IFS-1608GSM-8PH

16x 10/100Base-TX + 8x 100/1000Base-X SFP w/ 8x PoE+

IFS+803GSM-8PH24

8x 10/100Base-TX + 3x 100/1000Base-X SFP w/ 8x PoE+

IFS-402GSM-4PU

4x 10/100Base-TX + 2x 100/1000Base-X SFP w/ 4x *PoE++, 60W*

UL60950-1 CE FC EN50121-4 EN61000-6-2 EN61000-6-4 NEMA TS2 PoE Regulated SmartView μ-Ring IEEE 1588v2 Negative Voltage

These models are managed industrial grade PoE (Power over Ethernet) switches that provide 4/8/16x FE UTP plus 2/3/8 GbE SFP with 4/8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, hereby considerably reducing cabling and electrical wiring expenses. With dual power input design, these models can provide redundant mechanisms for critical applications that need always-on connections. These switches can also operate either at standard operating temperature range (-10 to 60°C) or at wide operating temperature range (-40 to 75°C) so as to fulfill the special needs of industrial automation applications. Housed in rugged DIN rail or wall mountable IP-30 enclosures, these switches are perfect choices for harsh environments, such as telecom network, industrial network, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

These managed switches also support a wide variety of Ethernet functions, including STP/RSTP/MSTP/ ITM-T G.8032 ERPS and multiple μ-Ring for redundant cabling, advanced PoE management functions such as weekly PoE power scheduling as well as device auto-checking and auto-reset. They also support layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostics and Green Ethernet. Additionally, these switches can also be managed by CTC Union's SmartView™ Element Management System which offers a user-friendly and centralized device management platform and provides network administrators the ability to monitor and configure these connected switches remotely (see figure).

Features

- 16x 10/100Base-TX RJ-45 + 8x 100/1000Base-X SFP with 8x PoE+, total 240W power budget (IFS-1608GSM-8PH)
- 8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP with 8x PoE+, total 180W power budget (IFS+803GSM-8PH24)
- 4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP with 4x **PoE++**, total 240W power budget (IFS-402GSM-4PU)
- 48VDC (44~57VDC) redundant dual input power (IFS-1608GSM-8PH, IFS-402GSM-4PU)
- 24/48VDC (20~57VDC) redundant dual input power with built-in very high efficiency booster (94~97%) to rise up 55 VDC for PoE output (Figure 2) (IFS+803GSM-8PH24)
- Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2) (IFS+803GSM-8PH24)
- **Supports negative voltage power input with isolated RS-232 console port (for example in telecom system)**
- Provides 8 port IEEE802.3af / 802.3at PoE+ output, 30W per port (IFS-1608GSM-8PH, IFS-803GSM-8PH24)
- Provides 4 port IEEE802.3af / 802.3at/802.3bt **PoE++ output, 60W** per port (IFS-402GSM-4PU)
- Advanced PoE Management, PoE PD Failure Auto Checking and auto reset when PD fail, PoE port on/off weekly scheduling, PoE configuration for power planning
- Rugged metal, IP30 protection & Fan-less design
- UL60950-1, EN60950-1, CE, FCC, Rail Traffic EN50121-4, traffic control NEMA TS2 certified
- Heavy Industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- **4KV surge protection for UTP, PoE and Fiber ports**
- **2.25K VDC Hi-pot isolation protection for Ethernet ports and power**
- Cable diagnostics, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize power consumption
- STP, RSTP, MSTP, ITM-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- 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
- DHCP Server/Client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Flexibility security: Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid upgrade failure
- Supports IEEE1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Supports Modbus/TCP protocols for management
- Provides SmartConfig for quick and easy mass configuration tool (Please see Catalog chapter 1- Software Management for more details)
- Supports SmartView for centralized management tool (Please see Catalog chapter 1- Software Management for more details)

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3af	PoE (Power over Ethernet)
	IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
	IEEE 802.3bt	PoE++(4 pairs Power over Ethernet)
	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): 19.2Gbps (IFS-1608GSM-8PH) 7.6Gbps (IFS+803GSM-8PH24) 4.8Gbps (IFS-402GSM-4PU) Full wire-speed	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
Network Connector	16x 10/100Base-TX RJ-45 + 8x 100/1000Base-X SFP connector (IFS-1608GSM-8PH) 8x 10/100Base-TX RJ-45 + 3x 100/1000Base-X SFP connector (IFS+803GSM-8PH24) 4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP connector (IFS-402GSM-4PU) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000M dual speed with DDMI	
Console	RS-232 (RJ-45) Isolated RS-232 port grounding for negative voltage power system, or telecom network application	
PoE standard & RJ-45 Pin Assignment	IFS-1608GSM-8PH, IFS+803GSM-8PH24: 8x IEEE 802.3at /IEEE 802.3af 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. IFS-402GSM-4PU: 4x IEEE 802.3bt /802.3at/ 802.3af **PoE++** 4 pairs PoE, **PoE++**, 60W/port End-Span, Alternative A and B mode. Positive (V+) : RJ-45 pin 1, 2, 4, 5 Negative (V-) : RJ-45 pin 3, 6, 7, 8	
Network Cable	UTP/STP above Cat. 5e cable	
	EIA/TIA-568 100-ohm (100m)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	**IFS-1608GSM-8PH, IFS-402GSM-4PU:** Redundant Dual DC 48V (44~57VDC) input power, and support negative voltage input power for telecom (Removable terminal block) (50~57V input is recommended for IEEE802.3at PoE+ in 30W applications) (50~57V input is recommended for IEEE802.3bt PoE++ in 60W applications)	

Power Supply	**IFS+803GSM-8PH24:** Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block) Built-in very high efficiency booster(94~97%) to rise up 55 VDC for PoE output Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter (Figure 2)
Power Consumption	IFS-1608GSM-8PH Power consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	254.2W	14.2W	240W

IFS+803GSM-8PH24 Power consumption & Booster efficiency

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%

IFS-402GSM-4PU Power consumption

Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget
50VDC	248.5W	8.5W	240W

PoE Power Budget	Maximum PoE Output power budget 30W / Per Port 240W for total (IFS-1608GSM-8PH) Maximum PoE Output power budget 30W / Per Port 180W for total (IFS+803GSM-8PH24) Maximum PoE Output power budget **60W / Per Port** 240W for total (IFS-402GSM-4PU)
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-1608GSM-8PH, IFS+803GSM-8PH24, IFS-402GSM-4PU) -40 ~ 75°C (IFS-1608GSM-8PHE, IFS+803GSM-8PHE24, IFS-402GSM-4PUE)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection, Fanless
Dimensions	116 x 91 x 157 mm (Dx Wx H) (IFS-1608GSM-8PH) 106 x 72 x 152 mm (D x W x H) (IFS+803GSM-8PH24) 106 x 62.5 x 135 mm (D x W x H) (IFS-402GSM-4PU)
Weight	1.375kg (IFS-1608GSM-8PH), 0.86kg (IFS+803GSM-8PH24) 0.7kg (IFS-402GSM-4PU)
Installation Mounting	DIN Rail mounting, or wall mounting (Optional)
MTBF	439,881 Hours (IFS-1608GSM-8PH) 528,753 Hours (IFS+803GSM-8PH24) 589,078 hours (IFS-402GSM-4PU) (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 (IFS+803GSM-8PH24)
Immunity for Heavy Industrial Environment	EN61000-6-2

Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B
	EN61000-4-3 (RS) Level 3, Criteria A
	EN61000-4-4 (Burst) Level 3, Criteria A
	EN61000-4-5 (Surge) Level 3, Criteria B
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-6 (CS) Level 3, Criteria A
	EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A

Safety	UL60950-1, EN60950-1
Hi pot protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV surge protection	Supported 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	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 Union μ-Ring white paper for more details and more topology application)
Loop Protection	Supported
ITM-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
QoS Features	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS, IP Precedence based CoS IP DSCP based CoS
	QCL(QoS Control List): Frame Type, Source/ Destination MAC, VLAN ID, PCP, DEI
	QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps
	Range : 100 kbps to 1Gbps / 1fps to 3300kfps
	Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps
	Range : 100 kbps to 1Gbps
	Rate Unit : bit
	Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Features	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2
	Port Filtering Profile
	Throttling
	Fast Leave
	Maximum Multicast Group : up to 1022 entries
	Query / Static Router Port
Security Features	
IEEE 802.1X	Port-Based
	MAC-Based
ACL	Number of rules : up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	Supported
SSL / SSH v2	Supported

User Name Password Authentication	Local Authentication
	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Support for management and monitoring
SW & Configuration Upgrade	TFTP, HTTP
	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server, Client, Relay, Snooping, Snooping option 82, Relay option 82
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE1588 PTP V2	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
NTP, SNTP	Client
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol
	LLDP-MED
IPv6 Features	
IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	Supported
HTTP over IPv6	Supported
SSH over IPv6	Supported
IPv6 Telnet	Supported
IPv6 NTP, SNTP	Client
IPv6 TFTP	Supported
IPv6 QoS	Supported
IPv6 ACL	Number of rules: up to 256 entries
	for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
Others Features	
Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
	Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring UTP cable 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 IFS-1608GSM-8PH, IFS-402GSM-4PU, 180W for IFS+803GSM-8PH24

Application

Figure : Application Example

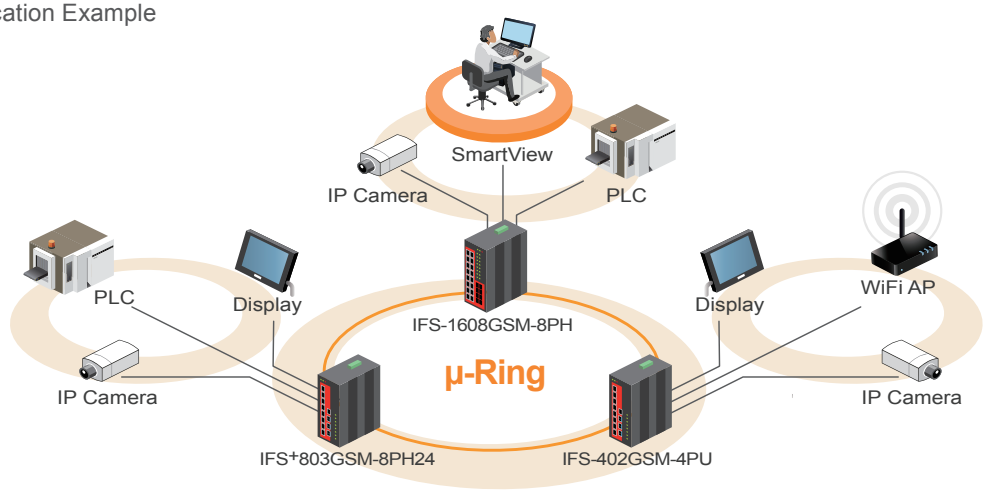
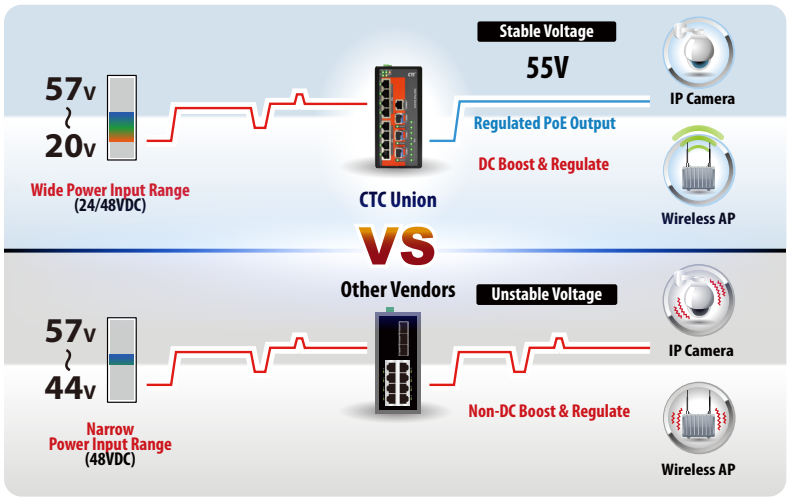


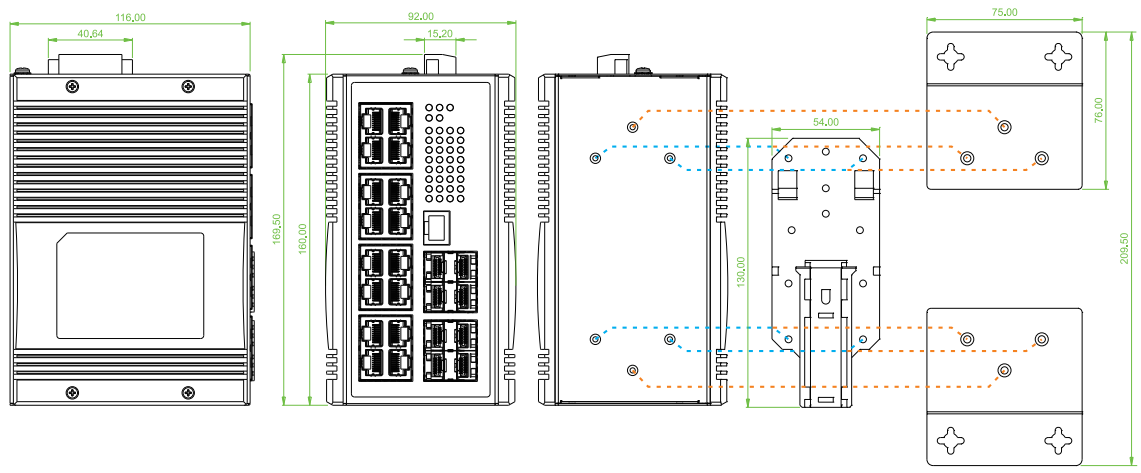
Figure 2 : High Efficiency Boost Technology for PoE



- 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

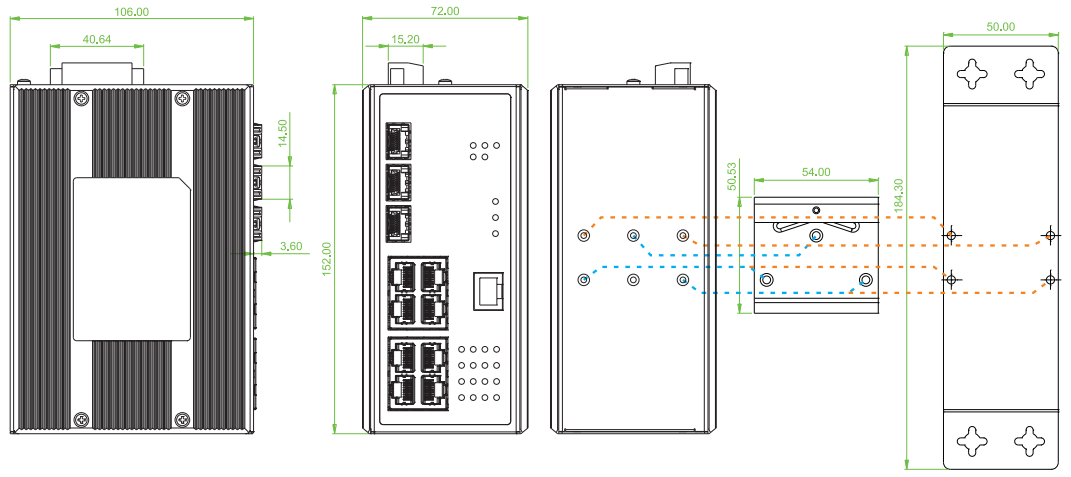
Dimensions

▶ IFS-1608GSM-8PH



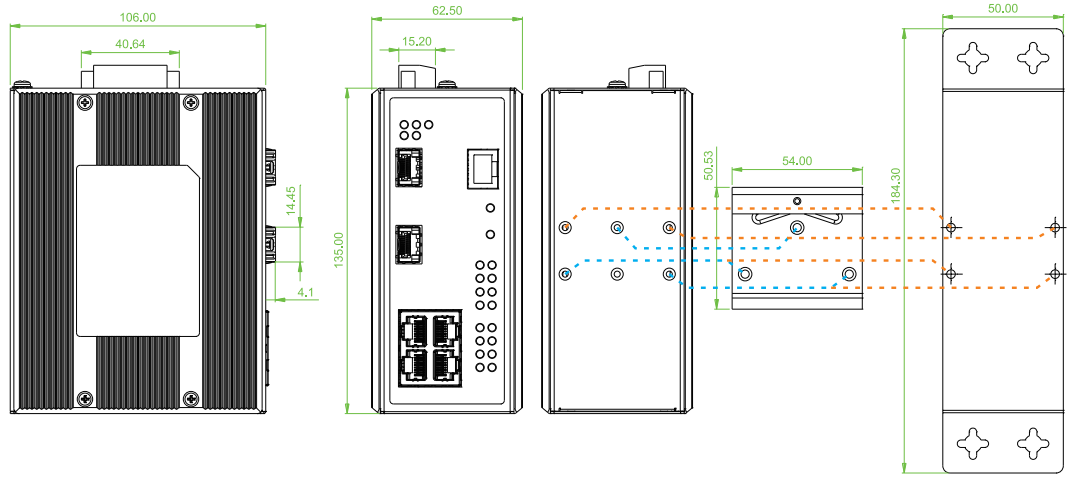
Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional accessory)

▶ IFS+803GSM-8PH24



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

▶ IFS-402GSM-4PU



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

Ordering Information

Model Name	Total Port	UTP	Fiber	PoE Port			Input power	Certification					Operating Temperture
		10/100 Base-TX	100/1000 Base-X	IEEE802.3at	IEEE802.3bt	Power Budget	Redundant	Railway EN50121-4	NEMA TS2	Safety UL60950-1 EN60950-1	EN61000-6-2 EN61000-6-4	CE, FCC	
IFS-1608GSM-8PH	24	16	8 SFP	8		240W	48, -48VDC	V		V	V	V	-10~60℃
IFS-1608GSM-8PHE	24	16	8 SFP	8		240W	48, -48VDC	V		V	V	V	-40~75℃
IFS+803GSM-8PH24	11	8	3 SFP	8		180W	24/48, -48VDC	V	V	V	V	V	-10~60℃
IFS+803GSM-8PHE24	11	8	3 SFP	8		180W	24/48, -48VDC	V	V	V	V	V	-40~75℃
IFS+402GSM-4PU	6	4	2 SFP		4	240W	48, -48VDC	V		V	V	V	-10~60℃
IFS+402GSM-4PUE	6	4	2 SFP		4	240W	48, -48VDC	V		V	V	V	-40~75℃

Model Naming Rule

IFS – 16 – 08GS – M – 8PH – E – 24

- IFS: Industrial Fast Ethernet Switch
- 16: 4: 4x FE UTP; 8: 8x FE UTP; 16: 16x FE UTP
- 08GS: 02GS: 2x GbE SFP; 03GS: 3x GbE SFP; 08GS: 8x GbE SFP
- M: Managed
- 8PH: 8PH: 8x High Power PoE+; 4PU: 4x Ulta Power PoE++
- E: E: -40~75℃; blank : -10~60℃
- 24: 24: 24V Booster; blank : Non Booster

Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- CD (SmartConfig, MIB file, Manual)
- Quickly installation guide
- Din Rail with screws
- Terminal block
- Protective caps for SFP ports

Optional Accessories

Wall mount kit

IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm) (For IFS+803GSM-8PH24, IFS-402GSM-4PU)
IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mmx 2pcs) (For IFS-1608GSM-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 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