NEW

4KV Surge Protection

IGS-804SM-SE-8PH

**8x 10/100/1000Base-T + 4x 100/1000Base-X SFP
with SyncE and 8x PoE**

IGS-1608SM-SE-8PH

**16x 10/100/1000Base-T + 8x 100/1000Base-X SFP
with SyncE and 8x PoE**

UL60950-1 | CE | FC | EN50121-4 | EN61000-6-2 EN61000-6-4 | SmartView | µ-Ring | IEEE 1588v2 | SyncE

These models are managed industrial grade Gigabit switches with 8/16 10/100/1000Base-T ports and 4/8 Gigabit/Fast SFP ports that provide stable and reliable Ethernet 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. SyncE and IEEE 1588 PTP V2 are also increasingly applied in mobile backhaul application where many devices are placed in outdoor cabinets. The switches support a variety of Ethernet functions, including STP/RSTP/MSTP/ITU-T G.8032 ERPS and multiple µ-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking, security automation applications, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications (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

- 8x 10/100/1000Base-T RJ-45 and 4x 100/1000Base-X SFP with SyncE and 8x IEEE 802.3af/at PoE,240W PoE power budget (IGS-804SM-SE-8PH)
- 16x 10/100/1000Base-T RJ-45 and 8x 100/1000Base-X SFPwith SyncE and 8x IEEE 802.3af/at PoE, 240W PoE power budget (IGS-1608SM-SE-8PH)
- Redundant dual DC input power 48VDC (44~57VDC)
- **Isolated RS-232 console port**
- UL60950-1, EN60950-1, CE, FCC, Rail Traffic EN50121-4, certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- **4KV surge protection for UTP and Fiber ports**
- Cable diagnostic, Measuring cable normal or broken point distance
- Rugged Metal, IP30 Protection & Fanless design
- Supports Green Ethernet IEEE 802.3az EEE (Energy Efficient Ethernet) management to optimize the power Cosumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support µ-Ring, µ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC µ-Ring white paper for more details and more topology application)
- µ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- DHCP Server/Client/Relay /Relay option 82 /Snooping
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE 802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE 802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports 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
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNTP, IEEE 802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet/SSH server for management
- 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+ (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	

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Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	**Removable Terminal Block**	Provide 2 redundant power, alarm relay contact, 6 Pin
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	**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
PoE standard & RJ-45 Pin Assignment	8x IEEE 802.3af/at PoE+ 2 pairs PoE, PoE+, 30W/port End-Span, Alternative A mode. Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6.	**Housing**	Rugged Metal, IP30 Protection, Fanless
		Dimensions	106 x 72 x152 mm (D x W x H) (IGS-803SM-SE-8PH) 116 x 91 x 157 mm (Dx Wx H) (IGS-1608SM-SE-8PH)
Console	RS-232 (RJ-45)	**Weight**	0.76kg (IGS-803SM-SE-8PH) 1.375g (IGS-1608SM-SE-8PH)
Network Cable	UTP/STP above Cat. 5e cable	**Installation Mounting**	DIN Rail mounting, or wall mounting (optional)
	EIA/TIA-568 100-ohm (100m)	**MTBF**	564,484 Hours (IGS-803SM-SE-8PH) 403,331 Hours (IGS-1608SM-SE-8PH) (MIL-HDBK-217)
Protocols	CSMA/CD	**Warranty**	5 years
Reverse Polarity Protection	Supported	**Certification**	
Overload Current Protection	Supported	**EMC**	CE (EN55024, EN55032)
CPU Watch Dog	Supported	**EMI (Electromagnetic Interference)**	FCC Part 15 Subpart B Class A, CE
Power Supply	Redundant Dual DC 48VDC (44~57VDC) Input power Removable Terminal Block for input power connector (50~57V input is recommended for IEEE 802.3at PoE+ in 30W applications)	**Railway Traffic**	EN50121-4
		Immunity for Heavy Industrial Environment	EN61000-6-2

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 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow)	**Emission for Heavy Industrial Environment**	EN61000-6-4
	Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)	**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
	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	**Safety**	UL60950-1, EN60950-1 (IGS-1608SM-SE-8PH) EN60950-1 (IGS-804SM-SE-8PH)
Jumbo Frame	9.6KB		
IEEE 802.3ac	Max frame size extended to 1522Bytes (allow Q-tag in packet)	**Surge protection**	4KV for UTP and Fiber ports
MAC Address Table	8K	**Shock**	IEC 60068-2-27
Memory Buffer	512K Bytes for packet buffer	**Freefall**	IEC 60068-2-32
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay	**Vibration**	IEC 60068-2-6
Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC		

Software Specifications

Topology

|	
VLAN	IEEE 802.1q VLAN,up to 4094 802.1Q VLAN VID
	IEEE 802.1q VLAN,up to 4094 Groups
	IEEE 802.1ad Q-in-Q
	MAC-based VLAN,up to 256 entries
	IP Subnet-based VLAN, up to 128 entries
	Protocol-based VLAN(Ethernt, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	GVRP (GARP VLAN Registration Protocal)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 6group (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 μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC Union μ-Ring white paper for more details and more topology applications)
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE 802.1p based CoS
	IP Precedence based CoS
	IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast

IP Multicasting Features

IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling, Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port

Security Features

IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

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RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name Password Authentication	Local Authentication
	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW &	TFTP, HTTP
Configuration 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
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
SyncE	ITU-T G.8262 Sync Ethernet
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Client

LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
	Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable normal or broken point distance
Advanced PoE Management	PoE PD failure auto checking, and auto reset when PD fail PoE port on/off weekly scheduling PoE Configuration PoE Enable/Disable Power limit by classification Power feeding priority Total PoE Power budge limitation: Maximum 240W for IGS-1608SM-SE-8PH, IGS-804SM-SE-8PH

Application

Figure : Application for mobile backhaul
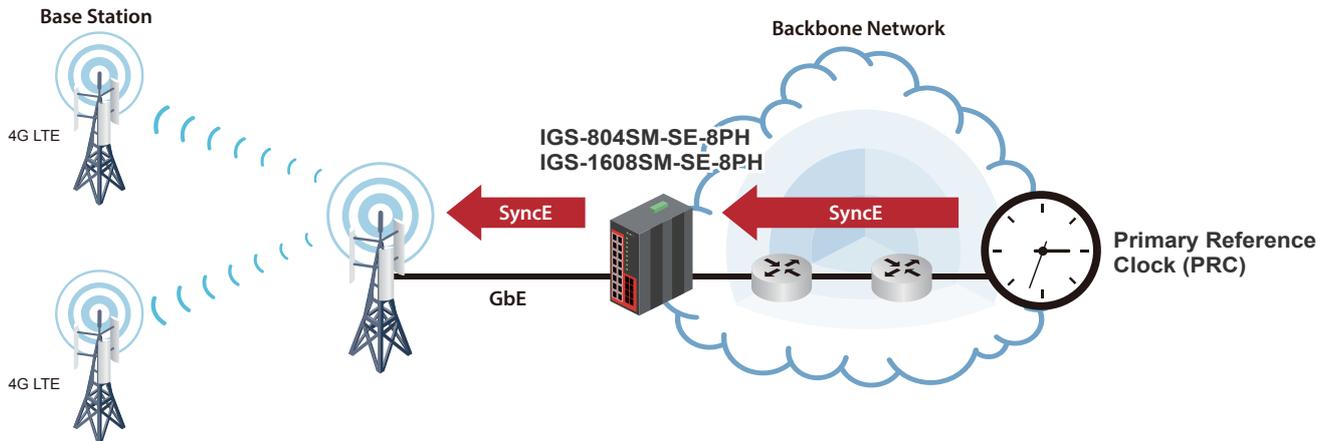
Dimensions

▶ IGS-804SM-SE-8PH

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

(Optional accessory)

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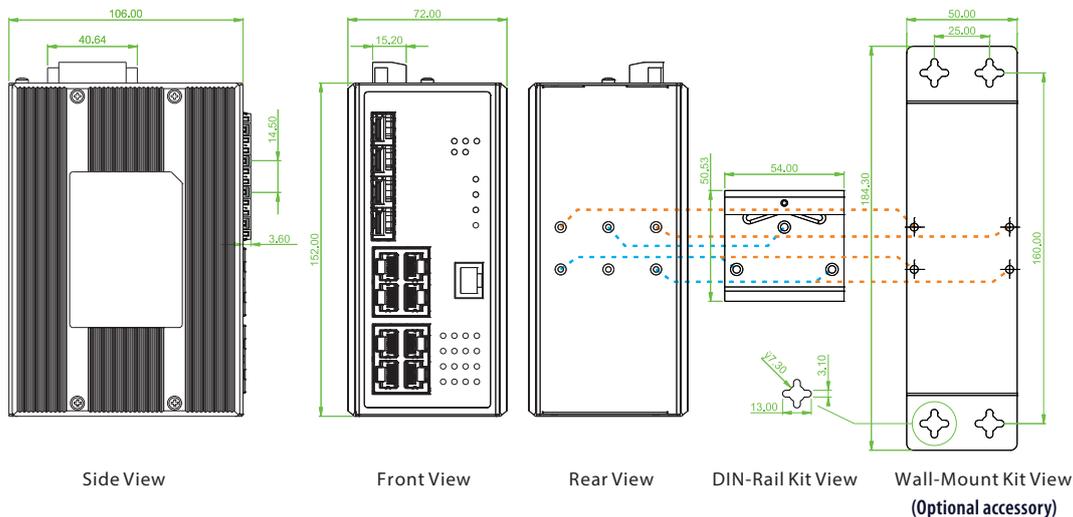
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Industrial GbE Switch

IGS–804SM–SE–8PH IGS–1608SM–SE–8PH

▶ IGS-1608SM-SE-8PH

Side View   Front View   Rear View   DIN-Rail Kit View   Wall-Mount Kit View
(Optional accessory)
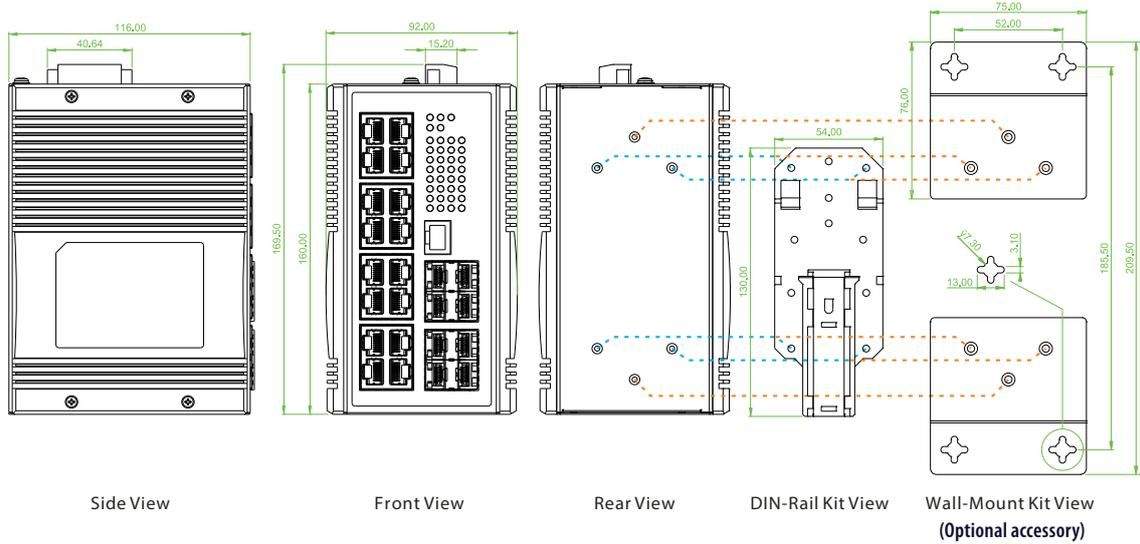
Ordering Information

Model Name	Managed	Total Port	UTP Port 10/100/1000 Base-T	Fiber Port 100/1000 Base-X	PoE IEEE 802.3af/at	PoE Power Budget	Input Power Redundant	Certification Railway EN50121-4	Certification Safety UL60950-1 EN60950-1	Certification EN61000-6-2 EN61000-6-4	Certification CE FCC	Operating Temperature
IGS-804SM-SE-8PH	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-10~60℃
IGS-804SM-SE-8PHE	V	12	8	4 SFP	8	240W	48VDC	V	EN60950-1	V	V	-40~75℃
IGS-1608SM-SE-8PH	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-10~60℃
IGS-1608SM-SE-8PHE	V	24	16	8 SFP	8	240W	48VDC	V	V	V	V	-40~75℃

Model Naming Rule

| IGS | – | 8 | 04S | M | – | SE | – | 8PH | – | E |

E: -40~75℃
Black: -10~60℃

- **I**ndustrial **G**igabit **S**witch
- 8: 8x UTP
- 16: 16x UTP
- 04S: 4x SFP
- 08S: 8x SFP
- M: Managed
- SE: SyncE
- 8PH : 8High Power PoE
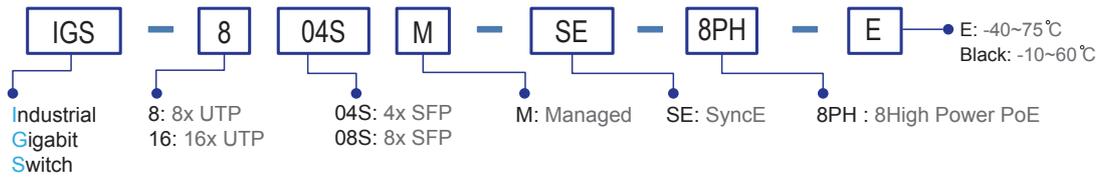
■ Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- CD (SmartConfig, MIB file, Manual)
- Quick installation guide
- Din Rail with screws
- Terminal block
- 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-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℃ (-40~85℃)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70℃ (-40~85℃)
ISFP-T7T00-00-(E)	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70℃ (-40~85℃)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70℃ (-40~85℃)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70℃ (-40~85℃)

SFP Naming Rule

| ISFP | – | S | 7 | 040 | – | 31 | – | D | E |

E:-40~85℃
Blank:0~70℃

- 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/1310nm (Bidi mode A)
  WB: TX/1550nm (Bidi Mode B)
- D: DDMI
  Blank: Non DDMI

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