

## 9 IGS-1604XSM-16PH



**16x GbE RJ45 + 4x 1G/2.5G/10G SFP+ with 16x PoE 300W**

- » Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for Redundant Cabling
- » Auto Checking and Auto Reset When PoE PD Fail
- » EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified



An Industrial 16-port PoE Gigabit Ethernet switch with 4-port 10 Gigabit SFP+ slot, supporting various types of 10 and 2.5 Gigabit optical small form-factor pluggable transceivers for long-distance and wide-bandwidth transmission, each PoE port support IEEE802.3af/at standard of the maximum 30W power output, each switch has a total power budget of up to 300Watts, used to connect and feed various types of Ethernet power devices, such as smoke sensors, Wi-Fi access points, femtocells, alarm centers, and IP cameras. the din-rail and fan less 20-port switch adopts an enhanced and hardened design for high surge protection, wide operating temperature and safety certified to meet critical and centralize strict requirements.

### Features

- 48VDC (46~57VDC) redundant dual power input
- Provides 16-port IEEE 802.3af / 802.3at PoE+ output (30W per port. total 300W)
- Cable diagnostics, identifies opens/shorts distance
- Provides 5 ring instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC  $\mu$ -Ring white paper for more details and more topology application)
- $\mu$ -Ring for redundant cabling, recovery time<10ms in 250 devices
- Supports EMS Management

### Specifications

Standard	Specification
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 802.3ae	10G bit/s Ethernet over Fiber
IEEE 802.3af	PoE (Power over Ethernet)
IEEE 802.3at	PoE+ (Power over Ethernet enhancements)
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)
ITU-T G.8031 /Y.1342	EPS (Ethernet 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
IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)
IEEE 802.3az	EEE (Energy Efficient Ethernet)

# Industrial Managed 10G PoE Switch

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<b>Switch Architecture</b>	Back-Plane (Switching Fabric): 112Gbps (Full Wire-Speed)			
<b>Data Processing</b>	Store and Forward			
<b>Flow Control</b>	IEEE 802.3x for full duplex mode back pressure for half duplex mode			
<b>Network Connector</b>	16x 10/100/1000Base-T RJ-45 + 4x 1G/2.5G/5G/10GBase-X SFP RJ-45 UTP port supports Auto-negotiation speed, Auto MDI/MDI-X function SFP port supports 1G/2.5G/5G/10G speed with DDMI			
<b>Console</b>	RS-232 (RJ-45)			
<b>PoE Standard &amp; RJ-45 Pin Assignment</b>	16x IEEE 802.3af /IEEE 802.3at 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.			
<b>Network Cable</b>	UTP/STP Cat. 5e cable or above EIA/TIA-568 100-ohm (100meter)			
<b>Protocols</b>	CSMA/CD			
<b>Reverse Polarity Protection</b>	Supported for power input			
<b>Overload Current Protection</b>	Supported			
<b>CPU Watch Dog</b>	Supported			
<b>Power Supply</b>	Redundant Dual DC 48V (46~57VDC) input power, (Removable terminal block ) (50~57V input is recommended for IEEE802.3at PoE+ applications)			
<b>Power Consumption</b>	<b>Input Voltage</b>	<b>Total Power Consumption</b>	<b>Device Power Consumption</b>	<b>PoE Budget</b>
	50VDC	337W	28.5W	300W
<b>PoE Power Budget</b>	Maximum PoE Output power budget 30W/port Total 300W			
<b>LED</b>	System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) SFP Slot: 1G/2.5G Link/Active (Amber), 10G Link/Active (Blue) PoE: ON (Green)			
<b>Jumbo Frame</b>	10KB			
<b>IEEE802.3ac</b>	Max frame size extended to 1522Bytes (allow Q-tag in packet)			
<b>MAC Address Table</b>	32K			
<b>Memory Buffer</b>	4M Bytes for packet buffer			
<b>Device Memory</b>	128M Bytes Flash ROM, 2G Bytes RAM			
<b>Warning Message</b>	System Syslog, SMTP/ e-mail event message, alarm relay			
<b>DO(Alarm Relay Contact)</b>	Relay outputs with current carrying capacity of 1A @24VDC			
<b>DI Input</b>	DI 17 to 30 V for state 1, 0 to 15 V for state 0			
<b>Removable Terminal Block</b>	Provides 2 terminal block for DO (Alarm Relay), DI, redundant power PWR1 and PWR2			
<b>Operating Temperature</b>	-40 ~ 60°C			
<b>Operating Humidity</b>	5% to 95% (Non-condensing)			
<b>Storage Temperature</b>	-40 ~ 85°C			
<b>Housing</b>	Rugged Metal, IP30 Protection, Fanless			
<b>Dimensions</b>	155.6 x 77 x 160mm (D x W x H)			
<b>Weight</b>	2.065kg			
<b>Installation Mounting</b>	DIN Rail mounting or wall mounting (Optional)			
<b>MTBF</b>	224,776 Hours (MIL-HDBK-217)			
<b>Warranty</b>	5 years			
<b>Certification</b>				
<b>EMC</b>	CE (EN55032, EN55035)			
<b>EMI (Electromagnetic Interference)</b>	FCC Part 15 Subpart B Class A, CE			
<b>Railway Traffic</b>	EN50121-4			
<b>Immunity for Heavy Industrial Environment</b>	EN61000-6-2			
<b>Emission for Heavy Industrial Environment</b>	EN61000-6-4			

# Industrial Managed 10G PoE Switch

<b>EMS (Electromagnetic Susceptibility) Protection Level</b>	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
<b>Safety</b>	EN62368-1
<b>Shock</b>	IEC 60068-2-27
<b>Freefall</b>	IEC 60068-2-31
<b>Vibration</b>	IEC 60068-2-6

## Software Specifications

### Topology

<b>VLAN</b>	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 ) Voice VLAN
<b>Link Aggregation (Port Trunk)</b>	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
<b>Spanning Tree</b>	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
<b>Multiple <math>\mu</math>-Ring</b>	Up to 5 instances that each supports $\mu$ -Ring, $\mu$ -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.
<b>Loop Protection</b>	Supported
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )</b>	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
<b>ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)</b>	Supported
<b>QoS Features</b>	
<b>Class of Service</b>	IEEE 802.1p 8 active priorities queues for per port
<b>Traffic Classification QoS</b>	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, Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
<b>Bandwidth Control for Ingress</b>	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
<b>Bandwidth Control for Egress</b>	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps" Per queue / Port shaper
<b>DiffServ (RF 2474) Remarking</b>	
<b>Storm Control</b>	For Unicast, Broadcast and Multicast
<b>IP Multicasting Features</b>	
<b>IGMP / MLD Snooping</b>	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

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## Security Features

<b>IEEE 802.1X</b>	Port-Based MAC-Based
<b>ACL</b>	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
<b>RADIUS</b>	Authentication & Accounting
<b>TACACS+</b>	Authentication, Authorization and Accounting
<b>HTTPS, HTTP</b>	Supported
<b>SSL / SSH v2</b>	Supported
<b>User Name Password Authentication</b>	Local Authentication Remote Authentication (via RADIUS / TACACS+)
<b>Management Interface Access Filtering</b>	Web, Telnet / SSH, CLI RS-232 console

## Management Features

<b>CLI</b>	Cisco® like CLI
<b>Web UI</b>	Supported
<b>Telnet</b>	Server
<b>SNMP</b>	V1, V2c, V3
<b>sFlow</b>	Supported
<b>Modbus/TCP</b>	Supports for management and monitoring
<b>SW &amp; Configuration Upgrade</b>	SFTP, TFTP, HTTP Redundant firmware in case of upgrade failure
<b>FTP client</b>	Supports for upload/download configuration
<b>RMON</b>	RMON I (1, 2, 3, 9 group), RMON II
<b>MIB</b>	RFC1213 MIB II, Private MIB
<b>UPnP</b>	Supported
<b>BOOTP</b>	Supported
<b>DHCP</b>	Server, Client, Relay, Relay option 82, Snooping
<b>RARP</b>	Supported
<b>IP Source Guard</b>	Supported
<b>Port Mirroring</b>	Supported
<b>Event Syslog</b>	Syslog server (RFC3164)
<b>Warning Message</b>	System syslog, e-mail, alarm relay
<b>DNS</b>	Client, Proxy
<b>NTP, SNTP</b>	Client
<b>LLDP (IEEE 802.1ab)</b>	Link Layer Discovery Protocol LLDP-MED

## IPv6 Features

<b>IPv6 Management</b>	Telnet Server/ICMP v6
<b>SNMP over IPv6</b>	Supported
<b>HTTP over IPv6</b>	Supported
<b>SSH over IPv6</b>	Supported
<b>IPv6 Telnet</b>	Supported
<b>IPv6 NTP, SNTP</b>	Client
<b>IPv6 TFTP</b>	Supported
<b>IPv6 QoS</b>	Supported
<b>IPv6 ACL</b>	Number of rules: up to 256 entries for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SIP, Subnet (32bit) L4: TCP/UDP

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## Others Features

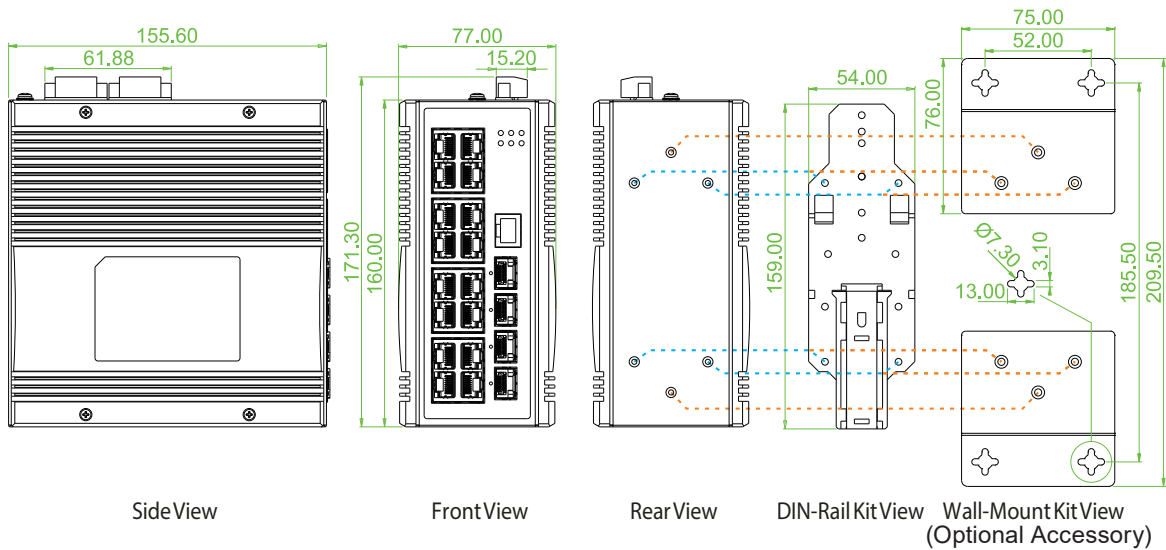
<b>Green Ethernet</b>	Supports IEEE 802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption
	Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link
	LED Power Management :Adjustment LEDs intensity

<b>Cable Diagnostic</b>	Measuring UTP cable normal or broken point distance
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## Advanced PoE

<b>Management</b>	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 budget limitation: maximum 300W

## Dimensions



## Ordering Information

Model Name	Total Port	RJ45		SFP		PoE		Input Power		Certification				Operating Temperature
		10/100/1000 Base-T(X)	1000/2.5G/5G/10G Base-X	1000/2.5G/5G/10G Base-X	1000/2.5G/5G/10G Base-X	IEEE802.3 at/af	Power Budget	Redundant	EN62368-1	EN50121-4	EN61000-6-2	EN61000-6-4	CE, FCC	
IGS-1604XSM-16PH	20	16	4	4	16	300W	48VDC	V	V	V	V	V	V	-40~60°C

## Optional Accessories

### Wall Mount Kit

IND-WMK04	Wall Mount kit for Industrial product (Wide) (2 pcs in 1 set, 76mm x 75mm x 2pcs)
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### 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-M9000-85-D(E)	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
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)

### Industrial Power Supply

NDR-480-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 480W, -20 ~ 70°C
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