



IFS-402GSM

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

IFS-803GSM

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

IFS-1604GSM

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



These models are managed industrial grade switches with 4/8/16 10/100Base-TX ports and 2/3/4 Gigabit/Fast Ethernet SFP ports that provide stable and reliable Ethernet transmission. These 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 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

- 4x 10/100Base-TX RJ-45 and 2x 100/1000Base-X SFP Fiber (IFS-402GSM)
- 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber (IFS-803GSM)
- 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Fiber (IFS-1604GSM)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4, Traffic control NEMA TS2 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 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 Consumption
- 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 u-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 FTP client for upload/download configuration
- 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 server for management
- Supports Modbus/TCP protocols for management
- 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 802.3z	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 802.3ac	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

Standard	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
VLAN ID	4094	IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 4.8Gbps (IFS-402GSM), 7.6Gbps (IFS-803GSM) 11.2Gbps (IFS-1604GSM) Full wire-speed	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
Network Connector	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP Slot (IFS-402GSM) 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Slot (IFS-803GSM) 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Slot (IFS-1604GSM) 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)	

Network Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)			
Protocols	CSMA/CD			
Reverse Polarity Protection	Supported			
Overload Current Protection	Supported			
CPU Watch Dog	Supported			
Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)			
Power Consumption	Input Voltage	IFS-402GSM	IFS-803GSM	IFS-1604GSM
	12VDC	5.7W	6.5W	10.8W
	24VDC	5.8W	7W	10.6W
	48VDC	8.5W	8.6W	12.5W
LED	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) Per RJ-45 port: 10/100 Link/Active (Green) SFP Fiber Per port: Link/Active (Green)			
Jumbo Frame	9.6KB			
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 (IFS-402GSM, IFS-803GSM, IFS-1604GSM) -40 ~ 75°C (IFS-402GSM-E, IFS-803GSM-E, IFS-1604GSM-E)			
Operating Humidity	5% to 95% (Non-condensing)			
Storage Temperature	-40 ~ 85°C			

Software Specifications

Topology	
VLAN	IEEE 802.1q VLAN, up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN, up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN, up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernet, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries 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 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 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

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

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 management and monitoring
SW & Configuration Upgrade	TFTP, HTTP Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB

7
Managed FE Switch
IFS-402GSM / IFS-803GSM / IFS-1604GSM

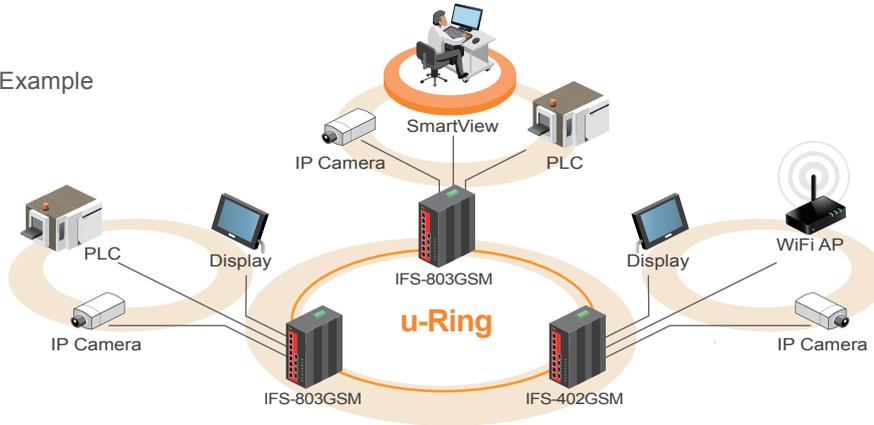
UPnP	Supported
DHCP	Server, Client, Relay, Relay option 82 , Snooping
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Support 5 operating mode in each port : 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

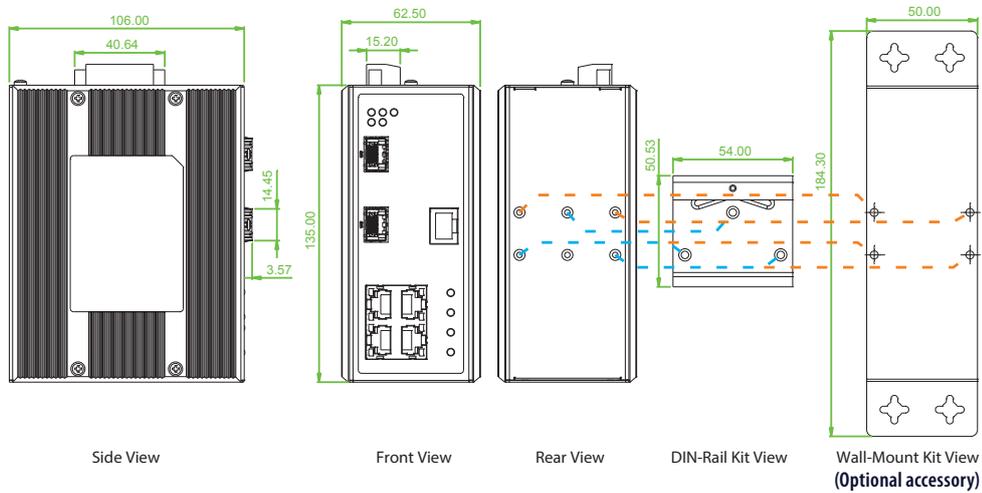
Application

Figure : Application Example

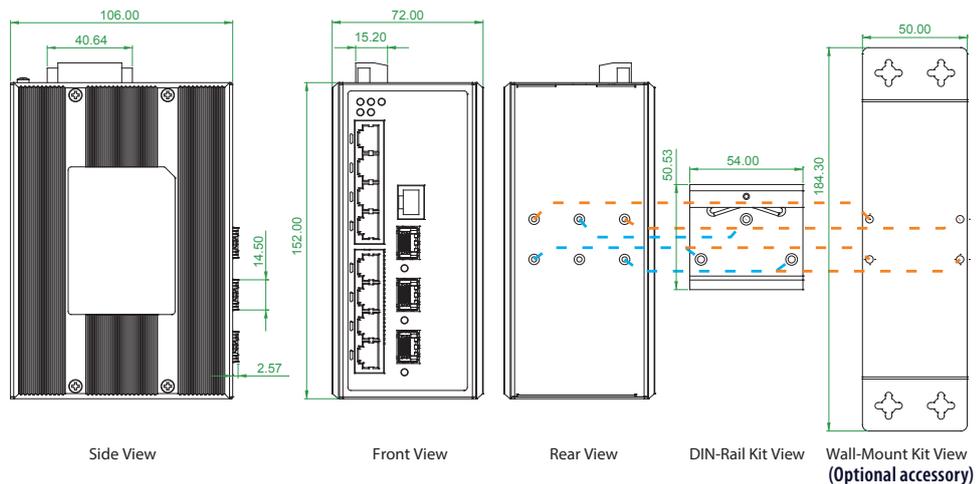


Dimensions

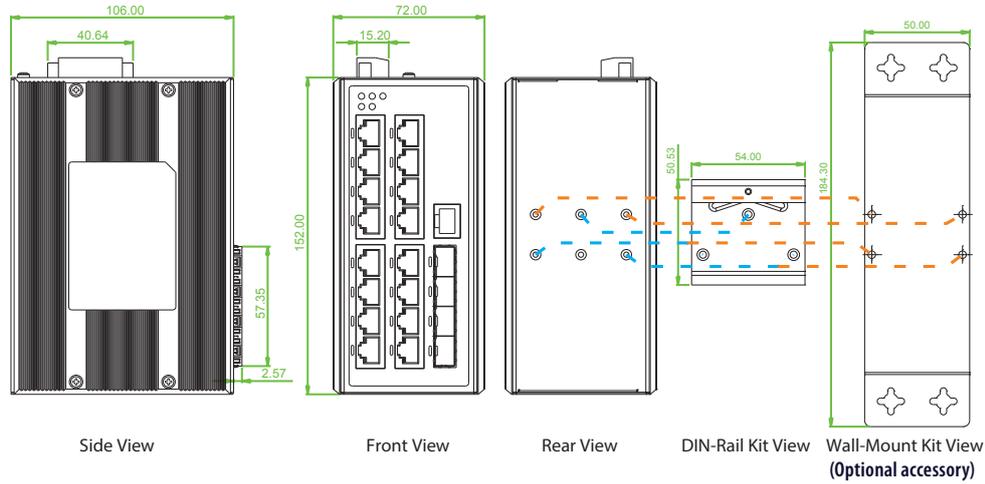
► IFS-402GSM



► IFS-803GSM



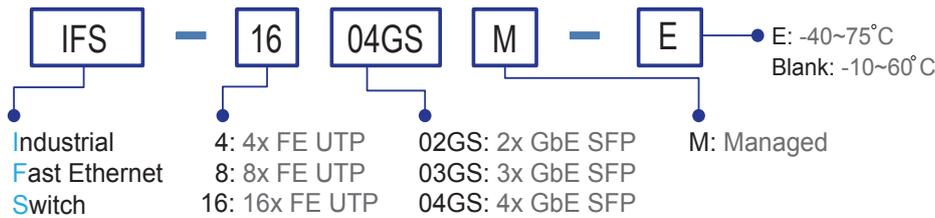
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Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port	Fiber Port	Power Input	Certification				Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	Railway EN50121-4	NEMATS2	Safety UL60950-1	EN61000-6-2 EN61000-6-4	
IFS-402GSM	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS-402GSM-E	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	-40~75°C
IFS-803GSM	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-10~60°C
IFS-803GSM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	-40~75°C
IFS-1604GSM	V	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
- 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

Industrial Power Supply

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

