

IFS-402GSM

4x 10/100Base-T+ 2x 100/1000Base-X SFP Slot (6 Port) Managed Switch



IFS-402GSM models are managed industrial grade Ethernet switches with 4 x 10/100Base-T(X) ports and 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. The Ethernet switches support a variety of management functions, including STP/ RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling , layer 2 Ethernet IGMP, VLAN, QoS ,Security ,IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking, security automation applications, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

Features

- 4x 10/100Base-T RJ-45 with 2x 100/1000Base-X SFP Fiber (Total 6 Port)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 4 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 4 Rings.
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices
- DHCP client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- 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
- SmartView Management System support

Specifications

Standard	IEEE 802.3	10Base-T 10Mbit/s Ethernet	Data Processing	Store and Forward
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet		
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		Flow Control
	IEEE 802.1d	STP (Spanning Tree Protocol)		IEEE 802.3x for full duplex mode Back pressure for half duplex mode
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)		
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)		Network Connector
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)		4 x RJ-45 10/100Base-T auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex 2X 100/1000 Base-X dual speed mode SFP slot, with DDMI
	IEEE 802.1Q	Virtual LANs (VLAN)		
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication		Console
				RS-232 (RJ-45)
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)		Network Cable
	IEEE 802.3x	Flow control for Full Duplex		UTP/STP above Cat. 5e cable
	IEEE 802.1ad	Stacked VLANs, Q-in-Q		EIA/TIA-568 100-ohm (100m)
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization		Protocols
	IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)		CSMA/CD
	IEEE 802.3az	EEE (Energy Efficient Ethernet)		Reverse Polarity Protection
				Present
VLAN ID	4094	IEEE802.1Q VLAN VID	Overload Current Protection	Present
Switch Architecture	Back-plane (Switching Fabric): 4.8Gbps		CPU Watch Dog	Present
			Power Supply	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)
Power Consumption LED			Power Consumption	7.1W in 24VDC
				8.5W in 48VDC
				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)

Specifications

Jumbo Frame	9.6KB
MAC Address Table	8K
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) -40 ~ 75°C (IFS-402GSM-E)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85°C
Housing	Rugged Metal, IP30 Protection
Dimensions	106 x 62.5 x 135 mm (D x W x H)
Weight	0.715kg
Installation Mounting	DIN Rail mounting or wall mounting
Certification	
EMC	CE
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A,CE EN55022 Class A

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 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 IEEE802.1d STP IEEE802.1w RSTP IEEE802.1s MSTP
Multiple u-Ring	up to 4 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 4 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250.
Loop Protection	Present
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
QoS Feature	
Class of Service	IEEE802.1p 8 active priorities queues for per port
Traffic Classification QoS	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
Bandwidth Control for Egress	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, Multicast
IP Multicasting Feature	
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling 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

Railway Traffic	EN50121-4
Immunity for Heavy Industrial Environment	EN61000-6-2
Emission for Heavy Industrial Environment	EN61000-6-4
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
Safety	UL60950-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6
MTBF	321,556 hrs (MIL-HDBK-217)
Warranty	5 years

RADIUS authentication & accounting TACACS+ authentication & accounting, TACACS+ 3.0 HTTPS, HTTP

SSL / SSH v2

User Name	Local Authentication
Password	
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management Interface Access Filtering	Web, Telnet / SSH , CLI RS-232 console

Management Features

CLI	
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
SW & Configuration Upgrade	TFTP, HTTP Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB II	RFC 1213
DHCP	Client Relay Snooping Snooping option 82 Relay option 82

IP Source Guard

Port Mirroring	
Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP / SNTP	
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol LLDP-MED

IPv6 Features

IPv6 Management	Telnet Server/ICMP v6
SNMP over IPv6	
HTTP over IPv6	
SSH over IPv6	
IPv6 Telnet Support	
IPv6 NTP / SNTP Support	
IPv6 TFTP Support	
IPv6 QoS	
IPv6 ACL	Number of rules: up to 256 entries L2 / L3 / L4

Others Features

Green Ethernet	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link LED Power Management :Adjustment LEDs intensity
Cable Diagnostic	Measuring cable OK or broken point distance

Application

Figure 1: Application Example

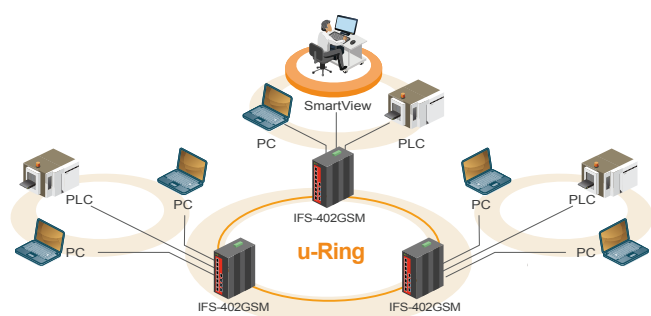


Figure 2: Multiple Rings

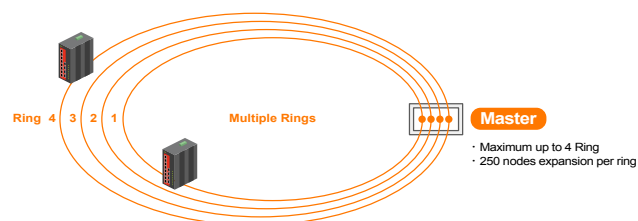
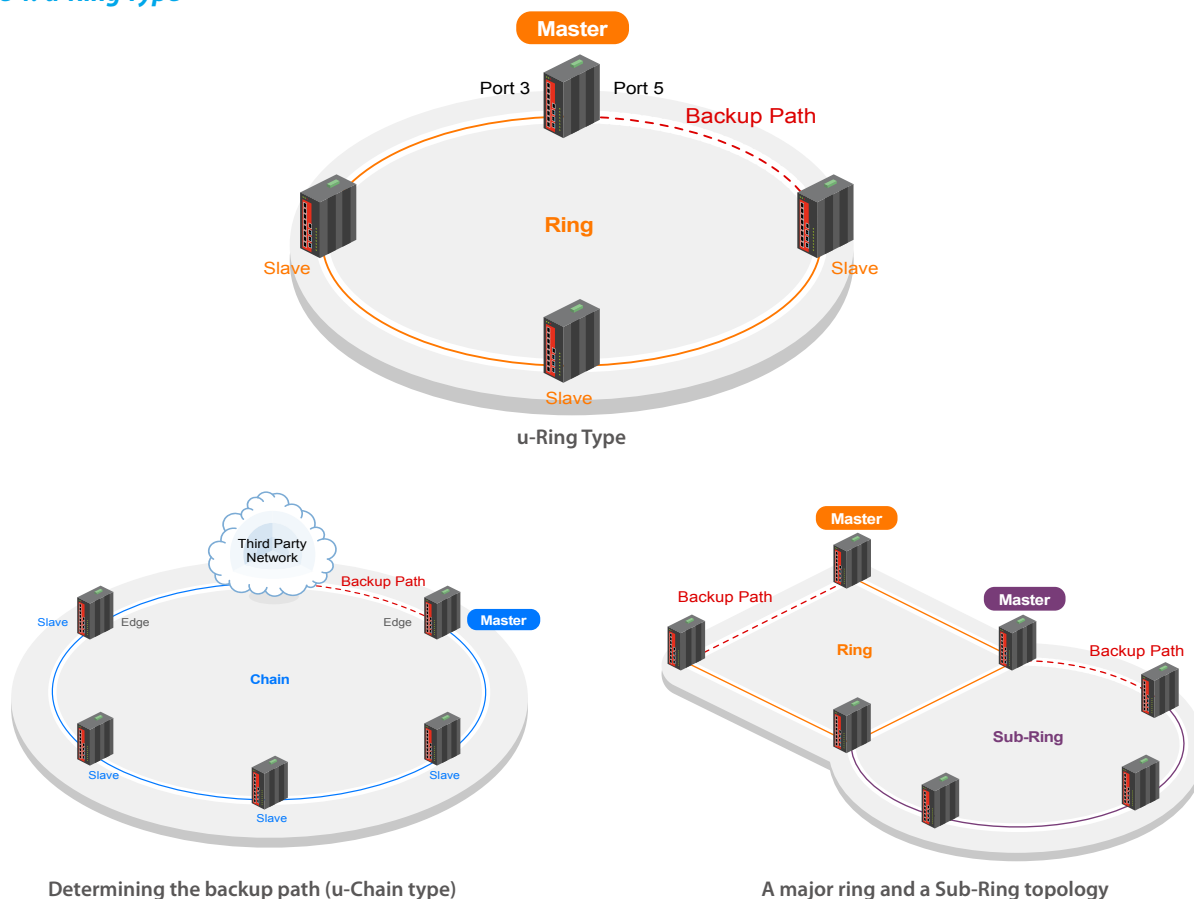


Figure 3: An illustration of u-Ring instances configured in Web interface

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

Figure 4: u-Ring Type



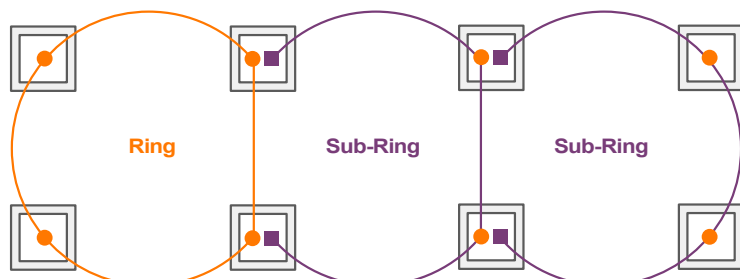
Determining the backup path (u-Chain type)

A major ring and a Sub-Ring topology

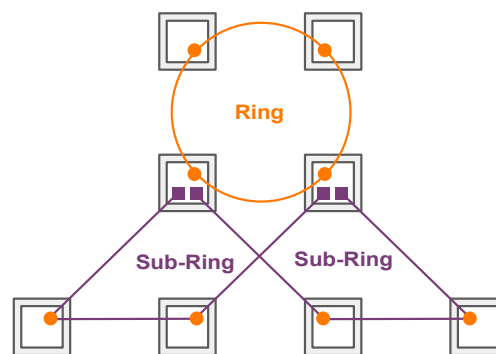
Figure 5: Ring Configuration Example

Ring Configuration Type

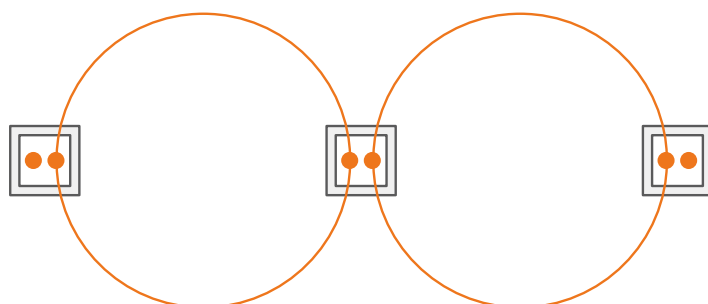
- u-Ring
- Sub-Ring
- ▲ u-Chain



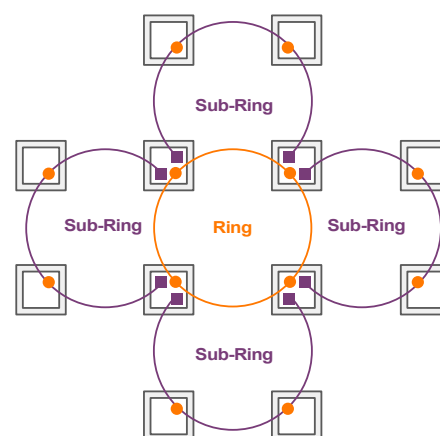
Ring Configuration Type



Combination of a ring and two Sub-Ring

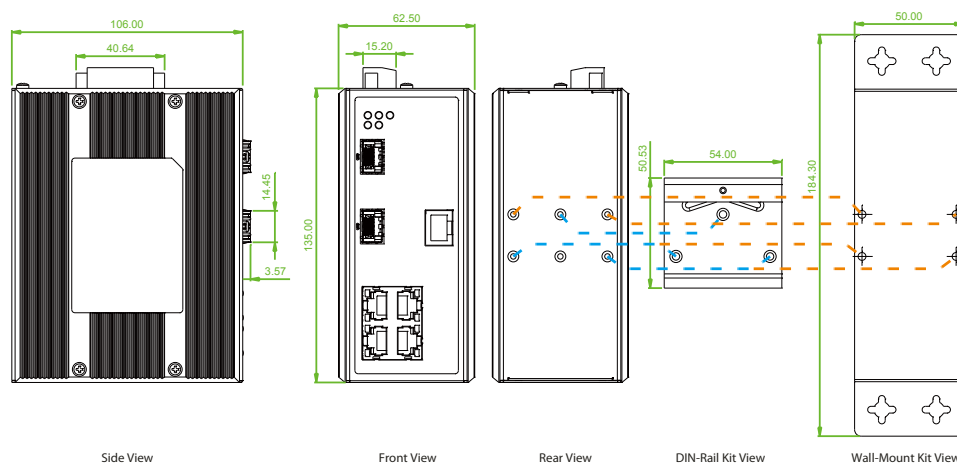


Cable Redundancy



Combination of a ring and four Sub-Ring

Dimensions



Ordering Information

Model Name	Description
IFS-402GSM	4x 10/100Base-T + 2x 100/1000Base-X SFP slot (6 Port) Managed Switch (-10~60°C)
IFS-402GSM-E	4x 10/100Base-T + 2x 100/1000Base-X SFP slot (6 Port) Managed Switch (-40~75°C)

Accessories

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

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

Temperature
IFS-402GSM -
 Example: IFS-402GSM - E