

IGS+402SM-4PH24

Industrial Managed GbE PoE Switch

4x 10/100/1000Base-T + 2x 100/1000Base-X SFP w/ 4x PoE+

- » Advanced PoE Management, PoE PD Failure Auto Checking and Auto Reset when PD Fail, PoE Port On/Off Weekly Scheduling
- » Redundant 48VDC Power Input
- » Supports μ -Ring, ERPS, EPS, MSTP, RSTP, STP for Redundant Cabling
- » EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified



These models are managed industrial grade Gigabit PoE (Power over Ethernet) switches that provide 4x GbE UTP plus 2 GbE SFP with 4/8x PoE Ports. The PoE features enable power and data to be transferred via a single cable, thereby 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.

Features

- 4x 10/100/1000Base-T RJ-45 + 2x 100/1000Base-X SFP with 4x PoE+, total 120W power budget
- 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
- Regulated PoE output voltage (55VDC) to stabilize PoE device, and guarantee delivery PoE power distance to 100meter
- Provides 4 port IEEE802.3af / 802.3at PoE+ output ,30W per port
- 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
- CE, FCC, Rail Traffic EN50121-4 certified
- Heavy Industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for PoE, UTP 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
- Supports EMS management

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 802.3bt	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): 12Gbps (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 10/100/1000Base-T RJ-45 + 2x 100/1000Base-X SFP connector RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function, SFP port supports 100/1000 dual speed with DDMI	
Console	RS-232 (RJ-45)	
PoE Standard & RJ-45 Pin Assignment	4x IEEE802.3at /802.3af PoE+ 2 pairs PoE, PoE+: Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6,4,5,7,8)	
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	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	

Power Consumption	Input Voltage	Total Power Consumption	Device Power Consumption	PoE Budget	Boost Efficiency
	24VDC	132W	7.2W	120W	96%
	48VDC	133.4W	7.2W	120W	95%
PoE Power Budget	Maximum PoE Output power budget 30W/port 120W				
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 /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 1A @24VDC				
Removable Terminal Block	Provides 2 redundant power, alarm relay contact, 6 Pin				
Operating Temperature	-10 ~ 60°C (IGS+402SM-4PH24)				
	-40 ~ 75°C (IGS+402SM-4PHE24)				
Operating Humidity	5% to 95% (Non-condensing)				
Storage Temperature	-40 ~ 85°C				
Housing	Rugged Metal, IP30 Protection, Fanless				
Dimensions	106 x 62.5 x 135mm (D x W x H)				
Weight	0.69kg				
Installation Mounting	DIN Rail mounting or wall mounting (Optional)				
MTBF	626,632 Hours (MIL-HDBK-217)				
Certification					
EMC	CE				
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE				
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				
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				
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 ID 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	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 device is allowed 250 nodes in a Ring.
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, 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 / Port shaper

DiffServ (RF 2474) Remarking

Storm Control	For Unicast, Broadcast and Multicast
----------------------	--------------------------------------

IP Multicasting Features

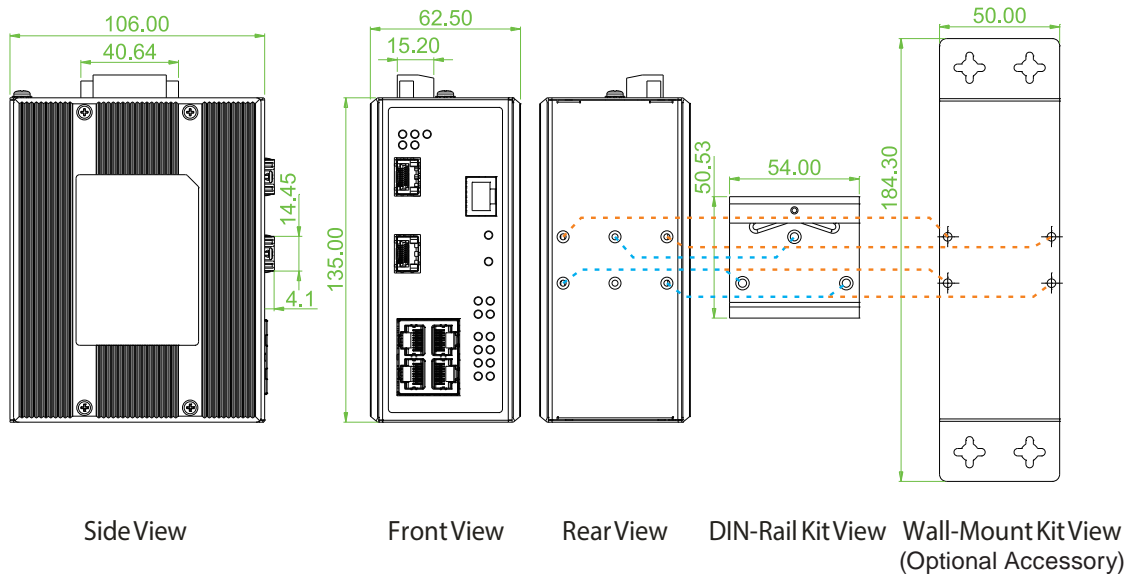
IGMP / MLD Snooping	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port
----------------------------	--

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
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
Others Features	L4: TCP/UDP
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 limit by management
	Total PoE Power budge limitation: maximum 120W
	Power feeding priority

Dimensions



Ordering Information

Model Name	Managed	Total Port	RJ45	SFP	PoE		Input Power	Certification			Operating Temperature
			10/100/1000 Base-T(X)	100/1000 Base-X	IEEE 802.3at	Power Budget		Railway EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC	
IGS+402SM-4PH24	V	6	4	2	4	120W	24/48VDC	V	V	V	-10~60°C
IGS+402SM-4PHE24	V	6	4	2	4	120W	24/48VDC	V	V	V	-40~75°C

Optional Accessories

■ Wall Mount Kit

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

■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDML, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDML, -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, DDML, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDML, -10~70°C (-40~85°C)

■ Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ 70°C (For IGS+402SM-4PH24)
NDR-240-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 240W, -20 ~ 70°C (For more ref.)