE Power Output	Maximum port) Reg	n PoE outpu ulated PoE d	t power buc output volta	lget 180W ( ge at 50VD	30W/per C (Figure 2)			
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48V (20~57VDC) input power Built-in very high efficiency booster(94~97%) to rise up 50VDC for PoE output Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)							
Power	ITP-802GS	SM-8PH24						
Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency			
	24 VDC	196.4W	8.1W	180W	95.50%			
	48 VDC	197.8W	9.6W	180W	95.60%			
	ITP-802GTM-8PH24							
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency			
	24 VDC 198.3W 8.9W 180W 95.009							
	48 VDC 198.8W 10.1W 180W 95.30%							
Warning Message	System Sy	/slog, SMTP/	′ e-mail ever	nt message	, alarm relay			
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC							
	Relay outp	outs with cur	rent carrying	capacity of `	1 A @24VDC			
Operating Temperature	-40 ~ 75°	C	rent carrying	capacity of '	1 A @24VDC			

#### Storage Temperature -40 ~ 85°C Rugged Metal, Fanless, IP67 grade housing for Housing against water, dust, and oil Dimensions 69 x 240 x 168mm (D x W x H) 2.170kg (ITP-802GSM-8PH24) 2.15kg (ITP-802GTM-8PH24) Weight Installation Wall mounting, or DIN Rail mounting (Optional) Mounting 371,961 Hours (ITP-802GSM-8PH24) 362,429 Hours (ITP-802GTM-8PH24) MTBF (MIL-HDBK-217) Warranty 5 years Certification EMC CE EMI (Electromagnetic FCC Part 15 Subpart B Class A, CE Interference) **Railway Traffic** EN50155, EN50121-4 Fire protection of EN45545-2 railway vehicles Immunity for Heavy Industrial EN61000-6-2 Environment **Emission for Heavy** EN61000-6-4 Industrial Environment EMS EN61000-4-2 (ESD) Level 3, Criteria B (Electromagnetic EN61000-4-3 (RS) Level 3, Criteria A Susceptibility) EN61000-4-4 (Burst) Level 3, Criteria A **Protection Level** EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A Safety EN60950-1 Shock IEC-61373 Freefall IEC 60068-2-32 Vibration IEC-61373

## **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN, up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ting is 250
	(Please see CTC µ-Ring white paper for more details and more topology application)
Loop Protection	(Please see CTC µ-Ring white paper for more details and more topology application) Supported
Loop Protection ITU-T G.8032 /	Supported       Recovery time < 50ms
Loop Protection ITU-T G.8032 / Y.1344 ERPS	(Please see CTC µ-Ring white paper for more details and more topology application) Supported Recovery time <50ms
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )	Supported TC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Feature	CPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Feature Class of Service	CPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Feature Class of Service Traffic	OPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port IEEE802.1p based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	CPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         IEEE802.1p based CoS         IP Precedence based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	CPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         IEEE802.1p based CoS         IP Precedence based CoS         IP DSCP based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	Supported         (Please see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         IEEE802.1p based CoS         IP Precedence based CoS         IP DSCP based CoS         QCL(QoS Control List): Frame Type, Source/ Destination MAC. VI AN ID. PCP. DEI
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	CPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         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         QCEQQS Control Entry): Protocol, Source IP, IP         Control Entry): Protocol, Source IP, IP
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	OP/Pass see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         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         Data internet         Detaintore II theorem
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	OPlease see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         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         Rate in steps : 1 kbps / Mbps / fps / kfps         Denses 100 kbes to 10 km st 00 km st 10 km st 000 km
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress	(Please see CTC µ-Ring white paper for more details and more topology application)         Supported         Recovery time <50ms         Single Ring, Sub-Ring, Multiple ring topology network         IEEE802.1p 8 active priorities queues for per port         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         Rate in steps : 1 kbps / Mbps / fps / kfps         Range : 100 kbps to 1Gbps / 1fps to 3300kfps

Bandwidth	Rate in steps : 1 kbps / Mbps
<b>Control for Egress</b>	Range : 100 kbps to 1Gbps
	Rate Unit : bit Per gueue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Fea	ature
IGMP / MLD	IGMP Snooping v1. v2. v3 / MLD Snooping v1. v2
Snooping	Port Filtering Profile, Throttling
IGMP / MLD	Fast Leave
Snooping	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
DADULC (L. )	L4: ICP/UDP
RADIUS authentica	ation & accounting
IACACS+ autnenti	Cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL/SSHV2	Supported
User Name Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Support for management and monitoring
EtherNet/IP	Support for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration

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P-802GTM-8PH2
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P-802GTM-8PH24 & ITP-80
P-802GTM-8PH24 & ITP-802
P-802GTM-8PH24 & ITP-802G
P-802GTM-8PH24 & ITP-802GS
P-802GTM-8PH24 & ITP-802GSA
P-802GTM-8PH24 & ITP-802GSM-
P-802GTM-8PH24 & ITP-802GSM-8
P-802GTM-8PH24 & ITP-802GSM-8F
P-802GTM-8PH24 & ITP-802GSM-8PH
P-802GTM-8PH24 & ITP-802GSM-8PH2
P-802GTM-8PH24 & ITP-802GSM-8PH24

RMON	RMON I (1, 2, 3, 9 group) RMON II	IPv6 NTP, SNTP	Server/Client
MIBII	RFC 1213	IPv6 TFTP	Supported
UPnP	Supported	IPv6 QoS	Supported
BOOTP	Supported	IPv6 ACL	Number of rules: up to 256 entries
DHCP	Server, Client, Relay, Relay option 82 , Snooping		for L2 / L3 / L4
RARP	Supported		L2: Mac address SA/DA/VLAN
TTDP	Supported (Train Topology Discovery Protocol)		L3: IP address SA/DA, Subnet
IP Source Guard	Supported	Others Features	L4. TCF/ UDF
Port Mirroring	Supported	Others realures	
Event Syslog	Syslog server (RFC3164) (Support 1 server )	Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
Warning Message	System syslog, e-mail, alarm relay		Determine the cable length and lowering the power
DNS	Client, Proxy		for ports with short cables
IEEE1588 PTP V2	Supports 5 operating mode in each port :		Lower the power for a port when there is no link
	Ordinary-Boundary, Peer to Peer Transparent Clock,		LED Power Management :Adjustment LEDs intensity
NTD CNTD	Sonvor/Client	Cable Diagnostic	Measuring UTP cable OK or broken point distance
	Link Laver Discovery Protocol	Advanced PoE	PoE PD Failure Auto Checking, and Auto reset when PD fail
802 1ab)		Management	PoE Scheduling (On/Off schedule weekly)
IDv6 Egaturas			PoE Configuration
IF VO Features			PoE Enable/Disable
IPv6 Management	Telnet Server/ICMP v6		Power limit by classification
SNMP over IPv6	Supported		Power limit by management
HTTP over IPv6	Supported		Total DaE Dowar budge (maximum 180\\/\) limitation
SSH over IPv6	Supported		Total Poe Power budge (maximum 180W) limitation
IPv6 Telnet	Supported		Power reearng priority

## **Application**

	Figure 1	:	ITP	Series	in	Onboard	Train	Application
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#### Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (50VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

# 

## **Dimensions**

▶ ITP-802GSM-8PH24



**Rear View** 

▶ ITP-802GTM-8PH24



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### **Ordering Information**



- Protective caps for SFP ports and
  - console, alarm port
- set (for ITP-802GSM-8PH24)
- Console cable (M12 to DB9)

# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the ITP-802GSM-8PH24 for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### .

SFP Naming Rule				
ISFP S Industrial SFP S: Single Mod Transceiver T: UTP	9: 10G         Distance         Waveler           e         7: GbE         T00: (UTP)         00: UTP           5: FE         000: (500m)         85: 850r           002: (2km)         31:1310           020: (20km)         55:1550           040: (40km)         WA: TX/	DEEBIANK:0~7 Blank:0~7 D: DDMI Blank: Non DDMI m nm nm 1310nm (Bidi mode A) 1550nm (Bidi Mode B)	C O°C	
Optional Cable/Connect	tor & Din-Rail Kit			
P/N: CAB-M12XM8-RJ45	P/N: CAB-M12AM8-RJ45	P/N: CAB-M12DM4-RJ45	P/N: CAB-M12AF5-OPEN	P/N: CAB-M23F5-OPEN
M12 X-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter	M12 A-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter	M12 D-code Male (4-Pin) to RJ-45, AWG 24 ,IP67, 1 meter	M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter	M23 Female (5-Pin) to open wire, (AWG 16) , IP67, 1 meter
			$\langle \rangle$	
For GbE UTP (X-code model)	For GbE UTP (A-code model)	For FE UTP	For Alarm	For Power
P/N: M12A-M8 M12 A-code Male (8-Pin) connector, IP67	P/N: M12D-M4 M12 D-code Male (4-Pin) connector, IP67	P/N: M12A-F5 M12 A-code Female (5-Pin) connector, IP67	<b>P/N: IND-DNK04</b> Din Rail Kit for Industrial, Wide: 52mm	
	C.	C		
For GbE UTP (A-code model)	For FE UTP	For Alarm	(130 X52mm / 4 Screws) (2pcs/set)	

EN50155 PoE Switch ITP-802GTM-8PH24 & ITP-802GSM-8PH24



# ITP-1622GTFM & ITP-1604GTM

- ◀ 16x 10/100Base M12 + 2x GbE M12 + 2x GbE Fiber
- ▶ 16x 10/100Base M12+ 4x GbE M12

#### Preliminary



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48/72/96/110VDC redundant dual input power
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Cable diagnostics, identifies opens/shorts distance



The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 16x 10/100Base-TX and 22/4x 10/100/1000Base-T(X) ports. The ITP switches use M12 connectors to ensure tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With a wide power input range of 24/48/72/96/110VDC (operating range 20 to 137.5VDC), this product series is especially suitable for rolling stock and track side installations.

#### **Features**

- M12 and M23 connector against vibration and shock, M12 X-code for Gigabit port
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Build-in 2 bypass GbE UTP ports to avoid one or more nodes power fail in a ring or bus structure to collapse the network (-BP bypass model)
- DHCP Server/ Client/ Relay/ Relay option 82/ Snooping
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- see Catalog chapter 1- Software Management for more details)
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\* \*Please see Chapter 1- Software Management for more details

#### 

Specificati	0115			
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processing	Store and Forward
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair	Network	half duplex mode 16x M12 (4-Pin, Female,D-Code) 10/100Base-TX UTP
	IEEE 802.1d	STP (Spanning Tree Protocol)	Connector	+ 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)		UTP (ITP-1604GTM)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		16x M12 (1-Pin Female D-Code) 10/100Base-TX LITP
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		+ 2x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP+ 2x O-ODC 1000Base-X Eiber (ITP-1622GTEM)
	IEEE 802.1Q	Virtual LANs (VLAN)		
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		UTP port provide auto negotiation speed, Auto MDI/ MDI-X, Full/Half duplex function
	IEEE802.3ac	Max frame size extended to 1522Bytes		Build-in 2x bypass GbE UTP ports (For -BP model optional)
		Link aggregation for parallel links	Console	RS-232 (5-pin A-Code M12 male )
	IEEE 802.3ad	with LACP(Link Aggregation Control Protocol)	Network Cable	UTP/STP above Cat. 5e cable
	IEEE 802.3x	Flow control for Full Duplex	Protocols	
	IFFF 802.1ad	Stacked VI ANs. O-in-O	Poverse Polarity	CSIMINCED
		LAN Layer 2 QoS/CoS Protocol for	Protection	Supported
	IEEE 802.1p	Traffic Prioritization	<b>Overload Current</b>	Supported
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	Protection	supported
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	CPU Watch Dog	Supported
VLAN ID	4094 IEEE802.	1Q VLAN VID	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault
Switch	10.4 Gbps (ITP-	-1204GTM-12PH)		(Amber), CPU Act (Green), Ring Master (Amber)
Architecture	12.4Gbps (ITP- (Full wire-spee	-2204GTM-16PH) ed)		UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)

Jumbo Frame	9.6KB
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual DC 24/48/72/96/110VDC (16.8~137.5VDC) wide input power
Power Consumption	TBD
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC
Operating Temperature	-40 ~ 75°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, Fanless, IP40 grade housing protection
Dimensions	TBD
Weight	TBD
Installation Mounting	Wall mounting
MTBF	TBD (MIL-HDBK-217)
Warranty	5 years

Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	EN50155, EN50121-4
Fire protection of railway vehicles	EN 45545-2
lmmunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for UTP port
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

# **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN,up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN,up to 256 entries
	IR Subpat based VLAN, up to 129 entries
	IP Subhet-based VLAN, up to 126 entries
	entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR ( Multicast VLAN Registration )
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC $\mu$ -Ring white paper for more details and
	more topology application)
Loop Protoction	Cupported
Loop Protection	Supported
Loop Protection ITU-T G.8032 / Y.1344 ERPS	Supported Recovery time <10ms
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Feature	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Feature Class of Service	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port IEEE802.1p based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port IEEE802.1p based CoS IP Precedence based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>Qo5 Feature</b> Class of Service Traffic Classification QoS	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEl QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>Qo5 Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Feature</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	Supported Recovery time <10ms Single Ring, Sub-Ring, Multiple ring topology network IEEE802.1p 8 active priorities queues for per port 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 Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper Remarking

IP Multicasting Fe	ature
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile, Throttling
IGMP / MLD	Fast Leave
Snooping	Maximum Multicast Group : up to 1022 entries
	Ouery / Static Router Port
Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4: TCP/UDP
RADIUS authentic	ation & accounting
TACACS+ authent	ication & accounting, TACACS+ 3.0
HITPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH, CLI, RS-232 console
Filtering	
<b>Management Feat</b>	tures
CLI	Cisco® like CLI
Web Based Manag	gement
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration	Redundant firmware in case of upgrade failure
ETD cliont	Supports for upload (dowpload configuration
	RMONU (1, 2, 3, 9 group) RMONU
MIRII	REC 1213
IIDnP	Supported
ROOTR	Supported
DHCP	Server Client Relay Relay ontion 82 Spooning
RARP	Supported
TTDP	Supported (Train Topology Discovery Protocol)
IP Source Guard	Supported (Hain Topology Discovery Hotocol)
Port Mirroring	Supported
Event Syslog	System server (REC 3164) (Support 1 server )
Warning Message	System system e-mail alarm relay
DNS	Client Proxy
	cherry, horry

### EN50155 Managed Switch



IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported

IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
	Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable OK or broken point distance

# **Ordering Information**

		Total	10/100Base-TX	GbE p	ort	Вура	ISS	Redundant Dual Input Power		Cert	ification	
Model Name	Managed	Port	D-code M12	GbE X-code M12 UTP	Q-ODC Fiber	GbE X-code M12 UTP	Q-ODC Fiber	24/48/72/96/110VDC (16.8~137.5VDC)	EN50155 EN50121-4 EN45545-2	EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC
ITP-1604GTM-E-2BP	V	20	16	4		2		V	$\vee$	V	V	V
ITP-1622GTFM-E-BP	V	20	16	2	2	1	1	V	V	V	V	V
ITP-1622GTFM-E	V	20	16	2	2			V	V	V	V	V





#### Package List

- One unit device
  Protective caps for UTP ports and console, alarm port

## **Optional Accessories**

#### Optional Cable/Connector

P/N: CAB-M12XM8-RJ45 M12 X-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



For GbE UTP (X-code)

P/N: CAB-M23F5-OPEN M23 Female (5-Pin) to open wire, (AWG 16), IP67, 1 meter



P/N: CAB-M12DM4-RJ45 M12 D-code Male (4-Pin) to RJ-45, AWG 24 ,IP67, 1 meter

• Console cable (M12 to DB9)



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



For FE UTP

P/N: CAB-M12AF5-OPEN M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter



P/N: M12A-F5 M12 A-code Female (5-Pin) connector, IP67



# - ITP-G802SM & ITP-G802TM

- ◀ IP67, 8x GbE + 2x 100/1000Base SFP
- ▶ IP67, 8x GbE M12 + 2x GbE M12



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Build-in 2 bypass GbE UTP ports
- Cable diagnostics, identifies opens/shorts distance



The ITP series models are managed, industrial grade, L2 GbE switches that provide 8x GbE UTP plus 2x GbE SFP or 10x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

#### **Features**

- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

#### **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network	10x M12 (8-Pin, Female, A-Code or X-code)				
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Connector	10/100/1000Base-T UTP (ITP-G802TM)				
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		8x M12(8-Pin, Female, A-Code or X-code) 10/100/1000Base-T + 2x 100/1000Base-X SFP				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		UTP port provide auto negotiation speed, Auto MDI/ MDLX_EuII/Half duplex_function				
	IEEE 802.1d	STP (Spanning Tree Protocol)		Build-in 2x bypass GbF UTP ports (ITP-G802TM)				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )		2x Water-proof cable connector 2x 100/1000Base-X				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		SFP slot, with DDMI (for ITP-G802SM)				
	ITU-T G.8032 /	ERPS (Ethernet Ring Protection	Console	RS-232 (5-pin A-Code M12 male )				
	Y.1344	Switching)	Network Cable	UTP/STP above Cat. 5e cable				
	IEEE 802.1Q	Virtual LANs (VLAN)		EIA/TIA-568 100-ohm (100m)				
	IEEE 802 1X	Port based and MAC based Network	Protocols	CSMA/CD				
		Access Control, Authentication	<b>Reverse Polarity</b>	Supported				
	IEEE 802.3ac	Max frame size extended to 1522Bytes	Protection					
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Overload Current Protection	Supported				
	IEEE 802.3x	Flow control for Full Duplex	<b>CPU Watch Dog</b>	Supported				
	IEEE 802.3ac	Max frame size extended to 1522Bytes	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q		(Amber), CPU Act (Green), Ring Master (Amber)				
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		UTP port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)				
	IEEE 802.1ab	Link Laver Discovery Protocol (LLDP)		SFP Fiber Per port: Link/Active (Green)				
	IFFF 802.3az	FFF (Energy Efficient Ethernet)	Jumbo Frame	9.6KB				
VLAN ID	4094 IFFE 802	10 VLAN VID	MAC Address Table	8K				
Switch	Back-plane (Sv	vitching Fabric): 20Gbps	Memory Buffer	512K Bytes for packet buffer				
Architecture	(Full wire-spee	ed)	Power Supply	Provides 1x M23 (5-Pin, male) for redundant dual				
Data Processing	Store and Forv	vard		input, optional Low (L) or High (H) voltage.				
Flow Control	rol IEEE 802.3x for full duplex mode Back pressure for half duplex mode			Low voltage (L) : 12/24/48V (8.4~60VDC) High voltage (H) : 110/220VDC (88~300VDC), or				



Power ITP-G802SM- ITP-G802TM- ITP-G802TM-ITP-G802SM Consumption LL HL LL HL 8.5W 9.9W 10.1W 11.9W 10.3W 10.9W 24VDC 9.2W 12.3W 13.1W 48VDC 11W 11.6W 14W 110 VAC/VDC 9.9W 11.9W 220 VAC/VDC 9.9W 11.9W Warning Message System Syslog, SMTP/ e-mail event message, alarm relay Alarm 5-pin A-code M12 male Relay outputs with current carrying capacity of 1 A @24VDC **Relay Contact** Operating -40 ~ 75°C Temperature Operating 5% to 95% (Non-condensing) Humidity Storage Temperature -40 ~ 85°C Rugged Metal, Fanless , IP67 grade housing for against water, dust, and oil Housing Dimensions 69 x 240 x 168mm (D x W x H) 2.645kg (ITP-G802SM-LL) 2.82kg (ITP-G802SM-HL) 2.625kg (ITP-G802TM-LL) 2.8kg (ITP-G802TM-HL) Weight Installation Wall mounting, or DIN Rail mounting (Optional) Mounting 443,868 Hours (ITP-G802SM-LL) 353,092 Hours (ITP-G802SM-HL) 423,602 Hours (ITP-G802TM-LL) MTBF 349,564 Hours (ITP-G802TM-HL) (MIL-HDBK-217) Warranty 5 years

## **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	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
(Port Trunk)	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
	(Please see CTC u-Ring white namer for more details and
	more topology application)
Loop Protection	Supported
ITU-T G.8032 /	Personal time of Comp
Y.1344 ERPS	Recovery time < soms
(Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology
Protection )	network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic	IEEE802.1p based CoS
Classification QoS	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	Rate in steps : 1 kbps / Mbps / fps / ktps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	ture
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile, Throttling
IGMP / MLD	Fast Leave
Snooping	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port

Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4
Fire protection of railway vehicles	EN45545-2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

Security Features	
IEEE 802.1X	Port-Based, MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4: ICP/UDP
RADIUS authentica	ition & accounting
TACACS+ authentio	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL/SSHv2	Supported
User Name	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	Web Telnet / SSH_CLERS-232 console
Filtering	
Management Feat	ures
CLI	Cisco <sup>®</sup> like CLI
Web Based Manage	ement
Telnet	Server
SNMP	TFTP, HTTP
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration	Redundant firmware in case of upgrade failure
Upgrade	
FIP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
	RFC 1213
DOUTD	Supported
BUUTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Shooping
KARP	Supported
	Supported (Train Topology Discovery Protocol)
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Systog server (RFC3164) (Support 1 server )
warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED



# EN50155 Managed Switch

IPv6 Features IPv6 Managemen	t Telnet Server/ICMP v6		for L2 / L3 / L4 L2: Mac address SA/DA/VLAN		
SNMP over IPv6	Supported		L3: IP address SA/DA, Subnet L4: TCP/UDP		
HTTP over IPv6	Supported	<b>Others Features</b>			
SSH over IPv6	Supported	Green Ethernet	Supports IEEE802 3az EEE (Eporaly Efficient Ethernot)		
IPv6 Telnet	Supported	Green Luiemer	Management to optimize the power consumption		
IPv6 NTP, SNTP	Server/Client		Determine the cable length and lowering the power		
IPv6 TFTP	Supported		for ports with short cables		
IPv6 QoS	Supported		Lower the power for a port when there is no link		
IPv6 ACL	Number of rules: up to 256 entries		LED Power Management :Adjustment LEDs intensity		
		Cable Diagnostic	Measuring UTP cable OK or broken point distance		

## **Application**

Figure 1 : ITP Series in Onboard Train Application



ITP-G802TM

ITP-G802TM

ITP-G802SM

## Dimensions

► ITP-G802SM







## **Ordering Information**

			Total	UTP Port M12	FiberPort Redundant Power supply			Certifica	Shock Vibration	Operating			
Model Name	Managed	IP67	Port	10/100/1000 Base-T(X)	100/1000 Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	High Volt 110/220 VDC 110/220 VAC	EN50155 EN50121-4		EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	Temperature
ITP-G802SM-ELL-X	V	V	10	8 (X-code)	2 SFP	2		V	V	V	V	V	-40~75°C
ITP-G802SM-EHL-X	V	V	10	8 (X-code)	2 SFP	1	1	V	V	V	V	V	-40~75°C
ITP-G802SM-ELL	V	V	10	8 (A-code)	2 SFP	2		V	V	V	V	V	-40~75°C
ITP-G802SM-EHL	V	V	10	8 (A-code)	2 SFP	1	1	V	V	V	V	V	-40~75°C
ITP-G802TM-ELL-X	V	V	10	10 (X-code)		2		V	V	V	V	V	-40~75°C
ITP-G802TM-EHL-X	V	V	10	10 (X-code)		1	1	V	V	V	V	V	-40~75°C
ITP-G802TM-ELL	V	V	10	10 (A-code)		2		V	V	V	V	V	-40~75°C
ITP-G802TM-EHL	V	V	10	10 (A-code)		1	1	V	V	V	V	V	-40~75°C



#### Package List

- One of the device series
- Protective caps for SFP ports and console, alarm port
- Fiber Cable Gland for SFP port x 2
- s and set (for ITP-G802SM)
  - Console cable (M12 to DB9)

# **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the ITP-G802SM for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule

ISFP -	- S 7	040	- 31	_ D	E	E:-40~85°C Blank:0~70°C
Industrial SFP Transceiver	M: Multi Mode S: Single Mode T: UTP	9: 10G 7: GbE 5: FE	Distance T00: (UTP) 000: (500m) 002: (2km) 020: (20km) 040: (40km)	Wavelength 00: UTP 85: 850nm 31:1310nm 55:1550nm WA: TX/1310nr WB: TX/1550n	D: DDMI Blank: Non DDMI m (Bidi mode A) m (Bidi Mode B)	

#### Optional Cable/Connector & Din-Rail Kit

#### P/N: CAB-M12XM8-RJ45

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



For GbE UTP (X-code model)

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



For GbE UTP (A-code model)

## **P/N: CAB-M12AM8-RJ45** M12 A-code Male (8-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



P/N: M12A-F5

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



For Alarm

## P/N: CAB-M12AF5-OPEN

M12 A-code Female (5-Pin) to open wire , AWG 22 , IP67, 1 meter



**P/N: CAB-M23F5-OPEN** M23 Female (5-Pin) to open wire, (AWG 16) , IP67, 1 meter



**P/N: IND-DNK04** Din Rail Kit for Industrial,



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



# ITP-2204GTM & ITP-1204GTM

- 4 22x 10/100Base M12+ 4x GbE M12
- ▶ 12x 10/100Base M12+ 4x GbE M12



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48/72/96/110VDC redundant dual input power
- 4KV surge protection for UTP ports
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- Cable diagnostics, identifies opens/shorts distance



The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 12/22x 10/100Base-TX and 4x 10/100/1000Base-T(X) ports. The ITP switches use M12 connectors to ensure tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With a wide power input range of 24/48/72/96/110VDC (operating range 20 to 137.5VDC), this product series is especially suitable for rolling stock and track side installations.

#### **Features**

- M12 and M23 fiber connector against vibration and shock, M12 X-code for Gigabit port
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses. (Please see CTC Union's  $\mu$ -Ring white paper for more details)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- Supports TTDP for train application
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard IEEE 802.3 10Base-T 10Mbit/s Ethernet 100Base-TX, 100Base-FX, Fast Ethernet IEEE 802 3u IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair IEEE 802.1d STP (Spanning Tree Protocol) IEEE 802.1w RSTP (Rapid Spanning Tree Protocol ) IEEE 802.1s MSTP (Multiple Spanning Tree Protocol) ITU-T G.8032 / ERPS (Ethernet Ring Protection Y1344 Switching) IEEE 802.1Q Virtual LANs (VLAN) Port based and MAC based Network IEEE 802 1X Access Control, Authentication IFFE 802.3ac Max frame size extended to 1522Bytes Link aggregation for parallel links with IEEE 802.3ad LACP(Link Aggregation Control Protocol) IEEE 802.3x Flow control for Full Duplex IEEE802 3ac Max frame size extended to 1522Bytes IEEE 802.1ad Stacked VLANs, Q-in-Q LAN Layer 2 QoS/CoS Protocol for IEEE 802.1p Traffic Prioritization Link Layer Discovery Protocol (LLDP) IEEE 802 1ab IEEE 802.3az EEE (Energy Efficient Ethernet) VLAN ID 4094 IEEE802.1Q VLAN VID Switch 10.4 Gbps (ITP-1204GTM) 12.4Gbps (ITP-2204GTM) Architecture (Full wire-speed) Data Processing Store and Forward IEEE 802.3x for full duplex mode Back pressure for Flow Control half duplex mode 12x M12 (4-Pin, Female, D-Code) 10/100Base-TX UTP Network + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T Connector UTP (ITP-1204GTM) 22x M12 (4-Pin, Female, D-Code) 10/100Base-TX UTP + 4x M12 (8-Pin, Female, X-Code) 10/100/1000Base-T UTP (ITP-2204GTM) UTP port provide auto negotiation speed, Auto MDI/ MDI-X, Full/Half duplex function Build-in 2x bypass GbE UTP ports (For -BP model optional)

Console	RS-232 (5-	RS-232 (5-pin A-Code M12 male )						
Network Cable	UTP/STP a	bove Cat. 5e d	able					
	EIA/TIA-5	58 100-ohm (1	00m)					
Protocols	CSMA/CD	)						
Reverse Polarity Protection	Supporte	d						
Overload Current Protection	Supporte	d						
CPU Watch Dog	Supporte	d						
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Amber)							
	on port.	1000 Link/Act	ive (Amber)	)				
Jumbo Frame	9.6KB							
MAC Address Table	8K							
Memory Buffer	512K Byte	s for packet bu	uffer					
Power Supply	Provides 24/48/72/9	1x M23 (5-Pin, 1 96/110VDC (16.8	male) for rec 3~137.5VDC) <sup>,</sup>	lundant dual DC wide input power				
Power	ITP-1204G	TM	ITP-22040	STM				
Consumption	Input Voltage	Device Power Consumption	Input Voltage	Device Power Consumption				
	24VDC	13W	24VDC	17.1W				
	46VDC	16.5W	48VDC	19.8				
Warning Message	System Syslog, SMTP/ e-mail event message, alarm							
5 5	System Sy	slog, SMTP/ e-	mail event r	nessage, alarm				
Alarm Relay Contact	System Sy relay 5-pin A-co Relay out @24VDC	rslog, SMTP/ e- ode M12 male outs with curre	mail event r	nessage, alarm capacity of 1 A				
Alarm Relay Contact Operating Temperature	System Sy relay 5-pin A-co Relay out @24VDC -40 ~ 75°C	rslog, SMTP/ e- ode M12 male outs with curre	mail event r	nessage, alarm capacity of 1 A				
Alarm Relay Contact Operating Temperature Operating Humidity	System Sy relay 5-pin A-cc Relay out @24VDC -40 ~ 75°C 5% to 95%	rslog, SMTP/ e- ode M12 male outs with curre c ó (Non-conder	mail event r ent carrying nsing)	nessage, alarm capacity of 1 A				
Alarm Relay Contact Operating Temperature Operating Humidity Storage Temperature	System Sy relay 5-pin A-cc Relay out @24VDC -40 ~ 75°C 5% to 95% -40 ~ 85°C	rslog, SMTP/ e- ode M12 male outs with curre (Non-conder	mail event r ent carrying nsing)	nessage, alarm capacity of 1 A				
Alarm Relay Contact Operating Temperature Operating Humidity Storage Temperature Housing	System Sy relay 5-pin A-cc Relay out @24VDC -40 ~ 75°C 5% to 95% -40 ~ 85°C Rugged M protection	rslog, SMTP/ e- ode M12 male buts with curre 6 (Non-conder 6 Metal, Fanless, I	mail event r ent carrying nsing) P54 grade h	nessage, alarm capacity of 1 A ousing				

# EN50155 Managed Switch

Dimensions	113 x 260 x 132 (D x W x H) (ITP-1204GTM) 113 x 360 x 132 (D x W x H) (ITP-2204GTM)
Weight	2.8kg (ITP-1204GTM) 3.9kg (ITP-2204GTM)
Installation Mounting	Wall mounting
MTBF	238,600 Hours (ITP-1204GTM) 227,899 Hours (ITP-2204GTM) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4
Fire protection of railway vehicles	EN 45545-2
Immunity for Heavy Industrial Environment	EN61000-6-2

# **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	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
(Port Trunk)	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain
	or Sub-Ring type for flexible uses, and maximum up
	to 5 Kings. Recovery time <10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC $\mu$ -Ring white paper for more details and
	more topology application)
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS	Recovery time <10ms
(Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology
Protection )	network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic	IEEE802.1p based CoS
Classification Qos	IP Precedence based CoS
	IP DSCP based CoS
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth	Rate in steps : 1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	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 Fea	iture
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
shooping	Port Filtering Profile, Throttling
	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
IEEE 802 1V	Port-Rasod MAC-Rasod
	Number of rules - up to 256 entries
ANGL .	for 12/13/14
	I 2: Mac address SA/DA/VI AN
	L3: IP address SA/DA, Subnet
	L4: TCP/UDP
RADIUS authentica	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported

Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported for UTP port
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

SSL / SSH v2	Supported
User Name	Local Authentication
Password	Remote Authentication (via RADIUS / TACACS+)
Authentication	
Management Interface Access Filtering	Web, Telnet / SSH, CLI, RS-232 console
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIBII	RFC 1213
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
TTDP	Supported (Train Topology Discovery Protocol)
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet)
	Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable OK or broken point distance



## **Application**

Figure : ITP Series in Onboard Train Application



## **Dimensions**



# **Ordering Information**

		Protection	Total	FE Port	G	bE port	Redundant Dual Input Power
Model Name	Managed		Port	D-code M12	GbE X-code M12 UTP	GbE X-code M12 UTP Bypass	24/48/72/96/110VDC (16.8~137.5VDC)
ITP-1204GTM-E	V	IP54	16	12	4		V
ITP-1204GTM-E-BP	V	IP54	16	12	2	2	V
ITP-2204GTM-E	V	IP54	26	22	4		V
ITP-2204GTM-E-BP	V	IP54	26	22	2	2	V

	Certification									
Model Name	EN45545-2	EN50155	EN60950-1	EN61000-6-2	CF. FCC	IEC61373				
		EN50121-4		EN61000-6-4						
ITP-1204GTM-E	V	V	V	V	V	V				
ITP-1204GTM-E-BP	V	V	V	V	V	V				
ITP-2204GTM-E	V	V	V	V	V	V				
ITP-2204GTM-E-BP	V	V	V	V	V	V				

# EN50155 Managed Switch





# ITP-802GSM & ITP-802GTM

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

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



- EN50155, EN45545-2, EN50121-4, EN60950-1, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC or 110/220VDC redundant dual input power
- Supports TTDP for train application
- Build-in 2 bypass GbE UTP ports
- Cable diagnostics, identifies opens/shorts distance



The ITP series models are managed, industrial grade, L2 Fast Ethernet switches that provide 8x Fast Ethernet UTP plus 2x GbE SFP or 8x Fast Ethernet UTP plus 2x GbE UTP Ports. Housed in rugged wall mountable enclosures, these switches are designed for the harshest environments. All ITP series switches use M12 connectors to ensure water-tight, robust connections and guarantee reliable connections against vibration and shock. These models are also compliant with EN50155, covering power input voltage, surge, EFT, ESD, vibration and shock, making these switches suitable for industrial applications, such as vehicle, rolling stock, or vessel. With an IP67 rating, to protect against dust and water submersion, they are particularly useful in environments with extreme temperature, high humidity, oil, dust and in outdoor environments requiring water-proof applications, such as IP surveillance or city security.

#### **Features**

- M12 and M23 connector against vibration and shock, X-code or A-code M12 for Gigabit port optional
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (ERPS) for redundant cabling
- Provides up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses. (Please see CTC Union's μ-Ring white paper for more details)
- Build-in 2 bypass GbE UTP ports to avoid one or more nodes power fail in a ring or bus structure to collapse the network (ITP-802GTM)
- Supports IEEE1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Console	RS-232 (5-p	in A-Code	M12 male )				
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Network Cable	UTP/STP above Cat. 5e cable						
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		EIA/TIA-568	3 100-ohm	(100m)				
Standard VLAN ID Switch Architecture Data Processing Flow Control	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Protocols CSMA/CD							
	IEEE 802.1d	STP (Spanning Tree Protocol)	Reverse Polarity Protection Supported							
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Overload Current	<u> </u>						
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Protection	Supported						
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	CPU Watch Dog	Supported	wor 1 (Cro	on) Power	(Groop) E	ault		
	IEEE 802.1Q	Virtual LANs (VLAN)	LLD	(Amber), CF	PU Act (Gre	en). Rina M	aster (Amb	ber)		
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		UTP port: 10/100 Link/Active (Green)						
	IEEE 802.3ac	Max frame size extended to 1522Bytes		SEP Fiber Per port: Link/Active (Green)						
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Jumbo Frame	Jumbo Frame 9.6KB						
	IEEE 802.3x	Flow control for Full Duplex	MAC Address Table 8K							
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Memory Buffer	512K Bytes	for packet	buffer				
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Power Supply	input, optional Low (L) or High (H) voltage. Low voltage (L) : 12/24/48V (8.4~60VDC) High voltage (H) : 110/220VDC (88~300VDC), or						
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)								
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		110/220VAČ (85~264VAC)						
VLAN ID	4094 IEEE802.	1Q VLAN VID	Power		ITP-802GSM-	ITP-802GSM-	ITP-802GTM-	ITP-802GTM-		
Switch	Back-plane (Sv	vitching Fabric): 5.6Gbps	Consumption	12//DC	6.0W/	HL 0.1\W/	LL 8.8\//	HL 8.8\//		
Architecture	(Full wire-spee	ed)		24VDC	8.3\//	9.100	9.000	9.2\W		
Data Processing	Store and Forv	ward		18VDC	0.9\//	10.5W	10.6W	10.6\//		
Flow Control	IEEE 802.3x for half duplex m	full duplex mode Back pressure for ode		110 VAC/VDC	5.077	9.7W	10.077	9.4W		
Network	8x M12 (4-Pin, F	emale,D-Code) 10/100Base-TX UTP + 2x		220 VAC/VDC		9.7W		9.4W		
Connector	M12 (8-Pin, ferr	nale,A-code or X-Code)		Curtains Curl						
	10/100/1000Ba	ise-T UTP (ITP-802GTM)	Alerma	System Syslog, SIVI IP/ e-mail event message, alarm rela						
	8x M12 (4-Pin, F 100/1000Base-	1000000000000000000000000000000000000	Alarm Relay Contact	Alarm     5-pin A-code M12 male       Relay Contact     Relay outputs with current carrying capacity of 1 A @24						
	MDI-X, Full/Ha	Ide auto negotiation speed, Auto MDI/ If duplex_function	Operating Temperature	-40 ~ 75°C						
	2x Water-proc	oass GDE OTP ports (TP-802GTM) f cable connector 2x 100/1000Base-X DDMI (TP-802GSM)	Operating Humidity	5% to 95%	(Non-cond	lensing)				

## EN50155 Managed Switch

Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, Fanless , IP67 grade housing for against water, dust, and oil
Dimensions	69 x 240 x 168mm (D x W x H)
Weight	2.645kg (ITP-802GSM-LL) 2.82kg (ITP-802GSM-HL) 2.625kg (ITP-802GTM-LL) 2.8kg (ITP-802GTM-HL)
Installation Mounting	Wall mounting, or DIN Rail mounting (Optional)
MTBF	443,868 Hours (ITP-802GSM-LL) 353,092 Hours (ITP-802GSM-HL) 335,823 Hours (ITP-802GTM-LL) 281,168 Hours (ITP-802GTM-HL) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50155, EN50121-4

#### **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 Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group (Port Trunk) Dynamic (IEEE 802.3ad LACP), up to 5 trunk group Spanning Tree IEEE802.1d STP, IEEE802.1w RSTP, IEEE802.1s MSTP up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Multiple u-Ring Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC $\mu$ -Ring white paper for more details and more topology application) **Loop Protection** Supported ITU-T G.8032 / Recovery time <50ms Y.1344 ERPS (Ethernet Ring Single Ring, Sub-Ring, Multiple ring topology Protection ) network **QoS Feature Class of Service** IEEE 802.1p 8 active priorities queues for per port Traffic IEEE 802.1p based CoS Classification QoS 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 Rate in steps : 1 kbps / Mbps / fps / kfps Control for Range : 100 kbps to 1Gbps / 1fps to 3300kfps Ingress Rate Unit : bit or frame Bandwidth Rate in steps : 1 kbps / Mbps Control for Egress 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 IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Snooping Port Filtering Profile, Throttling IGMP / MLD Fast Leave Snooping Maximum Multicast Group : up to 1022 entries Query / Static Router Port **Security Features IEEE 802.1X** Port-Based, MAC-Based Number of rules : up to 256 entries ACL for 12/13/14 L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP **RADIUS** authentication & accounting

TACACS+ authentication & accounting, TACACS+ 3.0

Fire protection of railway vehicles	EN45545-2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN60950-1
Shock	IEC-61373
Freefall	IEC 60068-2-32
Vibration	IEC-61373

HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Romote Authentication (via RADIUS / TACACS+)
Authentication	
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	TETP. HTTP
Modbus/TCP	Supports for management and monitoring
EtherNet/IP	Supports for management and monitoring
SW &	TETP HTTP
Configuration	
Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
UPnP	Supported
воотр	Supported
DHCP	Server, Client, Relay, Relay option 82. Snooping
RARP	Supported
TTDP	Supported (Train Topology Discovery Protocol)
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	System server (BEC 3164) (Support 1 server )
Warning Mossage	System system on mail alarm rolay
DNC	Client Provy
	Current, Floxy
IEEE ISOO PIP V2	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4
	L2: Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet)
	Management to optimize the power consumption
	Determine the cable length and lowering the power
	tor ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP Cable OK or broken point distance

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.



## **Application**



Figure 1 : ITP Series in Onboard Train Application

#### **Dimensions**



► ITP-802GSM







DIN-Rail Kit View (Optional Accessory)

# **Ordering Information**

				UTP Port M12	SFP or UTP Redundant Power supply			Certification				Shock Vibration	<b>A</b>
Model Name	Managed	IP67	Port	10/100 Base-TX	100/1000 Base-X	Low Volt 12/24/48VDC (8.4~60VDC)	High Volt 110/220 VDC 110/220 VAC	EN50155 EN50121-4	EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	Operating Temperature
ITP-802GSM-ELL	$\vee$	V	10	8	2 SFP	2		$\vee$	V	V	V	V	-40~75°C
ITP-802GSM-EHL	V	V	10	8	2 SFP	1	1	V	V	V	V	V	-40~75°C
ITP-802GTM-ELL-X	$\vee$	V	10	8	2 UTP (X-code)	2		$\vee$	V	V	V	V	-40~75°C
ITP-802GTM-EHL-X	V	V	10	8	2 UTP (X-code)	1	1	V	V	V	V	V	-40~75°C
ITP-802GTM-ELL	$\vee$	V	10	8	2 UTP (A-code)	2		$\vee$	V	V	V	V	-40~75°C
ITP-802GTM-EHL	V	V	10	8	2 UTP (A-code)	1	1	V	V	V	V	V	-40~75°C

#### Model Naming Rule



#### Package List

- One of the device series
- Protective caps for UTP ports and console, alarm port
- Fiber Cable Gland for SFP port x 2 set (for ITP-802GSM)
- Console cable (M12 to DB9)

**Rear View** 

**Bottom View** 



## **Optional Accessories**

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the ITP-802GSM for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

 ISFP-M7000-85-D(E)
 Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)

 ISFP-57020-31-D(E)
 Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)

 ISFP-M5002-31-D(E)
 Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)

 ISFP-55030-31-D(E)
 Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



For GbE UTP (A-code model)

For FE UT

For Alarm

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

# ITP-800A-8PH24

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



- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- M12/M23 connector for UTP and Power
- EN50155, EN50121-4 and EN45545-2 for railway certified



The ITP-800A-8PH24 is an unmanaged, Fast Ethernet, PoE switch, that provides 8 x 10/100Base-TX PoE+ Ethernet ports. This Ethernet switch is designed for industrial applications in harsh environments with Ethernet ports that utilize M12 connectors to ensure water-tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock. The ITP-800A-8PH24 series Ethernet switches are compliant with EN50155, covering operating temperature, power input voltage, surge, ESD, vibration, and shock, thus making these switches suitable for industrial applications in vehicle, rolling stock and factory automation.

#### **Features**

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

# **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet	Power Supply	Provide 1x M23 (5-Pin, male) for redundant dual DC						
	IEEE 802.3u 100Base-TX Fast Ethernet		24/48V (2	20~57VDC)	input powe	r			
	IEEE 802.3x Flow Control and Back Pressure		Built-in v	ery high eff	iciency (9/~	·98%) to be	oost Poe		
	IEEE 802.3af PoE (Power over Ethernet)		Regulate	PoF outou	t voltage (50	)VDC) to st	abilize PoF		
	IEEE 802.3at PoE <sup>+</sup> (Power over Ethernet enhancements)		device, a	nd quarante	ee deliverv l	PoE power	distance to		
Switch	Back-plane (Switching Fabric): 1.6Gbps		100 mete	ers (Figure 2	2)	1			
Architecture	(Full wire-speed)	Power	Input	Total Power	Device Power	PoE	Boost		
Data Processing	Store and Forward	Consumption	Voltage	Consumption	Consumption	Budget	Efficiency		
Flow Control	IEEE 802.3x flow control, back pressure flow control		24 VDC	125W	3.6W	120W	98%		
MAC Address Table	1 K	Operating	-10°C~60	°C (ITP-800	4.3W A-8PH24)	12000	97%		
Packet Buffer Size	448Kbits	Temperature	-40°C~75	°C (ITP-800	A-8PHE24)				
Network Connector	8x M12 D-code Female	Operating Humidity	5% to 95	% (Non-cor	ndensing)				
connector	Auto MDI/MDI-X function	Storage Temperature	-40°C~85	5°C					
	Full/Half duplex	Housing	Rugged	metal IP40	protection	housing ar	nd fanless		
Network Cable	10Base-T: 2-pair UTP/STP Cat. 5e cable	Dimensions	64 x 71 5	x 219 mm (	$D \times W \times H$	no asing, ai	ia ia iiciss		
	EIA/TIA-568 100-ohm (100m)	Weight	860a	7 219 mm	D X II X II)				
	100Base-TX: 2-pair UTP/STP Cat. 5e cable	Installation	ooog						
	EIA/TIA-568 100-ohm (100m)	Mounting	Wall mou	unting					
Protocols	CSMA/CD	MTBF	937,878 H	Hours					
LED	Per unit: Power 1 (Green), Power 2 (Green)		(MIL-HDE	3K-217)					
	Per port: Link/Active (Green)	Warranty	5 years						
	PoE Port   ED 1x   ED /per Port :	Certification							
	• PoE Output Power On : ON (Green)	EMC	CE (EN55	024, EN5503	32)				
Reverse Polarity		EMI	FCC, FCC	Part 15 Sub	part B Class	; A			
Protection	Present for power input		CE						
Overload Current Protection	Supported	Railway Traffic Fire Protection of	EN50155,	, EN50121-4					
PoE Standard	IFFE 802.3af. IFFE 802.3at	<b>Railway Vehicles</b>	EIN45545	-2					
PoE Power Budget	Maximum PoE output power budget 120W (30W/per port) Regulated PoE output voltage at 50VDC (Figure 2)	lmmunity for Heavy Industrial Environment	EN61000	-6-2					
		Emission for Heavy Industrial Environment	EN61000	-6-4					



EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	EN61000-4-4 (Burst) Level 3, Criteria A
Protection Level	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

Safety	UL60950-1 (Pending)
Shock	IEC 61373
Freefall	IEC 60068-2-32
Vibration	IEC 61373

## **Application**

Figure 1 : EN50155 PoE switch in smart Bus application



Figure 2 : High efficiency boost technology for PoE



- Regulated PoE output voltage (50VDC) to stabilize PoE device

- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (97~98%) to boost PoE output voltage

## **Dimensions**



## **Ordering Information**

Markel News		UTP Port M12	PoE Port	PoE Total	Power Input		Certif	ication		Shock Vibration	Operating
Model Name			IEEE802.3at	Power Budget					CE FCC	IEC61373	Temperature
ITP-800A-8PH24	8	8	8	120W	24/48VDC	V	V	V	V	V	-10~60°C
ITP-800A-8PHE24	8	8	8	120W	24/48VDC	V	V	V	V	V	-40~75°C

#### Model Naming Rule



#### Package List

- ITP-800A-8PH(E)24 device
- Wall mount (bound with switch device)
- Protective caps for UTP port

# **Optional Accessories**

#### Optional Cable/Connector

P/N: CAB-M12DM4-RJ45 M12 D-code Male (4-Pin) to RJ-45, AWG 24 ,IP67, 1 meter



P/N: CAB-M23F5-OPEN M23 Female (5-Pin) to open wire, (AWG 16), IP67, 1 meter



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



For FE UTP



✓ IP56, 8x 10/100Base M12 with 8x PoE (120W, 24/48VDC)
 > IP56, 6x 10/100Base M12 with 4x PoE (90W, 24/48VDC)



- 24/48VDC redundant dual input power
- Regulated PoE output voltage
- M12/M23 connector for UTP and Power
- EN50155, EN50121-4 for railway certified
- IP56 protection for water and dust



The ITP-800-8PH24 and ITP-600-4PH24 are unmanaged, Fast Ethernet, PoE switches, that provides 8 or 6 x 10/100Base-TX PoE+ Ethernet ports. The Ethernet switches are designed for industrial applications in harsh environments with Ethernet ports that utilize M12 connectors to ensure water-tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock. The ITP-800-8PH24 and ITP-600-4PH24 Ethernet switches are compliant with EN50155, covering operating temperature, power input voltage, surge, ESD, vibration, and shock, thus making these switches suitable for industrial applications in vehicle, rolling stock and factory automation.

#### **Features**

- Use M12/M23 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency (97~98%) to boost PoE output voltage to 50VDC
- Regulated PoE output voltage (50VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100 meters (Figure 2)
- Wide operating temperature -40~75°C (ITP-800-8PHE24, ITP-600-4PHE24)
- CE, FCC, EN50155 and EN50121-4 for railway certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified

#### **IEEE Standard** IEEE 802.3 10Base-T Ethernet PoE Power Budget PoE power budget 120W (30W/port) (ITP-800-8PH24) IEEE 802.3u 100Base-TX Fast Ethernet PoE power budget 90W (30W/ port) (ITP-600-4PH24) Regulated PoE output voltage at 50VDC (Figure 2) IEEE 802.3x Flow Control and Back Pressure Power Supply Provide 1x M23 (5-Pin, male) for redundant dual DC IEEE 802.3af PoE (Power over Ethernet) 24/48V (20~57VDC) input power Built-in very high efficiency (97~98%) to boost PoE IEEE 802.3at PoE<sup>+</sup> (Power over Ethernet enhancements) Back-plane (Switching Fabric): 1.6Gbps (ITP-800-8PH24) Switch output voltage to 50VDC Architecture Regulate PoE output voltage (50VDC) to stabilize PoE 1.2Gbps (ITP-600-4PH24) device, and guarantee delivery PoE power distance to (Full wire-speed) 100 meters (Figure 2) **Data Processing** Store and Forward ITP-800-8PH24 Power Flow Control Consumption IEEE 802.3x flow control, back pressure flow control Input Voltage Total Power Consumption Consumption PoF Boost Efficiency Budget MAC Address 1 K 24 VD0 3.6W 120W 98% Table 48 VDC 127W 4.3W 97% **Packet Buffer Size** 448Kbits Network 8x M12 D-code Female (ITP-800-8PH24) ITP-600-4PH24 6x M12 D-code Female (ITP-600-4PH24) Connector 10/100Base-TX auto negotiation speed -10°C~60°C (ITP-800-8PH24, ITP-600-4PH24) -40°C~75°C (ITP-800-8PHE24, ITP-600-4PHE24) Operating Auto MDI/MDI-X function Temperature Full/Half duplex Operating 5% to 95% (Non-condensing) Humidity Network Cable 10Base-T: 2-pair UTP/STP Cat. 5e cable Storage EIA/TIA-568 100-ohm (100m) -40°C~85°C Temperature 100Base-TX: 2-pair UTP/STP Cat. 5e cable Housing IP56 water-proof grade housing, and fanless EIA/TIA-568 100-ohm (100m) Dimensions 67 x 71.4 x 219.5 mm (D x W x H) Protocols CSMA/CD Weight 715g (ITP-800-8PH24) LED Per unit: Power 1 (Green), Power 2 (Green) TBD (ITP-600-4PH24) Per port: Link/Active (Green) Installation Wall mounting Mounting PoE Port LED 1x LED /per Port : • PoE Output Power On : ON (Green) 937,878 Hours (ITP-800-8PH24) **MTBF** TBD (ITP-600-4PH24) **Reverse Polarity** (MIL-HDBK-217) Present for power input Protection Warranty 5 years **Overload Current** Supported Protection **PoE Standard** IEEE 802.3af, IEEE 802.3at

# **Specifications**



Certification		EMS	EN61000-4-2 (ESD) Level 3, Criteria B			
EMC	CE (EN55024, EN55032)	(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A			
EMI	FCC, FCC Part 15 Subpart B Class A	Susceptibility)	EN61000-4-4 (Burst) Level 3, Criteria A			
	CE	Protection Level	EN61000-4-5 (Surge) Level 3, Criteria B			
Railway Traffic	c EN50155, EN50121-4		EN61000-4-6 (CS) Level 3, Criteria A			
Immunity for			EN61000-4-8 (PFMF, Magnetic Field) Field Strength:			
Heavy Industrial	EN61000-6-2		300A/m, Criteria A			
Environment			EN 61000-4-11 Voltage Dips			
Emission for		Safety	UL60950-1 (Pending)			
Heavy Industrial	EN61000-6-4	Shock	IEC 61373			
Linvironment		Freefall	IEC 60068-2-32			
		Vibration	IEC 61373			

#### **Application**

Figure 1 : EN50155 PoE switch in Smart Bus application



#### Figure 2 : High efficiency boost technology for PoE



- Regulated PoE output voltage (50VDC ) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (97~98%) to boost PoE output voltage

## **Dimensions**



# **Ordering Information**

Adv. J. J. N	Total	UTP Port M12	PoE Port	PoE Total	Power Input		Certific		Shock Vibration	Operating	
Model Name		10/100 Base-TX	IEEE802.3at	Power Budget				EN61000-6-2 EN61000-6-4	CE FCC	IEC61373	Temperature
ITP-800-8PH24	8	8	8	120W	24/48VDC	V	V	V	V	V	-10~60°⊂
ITP-800-8PHE24	8	8	8	120W	24/48VDC	V	V	V	V	V	-40~75°C
ITP-600-4PH24	6	6	4	90W	24/48VDC	V	V	V	V	V	-10~60°C
ITP-600-4PHE24	6	6	4	90W	24/48VDC	V	V	V	V	V	-40~75°C

#### Model Naming Rule



#### Package List

- One deviceProtective caps for UTP port
- Wall mount (bound with switch device)

## **Optional Accessories**

#### Optional Cable/Connector

**P/N: CAB-M12DM4-RJ45** M12 D-code Male (4-Pin) to RJ-45, AWG 24, JP67, 1 meter



For 100M UTP

P/N: CAB-M23F5-OPEN M23 Female (5-Pin) to open wire, (AWG 16), IP67, 1 meter



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



For 100M UTP

ITP-800A



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



The ITP-800A is an unmanaged, industrial grade, Fast Ethernet switch, with 8 x 10/100Base-TX Ethernet ports and is designed for industrial applications in harsh environments. The Ethernet ports utilize M12 connectors to ensure water-tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock. This switch is compliant with EN50155, covering operating temperature, power input voltage, surge, ESD, vibration, and shock, thus making it suitable for industrial applications in vehicle, rolling stock and factory automation.

#### **Features**

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

#### **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ether	net	Operating	-40°C~75°C		
	IEEE 802.3u 100Base-TX Fa	ast Ethernet	Operature			
	IEEE 802.3x Flow Control a	and Back Pressure	Humidity	5% to 95% (Non-condensing)		
Switch Architecture	Back-plane (Switching Fabric): 1.6Gbps (Full wire-speed)		Storage Temperature	-40°C~85°C		
Data Processing	Store and Forward		Housing	Rugged metal housing JP40 protection and fanless		
Flow Control	IEEE 802.3x flow control, b	back pressure flow control	Dimensions	45x 71 5x 219 mm (D x W x H)		
MAC Address Table	1 K		Weight	420g		
Packet Buffer Size	448Kbits		Installation	Wall mounting		
	8x M12 D-code Female		Mounting	Wair mounting		
	10/100Base-TX auto nego	tiation speed	MTBF	1,492,660 Hours (MIL-HDBK-217)		
	Auto MDI/MDI-X function	1	Warranty	5 vears		
	Full/Half duplex		Certification			
	Built in 2 bypass port		EMC	CE (EN55024, EN55032)		
Network Cable	10Base-T: 2-pair UTP/STP	Cat. 5e cable	EMI	ECC. ECC Part 15 Subpart B Class A. CE		
	EIA/TIA-568 100-ohm (10	0m)	Railway Traffic	EN50155 EN50121-4		
	100Base-TX: 2-pair UTP/S	TP Cat. 5e cable	Fire Protection of			
	EIA/TIA-568 100-ohm (100m)		Railway Vehicles	EN45545-2		
Protocols	CSMA/CD		Immunity for			
LED	Per unit: Power 1 (Green),	Power 2 (Green)	Heavy Industrial Environment	EN61000-6-2		
	Per port: Link/Active (Gre	en)	Emission for			
Reverse Polarity	Present for power input		Heavy Industrial Environment	EN61000-6-4		
				EN61000-4-2 (ESD) Level 3, Criteria B		
Overload Current	Supported	ed		EN61000-4-3 (RS) Level 3, Criteria A		
Protection Power Supply	Deducedant Dual DC 12/2	4/49// /9.4. (0)/DC) looput	Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A		
i owei Suppiy	neuunuant Duar DC 12/24	+/48V (8.4~00VDC) INPUL		EN61000-4-5 (Surge) Level 3, Criteria B		
Power Connector	5 Din Mala A. Cada M12			EN61000-4-6 (CS) Level 3, Criteria A		
Power	5 PITI Male A-Code MT2			EN61000-4-8 (PFMF, Magnetic Field) Field Strenath		
Consumption	Input	ITP-800A		300A/m, Criteria A		
		1.0\\/		EN 61000-4-11 Voltage Dips		
	24/DC	2.2\W	Safety	UL60950-1 (Pending)		
	48VDC	3.4W	Shock	IEC 61373		
			Freefall	IEC 60068-2-32		
			Vibration	IEC 61373		



Figure 1 : ITP Series in Onboard Train Application



**Dimensions** 





## **Ordering Information**

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



#### Package List

- ITP-800A-E device
- Protective caps for UTP port and power
- Wall mount (bound with switch device)

# **Optional Accessories**

#### Optional Cable/Connector

**P/N: CAB-M12DM4-RJ45** M12 D-code Male (4-Pin) to RJ-45, AWG 24, JP67, 1 meter



For FE UTP



P/N: CAB-M12AF5-OPEN

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



P/N: M12A-F5 M12 A-code Female (5-Pin) connector, IP67



EN50155 Ethernet Switch ITP-800A

# ITP-500 & ITP-800

IP56, 5/8x 10/100Base M12



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



The ITP-500/800 models are unmanaged, industrial grade, Fast Ethernet switches, with 5(8) 10/100Base-TX Fast Ethernet ports. This series of unmanaged Ethernet switches is designed for industrial applications in harsh environments. The Ethernet ports utilize M12 connectors to ensure water-tight, robust connections and guarantee reliable operation against environmental disturbances such as vibration and shock. These switches are compliant with EN50155, covering operating temperature, power input voltage, surge, ESD, vibration, and shock, thus making them suitable for industrial applications in vehicle, rolling stock and factory automation.

## **Features**

EN50155 Ethernet Switch ITP-500 & ITP-800

- Use M12 connector anti vibration and shock for vehicle, rolling stock, and railway applications
- Slim design (ITP-500, figure 2)
- Build-in 2 bypass port to avoid one or more nodes power fail in a bus structure to collapse the network (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)
- 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 10	Base-T Ethernet		Operating	-40°C~75°C			
	IEEE 802.3u I	OUBase-IX Fast Ethe	rnet	Temperature				
Cwitch	IEEE 802.3x F	low Control and Bac	k Pressure	Operating	5% to 95% (Non-condensing)			
Architecture	Back-plane (Switching Fabric): 1.6Gbps (ITP-800) (Full wire-speed)		Storage Temperature	-40°C~85°C				
Data Processing	Store and Fo	rward		Housing	IP56 Rugged housing, and fanless			
Flow Control	IEEE 802.3x fl	low control, back pre	essure flow control	Dimensions	43 x 30 x 206.5 mm (D x W x H) (ITP-500)			
MAC Address Table	1 K			Weight	39 x 65.1 x 191.5 mm (D x W x H) (ITP-800) 150g (ITP-500)			
Packet Buffer Size	448Kbits				300g (ITP-800)			
Network	5x M12 D-co	de Female (ITP-500)		Installation	Wall mounting			
Connector	8x M12 D-co	de Female (ITP-800)		Mounting	2 245 202 LL (ITD 500)			
	10/100Base-	TX auto negotiation	speed	MIRF	2,315,383 Hours (TTP-800) 1,492,660 Hours (TTP-800)			
	Auto MDI/M	DI-X function			(MIL-HDBK-217)			
	Full/Half dup	olex		Warranty	5 years			
	Built in 2 byp	bass port (ITP-800)		Certification				
Network Cable	etwork Cable 10Base-T: 2-pair UTP/STP Cat. 5e cable		cable	EMC	CE			
	EIA/TIA-568	100-ohm (100m)		EMI	ECC ECC Part 15 Subpart B Class A CE			
100Base-TX: 2-pair UTP/STP Cat. 5e cable		5e cable	Railway Traffic	EN50155 EN50121-4				
	EIA/TIA-568 100-ohm (100m)		Immunity for					
Protocols	CSMA/CD		Heavy Industrial	EN61000-6-2				
LED	Per unit: Pow	ver 1 (Green), Power 1	2 (Green) (ITP-800)	Environment				
	Per unit: Pow	ver (Green) (ITP-500)		Emission for	EN(1000 C 4			
	Per port: Link	k/Active (Green)		Environment	EN61000-0-4			
Reverse Polarity	Present for n	owerinput		EMS	EN61000-4-2 (ESD) Level 3, Criteria B			
Protection	riesencior p	owerinput		(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A			
Overload Current	Supported			Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A			
Protection	Deducedent	DC 12/24/40// (0			EN61000-4-5 (Surge) Level 3, Criteria B			
Power Supply	nower (ITP-8	Juai DC 12/24/48V (8 300)	3.4~60VDC) Input		EN61000-4-6 (CS) Level 3, Criteria A			
	DC 12/24/48	V (8.4~60VDC) Input	power (ITP-500)		EN61000-4-8 (PFMF, Magnetic Field) Field Strength:			
Power Connector	5 Pin Male A-Code M12			300A/m, Criteria A				
Power	Innut				EN 61000-4-11 Voltage Dips			
Consumption	Voltage	ITP-500	ITP-800	Safety	UL60950-1 (Pending)			
	12VDC	0.8W	1.8W	Shock	IEC 61373			
	24VDC	1.0W	2.2W	Freefall	IEC 60068-2-32			
	48VDC	1.9W	3.4W	Vibration	IEC 61373			


Figure 1 : ITP Series in Onboard Train Application



**Dimensions** 









Front View



## **Ordering Information**

Model Name Total Port	Total	UTP Port M12 Power Supply Certification					Shock Vibration	Operating	
	Port		12/24/48VDC (8.4~60VDC)				CE IEC61373 FCC		
ITP-500-E	5	5	1	V	V	V	V	V	-40~75°C
ITP-800-E	8	8	2	V	V	V	V	V	-40~75°C

Rear View

#### Model Naming Rule



#### Package List

- ITP-500 or ITP-800 device
- Protective caps for UTP port and power
- Wall mount (bound with switch device)



#### Optional Cable/Connector

#### P/N: CAB-M12DM4-RJ45 M12 D-code Male (4-Pin) to RJ-45,

AWG 24 ,IP67, 1 meter



For FE UTP

P/N: CAB-M12AF5-OPEN M12 A-code Female (5-Pin) to open wire, AWG 22, IP67, 1 meter



### P/N: M12D-M4 M12 D-code Male (4-Pin)



**P/N: M12A-F5** M12 A-code Female (5-Pin) connector, IP67



For Power

# PoE Series

Stability and Efficiency in IP Surveillance Networks

## **Industrial Regulate PoE Managed Switch**

Boost and Regulate PoE Output to stabilize PoE device Advanced PoE Management–Auto Test & Auto Reset PD, Scheduling SmartView<sup>™</sup> Management System SmartConfig<sup>™</sup> Tool for Quick & Easy Setting µ–Ring, Sub–Ring, µ–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 to fulfill different application needs. All industrial PoE models are fanless and designed in robust IP30 housings that make them ideal for din rail installation or wall mounting. Additionally, PoE models all support IEEE 802.3af/802.3at standards which are able to provide up to 30W (use 50VDC or above input voltage) power supply per port. With power boost and regulation technology, PoE devices can offer 24~48V input range to provide the required 55V PoE output voltage for IEEE 802.3at.

## High efficiency boost technology for PoE

- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guaranteed delivery of PoE power distance to 100 meter
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage



## Remote PD Auto Test & Reset

- PoE PD failure auto checking, and auto reset when PD fail.
- The feature helps to reduce operational expenses.



## Power Over Ethernet Solutions

#### Industrial Gigabit PoE Injector

- Provides 1 port IEEE 802.3at/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
- Heavy industrial grade CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- Wide operating temperature -40 ~ 75°C model available



#### Industrial PoE LAN Extender

- Long transmission data and power feeding distance up to 1200 meter
- · Simultaneous transmission of Ethernet data and PoE over 2 wire RJ-11 or coaxial cable
- Supports 4 complies IEEE 802.3at PoE port
- Feeds power to Remote unit from Local power supply
- Easy cabling for quick installation, plug and play
- · Quick deployment and easy maintenance



#### **Industrial Gigabit Passive PoE Injector**

- Provides 1 port Passive PoE Injector
- Maximum PoE budget 30W (2-pair), 60W (4-pair)
   Supports 10/100/1000Base-T
- Power input range 24~57VDC
- Heavy industrial grade CE, FCC, EN50121-4, EN61000-6-2, EN61000-6-4 certified
- Fanless, IP30 rugged metal housing, operating temperature -40 ~ 75°C



#### Industrial Passive PoE Converter

- Converts IEEE802.3af/at PoE Input to Passive PoE Output
- Supports standard PoE IEEE802.3af/at PD mode of 15.4W/30W power input
- Selectable passive PoE output voltage on 12/19/24VDC and A mode (1,2,3,6)/B mode (4,5,7,8)
- Compliant with 10/100/1000Base-T(X)
- Heavy industrial grade CE, FCC, EN50121-4 , EN61000-6-2, EN61000-6-4 certified
- Fanless, IP30 rugged metal housing, operating temperature -40 ~ 75°C



#### Industrial Media Converter with PoE

- Conversion between 10/100/1000Base-T Copper and 100/1000Base-X Fiber Ethernet port
- Supports dual rate SFP slot for 100Mbps/1Gbps Fiber module
- Provides 1 port IEEE 802.3af/at PoE PSE/Injector (up to 30Watts)
- Dual power input 12/24/48VDC for failover and high efficiency booster for PoE output Supports Remote PD reset by fiber port link down/up
- · Supports LFPT (Link Fault Pass Through)



#### Industrial PoE Splitter

- Splits DC Power and Data from PoE Input
- Output power range 12VDC/1.4A, 19VDC/1.05A, or 24VDC/0.85A
- Selectable output voltage 12/19/24VDC
- Supports PoE IEEE802.3af/at both A mode (1,2,3,6) and B mode (4,5,7,8)
- Compliant with 10/100/1000Base-T(X)
- Fanless, IP30 rugged metal housing, operating temperature -40 ~ 75°C





## IGS-1608SM-16PH & IGS-1608SM-8PH & IGS+803SM-8PH

- ▲ 16x GbE RJ45 + 8x 100/1000Base SFP with 16x PoE (400W, 48VDC)
- 16x GbE RJ45 + 8x 100/1000Base SFP with 8x PoE (240W, 48VDC)
- ▶ 8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE (240W, 48VDC)



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



These models are managed, industrial grade, L2 Gigabit PoE (Power over Ethernet) switches that provide 4/8/16x 10/100/1000Base-T ports plus 8/3 100/1000Base-X SFP ports with 16/8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. 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) to fulfill the special needs of industrial automation applications.

### **Features**

- 48VDC (44~57VDC) redundant dual input power
- Provides 16 port IEEE 802.3af / 802.3at PoE+ output ,30W per port, total 400W (IGS-1608SM-16PH)
- Provides 8 port IEEE 802.3af / 802.3at PoE+ output ,30W per port , total 240W (IGS-1608SM-8PH, IGS+803SM-8PH)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- $\bullet$   $\mu\text{-Ring}$  for redundant cabling, recovery time<10ms in 250 devices
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE <sup>+</sup> (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)
	ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE802.3ac	Max frame size extended to 1522Bytes
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
	IEEE 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)

Switch Architecture	Back-plane (Switching Fabric): 48Gbps (IGS-1608SM-16PH, IGS-1608SM-8PH) 22Gbps (IGS+803SM-8PH) Full wire-speed
Data Processing	Store and Forward
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
Network Connector	16x 10/100/1000Base-T RJ-45 + 8x 100/1000Base-X SFP connector (IGS-1608SM-16PH, IGS-1608SM-8PH) 8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFP connector (IGS+803SM-8PH) RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function, SFP port supports 100/1000 dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	16x IEEE 802.3af /IEEE 802.3at (IGS-1608SM-16PH) 8x IEEE 802.3af /IEEE 802.3at (IGS-1608SM-8PH, IGS <sup>+</sup> 803SM-8PH) 2 pairs PoE, PoE <sup>+</sup> , 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported



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Power Supply	Redundant power, (Rer (50~57V inp PoE <sup>+</sup> applic	Temperat Housing Dimension			
Power Consumption	IGS-1608SN TBD	I-16PH			Weight
	IGS-1608SN	1-8PH Power c	onsumption		
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Installatio Mounting
	50VDC	255.2W	15.2W	240W	MTBF
	IGS+803SM-8	8PH Power con:	sumption & Boos	er efficiency	
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	
	50VDC	255.5W	15.5W	240W	Warranty
PoE Power Budget	Maximum F Total 240W Total 400W	PoE Output po ( IGS-1608SM- ( IGS-1608SM-	wer budget 30 8PH, IGS+803S 16PH)	)W / Per Port M-8PH)	Certificati EMC EMI
LED	Per unit: Po (Amber), CP	(Electrom Interferen Railway Tr			
		Traffic cor			
	SFP Fiber Pe PoF Port LF	Immunity Heavy Ind			
	PoE Outp     PoE Outp	Environm			
Jumbo Frame	9.6KB				Environm
IEEE802.3ac	Max frame in packet)	size extended	to 1522Bytes (a	allow Q-tag	EMS (Electrom
MAC Address Table	8K	Susceptib			
Memory Buffer	512K Bytes f	for packet buf	fer		Protection
Warning Message	System Sysl relay	og, SMTP/ e-n	nail event mess	age, alarm	EMS
Alarm Relay Contact	Relay outpu @24VDC	Susceptib			
Removable Terminal Block	Provide 2 re	Safety			
Operating	-10 ~ 60°C (				
remperature	-40 ~ 75°C (	Surge prot			
	10 /0 0(	IGS+803SM-81	PHE)		Shock
Operating Humidity	5% to 95% (	Non-condens	ing)		Freefall Vibration

Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	135.6x 99x 160mm (Dx Wx H) (IGS-1608SM-16PH) 116 x 92 x 160mm (Dx Wx H) (IGS-1608SM-8PH) 106 x 72 x 152 mm (D x W x H) (IGS <sup>+</sup> 803SM-8PH)
Weight	1.95kg (IGS-1608SM-16PH) 1.375kg (IGS-1608SM-8PH) 0.85kg (IGS+803SM-8PH)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	436,353 Hours (IGS-1608SM-16PH) 439,881 Hours (IGS-1608SM-8PH) 487,189 Hours (IGS <sup>+</sup> 803SM-8PH) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	EN50121-4
Traffic control	NEMA TS2 (IGS+803SM-8PH)
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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
EMS	EN61000-4-6 (CS) Level 3, Criteria A
(Electromagnetic Susceptibility) Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	EN62368-1 (IGS-1608SM-16PH) UL60950-1, EN60950-1 (IGS-1608SM-8PH, IGS <sup>+</sup> 803SM-8PH)
Surge protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Software Specifications**

CPU Watch Dog

Supported

Topology								
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID							
	IEEE 802.1q VLAN,up to 4094 Groups							
	IEEE 802.1ad Q-in-Q							
	MAC-based VLAN,up to 256 entries							
	IP Subnet-based VLAN, up to 128 entries							
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries							
	VLAN Translation, up to 256 entries							
	GVRP (GARP VLAN Registration Protocol)							
	MVR (Multicast VLAN Registration)							
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group							
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group							
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP							
Multiple μ-Ring	up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250 (Please see CTC Union $\mu$ -Ring white paper for more details and more topology application)							
Loop Protection	Supported							
ITM-T G.8032 / Y.1344 ERPS	Recovery time <50ms							
(Ethernet Ring Protection )	Single Ring, Sub-Ring, Multiple ring topology network							
QoS Features								
Class of Service	IEEE 802.1p 8 active priorities queues for per port							

Traffic Classification QoS	IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS				
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI				
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number				
Bandwidth	Rate in steps :1 kbps / Mbps / fps / kfps				
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps				
ingress	Rate Unit : bit or frame				
Bandwidth	Rate in steps : 1 kbps / Mbps				
Control for Egress	Range : 100 kbps to 1Gbps				
	Rate Unit : bit				
	Per queue / Per port shaper				
DiffServ (RF 2474)	Remarking				
Storm Control	for Unicast, Broadcast, Multicast				
<b>IP Multicasting Fea</b>	atures				
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2				
Snooping	Port Filtering Profile				
	Throttling				
	Fast Leave				
	Maximum Multicast Group : up to 1022 entries				
	Query / Static Router Port				
Security Features					
IEEE 802.1X	Port-Based				
	MAC-Based				
ACL	Number of rules : up to 256 entries				
	for L2 / L3 / L4 L2 : Mac address SA /DA //LAN				
	L3: IP address SA/DA, Subnet L4: TCP/UDP				

RADIUS authentica	ation & accounting	IPv6 Features			
TACACS+ authenti	cation & accounting, TACACS+ 3.0	IPv6 Management	Telnet Server/ICMP v6		
HTTPS, HTTP	Supported	SNMP over IPv6	Supported		
SSL / SSH v2	Supported	HTTP over IPv6	Supported		
User Name	Local Authentication	SSH over IPv6	Supported		
Authentication	Remote Authentication (via RADIUS / TACACS+)	IPv6 Telnet	Supported		
Management		IPv6 NTP, SNTP	Server/Client		
Interface Access	Web, Telnet / SSH , CLI RS-232 console	IPv6 TFTP	Supported		
Management Feat	lires	IPV6 Q05	Supported		
CII	Cisco® like CL	IPv6 ACL	Number of rules: up to 256 entries		
Web Based Manag	ement		for L2 / L3 / L4		
Telnet	Server		I 3: IP address SA/DA/ VLAN		
SNMP	V1 V2c V3		L4: TCP/UDP		
EtherNet/IP	Supports for management and monitoring	Others Features			
Modbus/TCP	Supports for management and monitoring	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)		
SW & Configuration Upgrade	TFTP, HTTP Redundant firmware in case of upgrade failure		Determine the cable length and lowering the power for ports with short cables		
FTP client	Supports for upload/download configuration		Lower the power for a port when there is no link		
RMON	RMONT(1, 2, 3, 9 group) RMONT		LED Power Management :Adjustment LEDs intensity		
MIB	REC1213 MIB II. Private MIB	Cable Diagnostic	Measuring UTP cable normal or broken point distance		
UPnP	Supported	Advanced PoE			
BOOTP	Supported	Management	PoE PD failure auto checking, and auto reset when PD fail		
DHCP	Server, Client, Relay, Relay option 82, Snooping		PoE port on/off weekly scheduling		
RARP	Supported		PoE Enable/Disable		
IP Source Guard	Supported		Power limit by classification		
Port Mirroring	Supported		Power feeding priority		
Event Syslog	Syslog server (RFC3164) (Support 1 server )		maximum 400W for IGS-1608SM-16PH.		
Warning Message	System syslog, e-mail, alarm relay		240W for IGS-1608SM-8PH and IGS+803SM-8PH		
DNS	Client, Proxy				
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave				

## **Application**

NTP, SNTP

LLDP (IEEE 802.1ab)

Figure 1 : Application Example

Server/Client

LLDP-MED

Link Layer Discovery Protocol



6

## **Dimensions**

▶ IGS-1608SM-16PH



(Optional accessory)

(Optional accessory)

▶ IGS-1608SM-8PH



► IGS+803SM-8PH



## **Ordering Information**

		UTP	Fiber	PoE	Port	Input power			Certifica	tion		o
Model Name	Port	10/100/1000 Base-T	100/1000 Base-X	IEEE802.3at	Power Budget	Redundanta	Railway EN50121-4	NEMA TS2	Safety EN62368-1	Safety EN60950-1 UL60950-1	CE, FCC EN61000-6-2 EN61000-6-4	Operating Temperature
IGS-1608SM-16PH	24	16	8 SFP	16	400W	48VDC	V		V		V	-10~60°C
IGS-1608SM-16PHE	24	16	8 SFP	16	400W	48VDC	V		V		V	-40~75℃
IGS-1608SM-8PH	24	16	8 SFP	8	240W	48VDC	V			V	V	-10~60°C
IGS-1608SM-8PHE	24	16	8 SFP	8	240W	48VDC	V			V	V	-40~75℃
IGS <sup>+</sup> 803SM-8PH	11	8	3 SFP	8	240W	48VDC	V	V		V	V	-10~60°C
IGS <sup>+</sup> 803SM-8PHE	11	8	3 SFP	8	240W	48VDC	V	V		V	V	-40~75°C

#### Model Naming Rule





E: -40~75°C blank : -10~60°C

## **Optional Accessories**

#### Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- Din Rail with screws
- Terminal blockProtective caps for SFP ports
- Wall mount kit

IND-WMK02 Wall Mount kit for Industrial product (Wide) (184 x 50mm) (For IGS<sup>+</sup>803SM-8PH)

IND-WMK04 Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs) (IGS-1608SM-16PH, IGS-1608SM-8PH)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





## IGS+803SM-8PH24

#### 8x GbE RJ45 + 3x 100/1000Base SFP with 8x PoE (180W, 24/48VDC)



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



IGS+803SM-8PH24 is a managed, industrial grade, L2 Gigabit PoE (Power over Ethernet) switch that provides 8x 10/100/1000Base-T ports plus 3x 100/1000Base-X SFP ports with 8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. The switch can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) to fulfill the special needs of industrial automation applications.

## **Features**

- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster (94~97%) to rise up 52VDC for PoE output (Figure 2)
- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)
- Provides 8 port IEEE 802.3af / 802.3at PoE+ output ,30W per port , total 180W
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

-						
Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processing	Store and Forward		
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for		
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over				
		1000Base V. Chit /s Ethernet ever	Network	8x 10/100/1000Base-T RJ-45 + 3x 100/1000Base-X SFF		
	IEEE 802.3z	Fiber-Optic	connector	RJ-45 UTP port supports Auto negotiation speed,		
	IEEE 802.3af	PoE (Power over Ethernet)		Auto MDI/MDI-X function, SEP port supports 100/1000 dual speed with DDMI		
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancements)	Console	RS-232 (RJ-45)		
	IEEE 802.1d	STP (Spanning Tree Protocol)	PoE standard &	8x IEEE 802.3af /IEEE 802.3at		
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	RJ-45 Pin	2 pairs PoE, PoE <sup>+</sup> , 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2.		
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Assignment			
	ITM-T G.8032 /	ITM-T G.8032 / ERPS (Ethernet Ring Protection		Negative (V-) : RJ-45 pin 3, 6.		
	Y.1344	Switching)	Network Cable	UTP/STP above Cat. 5e cable		
	IEEE 802.1Q	Virtual LANs (VLAN)		EIA/TIA-568 100-ohm (100m)		
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Protocols	CSMA/CD		
	IEEE802.3ac	Max frame size extended to 1522Bytes	Reverse Polarity Protection	Supported for power input		
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Overload Current Protection	Supported		
	IEEE 802.3x	Flow control for Full Duplex	CPU Watch Dog	Supported		
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Power Supply	Redundant Dual DC 24/48V (20~57VDC) input		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		power, (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise		
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)		up 52VDC for POE output Regulated PoE output voltage (52VDC) to stabilize		
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		PoE device, and guarantee delivery PoE power		
Switch Architecture	Back-plane (Sv Full wire-spee	vitching Fabric): 22Gbps d		distance to 100meter (Figure 2)		

## **CTC**<sup>®</sup>

## Industrial Managed GbE PoE Switch

Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency		
	24VDC	194.2W	10.8W	180W	97%		
	48VDC	196W	11.5W	180W	97%		
PoE Power Budget	Maximur Total 180	n PoE Outp W	ut power b	udget 30W	/ / Per Port		
LED	Per unit: l (Amber),	Power 1 (Gr CPU Act (G	een), Powe reen), Ring	r 2 (Green), Master (Yel	Fault low)		
	Per RJ-45	port: 10/10 1000	0 Link/Acti Link/Active	ve (Green) e (Amber)			
	SFP Fiber	Per port: Li	ink/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) : Elash Itimes /sec (Green)						
Jumbo Frame	9.6KB						
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)						
MAC Address Table	8K						
Memory Buffer	512K Bytes for packet buffer						
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay						
Alarm Relay Contact	Relay out @24VDC	puts with c	urrent carr	ying capac	ity of 1 A		
Removable Terminal Block	Provide 2	redundant	power, alar	m relay cor	ntact, 6 Pin		
Operating Temperature	-10 ~ 60°C (IGS+803SM-8PH24) -40 ~ 75°C (IGS+803SM-8PHE24)						
Operating Humidity	5% to 959	% (Non-cor	idensing)				
Storage Temperature	-40 ~ 85°C						
Housing	Rugged Metal, IP30 Protection, Fanless						

## 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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms The maximum number of devices allowed in a Ring
	(Please see CTC Union $\mu$ -Ring white paper for more details and more topology application)
Loop Protection	Supported
LOODFIDIECTION	3UDD01E0
ITM-T G.8032 /	
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) QoS Features	Single Ring, Sub-Ring, Multiple ring topology network
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service Traffic Classification QoS Bandwidth	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingrees	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps :1 kbps / Mbps
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps :1 kbps / Mbps Range : 100 kbps to 1Gbps

Per queue / Per port shaper

Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.86kg (IGS <sup>+</sup> 803SM-8PH24)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	528,753 Hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Emission for Heavy Industrial Environment EMS	EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B
Emission for Heavy Industrial Environment EMS (Electromagnetic Succentibility)	EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level	EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level	EN61000-6-4 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
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS	EN61000-6-4 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
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level	EN61000-6-4 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
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level Safety	EN61000-6-4 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 UL60950-1, EN60950-1
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level Safety Surge protection	EN61000-6-4 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 UL60950-1, EN60950-1 4KV for PoE, UTP and Fiber ports
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level Safety Surge protection Shock	EN61000-6-4 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 UL60950-1, EN60950-1 4KV for PoE, UTP and Fiber ports IEC 60068-2-27
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level Safety Surge protection Shock Freefall	EN61000-6-4 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 UL60950-1, EN60950-1 4KV for PoE, UTP and Fiber ports IEC 60068-2-27 IEC 60068-2-32
Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS (Electromagnetic Susceptibility) Protection Level Safety Surge protection Shock Freefall Vibration	EN61000-6-4 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 UL60950-1, EN60950-1 4KV for PoE, UTP and Fiber ports IEC 60068-2-27 IEC 60068-2-32 IEC 60068-2-6

DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fe</b>	atures
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
	Ouery / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>RADIUS</b> authentic	ation & accounting
TACACS+ authent	ication & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	tures
CLI	Cisco® like CLI
Web Based Manag	gement
Telnet	Server
SNMP	V1, V2c, V3
EtherNet/IP	Supports for management and monitoring
Modbus/TCP	Supports for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported

6



Warning Message	System syslog, e-mail, alarm relay	Green Ethernet	Supports IEEE 802 3az EEE (Energy Efficient Ethernet)
DNS	Client, Proxy	Green Ethernet	Management to optimize the power consumption
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock,		Determine the cable length and lowering the power for ports with short cables
	End to End Transparent Clock, Master, Slave		Lower the power for a port when there is no link
NTP, SNTP	Server/Client		LED Power Management : Adjustment LEDs intensity
LLDP (IEEE	Link Layer Discovery Protocol	Cable Diagnostic	Measuring UTP cable normal or broken point distance
802.1ab)	LLDP-MED	Advanced PoE	······································
IPv6 Features		Management	DoE DD failure auto checking, and auto recet when DD fail
IPv6 Management	Telnet Server/ICMP v6	Management	PoE port on/off weekly scheduling
SNMP over IPv6	Supported		PoE Configuration
HTTP over IPv6	Supported		PoE Enable/Disable Dower limit by classification
SSH over IPv6	Supported		Power feeding priority
IPv6 Telnet	Supported		Total PoE Power budge limitation:
IPv6 NTP, SNTP	Server/Client		maximum 180W
IPv6 TFTP	Supported		

## **Application**

BOOTP

DHCP

RARP

**IP Source Guard** 

Port Mirroring

**Event Syslog** 

Supported

Supported

Supported

Supported

Figure 1 : Application Example



#### Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

6

## **Dimensions**







**Front View** 

**Rear View** 

DIN-Rail Kit View

Wall-Mount Kit View (Optional accessory)

 $\Leftrightarrow$ 

 $\langle \rangle$ 

## **Ordering Information**

	Terel	UTP	Fiber	PoE	Port	Input power			Certifica	tion		0
Model Name	Port	10/100/1000 Base-T	100/1000 Base-X	IEEE802.3at	Power Budget	Redundant	Railway EN50121-4	NEMA TS2	Safety EN60950-1	Safety UL60950-1	CE, FCC EN61000-6-2 EN61000-6-4	Temperature
IGS <sup>+</sup> 803SM-8PH24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-10~60°C
IGS <sup>+</sup> 803SM-8PHE24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75℃

#### Model Naming Rule



## **Optional Accessories**

#### Package List

- One device of the series
- Terminal block
- Console cable (RJ-45 to DB9)
- Protective caps for SFP ports
- Din Rail with screws

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





#### 4x GbE RJ45 + 2x 100/1000Base-X SFP with 4x 60W PoE (240W, 48VDC)



IGS-402SM-4PU is a managed, industrial grade, L2 Gigabit PoE (Power over Ethernet) switch that provides 4x 10/100/1000Base-T ports plus 2x 100/1000Base-X SFP ports with 4x PoE Ports. The PoE features enable power and data to be transferred via a single cable, thereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. The switch can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) to fulfill the special needs of industrial automation applications.

#### **Features**

- 48VDC (44~57VDC) redundant dual input power
- Provides 4 port IEEE 802.3af / 802.3at PoE+ output, 60W per port, total 240W
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE <sup>+</sup> (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)
	ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE802.3ac	Max frame size extended to 1522Bytes
	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 (Sw Full wire-speed	itching Fabric): 12Gbps I
Data Processing	Store and Forw	vard

Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode					
Network Connector	4x 10/100/100 connector RJ-45 UTP po Auto MDI/ME SFP port supp	4x 10/100/1000Base-T RJ-45 + 2x 100/1000Base-X SFP connector RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function, SFP port supports 100/1000 dual speed with DDMI				
Console	RS-232 (RJ-45	)				
PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3a 4 pairs PoE, 60 End-Span, Alt Positive (V+) : Negative (V-)	at/ 802.3af Pol OW/port ernative A an RJ-45 pin 1, 2 : RJ-45 pin 3,	<u>=</u> + d B mode. , 4, 5 6, 7, 8			
Network Cable	UTP/STP abov	ve Cat. 5e cab	le			
	EIA/TIA-568 1	00-ohm (100	m)			
Protocols	CSMA/CD	CSMA/CD				
Reverse Polarity Protection	Supported fo	Supported for power input				
Overload Current Protection	Supported					
CPU Watch Dog	Supported					
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE802.3at PoE <sup>+</sup> in 30W/ 60W applications)					
Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget		
	50VDC	249.6W	9.6W	240W		
PoE Power Budget	Maximum PoE Output power budget <b>60W / Per Port</b> Total 240W					





LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)
	Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)
	SFP Fiber Per port: Link/Active (Green)
	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit,Port failed at Startup) : Flash 1times /sec (Green)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS-402SM-4PU) -40 ~ 75°C (IGS-402SM-4PUE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.7kg

## **Software Specifications**

lopology	
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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings
	Recovery time <10ms
	The maximum number of devices allowed in a Ring
	(Please see CTC Union u-Ring white paper for more details
	and more topology application)
Loop Protection	Supported
ITM-T G.8032 /	Recovery time <50ms
(Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology network
FIOLECTION)	
QoS Features	
QoS Features Class of Service	IEEE 802.1p 8 active priorities queues for per port
QoS Features Class of Service Traffic Classification QoS	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS
QoS Features Class of Service Traffic Classification QoS	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
QoS Features Class of Service Traffic Classification QoS	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
QoS Features Class of Service Traffic Classification QoS	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit or frame Rate Unit : bit Per queue / Per port shaper
QoS Features Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b>

Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	589,078 Hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
EMS	EN61000-4-6 (CS) Level 3, Criteria A
(Electromagnetic Susceptibility) Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Surge protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

#### **IP Multicasting Features**

IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling
	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
<b>Security Features</b>	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
RADIUS authentic	ation & accounting
TACACS+ authenti	ication & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
Management Feat	tures
CLI	Cisco® like CLI
Web Based Manag	jement
Teinet	Server
SNMP	V1, V2c, V3
EtherNet/IP	Supports for management and monitoring
Modbus/TCP	Supports for management and monitoring
SW &	IFIP, HI IP
Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server Client Relay Relay ontion 82 Spooning
	Server, elient, neidy, neidy option 62, shooping
RARP	Supported
RARP IP Source Guard	Supported Supported

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maximum 240W



Event Syslog	Syslog server (RFC3164) (Support 1 server )	IPv6 ACL	Number of rules: up to 256 entries				
Warning Message	System syslog, e-mail, alarm relay		for L2 / L3 / L4				
DNS	Client, Proxy		L2 : Mac address SA/DA/VLAN				
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary Roundary Poor to Poor Transparent Clock		L3: IP address SA/DA, Subnet L4: TCP/UDP				
	End to End Transparent Clock, Master, Slave	Others Features					
NTP, SNTP	Server/Client	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)				
LLDP (IEEE	Link Layer Discovery Protocol						
802.1ab)	LLDP-MED		for ports with short cables				
IPv6 Features			Lower the power for a port when there is no link				
IPv6 Management	Telnet Server/ICMP v6		LED Power Management : Adjustment LEDs intensity				
SNMP over IPv6	Supported	Cable Diagnostic	Measuring LITP cable, normal or broken point distance				
HTTP over IPv6	Supported	Advanced PoE	measuring officially include from a provent point abance				
SSH over IPv6	Supported	Management	PoE PD failure auto checking, and auto reset when PD fail				
IPv6 Telnet	Supported		PoE port on/off weekly scheduling				
IPv6 NTP, SNTP	Server/Client		PoE Configuration				
IPv6 TFTP	Supported		PoE Enable/Disable Dower limit by classification				
IPv6 QoS	Supported		Power feeding priority				
			lotal PoE Power budge limitation:				

## **Application**

Figure 1 : Application Example



## **Dimensions**





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## **Optional Accessories**

#### Package List

- One device of the series
- Terminal block
- Console cable (RJ-45 to DB9)
- Protective caps for SFP ports
- Din Rail with screws

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





## IGS-803SM-8PH24 & IGS-402SM-4PH24

◆8x GbE RJ45 + 1x 100/1000 SFP + 2x 100M/1G/2.5G SFP with 8x PoE (180W, 24/48VDC)
◆4x GbE RJ45 + 1x 100/1000 SFP + 1x 100M/1G/2.5G SFP with 4x PoE (120W, 24/48VDC)



- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- EN50121-4, UL60950-1, EN60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail



These Gigabit Ethernet switch models are managed industrial grade L2 switches with 8/4 10/100/1000Base-T ports and 3/2 GbE/100M SFP ports which also supports PoE+/PSE and provide stable and reliable transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking. They are an ideal solution for Smart City, surveillance, Intelligent traffic control systems, production automation applications and support up to 8/4 PoE/PoE+ (IEE 802.3af/IEEE 802.3at) ports which can provide 15.4/30watts power output per port for connecting with heavy-duty industrial PoE devices, such as PTZ IP surveillance cameras, high-performance wireless access points, digital signage and IP phones. (See Figure). 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**

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)
- Provides 4/8 port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processing	Store and Forward				
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for				
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair	Network	half duplex mode 4x 10/100/1000Base-T RJ-45 + 1x FE/GbE SEP slot+ 1x				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Connector	FE/GbE/2.5G SFP slot (IGS-402SM-4PH24) 8x 10/100/1000Base-T RJ-45 + 1x FE/GbE SFP slot + 2x				
	IEEE 802.3cb	2.5GBase-X		FE/GbE/2.5G SFP slot (IGS-803SM-8PH24)				
	IEEE 802.3af	PoE (Power over Ethernet)		RI-45 LITP port support Auto pegotiation speed				
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancements)		Auto MDI/MDI-X function, SEP ports support 100/1000 or 2 5G with DDMI				
	IEEE 802.1d	STP (Spanning Tree Protocol)	PoE standard &	4x IFFF 802.3af /IFFF 802.3at PoF+				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)	RJ-45 pin	(IGS-402SM-4PH24) 8x IEEE 802.3af /IEEE 802.3at PoE <sup>+</sup> (IGS-803SM-8PH24) End-Span, Alternative A mode.				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	assignment					
	ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)						
	IEEE 802.1Q	Virtual LANs (VLAN)		Positive (V+) : RJ-45 pin 1, 2.				
	IEEE 802.1X	Port based and MAC based Network		Data (1,2,3,6,4,5,7,8)				
	IEEE802 3ac	Max frame size extended to 1522Bytes	Console	RS-232 (RJ-45)				
	ILLLOUZ.Jac	Link aggregation for parallel links with	Network Cable	UTP/STP above Cat. 5e cable				
	IEEE 802 3ad	LACP(Link Aggregation Control		EIA/TIA-568 100-ohm (100m)				
	1222 0021044	Protocol)	Protocols	CSMA/CD				
	IEEE 802.3x	Flow control for Full Duplex	<b>Reverse Polarity</b>	Supported for power input				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Protection					
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Overload Current Protection	Supported				
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	CPU Watch Dog	Supported				
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power				
Switch Architecture	Back-plane (Sv 15Gbps (IGS-4 28Gbps (IGS-8 Full wire-spee	vitching Fabric): 02SM-4PH24) 03SM-8PH24) d		(Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power				

## Industrial 1G/2.5G Managed PoE Switch

Power	IGS-402SM-4PH24								
Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency				
	24VDC	135.2W	7.5W	120W	94.0%				
	48VDC	132.5W	9W	120W	97.2%				
	IGS-803SM-8PH24								
	Input Voltage	Input Total Power Voltage Consumption		PoE Budget	Boost Efficiency				
	24VDC	200.2W	9.2W	180W	94%				
	48VDC	195.1W	9.8W	180W	97%				
PoE Power Budget	Maximur 120W (IG 180W (IG	Maximum PoE Output power budget 30W / Per Pc 120W (IGS-402SM-4PH24) 180W (IGS-803SM-8PH24)							
LED	Per unit:	Power 1 (Gr	reen), Power	2 (Green),	Fault				
	(Amber),	CPU Act (G	reen), Ring I	Master (Yel	low)				
	Per RJ-45	port: 10/10 1000	)0 Link/Active Link/Active	ve (Green) (Amber)					
	SFP Fiber	Per port: L	ink/Active (	Green)					
	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit,Port failed Startup) : Flash 1times /sec (Green) • PoE Output Power Off : Off								
Jumbo Frame	9.6KB								
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)								
MAC Address Table	8K								
Memory Buffer	512K Bytes for packet buffer								
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relav								
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°0 -40 ~ 75°	C (IGS-402S) C (IGS-402S	M-4PH24, IG SM-4PHE24,	iS-803SM-8 IGS-803SN	3PH24) 1-8PHE24)				
Operating Humidity	5% to 959	% (Non-cor	ndensing)						

## **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	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Supported
ITM-T G.8032 /	Recovery time <50ms
Y.1344 ERPS	,
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
<b>Classification QoS</b>	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	Rate in steps :1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame

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 (Optional)
MTBF	674,963 Hours (IGS-402SM-4PH24) 466,542 Hours (IGS-803SM-8PH24) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	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

Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	atures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4. TCP/UDP
DADILIC suith suitise	
RADIUS authentica	ation & accounting TACACS+ 3.0
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RADIUS authentica TACACS+ authentica HTTPS, HTTP SSL / SSH v2 User Name Password Authentication Management Interface Access Filtering <b>Management Feat</b> CLI Web Based Manag Telnet SNMP EtherNet/IP ModBus/TCP SW & Configuration Upgrade	ation & accounting cation & accounting, TACACS+ 3.0 Supported Supported Local Authentication Remote Authentication (via RADIUS / TACACS+) Web, Telnet / SSH, CLI RS-232 console ures Cisco® like CLI ement Supports for management and monitoring V1, V2c, V3 Supports for management and monitoring Supports management and monitoring TFTP, HTTP Redundant firmware in case of upgrade failure



RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported

IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management : Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable normal or broken point distance
Advanced PoE	
Management	PoE PD failure auto checking ,and auto reset when PD fail
	PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power limit by management Power feeding priority Total PoE Power budge limitation (maximum 120W for IGS-402SM-4PH24_180W for IGS-803SM-8PH24)

## **Application**



#### Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

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## Dimensions



► IGS-402SM-4PH24



## **Ordering Information**

		UTP	F	iber	PoEl	Port	Input power			Certificatio	on		<b>A 1</b>
ModelName	Port	10/100/1000 Base-T	100/1000 Base-X	100/1000/ 2.5GBase-X	IEEE802.3at	Power Budget	Redundant	Railway EN50121-4	Traffic Control NEMA TS2	Safety EN60950-1	Safety UL60950-1	CE,FCC EN61000-6-2 EN61000-6-4	Operating Temperature
IGS-803SM-8PH24	11	8	1 SFP	2 SFP	8	180W	24/48VDC	V	V	V	V	V	-10~60°C
IGS-803SM-8PHE24	11	8	1 SFP	2 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75°C
IGS-402SM-4PH24	6	4	1 SFP	1 SFP	4	120W	24/48VDC	V	V	V	V	V	-10~60°C
IGS-402SM-4PHE24	6	4	1 SFP	1 SFP	4	120W	24/48VDC	V	V	V	V	V	-40~75℃



(Optional accessory)

## **Optional Accessories**

#### Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- Din Rail with screws
- Terminal blockProtective caps for SFP ports
- /s

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





## IFS-1608GSM-16PH & IFS-1608GSM-8PH

- ▲16x 10/100Base RJ45 + 8x 100/1000Base SFP with 16x PoE (400W, 48VDC)
- ▶ 16x 10/100Base RJ45 + 8x 100/1000Base SFP with 8x PoE (240W, 48VDC)
- NEW



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



These models are managed, industrial grade, L2 PoE (Power over Ethernet) switches that provide16x 10/100Base-TX ports plus 8x 100/1000Base-X SFP ports with 16/8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, hereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. 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) to fulfill the special needs of industrial automation applications.

## **Features**

- 48VDC (44~57VDC) redundant dual input power
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output ,30W per port, total 400W (IFS-1608GSM-16PH)
- Provides 8-port IEEE 802.3af / 802.3at PoE+ output ,30W per port , total 240W ( IFS-1608GSM-8PH)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management Tool\*

\*Please see Chapter 1- Software Management for more details

## **Specifications**

IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processi
IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Flow Control
IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Network
IEEE 802.3af	PoE (Power over Ethernet)	Connector
IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancements)	
IEEE 802.1d	STP (Spanning Tree Protocol)	
IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Console
IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	PoE standard
ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	RJ-45 Pin Assignment
IEEE 802.1Q	Virtual LANs (VLAN)	
IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	
IEEE 802.3ac	Max frame size extended to 1522Bytes	
IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Network Cab
IEEE 802 3x	Flow control for Full Duplex	Protocols
IFFF 802.1ad	Stacked VI ANs. O-in-O	Protection
IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Overload Cur Protection
IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	CPU Watch Do
IEEE 802.3az	EEE (Energy Efficient Ethernet)	Power Supply
Back-plane (Sw 19.2Gbps Full wire-speed	/itching Fabric):	
	IEEE 802.3 IEEE 802.3u IEEE 802.3u IEEE 802.3a IEEE 802.3at IEEE 802.1d IEEE 802.1w IEEE 802.1s ITM-T G.8032 / Y.1344 IEEE 802.1Q IEEE 802.1X IEEE 802.3ac IEEE 802.3ac IEEE 802.3at IEEE 802.1ab IEEE 802.1ab IEEE 802.1ab IEEE 802.3az Back-plane (Sw Y9.2Gbps Full wire-speed	IEEE 802.310Base-T 10Mbit/s EthernetIEEE 802.3u100Base-TX, 100Base-FX, Fast EthernetIEEE 802.3z1000Base-X, Gbit/s Ethernet over Fiber-OpticIEEE 802.3afPoE (Power over Ethernet)IEEE 802.3atPoE <sup>+</sup> (Power over Ethernet enhancements)IEEE 802.1dSTP (Spanning Tree Protocol)IEEE 802.1sMSTP (Multiple Spanning Tree Protocol)IEEE 802.1QVirtual LANs (VLAN)IEEE 802.1XPort based and MAC based Network Access Control, AuthenticationIEEE 802.3acMax frame size extended to 1522BytesIEEE 802.3aFlow control for Full DuplexIEEE 802.1aStacked VLANs, Q-in-QIEEE 802.1bLink Layer 2 QoS/CoS Protocol for Traffic PrioritizationIEEE 802.1aStacked VLANs, Q-in-QIEEE 802.1aEEE (Energy Efficient Ethernet)IEEE 802.1aEEE (Energy Efficient Ethernet)IEEE 802.3azEEE (Energy Efficient Ethernet)IEEE 802.3azFlow control for Full DuplexIEEE 802.3aEEE (Energy Efficient Ethernet)IEEE 802.3aEEE (Energy Efficient Ethernet)III wire-speedIII wire-spee

Data Processing	Store and Forward
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
Network Connector	16x 10/100Base-TX RJ-45 + 8x 100/1000Base-X SFP connector RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function, SFP port supports 100/1000M dual speed with DDMI
Console	RS-232 (RJ-45)
PoE standard & RJ-45 Pin Assignment	IFS-1608GSM-16PH : 16x IEEE 802.3af /IEEE 802.3at PoE+ IFS-1608GSM-8PH : 8x IEEE 802.3af /IEEE 802.3at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.
Network Cable	UTP/STP above Cat. 5e cable
	EIA/TIA-568 100-ohm (100m)
Protocols	CSMA/CD
Reverse Polarity Protection	Supported for power input
Overload Current Protection	Supported
CPU Watch Dog	Supported
Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE <sup>+</sup>





## **Software Specifications**

Power

LED

Consumption

**PoE Power Budget** 

Jumbo Frame

MAC Address Table 8K Memory Buffer 512

Warning Message

**Removable Terminal** 

Block Operating Temperature

Operating

Temperature Housing

Humidity Storage

IEEE802.3ac

IFS-1608GSM-16PH

IFS-1608GSM-8PH Input To Voltage Cor

50VD0

Total Power

Consumption

254.2W

400W for total (IFS-1608GSM-16PH)

240W for total (IFS-1608GSM-8PH)

512K Bytes for packet buffer

Alarm Relay Contact Relay outputs with current carrying capacity of 1 A

5% to 95% (Non-condensing)

Rugged Metal, IP30 Protection, Fanless

Maximum PoE Output power budget 30W / Per Port

Maximum PoE Output power budget 30W / Per Port

Max frame size extended to 1522Bytes (allow Q-tag

System Syslog, SMTP/ e-mail event message, alarm relay

Provide 2 redundant power, alarm relay contact, 6 Pin

-10 ~ 60°C (IFS-1608GSM-16PH & IFS-1608GSM-8PH) -40 ~ 75°C (IFS-1608GSM-16PHE & IFS-1608GSM-8PHE)

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) PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Output Power Off : Off

Device Power Consumption

14.2W

PoE

Budget

240W

TBD

9.6KB

in packet)

@24VDC

-40~85°C

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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP			
Multiple μ-Ring	up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250 (Please see CTC Union $\mu$ -Ring white paper for more details and more topology application)			
Loop Protection	Supported			
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring	Recovery time <50ms			
Protection )	single mild, sub mild, mattiple mild topology network			
QoS Features				
	IEEE 802.1p 8 active priorities queues for per port			
Classification QoS	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	Rate in steps :1 kbps / Mbps / fps / kfps			
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps			
ingress	Rate Unit : bit or frame			

135.6x 99x 160mm (Dx Wx H) (IFS-1608GSM-16PH) 116 x 92 x 160mm (Dx Wx H) (IFS-1608GSM-8PH)		
1.95kg (IFS-1608GSM-16PH) 1.375kg (IFS-1608GSM-8PH)		
DIN Rail mounting, or wall mounting (Optional)		
436,353 Hours (IFS-1608GSM-16PH) 439,881 Hours (IFS-1608GSM-8PH) (MIL-HDBK-217)		
5 years		
CE (EN55024, EN55032)		
FCC Part 15 Subpart B Class A, CE		
EN50121-4		
EN61000-6-2		
EN61000-6-4		
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		
EN62368-1 (IFS-1608GSM-16PH) UL60950-1, EN60950-1 (IFS-1608GSM-8PH)		
4KV for PoE, UTP and Fiber ports		
IEC 60068-2-27		
IEC 60068-2-32		
IEC 60068-2-6		

Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	atures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling
	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subhet L4: TCP/UDP
<b>RADIUS</b> authentica	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Management Feat	
Management reat	
Web Based Manag	ement
Telnet	Sonvor
SNMP	
EtherNet/IP	VI, V2C, V3
Luienvet/Ir	support for management and monitoring

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Modbus/TCP	Supports for management and monitoring	SSH over IPv6	Supported	
SW &	TFTP, HTTP	IPv6 Telnet	Supported	
Configuration	Redundant firmware in case of upgrade failure	IPv6 NTP, SNTP	Server/Client	
ETP client	Supports for upload (download configuration	IPv6 TFTP	Supported	
		IPv6 QoS	Supported	
		IPv6 ACL	Number of rules: up to 256 entries	
	RFC1213 MIB II, Private MIB		for L2 / L3 / L4	
DOUTD	Supported		L2 : Mac address SA/DA/VLAN	
BUUIP	Supported		L3: IP address SA/DA, Subnet	
DHCP	Server, Client, Relay, Relay option 82 , Shooping	Others Features	L4. TCP/ODP	
KARP	Supported	Others realures		
IP Source Guard	Supported	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)	
Port Mirroring	Supported			
Event Syslog	Syslog server (RFC3164) (Support 1 server )		Determine the cable length and lowering the power for ports with short cables	
Warning Message	System syslog, e-mail, alarm relay		I ower the power for a port when there is no link	
DNS	Client, Proxy		LED Power Management : Adjustment LEDs intensity	
IEEE1588 PTP V2	Supports 5 operating mode in each port :	Cable Diagnostic	Measuring LITD cable, normal or broken point distance	
	Ordinary-Boundary, Peer to Peer Transparent Clock,	Advanced BoE	Measuring off cable normal of broken point distance	
	End to End Transparent Clock, Master, Slave	Auvanceu POE		
NTP, SNTP	Server/Client	Management	PoE PD failure auto checking, and auto reset when PD fail	
LLDP (IEEE	Link Layer Discovery Protocol		POE port on/off weekly scheduling PoE Configuration	
802.1ab)	LLDP-MED		PoF Enable/Disable	
IPv6 Features			Power limit by classification	
IPv6 Management	Telnet Server/ICMP v6		Power feeding priority	
SNMP over IPv6 Supported			Iotal PoE Power budge limitation:	
HTTP over IPv6	Supported		240W for IFS-1608GSM-8PH	

## **Application**



## **Dimensions**

### ▶ IFS-1608GSM-16PH



Front View

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#### ► IFS-1608GSM-8PH



## **Ordering Information**



55:1550nm

WA: TX/1310nm (Bidi mode A)

WB: TX/1550nm (Bidi Mode B)

020: (20km)

040: (40km)



## IFS<sup>+</sup>803GSM-8PH24

#### 8x 10/100Base RJ45 + 3x 100/1000Base SFP with 8x PoE (180W, 24/48VDC)



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



IFS+803GSM-8PH24 is a managed, industrial grade, L2 PoE (Power over Ethernet) switch that provide 8x 10/100Base-TX ports plus 3x 100/1000Base-X SFP ports with 8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, hereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. The switch can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) to fulfill the special needs of industrial automation applications.

## **Features**

- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster (94~97%) to rise up 52VDC for PoE output (Figure 2)
- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)
- Provides 8 port IEEE 802.3af / 802.3at PoE+ output, 30W per port, total 180W
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC  $\mu$ -Ring white paper for more details and more topology application)
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for guick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management Tool\*

\*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	
	IEEE 802.3af	PoE (Power over Ethernet)	
	IEEE 802.3at	PoE <sup>+</sup> (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)	
	ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	
	IEEE 802.1Q	Virtual LANs (VLAN)	
	IEEE 802.1X	Port based and MAC based Networ Access Control, Authentication	
	IEEE 802.3ac	Max frame size extended to 1522Bytes	
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	
	IEEE 802.3x	Flow control for Full Duplex	
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	
Switch Architecture	Back-plane (Sw Full wire-speed	ritching Fabric): 7.6Gbps	
Data Processing	Store and Forw	vard	

Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
Network Connector	8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP connector RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function, SFP port supports 100/1000M dual speed with DDMI	
Console	RS-232 (RJ-45)	
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3at /IEEE 802.3af PoE <sup>+</sup> 2 pairs PoE, PoE <sup>+</sup> , 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)	

S۱ A D





Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost efficiency	
	24VDC	191.2W	7.8W	180W	97.00%	
	48VDC	193.4W	8.9W	180W	97.00%	
PoE Power Budget	Maximum PoE Output power budget 30W / Per Port 180W for total					
LED	een), Power een), Ring N	n), Power 2 (Green), Fault m), Ring Master (Yellow)				
	Per RJ-45	Per RJ-45 port: 10/100 Link/Active (Green)				
	SFP Fiber	Per port: Li	nk/Active (G	reen)		
	PoE Port LED 1 LED /per Port : • PoE Output Power On : ON (Green) • PoE Fault (Over Load, Short Circuit,Port failed at Startup) : Elash 1times /sec (Green)					
Jumbo Frame	9.6KB					
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)					
MAC Address Table	8K					
Memory Buffer	512K Bytes for packet buffer					
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relav					
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 <sup>+</sup> 803GSM-8PH24) -40 ~ 75°C (IFS <sup>+</sup> 803GSM-8PHE24)					
Operating Humidity	5% to 95% (Non-condensing)					
Storage Temperature	-40 ~ 85°C					
Housing	Rugged Metal, IP30 Protection, Fanless					
Dimensions	106 x 72 x 152 mm (D x W x H)					

## **Software Specifications**

Topology			
VLAN	IEEE 802.1g 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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP		
Multiple µ-Ring	up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms		
	supported ring is 250		
	(Please see CTC Union µ-Ring white paper for more details and more topology application)		
Loop Protection	Supported		
ITM-T G.8032 / Y.1344 ERPS	Supported Recovery time <50ms		
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network		
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) QoS Features Class of Service	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QOS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps :1 kbps / Mbps		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate in steps :1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps		
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection ) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate unit : bit or frame Rate in steps :1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit or frame Rate Unit : bit		

Weight	0.86kg		
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)		
MTBF	528,753 Hours (MIL-HDBK-217)		
Warranty	5 years		
Certification			
EMC	CE (EN55024, EN55032)		
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE		
Railway Traffic	EN50121-4		
Traffic control	NEMA TS2		
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		
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A		
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A		
	EN61000-4-5 (Surge) Level 3, Criteria B		
EMS	EN61000-4-6 (CS) Level 3, Criteria A		
(Electromagnetic Susceptibility) Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A		
Safety	UL60950-1, EN60950-1		
Surge protection	4KV for PoE, UTP and Fiber ports		
Shock	IEC 60068-2-27		
Freefall	IEC 60068-2-32		
Vibration	IEC 60068-2-6		

DiffServ (RF 2474) Remarking					
Storm Control for Unicast, Broadcast, Multicast					
IP Multicasting Features					
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2				
Snooping	Port Filtering Profile				
	Throttling				
	Fast Leave				
	Maximum Multicast Group : up to 1022 entries				
	Query / Static Router Port				
Security Features					
IEEE 802.1X	Port-Based				
	MAC-Based				
ACL	Number of rules : up to 256 entries				
	for L2 / L3 / L4				
	L2 : Mac address SA/DA/VLAN				
	L3: IP address SA/DA, Subnet				
PADILIS authentics	L4. ICP/UDP				
TACACS+ authenti	cation & accounting TACACS+ 3.0				
HTTPS, HTTP	Supported				
SSL / SSH v2	Supported				
User Name					
Password					
Authentication	Remote Authentication (via RADIUS / TACACS+)				
Management	Web Talast (CCU, CU DC 222 sensels				
Filtering	Web, Teinel 7 SSH , CLI KS-252 CONSOLE				
Management Feat	ures				
CLI	Cisco® like CLI				
Web Based Manag	ement				
Telnet	Server				
SNMP	V1, V2c, V3				
EtherNet/IP	Supports for management and monitoring				
Modbus/TCP	Supports for management and monitoring				
SW &	TFTP, HTTP				
Configuration	Redundant firmware in case of ungrade failure				
Upgrade					
FIP client	Supports for upload/download configuration				
RMON	RMON I (1, 2, 3, 9 group), RMON II				
MIR	RFC1213 MIB II, Private MIB				
UPnP	Supported				

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## Industrial Managed FE PoE Switch

BOOTP	Supported	IPv6 TFTP	Supported	
DHCP	Server, Client, Relay, Relay option 82, Snooping	IPv6 QoS	Supported	
RARP	Supported	IPv6 ACL	Number of rules: up to 256 entries	
IP Source Guard	Supported		for L2 / L3 / L4	
Port Mirroring	Supported		L2 : Mac address SA/DA/VLAN	
Event Syslog	Syslog server (RFC3164) (Support 1 server )		L3: IP address SA/DA, Subnet I 4: TCP/UDP	
Warning Message	System syslog, e-mail, alarm relay	<b>Others Features</b>		
DNS	Client, Proxy	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)	
IEEE1588 PTP V2	Support 5 operating mode in each port :		Management to optimize the power consumption	
	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave		Determine the cable length and lowering the power for ports with short cables	
NTP, SNTP	Server/Client		I ower the power for a port when there is no link	
LLDP (IEEE	Link Layer Discovery Protocol		LED Power Management : Adjustment LEDs intensity	
802.1ab)	LLDP-MED	Cable Diagnostic	Measuring UTP cable normal or broken point distance	
IPv6 Features		Advanced PoE	······································	
IPv6 Management	Telnet Server/ICMP v6	Management	PoE PD failure auto checking, and auto reset when PD fail	
SNMP over IPv6	Supported	5	PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Deword limit by clocification	
HTTP over IPv6	Supported			
SSH over IPv6	Supported			
IPv6 Telnet	Supported		Power feeding priority	
IPv6 NTP, SNTP	Server/Client		Total PoE Power budge limitation:	

## **Application**



#### Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage



## **Dimensions**

IFS+803GSM-8PH24



## **Ordering Information**

	Total Port	UTP Fiber		PoE Port		Input power		Certification				
Model Name		10/100 Base-TX	100/1000 Base-X	IEEE802.3at	Power Budget	Redundant	Railway EN50121-4	NEMA TS2	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	Operating Temperature
IFS <sup>+</sup> 803GSM-8PH24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-10~60°C
IFS+803GSM-8PHE24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75°C
Model Naming R	ule	B 0	3GS 03GS: 3	M: Manage M: GbE SFF	ed BPH	: 8x High Pc	E –	24 E: -4 blank	<b>) −</b> 24 bla 0~75°C ∷ -10~60°C	: 24V Booster nk : Non Boo	r vster	

- Terminal block
- One device of the series • Console cable (RJ-45 to DB9)
- Din Rail with screws

- Protective caps for SFP ports

## **Optional Accessories**

#### Wall mount kit

IND-WIMKO2 Wall Mount kit for Industrial product (Wide) (184 x 50mm)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



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## IFS-402GSM-4PU

#### 4x 10/100Base RJ45 + 4x 100/1000Base-X SFP with 4x 60W PoE (240W, 48VDC)



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



IFS-402GSM-4PU is a managed, industrial grade, L2 PoE (Power over Ethernet) switch that provide 4x 10/100Base-TX ports plus 2x 100/1000Base-X SFP ports with 4x PoE Ports. The PoE features enable power and data to be transferred via a single cable, hereby considerably reducing cabling and electrical wiring expenses. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as industrial networks, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. The switch can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) to fulfill the special needs of industrial automation applications.

## **Features**

- 48VDC (44~57VDC) redundant dual input power
- Provides 4 port IEEE 802.3af / 802.3at PoE+ output, 60W per port
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices</li>
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management Tool\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet			
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet			
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic			
	IEEE 802.3af	PoE (Power over Ethernet)			
	IEEE 802.3at	PoE <sup>+</sup> (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)			
	ITM-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)			
	IEEE 802.1Q	Virtual LANs (VLAN)			
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication			
	IEEE 802.3ac	Max frame size extended to 1522Bytes			
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)			
	IEEE 802.3x	Flow control for Full Duplex			
	IEEE 802.1ad	Stacked VLANs, Q-in-Q			
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization			
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)			
	IEEE 802.3az	EEE (Energy Efficient Ethernet)			
Switch Architecture	Back-plane (Sw Full wire-speed	vitching Fabric): 4.8Gbps d			
Data Processing	Store and Forw	vard			
Flow Control	full duplex mode Back pressure for				

Network Connector4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP connector RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000M dual speed with DDMIConsoleRS-232 (RJ-45)PoE standard & RJ-45 Pin Assignment4x IEEE 802.3at/ 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8Network Cable EIA/TIA-568 100-ohm (100m)TrotocolsProtocolsCSMA/CDReverse Polarity ProtectionSupported for power inputOverload Current ProtectionSupportedPower SupplyRedundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)Power ConsumptionInput Voltage ConsumptionDevice Power Pote ConsumptionPoE Power Budget 240W for totalMaximum PoE Output power budget 60W / Per Port 240W for total							
ConsoleRS-232 (RJ-45)PoE standard & RJ-45 Pin4x IEEE 802.3at / 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8Network CableUTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)ProtocolsCSMA/CDReverse Polarity ProtectionSupported for power inputOverload Current ProtectionSupportedPower SupplyRedundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (S0~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)Power ConsumptionInput Voltage Support 248.5WDevice Power 8.5WPoE Power BudgetMaximum PoE Output power budget 60W / Per Port 240W for total	Network Connector	4x 10/100Base connector RJ-45 UTP po Auto MDI/ME SFP port supp	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP connector RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000M dual speed with DDMI				
PoE standard & RJ-45 Pin4x IEEE 802.3at/ 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8Network CableUTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)ProtocolsCSMA/CDReverse Polarity ProtectionSupported for power inputOverload Current ProtectionSupportedPower SupplyRedundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)Power ConsumptionInput Voltage Support 248.5WDevice Power 8.5WPoE Power Budget 240W for totalMaximum PoE Output power budget 60W / Per Port 240W for total	Console	RS-232 (RJ-45	RS-232 (RJ-45)				
Network Cable     UTP/STP above Cat. 5e cable       EIA/TIA-568 100-ohm (100m)       Protocols     CSMA/CD       Reverse Polarity Protection     Supported for power input       Overload Current Protection     Supported       CPU Watch Dog     Supported       Power Supply     Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)       Power Consumption     Input Voltage     Total Power Consumption     Device Power Budget       FOE Power Budget     Maximum PoE Output power budget 60W / Per Port 240W for total	PoE standard & RJ-45 Pin Assignment	4x IEEE 802.3at/ 802.3af PoE+ 4 pairs PoE, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8					
EIA/TIA-568 100-ohm (100m)         Protocols       CSMA/CD         Reverse Polarity Protection       Supported for power input         Overload Current Protection       Supported         CPU Watch Dog       Supported         Power Supply       Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)         Power Consumption       Input Voltage       Total Power Consumption       Device Power Budget 50VDC       248.5W         PoE Power Budget       Maximum PoE Output power budget 60W / Per Port 240W for total       Maximum Poe Sutput power budget 60W / Per Port	Network Cable	UTP/STP abov	ve Cat. 5e cab	le			
Protocols     CSMA/CD       Reverse Polarity Protection     Supported for power input       Overload Current Protection     Supported       CPU Watch Dog     Supported       Power Supply     Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)       Power Consumption     Input Voltage     Total Power Consumption     Device Power Budget       PoE Power Budget     Maximum PoE Output power budget 60W / Per Port 240W for total		EIA/TIA-568 1	EIA/TIA-568 100-ohm (100m)				
Reverse Polarity Protection     Supported for power input       Overload Current Protection     Supported       CPU Watch Dog     Supported       Power Supply     Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)       Power Consumption     Input Voltage     Total Power Consumption     Device Power Budget       50VDC     248.5W     8.5W     240W       PoE Power Budget     Maximum PoE Output power budget 60W / Per Port 240W for total	Protocols	CSMA/CD	CSMA/CD				
Overload Current Protection         Supported           CPU Watch Dog         Supported           Power Supply         Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)           Power Consumption         Input Voltage         Total Power Consumption         PoE Budget 50VDC         248.5W         8.5W         240W           PoE Power Budget         Maximum PoE Output power budget 60W / Per Port 240W for total         Maximum Poe         Supported	Reverse Polarity Protection	Supported fo	Supported for power input				
CPU Watch Dog     Supported       Power Supply     Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE <sup>+</sup> in 30W / 60W applications)       Power Consumption     Input Voltage     Total Power Consumption     Device Power Budget       PoE Power Budget     Maximum PoE Output power budget 60W / Per Port 240W for total	Overload Current Protection	Supported					
Power Supply     Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoE+ in 30W / 60W applications)       Power Consumption     Input Voltage     Total Power Consumption     Device Power Budget       50VDC     248.5W     8.5W     240W       PoE Power Budget     Maximum PoE Output power budget 60W / Per Port 240W for total     Maximum PoE	CPU Watch Dog	Supported					
Power Consumption         Input Voltage         Total Power Consumption         Device Power Budget         PoE Budget           50VDC         248.5W         8.5W         240W           PoE Power Budget         Maximum PoE Output power budget 60W / Per Port 240W for total         Port total	Power Supply	Redundant Dual DC 48V (44~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE 802.3at PoE <sup>+</sup> in 30W / 60W applications)					
50VDC         248.5W         8.5W         240W           PoE Power Budget         Maximum PoE Output power budget 60W / Per Port 240W for total	Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget		
PoE Power Budget Maximum PoE Output power budget 60W / Per Port 240W for total		50VDC	248.5W	8.5W	240W		
	PoE Power Budget	Maximum Pol 240W for tota	E Output pow I	er budget <b>60</b>	W / Per Port		



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)
	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)
Jumbo Frame	9.6KB
IEEE802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IFS-402GSM-4PU) -40 ~ 75°C (IFS-402GSM-4PUE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.7kg

Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	589,078 hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
EMS	EN61000-4-6 (CS) Level 3, Criteria A
(Electromagnetic Susceptibility) Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Surge protection	4KV for PoE, UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Software Specifications**

Topology	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN,up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	_ Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
Multiple μ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250 (Please see CTC Union µ-Ring white paper for more details and more topology application)
Loop Protection	Supported
ITM-T G.8032 /	Recovery time <50ms
(Ethernet Ring Protection )	Single Ring, Sub-Ring, Multiple ring topology network
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities gueues for per port
Traffic Classification QoS	IEEE 802.1p based CoS, IP Precedence based CoS IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	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	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 Rate in steps :1 kbps / Mbps / fps / kfps
Bandwidth Control for	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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Bandwidth Control for Ingress	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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Bandwidth Control for Ingress Bandwidth	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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps
Bandwidth Control for Ingress Bandwidth Control for Egress	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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps
Bandwidth Control for Ingress Bandwidth Control for Egress	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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit
Bandwidth Control for Ingress Bandwidth Control for Egress	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         Rate in steps :1 kbps / Mbps / fps / kfps         Range : 100 kbps to 1Gbps / 1fps to 3300kfps         Rate Unit : bit or frame         Rate in steps : 1 kbps / Mbps         Range : 100 kbps to 1Gbps         Rate Unit : bit or frame         Rate Unit : bit or frame         Rate Unit : bit         Per queue / Per port shaper
Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	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         Rate in steps :1 kbps / Mbps / fps / kfps         Range : 100 kbps to 1Gbps / 1fps to 3300kfps         Rate Unit : bit or frame         Rate in steps : 1 kbps / Mbps         Range : 100 kbps to 1Gbps         Rate Unit : bit or frame         Rate Unit : bit         Per queue / Per port shaper         Remarking

IP Multicasting Fea	atures				
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2				
Snooping	Port Filtering Profile				
	Throttling				
	Fast Leave				
	Maximum Multicast Group : up to 1022 entries				
	Query / Static Router Port				
Security Features					
IEEE 802.1X	Port-Based				
	MAC-Based				
ACL	Number of rules : up to 256 entries				
	for L2 / L3 / L4				
	L2 : Mac address SA/DA/VLAN				
	L3: IP address SA/DA, Subnet				
RADIUS authentic	tet. ICF/0DF				
TACACS+ authenti	cation & accounting, TACACS+ 3.0				
HTTPS, HTTP	Supported				
SSL / SSH v2	Supported				
User Name	Local Authentication				
Password					
Authentication	Remote Authentication (Via RADIUS / TACACS+)				
Management	Wah Talant (CCLL CLLDC 222 engages				
Filtering	Web, Teinel / SSH , CLIRS-252 COnsole				
Management Feat	ures				
CLI	Cisco® like CLI				
Web Based Manag	ement				
Telnet	Server				
SNMP	V1, V2c, V3				
EtherNet/IP	Supports for management and monitoring				
Modbus/TCP	Supports for management and monitoring				
SW &	TFTP, HTTP				
Configuration Upgrade	Redundant firmware in case of upgrade failure				
FTP client	Supports for upload/download configuration				
RMON	RMON I (1, 2, 3, 9 group), RMON II				
MIB	RFC1213 MIB II, Private MIB				
UPnP	Supported				
BOOTP	Supported				
DHCP	Server, Client, Relay, Relay option 82 , Snooping				
RARP	Supported				
IP Source Guard	Supported				
Port Mirroring	Supported				



## Industrial Managed FE PoE Switch

Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables				
	Lower the power for a port when there is no link				
	LED Power Management :Adjustment LEDs intensity				
Cable Diagnostic	Measuring UTP cable normal or broken point distance				
Advanced PoE					
Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE Power budge limitation: maximum 240W				

**Others Features** 

### **Application**



## **Dimensions**

► IFS-402GSM-4PU 62.50 106.00 40.64 15.2  $\Leftrightarrow$  $\Leftrightarrow$ Π Г ( 880 l and þ 0 0 0 0 00 00 00 Ô 0 ٩ Ć 00  $\Leftrightarrow$  $\diamond$ Wall-Mount Kit View (Optional accessory) Side View **Front View Rear View** DIN-Rail Kit View

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## **Ordering Information**



**Optional Accessories** 

• Console cable (RJ-45 to DB9)

• Din Rail with screws

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

Protective caps for SFP ports

#### SFP Naming Rule

ISFP	- S 7	040	] – 31	- D	E E:-40~85°C Blank:0~70	) C
Industrial SFP Transceiver	M: Multi Mode S: Single Mode T: UTP	9: 10G 7: GbE 5: FE	Distance T00: (UTP) 000: (500m) 002: (2km) 020: (20km) 040: (40km)	Wavelength 00: UTP 85: 850nm 31:1310nm 55:1550nm WA: TX/1310r	D: DDMI Blank: Non DDMI	
			040: (40km)	WA: TX/1310	nm (Bidi mode A) am (Bidi Mode B)	

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## IFS-803GSM-8PH24 & IFS-402GSM-4PH24

▲ 8x 10/100Base RJ45 + 3x 100/1000Base SFP with 8x PoE (180W, 24/48VDC)
 ▶ 4x 10/100Base RJ45 + 2x 100/1000Base SFP with 4x PoE (120W, 24/48VDC)



- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- EN50121-4, UL60950-1, EN60950-1, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE, FCC certified
- = 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster
- Auto checking and auto reset when PoE PD fail



These Fast Ethernet switch models are managed industrial grade L2 switches with 8/4 10/100Base-T ports and 3/2 GbE/100M SFP ports which also supports PoE+/PSE and provide stable and reliable transmission. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking. They are an ideal solution for Smart City, surveillance, Intelligent traffic control systems, production automation applications and support up to 8/4 PoE/PoE+ (IEE 802.3af/IEEE 802.3at) ports which can provide 15.4/30watts power output per port for connecting with heavy-duty industrial PoE devices, such as PTZ IP surveillance cameras, high-performance wireless access points, digital signage and IP phones. (See Figure). 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**

- Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)
- Provides 4/8 port IEEE 802.3af / 802.3at PoE output (30W per Port)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device
- μ-Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management Tool\*

\*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processing	Store and Forward	
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Flow Control	IEEE 802.3x for full duplex mode Back pressure for half	
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair	Network	duplex mode 4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP slot	
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Connector	(IFS-402GSM-4PH24) 8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP slot (IFS-803GSM-8PH24) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP ports support 100/1000M with DDMI	
	IEEE 802.3af	PoE (Power over Ethernet)			
	IEEE 802.3at	PoE <sup>+</sup> (Power over Ethernet enhancements)			
	IEEE 802.1d	STP (Spanning Tree Protocol)			
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	PoE standard & RJ-45 pin assignment	4x IEEE 802.3af /IEEE 802.3at PoE <sup>+</sup> (IFS-402GSM-4PH24) 8x IEEE 802.3af /IEEE 802.3at PoE <sup>+</sup> (IFS-803GSM-8PH24) End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6,4,5,7,8)	
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)			
	ITM-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			
	IEEE 802 3ac	Max frame size extended to 1522Bytes	Console	RS-232 (RJ-45)	
	1222 002.0040	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Network Cable	UTP/STP above Cat. 5e cable	
	IEEE 802.3ad			EIA/TIA-568 100-ohm (100m)	
			Protocols	CSMA/CD	
	IEEE 802.3x	Flow control for Full Duplex	Reverse Polarity	Supported for power input	
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Protection		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	Overload Current Protection	Supported	
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	CPU Watch Dog	Supported	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power	
Switch Architecture	Back-plane (Sv 7.8Gbps (IFS-4 10.6Gbps (IFS- Full wire-spee	vitching Fabric): 02GSM-4PH24) 803GSM-8PH24) d		Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)	

## Industrial Managed FE PoE Switch



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Power	IFS-402GSM-4PH24 Power consumption & Booser efficiency				
Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
	24VDC	134.8W	7.1W	120W	94.0%
	48VDC	132.2W	8.5W	120W	97.2%
	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%
PoE Power Budget	Maximum PoE Output power budget 30W / Per Port 120W (IFS-402GSM-4PH24) 180W (IFS-803GSM-8PH24)				
LED Per unit: Power 1 (Green), Power (Amber), CPU Act (Green), Ring M		2 (Green), Fault Jaster (Yellow)			
	Per RJ-45 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			led at	
Jumbo Frame	9.6KB				
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)				
<b>MAC Address Table</b>	8K				
Memory Buffer	512K Byte	es for packe	t 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 (Optional)
MTBF	674,963 Hours (IFS-402GSM-4PH24) 466,542 Hours (IFS-803GSM-8PH24) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic	FCC Part 15 Subpart B Class A,CE
Interference)	
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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
	VI AN Translation up to 256 entries
	GVRP (GARP VI AN Registration Protocal)
	MVR (Multicast VI AN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Multiple μ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings
	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported
Loop Protection ITM-T G.8032 /	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>OoS Features</b>	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service Traffic	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IFFE 802.1p based CoS
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <10ms
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <10ms
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP 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
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP 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 Rate in steps :1 kbps / Mbps / fps / kfps
Loop Protection ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Bandwidth Control for	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. Supported Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP 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 Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps

Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per gueue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	atures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4. ICF/UDF
<b>DADIUS</b> authorities	ation & accounting
RADIUS authentica	ation & accounting
RADIUS authentica TACACS+ authenti	ation & accounting cation & accounting, TACACS+ 3.0
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RADIUS authentica TACACS+ authentica TACACS+ authenti HTTPS, HTTP SSL / SSH v2 User Name Password Authentication Management Interface Access Filtering Management Feat CLI Web Based Manag Telnet SNMP EtherNet/IP Modbus/TCP SW & Configuration Upgrade	ation & accounting cation & accounting, TACACS+ 3.0 Supported Local Authentication Remote Authentication (via RADIUS / TACACS+) Web, Telnet / SSH, CLI RS-232 console ures Cisco® like CLI ement Server V1, V2c, V3 Supports for management and monitoring Supports for management and monitoring TFTP, HTTP Redundant firmware in case of upgrade failure

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## 

## Industrial Managed FE PoE Switch

FTP client	Supports for upload/download configuration	IPv6 TFTP	Supported
RMON	RMON I (1, 2, 3, 9 group), RMON II	IPv6 QoS	Supported
MIB	RFC1213 MIB II, Private MIB	IPv6 ACL	Number of rules: up to 256 entries
UPnP	Supported		for L2 / L3 / L4
BOOTP	Supported		L2 : Mac address SA/DA/VLAN
DHCP	Server, Client, Relay, Relay option 82 , Snooping		L3: IP address SA/DA, Subnet L4: TCP/UDP
RARP	Supported	Others Features	
IP Source Guard	Supported	Green Ethernet	Supports IEEE 802 3az EEE (Energy Efficient Ethernet)
Port Mirroring	Supported		Management to optimize the power consumption
Event Syslog	Syslog server (RFC3164) (Support 1 server)		Determine the cable length and lowering the power
Warning Message	System syslog, e-mail, alarm relay		for ports with short cables
DNS	Client, Proxy		Lower the power for a port when there is no link
IEEE1588 PTP V2	Supports 5 operating mode in each port :		LED Power Management : Adjustment LEDs intensity
	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave	Cable Diagnostic	Measuring UTP cable normal or broken point distance
NTP, SNTP	Server/Client	Advanced PoE	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol LLDP-MED	Management	PoE PD failure auto checking ,and auto reset when PD fail
IPv6 Features			PoE port on/off weekly scheduling
IPv6 Management	: Telnet Server/ICMP v6		PoE Configuration
SNMP over IPv6	Supported		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
HTTP over IPv6	Supported		
SSH over IPv6	Supported		
IPv6 Telnet	Supported		
IPv6 NTP, SNTP	Server/Client		

## **Application**



#### Figure 2 : High Efficiency Boost Technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage


## **Dimensions**

► IFS-402GSM-4PH24





## **Ordering Information**

	1	UTP	Fiber	PoE	Port	Input power	Certification					
Model Name	lotal Port	10/100 Base-TX	100/1000 Base-X	IEEE802.3at	Power Budget	Redundant	Railway EN50121-4	Traffic Control NEMA TS2	Safety EN60950-1	Safety UL60950-1	CE, FCC EN61000-6-2 EN61000-6-4	Operating Temperature
IFS-803GSM-8PH24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-10~60°C
IFS-803GSM-8PHE24	11	8	3 SFP	8	180W	24/48VDC	V	V	V	V	V	-40~75℃
IFS-402GSM-4PH24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	V	V	-10~60°C
IFS-402GSM-4PHE24	6	4	2 SFP	4	120W	24/48VDC	V	V	V	V	V	-40~75℃





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## **Optional Accessories**

#### Package List

- One device of the series • Console cable (RJ-45 to DB9)
- Terminal block
- Protective caps for SFP ports
- Din Rail with screws
- Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications.

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





## IMC-1000MS-PH12

1x GbE RJ45 to 100/1000Base SFP with PoE PSE (30W, 12/24/48VDC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC (9.6~57VDC) redundant dual input power
- Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- SNMP, Web based and In-band management, Remote Loop-Back test
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)



IMC-1000MS-PH12 is a 10/100/1000Base-T to 100/1000Base-X manageable GbE media converter which not only offers dual-speed fixed fiber transceiver or 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-1000MS-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.

### **Features**

- Conversion between 10/100/1000Base-T and 100/1000Base-X fiber cable interface
- Provides IEEE 802.3at PoE output (30W)
- IP30 rugged metal housing and fanless
- Supports Jumbo frame 9K bytes packet
- Ingress/Egress bandwidth control with 64K granularity
- PoE configuration and monitor
- Supports SmartView for centralized management\*
   \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	LED	Per Unit: Power 1 (Green), Power 2 (Green), Fault (Amber)
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet		Fiber LNK/ACT (Green):
	IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair_		ON : Connected to network, OFF: Not connected to network,
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic		BLK : Receive / Iransmit Data
	IEEE 802.3x Flow Control and Back pressure		Fiber Speed: Yellow : 1000Base-X, Green : 100Base-X
	IEEE 802.3at PoE <sup>+</sup> (Power over Ethernet enhancement)		RJ-45 port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)
	IEEE 802.3af PoE (Power over Ethernet)		LNK/ACT for RJ45(Green):
	IEEE 802.1q Tag VLAN		ON : Connected to network, OFF: Not connected to network, BLK : Networking is active
Fiber Ports	SFP slot for 100Base-X or 1000Base-X, 100M/1000M speed set by Web		PoE Status (Green):
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto- Negotiation Function Supports UTP CAT.5e Twisted Pair cable	_	Plash : Poe Fault (Over-load or short), ON : Poe normal working, OFF : Poe No Power output
Push Button	Reset, Load default setting	Reverse	Supported for Power laput
Data Process	Pass through mode	Protection	Supported for Fower input
Architecture		Overload	
Fibor	_9K Dytes	Protection	Supported
Parameters	Fiber Cable (Multi-Mode): 30/125011,02.5/125011	Alarm Relay	Relay outputs with current carrying capacity of 1 A
	Fiber Cable (Single-mode). 9/125000	Contact	@24VDC
I FPT		Removable	Provides 2 redundant power alarm relay contact 6 Pin
(Link Fault Pass	force Fiber port to link down	Ierminal Block	
Through)	Fiber-TX: If Fiber port link down, the media converter will	Humidity	5%~95% (Non-condensing )
Far-End Fault	Work with LFPT to prevents data loss	Operating Temperature	-20°C ~ 75°C
Connector and	SFP Slot	Storage Temperature	-40°C ~ 85°C
Pin Assignment	RJ-45 Socket: Cat 5e (10/100/1000Mbps) Twisted Pair cable	Housing	Rugged Metal, IP30 Protection and fanless
	Auto MDI/MDI-X and Auto-Negotiation Function Support	Dimensions	106 x 62.5 x 135 mm (D X W X H)
Connector and	RJ-45 Port support IEEE 802.3at/af End-Span, Alternative	Weight	650g
Pin Assignment	A mode	Installation	DIN Rail mounting, or wall mounting (Optional)
	PoE (V+): RJ-45 pin 1, 2	Power Supply	12/24/48VDC (9.6~57VDC), Redundant power with polarity
	PoE (V-): RJ-45 pin 3, 6		reverse protect function and removable terminal block
	Data (1,2,3,6,4,5,7,8)		Built-in very high efficiency booster(97~99%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure)

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PoE Power budget	30W							
Power	Power consumption	ption & Boost	efficiency					
Consumption	Input Total Power Device Power Voltage Consumption 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%			
Warrapty	864,121 Hours MIL-HDBK-217							
warranty	5 years							
Certifications								
EMC	CE							
EMI	FCC Part 15 S	ubpart B Cl	ass A, CE					
Rail Way 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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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 Mo	de					
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 &	Supports Link Fault Pass-Through (LFPT) Function					
Monitor	Broadcast/Multicast/Unicast storm filter					
	SNMP alarm trap for power loss and port link Up/Down					
	PoE Status					

Management	Supports in-band management from FRM220 Chassis With FRM220-1000MS card (Figure 2)				
	Ingress/Egress bandwidth control with 64K granularity				
Configuation	IP configuration, converter configuration, port configuration, MIB counter				
	VLAN group configuration, alarm configuration, PoE Configuration				
Diagnostic &	Remote loop back test				
Monitor	Supports Link Fault Pass-Through (LFPT) Function				
	Broadcast/Multicast/Unicast storm filter				
	PoE Status				

## **Application**

Figure 1: High efficiency boost technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

Figure 2 : IMC-1000MS-PH12 Application in Remote, In-Band Management



## **Dimensions**



## **Ordering Information**



- IMC-1000MS-PH12
- Protective caps for SFP ports
- Din Rail bracket with screws
- Terminal block

## **Optional Accessories**

Wall mount kit accessories

IND-WMK02 Wall Mount kit for Industrial product, 184 x 50mm

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IMC-1000MS-PH12 product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



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## IGS-800C-8PH

8x GbE RJ45 with 8x PoE, Compact Size (240W, 48VDC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 48VDC (44~57VDC) redundant dual input power
- IP30, rugged & compact metal housing, fanless
- 4KV surge protection for RJ45 and PoE ports



IGS-800C-8PH is an unmanaged, industrial grade, Gigabit PoE switch with 8x 10/100/1000Base-T PoE ports that provide stable and reliable Ethernet transmissions. 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 (See figure 1). Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 70°C) fulfill the special needs of industrial automation applications.

## **Features**

- Provides 8-port IEEE 802.3at/af PoE+ output, 30W/per port, total 240W
- 48VDC (44~57VDC) redundant dual input power
- Supports flow control

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- Jumbo frame support
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40 ~ 70°C ("E" model)

## **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet	Power Supply	Redundant D	4~57VDC) inpu	ut		
	IEEE 802.3u 100Base-TX Fast Ethernet		power (Remo	vable termina t is recommo	al block ) adad for IEEE 8	02.3 at	
	IEEE 802.3ab 1000Base-T Gigabit Ethernet		PoE <sup>+</sup> )	t is recommen	Idea IOI ILLE 0	uz.jai	
	IEEE 802.3x Flow Control and Back Pressure	<b>Power Consumption</b>	Input	Total Power	Device Power	PoE	
	IEEE 802.3af PoE (Power over Ethernet)		Voltage	Consumption	Consumption	Budget	
	IEEE 802.3at PoE <sup>+</sup> (Power over Ethernet enhancements)	PoE Power Budget	Maximum Po	E Output pov	<u>6.8W</u>	240W	
Switch Architecture	Back-plane (Switching Fabric): 16Gbps Full wire-speed	Pomovable Terminal	per port	2 output por	ter budget 2 h	,	
Data Processing	Store and Forward	Block	Provides 2 Re	dundant pov	ver, 4 pin		
Flow Control	IEEE 802.3x flow control, back pressure flow control	Operating	-10 ~ 60°C (IC	GS-800C-8PH)	-\		
Jumbo Frame	9K Bytes	Operating Humidity	-40 ~ 70°C (10	35-800C-8PH	=)		
MAC Address Table	4K		5% to 95% (IN	on-condensi	ng)		
PoE standard &	8x IEEE 802.3at/af PoE+	Dimensions	TUUX 42X TISP		H)		
RJ-45 Pin Assignment	2 pairs PoE, PoE+	Power SupplyRedundant Dual DC 48V (44~57VDC) ir power (Removable terminal block) (50~57V input is recommended for IEEE PoE+)Power ConsumptionInput Voltage ConsumptionTotal Power ConsumptionPower ConsumptionInput Voltage ConsumptionTotal Power ConsumptionPower ConsumptionInput Voltage ConsumptionTotal Power ConsumptionPower ConsumptionInput Voltage ConsumptionTotal Power ConsumptionPower ConsumptionInput 	tion, Faniess				
Assignment	Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6						
	Data (1,2,3,6,4,5,7,8)	Mounting	Optional acc	nting, or wall ressories)	mounting		
Network Connector	8x RJ-45 10/100/1000Base-T auto negotiation	MTBF	1,494,598 Hou	urs (MIL-HDB	<-217)		
Network Cable	LITR/STR above Cat. So cable	Warranty	5 years				
Network Cable	EIA /TIA 568 100 obm (100m)	Certification					
Protocols		EMC	CE (EN55024,	EN55032)			
LED	Per unit: Power 1 (Green), Power 2 (Green)	EMI (Electromagnetic	ECC Dart 15 S	ubpart B Clas		Class A	
	Per port: 10/100 Link/Acttive (Green)	Interference)	ree Fait 15 Subpait b Class A, CE EN55022 Class A			.z Class A	
	1000 Link/Active (Amber)	Railway Traffic	EN50121-4				
	Per Port PoE LED • Active : ON • Inactive : OFF	Immunity for Heavy Industrial Environment	EN61000-6-2				
Reverse Polarity Protection	Supported for Power Input	Emission for Heavy Industrial	EN61000-6-4				
Overload Current Protection	Supported	Environment					



#### EMS (Electromagnetic Susceptibility) Protection Level

EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A

Safety	EN62368-1 (Pending)
Surge protection	4KV for PoE and UTP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Dimensions**



Wall-Mount Kit View (Optional accessory)

## **Ordering Information**

	<b>T</b>	RJ45 UTP Port	PoE	port	Input power		Certification		
Model Name	Port	10/100/1000 Base-T(X)	IEEE 802.3at	Power Budget	Redundant	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	Temperature
IGS-800C-8PH	8	8	8	240W	48VDC	V	V	V	-10~60°C
IGS-800C-8PHE	8	8	8	240W	48VDC	V	V	V	-40~70°C
Model Naming F IGS Industrial 8: Gigabit Switch Package List	8ule 8x GbE	8 00C UTP 00C: (	)x GbE Fil	8PHE ber 8PH 8PH	I: 8x High Pow IE: 8x High Pow	er PoE -10~6 wer PoE -40~	0°C 70°C		
<ul><li>One of the set</li><li>Din Rail with set</li></ul>	ries device screws	e • 1	Ferminal blo	ck					

## **Optional Accessories**

	Wall	mount	kit ac	cessories
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IND-WMK03 Wa

Wall Mount kit for Industrial product (Compact, 150 x 30mm)

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## IGS-600-4PH24 & IGS-402S-4PH24

6x GbE RJ45 with 4x PoE (120W, 24/48VDC)
4x GbE RJ45 + 2x 100/1000Base SFP with 4x PoE (120W, 24/48VDC)

## IGS-402F-4PH24 & IGS-402S-4PU

 4x GbE RJ45 + 2x 1000Base Fiber (SC) with 4x PoE (120W, 24/48VDC)
 ▶ 4x GbE RJ45 + 2x 100/1000Base SFP with 4x 60W PoE (240W, 48VDC)



- UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster - Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE
- power distance to 100meter
- Provides a DIP-Switch to set functions



These models are 6 port unmanaged industrial grade Gigabit PoE switches with 4x 10/100/1000Base-T PoE 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, 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 (See figure 1). Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

## **Features**

- Provides 4-port IEEE 802.3at/af PoE+ output, 60W/per port (IGS-402S-4PU)
- Provides 4-port IEEE 802.3at/af PoE<sup>+</sup> output, 30W/per port (IGS-402S-4PH24, IGS-402F-4PH24, IGS-600-4PH24)
- Supports power failure alarm message by relay
- Supports flow control
- Jumbo frame support
- IP30 rugged metal housing and fanless
- Wide operating temperature -40 ~ 75°C ("E" model)

## **Specifications**

JTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)		
EIA/TIA-568 100-ohm (100m)		
_iber Cable (Multi-mode): 50/125um, 62.5/125um		
-iber Cable (Single-mode): 9/125um		
_SMA/CD		
Per unit: Power 1 (Green), Power 2 (Green), Fault		
Amper) Eihar Par part: Link (Activa (Graan)		
Per Port Poe LED Active : ON Inactive : OFF		
Fault : Flash		
(Fault: Over Load, Short Circuit, Port failed at Startup)		
DIP 1 ON : Disable power failure alarm OFF : Enable power failure alarm		
DIP 2 ON : Disables broadcast storm protection		
DIP 3 ON : Fiber 2 for 100Base-FX SFP		
OFF : Fiber 2 for Gigabit SFP (for IGS-402S-4PU, IGS-402S-4PH24)		
DIP 4 ON : Fiber 1 for 100Base-FX SFP OFF : Fiber 1 for Gigabit SFP (for IGS-402S-4PU, IGS-402S-4PH24)		
Supported for Power Input		
Supported		
IGS-402S-4PU: Redundant Dual DC 48V (44~57VDC) input power (Removable terminal block) (50~57V input is recommended for IEEE 802.3at PoF <sup>±</sup> in 30W/60W applications)		
GS-402S-4PH24, IGS-402F-4PH24, IGS-600-4PH24: Redundant Dual DC 24/48V (20~57VDC) input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)		

6-41



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Power Consumption	input	105-4025-	IG3-402F-	IG2-000-				
	Voltage	4PH24	4PH24	4PH24				
	24VDC	143.3W	143.2W	142.9W				
	48VDC	138.2W	138.2W	139.6W				
	(Include full load 120W PoE output)							
	IGS-402S-4PU Power consumption							
	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget				
	50VDC	250.3W	8W	240W				
PoE Power Budget	Maximum PoE Output power budget 240W, <b>60W/</b> <b>per port</b> (IGS-402S-4PU) Maximum PoE Output power budget 120W, 30W/ per port (IGS-402S-4PH24, IGS-402F-4PH24, IGS-600-4PH24)							
Alarm Relay Contact	: Relay outputs with current carrying capacity of 1A @24VDC							
Removable Terminal Block	al Provides 2 Redundant power, Alarm relay contac Pin							
Operating Temperature	-10 ~ 60°C (IGS-402S-4PU, IGS-402S-4PH24, IGS- 402F-4PH24, IGS-600-4PH24)							
	-40 ~ 75°C (IGS-402S-4PUE, IGS-402S-4PHE24, IGS-402F-4PHE24, IGS-600-4PHE24)							
<b>Operating Humidity</b>	5% to 95% (N	lon-condensi	ing)					
Dimensions	106 x 62.5 x 1 (IGS-402S-4P 106 x 62.5 x13	62.5 x 134.8mm (D X W X H) 025-4PH24, IGS-402F-4PH24, IGS-600-4PH24) 62.5 x135mm (IGS-402S-4PU)						
Housing	Rugged Met	al, IP30 Protec	ction, Fanless					
Weight	0.84kg (IGS-4 0.84kg (IGS-6	102S-4PH24) 500-4PH24)	0.68kg (IGS- 0.74kg (IGS-	-402F-4PH24) -402S-4PU)				
Installation Mounting	DIN Rail mou (Optional acc	inting, or wal cessories)	l mounting					

MTBF	736,988 Hours @25°C (IGS-402S-4PH24) 635,099 Hours @25°C (IGS-402F-4PH24) 649,579 Hours @25°C (IGS-600-4PH24) 688,499Hours (IGS-402S-4PU) (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				
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A				
Protection Level	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 (IGS-402S-4PH24, IGS-402F-4PH24, IGS-600-4PH24)				
Shock	IEC 60068-2-27				
Freefall	IEC 60068-2-32				
Vibration	IEC 60068-2-6				

### **Application**

**Dimensions** ► IGS-402S-4PU

Figure : High efficiency boost technology for PoE



106.00

Side View

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- Regulated PoE output voltage (55VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage



Industrial Unmanaged GbE PoE Switch IGS-600-4PH24 & IGS-402S-4PH24 IGS-402F-4PH24 & IGS-402S-4PU

(Optional accessory)

► IGS-402S-4PH24



Side View

Front View

Rear View DIN-Rail Kit View

Wall-Mount Kit View (Optional accessory)

IGS-402F-4PH24



Side View

**Front View** 



Rear View DIN-Rail Kit View

Wall-Mount Kit View (Optional accessory)



Wall-Mount Kit View (Optional accessory)

## **Ordering Information**

		RJ45 UTP Port Fiber Port		PoEport			Inputpower	Certification				
ModelName	Total Port	10/100/1000 Base-T(X)	1000Base-X Base-X	100/1000 Base-X	IEEE 802.3at	IEEE 802.3at 4 Pairs PoE/60W	Power Budget	Redundant	Railway EN50121-4	Safety UL60950-1	CE, FCC EN61000-6-2 EN61000-6-4	Operating Temperature
IGS-402S-4PU	6	4		2 SFP		4	240W	48VDC	V		V	-10~60°C
IGS-402S-4PUE	6	4		2 SFP		4	240W	48VDC	V		V	-40~75°C
IGS-402S-4PH24	6	4		2 SFP	4		120W	24/48VDC	V	V	V	-10~60°C
IGS-402S-4PHE24	6	4		2 SFP	4		120W	24/48VDC	V	V	V	-40~75℃
IGS-402F-4PH24	6	4	2 SC		4		120W	24/48VDC	V	V	V	-10~60°C
IGS-402F-4PHE24	6	4	2 SC		4		120W	24/48VDC	V	V	V	-40~75°C
IGS-600-4PH24	6	6			4		120W	24/48VDC	V	V	V	-10~60°C
IGS-600-4PHE24	6	6			4		120W	24/48VDC	V	V	V	-40~75°C
IGS Industrial 4: Gigabit 6: Switch	4x GbE	4 02 UTP 02S UTP 02F 00:	S 2x GbE S 2x GbE S 0x GbE Fi	4PH FP 4F C 4x ber 24 4F 4x 24 4x 24 4x	PHE24: (High Pc V Boost PH24: (High Pc V Boost PU: (Ultra Pc	24 wer PoE er -40~75°C wer PoE er -10~60°C wer PoE	See bel (For IGS	ow for more S-402F-4PF	e detail 124) IGS-40 : IGS-40	<b>2F –4PH</b> 2F –4PH	Conner Type E24 – 🗋 🗖 E24 – SCO	ctor Connectivit Distance
Fiber Connector 1	jype Co	nnectivity Dista	ance									
SC	SC	001: 500m (SC, N	л/м) SC002:2	2km (SC, M/	/M) SC02	0: 20km (SC, S/M)	SC040: 4	l0km (SC, S/M)	)			
(IGS-402F-4PH24)	SC	)20A: WDM 20km	n A type (TX: 13	10nm) SCO	020B: WDN	1 20km B type (TX:	1550nm)					
Package List	:											
	series d	evice	Prot	tective ca	ps for SF	P ports						

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C(-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)
SEP Naming Rule	





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## IFS-1602GS-8PH & IFS-802GS-8PH

↓ 16x 10/100Base RJ45 + 2x 1000Base-X SFP with 8x PoE (240W, 48VDC)
 ▶ 8x 10/100Base RJ45 + 2x 1000Base-X SFP with 8x PoE (240W, 48VDC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 4KV surge protection for PoE UTP and PoE ports
- Wide operating temperature -40 ~ 75°C
- IP30 rugged metal housing and fanless



The IFS-1602GS-8PH and IFS-802GS-8PH are 18/10 Ports unmanaged industrial grade Ethernet PoE switches with 8x 10/100Base-TX PoE+/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 8-port IEEE 802.3at/af PoE output (30W/Per Port )
- Maximum PoE output power budget 240W
- 48VDC (44~57VDC) redundant dual input power
- Supports power failure alarm message by relay
- Supports flow control
- Provides broadcast storm protection (IFS-1602GS-8PH)
- DIN Rail mounting or wall mounting

## **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet	Network Cable	Fiber Ca	ble (N	Multi-mode):	50/125um, 6	2.5/125um
	IEEE 802.3u 100Base-TX Fast Ethernet		Fiber Ca	ble (S	ingle-mode	): 9/125um	
	IEEE 802.3z 1000Base-X Gigabit Ethernet	Protocols	CSMA/CD				
	IEEE 802.3x Flow Control and Back Pressure	LED	Per unit: (Amber)	Pow	er 1 (Green),	Power 2 (Gre	en), Fault
	IEEE 802.3at PoE+ (Power over Ethernet enhancements)		Per RJ-4	5 por	t : Link/Activ	ve (Green)	
	IEEE 802.3af PoE (Power over Ethernet)	LED	Ele er De		Speed to		
Switch Architecture	Back-plane (Switching Fabric): 5.6Gbps (IFS-802GS-8PH) 7.2Gbps (IFS-1602GS-8PH)	LED	Per PoE	Priper Per port: LINK/Active (Green) Per PoE Port LED : • Active · ON			
Data Processing	Store and Forward		<ul> <li>Active</li> <li>Inactive</li> </ul>	Active : ON     Inactive : OFF			
Flow Control	IEEE 802.3x flow control, back pressure flow control	DIP SW	macen	Power failure alarm			
MAC Address Table	8K (IFS-802GS-8PH) 16K (IFS-1602GS-8PH)		DIP 1	OF	F · Fnable	ON · Disable	
Packet Buffer Size	1Mbits (IFS-802GS-8PH) 4Mbits (IFS-1602GS-8PH)			Bro	padcast Prote	ection (IFS-16	02GS-8PH)
Max Frame Size	1632 Bytes (IFS-802GS-8PH)		DIP 2	OF	F : Enable	ON : Disable	
Jumbo Frame	16K Byte (IFS-1602GS-8PH)	Reverse Polarity Protection	Support	ed fo	ed for Power Input		
PoE standard	IEEE 802.3at/af	Overload Current	Support	ed			
PoE RJ-45 pin Assignment	RJ-45 port #1~# 8 support IEEE 802.3at/af (IFS-802GS-8PH) RJ-45 port #9~# 16 support IEEE 802.3at/af (IFS-1602GS-8PH) End-Spap, Alternative A mode	Protection Power Supply	Redunda (Remova (50~57V 30W app	ant d able t ' inpu	ual 48VDC (4 erminal bloc t is recomme ions)	I4~57VDC) in :k) ended for IEE	put power E802.3at in
	Positive (V+): RI-45 pin 1 2	Power Consumption	IFS-802GS-8PH power consumption				
	Negative (V-): RJ-45 pin 3, 6.		Input	t	Total Power	Device Power	PoE Power
	Data (1, 2, 3, 6)		50 VD	)(	251W	5.2W	240W
Network Connector	8x RJ-45 for 10/100Base-TX (IFS-802GS-8PH)		IFS-1602	GS-8F	PH power cons	umption	
	auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex		Input Voltag	t ge	Total Power Consumption	Device Power Consumption	PoE Power Budget
	2x 1000Base-X SFP			~	= 0		
Network Cable	UTP/STP above Cat. 5e cable	Poe Power Budget	Maximu Per Port	m Po )	E Output po	wer budget 2	240W (30W/
	EIA/TIA-568 100-ohm (100m)	Alarm Relay Contact	Relay ou @24VDC	tputs	s with curren	it carrying ca	pacity of 1A



Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating	-10 ~ 60°C (IFS-802GS-8PH, IFS-1602GS-8PH)
Temperature	-40 ~ 75°C (IFS-802GS-8PHE, IFS-1602GS-8PHE)
<b>Operating Humidity</b>	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged metal, IP30 Protection and fanless
Dimensions	106 x 72 x 152 mm (D X W X H)
Weight	765g (IFS-802GS-8PH) 850g (IFS-1602GS-8PH)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	635,446Hours (IFS-802GS-8PH) 493,382 Hours (IFS-1602GS-8PH) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
,	

Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
. lottetton Level	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)
4KV surge protection	Supported for PoE, UTP and SFP port (IFS-1602GS-8PH)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Dimensions**







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## **Ordering Information**

	Tabl	RJ45 UTP Port	Fiber Port	Ро	EPort	Input Power		Certification		Operating
Model Name Port		10/100 Base-T(X)	1000 Base-X	IEEE802.3at	Power Budget	Redundant	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	Temperature
IFS-802GS-8PH	10	8	2 SFP	8	240W	48VDC	V	V	V	-10~60°C
IFS-802GS-8PHE	10	8	2 SFP	8	240W	48VDC	V	V	V	-40~75°C
IFS-1602GS-8PH	18	16	2 SFP	8	240W	48VDC	V	V	$\vee$	-10~60°C
IFS-1602GS-8PHE	18	16	2 SFP	8	240W	48VDC	V	V	V	-40~75℃
Industrial Fast Etherne Switch Package List	8: 8x F et 16: 16:	E UTP 02GS x FE UTP	2x GbE SFP	8PH: 8x Po	High Power E					
<ul> <li>IFS-802GS- Device</li> <li>Din Bail with</li> </ul>	•8PH or IFS	-1602GS-8PH	Terminal bloc Protective cap	k os for SFP po	orts					

## **Optional Accessories**

#### Wall mount kit accessories

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85- <mark>(E)</mark>	Industrial SFP	GbE 1000	Base-SX, M/M, 5	500 meter,wave l	ength 850nm, 7.5dB, l	.C, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SFI	P 1000Bas	e-LX, S/M, 20kr	n, wave length	1310nm, 15dB, LC, -1	0~70℃ (-40~85℃)
ISFP-T7T00-00- (E)	Industrial SFI	P 10/100/1	000Base-T UTF	2 100meter, -10-	~70°C (-40~85°C)	
SFP Naming Rule	S 7 M: Multi Mode S: Single Mode T: UTP	040 9: 10G 7: GbE 5: FE	- 31 Distance T00: (UTP) 000: (500m)	D     Wavelength     00: UTP     85: 850nm	E D: DDMI Blank: Non DDMI	● E:-40~85°C Blank:0~70°C

85: 850nm

31:1310nm

55:1550nm

WA: TX/1310nm (Bidi mode A) WB: TX/1550nm (Bidi Mode B)

000: (500m)

002: (2km)

020: (20km)

040: (40km)

Transceiver



# IMC-1000S-PH12

1x GbE RJ45 to 1x 100/1000Base SFP with PoE PSE (30W, 12/24/48VDC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC (9.6~57VDC) redundant dual input power with power booster
- Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Supports Remote PD reset by fiber port link down
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)



IMC-1000S-PH12 is a family of unmanaged Gigabit Ethernet media converters that support conversion between electrical 10/100/1000Base-T and optical 1000Base-X Ethernet and as PSE (Power Source Equipment) provides PoE+/PoE power over Ethernet. The IMC-1000S-PH12 utilizes 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
- Provides IEEE 802.3at PoE output (30Watts)
- Provides a DIP-Switch to set functions
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C
- Supports Jumbo frame 9K bytes packet

## **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet							
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet							
	IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair							
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic							
	IEEE 802.3x Flow Control and Back pressure							
	IEEE 802.3at PoE <sup>+</sup> (Power over Ethernet enhancement)							
	IEEE 802.3af PoE (Power over Ethernet)							
	IEEE 802.1q Tag VLAN							
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto- Negotiation Function Supports UTP CAT.5e Twisted Pair cable							
Fiber Ports	100Base-X or 1000Base-X SFP slot 100Base-X or 1000Base-X set by DIP SW							
Data Process Architecture	Store and Forward mode or Pass Through mode Set by DIP SW							
Jumbo Frame	9K bytes							
Fiber	Fiber Cable (Multi-mode): 50/125um, 62.5/125um							
Parameters	Fiber Cable (Single-mode): 9/125um							
	Wavelength: 1310nm (Multi-mode/Single-mode)							
	Available distance: • SFP, Distance depend on plug-in Fiber Transceiver							
Link Fault Pass Through	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down							
(LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down							
Far-End Fault (FEF)	Work with LFPT to prevents data loss							
DIP Switch	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							

DIP Switch	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	SFP Slot
and Pin Assignment	RJ-45 Socket: CAT.5e (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.
Connector and Pin Assignment	PoE (V+): RJ-45 pin 1, 2. PoE (V-): RJ-45 pin 3, 6. Data (1,2,3,6,4,5,7,8 )
LED	Per Unit :Power 1 (Green ) ,Power 2 (Green) ,Fault (Amber )
	Fiber LNK/ACT (Green): ON: Connected to network, OFF: Not connected to network , BLK: Receive /Transmit Data
	Fiber Speed: Yellow : 1000Base-X, Green : 100 Base- X
	RJ-45 Port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)
	LNK/ACT for RJ45(Green): ON: Connected to network, OFF: Not connected to network, BLK: Networking is active
	PoE Status (Green): Flash: PoE Fault (Over-load or short ), ON: PoE normal working, OFF : PoE No Power output
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power Supply	12/24/48VDC (9.6~57VDC), Redundant power with polarity reverse protect function and removable terminal block Built-in very high efficiency booster(97~99%) to rise up 52VDC for PoE output Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 1)
PoE Power budget	30W

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Power	Power consumption & Boost efficiency					
Consumption		Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
		12VDC	34.2W	3.9W	30W	99.0%
		24VDC	34.7W	4.4W	30W	99.0%
		48VDC	35.4W	4.7W	30W	97.7%
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC					
Removable Terminal Block	Provi	– Provides 2 redundant power, alarm relay contact, 6 Pin				
Operating Humidity	5%~9	5%~95% (Non-condensing)				
Operating Temperature	-20°C ~ 75°C					
Storage Temperature	-40°C ~ 85°C					
Housing	Rugged Metal, IP30 Protection and fanless					
Dimensions	106 x 62.5 x 135 mm (D x W x H)					
Weight	650g					
Installation	DIN Rail mounting, or wall mounting (Optional)					
MTBF	881,372 Hours MIL-HDBK-217					
Warranty	5 yea	rs				

Certification	
EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial environment	EN 61000-6-2
Emission for Heavy industrial environment	EN 61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	EN61000-4-4 (EFT) Level 3, Criteria A
. Toteenon Level	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 1 : High efficiency boost technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage

Figure 2 : Remote PD Reset Application



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## **Dimensions**



## **Ordering Information**



- IMC-1000S-PH12
- Protective caps for SFP ports
- Din Rail bracket with screws
- Terminal block

## **Optional Accessories**

#### Wall mount kit accessories

IND-WMK02 Wall Mount kit for Industrial product, 184 x 50mm

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IMC-1000S-PH12 product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



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Industrial GbE PoE Media Converter IMC-1000S-PH12



## IMC-100-PH12

### 1x 10/100Base RJ45 to 1x 100Base Fiber (SC/ST) with PoE PSE (30W, 12/24/48VDC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC (9.6~57VDC) redundant dual input power with power booster
- Regulate PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Supports Remote PD reset by fiber port link down
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)



IMC-100-PH12 is a 10/100Base-TX to Fixed 100Base-FX unmanaged Ethernet media converter that also injects PoE+/PoE power through the electrical RJ-45 port. 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
- Provides IEEE 802.3at PoE output (30Watts)
- Provides a DIP-Switch to set functions
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C
- Supports Jumbo frame 9K bytes packet

## **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	Fiber	Fiber: SC / ST (Multi-mode, 2KM), SC / ST (Single-mode, 30KM, 50KM)	
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet	Connector		
	IEEE 802.3x Flow Control and Back pressure	RJ45 Connector	RJ-45 Socket: CAT.5e (10/100Mbps) Twisted Pair cable	
	IEEE 802.3at PoE+ (Power over Ethernet enhancement)	and Pin Assignment	Auto MDI/MDI-X and Auto-Negotiation Function Support RJ-45 Port support IEEE 802.3at/af End-Span, Alternative A	
	IEEE 802.3af PoE (Power over Ethernet)	0	mode.	
	IEEE 802.1q Tag VLAN		PoE (V+): RJ-45 pin 1, 2.	
RJ45 Ports	10/100Base-TX Auto MDI/MDI-X and Auto-Negotiation Function		PoE (V-): RJ-45 pin 3, 6. Data (1,2,3,6)	
	Supports UTP CAT.5e Twisted Pair cable	LED	Per Unit : Power T (Green ), Power 2 (Green), Fault (Amber )	
Fiber Ports	100Base-FX with SC or ST connector		Fiber LNK/ACT (Green):	
Data Process Architecture	Store and Forward mode or Pass Through mode (Set by DIP SW)		ON: Connected to network OFF: Not connected to network BLK: Pocouvo (Transmit Data	
Jumbo Frame	9K bytes		Eiber Speed (Creen + 100 Pace, V	
Fiber	Fiber Cable (Multi-mode): 50/125um, 62.5/125um			
Parameters	Fiber Cable (Single-mode): 9/125um		KJ-45 POTC: Speed: 10 (OFF), 100 (Green) LNK/ACT for B I45(Green):	
	Wavelength: 1310nm (Multi-mode/Single-mode)			
	Available Distance: 2KM (Multi-mode ), 30KM (Single- mode), 50KM(Single-mode)		ON: Connected to network OFF: Not connected to network	
Link Fault Pass Through	5 TX- Fiber: If TX port link down, the media converter will force Fiber port to link down		BLK: Networking is active PoE States (Green) Flash: PoE Fault (Over-load or short ) ON: PoE normal working, OE: PoE No Power output	
(LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down			
Far-End Fault (FEF)	Work with LFPT to prevents data loss	Reverse		
DIP Switch	ON: Disable Alarm For Power Loss OFF: Enable Alarm For Power Loss	Polarity Protection	Supported for Power Input	
	ON: Disable Alarm For Port Link-Failure OFF: Enable Alarm For Port Link-Failure	Overload Current Protection	Supported	
	ON: LFPT Enable, OFF: LFPT Disable	Power Supply	12/24/48VDC (9.6~57VDC), Redundant power with polarity	
	Data process Architecture : ON : Pass through mode OFF : Store and Forward Switch mode		reverse protect function and removable terminal block Built-in very high efficiency booster(97~99%) to rise up 52VDC for PoE output	
	PoE Output OFF: Enable PoE output ON: Disable PoE output		Regulated PoE output voltage (52VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 1)	
	Remote PD reset (Figure 2) OFF : Disable Remote PD reset ON: Enable Remote PD reset by fiber port link down	PoE Power budget	30W	

Certifications



Power	Power consumption & Boost efficiency					
Consumption	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%	
Alarm Relay Contact	Relay outputs @24VDC	Relay outputs with current carrying capacity of 1 A @24VDC				
Removable Terminal Block	Provide 2 redu	Provide 2 redundant power, alarm relay contact, 6 Pin				
Operating Humidity	5%~95% (Non-condensing )					
Operating Temperature	-20°C ~ 75°C					
Storage Temperature	-40°C ~ 85°C					
Housing	Rugged Metal, IP30 Protection and fanless					
Dimensions	106 x 62.5 x 135 mm (D x W x H)					
Weight	655g					
Installation	DIN Rail mounting, or wall mounting (Optional)					
MTBF	801,948 Hours MIL-HDBK-217					
Warranty	5 years					

EMC	CE
EMI	FCC Part 15 Subpart B Class A, CE
<b>Railway Traffic</b>	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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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 1 : High efficiency boost technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device
- Guarantee delivery PoE power distance to 100 meters
- Wide range input power 24/48VDC (20~57VDC)
- Built-in very high efficiency (94~97%) to boost PoE output voltage





## **Dimensions**



## **Ordering Information**



## **Optional Accessories**

#### Wall mount kit accessories

IND-WMK02 Wall Mount kit for Industrial product, 184 x 50mm



## IGS-1604SM & IGS-812SM

▲ 16x GbE RJ45 + 4x 100/1000Base-X SFP

▶ 8x GbE RJ45 + 12x 100/1000Base-X SFP



- UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance



These models are managed industrial grade GbE L2+ switches with 16/8 10/100/1000Base-T ports and 4/12 GbE/100M Ethernet SFP 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, 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 (See figure). 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 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\*

\*Please see Chapter 1- Software Management for more details

### **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Protocols	CSMA/CD		
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Reverse Polarity	Supported for	power input	
	IEEE 802.3ab IEEE 802.3z	1000Base-1 Gbit/s Ethernet over twisted pair 1000Base-X Gbit/s Ethernet over Fiber-Optic	Overload Current Protection	Overload Current Protection Supported		
	IFFE 802.1d	STP (Spanning Tree Protocol) CPU Watch Dog Supported				
	IFFE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Power Supply	Redundant Du	al DC 12/24/48V (9	.6~60VDC) Input
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		power (Remov	able Terminal Bloc	k)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	Power Consumption	Input Voltage	IGS-812SM	IGS-1604SM
	IEEE 802.1Q	Virtual LANs (VLAN)		12VDC	14.3W	14.5W
		Port based and MAC based Network		24VDC	14.2W	14.4W
	IEEE OUZ.IA	Access Control, Authentication		48VDC	15.8W	16.3W
	IEEE 802.3ac	Max frame size extended to 1522Bytes.	LED	Per unit: Powe	r 1 (Green), Power 2	2 (Green), Fault
		Link aggregation for parallel links		(Amber), CPU Act (Green), Ring Master (Yellow)		
	IEEE 802.3ad	with LACP(Link Aggregation Control Protocol)		Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)		
	IEEE 802.3x	Flow control for Full Duplex		SEP Fiber Per p	ort: Link/Active (G	reen)
Standard	IEEE 802.1ad	Stacked VLANs, Q-in-Q	Jumbo Frame	9.6KB		/
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-ta-		
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	MAC Address Table			
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Mamory Puffor	E12K Puter for	nacket buffer	
VLAN ID	4094 IEEE 802.1Q VLAN VID		Memory Burrer	SIZK Bytes IOI	CMTD( a mail aver	
Switch Architecture	Back-plane (Switching Fabric): 40Gbps (IGS-812SM_IGS-1604SM)		warning wessage	system sysiog, relay	, SIVI I P/ e-mail ever	nt message, alarm
Data Processing	Full wire-spee	d	Alarm Relay Contact	Relay outputs @24VDC	with current carryi	ng capacity of 1 A
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode		Removable Terminal Block	Provide 2 redu Pin	ndant power, alarn	n relay contact, 6
Network Connector	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		Operating Temperature	-10 ~ 60°C (IGS-812SM, IGS-1604SM) -40 ~ 75°C (IGS-812SM-E, IGS-1604SM-E)		I) 4SM-E)
			Operating Humidity	5% to 95% (Non-condensing)		
			Storage Temperature	-40 ~ 85°C		
Console	RS-232 (RJ-45)		Housing	Rugged Metal, IP30 Protection, Fanless		
Network Cable	UTP/STP abov	e Cat. 5e cable	Dimensions	106 x 72 x152 r	nm (D x W x H) S-1604SM)	
	EIA/TIA-568 10	)0-ohm (100m)		(100 012010) 10	5 100 ISINI	

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## Industrial Managed GbE Switch

Weight	0.795kg (IGS-812SM) 0.82kg (IGS-1604SM)
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	517,181 Hours (IGS-812SM) 412,015 Hours (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

## **Software Specifications**

Topology	
VLAN	IEEE 802.1g VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g VLAN.up to 4094 Groups
	IEEE 802 lad O-in-O
	MAC-based VI AN up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol based V/LAN/Ethorpt SNAPLL() up to 128 optrios
	_FIOLOCOF-Dased VLAN(LUTEFTT, SINAF, LLC), up to 120 entries_
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
Link Aggregation	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
(Port Trunk)	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain
	or Sub-Ring type for flexible uses, and maximum up
	to 5 Rings.
	Recovery time <10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC Union $\mu$ -Ring white paper for more details
Loop Protoction	and more topology applications)
	Supported
11U-1 G.8032 /	Recovery time <50ms
Y.1344 ERPS	
(Ethernet King	Single Ring, Sub-Ring, Multiple ring topology network
Quis realures	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Irattic Classification Occ	IEEE 802.1p based CoS
Classification Qos	IP Precedence based CoS
	IP DSCP based CoS
Traffic	QCL(QoS Control List): Frame Type, Source/
Classification QoS	Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP
8 I I I I I	Fragment, DSCP, TCP/UDP port number
Bandwidth	Rate in steps : 1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
ingress	Rate Unit : bit or frame
	Rate in steps : 1 kbps / Mbps
Bandwidth	Range : 100 kbps to 1Gbps
Control for Egress	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast Broadcast Multicast
IP Multicasting Fea	tures
	ICMD Spaaning v1 v2 v2 / MLD Spaaning v1 v2
Spooping	Davt Eltavia a Drafila
Shooping	Port Filtering Profile
	Inrottling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4: TCP/UDP

Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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

RADIUS authentica	ition & accounting
TACACS+ authentie	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
EtherNet/IP	Supports for management and monitoring
Modbus/TCP	Supports for management and monitoring
SW & Configuration	IFIP, HTTP
Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
	Server/Client
	Supported
	Supported
IFVOACL	for 1.2 / 1.2 / 1.4
	L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
	Determine the cable length and lowering the power
	for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable normal or broken point distance



## **Application**

Figure : Application Example



## **Dimensions**

► IGS-812SM



#### ► IGS-1604SM



(Optional accessory)

## **Ordering Information**

MadalNama	Managod	Total	RJ45 UTP port	Fiber Port	Power Input	Certification			Operating	
Modername	ivianageu	Port	10/100/1000 Base-T	100/1000 Base-X	Redundant	Railway Safety EN61000 EN50121-4 UL60950-1 EN61000		EN61000-6-2 EN61000-6-4	CE FCC	Temperature
IGS-812SM	V	20	8	12 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-812SM-E	V	20	8	12 SFP	12/24/48VDC	V	V	V	V	-40~75°C
IGS-1604SM	$\vee$	20	16	4 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-1604SM-E	V	20	16	4 SFP	12/24/48VDC	V	V	V	V	-40~75°C

#### Model Naming Rule



Terminal block

#### Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- Din Rail with screws
- Protective caps for SFP ports

## **Optional Accessories**

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule



# IGS<sup>+</sup>803SM & IGS<sup>+</sup>404SM

♦ 8x GbE RJ45 + 3x 100/1000Base-X SFP
 ♦ 4x GbE RJ45 + 4x 100/1000Base-X SFP



- UL60950-1, EN60950-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance



These models are managed industrial grade GbE L2+ switches with 8/4 10/100/1000Base-T ports plus 3/4 GbE/100M Ethernet SFP 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 networks, 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 (See Figure 1). 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)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses. (Please see CTC  $\mu$ -Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet 100Base-TX 100Base-FX East Ethernet	Network Connector	4x 10/100/1000Base-T RJ-45 + 4x 100/1000Base-X connector (IGS+404SM)				
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		8x 10/100/1000B connector (IGS+	ase-T RJ-45 - 803SM)	+ 3x 100/100	0Base-X SFP	
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		Auto MDI/MDI-X	upport Auto function, t dual speed	with DDMI	n speed,	
	IEEE 802.1d	STP (Spanning Tree Protocol)	Console	BS-232 (BI-45)	t dddi speed	WICH DDIVI		
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Network Cable	LITP/STP above (	at 50 cable			
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Network Cable	EIA /TIA-568 100-	obm (100m)			
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	Protocols	CSMA/CD				
	IEEE 802.1Q	Virtual LANs (VLAN)	Reverse Polarity Protection	Supported	Supported			
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Overload Current Protection	Supported				
Standard	IEEE 802.3ac	Max frame size extended to 1522Bytes.	CPU Watch Dog	Supported				
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)			C) Input	
	IFFF 802.3x	Flow control for Full Duplex	Power	IGS+404SM				
	IEEE 802.1ad	Stacked VLANs, O-in-O	Consumption	Input Voltage	12VDC	24VDC	48VDC	
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		IGS+404SM	7.7W	8W	9.2W	
	IFFE 802 1ab	Link Laver Discovery Protocol (LLDP)		Input Voltage	12VDC	24VDC	48VDC	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		IGS+803SM	8.6W	10.8W	11.5W	
VLAN ID	4094 IEEE 802	.1Q VLAN VID	LED	Per unit: Power 1	(Green), Pov	ver 2 (Green)	, Fault	
Switch Architecture	Back-plane (Switching Fabric): 16Gbps (IGS <sup>+</sup> 404SM) 22Gbps (IGS <sup>+</sup> 803SM) Full wire-speed			(Amber), CPU Ac Per RJ-45 port: 1 1	t (Green), Rir 0/100 Link/A 000 Link/Act	ig Master (Ye ctive (Green) ive (Amber)	ellow)	
Data Processing	Store and Forv	ward		SEP Fiber Per port: Link/Active (Green)				
Flow Control	IEEE 802.3x for	full duplex mode Back pressure for	Jumbo Frame	9.6KB		/		
	half duplex m	ode	IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)				

pecifications & design are subject to change without prior notice. Please visit CTC Union website for more detai

MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin
Operating Temperature	-10 ~ 60°C (IGS <sup>+</sup> 404SM, IGS <sup>+</sup> 803SM) -40 ~ 75°C (IGS <sup>+</sup> 404SM-E, IGS <sup>+</sup> 803SM-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 <sup>+</sup> 404SM) 106 x 72 x152 mm (D x W x H) (IGS <sup>+</sup> 803SM)
Weight	0.65kg (IGS+404SM) 0.81kg (IGS+803SM)
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	861,962 Hours (IGS+4045M) 688,248 Hours (IGS+8035M) (MIL-HDBK-217)
Warranty	5 years

Certification	
EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	EN50121-4
Traffic control	NEMA TS2 (IGS+803SM)
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1 (IGS+803SM)
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## Software Specifications

торогоду	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g VLAN,up to 4094 Groups
	IEEE 802.1ad O-in-O
	MAC-based VI AN.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 VI AN Registration Protocal)
	MVR (Multicast VLAN Registration)
Link Aggregation	Static (Hash with SA_DA_IP_TCP/UDP_port) up to 5
(Port Trunk)	trunk aroup
(i ore mainty	Dynamic (IEEE 802 3ad LACP) up to 5 trunk group
Spanning Tree	
spanning nee	
Multiple + Dine	IEEE OUZ.IS IVISIP
Multiple µ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain
	to 5 Rings
	Recovery time < 10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC Union u-Ring white paper for more details
	and more topology applications)
Loop Protection	Supported
ITU-T G.8032 /	Pacevary time (E0mc
	Recovery lime < 50ms
Y.1344 ERPS	
Y.1344 ERPS (Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology network
Y.1344 ERPS (Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network
Y.1344 ERPS (Ethernet Ring Protection) QoS Features	Single Ring, Sub-Ring, Multiple ring topology network
Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port
Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service Traffic	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS
Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service Traffic Classification QoS Traffic	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS OCI (OoS Control List): Frame Type, Source/
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC VI AN ID PCP DEI
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI OCE(OoS Control Entry): Protocol Source IP IP
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Y.1344 ERPS (Ethernet Ring Protection) QoS Features Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Rate Unit : bit or frame Bate in steps : 1 kbps / Mbps
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE[QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Pate Unit : bit
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEl QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate in steps : 1 kbps / Mbps Rate in steps : 1 kbps / Mbps Rate in steps : 1 kbps / Mbps Rate Unit : bit or frame Rate Unit : bit Der guege / Der port febrore
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate in steps : 1 kbps / Mbps Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit or frame Rate Unit : bit Per queue / Per port shaper Poemoeiter
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474)	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper Remarking Cartholicate Davalant Multipet
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b>	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast <b>atures</b>
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast <b>IGMP</b> Snooping v1, v2, v3 / MLD Snooping v1, v2
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast <b>atures</b> IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast <b>Stures</b> IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling, Fast Leave
Y.1344 ERPS (Ethernet Ring Protection) <b>QoS Features</b> Class of Service Traffic Classification QoS Traffic Classification QoS Bandwidth Control for Ingress Bandwidth Control for Egress DiffServ (RF 2474) Storm Control <b>IP Multicasting Fea</b> IGMP / MLD Snooping	Single Ring, Sub-Ring, Multiple ring topology network IEEE 802.1p 8 active priorities queues for per port IEEE 802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number Rate in steps : 1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper <b>Remarking</b> for Unicast, Broadcast, Multicast <b>IGMP</b> Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling, Fast Leave Maximum Multicast Group : up to 1022 entries

Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
PADILIS authoritica	tion & accounting
TACACE L authoritie	sotion & accounting TACACE + 2.0
	Supported
ППР5, ППР ССП/ССПур	Supported
SSL/SSHV2	Supported
Diser Name Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
EtherNet/IP	Supports for management and monitoring
Modbus/TCP	Support for management and monitoring
SW &	TFTP, HTTP
Configuration Upgrade	Redundant firmware in case of upgrade failure
FTP client	Support for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	REC1213 MIB II. Private MIB
UPnP	Supported
ВООТР	Supported
DHCP	Server Client Relay Relay option 82 Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relav
DNS	Client, Proxy
IEEE 1588 PTP V2	Support 5 operating mode in each port :
	Ordinary-Boundary, Peer to Peer Transparent Clock,
	End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLUP (IEEE	LINK Layer Discovery Protocol
002.1aD)	LLUY-MEU
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported



SSH over IPv6	Supported	Others Features				
IPv6 Telnet	Supported	<b>Green Ethernet</b>	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)			
IPv6 NTP, SNTP	Server/Client		Management to optimize the power consumption			
IPv6 TFTP	Supported		Determine the cable length and lowering the powe			
IPv6 QoS	Supported		for ports with short cables			
IPv6 ACL	Number of rules: up to 256 entries		Lower the power for a port when there is no link			
	for 12/13/14		LED Power Management :Adjustment LEDs intensity			
	L2 : Mac address SA/DA/VLAN	Cable Diagnostic	<ul> <li>Measuring UTP cable normal or broken point distance</li> </ul>			
	L4: TCP/UDP					

## **Application**



**Dimensions** 



**Front View** 

DIN-Rail Kit View **Rear View** 

Wall-Mount Kit View (Optional accessory)

IGS+803SM



Side View

15.20 i Band i i 0 0 0

**Front View** 



DIN-Rail Kit View

Wall-Mount Kit View (Optional accessory)

## **Ordering Information**

	Total			Total	RJ45 UTP port	Fiber Port	PowerInput			Certif	fication			Operating
ModelName	Managed	Port	10/100/1000 Base-T	100/1000 Base-X	Redundant	Railway EN50121-4	NEMATS2	Safety UL60950-1	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Temperature		
IGS <sup>+</sup> 404SM	V	8	4	4 SFP	12/24/48VDC	V				V	V	-10~60°C		
IGS+404SM-E	V	8	4	4 SFP	12/24/48VDC	V				V	V	-40~75°C		
IGS <sup>+</sup> 803SM	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	V	-10~60°C		
IGS <sup>+</sup> 803SM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	V	-40~75℃		

#### Model Naming Rule



#### Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- Din Rail with screws
- Protective caps for SFP ports

Terminal block

**Optional Accessories** 

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00- <mark>(E)</mark>	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

SFP Naming Rule



## IGS-803SM & IGS-404SM



- UL60950-1, EN60950-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance



These models are managed industrial grade GbE L2+ switches with 8/4 10/100/1000Base-T ports and 3/4 GbE/100M SFP ports (2 ports support 2.5GbE) 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, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications (See figure 1). 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 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*

Supports SmartView for Centralized Management\*
 \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Console	RS-232 (RJ-45)				
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Network Cable	UTP/STP above C	at. 5e cable			
	IFFE 802 3ab	1000Base-T Gbit/s Ethernet over		EIA/TIA-568 100-	ohm (100m)			
	1222 002.500	twisted pair	Protocols	CSMA/CD				
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic	Reverse Polarity Protection	Supported for po	ower input			
	IEEE 802.3cb IEEE 802.1d	2.5GBase-X STP (Spanning Tree Protocol)	Overload Current	Supported				
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	CPI Watch Dog	Supported				
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)	Crowaten Dog	Supported Dealerst Deal	DC 12/24/40			
	ITU-T G.8032 / V 1344	ERPS (Ethernet Ring Protection	Power Supply	power (Removab	ble Terminal	3V (9.6~60VL Block )	ic) input	
	IEEE 802 10	Virtual LANs (VLAN)	Power	IGS-404SM				
	1222 002.1Q	Port based and MAC based Network	Consumption	Input Voltage	12VDC	24VDC	48VDC	
	IEEE 802.1X	Access Control, Authentication		IGS-404SM	8.2W	8.1W	9.6W	
	IEEE 802.3ac	Max frame size extended to 1522Bytes.		IGS-803SM				
		Link aggregation for parallel links		Input Voltage	12VDC	24VDC	48VDC	
	IEEE 802.3ad	with LACP(Link Aggregation Control		IGS-803SM	8.6W	10.8W	11.5W	
		Protocol)	LED	Per unit: Power 1	(Green), Pov	ver 2 (Green)	. Fault	
Standard	IEEE 802.3x Flow control for Full Duplex			(Amber), CPU Act (Green), Ring Master (Yellow)				
	IEEE 802.1ad	Stacked VLANs, Q-in-Q		Per RJ-45 port: 10	)/100 Link/A	ctive (Green)		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for		. 10	000 Link/Act	ive (Amber)		
				SFP Fiber Per por	t: Link/Activ	e (Green)		
	IEEE 802.1aD	LINK Layer Discovery Protocol (LLDP)	Jumbo Frame	9.6KB				
	1EEE 802.3dZ		IEEE 802.3ac	Max frame size e	xtended to 1	1522Bytes (al	low O-tag	
Cuitab	4094 ILLL 602	uitabing Fabric)		in packet)				
Architecture	22Gbps (IGS-4	MCNING FADITC): 04SM)	MAC Address Table	ddress Table 8K				
Architecture	28Gbps (IGS-8	03SM)	Memory Buffer	512K Bytes for pa	cket buffer			
	Full wire-spee	d	Warning Message	arning Message System Syslog, SMTP/ e-mail event message, alar relay			ge. alarm	
Data Processing	Store and Forv	vard	······				9 -,	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for balf duplex mode		Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A				
Network	4x 10/100/100	DBase-T RJ-45 + 2x FE/GbE SFP slot +	Removable	Provide 2 redund	lant nower :	alarm rolav c	ontact 6	
Connector	2x FE/GbE/2.5 (IGS-404SM)	GbE SFP slot	Terminal Block	Pin	ant power, a		Sinder, O	
	8x 10/100/100 2x FE/GbE/2.5	0Base-T RJ-45 + 1x FE/GbE SFP slot + GbE SFP slot	Operating Temperature	-10 ~ 60°C (IGS-4 -40 ~ 75°C (IGS-4	04SM, IGS-8 04SM-E, IGS	03SM) -803SM-E)		
	(IGS-803SM) RJ-45 UTP por Auto MDI/MD	t support Auto negotiation speed, I-X function,	Operating Humidity	5% to 95% (Non-condensing)				
	or P port supp	טוג טעמו speed אונח טטואו						

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details

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)
Weight	0.725kg (IGS-404SM) 0.78kg (IGS-803SM)
Installation Mounting	DIN Rail mounting, or wall mounting (optional)
MTBF	861,962 Hours (IGS-404SM) 612,523 Hours (IGS-803SM) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55022 Class A
<b>Railway Traffic</b>	EN50121-4

## **Software Specifications**

Topology			
VLAN	IEEE 802.1g VLAN up to 4094.802.10 VLAN VID		
	IEEE 802 to VLAN up to 4094 Groups		
	IEEE 802 1ad O-in-O		
	MAC-based VI AN 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		
Spanning Tree	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group IEEE 802.1d STP		
	IEEE 802.1w RSTP		
	IEEE 802.1s MSTP		
Multiple µ-Ring	up to 5 instances that each supports µ-Ring, µ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings.		
	Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC Union $\mu$ -Ring white paper for more details		
Loop Protection	_ and more topology applications)		
	Supported		
Y.1344 ERPS	Recovery time <50ms		
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network		
QoS Features			
Class of Service	IEEE 802.1p 8 active priorities queues for per port		
Traffic	IEEE 802.1p based CoS		
Classification Qos	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	Rate in steps : 1 kbps / Mbps / fps / kfps		
Ingress	Range : 100 kbps to 1Gbps / 1fps to 3300kfps		
ingress	Rate Unit : bit or frame		
	Rate in steps : 1 kbps / Mbps		
Bandwidth	Range : 100 kbps to 1Gbps		
Control for Egress	Rate Unit : bit		
	Per queue / Per port shaper		
DiffServ (RF 2474)	Remarking		
Storm Control	for Unicast, Broadcast, Multicast		
IP Multicasting Fea	atures		
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2		
Shooping	Port Filtering Profile		
	I hrottling, Fast Leave		
	Maximum Multicast Group : up to 1022 entries		
	Query / Static Router Port		

Traffic control	NEMA TS2
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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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

Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
RADIUS authentica	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	
Authentication	Remole Authentication (Via RADIUS / TACACS+)
Management	Wah Talast (SCI) CLIPS 222 samaala
Filtering	Web, Telhet 7 SSH, CLI RS-252 COTISOLE
Management Feat	ures
CLI	Cisco® like CLI
Web Based Manag	ement
Telnet	Server
SNMP	V1, V2c, V3
EtherNet/IP	Support for management and monitoring
Modbus/TCP	Support for management and monitoring
SW &	TFTP, HTTP
Configuration	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	BMONUL(1, 2, 3, 9 group), BMONUL
MIB	REC1213 MIB II. Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server Client Relay Relay option 82 Spooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Support 5 operating mode in each port :
	Ordinary-Boundary, Peer to Peer Transparent Clock,
NTD CNTD	End to End Transparent Clock, Master, Slave
	Server/Client
802.1ab)	LINK Layer Discovery Protocol
IDv6 Easturas	LLDP-MED
IPv6 Management	Talpat Sarvar/ICMD.v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP SNTP	Sorver/Client
IPv6 TFTP	Supported
IPv6 OoS	Supported
	Supported

distance

LED Power Management :Adjustment LEDs intensity

Measuring UTP cable normal or broken point



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Cable Diagnostic

### **Application**



## **Dimensions**







Side View





(Optional accessory)

50.00

**Front View** 

## **Ordering Information**

	Total	UTP port	Fik	per Port	Power Input	Certification					Operating
ModelName	Port	10/100/1000 Base-T	100/1000 Base-X	100/1000 2.5G Base-X	Redundant	Railway EN50121-4	Traffic Control NEMA TS2	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Temperatu
IGS-404SM	6	4	2 SFP	2 SFP	12/24/48VDC	V	V	V	V	V	-10~60°C
IGS-404SM-E	6	4	2 SFP	2 SFP	12/24/48VDC	V	V	V	V	V	-40~75°C
IGS-803SM	11	8	1 SFP	2 SFP	12/24/48VDC	V	V	V	V	V	-10~60°C
IGS-803SM-E	11	8	1 SFP	2 SFP	12/24/48VDC	V	V	V	V	V	-40~75°C
Industrial Gigabit Switch	4: 4x 0 8: 8x 0	GDE UTP GDE UTP	03S: 3x ( 04S: 4x (	GbE SFP GbE SFP	M: Manageo	E: -40~ Blank :	75℃ -10~60℃				
Package List											
<ul><li>One device</li><li>Console cal</li></ul>	of the se ole (RJ-4	eries 5 to DB9)	<ul><li>Term</li><li>Prot</li></ul>	ninal block ective caps for	SFP ports						

**Optional Accessories** 

• Din Rail with screws

#### Wall mount kit

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

SFP Naming Rule



# -IFS<sup>+</sup>803GSM

8x 10/100Base RJ45 + 3x 100/1000Base SFP



- UL60950-1, EN60950-1, EN50121-4, NEMA-TS2, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance



IFS+803GSM is a managed industrial grade L2+ switch with 8 10/100Base-TX ports and 3 GbE/100M SFP ports that provides stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, the switch is designed for harsh environments, such as industrial networks, 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 (See Figure). 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)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- 4KV surge protection for UTP and fiber ports
- Provides 5 instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses. (Please see CTC  $\mu$ -Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices</li>
   Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supports SmartView for Centralized Management\*
- \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Network Cable	UTP/STP above Cat.	5e cable		
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet		EIA/TIA-568 100-ohr	n (100m)		
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over	Protocols	CSMA/CD			
	IEEE 802.1d	STP (Spanning Tree Protocol)	Reverse Polarity	Supported			
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )	Overload Current	c i			
	IEEE 802.1c	MSTP (Multiple Spanning Tree	Protection	Supported			
	ILLL 002.15	Protocol)	CPU Watch Dog	Supported			
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)	Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block )			
	IEEE 802.1Q	Virtual LANs (VLAN)	Power	Input Voltage	IFS <sup>+</sup> 803GSM		
	IEEE 802 1X	Port based and MAC based Network	Consumption	12VDC	7.4W		
	1222 002.17	Access Control, Authentication		24VDC	7.8W		
	IEEE 802.3ac	Max frame size extended to 1522Bytes.		48VDC	8.9W		
Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)	LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)			
	IEEE 802.3x	Flow control for Full Duplex		Per RJ-45 port: 10/10	U LINK/ACTIVE (Green)		
	IEEE 802.1ad	Stacked VLANs, O-in-O		SFP Fiber Per port: Li	nk/Active (Green)		
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	IEEE 802.3ac	9.6KB Max frame size exter	nded to 1522Bytes (allow Q-tag		
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	MAC Adduces Table	in packet)			
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	MAC Address Table	8K			
VLAN ID	4094 IEEE 802	.1Q VLAN VID	Memory Buffer	512K Bytes for packet	t buffer		
Switch	Back-plane (Sv	vitching Fabric):	Warning Message	System Syslog, SMTP relay	% e-mail event message, alarm		
Architecture	Full wire-spee	d	Alarm Relay Contact	Relay outputs with c @24VDC	urrent carrying capacity of 1 A		
Data Processing	Store and Forv	ward	Removable	Provide 2 redundant	power, alarm relay contact, 6		
Flow Control	IEEE 802.3x for	full duplex mode Back pressure for ode	Terminal Block	Pin	CN //)		
Network	8x 10/100Base	-TX RI-45 and 3x 100/1000Base-X SEP	Temperature	-40 ~ 75°C (IFS <sup>+</sup> 803G	5141) SM-F)		
Connector	Slot		Operating	E0/ to 0E0/ (Non con	doncing)		
Network	RJ-45 UTP por	t support Auto negotiation speed,	Humidity	5% to 95% (NON-con	densing)		
Connector	Auto MDI/MD SFP port supp	I-X function, ort 100/1000M dual speed with DDMI	Storage Temperature	-40~85°C			
Console	RS-232 (RJ-45)	·	Housing	Rugged Metal, IP30 F	Protection, Fanless		

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## 

## Industrial Managed Fast Ethernet Switch

Dimensions	106 x 72 x 152 mm (D x W x H)
Weight	0.81kg
Installation Mounting	DIN Rail mounting or wall mounting (optional)
MTBF	688,248 hours (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55032, EN55024)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE EN55032 Class A
Railway Traffic	EN50121-4
Traffic control	NEMA TS2
Immunity for Heavy Industrial Environment	EN61000-6-2

Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1, EN60950-1
Hipot	DC 2.25KV for power to chassis ground, Ethernet ports to chassis ground
Surge protection	4KV for UTP and Fiber port
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Software Specifications**

Topology	
VLAN	IEEE 802.1g 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	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group
(Port Trunk)	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Tree	IEEE 802.1d STP
	IEEE 802.1w RSTP
	IEEE 802.1s MSTP
Multiple µ-Ring	up to 5 instances that each supports $\mu$ -Ring, $\mu$ -Chain
	or Sub-Ring type for flexible uses, and maximum up
	to 5 Rings.
	Recovery time < 10ms
	supported ring is 250
	(Please see CTC Union u-Ring white paper for more
	details and more topology applications)
Loop Protection	Supported
ITU-T G.8032 /	Pacavary time <50mc
Y.1344 ERPS	Recovery time < 30ms
(Ethernet Ring	Single Ring Sub-Ring Multiple ring topology network
Protection)	Single hing, sub hing, maniple hing topology network
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic	IEEE 802.1p based CoS
Classification QoS	IP Precedence based CoS
	IP DSCP based Cos
Classification OoS	QCL(QoS Control List): Frame Type, Source/
Classification Q05	OCE(OoS Control Entry): Protocol Source ID ID
	Fragment DSCP TCP/UDP port number
Bandwidth	Rate in steps 1 kbps / Mbps / fps / kfps
Control for	Bange : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit - bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474)	Remarking
Storm Control	for Unicast, Broadcast, Multicast
<b>IP Multicasting Fea</b>	atures
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
Snooping	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4
	L2 : Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4. ICP/UDP

TACACS+ authenti	cation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	ures
CII	Cisco® like CLL
Web Based Manag	ement
Telnet	Server
SNMD	
EthorNot/ID	Support for management and monitoring
Modbus/TCD	Support for management and monitoring
Modbus/TCP	Support for management and monitoring
SW &	IFIP, HIIP
Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group) RMON II
MIR	BEC1213 MIB II Private MIB
LIPnP	Supported
BOOTP	Supported
	Server Client Polay Polay option 82 Speeping
DADD	
ID Sourco Guard	Supported
Port Mirroring	Supported
Fort Millioning	Supported
Warning Massage	System cyclog, a mail alarm rolay
	Client Drow
	Cilent, Proxy
IEEE IS88 PTP V2	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
	Determine the cable length and lowering the power
	for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable normal or broken point distance

**RADIUS** authentication & accounting



## Industrial Managed Fast Ethernet Switch



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The ISFP series of indust even in mission-critical a	rial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The pplications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)	best performance can be guaranteed
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)	
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)	
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)	
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)	
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)	
SFP Naming Rule		
	7         040         -         31         -         D         E         -         E:-40~85°C           Blank:0~70°C         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <th></th>	
Industrial M: Multi SFP S: Single Transceiver T: UTP	Mode         9: 10G         Distance         Wavelength         D: DDMI           PMode         7: GbE         T00: (UTP)         00: UTP         Blank: Non DDMI           5: FE         000: (S00m)         58: 850nm         002: (2km)         31:1310nm           020: (2km)         55:1550nm         040: (40km)         WA: TX/1310nm (Bidi mode A)           WB: TX/1350nm (Bidi Mode B)         WB: TX/150nm (Bidi Mode B)	
		2020 1/4 0

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## IFS-1604GSM & IFS-803GSM & IFS-402GSM

- ◀ 16x 10/100Base RJ45 + 4x 100/1000Base SFP
- 8x 10/100Base RJ45 + 3x 100/1000Base SFP
- ▶ 4x 10/100Base RJ45 + 2x 100/1000Base SFP



- UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Supports IEEE 1588 PTP V2
- Supports u-Ring, ERPS, MSTP, RSTP, STP for redundant cabling
- Cable diagnostics, identifies opens/shorts distance



These models are managed industrial grade L2+ switches with 16/8/4 10/100Base-TX ports and 4/3/2 GbE/100M SFP 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, 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 (See Figure 1). 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 5 instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC u-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides SmartConfig for quick and easy mass Configuration\*
- Supports SmartView for Centralized Management\* \*Please see Chapter 1- Software Management for more details

## **Specifications**

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Console	RS-232 (RJ-4	5)		
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet	Network Cable	UTP/STP above Cat. 5e cable			
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over		EIA/TIA-568 100-ohm (100m)			
	IEEE 002.1d	Fiber-Optic	Protocols	CSMA/CD			
	IEEE 802.1d IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)	Reverse Polarity Protection	Supported Supported			
	IEEE 802.1s ITU-T G.8032 /	MSTP (Multiple Spanning Tree Protocol) / ERPS (Ethernet Ring Protection	Overload Current Protection				
	Y.1344	Switching)	CPU Watch Dog	Supported			
	IEEE 802.1Q	Virtual LANs (VLAN)	Power Supply	Redundant [	Dual DC 12/2	4/48V (9.6~60\	/DC) Input
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication	Power	power (Rem	ovable Termi	nal Block )	
	IEEE 802.3ac	Max frame size extended to 1522Bytes.	Consumption	Voltage	402GSM	803GSM	1604GSM
	IEEE 802 3ad	with LACP(Link Aggregation Control		12VDC	5.7W	6.5W	10.8W
	1222 002.000	Protocol)		24VDC	5.8W	7W	10.6W
	IEEE 802.3x	Flow control for Full Duplex		48VDC	8.5VV	8.6VV	12.577
	IEEE 802.1ad	Stacked VLANs, Q-in-Q	LED	Per unit: Pov	ver 1 (Green),	Power 2 (Gree	en), Fault
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		Per RJ-45 po	ort: 10/100 Lin	, Ring Master ( k/Active (Gree	n)
Standard	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)		SFP Fiber Pe	r port: Link/A	ctive (Green)	
	IEEE 802.3az	EEE (Energy Efficient Ethernet)	Jumbo Frame	9.6KB			
VLAN ID	4094 IEEE 802	2.1Q VLAN VID	IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag			
Architecture	4.8Gbps (IFS-4	witching Fabric): 402GSM),    7.6Gbps (IFS-803GSM)	MAC Address Table 8K				
	11.2Gbps (IFS-1604GSM)		Memory Buffer	512K Bytes for packet buffer			
Data Processing	Full wire-spee Store and For	ed ward	Warning Message	System Syste	og, SMTP/ e-n	nail event mes	sage, alarm
Flow Control	IEEE 802.3x for half duplex m	r full duplex mode Back pressure for ode	Alarm Relay Contact	Relay output @24VDC	ts with currer	nt carrying cap	bacity of 1 A
Network Connector	4x 10/100Base Slot (IFS-402G	e-TX RJ-45 + 2x 100/1000Base-X SFP (SM)	Removable Terminal Block	Provide 2 redundant power, alarm relay contact, 6 Pin			
	8x 10/100Base Slot (IFS-803G	P-TX RJ-45 and 3x 100/1000Base-X SFP SM)	Operating Temperature	-10 ~ 60°C (IFS-402GSM, IFS-803GSM, IFS-1604GSM) -40 ~ 75°C (IFS-402GSM-F IFS-803GSM-F IFS-1604GSM-F)			
	Slot (IFS-1604) R I-45 UTP poi	GSM) rt support. Auto negotiation speed	Operating Humidity	5% to 95% (Non-condensing)			
	Auto MDI/MD SFP port supp	PI-X function, port 100/1000M dual speed with DDMI	Storage Temperature	-40 ~ 85°C			
- ui	nion						
------	------						

Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 135 mm (D x W x H) (IFS-402GSM) 106 x 72 x 152 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 (optional)
MTBF	861,962hrs (IFS-402GSM) 612,523hrs (IFS-803GSM) 419,048hrs (IFS-1604GSM) (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

## **Software Specifications**

Topology	
VLAN	IEEE 802.1g VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1g 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	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5
(Port Trunk)	trunk group
Constant Trees	Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
Spanning Iree	IEEE 802.10 STP, IEEE 802.1W RSTP, IEEE 802.1S MSTP
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain
	to 5 Rings
	Recovery time <10ms
	The maximum number of devices allowed in a Ring
	supported ring is 250.
	(Please see CTC Union µ-Ring white paper for more
	details and more topology applications)
Loop Protection	Supported
ITU-T G.8032 /	Recovery time <50ms
Y.1344 EKPS (Ethernet Ping	
Protection)	Single Ring, Sub-Ring, Multiple ring topology network
OoS Features	
Class of Service	IEEE 802 1p 8 active priorities queues for per port
Traffic	IEEE 802 In based CoS
Classification QoS	IP Precedence based CoS
	IP DSCP based CoS
	OCL (OoS 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	Rate in steps :1 kbps / Mbps / fps / kfps
Control for	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
Ingress	Rate Unit : bit or frame
Bandwidth	Rate in steps : 1 kbps / Mbps
Control for Egress	Range : 100 kbps to 1Gbps
	Rate Unit : bit
D://C (DE 2.474)	Per queue / Per port shaper
DiffServ (RF 24/4)	Kemarking
D Multi control	for Unicast, Broadcast, Multicast
IP Multicasting Fea	ICMD Speeping with 20 with Companying with 20
Spooning	Birt Filtering Profile
Shooping	Throttling East Loave
	Maximum Multicast Group : up to 1022 optrios
	Quary / Static Pouter Port
Security Features	Query / Static Houter Fort
IFFF 802.1X	Port-Based MAC-Based
ACI	Number of rules - up to 256 entries
ACL	for 1 2 / 1 3 / 1 4
	12 · Mac address SA/DA/VLAN
	L3: IP address SA/DA, Subnet
	L4: TCP/UDP
<b>RADIUS</b> authentica	ation & accounting
TACACS+ authenti	cation & accounting, TACACS+ 3.0

Traffic control	NEMA TS2 (IFS-402GSM, IFS-803GSM)
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
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	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

HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Feat	Ires
CU	Cisco® like CL
Web Based Manag	ement
Telnet	Sarvar
CNIMD	
EthorNot/IP	Supports for management and monitoring
	Supports for management and monitoring
CW/ 8.	
Configuration	,
Upgrade	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
BOOTP	Supported
DHCP	Server, Client, Relay, Relay option 82, Snooping
RARP	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server )
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Server/Client
LLDP (IEEE	Link Layer Discovery Protocol
802.1ab)	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Server/Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
	for ports with short cables
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable normal or broken point distance



## Industrial Managed Fast Ethernet Switch



2020 V1.0 www.ctcu.com / sales@cto (Optional accessory)



## **Ordering Information**

	Total		RJ45 UTP Port	Fiber Port	Power Input	Certification			Operating		
Model Name	Managed	Port	10/100 Base-TX	100/1000 Base-X	Redundant	Railway EN50121-4	NEMATS 2	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE FCC	Temperature
IFS-402GSM	$\vee$	6	4	2 SFP	12/24/48VDC	V	V	V	V	V	-10~60°C
IFS-402GSM-E	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	V	-40~75°C
IFS-803GSM	$\vee$	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	-10~60°C
IFS-803GSM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	-40~75°C
IFS-1604GSM	$\vee$	20	16	4 SFP	12/24/48VDC	V		V	V	V	-10~60°C
IFS-1604GSM-E	V	20	16	4 SFP	12/24/48VDC	V		V	V	V	-40~70°C

#### Model Naming Rule



#### Package List

- One device of the series
   Terminal block
- Console cable (RJ-45 to DB9)
   Protective caps for SFP ports
- Din Rail with screws

#### **Optional Accessories**

#### Industrial Power Supply

IND-WMK02	Wall Mount kit for Industrial product (Wide ) (184 x 50mm)
	Wainfibalie Reformation industrial produce (Wide) (101X Softinity)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00- (E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

SFP Naming Rule





# IMC-1000MS

1x GbE RJ45 to 1x 100/1000Base SFP



- UL60950-1, EN50121-4, CE, FCC, EN61000-6-2, EN61000-6-4 certified
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- SNMP, Web based and In-band management,
- Remote Loop-Back test



IMC-1000MS is a 10/100/1000Base-T to 100/1000Base-X managed GbE media converter which offers dual speed fiber (100M/1G) transmission. 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. 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**

- Conversion between 10/100/1000Base-T and 100/1000Base-X Fiber cable interface
- Supports Dual Rate (100/1000) SFP for selectable Fast or Gigabit speed on fiber
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20~75°C (IMC-1000MS-E)
- Supports Digital Diagnostic Monitor Interface (DDMI) for SFP
- Supports SmartView for centralized management (Please see Catalog chapter 1- Software Management for more details)
- Web management
- Dying gasp (remote power failure detection)

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet IEEE 802.3 u 100Base-TX, 100Base-FX, Fast Ethernet	Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
	IEEE 802.3ab 1000Base-TX Gbit/s Ethernet over twisted pair IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-optic IEEE 802.3x Flow Control and Back pressure	Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 7 Pin
Fiber Ports	IEEE 802.3ah OAM management 100Base-X or 1000Base-X set by Web Supports Auto Laser Shutdown (ALS)	Power Consumption	4.8 W
DI45 Davida	Supported DDMI for SFP diagnostic	Operating Humidity	5% ~ 95% (Non-condensing )
KJ45 Ports	Function Supports UTP CAT.5e Twisted Pair cable	Operating Temperature	-20 ~ 75°C (IMC-1000MS-E)
CPU watch dog	Supported	Storage Temperature	-40 ~ 85°C
Push Button	Reset, Load default seting	Housing	Rugged Metal, IP30 Protection and fanless
Fiber	Fiber Cable (Multi-mode): 50/125um 62 5/125um	Dimensions	106 x 38.6 x 142.1mm (D x W x H)
Parameters	Fiber Cable (Single-mode): 9/125um	Weight	0.62kg
	Wavelength: 1310nm (Multi-mode/Single-mode)	Installation	DIN Rail mounting, or wall mounting (Optional)
	SFP, Distance depend on plug-in Fiber Tranceiver	MTBF	1,153,428 Hours
Link Fault	TX-Fiber: If TX port link down, the media converter will force Fiber port to link down	Warranty	NIL-HUBK-2175 vears
(LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	Certification	5) (015
Far-End Fault	Work with LEPT to prevents data loss	EMI	CE
(FEF)	Por Unit : Power 1 (Groop) Power 2 (Groop) Fault (Amber)	EMI (Electromage	
LED	Fiber LNK/ACT (Green): ON: Connected to network	netic Interfe- rence)	FCC Part 15 Subpart B Class A, CE
	OFF: Not connected to network BLK: Beceive /Transmit Data	Railway Traffic	EN50121-4
	Fiber speed : Yellow : 1000Base-X     Green : 100Base-X       RJ-45 port:     Second 10 (OFF)	Immunity for Heavy Industr Environment	ial EN61000-6-2
	LNK/ACT for FJ, 100 (Green); LNK/ACT for RJ45(Green); ON : Connected to network/ OFF: Not connected to network/	Emission for Heavy Industr Environment	ial EN61000-6-4
	BLK: Networking is active	EMS	EN61000-4-2 (ESD) Level 3, Criteria B
Reverse Polarity	Supported for power logut	Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection		Protection Lev	EN61000-4-4 (Burst) Level 3, Criteria A
Overload Current	Supported		EN61000-4-5 (Surge) Level 3. Criteria B
Protection			FN61000-4-6 (CS) Level 3 Criteria A
Power Supply	12/24/48VDC (9.6~60VDC) , Redundant power with polarity Reverse protect function and removable terminal block		EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A





Safety UL60950-1		Freefall	IEC 60068-2-3
Shock	IEC 60068-2-27	Vibration	IEC 60068-2-6

#### **Software Specifications**

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

Diagnostic &	Supports Link Fault Pass-Through (LFPT) Function
Monitor	Broadcast/Multicast/Unicast storm filter
	SNMP alarm trap for power loss and port link Up/Down
In-Band Remot	e mode
Management	Supports in-band management from FRM220 Chassis With FRM220-1000MS card
	Ingress/Egress bandwidth control with 64K granularity
Configuration	IP configuration, converter configuration, port configuration, MIB counter
	VLAN group configuration, alarm configuration, PoE Configuration
Diagnostic &	Remote loop back test
Monitor	Supports Link Fault Pass-Through (LFPT) Function
	Broadcast/Multicast/Unicast storm filter

## Dimensions





Side View

Front View

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

## **Ordering Information**



#### **Optional Accessories**

Wall mount kit Accessories

IND-WMK01 Wall Mount kit for Industrial product, 184 x 30mm

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IMC-1000MS for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)         Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, DDMI, LC, -10~70°C (-40~85°C)           ISFP-57020-31-D(E)         Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)           ISFP-T7T00-00-(E)         Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)           ISFP MC002 31 D(E)         Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-57020-31-D(E)         Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)           ISFP-T7T00-00-(E)         Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)           ISFP 45022 31 D(E)         Industrial SFP 155M 100Pase TV MM, 2km wave length 1310nm, 15dB, LC, DDMI, 10, 70°C (-40, 85°C)
ISFP-T7T00-00-(E)         Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)           ISEP ME002 31 DE         Industrial SEP 15EM 100Base-T UTP 100meter, -10~70°C (-40~85°C)
ISED MEOOD 21 D(E) Industrial SED 155M 100Page EV MMA 2km wave length 1210pm 12dP I/C DDMI 10, 70% (40, 85%)
<b>Industrial SP 155W 100Base-rx, MW, 2km, wave length 1510hm, 12db, EC, DDM, -10~70 C (-40~85 C)</b>
ISFP-S5030-31-D(E) Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)
SFP Naming Rule
Industrial SFP Transceiver         M: Multi Mode S: Single Mode         9: 10G 7: GbE         Distance T00: (UTP)         Wavelength 00: UTP         D: DDMI Blank: Non DDMI           002: (2km) 020: (2km)         5: FE         000: (500m)         85: 850nm           040: (40km)         040: (40km)         9: 10G         Distance

# **IGS-800C**

NEW

8x GbE RJ45 (Compact Size)

Industrial Unmanaged GbE Switch IGS-800C



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- Low profile size, IP30, rugged metal housing, fanless



IGS-800C is a Compact, 8 Ports unmanaged Gigabit Ethernet switche, that provide stable and reliable Ethernet transmission. Housed in rugged DIN rail or wall mountable enclosures, the switch is designed for harsh environments, such as industrial networking, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications (See Figure). Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 70°C) fulfill the special needs of industrial automation applications.

#### **Features**

- Supports flow control
- Jumbo frame support
- Supports auto-negotiation and auto-MDI/MDI-X
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40~70°C (-E model)

## **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet					
	IEEE 802.3u 100Base-TX, 10	00Base-FX, Fast Ethernet				
	IEEE 802.3ab 1000Base-T G	bit/s Ethernet over				
	twisted pair					
	IEEE 802.3x Flow Control					
	IEEE 802.3z 1000Base-X Gbit,	/s Ethernet over Fiber-Optic				
Switch Architecture	Back-plane (Switching Fab Full wire-speed	ric): 16 Gbps				
Data Processing	Store and Forward					
Flow Control	IEEE 802.3x flow control fo pressure for half duplex	r Full duplex , back				
Jumbo Frame	9K Bytes					
MAC Address Table	4K					
Network Connector	8 x 10/100/1000Base-T RJ	45				
	10/100/1000Base-TX auto MDI/MDI-X function, Full/I	negotiation speed, Auto Half duplex				
Network Cable	10Base-T: 2-pair UTP/STP C	P/STP Cat. 5 cable				
	EIA/TIA-568 100-ohm (100	m)				
	100Base-TX: 2-pair UTP/ST	P Cat. 5 cable				
	EIA/TIA-568 100-ohm (100	m)				
Protocols	CSMA/CD					
LED	Per unit: Power 1 (Green), F	Power 2 (Green)				
	Per RJ45: Link/Act 1000 (Ye (Green)	ellow), Link/Act 10/100				
Reverse Polarity Protection	Supported for Power Inpu	ıt				
Overload Current Protection	Supported					
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC), Input power (Removable Terminal Block)					
<b>Power Consumption</b>	Input	IGS-800C				
	12VDC	3.9W				
	24VDC	4.6W				
	48VDC	6.8W				
Removable Terminal Block	Provides 2 redundant pow	ver, 4 Pin				

Operating	-10°C~60°C (IGS-800C)
Temperature	-40°C~70°C (IGS-800C-E)
<b>Operating Humidity</b>	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30Protection and fanless
Dimensions	100 x 42x 115mm (D x W x H)
Weight	0.27kg
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	TBD
Warranty	5 years
Certification	
EMC/EMS	CE (EN55024, EN55032)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
EMS	EN61000-4-5 (Surge) Level 3, Criteria B
(Electromagnetic	EN61000-4-6 (CS) Level 3, Criteria A
Susceptibility) Protection Level	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

Terminal Bloc

## Dimensions



## **Ordering Information**



## **Optional Accessories**

#### Wall mount kit accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm)



# - IGS-800 & IGS-501S & IGS-500

48x GbE RJ45
■ 5x GbE R I45 +

■ 5x GbE RJ45 + 1x 100/1000Base SFP > 5x GbE RJ45



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless



These models are 8/5-port 10/100/1000Base-T unmanaged GbE switches. The IGS-501S includes a 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 (See Figure). 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**

- Supports flow control
- Jumbo frame support
- Supports IEEE 802.3az Green Ethernet
- Supports auto-negotiation and auto-MDI/MDI-X
- Supports DIN Rail or wall mounting installation
- Wide operating temperature -40~75°C (-E model)

IEEE Standard	IEEE 802.	3 10Base-T Ethernet	DIP SW		Gr	een Etherne	et		
	IEEE 802.	3u 100Base-TX, 100Base-FX, Fast Ethernet		DIP 3	ON	V : Disable G	ireen Ethernet	t	
	IEEE 802.	3ab 1000Base-T Gbit/s Ethernet over			OFF · Enable 802 3az Green Ethernet				
	twisted p	Dair Du Flaux Caustural			SE	P speed (or	ly for IGS-501	S)	
	IEEE 802.	3X Flow Control		DIP 4		1 · 100M		5)	
Curitale Analeita atuma	De el velo	2 1000Base-X GDIL/S Ethernet over Fiber-Optic	Povorco Dolarity		OI	N. 100101	JTT. 1000101		
Switch Architecture	12Gbps ( Full wire	GS-501S), 10Gbps (IGS-500), 16Gbps (IGS-800) -speed	Protection	Supported for Power Input					
Data Processing	Store and	d Forward	Protection	Supporte	ed				
Flow Control	IEEE 802. pressure	3x flow control for Full duplex , back for half duplex	Power Supply	Redunda (18~36VA	nt Di C) In	ual DC 12/24 put power (	l/48V (9.6~60V Removable Te	'DC), or AC 24' rminal Block)	
Provides Broadcast Storm Protection	Support	ed	Power Consumption	Inpu	t	IGS-500	IGS-501S	IGS-800	
Jumbo Frame	9.6KByte	S		12VD0	<u> </u>	3.3W	3.9W	7.0W	
MAC Address Table	8K			24VD0	<u> </u>	5.4VV 4.8W/	5.900	7.0W	
Packet Buffer Size	128K Byt 512K Byt	e (IGS-500, IGS-501S) e (IGS-800)	Alarm Relay Contact	: Relay out	tput	s with curre	nt carrying ca	pacity of 1 A	
<b>Network Connector</b>	5 x 10/10	0/1000Base-T RJ-45 (IGS-500, IGS-501S)	2	@24VDC, NC					
	8 x 10/10	0/1000Base-T RJ-45 (IGS-800)	Removable Terminal Block	Provides 2 redundant power, alarm relay contact, i Pin					
	1x 100/10	000Base-X SFP connector (only for IGS-501S)	Operating	10°C 60°C (ICS 5015 ICS 500 ICS 800)					
	10/100/1	000Base-TX auto negotiation speed, Auto	Temperature	-10 C~00	<u>и</u> 200 г.)				
	MDI/MDI-X function, Full/Half duplex  -40 C~75 C (IGS-5015-E, IGS-500-E, ISS-500-E, ISS-						GS-500-Е, IGS-	-800-E)	
Network Cable	10Base-I	: 2-pair UTP/STP Cat. 5 cable	Operating Humidity	5% to 959	% (N	on-conden	sing)		
	EIA/TIA-	568 100-ohm (100m)	Storage	-40 ~ 85°C					
	100Base	-TX: 2-pair UTP/STP Cat. 5 cable	Housing	Duggod	Moto		stion and fanl	0.00	
	EIA/TIA-	568 100-ohm (100m)	Housing						
	Fiber Cal	ole (Multi-mode): 50/125um, 62.5/125um	Dimensions	106 x 31.6 x 142 mm (D x W x H)					
	Fiber Cab	ble (Single-mode): 9/125um (only for IGS-501S)	Weight	0.415kg (IGS-5015) 0.41kg (IGS-500)					
Protocols	CSMA/C	D		0.44kg (	IGS-	800)			
LED	D Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)			DIN Rail r	mou	nting, or wa	all mounting (	Optional)	
	Per RJ45: (Green)	Link/Act 1000 (Yellow), Link/Act 10/100 Fiber LED: Link/Act (Green)	MTBF	1,101,374 1,154,166	hrs ( hrs	(IGS-501S) (IGS-500)			
DIP SW		ON : Disable		747,984hi	rs w วา	(IGS-800)			
		OFF : Enable power failure alarm	147 -	(MIL-HDBK-217)					
	DIP 2	ON : Disables broadcast storm protection	Warranty	5 years					
		OFF : Enable broadcast storm protection							

Industrial Unmanaged GbE Switch



Industrial Unmanaged GbE Switch IGS-800 & IGS-501S & IGS-500

7-25

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

EMS (Electromagnetic	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility) Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A
EMS	EN61000-4-5 (Surge) Level 3, Criteria B
(Electromagnetic	EN61000-4-6 (CS) Level 3, Criteria A
Susceptibility) Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

#### **Dimensions**



Wall-Mount Kit View (Optional accessory)

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ions & design are subject to change without prior notice. Please visit CTC Union website for more

Front View

**Rear View** 

DIN-Rail Kit View

Side View

#### **Ordering Information**

	Total	RJ45 UTP port	Fiber Port	PowerInput		Certificatio	on		Operating
Model Name	Port	10/100/1000 Base-T	100/1000Base-X	Redundant	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	Temperature
IGS-501S	6	5	1x SFP	12/24/48VDC	V	V	V	V	-10~60°C
IGS-501S-E	6	5	1x SFP	12/24/48VDC	V	V	V	V	-40~75°C
IGS-500	5	5		12/24/48VDC	V	V	V	V	-10~60°C
IGS-500-E	5	5		12/24/48VDC	V	V	V	V	-40~75°C
IGS-800	8	8		12/24/48VDC	V	V	V	V	-10~60°C
IGS-800-E	8	8		12/24/48VDC	V	V	V	V	-40~75°C
Model Naming	Rule								
IGS	- [	5 01S	] <b>–</b> [E	E: -40 Blank:	~75°C -10~60°C			Port Number	Temperature



• Din Rail with screws

Terminal block





#### Switch Package List

Industrial

Gigabit

- One device of the series
- · Protective caps for SFP ports (for IGS-501S)

#### **Optional Accessories**

#### Wall mount kit accessories

IND-WMK01 Wall Mount kit for Industrial product (184 x 30mm)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IGS-501S product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85- <mark>(E)</mark>	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, -10~70°C (-40~85°C)
ISFP-T7T00-00- (E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, -10~70°C (-40~85°C)
ISFP-S5030-31-(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, -10~70°C (-40~85°C)

#### SFP Naming Rule



# CTC

# IGS-402S & IGS-402F

► 4x GbE RJ45 + 2x 1000Base Fiber (ST/SC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless



These models are unmanaged industrial grade Gigabit switches with 4 10/100/1000Base-T ports and 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 (See Figure). Standard operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

#### **Features**

- Wide operating temperature -40 ~ 75°C ("-E" model)
- Supports flow control
- Jumbo frame support

IEEE Standard	IEEE 802.3 10Base-T Ethernet							
	<b>IEEE 802</b>	.3u 100Base-TX, 100Base-FX, Fast Ethernet						
	IEEE 802	.3ab 1000Base-T Gbit/s Ethernet over						
	twisted	pair						
	IEEE 802 Fiber-Op	.3z 1000Base-X Gbit/s Ethernet over otic						
	IEEE 802	.3x Flow Control and Back Pressure						
Switch Architecture	Back-plane (Switching Fabric): 12Gbps							
	(IGS-402	25, IGS-402F)						
Data Dua sastu u	Full wire	e-speed						
Data Processing	Store an	a Forward						
Flow Control	IEEE 802.3X flow control, back pressure flow contro							
Provides Broadcast Storm Protection	Present,	Enable / Disable set by DIP SW						
Jumbo Frame	10K Byte	25						
MAC Address Table	8K							
Packet Buffer Size	1Mbits							
Network Connector	4 x RJ-4	5						
	10/100/ MDI/ME	1000Base-TX auto negotiation speed, Auto DI-X function, Full/Half duplex						
	2 1000B 2 100/10	ase-X Fiber SC connector (IGS-402F) )00Base-X SFP connector (IGS-402S)						
Network Cable	UTP/STP above Cat. 5e cable							
	EIA/TIA-	568 100-ohm (100m)						
	Fiber Ca	ble (Multi-mode): 50/125um, 62.5/125um						
	Fiber Ca	ble (Single-mode): 9/125um						
Protocols	CSMA/C	D						
LED	Per unit (Amber)	Power 1 (Green), Power 2 (Green), Fault						
	Per RJ-4 100 (Gre	5 port : Link/Active (Green), Speed 10 (OFF), en), 1000 (Yellow)						
	Fiber Pe	r 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 SW	DIP 4	ON : Fiber 2 for 100Base-FX SFP						
		OFF : Fiber 2 for Gigabit SFP (IGS-402S)						
	DIP 4	OFE - Eiber 1 for Gigabit SEP (ICS 402S)						
Reverse Polarity	_							
Protection	Support	ed for Power Input						
protection	Support	red						
Power Supply	Redund	ant Dual DC 12/24/48V (9.6~60VDC) Input						

Power Consumption	7.9W (IGS-402F)
•	7.9W (IGS-402S)
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin
Operating	-10 ~ 60°C (IGS-402S, IGS-402F)
Temperature	-40 ~ 75°C (IGS-402S-E, IGS-402F-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	106 x 62.5 x 134.8 mm (D X W X H)
Weight	0.84kg (IGS-402S) 0.68kg (IGS-402F)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,000,643 Hours (IGS-402S) 821,412 Hours (IGS-402F) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC/EMS	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
EMI (Electromagnetic Interference) Railway Traffic	FCC Part 15 Subpart B Class A, CE EN50121-4
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Curearethilia)	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 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
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 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 A EN61000-4-5 (Surge) Level 3, Criteria A
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 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 A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS Safety	FCC Part 15 Subpart B Class A, CE EN50121-4 EN61000-6-2 EN61000-6-4 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 UL60950-1
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS Safety Shock	FCC Part 15 Subpart B Class A, CEEN50121-4EN61000-6-2EN61000-6-4EN61000-4-2 (ESD) Level 3, Criteria BEN61000-4-3 (RS) Level 3, Criteria AEN61000-4-4 (Burst) Level 3, Criteria AEN61000-4-5 (Surge) Level 3, Criteria BEN61000-4-6 (CS) Level 3, Criteria AEN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria AUL60950-1IEC 60068-2-27
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS Safety Shock Freefall	FCC Part 15 Subpart B Class A, CEEN50121-4EN61000-6-2EN61000-6-4EN61000-4-2 (ESD) Level 3, Criteria BEN61000-4-3 (RS) Level 3, Criteria AEN61000-4-4 (Burst) Level 3, Criteria AEN61000-4-5 (Surge) Level 3, Criteria BEN61000-4-6 (CS) Level 3, Criteria AEN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria AUL60950-1IEC 60068-2-27IEC 60068-2-32
EMI (Electromagnetic Interference) Railway Traffic Immunity for Heavy Industrial Environment Emission for Heavy Industrial Environment EMS (Electromagnetic Susceptibility) Protection Level EMS Safety Shock Freefall Vibration	FCC Part 15 Subpart B Class A, CEEN50121-4EN61000-6-2EN61000-6-4EN61000-4-2 (ESD) Level 3, Criteria BEN61000-4-3 (RS) Level 3, Criteria AEN61000-4-4 (Burst) Level 3, Criteria AEN61000-4-5 (Surge) Level 3, Criteria BEN61000-4-6 (CS) Level 3, Criteria AEN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria AUL60950-1IEC 60068-2-27IEC 60068-2-32IEC 60068-2-6

## **Application**

Figure : IGS-402S & IGS-402F Giagabit Ethernet Switch Transmission



## **Dimensions**

▶ IGS-402F

Industrial Unmanaged GbE Switch IGS-402S & IGS-402F





**Front View** 

**Rear View** DIN-Rail Kit View Wall-Mount Kit View (Optional accessory)

50.00

▶ IGS-402S





62.50



(Optional accessory)





## **Ordering Information**

	Total	RJ45 UTP port	Fi	ber Port	PowerInput		C	ertification			Operating
Model Name	Port	10/100/1000 Base-T	1000Base-X	100/1000Base-X	Redundant	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	Temperature
IGS-402F	6	4	2 SC		12/24/48VDC	V	V	V	V	V	-10~60°C
IGS-402F-E	6	4	2 SC		12/24/48VDC	V	V	V	V	V	-40~75°C
IGS-402S	6	4		2 SFP	12/24/48VDC	V	V	V	V	V	-10~60°C
IGS-402S-E	6	4		2 SFP	12/24/48VDC	V	V	V	V	V	-40~75℃
IGS Industrial Gigabit Switch	4:	4x GbE UTP	02S 02S: 2: 02F: 2:	x GbE SFP GbE Fiber	E: -40~75°C Blank: -10~	SC002	e below for r IGS-402F)	more detail			
Fiber Connecto	or Co	nnectivity Distan	ice					Port	er Tompor	Conne	ector Connectivity
SC (IGS-402F only)	SCO SCO SCO	001: 500m (SC, M/M 020A: WDM 20km A 020B: WDM 20km B	4) 002 : 2km (A type (TX:1310) type (TX:1550)	//M) SC020: 20km Dnm) Dnm)	(SC, S/M) SC040:	40km (SC, S/M)	Example	<b>IGS – 402</b> e: IGS – 402	<b>F</b> – [] F – E -	- SC00	2
Package Li	ist										
<ul> <li>One devi</li> <li>Protectiv</li> <li>IGS-402S</li> </ul>	ce of th e caps f	e series or SFP ports (fo	• Dir • Ter	n Rail with screv minal block	VS						

## **Optional Accessories**

#### Wall mount kit accessories

IND-WMK02 Wall Mount kit for Industrial product, 184 x 50mm

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, -10~70°C (-40~85°C)
ISFP-S5030-31-(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, -10~70°C (-40~85°C)

#### SFP Naming Rule

ISFP	- S 7	040	] – 31	_ D	E	<ul> <li>E:-40~85°C</li> <li>Blank:0~70°C</li> </ul>
Industrial SFP Transceiver	M: Multi Mode S: Single Mode T: UTP	9: 10G 7: GbE 5: FE	Distance T00: (UTP) 000: (500m) 002: (2km) 020: (20km) 040: (40km)	Wavelength 00: UTP 85: 850nm 31:1310nm 55:1550nm WA: TX/1310n WB: TX/15500	D: DDMI Blank: Non DDMI nm (Bidi mode A) nm (Bidi Mode B)	



# - IFS-1602GS & IFS-802GS & IFS-800

▲ 16x (or 8x) 10/100Base RJ45 + 2x 1000Base SFP
 ▶ 8x 10/100Base RJ45

## IFS-402F & IFS-401F

4x 10/100Base RJ15 + 2x (or 1x) 100Base Fiber (ST/SC)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless



These models are unmanaged industrial grade switches with 16/8/4 10/100Base-TX ports and 2/1/0 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 (See Figure 1, 2). Standard operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

#### **Features**

- Wide operating temperature -40 ~ 75°C (-E model )
- Provides broadcast storm protection (IFS-401F, IFS-402F, IFS-800, IFS-1602GS)
- 4KV surge protection for UTP ports (IFS-1602GS)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power (IFS-1602GS)

IEEE Standard	IEEE 802.3 10Base-T Ethernet	Network Cable	10Base-T:	2-pair UTP/STP Cat. 5e cable
	IEEE 802.3u 100Base-TX and 100Base-FX Fast Ethernet		EIA/TIA-5	68 100-ohm (100m)
	IEEE 802.3x Flow Control and Back Pressure		100Base-	TX: 2-pair UTP/STP Cat. 5e cable
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic		EIA/TIA-5	68 100-ohm (100m)
Switch	Back-plane (Switching Fabric) :		Fiber Cab	le (Multi-mode): 50/125um~62.5/125um
Architecture	1.0Gbps (IFS-401F) 1.2Gbps (IFS-402F)	Network Cable	Fiber Cab	le (Single-mode): 8/125um~10/125um
	1.6Gbps (IFS-800) 5.6Gbps (IFS-802GS)		Wavelend	gth: 1310nm (Multi-mode/Single-mode)
	7.2 GDps (IFS-1602GS)		Available	distance: 2KM (Multi-Mode)
Data Processing	Store and Forward			30KM (Single-Mode)
Transfor Pato	14.990pps for Ethernet port			50KM (Single Mode )
ITalister hate	14,800pps for East Ethernet part		SFP: Dista	ince depend on SFP Fiber Transceiver
	1488 000pps for Ciga Ethernet port	Protocol	CSMA/CE	)
Flow Control	1,460,000 pps for Giga Ethemet port	LED	Per unit: P	'ower 1 (Green), Power 2 (Green), Fault (Amber
Flow Control	IEEE 802.3X HOW CONTROL DACK PRESSURE HOW CONTROL		RJ-45 Per	port: Link/Active (Green), Speed 100 (Yellow)
Dumbo Frame	TOK Dyte (IFS-TOUZGS)		Fiber Per	port: Link/Active (Green) (IFS-401F, IFS-402F
Broadcast Storm	Present, Enable /Disable set by DIP SW	DIP SW	SEP Port :	Link/Active (Green) (IFS-802GS, IFS-1602GS)
Protection	(IFS-401F, IFS-402F, IFS-800, IFS-1602GS)		DIP 1	OFF : Enable power failure alarm
MAC Address	2K (IES-401E IES-402E IES-800) 8K (IES-802GS)			ON : Disable
Table	16K (IFS-1602GS)		010.0	Broadcast storm protection
Packet Buffer Size	448Kbit (IFS-401F, IFS-402F, IFS-800)		DIP 2	(IFS-401F, IFS-402F, IFS-800, IFS-1002GS)
	1024Kbit (IFS-802GS) 4M bit (IFS-1602GS)	December Deleviter		OFF : Enable ON : Disables
Network	4x RJ-45, 1x Fiber (IFS-401F), 4x RJ-45, 2 Fiber (IFS-402F)	Reverse Polarity	Supporte	ed for Power Input
Connector	8x RJ-45 (IFS-800)	Overland Current		
	8x RJ-45, 2 SFP (IFS-802GS)	Protection	Supporte	ed .
	16x RJ-45, 2x SFP (IFS-1602GS)	Power Supply	Redunda	nt Dual DC 12/24/48V (9.6~60\/DC) Input
	R I-45 Port. Auto MDI/MDI-X function, 10/100Base-TX		power (Re	emovable Terminal Block )
	auto negotiation speed, Full/Half duplex	Power	4.4\N/ (IFS	-401F) 5.8W (IFS-402F) 4.4W (IFS-802GS
	1 or 2x 100Base-FX SC/ST fiber port, Multi/Single Mode	Consumption	3.9W (IFS	-800) 8.7W (IFS-1602GS)
	(IFS-4UTF, IFS-4UZF) 2x 1000Bases-X SEP port (IES-802CS, IES-1602CS)			
	2x 1000base-x 311 port (ii 3=002G3, ir 3=1002G3)			

Certification



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Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, NC			
Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact, 6 Pin			
Operating Temperature	-10 ~ 60°C (IFS-401F, IFS-402F, IFS-800, IFS-802GS, IFS-1602GS) -40 ~ 75°C (IFS-401F-E, IFS-402F-E, IFS-800-E, IFS-802GS-E, IFS-1602GS-E)			
Operating Humidity	5% to 95% (Non-condensing)			
Storage Temperature	-40 ~ 85°C			
Housing	Rugged Metal, IP30 Protection and Fanless			
Dimensions	106 x 31.6 x 142mm (D x W x H) (IFS-401F, IFS-402F, IFS-800) 106 x 72 x 152 mm (D x W x H) (IFS-802GS, IFS-1602GS)			
Weight	0.37kg (IFS-401F), 0.42kg (IFS-402F), 0.67kg (IFS-802GS) 0.43kg (IFS-800), 0.82kg (IFS-1602GS)			
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)			
MTBF	908,971 Hours (IFS-401F) 907,622 Hours (IFS-402F) 1,064,064 Hours (IFS-800) 837,414 Hours (IFS-802GS) 461,653 Hours (IFS-1602GS) (MIL-HDBK-217)			
Warranty	5 years			

EMC/EMS	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A
Susceptibility)	EN61000-4-4 (Burst) Level 3, Criteria A
Protection Level	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)
Hi-pot isolation protection	DC 2.25KV for power to chassis ground, and UTP port to chassis ground (IFS-1602GS)
4KV surge protection	Supported for UTP Port (IFS-1602GS)
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

## **Dimensions**

▶ IFS-401F



#### ► IFS-402F





(Optional accessory)

▶ IFS-800



► IFS-802GS



Side View





(Optional accessory)



Side View



	Total	RJ45 UTP Port Fiber Port				Certificatio	Operating		
ModelName	Port	10/100Base-TX	100Base-FX	1000Base-X	Railway EN61000-6-2 EN50121-4 EN61000-6-4	EN61000-6-2 EN61000-6-4	CE	FCC	Temperature
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℃
IFS-800	8	8			V	V	V	V	-10~60°C
FS-800-E	8	8			V	V	V	V	-40~75℃
FS-802GS	10	8		2 SFP	V	V	V	V	-10~60°C
FS-802GS-E	10	8		2 SFP	V	V	V	V	-40~75°C
FS-1602GS	18	16		2 SFP	V	V	V	$\vee$	-10~60°C
FS-1602GS-E	18	16		2 SFP	V	V	V	V	-40~75°C
Fast Ethernet Switch	8: 8x FE U 16: 16x FE	UTP 02F: 2x UTP 00: 0x F 02GS: 2	FE Fiber Fiber 2x GbE SFP	Blank: -10	~60°C (Fo	r IFS-401F, IFS	-402F)		
Fiber Option Type	Connect	tivity Distance					Port	Tomporati	Connector Connectiv
<b>SC, ST</b> (for IFS-401F, IFS-402F)	002: 2km 020A: WD 020B: WD	030: 30km 050: . DM Bidi 20km A type ( DM Bidi 20km B type (	50km TX:1310nm) TX: 1550nm)			– <b>IFS</b> – Example: IFS	402F	- E -	- COO2
Package List									
• One device of th									

#### **Optional Accessories**

#### Wall mount kit Accessories

 IND-WMK01
 Wall Mount kit for Industrial product, 184 x 30mm (Narrow) (For IFS-401F, IFS-402F, IFS-800)

 IND-WMK02
 Wall Mount kit for Industrial product, 184 x 50mm (Wide) (For IFS-802GS, IFS-1602GS)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IFS-802GS & IFS-1602GS product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, -10~70°C (-40~85°C)
ISFP-T7T00-00- (E)	Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)

SFP Naming Rule



# IFS-500C

5x 10/100Base RJ45 (Compact Size)



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Compact size for easy installation
- IP30, rugged metal housing, fanless



IFS-500C is a compact sized, unmanaged industrial grade Fast Ethernet switch with 5 10/100Base-TX 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 (See Figure). 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)
- Wide operating temperature -40 ~ 75°C (-E model )
- Very low power consumption
- Supports flow control

IEEE Standard         IEEE 802.3 108ase-T Ethernet IEEE 802.3 1008ase-TX and 1008ase-XF Fast Ethernet IEEE 802.3 kTlow Control and Rack Pressure         Operating Perperature         -10~ 60°C (IFS-500C)           Switch Architecture         Back-plane (Switching Fabric) : 1.0 Gbps Architecture         Operating Perperature         5% to 95% (Non-condensing)           Data Processing Transfer Rate 148.800ps for Ethernet port         Mousing         Rugged Metal, IP30 Protection and Fanless           Flow Control         IEEE 802.3 flow control, back pressure flow control         Munidity         20g           MAC Address Table         K         Installation         DIN Rail mounting, or wall mounting (optiona Mac Address           Packet Buffer Size Table         448/bits         MTBF         1/78.3327 Hours (MIL+HDBK-27)           Network Connector         58 R0-45         Scale         Munidity           EIA/TIA-568 100-ohm (100m) 1008ase-T2-2pait UTP/STP Cat.5 cable         FMC/EMS         CE           EIA/TIA-568 100-ohm (100m) 1008ase-T2-2pait UTP/STP Cat.5 cable         FMC/EMS         EN61000-6-2           IEE         Prover (Green) Rue of Viellow/ Induction         FNS1021-4         FNS1021-4           Protection         Supported         FOC 1/2/4/8V (66-60VDC) or AC 24V (18-36VAC)         FN61000-4-2 (ESD) Level 3, Criteria A EN61000-4-4 (SD) Level 3, Criteria A           Power Supply Consumption         Input Voltage						
IEEE 802.3u 100Base-TX and 100Base-TX Fast Ethernet IEEE 802.3x 1000Base-TX and 100Base-FX Fast Ethernet BECK Plul Wire-speed     -40 ~ 75°C (IFS-500C-E)       Switch Architecture Full wire-speed     Back-Plane (Switching Fabric): 1.0 Gbps Architecture 14.8800pps for Ethernet port 14.8800pps for Fast Ethernet port     Storage Wurderspeed     -40 ~ 75°C (IFS-500C-E)       Dimensions Tansfer Rate 14.8800pps for Fast Ethernet port 148.800pps for Fast Ethernet port     Dimensions 70: 30 x 103 mm (D x W x H)       Pocket Buffer Size Connector     1K     Weight 220 g       Network Connector     5x RJ-45 RJ-45 Port: Auto MDI/MDI:X function, 10/100Base-TX auto negotiation speed, Full/Half duplex EIA/TIA-568 100-ohm (100m) 100Base-TX: 2-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m) RJ-45 Per port: Link/Active (Green) RJ-45 Per port: Link/Active (Green	IEEE Standard	IEEE 802.3 10Base	-T Ethernet	Operating	-10 ~ 60°C (IFS-500C)	
IEEE 802.3x Flow Control and Back Pressure         Operating         S% to 95% (Non-condensing)           Architecture         Full windity         5% to 95% (Non-condensing)         5% to 95% (Non-condensing)           Architecture         Full windity         5% to 95% (Non-condensing)         5% to 95% (Non-condensing)           Transfer Rate         14,8800pps for Ethernet port         Full windity         8% to 95% (Non-condensing)           Flow Control         IEEE 802.3x flow control, back pressure flow control         Rugged Metal, IP30 Protection and Fanless           MAC Address         1K         220g           MAC Address         1K         220g           Packet Buffer Size         448kbits         MTBF         1/338,327 Hours           Network Connector         108ase-T: 2-pair UTP/STP Cat. 5 cable         INTIF         1/3738,327 Hours           Full/Half duplex         108ase-T: 2-pair UTP/STP Cat. 5 cable         EMC/EMS         CE           EIA/TIA-568 100-ohm (100m)         1008ase-TX: 2-pair UTP/STP Cat. 5 cable         EMC/EMS         EN61000-6-2           Reverse Polarity         For DC input power (Green)         munuity for         Heavy Industrial         EN61000-6-4           Protection         Supported         EMS         EN61000-6-4 (ES) Level 3, Criteria A           Power Supply         DC 12/2/4/48V		IEEE 802.3u 100Ba	ase-TX and 100Base-FX Fast Ethernet	Temperature	-40 ~ 75°C (IFS-500C-E)	
Switch Architecture Full Wire-speedBack-plane (Switching Fabric): 1.0 Gbps Architecture Full Wire-speedHumidityFundation Corrage TemperatureData Processing Transfer Rate 14.8800pps for Ethernet portStore and ForwardHusing PumensionsRugged Metal, IP30 Protection and Fanless 70 x 30 x 103 mm (D x W x H)Flow ControlIEEE 802.3x flow control, back pressure flow controlDIN Rail mounting, or wall mounting (optiona MAC Address TableFlow ControlIEEE 802.3x flow control, back pressure flow controlDIN Rail mounting, or wall mounting (optiona MTBFMake Sub Str. St. St. St. St. St. St. St. St. St. St		IEEE 802.3x Flow	Control and Back Pressure	Operating	5% to 95% (Non-condensing)	
Data ProcessingStore and ForwardTemperature440 × 05 CTransfer Rate14,8800pps for Ethernet portHousingRugged Metal, IP30 Protection and FanlessFlow ControlIEEE 802.3x flow control, back pressure flow control70 x 30 x 103 rm (D x W x H)MAC AddressIKWeight220gTableIKNetworkPacket Buffer Size448KbitsMTBF1,738,327 Hours (MiL-HDBK-217)Network Connector5x RU-45Warranty5 yearsRu-45 Port:auto negotiation speed, Full/Half duplex EIA/TIA-568 100-ohm (100m)Reverse F12: 2-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m)FCC Part 15 Subpart B Class A, CE Interference)ProtocolCSMA/CDEMEMLEDPer unit: Power (Green) Reverse Polarity ProtectionSupportedENReverse Polarity ProtectionFor DC input power protectionEMSEN/61000-6-2 EN/1000-6-2EN/61000-4-2 (ESD) Level 3, Criteria A EN/61000-4-3 (RS) Level 3, Criteria A EN/61000-4-3 (Store) Level 3, Criteria A EN/61000-4-3 (Store) Level 3, Criteria A EN/61000-4-4 (Burst) Level 3, Criteria A EN/61000-4-5 (Store) Level 3, Criteria A EN/61000-4-6 (CS) Level 3,	Switch Architecture	Back-plane (Swite Full wire-speed	hing Fabric) : 1.0 Gbps	Storage	10 0E°C	
Transfer Rate14,880pps for Ethernet port 148,800pps for Fast Ethernet portHousing Rugged Metal, IP30 Protection and Fanless DimensionsFlow ControlIEEE 802.3x flow control, back pressure flow controlDimensions70 x 30 x 103 mm (D x W x H)MAC AddressIK220gTableIK220gPacket Buffer Size448KbitsMTBF1,738,327 Hours (MIL-HDBK-217)Network CableE48KbitsMTBF1,738,327 Hours (MIL-HDBK-217)Network Cable108ase-Ti: 2-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m)EMC/EMSCEEIA/TIA-568 100-ohm (100m)FCC Part 15 Subpart B Class A, CE Interference)FCC Part 15 Subpart B Class A, CE Interference)ProtocolCSMA/CDImmunity for Heavy Industrial EnvironmentEN61000-6-2Per unit: Power (Green) Ri-45 Per port: Link/Active (Green), Speed 100 (Yellow)EN61000-4-4 (Burst) Level 3, Criteria APower SupplyDC 12/24/48V (9.6-60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Burst) Level 3, Criteria APower ConsumptionInput Voltage DC 12/24/48V (9.6-60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Burst) Level 3, Criteria APower ConsumptionInput Voltage DC 12/24/48V (9.6-60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (CS) Level 3, Criteria APower ConsumptionInput Voltage DC 12/24/48V (9.6-60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Burst) Level 3, Criteria AProvides for input power (2 Pin)Shock <td>Data Processing</td> <td>Store and Forwar</td> <td>d</td> <td>Temperature</td> <td>-40 ~ 65 C</td>	Data Processing	Store and Forwar	d	Temperature	-40 ~ 65 C	
10000 point10000 point100000 point1000000000000000000000000000000000000	Transfer Rate	14 880pps for Eth	ernet port	Housing	Rugged Metal, IP30 Protection and Fanless	
Flow Control       IEEE 80.3x flow control, back pressure flow control       Weight       220g         MAC Address Table       1K       DIN Rail mounting, or wall mounting (optiona         Packet Buffer Size       448Kbits       MTBF       1,738,327 Hours (MIL-HDBK-217)         Network Connector       5x RJ-45       MTBF       1,738,327 Hours (MIL-HDBK-217)         Network Cable       108ase-T: 2-pair UTP/STP Cat. 5 cable       EMC/EMS       CE         EIA/TIA-568 100-ohm (100m)       1008ase-TX: 2-pair UTP/STP Cat. 5 cable       EMC/EMS       CE         EIA/TIA-568 100-ohm (100m)       Railway Traffic       EN50121-4         Protocol       CSMA/CD       Immunity for Heavy Industrial Environment       EN61000-6-2         Protection       For DC input power protection       Emission for Heavy Industrial Environment       EN61000-6-4         Power Consumption       Input Voltage       Power Consumption(Watt) DC 12/2 / 0.9W       EMS       EN61000-4-2 (ESD) Level 3, Criteria A         Power Consumption       Input Voltage       Power Consumption(Watt) DC 12/2 / 0.9W       EN61000-4-8 (PFMF, Magnetic Field) Field Stret 300A/m, Criteria A       EN61000-4-8 (PFMF, Magnetic Field) Field Stret 300A/m, Criteria A         Removable Terminal Block       Provides for input power (2 Pin)       200       Shock       IEC 60068-2-3		148 800pps for Fa	ast Ethernet port	Dimensions	70 x 30 x 103 mm (D x W x H)	
MAC Address Table     IK     Installation Mounting     DIN Rail mounting, or wall mounting (optional Mounting)       Packet Buffer Size     448Kbits     MTBF     1,738,327 Hours (MIL-HDBK-217)       Network Cable     5 x RJ-45     (MIL-HDBK-217)       Network Cable     10Base-T: 2-pair UTP/STP Cat. 5 cable     EM/ (MIL-HDBK-217)       EIA/TIA-568 100-ohm (100m)     EIA/TIA-568 100-ohm (100m)     EM/ (Electromagnetic Interference)     FCC Part 15 Subpart B Class A, CE Interference)       Protocol     CSMA/CD     Railway Traffic     EN50121-4       Protocol     CSMA/CD     Image: Sign of the sign of th	Flow Control	IFFF 802 3x flow of	control back pressure flow control	Weight	220g	
Packet Buffer Size448KbitsMTBF1,738.327 Hours (MIL-HDBK-217)Network Connector5 x RJ-45Sx RJ-45Warranty5 yearsRJ-45 Port:Auto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplexWarranty5 yearsNetwork Cable10Base-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)EMC/EMSCEProtocolCSMA/CDImmunity for Heavy Industrial For DC input power (Green) (Yellow)FCC Part 15 Subpart B Class A, CE Interference)EN50121-4Reverse Polarity ProtectionFor DC input power protectionImmunity for Heavy Industrial EIN61000-6-2EN61000-6-2Overload Current ProtectionSupportedEN61000-4-2 (ESD) Level 3, Criteria A EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria A EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strei 300A/m, Criteria APower ConsumptionDC 12/2 DC 24V DC 24V DC 24V0.9WShockIEC 60068-2-32Removable Terminal BlockProvides for input power (2 Pin)ShockIEC 60068-2-32Removable Terminal BlockProvides for input power (2 Pin)EN61000IEC 60068-2-32	MAC Address Table	1K		Installation Mounting	DIN Rail mounting, or wall mounting (optional)	
Network Connector5x RJ-45Warranty5 yearsRJ-45 Port:Auto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplexWarranty5 yearsNetwork Cable10Base-T: 2-pair UTP/STP Cat. 5 cableEMC/EMSCEEIA/TIA-568 100-ohm (100m)100Base-TX: 2-pair UTP/STP Cat. 5 cableFCC Part 15 Subpart B Class A, CEEIA/TIA-568 100-ohm (100m)Railway TrafficEN50121-4ProtocolCSMA/CDImmunity forLEDPer unit: Power (Green) RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)EN61000-6-2Reverse Polarity ProtectionFor DC input power protectionEN61000-6-4Overload Current ProtectionSupportedEN61000-4-4 (Burst) Level 3, Criteria AOverload Current Power SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Surge) Level 3, Criteria APower ConsumptionDC 12/2 0.9W DC 12/2 0.12V0.9WEN61000-4-4 (Burst) Level 3, Criteria ADC 12/20.9W DC 12/2 0.24V1.2WShockEC 60068-2-27Removable Terminal BlockProvides for input power (2 Pin)ENckEC 60068-2-32PriotectionProvides for input power (2 Pin)ENckEC 60068-2-6	Packet Buffer Size	448Kbits		MTBF	1,738,327 Hours (MIL-HDBK-217)	
ConnectorAuto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplexNetwork Cable10Base-T: 2-pair UTP/STP Cat. 5 cableEM/EIA/TIA-568 100-ohm (100m)EIA/TIA-568 100-ohm (100m)FCC Part 15 Subpart B Class A, CEIOBase-TX: 2-pair UTP/STP Cat. 5 cableInterference)FCC Part 15 Subpart B Class A, CEEIA/TIA-568 100-ohm (100m)Railway TrafficEN50121-4ProtocolCSMA/CDImmunity for Heavy Industrial EnvironmentEN61000-6-2LEDPer unit: Power (Green) 	Network	5x RJ-45		Warranty	5 vears	
Network Cable10Base-T: 2-pair UTP/STP Cat. 5 cableEMC/EMSCEEIA/TIA-568 100-ohm (100m)100Base-T: 2-pair UTP/STP Cat. 5 cableFCC Part 15 Subpart B Class A, CE100Base-T: 2-pair UTP/STP Cat. 5 cableElA/TIA-568 100-ohm (100m)Railway TrafficFCC Part 15 Subpart B Class A, CEProtocolCSMA/CDImmunity forEN50121-4EN61000-6-2LEDPer unit: Power (Green)For DC input power protectionEmvironmentEN61000-6-4Reverse Polarity ProtectionFor DC input power protectionEMSEN61000-6-4Overload Current ProtectionSupportedEMSEN61000-4-2 (ESD) Level 3, Criteria BOverload Current ConsumptionInput Voltage DC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EMSEN61000-4-4 (Burst) Level 3, Criteria APower ConsumptionInput Voltage DC 24V0.9WShockIEC 60068-2-27Removable Terminal BlockProvides for input power (2 Pin)ErefallIEC 60068-2-6VibrationIEC 60068-2-6EN61000IEC 60068-2-6	connector	RJ-45 Port: Auto	MDI/MDI-X function, 10/100Base-TX	Certification		
EIA/TIA-568 100-0hm (100m)EMI (Electromagnetic (Ele/TIA-568 100-0hm (100m))EMI (Electromagnetic (Ele/TIA-568 100-0hm (100m))EMI (Electromagnetic (Ele/TIA-568 100-0hm (100m))ProtocolCSMA/CDImmunity for Heavy Industrial EnvironmentEN50121-4ProtocolCSMA/CDImmunity for Heavy Industrial EnvironmentEN61000-6-2LEDPer unit: Power (Green) RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)Emission for Heavy Industrial EnvironmentEN61000-6-4Overload Current ProtectionSupportedEMS (Electromagnetic Susceptibility)EN61000-4-2 (ESD) Level 3, Criteria BPower SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-3 (RS) Level 3, Criteria APower ConsumptionInput Voltage DC 12/2Power Consumption(Watt) DC 12/2O.9WEN61000-4-6 (CS) Level 3, Criteria ADC 24V1.2W DC 48V0.9WShockIEC 60068-2-27Removable Terminal BlockProvides for input power (2 Pin)For input power (2 Pin)IEC 60068-2-32	Network Cable	10Base-T: 2-pair L	TP/STP Cat 5 cable	EMC/EMS	CE	
List of Notion ControlProvides for input power (2 Pin)Prover (2 Pin)Pro		FIA/TIA-568 100-	20m (100m)	EMI		
InterfactEIA/TIA-568 100-ohm (100m)ProtocolCSMA/CDLEDPer unit: Power (Green) RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)EN61000-6-2 EnvironmentReverse Polarity ProtectionFor DC input power protectionEN61000-6-4 EnvironmentOverload Current ProtectionSupportedEN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria A EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Street 300A/m, Criteria APower ConsumptionInput Voltage DC 12/2 U DC 24V DC 24V DC 24V DC 48V DC 48VPower (2 Pin)Removable Terminal BlockProvides for input power (2 Pin)ENckProvides for input power (2 Pin)FreefallIEC 60068-2-32VibrationIEC 60068-2-6Encence		100Base-TX: 2-pa	ir UTP/STP Cat. 5 cable	(Electromagnetic	FCC Part 15 Subpart B Class A, CE	
ProtocolCSMA/CDEndote 1LEDPer unit: Power (Green) RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)EnvironmentEN61000-6-2Reverse Polarity ProtectionFor DC input power protectionEN61000-6-4EN61000-6-4Overload Current ProtectionSupportedEN61000-4-2 (ESD) Level 3, Criteria BEN61000-4-2 (ESD) Level 3, Criteria APower SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Burst) Level 3, Criteria APower ConsumptionInput Voltage DC 12/2Power Consumption(Watt) DC 12/2EN61000-4-8 (CS) Level 3, Criteria ADC 12/20.9WEN61000-4-8 (PFMF, Magnetic Field) Field Street 300A/m, Criteria AEmovable Terminal BlockProvides for input power (2 Pin)ShockProvides for input power (2 Pin)Input power (2 Pin)IEC 60068-2-32		FIA/TIA-568 100-	ohm (100m)	Railway Traffic	EN50121-4	
LEDPer unit: Power (Green) RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)Heavy Industrial EnvironmentEN61000-6-2Reverse Polarity ProtectionFor DC input power protectionHeavy Industrial EnvironmentEN61000-6-4Overload Current ProtectionSupportedEN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-2 (ESD) Level 3, Criteria APower SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-2 (ESD) Level 3, Criteria APower ConsumptionInput Voltage DC 12/2Power Consumption(Watt) DC 12/VO.9W 0.9WEN61000-4-8 (CS) Level 3, Criteria ARemovable Terminal BlockProvides for input power (2 Pin)ShockIEC 60068-2-27FreefallIEC 60068-2-32FreefallIEC 60068-2-6	Protocol	CSMA/CD		Immunity for		
RJ-45 Per port: Link/Active (Green), Speed 100 (Yellow)EnvironmentReverse Polarity ProtectionFor DC input power protectionEmission for Heavy Industrial EnvironmentEN61000-6-4Overload Current ProtectionSupportedEMS (Electromagnetic Susceptibility) Protection LevelEN61000-4-2 (ESD) Level 3, Criteria BPower SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EMS (Electromagnetic Susceptibility) Protection LevelEN61000-4-2 (ESD) Level 3, Criteria APower ConsumptionInput Voltage DC 12/2Power Consumption(Watt) DC 12/2O.9WEN61000-4-8 (PFMF, Magnetic Field) Field Street 300A/m, Criteria ARemovable Terminal BlockProvides for input power (2 Pin)ShockIEC 60068-2-27FreefallIEC 60068-2-6IEC 60068-2-6	LED	Per unit: Power (	Green)	Heavy Industrial	EN61000-6-2	
Reverse Polarity Protection       For DC input power protection       Heavy Industrial Environment       EN61000-6-4         Overload Current Protection       Supported       EMS       EN61000-4-2 (ESD) Level 3, Criteria B         Power Supply       DC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)       EN61000-4-2 (ESD) Level 3, Criteria A         Power Consumption       Input Voltage       Power Consumption(Watt)       Power Consumption(Watt)         DC 12/V       0.9W       DC 24V       1.2W         DC 48V       2W       Shock       IEC 60068-2-27         Freefall       IEC 60068-2-32       Freefall       IEC 60068-2-6		RJ-45 Per port: Lii	nk/Active (Green), Speed 100	Environment Emission for		
ENDECEDDSupportedEMS (Electromagnetis Susceptibility) ProtectionEN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria B EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria A EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Street 300A/m, Criteria APower ConsumptionInput Voltage DC 12/V DC 24V DC 24V 	Reverse Polarity	For DC input pov	ver protection	Heavy Industrial Environment	EN61000-6-4	
ProtectionSupportedEN61000-4-3 (RS) Level 3, Criteria APower SupplyDC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)EN61000-4-4 (Burst) Level 3, Criteria APower ConsumptionInput Voltage DC 12/VPower Consumption(Watt)EN61000-4-5 (Surge) Level 3, Criteria ADoc 12/V0.9WEN61000-4-6 (CS) Level 3, Criteria ADc 12/V0.9WEN61000-4-8 (PFMF, Magnetic Field) Field Streed 	Overload Current			EMS	EN61000-4-2 (ESD) Level 3, Criteria B	
Power Supply     DC 12/24/48V (9.6~60VDC) or AC 24V (18~36VAC) input power (Removable Terminal Block)     Dusception (Removable Terminal Block)     EN61000-4-4 (Burst) Level 3, Criteria A       Power Consumption     Input Voltage     Power Consumption(Watt)     Protection Level     EN61000-4-6 (CS) Level 3, Criteria A       DC 12/V     0.9W     EN61000-4-8 (PFMF, Magnetic Field) Field Strest 300A/m, Criteria A     EN61000-4-8 (PFMF, Magnetic Field) Field Strest 300A/m, Criteria A       Removable Terminal Block     Provides for input power (2 Pin)     Freefall     IEC 60068-2-32       Vibration     IEC 60068-2-6     Vibration     IEC 60068-2-6	Protection	Supported		(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A	
Input power (Removable Terminal Block)     EN61000-4-5 (Surge) Level 3, Criteria B       Power Consumption     Input Voltage     Power Consumption(Watt)     EN61000-4-6 (CS) Level 3, Criteria A       DC 12V     0.9W     EN61000-4-8 (PFMF, Magnetic Field) Field Street 300A/m, Criteria A       DC 24V     1.2W     B       DC 48V     2W       Provides for input power (2 Pin)     Freefall       IEC 60068-2-6     IEC 60068-2-6	Power Supply	DC 12/24/48V (9.6	5~60VDC) or AC 24V (18~36VAC)	Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A	
Power Consumption         Input Voltage         Power Consumption(Watt)         EN61000-4-6 (CS) Level 3, Criteria A           DC 12V         0.9W         EN61000-4-8 (PFMF, Magnetic Field) Field Strest 300A/m, Criteria A           DC 24V         1.2W         300A/m, Criteria A           DC 48V         2W         Shock         IEC 60068-2-27           Freefall         IEC 60068-2-32         Freefall         IEC 60068-2-6		input power (Ren	novable Terminal Block)		EN61000-4-5 (Surge) Level 3, Criteria B	
DC 12V         0.9W         EN61000-4-8 (PFMF, Magnetic Field) Field Strest 300A/m, Criteria A           DC 24V         1.2W         300A/m, Criteria A           DC 48V         2W         Shock         IEC 60068-2-27           Freefall         IEC 60068-2-32         Vibration         IEC 60068-2-6	Power	Input Voltage	Power Consumption(Watt)		EN61000-4-6 (CS) Level 3, Criteria A	
DC 24V         1.2W         300A/m, Criteria A           DC 48V         2W         Shock         IEC 60068-2-27           Freefall         IEC 60068-2-32         Freefall         IEC 60068-2-6	Consumption	DC 12V	0.9W		EN61000-4-8 (PFMF, Magnetic Field) Field Strength:	
Removable Terminal Block         Provides for input power (2 Pin)         Snock         IEC 60068-2-2/           Vibration         IEC 60068-2-6         Vibration         IEC 60068-2-6		DC 24V	1.2W	Ch. e. ele	300A/m, Criteria A	
Removable Terminal Block         Provides for input power (2 Pin)         Freefall         IEC 60068-2-32           Vibration         IEC 60068-2-6		L DC 48V	ZVV	SNOCK	IEC 60068-2-27	
Vibration IEC 60068-2-6	Removable	Provides for inpu	t power (2 Pin)	Freefall	IEC 60068-2-32	
	Terminal Block			Vibration	IEC 60068-2-6	

## **Dimensions**



## **Ordering Information**

	RJ45 UTP port		Powerinput	Certification				Operating
Model Name	Port	10/100Base-TX	Single power	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	Temperature
IFS-500C	5	5	12/24/48VDC, 24VAC	V	V	V	V	-10~60°C
IFS-500C-E	5	5	12/24/48VDC, 24VAC	V	V	V	V	-40~75℃

#### Model Naming Rule



## **Optional Accessories**

#### Wall mount kit Accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm) 0

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IFS-500



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power
- IP30, rugged metal housing, fanless



The series models are 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 operating temperature -40 ~ 75°C (-E model)
- Provides broadcast storm protection
- Supports DIP SW for alarm setting and broadcast storm protection
- Supports flow control

-					
IEEE Standard	IEEE 802.3	10Base-T Ethernet	Alarm Relay	Relay outputs with current carrying capacity of 1 A	
	IEEE 802.3	u 100Base-TX and 100Base-FX Fast Ethernet	Democratic	@24VDC, NC	
	IEEE 802.3	x Flow Control and Back Pressure	Terminal Block	Provide 2 Redundant power, Alarm relay contact, 6	
	IEEE 802.3	z 1000Base-X Gbit/s Ethernet over Fiber-	Operating	-10 ~ 60°C (IFS-500)	
Switch	Ορτις		Temperature	-40 ~ 75°C (IES-500-E)	
Architecture	Back-plan	e (Switching Fabric) : 1.0 Gbps	Operating	5% to $95%$ (Non-condensing)	
Data Processing	Store and	Forward	Humidity	s to ss to (non condensing)	
Transfer Rate	14,880pp	s for Ethernet port	Storage Temperature	-40 ~ 85°C	
	148,800p	ps for Fast Ethernet port	Housing	Rugged Metal IP30 Protection and Fanless	
	1,488,000	pps for Giga Ethernet port	Dimensions	$106 \times 31.6 \times 142 \text{mm}$ (D x W x H)	
Flow Control	IEEE 802.3	x flow control, back pressure flow control	Weight	0.42kg	
Provides Broadcast Storm Protection	Present, E	nable /Disable set by DIP SW	Installation Mounting	DIN Rail mounting or wall mounting	
MAC Address			MTBF	650,473Hrs (MIL-HDBK-217)	
Table	2K		Warranty	5 years	
Packet Buffer Size	448Kbit		Certification	·	
Network	5x RJ-45		EMC/EMS	CE	
Connector	RJ-45 Por	Auto MDI/MDI-X function, 10/100Base-TX auto negotiation speed, Full/Half duplex	EMI (Electromagnetic	FCC Part 15 Subpart B Class A,CE EN55022 Class A	
Network Cable	10Base-T:	2-pair UTP/STP Cat. 5 cable	Interference)		
	EIA/TIA-5	58 100-ohm (100m)	Railway Traffic	EN50121-4	
	100Base-T	X: 2-pair UTP/STP Cat. 5 cable	Immunity for Heavy Industrial	EN61000-6-2	
	EIA/TIA-5	58 100-ohm (100m)	Environment	EN01000-0-2	
Protocol	CSMA/CD		Emission for		
LED	Per unit: P	ower 1 (Green), Power 2 (Green), Fault (Amber)	Heavy Industrial	EN61000-6-4	
DID CIW	RJ-45 Per	port: Link/Active (Green), Speed 100 (Yellow)	EMS	EN61000-4-2 (ESD) Level 3. Criteria B	
DIPSW	DIP 1	OFF : Enable power failure alarm		EN61000-4-3 (RS) Level 3, Criteria A	
		ON : Disable		EN61000-4-4 (Burst) Level 3. Criteria A	
	DIP 2	OFF : Enable broadcast storm protection		EN61000-4-5 (Surge) Level 3 Criteria B	
December Delevites		ON : Disables broadcast storm protection		EN61000-4-6 (CS) Level 3 Criteria A	
Protection	Present			EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 3004/m Criteria A	
Protection	Present		Safety	Ul 60950-1 (Pendina)	
Power Supply	Redundar	nt Dual DC 12/24/48V (9.6~60VDC) Input	Shock	IFC 60068-2-27	
	power (Re	emovable Terminal Block )	Freefall	IEC 60068-2-32	
Power Consumption	2.9W		Vibration	IEC 60068-2-6	

## **Dimensions**



## **Ordering Information**



#### Wall mount kit Accessories

IND-WMK01

Wall Mount kit for Industrial product,  $184\, x\, 30 mm$  (Narrow )

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# - IMC-1000CS & IMC-1000C

- ▲ 1x GbE RJ45 to 1x 100/1000Base SFP (Compact, Size)
- ▶ 1x GbE RJ45 to 1x 1000Base Fiber (ST/SC) (Compact, Size)



- EN50121-4, CE, FCC, EN61000-6-2, EN61000-6-4 certified
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- 12/24/48VDC (9.6~60VDC, 24VAC) input power



These compact models are unmanaged industrial grade GbE media converters that support conversion between electrical 10/100/1000Base-T and optical 1000Base-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 (See Figure). 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**

- IP30 rugged metal housing and fanless
- Wide operating temperature -20  $\sim 75^\circ\mathrm{C}$
- Store-and-Forward mode and Pass through mode (set by DIP SW)
- Conversion between 10/100/1000Base-T and 1000Base-X Fiber cable interface

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	LED	Per Unit: Power (	Green)	
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet		SFP/Fiber port Li	nk/Act (Yellow)	
	IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair		RJ-45 port: Spee	d & Link/Act	
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic	_	10/100 (Green), 1	000 (Yellow)	
	IEEE 802.3x Flow Control	Reverse	Current and farmer	and the second	
RJ45 Ports	10/100/1000Base-T Auto MDI/MDI-X and Auto-	Protection	supported for po	owerinput	
	Negotiation Function Supports UTP CAT.5e Twisted Pair cable	Overload	Supported		
Fiber Ports	1000Base-SX/LX SC (IMC-1000C) 100/1000Base-X SFP Slot (IMC-1000CS)	Protection Power Supply	12/24/49//DC (06-	60\/DC) or 24\/AC (19	- 26\/AC) with polarity
Data Process Architecture	Store and Forward mode or Pass through mode set by DIP SW	Power	reverse protect fu	nction and removable	e terminal block
Jumbo Frame	9K bytes	Consumption	Input Voltage	IMC-1000C	IMC-1000CS
Fiber	Fiber Cable (Multi-mode): 50/125um, 62.5/125um		12VDC	2.1W	1.8W
Parameters	Fiber Cable (Single-mode): 9/125um		24VDC 48VDC	2.2VV 3.4W	2 9W/
	Wavelength: 1310nm (Multi-mode/Single-mode)	Demonstelle	10700	5.117	2.711
	Available distance: (IMC-1000C) 500M (Multi-mode SX) 20KM (Single-mode)	Terminal Block	Provides for inpu	t power (2 Pin)	
	40KM (Single-mode)	Operating	5% ~ 95% (Non-o	condensing)	
	Distance depend on SFP Fiber Tranceiver (IMC-1000CS)	Operating	20 7500 (0.4014	0000 E INIC 1000CC	
Through	I X-Fiber: If TX port link down, the media converter will force Fiber port to link down	Temperature	-20 ~ 75°C (IMC-1	000С-Е, IMC-1000СS-	-E)
(LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	Temperature	-40 ~ 85°C		
Far-End Fault	Wark with LEDT to provide data loss	Housing	Rugged Metal, IP	30 Protection and fa	inless
(FEF)	work with LFPT to prevents data loss	Dimensions	70x 30x 103 mm	(D x W x H)	~~~
DIP Switch	Data process architecture	Installation	220g (IMC-1000C	) 215g (IMC-1000	(5)
	LEPT_OFFLEPT Disable_ONLLEPT Enable		DIN Rail, or Wall r	nounting (Optional)	MC 1000CC)
	Eiher Dupley OEE: Auto ON: Enro	MIDE	(MII-HDBK-217)	100C) 1,789,658 (I	NIC-1000CS)
	Fiber Speed	Warranty	5 vears		
	OFF: 1000Base-X ON: 100Base-FX (IMC-1000CS)	Certification	5 ) cuis		
Connector	Fiber:	EMC	CE		
	SC (Multi-mode, 500M), SC (Single-mode, 20KM, 40KM) (IMC-1000C) SFP Slot (IMC-1000CS)	EMI (Electromagnetic Interference)	FCC Part 15 Subp	oart B Class A, CE	
	RJ-45 Socket: CAT 5e Twisted Pair cable Auto MDI/MDI-X and Auto- Negotiation Function Supports	Railway Traffic	EN50121-4		



Immunity for Heavy Industrial Environment	EN61000-6-2	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
Emission for Heavy Industrial Environment	EN61000-6-4	EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A	
		Shock	IEC 60068-2-27
		Freefall	IEC 60068-2-32
		Vibration	IEC 60068-2-6

#### **Dimensions**

► IMC-1000C



▶ IMC-1000CS



)20 V1.0 ctcu.com

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## **Ordering Information**



- Din Rail with screws
- Terminal block

**Optional Accessories** 

#### Wall mount kit Accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm)

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IMC-1000CS product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, -10~70°C (-40~85°C)
ISFP-T7T00-00- (E)	Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, -10~70°C (-40~85°C)
ISFP-S5030-31-(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, -10~70°C (-40~85°C)

#### SFP Naming Rule





# -IMC-1000S

1x GbE RJ45 to 1x 100/1000Base-X SFP



- UL60950-1, EN50121-4, CE, FCC, EN61000-6-2, EN61000-6-4 certified
- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- Supports power failure alarm message by relay
- 12/24/48VDC (9.6~60VDC) redundant dual input power



IMC-1000S is an unmanaged industrial grade GbE media converter that supports 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. 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**

- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 75°C
- 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

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	Overload	Supported	
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet	Protection	supported	
	IEEE 802.3ab 1000Base-I Gbit/s Ethernet over twisted pair	Power Supply	12/24/48VDC (9.6~60VDC) Redundant power with	
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic	i onci suppiy	polarity reverse protect function and removable terminal	
	IEEE 802.3X Flow Control		block	
RJ45 Ports	10/100/1000Base-1 Auto MDI/MDI-X and Auto- Negotiation Function Supports LITP CATSe Twisted Pair cable	Power Consumption	4.2W	
Fiber Ports	100Base-X or 1000Base-X SFP slot 100Base-X or 1000Base-X set by DIP SW	Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC	
Data Process Architecture	Store and Forward mode or Pass through mode set by DIP SW	Removable Terminal Block	Provides 2 Redundant power, Alarm relay contact	
Jumbo Frame	9K bytes	Operating	5% ~ 95% (Non-condensing)	
Fiber	Fiber Cable (Multi-mode): 50/125um, 62.5/125um	Operating		
Parameters	Fiber Cable (Single-mode): 9/125um	Temperature	-20 ~ 75°C (IMC-1000S-E)	
	Wavelength: 1310nm (Multi-mode/Single-mode)	Storage Temperature	40 05%	
	SFP, Distance depend on Fiber Tranceiver		-40 ~ 03 C	
Link Fault Pass	Fault Pass TX-Fiber: If TX port link down, the media converter will		Rugged Metal, IP30 Protection and fanless	
I hrough	force Fiber port to link down	Dimensions	106 x 38.6 x 142 mm (D x W x H)	
	fiber-i X: If Fiber port link down, the media converter Will force TX port to link down	Weight	620g	
Far-End Fault		Installation	DIN Rail mounting, or wall mounting (Optional)	
(FEF)	work with LFPT to prevents data loss	MTBF	1.198.203 Hours	
DIP Switch	Off: Alarm For Power Enable On: Alarm For Power Disable		MIL-HDBK-217	
	Off: Alarm For Port Enable On: Alarm For Port Disable	Warranty	5 years	
	Off: LFPT Disable On: LFPT Enable	Certification		
	Off: Switch Mode On: Converter Mode	EMC	CE	
	Off: 1000Base-X On: 100Base-FX	EMI		
LEU	rer unit: rower T (Green), rower Z (Green), rault (Amber)	(Electromagnetic	FCC Part 15 Subpart B Class A, CE	
	LINN/ACTION FIDER(GREEN): ON Connected to network/ OFF · Not connected to network/	Interference)		
	BLK : Receive /Transmit Data	Railway Traffic	EN50121-4	
	SFP Fiber speed:	Immunity for		
	Yellow : 1000Base-X Green : 100Base-FX	Heavy	EN61000-6-2	
	RJ-45 port: Speed: 10 (OFF), 100 (Green), 1000 (Yellow)	Environment		
	LINK/ACT TOT KJ45(Green): ON: Connected to network/ OFF: Not connected to	Emission for		
	network/	Heavy	EN61000-6-4	
	BLK: Networking is active	Industrial		
Reverse Polarity Protection	Supported for power input	Environment		



## Industrial Unmanaged GbE Media Converter

EMS (Electromagneti Susceptibility) Protection Leve

	EN61000-4-2 (ESD) Level 3, Criteria B
ic	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A

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

#### **Dimensions**



Side View





**Front View** 



#### Wall-Mount Kit View (Optional accessory)

## **Ordering Information**

	RJ45 UTP Port	Fiber	Power Input			Certification			Oneverting
ModelName	10/100/1000 Base-T	Dual Speed 100/1000Base-X	Redundant	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	Œ	FCC	Temperature
IMC-1000S-E	1	1 SFP	12/24/48VDC	V	V	V	V	V	-20~75°C
Model Naming Rule IMC - 1000 S - E - 20~75°C Industrial Media Converter									
Package List									
<ul><li>IMC-1000S</li><li>Din Rail with</li></ul>	device h screws	<ul><li>Terminal bloc</li><li>Protective ca</li></ul>	ck ps for SFP ports						

## **Optional Accessories**

#### Wall mount kit Accessories

Wall Mount kit for Industrial product, 184 x 30mm IND-WMK01

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IMC-1000S product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

WB: TX/1550nm (Bidi Mode B)

ISFP-M7000-85-(E)	Industrial SF	P GbE 100	)Base-SX, M/M, S	500 meter,wave l	ength 850nm, 7.5dB,	LC, -10~70°C (-40~85°C)
ISFP-S7020-31-(E)	Industrial SI	FP 1000Ba	se-LX, S/M, 20ki	m, wave length	1310nm, 15dB, LC, -1	0~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SI	FP 1000Ba	se-T UTP 100me	eter, -10~70°C (-	40~85°C)	
ISFP-M5002-31-(E)	Industrial S	FP 155M 1	00Base-FX, MN	l, 2km, wave ler	ngth 1310nm, 12dB,	LC, -10~70°C (-40~85°C)
ISFP-S5030-31-(E)	Industrial S	FP 155M 1	00Base-FX, SM,	30km, 1310nm	n, 19dB, LC, -10~70°C	C (-40~85℃)
SFP Naming Ru	ule					
ISFP -	- S 7	9: 10G 7: Gb5	Distance	- D Wavelength	E D: DDMI	● E:-40~85°C Biank:0~70°C
SFP Transceiver	T: UTP	5: FE	000: (01P) 000: (500m) 002: (2km) 020: (20km)	85: 850nm 31:1310nm 55:1550nm	Blank: Non DDMI	

Industrial Unmanaged GbE Media Converter IMC-1000S



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IMC-100C is a compact sized, unmanaged industrial grade 100M Ethernet media converter that supports conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet. Housed in rugged DIN rail or wall mountable enclosures, 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. 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**

- 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  $\sim$  75°C (IMC-100C-E )
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet	LED	PWR (Green):	ON: Power active / OFF: Power is inactive		
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet		Fiber (Green):			
	IEEE 802.3x Flow Control		LNK/Act (Green) : Link & Active			
RJ45 Ports	10/100Base-TX Auto MDI/MDI-X and Auto-Negotiation Function Supports UTP CAT.5e Twisted Pair cable		LAN:100 (Gree 10 (Gree	een ) : Fiber port Full of Half duplex en): 100M Link & Active n): 10M Link & Active		
Fiber Ports	100Base-FX (SC/ST connectors)	Reverse				
Switch	Store and Forward in Switch mode	Polarity	Supported fo	r power input		
Architecture	Supports 1024 MAC addresses in Switch mode	Overload				
Ethernet Packet length	2046Byte (Max) in Switch mode	Current Protection	Supported			
Jumbo Frame	9K bytes in Pass through (Converter mode)	Power Supply	12/24/48VDC	(9.6~60VDC) or 24VAC (18~36VAC), polarit		
Fiber	Fiber Cable (Multi-mode): 50/125um,62.5/125um		reverse prote	ct function and removable terminal block		
Parameters	Fiber Cable (Single-mode): 9/125um	Power	Input	Watt(W)		
	Wavelength: 1310nm (Multi-mode/Single-mode)	consumption	12VDC	1.0\//		
	Available distance: 2KM (Multi-mode)		24VDC	1.8W		
	30KM (Single-mode)		48VDC	2.1W		
Link Fault Pass Through	TX- Fiber: If TX port link down, the media converter will force Fiber port to link down	Removable Terminal Block	Provide for 1x DC input power (2 Pin)			
(LFPT)	Fiber-TX: If Fiber port link down, the media converter will force TX port to link down	Operating	5% ~ 95% (Non-condensing)			
Far-End Fault (FEF)	Work with LFPT to prevents data loss	Operating	-40 ~ 75°C (IN	1С-100С-Е)		
DIP Switch	Force Fiber port Duplex OFF: Full Duplex ON: Half Duplex	Storage Temperature	-40 ~ 85°C			
	LFPT:	Housing	IP30 rugged r	netal housing ,compact size and fanless		
	OR: Enables LEPT (Link Fault Pass through) OFE: Disables LEPT	Dimensions	$70 \times 30 \times 103 \text{ mm} (D \times W \times H)$			
	Architecture	Weight	215a			
	OFF: Switching mode	Installation	DIN Rail mou	nting, Wall Mounting (Optional)		
	ON: Pass through Converter mode	MTBF	1.558.180 Hou	irs		
Connector	Fiber: SC (Multi-mode, 2km), SC (Single-mode, 30km, 50KM)		(MIL-HDBK-217)			
	ST (Multi-mode, 2km), ST (Single-mode, 30km, 50KM)	Warranty	5 years			
	KJ-45 SOCKET: CAI.5e (10/100Mbps) Twisted Pair cable					
	Auto Multimulti and Auto-Negotiation Function Support					



## Industrial Unmanaged Fast Ethernet Media Converter

Certifications		EMS	EN61000-4-2 (ESD) Level 3, Criteria B	
EMC	CE	(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A	
EMI	FCC Part 15 Subpart B Class A, CE	Protection Level	EN61000-4-4 (EFT) Level 3, Criteria A	
Railway	EN50121-4		EN61000-4-5 (Surge) Level 3, Criteria B	
Traffic			EN61000-4-6 (CS) Level 3, Criteria A	
Immunity for			EN61000-4-8 (PFMF) Field strength 300A/m Criteria A	
Industrial	EN 61000-6-2	Shock	IEC 60068-2-27	
environment		Freefall	IEC 60068-2-32	
<b>Emission for</b>		Vibration	IEC 60068-2-6	
Heavy Industrial Environment	EN 61000-6-4			

## Dimensions



## **Ordering Information**

Model Name 10/1 IMC-100C-E	00Base-TX	100Base-FX	Single power	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE	FCC	Temperating
IMC-100C-E	1							
		1 SC	12/24/48VDC	V	V	V	V	-40~75°C
Model Naming Ru IMC Industrial Media Converter	le 100 ): 100Base-;	C – X Converter C: (	E – ( E: -40~75°C Compact Size	Scool See below for mo	pre detail Examp	<b>IMC – 100</b> le: IMC – 100	Temperature Typ C – 🗌 – 🛄 C – E – SCO	e Distance
Connector Type	Connectivi	ty Distance						
sc, st Package List	002:2km (M/ 020A: WDM 2 020B: WDM 2	M) 030:30km (S/I 20km A type (TX:13 20km B type (TX: 15	M) 050:50km (S/M) :10nm) :50nm)	)				
<ul><li>IMC-100C device</li><li>Din Rail with scr</li></ul>	e rews	• Te	rminal block					

#### Wall mount kit Accessories

IND-WMK03

Wall Mount kit for Industrial product (Compact, 150 x 30mm)



# -IMC-100

1x 10/100Base RJ45 to 1x 100Base-FX Fiber (ST/SC)



- Supports LFPT (Link Fault Pass Through) and FEF (Far End Fault)
- Provides a DIP-Switch to set functions
- UL60950-1, EN50121-4, CE, FCC, EN61000-6-2, EN61000-6-4 certified
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)



IMC-100 is an unmanaged industrial grade 100M Ethernet media converter that supports conversion between electrical 10/100Base-TX and optical 100Base-FX Ethernet. Housed in rugged DIN rail or wall mountable enclosures, 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. Standard operating temperature range models (-10 to  $60^{\circ}$ C) and wide operating temperature range models (-40 to  $75^{\circ}$ C) fulfill the special needs of industrial automation applications.

#### **Features**

- IP30 rugged metal housing and fanless
- Wide operating temperature -40  $\sim$  75°C (IMC-100-E )
- Store-and-Forward mode and Pass Through mode (set by DIP SW)
- Conversion between 10/100Base-TX and 100Base-FX cable interface

IEEE 802.3 10Base-T 10Mbit/s Ethernet
IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet
IEEE 802.3x Flow Control
10/100Base-TX Auto MDI/MDI-X and Auto-Negotiation
Function
Supports UTP CAT.5e Twisted Pair cable
100Base-FX (SC/ST connectors)
Store and Forward in Switch mode
Supports 1024 MAC addresses in Switch mode
2046Byte (Max) in Switch mode
9K bytes in Pass through (Converter mode)
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)
I X- 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
Work with LFPT to prevents data loss
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
UN: Pass through Converter mode
FIBER:
ST (Multi-mode 2km) ST (Single-mode 30km 50KM)
s (mara mode, zan), s (single mode, solari, solar)
RI-45 Socket: CAT 5e (10/100Mbps) Twisted Pair cable

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/ Iransmit Data
LED	100 (Amber): ON: 100Mbps/ OFF: 10Mbps
	LAN (Green):
	OFF: Not connected to network / BLK: Networking is active
Reverse	OFF. NOT CONTRECTED TO HELWORK DER. NETWORKING IS ACTIVE
Polarity	Supported for power input
Protection	
Overload	
Current	Supported
Protection	
Power Supply	12/24/48VDC(9.6~60VDC), Redundant power with
	block
Alarm Relay	Relay outputs with current carrying capacity of 1 A
Contact	@24VDC
Removable Terminal Block	Provides 2 redundant power, alarm relay contact
Power	2014/
Consumption	2.9 W
Operating	5% ~ 95% (Non-condensing)
Humidity	5% 55% (Norr condensing)
Operating Temperature	-40 ~ 75°C (IMC-100-E)
Storage	-10 ~ 85°C
Temperature	
Housing	Rugged Metal, IP30 Protection and fanless
Dimensions	106 x 38.6 x 142.1mm (D X W X H)
Weight	0.62kg
Installation	DIN Rail mounting, or wall mounting (Optional)
MTBF	1,199,572 Hours
	MIL-HDBK-217



## Industrial Unmanaged Fast Ethernet Media Converter

Certification		EMS	EN61000-4-2 (ESD) Level 3, Criteria B	
EMI	CE	(Electromagnetic	EN61000-4-3 (RS) Level 3, Criteria A	
EMI (Electromagnetic FCC Part 15 Subpart B Class A, CE Interference)	ECC Part 15 Subpart B Class A. CE	Protection Level	EN61000-4-4 (Burst) Level 3, Criteria A	
		EMS	EN61000-4-5 (Surge) Level 3, Criteria B	
Railway Traffic EN50121-4		(Electromagnetic	EN61000-4-6 (CS) Level 3, Criteria A	
Immunity for Heavy	EN61000-6-2	Protection Level	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A	
Industrial		Safety	UL60950-1	
Environment Emission for		Shock	IEC 60068-2-27	
Heavy		Freefall	IEC 60068-2-32	
Industrial	EIN01000-0-4	Vibration	IEC 60068-2-6	
Environment				

#### **Dimensions**



## **Ordering Information**



- IMC-100 device
- Din Rail with screws

## **Optional Accessories**

#### Wall mount kit Accessories

IND-WMK01 Wall Mount kit for Industrial product, 184 x 30mm



# IBP-202

Optical Fiber Bypass Switch



- 100M/1G/2.5G/10G Ethernet or Telecom applications
- SC/ST/LC SM or MM optical
- Optical bypass switching time <10ms</li>
- Provides rotary switch to set delay boot time (0~180 seconds)
- EN50121-4, EN61000-6-2, EN61000-6-4,CE, FCC certified



The IBP-202 Optical Bypass Switch is an industrial grade external bypass switch for optical-node failure in fiber optical network infrastructures. The IBP-202 Optical Bypass Switch prevents and saves communication from network failures during power loss. When power failure occurs, the Bypass switch will swiftly set to bypass mode and isolate the main-network from the local networking device (See Figure 1). Bypass switches are commonly used in some major optical networks, such as in railway communication systems, factory automation, and power substation, where fiber link failures are not tolerated.

#### **Features**

- Low insertions loss (<1.5dB)</li>
- Redundant dual DC input power 12/24/48VDC (9.6 ~ 60VDC)
- IP30 rugged metal housing and fanless
- Wide operating temperature -20 ~ 70°C

Fiber Connector	SC, ST, LC
Operating wavelength	SM: 1260 ~ 1650nm MM: 810~890nm , 1260~1340nm
Optic Fiber cable	Single mode: 8/125um~10/125um Multi mode: 50/125um
Insertion loss	<1.5dB
Optical Switching time	< 10ms
LED indicator	Power 1, Power 2, Operation mode (Normal /Bypass)
Boot up delay adjuster	Provides a rotary switch to configure boot up delay time (0~180 seconds)
Removable Terminal Block	Provide for redundant power
Power supply	12/24/48VDC (9.6~60VDC), Redundant power with polarity reverse protect function and removable terminal block
Reverse Polarity Protection	Supported for Power Input
Overload Current Protection	Supported
Power consumption	0.4W (12VDC), 0.5W (24VDC), 0.8W (48VDC)
Housing	Rugged metal, IP30 protection and fanless
Dimensions	106 x 62.5 x 135mm (D x W x H)
Weight	530g (IBP-202-SLC) 545g (IBP-202-SSC, IBP-202-SST)
Installation	DIN Rail mounting, or wall mounting (Optional)
Operating Temperature	-20~70°C
Storage temperature	-40 ~ 85°C
Operating Humidity	5% ~ 95% (Non-condensing)
MTBF	273,054 Hours (MIL-HDBK-217)
Warranty	5 Years

Certification						
EMC	CE (EN55024, EN55032)					
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE					
Immunity for Heavy Industrial Environment	EN61000-6-2					
Emission for Heavy Industrial Environment	EN61000-6-4					
Railway Traffic	EN50121-4					
EMS	EN61000-4-2 (ESD) Level 3, Criteria B					
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A					
Protection Leve	EN61000-4-4 (EFT) Level 3, Criteria A					
	EN61000-4-5 (Surge) Level 3, Criteria B					
	EN61000-4-6 (CS) Level 3, Criteria A					
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A					
Shock	IEC 60068-2-27					
Freefall	IEC 60068-2-32					
Vibration	IEC 60068-2-6					





## **Application**

The IBP-202 supports the function of optical path Normal mode and Bypass mode for fiber optical networks. It offers a simple mechanism to switch both of upload and down load fiber path when a power system failure occurs, and a path restores when power back. It offers a simple way to reduce the risk of optical network Node-Down which is caused by the power system.





#### Figure 2 : Application example in line connection



Figure 3 : Application example in ring connection





IBP-202 SC Type



► IBP-202 LC Type



► IBP-202 ST Type





Industrial Optical Fiber Bypass Switch IBP-202

Terminal block

## **Ordering Information**

Model Name	Fiber connector			PowerInput	Certification			Operating	
	Connectortype	Connector Q'ty	Datarate	Redundant	EN61000-6-2 EN61000-6-4	EN50121-4	CE	FCC	Temperature
IBP-202-SSC	SM SC	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C
IBP-202-SST	SM ST	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C
IBP-202-SLC	SM LC	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C
IBP-202-MSC	MM SC	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C
IBP-202-MST	MM ST	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C
IBP-202-MLC	MM LC	4	100M/Giga/10G	12/24/48VDC	V	V	V	V	-20~70°C

#### Package List

• IBP-202 device

• Din Rail with screws

## **Optional Accessories**

#### Wall Mount Kit Accessories

IND-WMK02 Wall Mount kit for Industrial product, 184 x 50mm



# -IFC-FDC-PRO

#### 1x RS232/422/485 to 2-ports Fiber (SC/ST) Media Converter, support PROFIBUS



- 2.5KV isolation for serial port (RS485)
- Supports fiber port for extend transmission distance
- Baud Rate up to 9.6K~12Mbps for Profibus application
- Supports Auto Baud Rate mode, or manual mode for setting Baud Rate
- CE, FCC, heavy industrial grade EN61000-6-2, EN61000-6-4 certified



IFC-FDC-PRO is a serial over fiber converter that is capable of selecting interface modes for connection to RS-485 2-wire half duplex and supports high-speed data rates of PROFIBUS. Fiber optical cabling extends distances and isolates from EMC/noise to reduce interference between PROFIBUS devices. With two fiber ports, this device supports both daisy-chain and ring topologies. The terminal block offers an alarm relay contact and two redundant DC power inputs. IFC-FDC-PRO is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range, making it is reliable and an ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. IFC-FDC-PRO is protocol transparent, and can be applied to PROFIBUS and other networks using RS485 interfaces.

#### **Features**

- Supports 2x Fiber and 1x RS485
- Extend serial transmission distance up to 500m, 2km, 20km
- Supports several fiber port topology , cable redundancy (Figure 3), ring redundancy (Figure 4), daisy chain (Figure 5), point to point (IFC-FDC-PRO)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent. These products can be applied to the PROFIBUS, but also can be applied to other network using RS485 interface
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

#### **Specifications**

FieldBus Protocol	Protocol transparent	PROFIBUS and all operations available on RS485	Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 60VDC)		
Problem isolation	Isolate EMC/noise between PROFIB	e to reduce mutual interference US device (Figure 1)		Power Consumption	<6W		
	Isolate the PROFI impact of the oth	BUS side of the failure, to avoid the ner side (See Figure 2 )		Power Reversal Protection	Yes		
Fiber Port Interface	Connector	SC, ST		Over Current Protection: Signal Short Together Protected			
	Fiber Port	2 fiber ports	<b>Terminal Block</b>	For Power and Alarm			
	Fiber Type	Fiber Type M/M 500M, M/M 2KM, S/M 20KM		V1+, V1-, V2+, V2-, Alarm NC, Alarm COM			
		M/M 850nm or 1310nm, S/M 1310nm	Mechanical	Proof	IP30 Protection, Fanless		
	Wavelength	Bidi: Mode A : TX1310nm/RX1550nm		Dimensions	85 x 30 x 115mm (D x W x H)		
File ou ve out		Mode B : 1X1550nm/RX1310nm		Mounting	DIN-Rail, or wall mounting (Optional)		
Fiber port	Ripa redundance	(Figure 3)		Weight	305g		
ropology	Daisy chain (Figu	re 5)	Certification				
	Point to point		EMC	CE (EN55024, EN55032)			
Serial port	Serial Port	DB9 Female	EMI	FCC Part 15 Subpart B Class A, CE (EN55032)			
Interface	Connector	RS-485 : 2 wires, Half duplex	Immunity for Heavy Industrial Environment	EN61000-6-2			
	RS-485 direction	Automatically detection					
		9.6K to 12Mbps					
	Serial port Baudrate	Auto mode : Auto sense Baudrate, no need to set Baudrate Manual Mode : Baudrate Set by DIP SW	Emission for Heavy	FN61000-6-4			
	Serial port	2.5KVrms isolation for serial signals	Industrial Environment				
	ISOIdtion	mutual interference between serial	EMS	EN61000-4-2 ESE	EN61000-4-2 ESD Level 3		
		port device	(Electromagnetic Susceptibility) Protection Level	EN61000-4-3 RS	Level 3		
Environmental	Operating	-10 ~ 60°C (IFC-FDC-PRO)		EN61000-4-4 EFT	T Level 3		
	Temperature	-40 ~ 75°C (IFC-FDC-PRO-E)		EN61000-4-5 Surge Level 3			
	Storage	-40 ~ 85°C		EN61000-4-6 CS	Level 3		
	Temperature	40 105 C	Free Fall	IEC 60068-2-32			
	Humidity	5 ~ 95% RH	Vibration	IEC 60068-2-6			
LED Indications	PWR1, PWR2, Alarm, Master, TD, RD, Fiber 1 Link,		Shock	IEC 60068-2-27			
	Fiber 2 Link, Ring	, System	Green	RoHS			
Alarm Relay	Alarm exists for p	power, fiber link or ring protection	MTBF	924,615 Hours (MIL-HDBK-217)			
	neidy output Will	i carry capacity i A @ 24VDC	Warranty	5 vears			

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## **Application & Topology**



#### Figure 2 : Isolate PROFIBUS Failure



#### Figure 3 : Fiber Cable Redundancy topology & application



#### Figure 4 : Fiber Ring Redundancy topology & application




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Industrial Serial to Fiber Media Converter IFC-FDC-PRC

#### Figure 5 : Fiber Daisy Chain topology & application



#### **Dimensions**

▶ IFC-FDC-PRO







Side View

Front View

Rear View

**DIN-Rail Kit View** 

Wall-Mount Kit View

#### **Ordering Information**

	Serial (ProfiBus)		Fiber	Power Input	Ce	Operating		
ModelName	RS422/485	Isolation 2.5KV	SC/ST	Redundant	EN61000-6-2 EN61000-6-4	Œ	FCC	Temperature
IFC-FDC-PRO	1	V	2	12/24/48VDC	V	V	V	-10~60°C
IFC-FDC-PRO-E	1	V	2	12/24/48VDC	V	V	V	-40~75°C



**Connector** Type **Connectivity Distance** SC, ST 001: M/M 500meter 002: M/M 2km 020: S/M 20km

020AB: 20km Bidi (20km 1x mode A + 1x Mode B) Mode A: TX 1310nm/RX1550nm Mode B: TX 1550nm/RX1310nm

Terminal block

#### Package List

- One device of the series
- Din Rail with screws

#### **Optional Accessories**

#### Wall Mount kit Accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm) Temperature Type

 $\mathsf{IFC} - \mathsf{FDC} - \mathsf{PRO} - \Box - \Box \Box \Box \Box \Box$ 

Example: IFC - FDC-PRO - E- SC002

# IFC-Serial-PRO

#### 1x RS232/422/485 to 1-port Fiber (SC/ST) Media Converter, support PROFIBUS



- 2.5KV isolation for serial port (RS485)
- Supports fiber port for extend transmission distance
- Baud Rate up to 9.6K~12Mbps for Profibus application
- Supports Auto Baud Rate mode, or manual mode for setting Baud Rate
- CE, FCC, heavy industrial grade EN61000-6-2, EN61000-6-4 certified



IFC-Serial-PRO is a serial over fiber converter that is capable of selecting interface modes for connection to RS-485 2-wire half duplex and supports high-speed data rates of PROFIBUS. Fiber optical cabling extends distances and isolates from EMC/noise to reduce interference between PROFIBUS devices. The terminal block offers an alarm relay contact and two redundant DC power inputs. IFC -Serial-PRO is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range, making it is reliable and an ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. IFC-Serial-PRO is protocol transparent, and can be applied to PROFIBUS and other networks using RS485 interfaces (See Figure 1).

#### **Features**

- Supports 1x Fiber and 1x RS485
- Extend serial transmission distance up to 500m, 2km, 20km
- Supports fiber port point to point (Figure 3)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent. These products can be applied to the PROFIBUS, but also can be applied to other network using RS485 interface
- CE, FCC, heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

#### **Specifications**

FieldBus Protocol	Protocol transparent	PROFIBUS and all operations available on RS485	Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 60VDC)
Problem isolation	Isolate EMC/noise between PROFIB	e to reduce mutual interference JS device (Figure 1)		Power Consumption	<6W
	Isolate the PROFII impact of the oth	BUS side of the failure, to avoid the ler side (See Figure 2 )		Power Reversal Protection	Yes
Fiber Port Interface	Connector	SC, ST		Over Current Pro Protected	tection: Signal Short Together
	Fiber Port	1 fiber port	<b>Terminal Block</b>	For Power and A	larm
	Fiber Tupe	M/M 500M, M/M 2KM, S/M 20KM		V1+, V1-, V2+, V2-	, Alarm NC, Alarm COM
		Bidi 20KM M/M 850nm or 1310nm, S/M 1310nm	Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Wavelength	Bidi: Mode A : TX1310nm/RX1550nm		Dimensions	85x 30x 115mm (D x W x H)
		Mode B : TX1550nm/RX1310nm		Mounting	DIN-Rail, or wall mounting (Optional)
Fiber port	Point to point (Fig	3)		Weight	295g
lopology		Juic 3)	Certification		
Serial port	Serial Port	DB9 Female	EMC	CE (EN55024, EN	55032)
Interface	Connector	RS-485 : 2 wires, Half duplex	EMI	FCC Part 15 Subp	oart B Class A, CE (EN55032)
	RS-485 direction	Automatically detection	Immunity for		
	Serial port Baudrate	9.6K to 12Mbps Auto mode : Auto sense Baudrate, no need to set Baudrate	Heavy Industrial Environment	EN61000-6-2	
		Manual Mode : Baudrate Set by DIP SW	<b>Emission for</b>		
	Serial port isolation	2.5KVrms isolation for serial signals EMC/noise isolation, to reduce mutual interference between serial	Heavy Industrial Environment	EN61000-6-4	
		port device	EMS	EN61000-4-2 ESE	) Level 3
Environmental	Operating	-10 ~ 60°C (IFC-Serial-PRO)	(Electromagnetic	EN61000-4-3 RS	Level 3
	Temperature	-40 ~ 75°C (IFC-Serial-PRO-E)	Susceptibility)	EN61000-4-4 EFT	F Level 3
	Storage	-40 ~ 85°C	FIOLECTION Level	EN61000-4-5 Sur	rge Level 3
	Humidity			EN61000-4-6 CS	Level 3
I ED Indications		D ~ 95% KT	Free Fall	IEC 60068-2-32	
	PVVRI, PVVRZ, Aldi	III, Master, TD, RD, FIDer LINK, System	Vibration	IEC 60068-2-6	
Alarm Relay	Alarm exists for p	ower, fiber link of ring protection	Shock	IEC 60068-2-27	
	nciay output Witi	i can y capacity in @ 2400c	Green	RoHS	
			MTBF	1,137,875 Hours (	MIL-HDBK-217)

5 years

Warranty



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Industrial Serial to Fiber Media Converter IFC-Serial-PRO

#### **Application & Topology**

#### Figure 1 : IFC-Serial-PRO Application for PROFIBUS



Benefit:

1. EMC/noise isolation, to reduce mutual interference between serial port device

2. Extend distance by fiber

3. Isolate PROFIBUS failure

4. Achieve a reliable network environment



#### Figure 3 : Fiber Point to Point topology & application



#### Dimensions

► IFC-Serial-PRO

Side View



Front View Rear View

0 0 0

0 0 0

DIN-Rail Kit View

0

Wall-Mount Kit View

л V

0

 $\Diamond$ 

0 0

8-5

#### **Ordering Information**

	Serial (ProfiBus) Fiber			PowerInput	Cert	tification	ification			
Model Name	RS422/485	lsolation 2.5KV	SC/ST	Redundant	EN61000-6-2 EN61000-6-4	Œ	FCC	- Operating Temperature		
FC-Serial-PRO	1	V	1	12/24/48VDC	V	V	V	-10~60°C		
FC-Serial-PRO-E	1	V	1	12/24/48VDC	V	V	V	-40~75°C		
Model Naming R	ule Seria	II <b>-</b> [	PRO	- E -	SC002					
Industrial Serial Fiber Converter			PRO: PROF	FIBUS E: -40~7 Blank: -1	5°C <b>See belo</b> 0~60°C	w for more	edetail			
Industrial Serial Fiber Converter	ConnectivityDista	nce - 002 <sup>.</sup> M/M 2km	PRO: PROF	FIBUS E: -40~7 Blank: -1	5°C See belo 0~60°C	w for more	e detail	Connector Connect Type Distance		
Industrial Serial Fiber Converter Connector Type SC, ST	Connectivity Dista 001: M/M 500meter 020A: 20km Bidi mc 020B: 20km Bidi mc Mode A: TX 1310nn	nce · 002: M/M 2km ode A ode B n/RX1550nm Moo	PRO: PROF 020: S/M 2 de B: TX 1550nm/	FIBUS E: -40~7 Blank: -1	5°C See belo D~60°C IFC – Se Example: IFC – Se	w for more erial –PR erial –PR	e detail Temperature <b>0</b> − □ − 0 − E− S(	Connector Connect Type Distance		
Industrial Serial Fiber Converter ConnectorType SC, ST Package List	Connectivity Dista 001: M/M 500meter 020A: 20km Bidi mc 020B: 20km Bidi mc Mode A: TX 1310nm	nce - 002: M/M 2km Ide A Ide B n/RX1550nm Mou	PRO: PROF	FIBUS E: -40~7 Blank: -1 20km /RX1310nm	5°C See belo D~60°C IFC – Se Example: IFC – Se	w for more erial –PR erial –PR	e detail Temperature <b>0</b> − □ − 0 − E− S(	Connector Connect Type Distance		

#### Wall Mount kit Accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm)



# IFC-Serial —

1x RS232/422/485 to 1-port Fiber (SC/ST) Media Converter



- 2.5KV isolation for serial port (RS485/422/232)
- UL60950-1, CE, FCC, heavy industrial EN61000-6-2, EN61000-6-4 certified
- Auto Baud Rate, no need to set BaudRate
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission



The IFC-Serial media converter is a capable of selecting interface mode for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and features a three-way communication plus a second independent RS-232 communication channel. Additionally, the terminal block offers an alarm relay contact and two redundant DC power inputs. IFC-Serial is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range. With all these specifically designed features, IFC-Serial is a reliable and ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The product is protocol transparent that can be applied to RS485/422/232 networks, such as MODBUS to achieve reliable network (See Figure 2).

#### **Features**

- Supports 1 fiber link
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 50km
- Supports fiber port point to point (Figure 3)
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent, suitable for all serial (RS485/422/232) transmission protocol, such as Modbus...
- Baudrate up to 1024kpbs for serial port
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

#### **Specifications**

Field Bus Protocol	Protocol transparent	Protocol applicable to all operations available on RS485/422/232, such as	Environmental	Operating Temperature	-10 ~ 60°C (IFC-Serial) -40 ~ 75°C (IFC-Serial-E)
Data Flow	Dual Channel	Both of Triple-Way and Two-Way		Storage Temperature	-40~85°C
	Communication	Communication Way (Figure 1)		Humidity	5 ~ 95% RH
Optical	Connector	SC, ST	LED Indications	PWR1, PWR2, Ala	rm, Master, TD, RD, Fiber Link
Interface	Fiber Port	1 fiber port	Alarm Relay	Alarm exists for p	oower, fiber link or ring protection
	Fiber Type	MM 2km, SM 30km, 50km Bidi 20KM	Power	Relay output wit	h carry capacity 1A @ 24VDC Redundant Dual Power 12, 24, 48 VDC
		MM 1310nm, SM 1310nm		Power Input	(9.6 ~ 58VDC)
	Wavelength	Bidi: Mode A : TX1310nm/RX1550nm Mode B : TX1550nm/RX1310nm		Power Consumption	5W
	Point to Point Transmission	Full duplex		Power Reversal Protection	Yes
	Ring	self-healing operation		Over Current Pro	tection : Signal Short Together Protected
Fiber port Topology	Point to point (Fig	gure3)		Terminal Block fo Terminal Block : \ Alarm NO	or Power and Alarm : /1+, V1-, V2+, V2-, Alarm NC, Alarm COM
Electrical	Serial Port	RS-232 (DB9), RS-422/RS-485 (5 pin terminal block)	Mechanical	Water & Dust Proof	IP30 Protection, Fanless
	Connector	RS-485 : 4, 2 wires, RS-422 : 4 wires		Dimensions	106 x 31.6 x 142.1mm (D x W x H)
	RS-485 direction	Automatically detection		Mounting	DIN-Rail, or wall mounting (Optional)
	Serial port	50 to 1024kpbs		Weight	0.63kg
	Baudrate	Auto baudrate, no need to set baudrate	Certification	Safety	UL60950-1
	Serial port	2.5KV isolation for serial signals		EMC	CE
	isolation	EMC/noise isolation, to reduce		EMI	FCC Part 15 Subpart B Class A, CE
		port device		Immunity for Heavy Industrial	EN61000-6-2
	Pull high resistor	Selected by 10 position rotary switch		Environment	
	Pull low resistor	Selected by 10 position rotary switch		Emission for	
	120 ohm terminator	Built-in 120 ohm terminator (Selected by Dip Switch)		Heavy Industrial Environment	EN61000-6-4



#### Industrial Serial to Fiber Media Converter

Certification	tification EMS (Electromagnetic Susceptibility)	EN61000-4-2 ESD Level 3	Certification	Free Fall	IEC 60068-2-32	
		EN61000-4-3 RS Level 3		Vibration	IEC 60068-2-6	
		EN61000-4-4 EFT Level 3		Shock	IEC 60068-2-27	
F	Protection Level	EN61000-4-5 Surge Level 3		Green	RoHS	
		EN61000-4-6 CS Level 3	MTBF	847,029 Hours (MIL-HDBK-217)		
			Warranty	5 vears		

#### **Application & Topology**



#### Benefit:

1. EMC/noise isolation, to reduce mutual interference between serial port device

IFC-Serial

2. Extend distance by fiber

3. Achieve a reliable network environment

#### Figure 3 : Fiber Point to Point topology & application



IFC-Serial

#### Dimensions

IFC-Serial





#### **Ordering Information**

	Dual	Seria F	l port (Modbus Field Bus transpa	or others, irent)	Fiber	PowerInput	verInput Certification			Operating	
Model Name	Channel	RS232	RS422/485	Isolation 2.5KV	SC/ST	Redundant	Safety UL60950-1	Safety EN61000-6-2 CE FCC		Temperature	
IFC-Serial	V	2	1	V	1	12/24/48VDC	V	V	V	V	-10~60°C
IFC-Serial-E	V	2	1	V	1	12/24/48VDC	V	V	V	V	-40~75℃
Model Naming Rule											
Connector Type		nnectivity D	istance	050.54	M.F.Olum				Т	emperature	Connector Connectivity Type Distance
56,51	002 020 020 Mo	::M/M 2km A: 20km Bidi B: 20km Bidi de A: TX 131	i mode A i mode B 0nm/RX1550nr	m Mode B: T	7X 1550nm/RX1	310nm	Exam	IFC – Se ple: IFC – Se	erial - erial -	- 🗌 – - E – SC	002
Package Li	st										
<ul><li>One devia</li><li>Din Rail w</li></ul>	ce of the s vith screw	series /s	• Te	erminal block							

#### **Optional Accessories**

#### Wall Mount kit Accessories

IND-WMK01

Wall Mount kit for Industrial product, 184 x 30mm

# -IFC-FDC

#### 1x RS232/422/485 to 2-ports Fiber (SC/ST) Media Converter



- 2.5KV isolation for serial port (RS485/422/232)
- UL60950-1, CE, FCC, heavy industrial EN61000-6-2, EN61000-6-4 certified
- Supports fiber port several topology, cable redundancy, ring redundancy, daisy chain, point to point
- Auto Baud Rate, no need to set Baud Rate
- Adjustable pull high/low resistor and terminator for RS-422/485 transmission



The IFC-FDC converter is a capable of selecting interface mode for connection to RS-232 (3 wire), RS-485 (2 wire, half duplex) or RS-422/485 (4 wire, full duplex) and features a three-way communication plus a second independent RS-232 communication channel. Additionally, the terminal block offers an alarm relay contact and two redundant DC power inputs. IFC-FDC is also available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range. With all these specifically designed features, IFC-FDC is a reliable and ideal solutions for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The product is protocol transparent that can be applied to RS485/422/232 networks, such as MODBUS to achieve reliable network (See Figure 2).

#### **Features**

- Supports 2 fiber link
- Supports dual channel communication, including Triple-Way communication, and Two-Way communication
- Extend serial transmission distance up to 2km, 30km, 50km
- Redundant dual power inputs (12/24/48VDC)
- Protocol transparent, suitable for all serial (RS485/422/232) transmission protocol, such as Modbus...
- Baudrate up to 1024kpbs for serial port
- Supports relay output for power or link failure warning
- Hardened housing with IP30 protection
- Fanless and DIN-Rail design for harsh industrial environment

#### **Specifications**

FieldBus Protocol	Protocol transparent	Protocol applicable to all operations available on RS485/422/232, such as	Environmental	Operating Temperature	-10 ~ 60°C (IFC-FDC, ) -40 ~ 75°C (IFC-FDC-E)
Data Flow	Dual Channel	Both of Triple-Way and Two-Way		Storage Temperature	-40 ~ 85°C
	Communication	Communication Way (Figure 1)		Humidity	5 ~ 95% RH
Optical	Connector	SC, ST	LED Indications	PWR1, PWR2, Ala	rm, Master, TD, RD, Fiber Link, Fiber 2
Interface	Fiber Port	2 fiber ports		Link, Ring	
	Fiber Type	MM 2km, SM 30km, 50km Bidi 20KM	Alarm Relay	Alarm exists for p Relay output wit	power, fiber link or ring protection h carry capacity 1A @ 24VDC
	Wavelength	MM 1310nm, SM 1310nm Bidi: Mode A : TX1310nm/RX1550nm	Power	Power Input	Redundant Dual Power 12, 24, 48 VDC (9.6 ~ 58VDC)
Point	Point to Point	Mode B : TX1550nm/RX1310nm		Power Consumption	6W
	Transmission	Full duplex		Power Reversal Protection	Yes
	Transmission	Full duplex		Over Current Pro	tection : Signal Short Together Protected
Fiber port Topology	Cable redundanc daisy chain (Figu	cy (Figure 3), ring redundancy (Figure 4), re 5), point to point (Figure 6)		Terminal Block for Terminal Block : N	or Power and Alarm : V1+, V1-, V2+, V2-, Alarm NC, Alarm COM,
Electrical Interface	Serial Port	RS-232 (DB9), RS-422/RS-485 (5 pin terminal block)	Mechanical	Water & Dust	IP30 Protection, Fanless
	connector	RS-485 : 4, 2 wires, RS-422 : 4 wires		Dimonsions	106 y 28 6 y 142 1mm (D y W y H)
	RS-485 direction	Automatically detection		Mounting	DIN Bail or wall mounting (Optional)
	Serial port	50 to 1024kpbs		Woight	
	Baudrate	Auto baudrate, no need to set baudrate	Cortification	Safoty	UL60050_1
	Serial port	2.5KV isolation for serial signals	Certification	EMC	CE
	ISOIGLIOIT	mutual interference between serial		EMI	ECC Part 15 Subpart B Class A CE
		port device		Immunity for	ree rare is subpart b class A, ee
	Pull high resistor	Selected by 10 position rotary switch		Heavy Industrial	EN61000-6-2
	Pull low resistor	Selected by 10 position rotary switch		Environment	
	120 ohm terminator	Built-in 120 ohm terminator (Selected by Dip Switch)		Emission for Heavy Industrial	EN61000-6-4
				Environment	

#### Industrial Serial to Fiber Media Converter



Certification	cation EMS (Electromagnetic Susceptibility)	EN61000-4-2 ESD Level 3	Certification	Free Fall	IEC 60068-2-32
		EN61000-4-3 RS Level 3	00-4-3 RS Level 3		IEC 60068-2-6
		EN61000-4-4 EFT Level 3		Shock	IEC 60068-2-27
	Protection Level	EN61000-4-5 Surge Level 3		Green	RoHS
		EN61000-4-6 CS Level 3	MTBF	739,886 Hours (MIL-HDBK-217)	
		V		5 years	

#### **Application & Topology**

#### Figure 1 : Dual Channel Data Flow (IFC-FDC)

#### Channel 1 : Triple Way

Channel 2 : Two Way



Figure 2 : Application for Modbus Network



#### Figure 3 : Redundant Fiber Point to Point topology & application



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#### Figure 4 : Fiber Ring Redundancy topology & application



Figure 5 : Fiber Daisy Chain topology & application



#### Figure 6 : Fiber Point to Point topology & application



#### Dimensions

► IFC-FDC





#### **Ordering Information**

	Dual	Se	erial (ModBus or o	thers)	Fiber	Power Input	Certification		On overting		
ModelName	Channel	RS232	RS422/485	Isolation 2.5KV	SC/ST	Redundant	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC	Temperature
IFC-FDC	V	2	1	V	2	12/24/48VDC	V	V	V	V	-10~60°C
IFC-FDC-E	V	2	1	V	2	12/24/48VDC	V	V	V	V	-40~75°C
Model Nami	ing Rule	I .									
IF	2	_	FDC	] _	E	_ 5	SC002				
			120	J				J			
Industri	al		FDC: IFC	-FDC	E: -40~7	5°C S	See below	w for more	detai	I	
Serial F	iber				Blank: -1	0~60°C					
Conver	ter										
Connector Type	e Cor	nnectivity D	istance						1	Temperature	Connector Connectivity Type Distance
SC, ST	002 020	:M/M 2km AB: 20km Bi	030: S/M 30 di (20km 1x mo	lkm 050: de A + 1x Mod	S/M 50km e B)			IFC -	FDC -	- 🗌 -	
	Mo	de A: TX 131	0nm/RX1550nn	n Mode B: T	TX 1550nm/RX1	310nm	Exa	imple: IFC –	FDC -	- E – SC	_002
Package Li	st										
One devi	ce of the s	series	• Te	rminal block	<						
• Din Rail v	vith screw	'S									
Optional	Acces	sories									
Wall Moun	t kit Acce	ssories									

IND-WMK01

Wall Mount kit for Industrial product, 184 x 30mm

# IFC-CCF40

#### 4 Channel Binary Transducer, 4 binary input ,4 high power MSR Relay output , fiber transmission



- 4 binary input
- 4 MSR high power relay output, maximum breaking capacity 2000VAC load
- M/M 2km, S/M 30km, or BiDi 20km single fiber for transmit
- CE, FCC heavy industrial environment EN61000-6-2, EN61000-6-4



IFC-CCF40 is a four channel, binary transducer, which registers binary information from contacts via its binary inputs and forwards it, interference-free, to the other side transducer via fiber-optic cable. The remote site transducer will output the indications/signals via its relay contacts and vice versa. The transducer is equipped with four independent and bidirectional binary inputs and four contact outputs. The four contacts can be used as trip contacts. Available in two operating temperature ranges, a standard -10° to 60°C commercial temperature range and an extended -40° to 75°C range, the IFC-CCF40 is reliable and an ideal solution for keeping your industrial automation applications running smoothly and continuously even in harsh environments. The IFC-CCF40 transducer has been designed for usage in substations, water treatment, metallurgical and material engineering application. It is an ideal solution for use in critical environments.

#### **Features**

4 Channel Binary Transducer IFC-CCF4

- 4 isolated binary input (BI-1, BI-2, BI-3, BI-4)
- Selectable binary input threshold level by DIP Switch (18V or 70V)
- Maximum 2.5ma input current for binary input channel
- 4 MSR contact relay output (K1, K2, K3, K4), maximum breaking capacity 2000VA for AC load , 50~280W for DC resistive load, or 30W for DC inductive load
- Supports multi mode fiber 2KM or single mode 30KM fiber for transmit distances
- Supports duplex fiber, or single fiber BiDi to save cabling
- AC or DC wide range power input (60~300VDC or 60~264VAC )
- Removable terminal block connector for Power input, Alarm, Binary input and MSR Relay output
- CE, FCC, heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Supports relay output for power or failure warning
- Hardened housing with IP40 protection
- Fanless and DIN-Rail design for harsh industrial environment

#### **Specifications**

Binary Input	4x channel Binary Input (BI-1, BI-2, BI-3, BI-4) Binary input threshold level select by DIP Switch, 18V or 70V threshold Maximum input current 2.5ma per channel					
Contact Relay output	Channel: 4xMSR contact relay (K1, K2, K3, K4) Contact rated voltage: 250VAC Contact maximum switching voltage: 400VAC Contact rated current: 8A AC breaking capacity: Max 2000VA DC resistive load breaking capacity: max. 50~280W (see below diagram for detail) DC inductive load breaking capacity: max. 30W @L/ R=50ms (see below diagram for detail) <b>Max. DC Load Breaking Capacity</b> <b>Max. DC Load Bre</b>					
Fiber transmission	Connector type: ST/SC, M/M, S/M or Bidi Optional distance: 2KM (M/M) 20KM (S(M) 20KM (Bidi)					

Fiber cable M/M : Dual fiber 50/125um, 62.5/125um S/M: Dual fiber 9/125um, 10/125um Bidi: Single fiber cable 9/125um, 10/125um

Removable terminal block connector	Support for Binary and Alarm	y input, MSR Relay output, Power input
DIP Switch	SW1: BI-1, BI-2 thre SW2: BI-3, BI-4 thr SW3: Debounce SW4: Loopback te	eshold eshold st
Environmental	Operating Temperature	-40 ~ 75°C
	Storage Temperature	-40 ~ 85°C
	Humidity	5 ~ 95% RH
LED Indications	PWR (Green): Pow SYS (Green): Nor LNK (Green): Fibe Test / Alarm: ON: Flas OFF BI-1~BI-4 (Green):	er on mal operation r link Link down, system loss or Power Error h: Local loopback test : Normal operation Active
	K-1~K-4 (Green) : /	Active
Alarm Relay	Alarm exists for p Relay output with	ower, fiber link carry capacity 1A @ 24VDC
Power	Power Input	AC or DC wide range input power 60~300VDC or 60~264VAC input range_
	Power Consumption	3.6W
	Power Reversal Protection	Supported for power input
	Removable termi	hal block connector for power input
Mechanical	Water & Dust Proof	IP40 Protection, Fanless
	Dimensions	106 x 62.5 x 135mm (Dx Wx H)
	Mounting	DIN-Rail, or wall mounting (Optional)
	Weight	815g
	-	-

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#### 4 channel Binary Transducer



Certification		EMS	EN61000-4-2 ESD Level 3
EMC	CE (EN55032, EN55024)	(Electromagnetic	EN61000-4-3 RS Level 3
EMI	FCC Part 15 Subpart B Class A, CE	Susceptibility)	EN61000-4-4 EFT Level 3
Immunity for		Protection Level	EN61000-4-5 Surge Level 3
Heavy	EN61000-6-2		EN61000-4-6 CS Level 3
Industrial		Free Fall	IEC 60068-2-32
Environment		Vibration	IEC 60068-2-6
Emission for		Shock	IEC 60068-2-27
Industrial	EN61000-6-4	Green	EN61000-4-3 RS Level 3 EN61000-4-4 EFT Level 3 EN61000-4-5 Surge Level 3 EN61000-4-6 CS Level 3 IEC 60068-2-32 IEC 60068-2-6 IEC 60068-2-7 RoHS 165,680 Hours (MIL-HDBK-21) 5 years
Environment		MTBF	165,680 Hours (MIL-HDBK-217
		Warranty	5 years
			· · · · · · · · · · · · · · · · · · ·

#### **Application & Topology**

Figure 1 : Application connection diagram



#### Dimensions



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#### • Related Product



- ◀ FRM220-CCF40: 4ch Contact Closure Fiber Converter, In-Band Managed FRM220-CCF20: 2ch Contact Closure Fiber Converter, In-Band Managed

#### **Ordering Information**

					Certification				
Model Name	Input	Output	Fiber transmission	Power Input	EN61000-6-2 EN61000-6-4	CE	FCC		
IFC-CCF40	4x Channel Binary	4x MSR Contact Relay	1x SC/ST/Bidi	60~264VAC or 60~300VDC	V	V	V		
Model Naming Rule IFC CCF40 ST020A Industrial Serial Fiber CCF40: 4x Channel Contact Fiber closure									
Connector Type SC, ST	Connectivity Distance       Temperature       Connectivity Distance         Dual fiber       030: S/M 30km         Single fiber       IFC - CCF40						Connector Connectivity Type Distance		
Package List									
<ul> <li>IFC-CCF40 device</li> <li>Terminal block</li> <li>Din Rail with screws</li> </ul>									
Optional Accessories									

Wall Mount kit Accessories Wall Mount kit for Industrial product, 184 x 50mm

IND-WMK02

# IDS-i241 & IDS-i211-

- ▲2 port (1x RS232 + 1x RS422/RS485, isolation) serial to 1x Ethernet
- ▶ 2 port RS422/RS485 (isolation) serial to 1x Ethernet

# IDS-i111 & IDS-121

- ▲ 1 port RS422/RS485 (isolation) serial to 1x Ethernet
- ▶ 1 port RS232 serial to 1x Ethernet

#### Preliminary



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC certified
- High surge/EFT/ESD protection level for serial, Ethernet, power
- Serial port Isolation
- Various Communication Modes: Modbus to RTU, TCP Server, TCP Client, Virtual COM mode, UDP, RFC2217

Industrial Device Servers, IDS series, provide RS232/422/485 serial-to-Ethernet connectivity for industrial automation applications. Device servers can connect any RS232 or RS422/485 devices to an Ethernet network allowing them to be managed virtually anywhere. IDS series device servers support TCP Server, TCP Client, virtual COM driver and UDP port operation modes. The RS232 serial interface supports full signals with RTS/CTS and DTR/DSR hardware flow control, while the RS422/485 interface provides 2KV signal isolation. IDS series is an ideal solution to establish an easy and reliable network access to serial devices, such as management ports, barcode reader, PLC, alarm sensors and PTZ cameras on industrial/factory automation, public safety and surveillance systems.

#### **Features**

- Alarm message by Alarm relay, e-mail, syslog, SNMP trap
- Configuration by Web console, Telnet console, Windows utility
- Redundant power input 12/24/48VDC
- Baudrate 50~921.6k bps
- Wide operating temperature -40 ~ 75°C

#### **Specifications**

Serial interface	DB9M for RS232 port
& Connector	Terminal block for RS422/RS485
Isolation	2KV for RS422/RS485
Serial signal	RS485 (2w) : Data+ , Data-
	RS485 (4w) : TX+, TX-, RX+, RX-, Gnd
	RS422 : TX+, TX-, RX+, RX-, Gnd
	RS232: TX, RX, RTS, CTS, DTR, DSR, DCD, Gnd
Baudrate	50~921.6k bps
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, Space, Mark
Flow Control	RTS / CTS and DTR/DSR (for RS-232)
	XON /XOFF
LAN Interface RJ-45 connector	1x10/100Base-TX
Power	Redudant Power input 12/24/48VDC (9.6~60VDC) , Terminial block
Power consumption	TBD
LED	Power 1, Power 2 (Green) ON : power ready
	Fault (Amber)
	Serial port Transmitt/per (Green)
	Serial port Receiver/per (Amber)
	Ethernet Link/act (Green)
Warning message	Syslog, e-mail, SNMP trap, alarm relay
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC. Terminal block
Operating	-40 ~ 75°C (-E version)
Temperature	-10 ~ 60°C (Non -E version)
Storage Temperature	-40 ~ 85°C
Humidity	0 – 90% non-condensing
Housing	Rugged Metal, IP30 Protection, Fanless
Installation Mounting	DIN rail mount, Wall mount (Optional)
Dimensions	TBD (D x W x H)

Weight	TBD
MTBF	TBD (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A, CE
Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromag	gnetic Susceptibility) Protection Level
EN61000-4-2 (ESD	) Level 3, Criteria B
EN61000-4-3 (RS)	Level 3, Criteria A
EN61000-4-4 (Bur	st) Level 3, Criteria A
EN61000-4-5 (Sur	ge) Level 3, Criteria B
EN61000-4-6 (CS)	Level 3, Criteria A
EN61000-4-8 (PFN	1F, Magnetic Field) Field Strength:300A/m, Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
Communication Modes	TCP Server, TCP Client, Virtual COM mode, UDP, Modbus to RTU, RFC2217
Virtual Com support	OS supported Windows 95/98/ XP / 2000 / 2003 / 2008 / VISTA / WIN7 / WIN8 / WIN10
Protocols	ICMP, IPv4, IPv6, TCP, UDP, ARP, HTTP, DHCP, BOOTP, Telnet, DNS, SNMP v1, SMTP, SNTP, Rtelnet
Configuration	Web console, Telnet console, Windows utility
Management	Web pages, Firmware upgrade
Security	Password change & access
Warning message	Syslog, e-mail, SNMP trap, alarm relay

#### **Ordering Information**

	Serial				Ethernet (RJ45)		Certification		Operating
Model Name	Total serial port	RS232 (DB9M)	422/485 (Terminal block)	Isolation	10/100Base-TX	EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC	Temperature
IDS-i241	2	1	1	V (RS422/RS485)	1	V	V	V	-10~60°C
IDS-i241-E	2	1	1	V (RS422/RS485)	1	V	V	V	-40~75°C
IDS-i211	2		2	V (RS422/RS485)	1	V	V	V	-10~60°C
IDS-i211-E	2		2	V (RS422/RS485)	1	V	V	V	-40~75°C
IDS-i111	1		1	V (RS422/RS485)	1	V	V	V	-10~60°C
IDS-i111-E	1		1	V (RS422/RS485)	1	V	V	V	-40~75°C
IDS-121	1	1			1	V	V	V	-10~60°C
IDS-121-E	1	1			1	V	V	V	-40~75℃

#### Model Naming Rule





# IEXT224-4PH

LAN Extender, 4x 100Mbps RJ45, 4x PoE



- Maximum PoE power budget 30W per port
- Wide operating temperature -40~75°C for use in harsh environments
- Dual power input for power source failure redundant



IEXT224-4PH is intended to extend the reach of Ethernet Data and IEEE 802.3at Power over Ethernet beyond standard limitations of 100 meters. The solution works in pairs for point-to-point connectivity. The unit at the local site can transmit data and remote power feeding power over a single twisted pair wire or Coaxial cable up to 1,200 meters. The unit at the remote side provides four 10/100Base-TX IEEE 802.3at PoE ports for total power budget of 30W and can receive its power 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
- Simultaneous transmission of Ethernet data and Power over 2 wire twisted pair or coax
- Display data rate by LED
- Display real power loading by LED
- Eliminated the need for power supply at remote site
- Quick deployment and easy maintenance.

#### **Specifications**

Hardware S	Standard	IEEE 802.3	10Base-T			
Interfaces		IEEE 802.3u	100Base-TX			
		IEEE 802.3af	PoE			
		IEEE 802.3at	PoE+			
		ITU-T G.993.2	VDSL2			
Network Cor	nnector	Terminal Block BNC Female for 4 x RJ-45 10/10	for 2 wire telephone UTP cable r Coaxial Cable 0Base-TX IEEE 802.3at PoE Port			
Dip Switch		SW 1: Selectable Asym (30a) or Sym(17a) (VDSL2 Profile)				
		SW 2 : Selectab	le target SNR margin 6dB or 9dB			
		SW 3 : Selectable Remote Power: OFF: Enable Feeding power by remote unit (Figure 1) ON: Disable Feeding power by remote unit (Figure 2)				
LED		Active: System Status				
		Local PWR : Local Power mode (See Figure 2)				
		Remote PWR: Remote Power (See Figure 1)				
		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 St	upport	VDSL2 ITU-T G.993.2				
		VDSL2 Profiles: 17a and 30a				
Protocol Sup	oport	Transparent to	higher layer protocols			
Operating Temperature	2	-40°C to 75°C				
Storage Tem	perature	-40°C to 85°C				
Humidity		10% - 95% (non-condensing)				
Power Supp	ly	Redundant dual 48VDC (44~57VDC) Input power (Removable Terminal Block)				
Power Consu	umption	65 Watts maximum				
Housing		Rugged Metal, IF	230 Protection and fanless			
Dimensions		106.5 x 62 x 135	mm (D x W x H)			

Weight	IEXT-224-4PH-L : 705g (local) IEXT-224-4PH-R : 715g (remote)
Installation Mounting	DIN Rail mounting and Wall Mounting (Option)
MTBF	IEXT224-4PH : IEXT224-4PH-L - 253,543 Hours IEXT224-4PH-R - 233,606 Hours (MIL-HDBK-217)
Certification	
EMS	CE, FCC
Safety	EN60950-1
Shock	IEC60068-2-27
Freefall	IEC60068-2-32
Vibration	IEC60068-2-6
Transmitting rate and	PoE Power budget

2 wire twisted pair – 24AWG Copper Wire

SNR	6dB		6	D - F		
Profile	Asymmetrical		Symm	POE		
Distance	Upstream Rate (Mbps)	Downstream Rate (Mbps)	Upstream Rate (Mbps)	Downstream Rate (Mbps)	Budget	
300 m	65	100	100	100	30W	
400 m	45	95	70	70	20W	
600 m	30	65	45	45	15W	
800 m	10	45	27	27	7W	
1,000 m	6	35	18	18	5W	
1,200 m	1	20	8	16	4W	

#### Coax Cable - RG59

SNR	SNR 6dB			6dB			
Profile	Asymr	netrical	Symm	Output			
Distance	Upstream Rate (Mbps)	Downstream Rate (Mbps)	Upstream Rate (Mbps)	Downstream Rate (Mbps)	Budget		
400 m	100	100	100	100	30W		
600 m	50	100	50	80	20W		
800 m	50	100	50	80	15W		
1,000 m	45	90	50	60	10W		
1,200 m	40	70	50	50	8W		

#### **Application**



IEXT224-4PH

NDR-120-48

Package List



One device of the series (1 IEXT-224-4PH-L for local unit, and 1 IEXT-224-4PH-R for remote unit)

**Optional Accessories** Industrial Power Supply

4

• Din Rail with screws Terminal block

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

Wall mount kit

V

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

V



### INJ-IG02-PH

Industrial Gigabit Passive PoE Injector (60W)



INJ-IG02-PH is an industrial grade, Gigabit, Passive, PoE injector, that can provide up to 60Watts power out through the 4 pairs of category 5e/6 cables. The injector operates with 24/48VDC power input, supports alternative A mode and alternative B mode with 30Watts output for passive PoE devices. Passive POE devices are usually proprietary and this injector provides an "always On" power over Ethernet. This injector is NOT compatible with IEEE802.3af/at standard PoE devices.

INJ-IG02-PH is housed in a rugged DIN rail or wall mountable IP30 metal enclosure and is designed for harsh environments, such as industrial automation, city surveillance & security, intelligent transportation systems (ITS) and also utility market applications.

Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of critical environment.

#### **Features**

- 1 port Passive PoE Injector
- 24 or 48VDC Power input
- Maximum PoE budget 30W (2-pair), 60W (4-pair)
- Wide operating temperature -40 ~ 75°C (INJ-IG02-PHE)
- IP30 rugged metal housing and fanless

#### **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
	IEEE 802.3ab 1000Base-T Gigabit Ethernet
PoE RJ-45	Positive (V+): RJ-45 pin 1, 2.
Pin Assignment	Negative (V-): RJ-45 pin 3, 6.
	Positive (V+): RJ-45 pin 4,5
	Negative (V-): RJ-45 pin 7,8
	Data (1, 2, 3, 6, 4, 5, 7, 8 )
Network	1 RJ-45 for 10/100/1000Base-T Data, and 1 RJ-45 for
Connector	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)
Reserve Polarity Protection	Present
Overload Current Protection	Present
Power Supply	24 or 48VDC Input power (Removable Terminal Block )
PoE output voltage	48VDC (for 48VDC input power ) 24VDC (for 24VDC input power )
PoE Power Budget	Maximum 60W for 4-pair POE (48VDC input power) Maximum 30W for 2-pair POE (48VDC input power) Maximum 30W for 4-pair POE (24VDC input power) Maximum 15.4W for 2-pair POE (24VDC input power)
Power Consumption	<2W (not include PoE output)
Removable Terminal Block	Provide 2 Pin for power input connectorn
Operating	-10 ~ 60°C (INJ-IG02-PH)
Temperature	-40 ~ 75°C (INJ-IG02-PHE)

Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection
Dimensions	70 x 30 x 103 mm (D x W x H)
Weight	210g
Installation Mounting	DIN Rail mounting and, Wall Mounting (Optional)
EMC	CE
EMI (Electromag	gnetic 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 (Electroma	gnetic Susceptibility) Protection Level
	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength:
	300A/m, Criteria A
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
MTBF	463,016 Hours (MIL-HDBK-217)
Warranty	5 years

Gigabit Passive PoE Injector INJ-IG02-PH

#### **Application**

#### Gigabit Ethernet, 24/48VDC, 30/60W Passive PoE



#### **Ordering Information**

	Ethernet	P	oE Port	Power input	Certification			Operating
Model Name	10/100/1000 Base-T	IEEE 802.3at	Power Budget	Single power	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC	Temperature
INJ-IG02-PH	1	1	15/30/60W	24/48VDC	V	V	V	-10~60°C
INJ-IG02-PHE	1	1	15/30/60W	24/48VDC	V	V	V	-40~75℃
Model Naming Ru	IC: Industrial Gigabit Etherr	02 net 0	PHE 2: Model 2	PHE: 1x	t High Power P t High Power P	oE -40~75°C oE -10~60°C		
Package List								
<ul> <li>INJ-IG02-PH dev</li> <li>Din Bail with sc</li> </ul>	vice	• Termina	lblock					

#### **Optional Accessories**

#### Wall mount kit Accessories

IND-WMK03

Wall Mount kit for Industrial product (Compact, 150 x 30mm)



# -INJ-IG01-PH

#### Industrial Gigabit IEEE802.3af/at Compact Size PoE Injector (15.4/30/36/60W, 48VDC)



- Power output 15.4W, 30W, 36W, 60W select by DIP SW
- Compliant with 10/100/1000Base-T(X) & IEEE802.3af/at PoE
- PoE Mode A/B Select by DIP SW
- Railway EN50121-4, Heavy industrial, EN61000-6-2, EN61000-6-4, CE, FCC certified



INJ-IG01-PH is an industrial grade, single port, gigabit Ethernet PoE (Power over Ethernet) injector. PoE 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 (See Figure 1). 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 IEEE 802.3at/af PoE Injector
- 4 Pairs PD handshake mode select by DIP SW (Such as AXIS® IP cam)
- Wide operating temperature -40 ~ 75°C (INJ-IG01-PHE)
- IP30 rugged metal housing and fanless

#### **Specifications**

IEEE Standard	IEEE 802.3 10Base-T Ethernet	Overload					
	IEEE 802.3u 100Base-TX Fast Ethernet	Current	Supported				
	IEEE 802.3ab 1000Base-T Gigabit Ethernet	Power Supply		(Domovable Tor	minal Plack)		
	IEEE 802.3at, IEEE802.3af		(44~57 VDC) Input power (Removable Terminal Block , Maximum Ultra High Dower 60W/ JEEE 802 2at 20W				
PoE Standard	IEEE 802.3at, IEEE802,3af	102.3at, IEEE802,3at VIEFE 202.2 +/ CM1 H C Alton C POE Power Output IEEE 802.3at High power 36W IEEE					
PoE Standard	RJ-45 support IEEE 802.3at/at Middle-Span Alternative B	Power					
& RJ-45 Pin Assignment	End Span Alternative A mode	Consumption		(2 Pairs)	(4 Pairs)		
	Positive (V+): RJ-45 pin 1, 2.		Input Power Consumption (Input 48VDC)	31.1W	62.8W		
	Data (1, 2, 3, 6, 4, 5, 7, 8)		PoE Output Power	30W	60W		
	Middle-Span, Alternative B mode Positive (V+): RJ-45 pin 4,5	Removable Terminal Block	Provides 2 Pin for power	input connector	n		
	Negative (V-): RJ-45 pin 7,8	Operating	-10 ~ 60°C (INJ-IG01-PH)				
	Data (1, 2, 3, 6, 4, 5, 7, 8)	Temperature	-40 ~ 75°C (INJ-IG01-PHE)				
Network Connector	1 RJ-45 for 10/100/1000Base-1 Data, and 1 RJ-45 for 10/100/1000Base-T Data with PoE Output power	Operating Humidity	5% to 95% (Non-condensing)				
Network Cable	EIA/TIA-568 100-ohm (100m)	Storage Temperature -40 ~ 85°C					
LED	Per unit: Power (Green)	Housing	Rugged Metal, IP30 Prote	ection and fanles	S		
	Alt A/PoE ,Alt B/PoE (Green)	Dimensions	70 x 30 x 103 mm (D x W x H)				
	GbE+PoE B I-45 connected to the	Weight	215g				
	Injector is feeding power in Alt A or B mode. Blinking One of the Injector faults (overload, short	Installation Mounting	DIN Rail mounting, and Wall Mounting (Optional)				
DIP SW	circuit or over-temperature) occurs. SW1 ON: Alternative B mode	MTBF	409,994 Hours (MII-HDBK-217)				
	PoE Power Pin 4, 5, 7, 8 (When DIP SW 3 Off)	Warranty	5 vears				
	PoE Power Pin 1, 2, 3, 6 (When DIP SW 3 Off)	Certification	5 years				
	SW2 ON: Hi Power 36W 36W PoE output	EMC	CE				
	OFF: Standard PoE 802.3af (15.4W), 802.3at (30W)	EMI	CE				
	SW3 ON: 4 Pair PoE Pin Ultra-High Power 60W PoE Output	ENII Pailway Traffic	FCC Part 15 Subpart B Class A, CE				
	OFF: 2 Pair PoE Pin depand on DIP SW 1,2		LINJUIZI-4				
	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	Industrial environment	EN 61000-6-2				
Reverse Polarity Protection	Supported for power input	Emission for Heavy industrial environment	EN 61000-6-4				



#### Industrial Gigabit PoE Injector

EMS (Electromagnetic Susceptibility) Protection Level

	EN61000-4-2 (ESD) Level 3, Criteria B
C	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 (PEME) 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 Giagabit Ethernet PoE Injector



#### **Dimensions**



#### **Ordering Information**

	Ethernet	PoE	Port	Powerinput		Certificatio	n		Operating
Model Name	10/100/1000 Base-T	IEEE 802.3at (PSE)	Power Budget	Single power	Railway EN50121-4	EN61000-6-2 EN61000-6-4	Œ	FCC	Temperature
INJ-IG01-PH	1	1	15/30/36/60	48VDC	V	V	V	V	-10~60℃
INJ-IG01-PHE	1	1	15/30/36/60	48VDC	V	V	V	V	-40~75℃
Model Naming Rule INJ INJ: Injector Package List INJ-IG01-PH devi Din Rail with scree	IG: Industria Gigabit Ethe	01 I errnet • Term	01: Model	PHE	→ PHE: 1x Hi PH: 1x Hi	igh Power PoE -40 igh Power PoE -10	0~75°C 0~60°C		

#### **Optional Accessories**

Wall mount kit Accessories

IND-WMK03 Wall Mount kit for Industrial product (Compact, 150 x 30mm)



# -INJ-IG60-24

#### Industrial Gigabit IEEE802.3af/at PoE Injector (15.4/30/36/60/72W, 12/24/48VDC)



- 12/24/48VDC redundant dual input power with booster for PoE output
- Regulate PoE output voltage
- Power output 15.4W/30W/36W/60W72W select by DIP SW
- Compliant with 10/100/1000Base-T(X) & IEEE802.3af/at PoE
- Railway EN50121-4, Heavy industrial, EN61000-6-2, EN61000-6-4, CE, FC certified



INJ-IG60-24 is an industrial grade, single port, gigabit Ethernet PoE (Power over Ethernet) injector with power boost technology. PoE 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 (See Figure 1). Standard operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

#### **Features**

- Provides 1 port IEEE 802.3at/af PoE Injector
- PoE Mode A/B Select by DIP SW
- 4 Pairs (60W/72W) PD handshake mode select by DIP SW (Such as AXIS® IP cam)
- Wide operating temperature -40 ~ 75°C (INJ-IG60-E24)
- IP30 rugged metal housing and fanless

#### **Specifications**

opeenieur							
IEEE Standard	IEEE 802.3 10Base-T Ethernet	PoE Power	Maximum	Ultra High P	ower 60W,	EEE 802.3at 3	30W, IEEE
	IEEE 802.3u 100Base-TX Fast Ethernet	Power	INJ-IG60-24	in 30W mode	(2 Pair)	.3dl 13.4VV	
	IEEE 802.3ab 1000Base-T Gigabit Ethernet	Consumption	Input	Input Power	Device Power	PoE	Boost
	IEEE 802.3at Power over Ethernet+, PoE+		Voltage	Consumption	Consumption	Power Budge	Efficiency
	IEEE 802.3af Power over Ethernet, PoE		12VDC	33.9W	1.1W	30W	91.46%
PoE Standard	IEEE 802.3at, IEEE 802,3af		24VDC	33W	1.4W	30W	94.90%
PoE Standard & RJ-45 Pin	RJ-45 support IEEE 802.3at/af Middle-Span Alternative B mode or End-Span Alternative A mode, set by DIP SW		48VDC	33.2W	(4 Pair)	30W	95.80%
Assignment	End-Span, Alternative A mode Positive (V-): RJ-45 pin 1, 2, Norative (V): RJ-45 pin 2, 6		Input Voltage	Input Power Consumption	Device Power Consumption	PoE Power Budge	Boost Efficiency
	Data (1, 2, 3, 6, 4, 5, 7, 8 )		12VDC	67.1W	1.1W	60W	90.90%
	Middle Creer Alternetive Dreede		24VDC	65.2W	1.4W	60W	94.10%
	Positive (V+): RJ-45 pin 4.5		48VDC	64.7W	1.9W	60W	95.50%
	Negativê (V-): RJ-45' pin 7,8 Data (1, 2, 3, 6, 4, 5, 7, 8 )	Alarm Relay Contact	Relay outpu	uts with curre	ent carrying	capacity of 1 /	4 @24VDC
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	Removable Terminal Block	Provides 2	redundant p	oower, alarr	n relay conta	ct, 6 Pin
Network Cable	UTP/STP above Cat. 5e cable	Operating	-10 ~ 60°C (INJ-IG60-24)				
	EIA/TIA-568 100-ohm (100m)	Temperature	-40 ~ 75°C	(INJ-IG60-E	24)		
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber)	Operating Humidity	5% to 95%	(Non-conde	ensing)		
	4/2 Pairs (Green) ON: 4 Pairs PoE Power output for 60/72W PoE OFF: 2 Pairs PoE Power output	<u>S</u> torage Temperature	-40 ~ 85°C				
	SW/1 ON: Alt P mode (4 5 7 8)	Housing	Rugged M	etal, IP30 Pro	otection and	d fanless	
DIF SW	OFF: Alt A mode (1,2,3,6)	Dimensions	106 x 31.6 >	k 142 mm (D	XWXH)		
	SW2 ON: Hi Power PoE 36W(in 2 pair), or 72W (in 4 pair) OFE: Standard PoE 154W/30W (in 2 pair) or 60W (in 4 pair)	Weight	0.425kg				
	SW3 QN: 4 Pair PoE Pin Ultra-High Power 60W/72W PoE Output	Installation Mounting	DIN Rail m	ounting, or \	Wall Mount	ng (Optional	)
	OFF: 2 Pair POE Pin depand on DIP SW 1,2	MTBF	1,403,339 Hours (MIL-HDBK-217)				
	by pin 1,2,3,6,4,5,7,8 (Such as AXIS® Q60 series)	Warranty	5 years				
Reverse	OTT. General D	Certification					
Polarity	Supported for power input	EMC	CE (EN55024	1, EN55032)			
Overload		EMI	FCC Part 15 Subpart B Class A, CE				
Current Protection	Supported	Railway Traffic	EN50121-4				
Power Supply	Redundant Dual DC 12/24/48V (10~57VDC) Input power (Removable Terminal Block )	Immunity for Heavy Industrial environment	EN 61000-6	5-2			
	Built-in very high efficiency booster(91~96%) to rise up 52VDC for PoE output	Emission for Heavy industrial environment	EN 61000-6	5-4			
	device, and guarantee delivery PoE power distance to 100meter (Figure 2)	entrionment					



#### Industrial Gigabit PoE Injector

EMS	EN61000-4-2 (ESD) Level 3, Criteria B
(Electromagnetic Susceptibility)	EN61000-4-3 (RS) Level 3, Criteria A
Protection Level	EN61000-4-4 (EFT) Level 3, Criteria A
	EN 61000-4-5 (Surge) Level 3, Criteria B
	EN 61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF) Field strength 300A/m Criteria A

Safety	EN60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

#### **Application**

Figure 1 : INJ-IG60-24 Giagabit Ethernet PoE Injector







Figure 2 : Very high efficiency boost technology for PoE



- Regulated PoE output voltage (52VDC) to stabilize PoE device

PoE PD Device ex. AXIS® Q60 series in 4 pair/60W mode

- Guarantee delivery PoE power distance to 100 meter
- Wide range input power 12/24/48VDC (10~57VDC)
- Built-in very high efficiency (91~96%) to boost PoE output voltage

#### **Dimensions**

Industrial Gigabit PoE Injector INJ-IG60-24





Gigabit Ethernet + PoE

15.4/30/36/60/72W

(Optional accessory)



60: 60W

15.20

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#### Package List

- INJ-IG60-24 device
- Din Rail with screws

CE FCC

V

V

Operating

Temperature

-10~60°C

-40~75°C

Terminal block

#### **Optional Accessories** Wall mount kit Accessories

IND-WMK01

**Gigabit Ethernet** 

Wall Mount kit for Industrial product, 184 x 30mm



Gigabit PoE Injector INJ-G30

# Image: State Stat

This device consists of 1 PoE Injector ports. That can solve the limitation of the power outlet location and offer the system designer a flexible solution to locate the network device everywhere. The compact size and wall mounting was specifically designed for easy installation. It can be installed where space is limited; moreover, it provides smooth network migration and easy upgrade to network capacity.

#### **Specifications**

Ethernet 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
PoE Standard	IEEE 802.3af	Power over Ethernet (PoE)
	IEEE 802.3at	Power over Ethernet (PoE+)
Indications	1x RJ-45 for 1	0/100/1000Base-T data
	1x RJ-45 for 1 output	0/100/1000Base-T data and PoE Power
Network Cable	10Base-T Cat	. 3, 4, 5e UTP/STP;
	100/1000Bas	e-T Cat. 5 UTP/STP
Filtering/ Forwarding Rate	10/100/1000/	Mbps pass through data rate
PoE Power output pin	RJ45 Pin 1,2(\	/+), Pin 3,6(V-)
LED	System Powe	er

External Power	Input 100/110/120/220/240 VAC (Wide Range)				
Adapter	Output 36W ,56VDC				
PoE output voltage	55VDC				
PoE Power Budget	30W (Maximum)				
Operating Temperature	0~45°C				
Storage Temperature	-20 ~ 85°C				
Humidity	10~90% RH (Non-condensing)				
Dimension	80 x 68 x 24mm (D x W x H)				
Weight	138g				
Installation mounting	Wall mount				
Certificates	CE & FCC Class B				

#### **Application**



#### **Ordering Information**

Model Name	Description
INJ-G30	1 Port Gigabit Ethernet, IEEE 802.3af/at high power PoE+ Injector

# INJ-SPL01

#### GbE, IEEE802.3af/at PoE Splitter, output voltage 12/19/24VDC selectable



- Splits power and data from PoE Input
- Supports PoE IEEE802.3af/at A mode (1,2,3,6) or B mode (4,5,7,8)
- Selectable output voltage, 12/19/24VDC select by slide SW
- Compliant with 10/100/1000Base-T(X)
- IP30 rugged metal housing and fanless

INJ-SPL01 is an Industrial Grade, Gigabit Ethernet, PoE Splitter, designed to deliver data, via RJ-45 Ethernet connector, and electrical power, via screw terminal block, to non-PoE devices. This device saves the high cost of running separate electrical service to edge devices. The INJ-SPL01 acts as PD equipment and can be powered by standard PoE IEEE802.3af/at PSE (Power Source Equipment) switches or work when paired with either INJ-IG01-PH or INJ-IG60-24 PoE Injectors. The data transmission, up to Gigabit speeds, with selectable power output voltages of 12V, 19V or 24V DC, run simultaneously up to the Ethernet limit of 100 meters. Simple settings of the INJ-SPL01, make it a plug and play device, requiring no tools or software configuration, and provides ease of use, with flexible installation and high reliability.

#### **Features**

- Splits power and data from PoE Input
- Supports PoE IEEE802.3af/at A mode (1,2,3,6) or B mode (4,5,7,8)
- Selectable output voltage, 12/19/24VDC select by slide SW
- Supports output power upto 12VDC/1.4A, 19VDC/1.05A, or 24VDC/0.85A
- Compliant with 10/100/1000Base-T(X)
- CE, FCC, Railway traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Wide operating temperature -40 ~ 75°C (INJ-SPL01-E)
- IP30 rugged metal housing and fanless

#### **Specifications**

IEEE Standard	IEEE 802.3 10Ba	se-T Ethernet	Storage	10 05%	
	IEEE 802.3u 100	Base-TX Fast Ethernet	Temperature	-40 ~ 85 C	
	IEEE 802.3ab 10	000Base-T Gigabit Ethernet	Housing	Rugged Metal, IP30 Protection and fanless	
	IEEE802.3af Po	E (Power over Ethernet)	Dimensions	22 x 84.2 x 80.7 mm (D x W x H)	
	IEEE802.3at Po	E <sup>+</sup> (Power over Ethernet enhancements)	Weight	85g	
PoE In	PoE Standard	PoE Standard IEEE 802.3af, IEEE802.3at	Installation	Mall Marynting	
		Support both PoE A mode or B mode (don't need select)	Mounting	waii Mounting	
		A mode:	MTBF	3,371,427 Hours (MIL-HDBK-217)	
	RJ45 Pin	Negative (V-): RJ-45 pin 3, 6.	Warranty	5 years	
	Assignments	B mode: Positive (V+): RJ-45 pin 4,5. Negative (V-): RJ-45 pin 7,8 Support 10/100/1000Base-T(X)	Certification		
			EMC	CE (EN55024, EN55032)	
			EMI	FCC Part 15 Subpart B Class A, CE	
		Data (1, 2, 3, 6, 4, 5, 7, 8)	<b>Railway Traffic</b>	EN50121-4	
Output voltage & power	12, 19, 24VDC s 12VDC: 1.4A, 19 with Removab	elect by slide switch VDC: 1.05A, 24VDC: 0.85A le terminal block	Immunity for Heavy Industrial	EN 61000-6-2	
Data out	RJ45 10/100/10	00Base-T(X)	environment		
Network Cable	UTP/STP above	Cat. 5e cable	Emission for	I EN 61000-6-4	
	EIA/TIA-568 10	0-ohm (100m)	Heavy industrial		
LED	PoE in (Green)		EMS	ENG1000-1-2 (ESD) Level 3 Criteria B	
Power Supply	Powered from	Powered from PoE in, IEEE802.3af/at		ENG1000-4-2 (ESD) ECVELS, Criteria A	
Output Dowor	44~5/VDC, 301	W Max	Susceptibility)	ENG1000-4-4 (EET) Lovel 3 Criteria A	
Output Power	19VDC, 1.4A (II 19VDC, 1.05A (	max)	Protection Level	EN 61000-4-4 (EFF) Level 2, Criteria A	
	24VDC, 0.85A (	max)		EN 61000-4-5 (Surge) Level 3, Criteria A	
Operating	-10 ~ 60°C (INJ-	SPL01)		EN 01000-4-0 (CS) Level S, Citteria A	
Temperature	-40 ~ 75°C (INJ	-SPL01-E)	ci i	EINDIUUU-4-8 (PERVE) FIEID SLIFENGTN 300A/M CRITERIA A	
Operating	5% to 95% (No	a-condensing)	Shock		
Humidity	570 (0 5570 (110)	r condensing)	Freefall		
			Vibration	IEC 60068-2-6	

9-10



#### **Application**

Figure 1: INJ-SPL01 application topology



	Po	Eln	Power & Data out		Certification			
ModelName	10/100/1000 Base-T(X)	IEEE802.3af/at	10/100/1000 Base-T(X)	Output Voltage selectable 12/19/24VDC	EN61000-6-2 EN61000-6-4	EN50121-4	CE/FCC	Operating Temperature
INJ-SPL01	1	1	1	V	V	V	V	-10~60°C
INJ-SPL01-E	1	1	1	V	V	V	V	-40~75℃
Model Naming Rule	SPL : PoE S	01 plitter	E	• E: -40~7: blank: -1	5°C 0~60°C			

#### Package List

INJ-SPL01 device
 Terminal block

# INJ-IG03-PH

Industrial Gigabit IEEE802.3af/at PoE to Passive PoE Converter

# NEW

- Converts 48V IEEE802.3af/at PoE Input to 12/19/24V Passive PoE Output
- Compliant with 10/100/1000Base-T(X)
- Supports PoE input IEEE802.3af/at A mode and B mode
- Selectable passive PoE output voltage
- Selectable passive PoE output mode, A mode or B mode

INJ-IG03-PH is an Industrial Grade, Gigabit Ethernet, passive PoE injector, designed to take IEEE802.3af/at standard PoE as input and deliver Passive PoE with switchable DC output voltages of 12V, 19V and 24V. This device is very useful when installing any non-standard PoE power devices, such as entry level PoE Camera or Wireless AP, that need the direct power over Ethernet without any protocol negotiation. When connected with IEEE802.af/at PSE switches, the INJ-IG03-PH appears as standard PD equipment powered by the PoE switch, without any additional electrical power input required. The non-standard power output is switchable to either Alternative A mode (power on pins 1,2,3,6) or Alternative B mode (power on pins 4,5,7,8). Simple settings make it a plug and play device, requiring no tools or software configuration, and make it easy to use, with flexible installation and high reliability.

#### **Features**

- Converts 48V IEEE802.3af/at PoE Input to 12/19/24V Passive PoE Output (Figure 1)
- Supports input PoE IEEE802.3af/at A mode (1,2,3,6) or B mode (4,5,7,8)
- Selectable passive PoE output voltage, 12/19/24VDC select by slide SW
- Selectable passive PoE output mode, A mode (1,2,3,6,) or B mode (4,5,7,8) select by slide SW
- Compliant with 10/100/1000Base-T(X)
- CE, FCC, Railway traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Wide operating temperature -40 ~ 75°C (INJ-IG03-PHE)
- IP30 rugged metal housing and fanless

#### **Specifications**

<b>IEEE Standard</b>	IEEE 802.3 10Ba	ase-T Ethernet	Storage	10 95°C	
	IEEE 802.3u 100	)Base-TX Fast Ethernet	Temperature	-40 ~ 65 C	
	IEEE 802.3ab 10	000Base-T Gigabit Ethernet	Housing	Rugged Metal, IP30 Protection and fanless	
	IEEE802.3af Po	E (Power over Ethernet)	Dimensions	22 x 84.2 x 80.7 mm (D x W x H)	
	IEEE802.3at Pc	E <sup>+</sup> (Power over Ethernet enhancements)	Weight	85g	
PoE In	PoE Standard	PoE Standard IEEE 802.3af, IEEE802.3at Support both PoE A mode or B mode	Installation Mounting	Wall Mounting	
		(don't need select) A mode: Positive (V+): RJ-45 pin 1, 2,	MTBF	2,531,635 Hours (MIL-HDBK-217)	
	RJ45 Pin	Negative (V-): RJ-45 pin 3, 6.	Warranty	5 years	
	Assignments	B mode:	Certification		
		Positive (V+): RJ-45 pin 4,5. Negative (V-): RJ-45 pin 7.8	EMC	CE (EN55024, EN55032)	
		Support 10/100/1000Base-T(X)	EMI	FCC Part 15 Subpart B Class A, CE	
		Data (1, 2, 3, 6, 4, 5, 7, 8 )	<b>Railway Traffic</b>	EN50121-4	
Passive PoE out	PoE Pin assignment	A mode or B mode select by slide switch A mode : Positive (V+): RJ-45 pin 1, 2. Negative (V-): RJ-45 pin 3, 6.	Immunity for Heavy Industrial environment	EN 61000-6-2	
		B mode : Positive (V+): RJ-45 pin 4,5. Negative (V-): RJ-45 pin 7,8	Emission for Heavy industrial environment	EN 61000-6-4	
	Output voltage	12, 19, 24VDC select by slide switch	EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B	
Network Cable	UTP/STP above	e Cat. 5e cable , upto 100meter (see Figure 1)		EN61000-4-3 (RS) Level 3, Criteria A	
	EIA/TIA-568 10	0-ohm (100m)		EN61000-4-4 (EFT) Level 3, Criteria A	
LED	PoE in (Green)			EN 61000-4-5 (Surge) Level 3, Criteria B	
Power Supply	Powered from	PoE in, IEEE802.3af/at		EN 61000-4-6 (CS) Level 3, Criteria A	
	44~57VDC, 30	W Max		EN61000-4-8 (PFMF) Field strength 300A/m Criteria A	
Passive PoE	12VDC, 0.8A (r	nax)	Shock	IEC 60068-2-27	
out	24VDC, 0.8A (r	nax)	Freefall	IEC 60068-2-32	
Operating	-10 ~ 60°C (INJ	-IG03-PH)	Vibration	IEC 60068-2-6	
Temperature	-40 ~ 75°C (INJ	-IG03-PHE)			
Operating Humidity	5% to 95% (No	n-condensing)			



#### Application

Figure : INJ-IG03-PH application topology



#### **Dimensions**



#### **Ordering Information**

	Po	Eln	Passive PoE out			Certification			
Model Name	10/100/1000 Base-T	IEEE802.3af/at	10/100/1000 Base-T(X)	Output Voltage selectable 12/19/24VDC	PoE pin selectable A mode /B mode	EN61000-6-2 EN61000-6-4	EN50121-4	CE/FCC	Operating Temperature
INJ-IG03-PH	1	1	1	V	V	V	V	V	-10~60°C
INJ-IG03-PHE	1	1	1	V	V	V	V	V	-40~75°C



#### Package List

INJ-IG03-PH device

# IPS-G803SM

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



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



IPS-G803SM is a managed industrial grade Gigabit Ethernet switch that is 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 provides 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). The managed Ethernet functions include STP/RSTP/MSTP/ITU-T G.8032 ERPS and multiple µ-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS, ACL, 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 networks (See Figure). The series product can be managed centrally and conveniently by CTC Union's SmartView<sup>™</sup> Element Management System or other third party SNMP managers.

#### **Features**

- Redundant isolated low voltage 24/48VDC, or/and isolated High voltage AC/DC (110/220 VAC/VDC) power inputs
- Wide Operating Temperature -40~85°C
- DIN Rail mounting or wall mounting
- IP30 rugged metal housing, Fanless
- Cable diagnostic, Measuring cable normal or broken point distance
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses.
- (Please see CTC Union  $\mu$ -Ring white paper for more details and more topology application)
- μ-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supported by SmartView for Centralized Management\*
  - \*Please see Chapter 1- Software Management for more details

#### **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet
	IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3ab 1000Base-T Gbit/s Ethernet over twisted pair
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.1d STP (Spanning Tree Protocol)
	IEEE 802.1w RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s MSTP (Multiple Spanning Tree Protocol)
	IEEE 802.1Q for VLAN Tagging
	IEEE 802.1X Port based and MAC based Network Access Control, Authentication
	IEEE 802.3ac Max frame size extended to 1522Bytes
	IEEE 802.3ad Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
Standard	IEEE 802.3x 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 Full wire-speed
Data Processing	Store and Forward
Flow Control:	IFEE 802.3x flow control, back pressure flow control

Jumbo Frame	9.6KB
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)
MAC Address Table	8K
Memory Buffer	512K Bytes for packet buffer
Network Connector	8x 10/100/1000Base-T RJ-45 auto negotiation speed Auto MDI/MDI-X function, Full/Half duplex 3x 100/1000Base-X dual speed mode SFP slot, 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	Supported for Power Input
Overload Current Protection	Supported
CPU Watch Dog	Supported



Power Input	Redundant. 2x Isolated Low Voltage DC Input power (-LL model) Redundant. 2x isolated Low Voltage DC and 1 High Voltage AC/DC input power (-HL model)					
	Isolated Low Voltage DC : Isolated 24/48V (18~72VD Removable Terminal Block High voltage AC/DC : isolated 110/220VAC (85VAC~264VAC) or 110/220VDC (88~300VDC), Removable Terminal Block					
Power	Input Voltage		IPS-G803SM			
consumption	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 Protect	tion, Fanless			
Dimension	106 x 82 x 152m	nm (D x W x	H)			
Weight	0.885kg (IPS-G8	803SM-LL)	1.085kg (IPS-G803SM-HL)			
-		- 7	J ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (			

#### Software Specifications

Topology						
VLAN	IEEE 802.1g VLAN,up to 4094 ID					
	IEEE 802.1g 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	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP					
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings Recovery time <10ms Maximum 250 devices in a Ring (Please see CTC Union µ-Ring white paper for more details					
Loop Drotoction	and more topology application)					
	Supported					
Y.1344 ERPS	Convergence time <50ms					
(Ethernet Ring Protection)	Single Ring, Sub-Ring, Multiple ring topology network					
QoS Feature						
Class of Service	IEEE 802.1p 8 active priorities queues for per port					
GOOSE Message	Complies with IEC61850 standard to achieve zero packet loss					
Traffic	IEEE 802.1p based CoS					
Classification QoS	IP Precedence based CoS					
	IP DSCP based CoS					
Traffic Classification QoS	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI					
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number					
Bandwidth Control	Rate in steps : 1 kbps / Mbps / fps / kfps					
for Ingress	Range : 100 kbps to 1Gbps / 1fps to 3300kfps					
	Rate Unit : bit or frame					
Bandwidth Control	Rate in steps : 1 kbps / Mbps					
for Egress	Range : 100 kbps to 1Gbps					
	Rate Unit : bit					
	Der euser / Der eert aberer					

Installation mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	535,335 Hours (IPS-G803SM-LL) 143,943 Hours (IPS-G803SM-HL) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC/EMS	CE (EN55024, EN55032)
EMI	FCC Part 15 Subpart B Class A
	EN55032 Class A
EMS	EN61000-4-2 (ESD) Level 4, Criteria B
(Electromagnetic	EN61000-4-3 (RS) Level 4, Criteria A
Protection Level	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
Safety	UL60950-1, EN60950-1
Power Substation	IEC 61850-3, IEEE 1613
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
Railway Traffic	EN50121-4
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

DiffServ (RF 2474) R	Remarking					
Storm Control	for Unicast, Broadcast, Multicast					
<b>IP Multicasting Feat</b>	ture					
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2					
Snooping	support 1022 IGMP groups					
	Port Filtering Profile					
IGMP / MLD	Throttling					
Snooping	Fast Leave					
	Maximum Multicast Group : up to 1022 entries Query / Static Router Port					
Security Features						
IEEE 802.1X	Port-Based					
	MAC-Based					
ACL	Number of rules : up to 256 entries					
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP					
<b>RADIUS</b> authentica	tion & accounting					
TACACS+ authentic	ation & accounting, TACACS+ 3.0					
HTTPS, HTTP	Supported					
SSL / SSH v2	Supported					
User Name Password	Local Authentication					
Authentication	Remote Authentication (via RADIUS/ TACACS+)					
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console					
Management Featu	ires					
CLI	Cisco® like CLI					
Web Based Manage	ement					
Telnet	Server					
SNMP	V1, V2c, V3					
Modbus/TCP	Support for management and monitoring					
SW &	TFTP, HTTP					
Upgrade	Redundant firmware in case of upgrade failure					
RMON	RMON I (1, 2, 3, 9 group), RMON II					
MIB	MIB II RFC1213, Private MIB					
UPnP	Supported					
DHCP	Server, Client, Relay, Relay option 82 , Snooping					
IP Source Guard	Supported					
Port Mirroring	Supported					
Event Syslog	Syslog server (REC 3164) (Support 1 server)					

Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay	IPv6 TFTP	Supported
DNS	Client, Proxy	IPv6 QoS	Supported
IEEE 1588 PTP V2	Support 5 operating mode in each port :	IPv6 ACL	Number of rules: up to 256 entries
	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave		for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet
NTP /SNTP	Client		L4: TCP/UDP
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol	Others Features	
	LLDP-MED	Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet)
IPv6 Features			Management to optimize the power consumption
IPv6 Management	Telnet Server/ICMP v6		Determine the cable length and lowering the power
SNMP over IPv6	Supported		for ports with short cables
HTTP over IPv6	Supported	Green Ethernet	Lower the power for a port when there is no link
SSH over IPv6	Supported		LED Power Management: Adjustment LEDs intensity
IPv6 Telnet	Supported	Cable Diagnostic	Measuring UTP cable is normal or broken point
IPv6 NTP / SNTP	Client		aistance

#### Application

Figure : IPS-Series in Power Substation Application



#### Dimensions





#### **Ordering Information**

			RJ45 UTP port	Fiber	Redundant I	nput Power			(	Certification		
Model Name	Managed	Total Port	10/100/1000 Base-T	100/1000 Base-X	Low Voltage 24/48VDC	High Volta 110/220 DC/AC	age V	IEC61850-3 IEEE 1613	Railway EN50121-4	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC
IPS-G803SM-LL	V	11	8	3 SFP	2			V	V	V	V	V
IPS-G803SM-HL	V	11	8	3 SFP	2	1		V	V	V	V	V
Model Namine IPS Industrial Power Substation	g Rule	G gabit vitch	8 8: 8x GbE U	03S TP 03S:	M – 3x GbE SFP	HL M: Mai	naged	<ul> <li>LL: Dual Low Inpu</li> <li>HL: High Low Inpu</li> </ul>	isolated voltage t power voltage & voltage ut power			
<ul><li>IPS-G803SM</li><li>Console cal</li><li>Din Rail wit</li></ul>	A device ble (RJ45 to h Screws	o DB9)	• Te • Pi	erminal block rotective cap	ks os for SFP ports							

#### **Optional Accessories**

#### Wall mount kit

IND-WMK02

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

#### Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the IPS-G803SM for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more detail and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00- (E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

#### SFP Naming Rule





# IPS-803GSM

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



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



IPS-803GSM is a managed industrial grade Ethernet switch that is 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 provides 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). The managed Ethernet functions include STP/RSTP/ITU-T G.8032 ERPS and multiple µ-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS, ACL, 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 networks (See Figure). The series product can be managed centrally and conveniently by CTC Union's SmartView<sup>™</sup> Element Management System or other third party SNMP managers.

#### **Features**

- Redundant isolated low voltage 24/48VDC, or/and isolated High voltage AC/DC (110/220 VAC/VDC ) power inputs
- Wide Operating Temperature -40~85°C
- DIN Rail mounting or wall mounting
- IP30 rugged metal housing, Fanless
- Cable diagnostic, measuring cable normal or broken point distance
- Supports IEEE 1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- $\bullet$  Provides 5 instances that each can support  $\mu\mbox{-Ring}, \mu\mbox{-Chain}$  or Sub-Ring type for flexible uses.
- (Please see CTC Union  $\mu\text{-Ring}$  white paper for more details and more topology application)
- μ-Ring for Redundant Ethernet Ring, recovery time<10ms in 250 units</li>
- Provides SmartConfig for quick and easy mass Configuration Tool\*
- Supported by SmartView for Centralized Management\*
   \*Please see Chapter 1- Software Management for more details

#### **Specifications**

Standard	IEEE 802.3 10Base-T 10Mbit/s Ethernet IEEE 802.3u 100Base-TX, 100Base-FX, Fast Ethernet				
	IEEE 802.3z 1000Base-X Gbit/s Ethernet over Fiber-Optic				
	IEEE 802.1d STP (Spanning Tree Protocol)				
	IEEE 802.1W KSTP (Kapid Spanning Tree Protocol)				
	IEEE 802.10 for VLAN Tagging				
	IEEE 802.1X Port based and MAC based Network Access Control, Authentication				
	IEEE 802.3ac Max frame size extended to 1522Bytes				
	IEEE 802.3ad Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)				
Standard	IEEE 802.3x 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 Full wire-speed				
Data Processing	Store and Forward				
Flow Control:	IEEE 802.3x flow control, back pressure flow control				
Jumbo Frame	9.6KB				
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)				
MAC Address Table	8K				
Memory Buffer	512K Bytes for packet buffer				
Network	8x 10/100Base-TX RJ-45 auto negotiation speed				
Connector	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 10	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 :	I0/100Link/Act: Green						
	SFP Fiber Per p	oort : Link/Active (Green)						
Reverse Polarity Protection	Supported for	Power Input						
Overload Current Protection	Supported							
CPU Watch Dog	Supported							
Power Input	Redundant 2x Isolated Low Voltage DC Input power (-LL model) Redundant 2x isolated Low Voltage DC and 1 High Voltage AC/DC input power (-HL model) Isolated Low Voltage DC : Isolated 24/48V (18~72VDC), Removable Terminal Block High voltage AC/DC : isolated 110/220VAC (85/VAC~264VAC) or 110/220VDC (88~300VDC), Removable Terminal Block							
Power	Input Voltage	IPS-803GSM						
consumption	110VAC	7.3 W						
	220VAC	7 W						
	24VDC 8W							
	48VDC	9.2 W						
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC							

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Removable Terminal Block	Provide 2 redundant low volt power, alarm relay contact (6 Pin) (-LL model) Provide 2 redundant low volt power, alarm relay contact (6 Pin), and High volt Power (2 Pin) (-HL model)
Operating Temperature	-40°C ~ 85°C
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40°C ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimension	106 x 82 x 152mm (D x W x H)
Weight	0.885kg (IPS-803GSM-LL) 1.085kg (IPS-803GSM-HL)
Installation mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	535,335 Hours (IPS-803GSM-LL) 143,943 Hours (IPS-803GSM-HL) (MIL-HDBK-217)
Warranty	5 years
Certification	
EMC/EMS	(EVIS5024 EVIS5032)

#### Software Specifications

Topology			
VIAN			
VLAN	IEEE 802.1q VLAN, up to 4094 ID		
	IEEE 802.1q VEAN, up to 4094 Groups		
	MAC-based VLAN up to 256 entries		
	IP Subnet-based VI AN, 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	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5		
(FOIL HUIK)	Dynamic (IEEE 802 3ad LACP) up to 5 trunk group		
Spanning Tree	IEFE 802 1d STP IEFE 802 1w RSTP IEFE 802 1s MSTP		
Multiple u-Ring	up to 5 instances that each supports u-Ring, u-Chain		
5	or Sub-Ring type for flexible uses, and maximum up		
	to 5 Rings Recovery time <10ms		
	Maximum 250 devices in a Ring		
	(Please see CTC Union $\mu$ -Ring white paper for more details		
Loop Protection	and more topology application)		
ITU-T G.8032 /			
Y.1344 ERPS	Convergence time <50ms		
(Ethernet Ring	Single Ring, Sub-Ring, Multiple ring topology		
Protection)	network		
QoS Feature			
Class of Service	IEEE 802.1p 8 active priorities gueues for per port		
GOOSE Message	Complies with IEC61850 standard to achieve zero		
	packet loss		
Irattic Classification OoS	IEEE 802.1p based CoS		
classification Q05	IP Precedence based CoS		
	IP DSCP based CoS		
Traffic	QCL(QoS Control List): Frame Type, Source/		
Classification Q03	OCE(OoS Control Entry): Protocol Source IP IP		
	Fragment, DSCP, TCP/UDP port number		
Bandwidth Control	Rate in steps : 1 kbps / Mbps / fps / kfps		
for Ingress	Range : 100 kbps to 1Gbps / 1fps to 3300kfps		
	Rate Unit : bit or frame		
Bandwidth Control	Rate in steps : 1 kbps / Mbps		
IOI LGIESS	Range : 100 Kbps to TGbps		
	Per queue / Per port shaper		
DiffServ (RF 2474) R	emarking		
Storm Control	for Unicast, Broadcast, Multicast		
IP Multicasting Feat	ure		
IGMP / MLD	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2		
Snooping	support 1022 IGMP groups		
	Port Filtering Profile		
IGMP / MLD	Throttling		
shooping	Fast Leave Multicast Croup rup to 1022 optrios		
	Ouery / Static Router Port		
Security Features			
IEEE 802.1X	Port-Based		
	MAC-Based		
ACL	Number of rules : up to 256 entries		
	for L2 / L3 / L4		
	L2 : Mac address SA/DA/VLAN		
	L3. IF address SA/DA, Subhet L4: TCP/UDP		

EMI	FCC Part 15 Subpart B Class A
	EN55032 Class A
EMS	EN61000-4-2 (ESD) Level 4, Criteria B
(Electromagnetic Susceptibility) Protection Level	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
Safety	UL60950-1, EN60950-1
Power Substation	IEC 61850-3, IEEE 1613
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for	
Heavy Industrial Environment	EN61000-6-4
Heavy Industrial Environment Railway Traffic	EN61000-6-4 EN50121-4
Heavy Industrial Environment Railway Traffic Freefall	EN61000-6-4 EN50121-4 IEC 60068-2-32
Heavy Industrial Environment Railway Traffic Freefall Vibration	EN61000-6-4 EN50121-4 IEC 60068-2-32 IEC 60068-2-6

<b>RADIUS</b> authenticat	tion & accounting
TACACS+ authentic	ation & accounting, TACACS+ 3.0
HTTPS, HTTP	Supported
SSL / SSH V2	Supported
User Name Password	Local Authentication
Authentication	Remote Authentication (via RADIUS/ TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Featu	res
CLI	Cisco® like CLI
Web Based Manage	ment
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Support for management and monitoring
SW &	TETP HTTP
Configuration	Redundant firmware in case of ungrade failure
Upgrade	
RMON	RMONT (1, 2, 3, 9 group), RMONT
IVIIB	MIB II RFC1213, Private MIB
DHCP	Server Client Relay Relay option 82 Spooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay
	Client, Proxy
IEEE ISOOPIP V2	Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP /SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
IDv6 Egaturos	LLDP-MED
IPv6 Management	T L . C
	Telnet Server/ICMP v6
SINIVIP OVER IPV6	Supported
HTTP OVER IPV6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP / SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables
Green Ethernet	Lower the power for a port when there is no link
	I FD Power Management: Adjustment I FDs intensity
Cable Diagnostic	Measuring UTP cable is normal or broken point distance

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details

10-6



WB: TX/1550nm (Bidi Mode B)




- Fully tested with CTC industrial grade product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications
- Eye safety compliant with Class 1 laser product standard IEC825-1
- CE, FCC class B certification

## CE F©

CTC Union's industrial SFP Transceivers are highly reliable, for serial optical data communications applications specified for single mode fiber operation at 1.25G/155M bps. They operate with +3.3V power supplies and are intended for single mode or multi-mode fiber, operating at a nominal wavelength of 1310nm/1550nm/850nm. Each SFP Transceiver consists of a transmitter optical subassembly (TOSA), a receiver optical subassembly (ROSA) and an electrical subassembly. CTC Union's industrial SFP transceivers ensure your networks operate with maximum reliability, performance, and flexibility.

#### **Features**

- Single 3.3V power supply
- Duplex or Simplex LC receptacle connector
- Hot Pluggable
- Lower power dissipation
- All 10G SFP<sup>+</sup> compliant to IEEE 802.3ae 10GBase-X Ethernet over fiber
- All Gigabit SFP compliant to IEEE 802.3z 1000Base-X and IEEE 802.3ab 100/1000Base-T
- All Fast Ethernet SFP Compliant to IEEE 802.3u 100Base-FX
- Industrial standard small form pluggable (SFP) package
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- RoHS compliant

### 10Gbps 10GBase-X Fiber SFP<sup>+</sup>



ModelName	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-M9000-85-D	MM	300m (OM3)	850	-6.5 ~ -1	-9.9	3.4	-1	1W	$\vee$	-10 ~ 70°C
ISFP-M9000-85-DE	MM	300m (OM3)	850	-6.5 ~ -1	-9.9	3.4	-1	1W	V	-40 ~ 85°C
ISFP-S9010-31-D	SM	10km	1310	-8 ~ 0.5	-14.4	6.4	0.5	1W	$\vee$	-10 ~ 70°C
ISFP-S9010-31-DE	SM	10km	1310	-8 ~ 0.5	-14.4	6.4	0.5	1W	V	-40 ~ 85°C
ISFP-S9040-31-D	SM	40km	1310	0.5 ~ 5	-15.5	16	0.5	1W	$\vee$	-10 ~ 70°C
ISFP-S9040-31-DE	SM	40km	1310	0.5 ~ 5	-15.5	16	0.5	1W	V	-40 ~ 85°C
ISFP-S9040-55-D	SM	40km	1550	-2 ~ 4	-15.8	13.8	0.5	1W	$\vee$	-10 ~ 70°C
ISFP-S9040-55-DE	SM	40km	1550	-2 ~ 4	-15.8	13.8	0.5	1W	V	-40 ∼ 85°C

## 1.25Gbps 1000Base-X Fiber SFP





Model Name	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature	
ISFP-M7000-85-D	MM	550m	850	-9.5 ~ -4	-17	7.5	-3	1W	V	-10 ~ 70°C	
ISFP-M7000-85-DE	MM	550m	850	-9.5 ~ -4	-17	7.5	-3	1W	V	-40 ~ 85°C	
ISFP-M7002-31-D	MM	2km	1310	-9 ~ -1	-19	10	-1	1W	V	-10 ~ 70°C	
ISFP-M7002-31-DE	MM	2km	1310	-9 ~ -1	-19	10	-1	1W	V	-40 ~ 85°C	
ISFP-S7020-31-D	SM	20km	1310	-8 ~ -2	-23	15	-1	1W	V	-10 ~ 70°C	
ISFP-S7020-31-DE	SM	20km	1310	-8 ~ -2	-23	15	-1	1W	V	-40 ~ 85°C	
ISFP-S7040-31-D	SM	40km	1310	-2 ~ 3	-23	21	-3	1W	V	-10 ~ 70°C	
ISFP-S7040-31-DE	SM	40km	1310	-2 ~ 3	-23	21	-3	1W	$\vee$	-40 ~ 85°C	
ISFP-S7020-WA-D	SM	20km	T1310/R1550	-8 ~ -2	-23	15	-2	1W	$\vee$	-10 ~ 70°C	
ISFP-S7020-WB-D	SM	20km	T1550/R1310	-8 ~ -2	-23	15	-2	1W	V	-10 ~ 70°C	
ISFP-S7020-WA-DE	SM	20km	T1310/R1550	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C	
ISFP-S7020-WB-DE	SM	20km	T1550/R1310	-8 ~ -2	-23	15	-2	1W	V	-40 ~ 85°C	

## 1.25Gbps 100/1000Base-T UTP SFP



Model Name	Cable Type	Typical Distance	Power Consumption	Operating Temperature
ISFP-T7T00-00	UTP Cat 5e	100m	1.1W	-10 ~ 70°C
ISFP-T7T00-00-E	UTP Cat 5e	100m	1.1W	-40 ~ 85°C

## 155Mbps 100Base-FX Fiber SFP



ModelName	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	Power Consumption	DDMI	Operating Temperature
ISFP-M5002-31-D	MM	2km	1310	-20 ~ -14	-32	12	-8	1W	V	-10 ~ 70°C
ISFP-M5002-31-DE	MM	2km	1310	-20 ~ -14	-32	12	-8	1W	V	-40 ~ 85°C
ISFP-S5030-31-D	SM	30km	1310	-15 ~ -8	-34	19	-5	1W	V	-10 ~ 70°C
ISFP-S5030-31-DE	SM	30km	1310	-15 ~ -8	-34	19	-5	1W	V	-40 ~ 85°C
ISFP-S5050-31-D	SM	50km	1310	-5 ~ 0	-35	30	-5	1W	$\vee$	-10 ~ 70°C
ISFP-S5050-31-DE	SM	50km	1310	-5 ~ 0	-35	30	-5	1W	$\vee$	-40 ~ 85°⊂
ISFP-S5020-WA-D	SM	20km	T1310/R1550	-14 ~ -8	-32	18	-3	1W	V	-10 ~ 70°C
ISFP-S5020-WB-D	SM	20km	T1550/R1310	-14 ~ -8	-32	18	-3	1W	V	-10 ~ 70°C
ISFP-S5020-WA-DE	SM	20km	T1310/R1550	-14 ~ -8	-32	18	-3	1W	$\vee$	-40 ~ 85°C
ISFP-S5020-WB-DE	SM	20km	T1550/R1310	-14 ~ -8	-32	18	-3	1W	$\vee$	-40 ~ 85°C

#### **4G LTE Router**

Model	NAW NAW	N	WAN/	Local p	Certification						
Model	Cellular Mobile	GNSS	WiFi	UTP Ethernet	DI, DO	Serial	Radio	Railway EN50121-4	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE/ FCC
IWA-AR114			IEEE802.11 b/g/n/ac (LAN)	1x GbE SFP (WAN) + 1x GbE (WAN or LAN) + 3x GbE (LAN)			RED		$\checkmark$		CE
ICR-W403	2G/3G/4G LTE	GPS (Ant. ptional)	IEEE 802.11ac/b/g/n (LAN or WAN )	2x GbE (LAN) + 1x GbE (LAN or WAN)	2x DI, 1x DO	1xRS232		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ICR-W401 (Compact)	2G/3G/4G LTE	GPS	IEEE 802.11 b/g/n (LAN)	1x FE (LAN) + 1x FE (WAN)	1x DI, 1x DO	1x RS232					$\checkmark$
ICR-4103	2G/3G/4G LTE			1x FE (WAN) + 3x FE (LAN)	2x DI, 1x DO	2x RS232 1x RS485	RED, NCC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### SyncE Switch & SyncE with PoE Switch

Madal		Total	UTP (RJ45)	Fiber	Po	ъE	Dodundant		Certifica	ition	
Model	Managed	Ports	10/100/1000 Base-T	100/1000 Base-X	IEEE 802.3af/at	Power Budget	Power Input	Railway EN50121-4	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE/ FCC
IGS-1608SM-SE-8PH	$\checkmark$	24	16	8 SFP	8	240W	48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-804SM-SE-8PH	$\checkmark$	12	8	4 SFP	8	240W	48VDC	$\checkmark$	EN60950-1	$\checkmark$	$\checkmark$
IGS-1608SM-SE	$\checkmark$	24	16	8 SFP			12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-804SM-SE	$\checkmark$	12	8	4 SFP			12/24/48VDC	$\checkmark$	EN60950-1	$\checkmark$	$\checkmark$

### **Industrial Rackmount Ethernet Switch**

#### Layer 3 Rackmount Ethernet Switch

Model Total	Total	Gt	E	10GbE	Redundant Input Power	Certification					
Model	Ports	10/100/1000 Base-T (X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G Base-X SFP+	110/220VAC or 24/48VDC, -48VDC	Safety EN62368-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC		
ICS-RG24044X	32	24	4	4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
ICS-RG16124X	32	16	12	4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
ICS-RG8204X	32	8	20	4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
IGS-R2408SM	32	24	8		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
IGS-R1616SM	32	16	16		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
IGS-R824SM	32	8	24		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		

#### **Rackmount Ethernet Managed Switch**

	Tatal	GbE		10GbE	Redundant Input Power		Certificat	ion	
Model	Ports	10/100/1000 Base-T (X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G Base-X SFP+	110/220VAC or 24/48VDC, -48VDC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC
ICS-G4804X	52	48		4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ICS-G24044X	32	24	4	4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ICS-G24S4X	28	4 (RJ/SFP) Combo	20	4	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ICS-G24S2X	26	4 (RJ/SFP) Combo	20	2	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-4804SM	52	48	4		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-2408SM	32	24	8		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-S2804TM	28	4 (RJ/SFP) Combo	24		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Rackmount Managed PoE Switch**

Tot	Total	Gt	ÞΕ	10GbE	PoE Port	Redundant Input Power	edundant Input Power Certification				
Model	Ports	10/100/1000 Base-T (X) RJ45	100/1000 Base-X SFP	1G/2.5G/10G Base-X SFP+	IEEE802.3af/at (Budget)	48VDC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC	
ICS-G24044X-24PH	32	24	4	4	24 (400W)	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IGS-2408SM-24PH	32	24	8		24 (400VV)	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	

## EN50155 Ethernet Switch

#### Managed EN50155 PoE Switch

		Tatal	U <sup>-</sup>	TP (M12)	Fiber	PoE	Deducedent		C	ertificatior	ı	
Model	Protection	Port	10/100Base- TX	10/100/1000Base-T	100/1000Base-X	IEEE802.3af/at (Budget)	Input Power	EN45545-2	Railway EN50155 EN50121-4	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE/ FCC
ITP-1622GTFM-16PH	IP40	20	16	2	2 Q-ODC	16 (120W)	24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-1604GTM-16PH	IP40	20	16	4		16 (120W)	24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-G802SM-8PH24	IP67	10		8	2 SFP	8 (180W)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-G802TM-8PH24	IP67	10		10		8 (180W)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-2204GTM-16PH	IP54	26	22	4		16 (120W)	24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-1204GTM-12PH	IP54	16	12	4		12 (120W)	24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-802GSM-8PH24	IP67	10	8		2 SFP	8 (180W)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-802GTM-8PH24	IP67	10	8	2		8 (180W)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### Managed EN50155 Ethernet Switch

Ma dal Duata dian	<b>.</b>	U	TP (M12)	Fiber ports	Deductor		C	ertification			
Model	Protection	Port	10/100Base-TX	10/100/1000Base-T	100/1000Base-X	Input Power	EN45545-2	Railway EN50155 EN50121-4	Safety EN60950-1	EN61000-6-2 EN61000-6-4	CE/ FCC
ITP-1622GTFM	IP40	20	16	2	2 Q-ODC	24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-1604GTM	IP40	20	16	4		24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-G802SM	IP67	10		8	2 SFP	12/24/48VDC or 110/220VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-G802TM	IP67	10		10		12/24/48VDC or 110/220VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-2204GTM	IP54	26	22	4		24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-1204GTM	IP54	16	12	4		24/48/72/96/110VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-802GSM	IP67	10	8		2 SFP	12/24/48VDC or 110/220VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-802GTM	IP67	10	8	2		12/24/48VDC or 110/220VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Unmanaged EN50155 PoE Switch**

		Tetal	UTP (M12)	PoE	Deducedent			Certification		
Model	Protection	Port	10/100Base-TX	IEEE802.3af/at (Budget)	Input Power	EN45545-2	EN50155	EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC
ITP-800A-8PH24	IP40	8	8	8 (120W)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-800-8PH24	IP56	8	8	8 (120W)	24/48VDC		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-600-8PH24	IP56	6	6	4 (90W)	24/48VDC		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Unmanaged EN50155 Ethernet Switch**

		Tatal	UTP (M12)	Deducedent			Certification		
Model	Protection	Port	10/100Base-TX	Input Power	EN45545-2	EN50155	EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC
ITP-800A	IP40	8	8	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-800	IP56	8	8	12/24/48VDC		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
ITP-500	IP56	5	5	12/24/48VDC		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

### **Industrial PoE Switch & Media Converter**

#### **Managed PoE Switch**

	Total UTP (RJ45)		J45)	Fibe	er	PoE Port	Deducedent			Certification			
Model	Ports	10/100/1000 Base-T	10/100 Base-TX	100/1000 Base-X	100M/ 1G/2.5G	IEEE802.3af/at (Budget)	Power Input	Safety UL60950-1 EN60950-1	Safety EN62368-1	RailWay EN50121-4	Traffic Control NEMATS2	EN61000-6-2 EN61000-6-4	CE/ FCC
IGS-1608SM-16PH	24	16		8 SFP		16 (400W)	48VDC		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
IGS-1608SM-8PH	24	16		8 SFP		8 (240W)	48VDC	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$
IGS+803SM-8PH	11	8		3 SFP		8 (240W))	48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS+803SM-8PH24	11	8		3 SFP		8 (180W)	24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402SM-4PU	б	4		2 SFP		4 (240W) 60W/port	48VDC	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$
IGS-803SM-8PH24	11	8		1 SFP	2 SFP	8 (180VV)	24/48VDC	UL60950-1		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402SM-4PH24	6	4		1 SFP	1 SFP	4 (120VV)	24/48VDC	UL60950-1		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-1608GSM-16PH	24		16	8 SFP		16 (400VV)	48VDC		$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
IFS-1608GSM-8PH	24		16	8 SFP		8 (240VV))	48VDC	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$
IFS+803GSM-8PH24	11		8	3 SFP		8 (180VV)	24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-402GSM-4PU	б		4	2 SFP		4 (240W) 60W/port	48VDC	$\checkmark$		$\checkmark$		$\checkmark$	$\checkmark$
IFS-803GSM-8PH24	11		8	3 SFP		8 (180VV)	24/48VDC	UL60950-1		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-402GSM-4PH24	6		4	2 SFP		4 (120W)	24/48VDC	UL60950-1		$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Unmanaged PoE Switch**

Model	Total	UTP	(RJ45)	Fibe	2r	PoE port	Podundant		Certifica	ation	
Model	Port	10/100 Base-TX	10/100/1000 Base-T (X)	1000Base-X	100/1000 Base-X	IEEE802.3af/at (Budget)	PowerInput	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE/ FCC
IGS-800C-8PH	8		8			8 (240W)	48VDC	$\checkmark$		$\checkmark$	$\checkmark$
IGS-600-4PH24	6		6			4 (120VV)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402S-4PH24	6		4		2 SFP	4 (120VV)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402F-4PH24	6		4	2 SC		4 (120VV)	24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402S-4PU	6		4		2 SFP	4 (240W) 60W/per port	48VDC	$\checkmark$		$\checkmark$	$\checkmark$
IFS-1602GS-8PH	18	16		2 SFP		8 (240VV)	48VDC	$\checkmark$		$\checkmark$	$\checkmark$
IFS-802GS-8PH	10	8		2 SFP		8 (240VV)	48VDC	$\checkmark$		$\checkmark$	$\checkmark$

#### **PoE Media Converter**

		UTP (	RJ45)	Fil	oer	P	PoE	Dodundant	С	ertification	
Model	Managed	10/100 Base-T	10/100/1000 Base-T	100Base-X	Dual Speed 100/1000Base-X	IEEE802.3af/at (PSE)	Power Budget	PowerInput	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC
IMC-1000MS-PH12	$\checkmark$		1		1 SFP	1	30W	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$
IMC-1000S-PH12			1		1 SFP	1	30W	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$
IMC-100-PH12		1		1 SC/ST		1	30W	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$

### **Industrial Ethernet Switch & Media Converter**

#### Managed Ethernet Switche

Model Total	UTP	(RJ45)	Fib	er	Dodundant		C	ertification			
Model	Ports	10/100 Base-TX	10/100/1000 Base-T(X)	100/1000 Base-X	100M/ 1G/2.5G	Power Input	Safety UL60950-1	Railway EN50121-4	Traffic Control NEMA TS2	EN61000-6-2 EN61000-6-4	CE/FCC
IGS-1604SM	20		16	4 SFP		12/24/48VDC	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
IGS-812SM	20		8	12 SFP		12/24/48VDC	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
IGS+803SM	11		8	3 SFP		12/24/48VDC	UL60950-1& EN60950-1	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS+404SM	8		4	4 SFP		12/24/48VDC		$\checkmark$		$\checkmark$	$\checkmark$
IGS-803SM	11		8	1 SFP	2 SFP	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-404SM	8		4	2 SFP	2 SFP	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS+803GSM	11	8		3 SFP		12/24/48VDC	UL60950-1& EN60950-1	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-1604GSM	20	16		4 SFP		12/24/48VDC	$\checkmark$	$\checkmark$		$\checkmark$	$\checkmark$
IFS-803GSM	11	8		3 SFP		12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-402GSM	8	4		2 SFP		12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Unmanaged Ethernet Switch**

	Total UTP (RJ45)		(RJ45)		Fiber	Dodundant		Cert	ification		
Model	Ports	10/100 Base-TX	10/100/1000 Base-T	100Base-FX	100/1000Base-X	Power Input	Railway EN50121-4	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC
IGS-800C (Compact)	8		8			12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IGS-800	8		8			12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IGS-501S	6		5		1 SFP	12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IGS-500	5		5			12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IGS-402S	6		4		2 SFP	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IGS-402F	6		4		2 1000Base-X SC/ST	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFS-1602GS	18	16			2 1000Base-X SFP	12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-802GS	10	8			2 1000Base-X SFP	12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-800	8	8				12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-402F	6	4		2 SC/ST		12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-401F	5	4		1 SC/ST		12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-500C (Compact)	5	5				12/24/48VDC Single Power	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$
IFS-500	5	5				12/24/48VDC	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$

#### **Media Converter**

Model Managed		UTF	UTP (RJ45)		iber	Podundant	Certification				
Model	Managed	10/100 Base-TX	10/100/1000 Base-T	100Base-FX Dual Speed 100/1000Base-X		Power Input	Safety UL60950-1	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE/ FCC	
IMC-1000MS	$\checkmark$		1		1 SFP	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IMC-1000S			1		1 SFP	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IMC-1000C (Compact)			1		1 SC/ST (1000Base-X)	12/24/48VDC Single Power		$\checkmark$	$\checkmark$	$\checkmark$	
IMC-1000CS (Compact)			1		1 SFP	12/24/48VDC Single Power		$\checkmark$	$\checkmark$	$\checkmark$	
IMC-100		1		1 SC/ST		12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	
IMC-100C (Compact)		1		1 SC/ST		12/24/48VDC Single Power		$\checkmark$	$\checkmark$	$\checkmark$	

#### **Optical Fiber Bypass Switch**

		Fiber connector		Redundant		Certification	
Model	Connector type	Connector port	Data rate	Power Input	Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC
IBP-202	SC/ST/LC (SM / MM optional )	4	100M/1G/2.5G/10G	12/24/48VDC	$\checkmark$	$\checkmark$	$\checkmark$

## **Industrial Serial Connectivity Series**

#### Serial to Fiber Media Converter

Model Di Cha			Serial						Fiber	C	ertification	
	Dual Channel	RS232	RS422/485	FieldBus	Baud rate Max (bps)	Isolatation	Redundant Power Input	SC/ST	Ring /Daisy Chain /Redundant	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE/FCC
IFC-FDC	$\checkmark$	2	1	Modbus or Others	1M	2.5KV	12/24/48VDC	2	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IFC-Serial	$\checkmark$	2	1	Modbus or Others	1M	2.5KV	12/24/48VDC	1		$\checkmark$	$\checkmark$	$\checkmark$
IFC-FDC-PRO			1	Profibus or Others	12M	2.5KV	12/24/48VDC	2	$\checkmark$		$\checkmark$	$\checkmark$
IFC-Serial-PRO			1	Profibus or Others	12M	2.5KV	12/24/48VDC	1			$\checkmark$	$\checkmark$

#### **4 Channel Binary Transducer**

					Certi	ification	ation	
Model	Input	Output	Fiber Transmission	Power Input	EN61000-6-2 EN61000-6-4	CE	FCC	
IFC-CCF40	4x Channel Binary	4x MSR Contact Relay	1x SC/ST/Bidi	60~264VAC or 60~300VDC	$\checkmark$	$\checkmark$	$\checkmark$	

#### **Industrial Device Server**

			Serial		Ethernet (RJ45)	Certification			
Model	Total serial port	RS232 (DB9M)	422/485 (Terminal block)	Isolation	10/100Base-TX	EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC	
IDS-i241	2	1	1	✓ (RS422/RS485)"	1	$\checkmark$	$\checkmark$	$\checkmark$	
IDS-i211	2		2	✓ (RS422/RS485)"	1	$\checkmark$	$\checkmark$	$\checkmark$	
IDS-i111	1		1	✓ (RS422/RS485)"	1	$\checkmark$	$\checkmark$	$\checkmark$	
IDS-121	1	1			1	$\checkmark$	$\checkmark$	$\checkmark$	

### **Industrial LAN Extender, Injector & Splitter**

#### LAN Extender with PoE

84 - de l	Long Distance	e (1.2km max)	UTP (RJ45)	PoE	Certification				
Model	RJ11	Coaxial	10/100Base-TX	IEEE802.3af/at	Safety EN60950-1	CE	FCC		
IEXT224-4PH	1	1	4	4	$\checkmark$	$\checkmark$	$\checkmark$		

#### **PoE Injectors**

	UTP (RJ45)		UTP (RJ45) with	PoE Output		Certification			
Model	10/100/1000 Base-T (X)	10/100/1000 Base-T (X)	PoE Protocol	PoE Power Budget	Power Input	EN60950-1	EN61000-6-2 EN61000-6-4	EN50121-4	CE/ FCC
INJ-IG60-24	$\checkmark$	$\checkmark$	IEEE802.3af/at	15.4W/30W/36W/60W/72W	12/24/48VDC Redundant	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
INJ-IG01-PH	$\checkmark$	$\checkmark$	IEEE802.3af/at	15.4W/30W/36W/60W	48VDC		$\checkmark$	$\checkmark$	$\checkmark$
INJ-IG02-PH	$\checkmark$	$\checkmark$	Passive PoE	15.4W/30W/36W/60W	24/48VDC		$\checkmark$	$\checkmark$	$\checkmark$
INJ-G30	$\checkmark$	$\checkmark$	IEEE802.3af/at	15.4W/30W	Power Adapter				$\checkmark$

#### **Passive PoE Converter**

UTP (RJ45)		45) Passive PoE Output		PoE Output	Certification			
Model	10/100/1000 Base-T(X) RJ45	IEEE802.3af/at	10/100/1000 Base-T(X) RJ45	Passive PoE	EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC	
INJ-IG03-PH	$\checkmark$	$\checkmark$	$\checkmark$	PoE Voltage 12/19/24V selectable	$\checkmark$	$\checkmark$	$\checkmark$	

#### **PoE Splitter**

	UTP (RJ45)		C	utput	Certification			
Model	10/100/1000 Base-T(X) RJ45	IEEE802.3af/at	10/100/1000 Base-T(X) RJ45	Output Power	EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC	
INJ-SPL01	$\checkmark$	$\checkmark$	$\checkmark$	12/19/24V selectable	$\checkmark$	$\checkmark$	$\checkmark$	

#### IEC61850-3 Ethernet Switch

		UTP	(RJ45)	Fiber				Certification		
Model	Total Ports	10/100 Base-TX	10/100/1000 Base-T(X)	100/1000 Base-X	Redundant Power Input	IEC61850-3 IEEE1613	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE/FCC
IPS-G803SM	11		8	3 SFP	24/48VDC or 110/220VDC/AC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
IPS-803GSM	11	8		3 SFP	24/48VDC or 110/220VDC/AC	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

#### **Industrial SFP Transceiver**

#### 10GBase-X Fiber SFP

Model	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	DDMI diagnostic monitoring	Operating Temperature
ISFP-M9000-85-D(E)	M/M (OM3)	300m	850nm	-7.1 ~ -1	-9.9 dBm	8.9	-1	V	-10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	S/M	10km	1310nm	-6~+0.5	-14.4	8.4	0.5	V	-10~70°C (-40~85°C)
ISFP-S9040-31-D(E)	S/M	40km	1310nm	0.5~5	-15.5	16	0.5	V	-10~70°C (-40~85°C)
ISFP-S9040-55-D(E)	S/M	40km	1550nm	-2~4	-15.8	8.4	0.5	V	-10~70°C (-40~85°C)

#### ■ 1.25Gbps 1000Base-X Fiber SFP

Model	Cable Type	Typical Distance	Wavelength (nm)	TX (dBm) (Min~Max)	RX Sensitivity (dBm)	Power Budget (dB)	Saturation (dBm)	DDMI diagnostic monitoring	Operating Temperature
ISFP-M7000-85-D(E)	MM	550m	850	-9.5~-4	-17	7.5	-3	V	-10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	SM	20km	1310	-8~-2	-23	15	-1	V	-10~70°C (-40~85°C)
ISFP-S7020-WA-D(E)	SM	20km	T1310/R1550	-8~2	-23	15	-2	V	-10~70°C (-40~85°C)
ISFP-S7020-WB-D(E)	SM	20km	T1550/R1310	-8~-2	-23	15	-2	V	-10~70°C (-40~85°C)

#### ■ 1.25Gbps 100/1000Base-T UTP RJ45 SFP

Model	Cable Type	Typical Distance	Operating Temperature
ISFP-T7T00-00-(E)	UTP Cat 5e	100m	-10~70°C (-40~85°C)

#### ■ 155Mbps 100Base-FX Fiber SFP

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

\*See more detail and more SFP item from Industrial SFP catalog on Web.

#### **Industrial Power Supply**

Model	Input Voltage Range	Output Voltage	Output Voltage Adj. Range	Output Power	Operating Temperature
NDR-480-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	480W	-20~70°C
NDR-240-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	240W	-20~70°C
NDR-120-48	90 ~ 264VAC / 127 ~ 370VDC	48VDC	48~55VDC	120W	-20~70°C
DR-4524	85 ~ 264VAC / 120 ~ 370VDC	24VDC	21.6~26.4VDC	48W	-10~50°C
MDR-40-24	85 ~ 264VAC / 120 ~ 370VDC	24VDC	21.6~26.4VDC	40W	-20~70°C
MDR-40-48	85 ~ 264VAC / 120 ~ 370VDC	48VDC	48~56VDC	40W	-20~70°C

#### Management Software, SmartView for Industrial Product

Model	Description
SV2-AGT-50	SmartView management software with 50 nodes (by IP address)
SV2-AGT-100	SmartView management software with 100 nodes (by IP address)
SV2-AGT-200	SmartView management software with 200 nodes (by IP address)
SV2-AGT-500	SmartView management software with 500 nodes (by IP address)
SV2-AGT-1000	SmartView management software with 1000 nodes (by IP address)
SV2-AGT-1500	SmartView management software with 1500 nodes (by IP address)
SV2-AGT-2000	SmartView management software with 2000 nodes (by IP address)