IGS-402SM-4PH24

4x 10/100/1000Base-T+ 2x 100/1000Base-X SFP Slot with 4x PoE+ Managed Switch
(120 Watts, 24V Booster)

IGS-402SM-4PH24 models are managed industrial grade Gigabit PoE (Power over Ethernet) switches with 4x 10/100/1000Base-T PoE 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 , advanced PoE management functions such as PoE device auto-checking and auto reset, PoE power weekly scheduling, 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, 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. 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 10/100/1000Base-T RJ-45 with 2x 100/1000Base-X SFP Fiber
- 24/48VDC redundant dual input power, and built-in power booster design upto 55 VDC for PoE/PoE+ output
- Constant and regulated PoE output voltage at 55VDC
- Provides 4-port IEEE802.3af / 802.3at PoE output (30W per Port)
- Maximum PoE output power budget 120W
- Advanced PoE Management, PoE PD Failure Auto Checking ,and auto reset when PD fail PoE configuration for power planning, weekly scheduling
- 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 3 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses

- **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	
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 802.3x	Flow control for Full Duplex	
IEEE 802.3af	PoE (Power over Ethernet)	
IEEE 802.3at	PoE+ (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 IEEE802.1Q VLAN VID	
Switch Architecture	Back-plane (Switching Fabric): 12Gbps	
Data Processing	Store and Forward	

Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
PoE RJ-45 Pin Assignment	4 RJ-45 ports support IEEE 802.3af / IEEE 802.3at 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)	
Network Connector	4 x RJ-45 10/100/1000Base-T auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex 2X 100/1000 Base-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	
Reverse Polarity Protection	Present	
Overload Current Protection	Present	
CPU Watch Dog	Present	
Power Supply	Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block)	
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) • PoE Output Power Off : Off (Green)	

Specifications

Jumbo Frame	9.6KB
MAC Address Table	8K
PoE Standard	IEEE802.3af, IEEE802.3at
PoE Power Output	Maximum PoE output power budget 120W (30W/per port)
Power Consumption	

Items Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
24VDC	135.2W	7.5W	120W	94%
48VDC	132.5W	9W	120W	97.2%

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℃ (IGS-402SM-4PH24) -40 ~ 75℃ (IGS-402SM-4PHE24)
Operating Humidity	5% to 95% (Non-condensing)
Storage Temperature	-40 ~ 85℃
Housing	Rugged Metal, IP30 Protection
Dimensions	106 x 62.5 x 134.8mm (D x W x H)
Weight	0.715kg
Installation Mounting	DIN Rail mounting or wall mounting

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
	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 u-Ring	up to 3 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 3 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported are 250 devices.
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
RADIUS authentication & accounting	
TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	
SSL / SSH v2	

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 (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	276,161Hrs (MIL-HDBK-217)
Warranty	5 years

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	
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
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

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

Application

Figure 1: Application Example

Figure 2: Multiple Rings
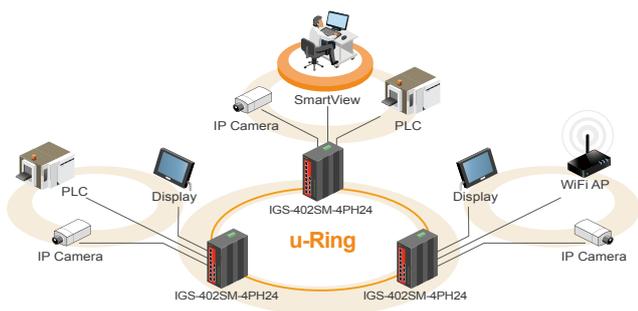

· Maximum up to 3 Ring
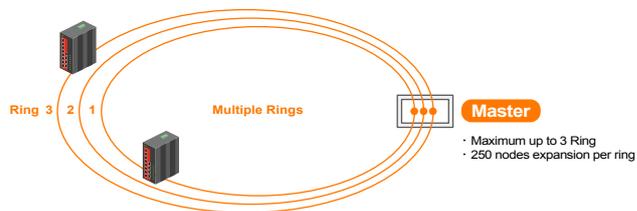· 250 nodes expansion per ring

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

u-Ring Configuration

Delete	Instance	Type	Master	East		West	
				Port	Edge	Port	Edge
Delete	1	u-Ring	☐	1		2	
Delete	2	Sub-Ring	☐	3			
Delete	3	u-Chain	☐	5	☐	6	☐

Add New Instance

Save Reset

Figure 4: u-Ring Type

u-Ring Type

Determining the backup path (u-Chain type)
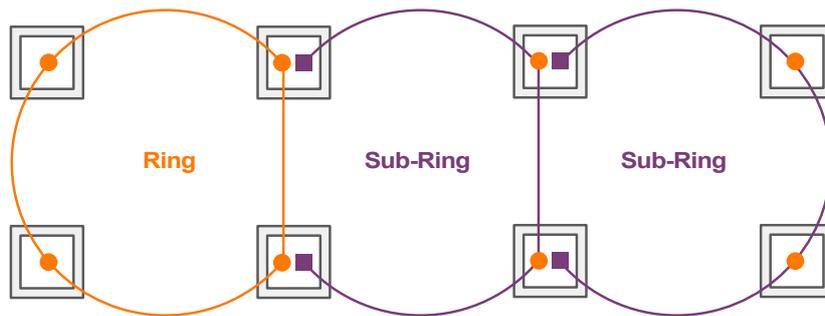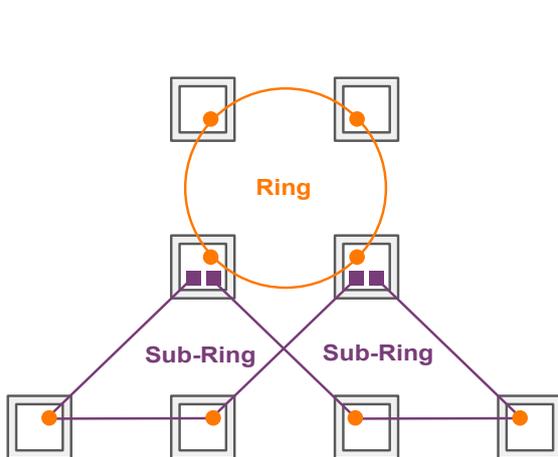

A major ring and a Sub-Ring topology
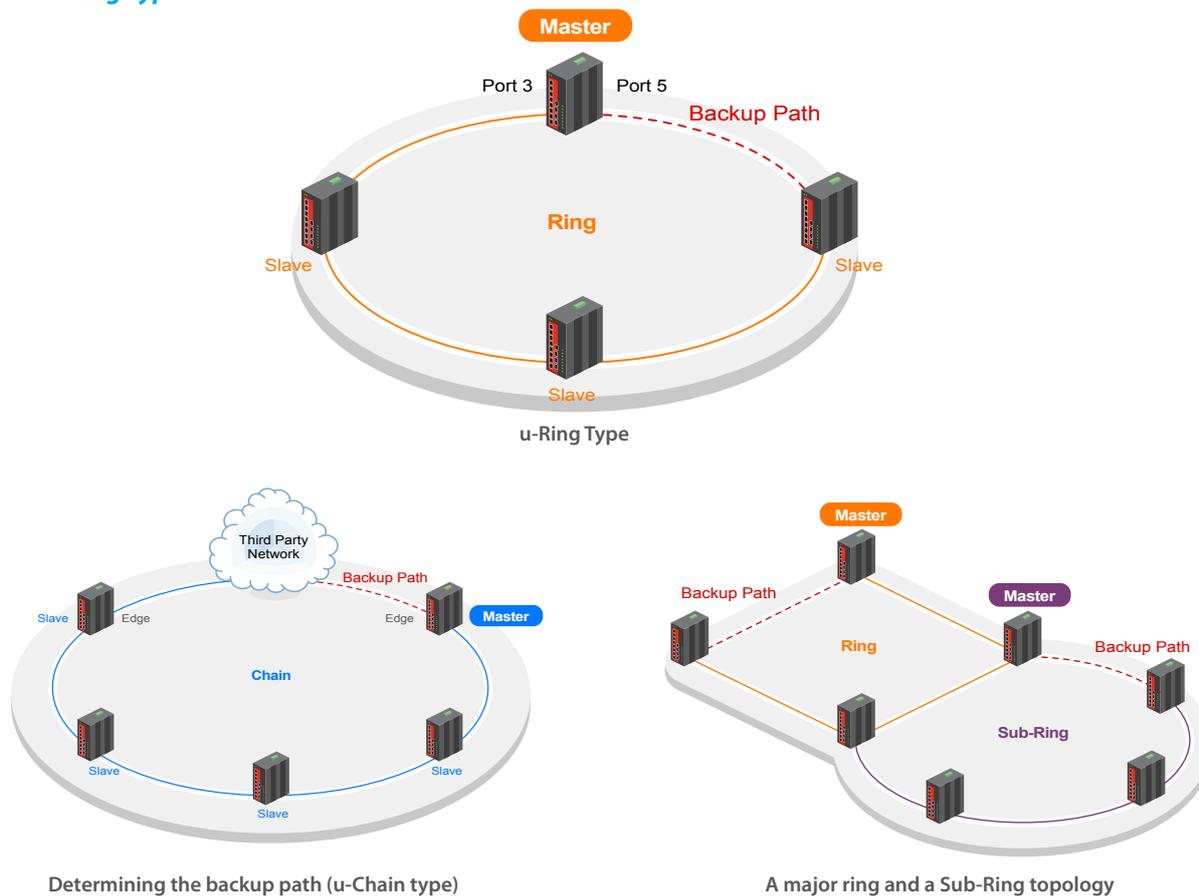
Figure 5: Ring Configuration Example

Ring Configuration Type
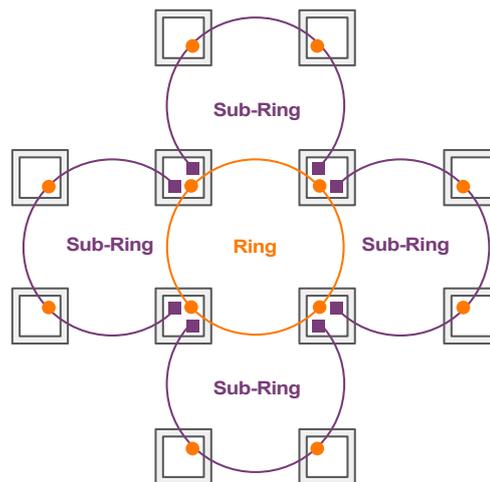- u-Ring
- Sub-Ring
- ▲ u-Chain

Ring Configuration Type

Combination of a ring and two Sub-Ring
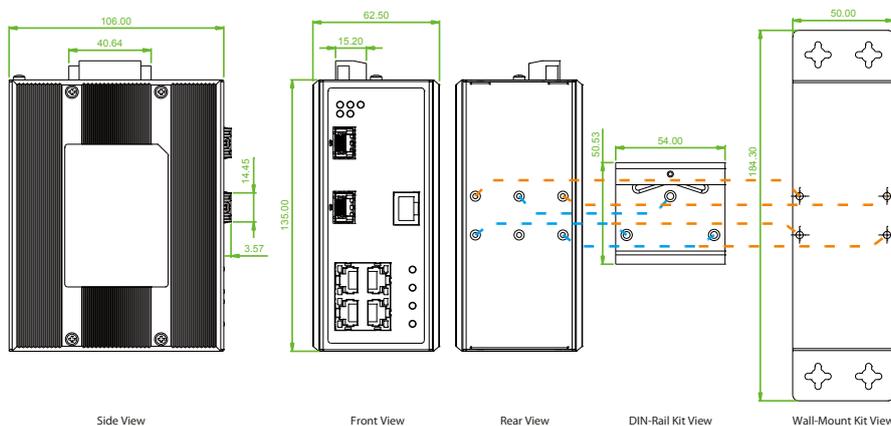

Combination of a ring and four Sub-Ring

Dimensions

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

Ordering Information

Model Name	Description
IGS-402SM-4PH24	4x 10/100/1000Base-T + 2x 100/1000Base-X SFP slot with 4 High Power PoE Managed Switch (30W/Per Port ,Total 120W, 24V Booster, -10~60℃)
IGS-402SM-4PHE24	4x 10/100/1000Base-T + 2x 100/1000Base-X SFP slot with 4 High Power PoE Managed Switch (30W/Per Port ,Total 120W, 24V Booster, -40~75℃)

Accessories

DR-120-24	Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃
DRP-240-48	Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70℃
SFP Transceiver	Compatible, Reliable, 5-year Warranty

Temperature

IGS-402SM-4PH ☐ 24

Example: IGS-402SM-4PH E24

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)...
- ● Wavelength
- ● E : -40~85℃
- Blank : 0~70℃

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