

IEC61850-3 Managed 10G Ethernet Switch

IPS-MG2404XS

3x Modular Slots + 4x 1G/10G SFP+ with PTP

- ◆ IEC62439-3 Clause 5 High-Avail-Seamless-Redundancy(HSR) (Optional Module)
- ◆ IEC62439-3 Clause 4 Parallel-Redundancy-Protocol (PRP) (Optional Module)
- ◆ IEEE1588 v2 Hardware Base TC, BC, High Precision <25ns, Power Profile for Substation
- ◆ Supports ERPS, MRP, MSTP, RSTP, STP for Redundant Cabling
- ◆ CE, FCC, EN62368-1, IEC61850-3, IEEE1613 Certified
- ◆ Modular Design for Flexible Application



The industrial grade IEC61850-3 Ethernet switch adopts an enhanced design to meet the substation IEC61850-3 and IEEE 1613 certification requirements. It provides up to 24 Gigabit Ethernet ports, which can be implemented through 4 types of Ethernet modules, including Gigabit copper ports, SFP slots and HSR/PRP Redbox modules, compliant with IEC 62439-3 clause 4 and 5 protocols for seamless redundancy, and it is equipped with 4 10 Gigabit SFP+ slot ports for uplinks. Its redundant power inputs increase system reliability and uninterrupted availability of the network backbone. This switch is ideal for smart grids and substations for Ethernet communication deployment in substations.

Features

- Redundant 24~120VDC, 100~240VAC or 120~380VDC power inputs
- Rugged metal, IP30 protection & Fanless design
- Supports GOOSE Message that complies with IEC61850 standard to achieve zero packet loss
- Operating in wide temperature environments between -40 ~ 85°C

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 802.3ae	10Gbit/s Ethernet over fiber
	IEEE 802.1D	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	IEC62439-2	Media Redundancy Protocol (MRP)
	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 802.1AE	MACsec, Local and metropolitan area networks-Media Access Control (MAC) Security
	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)
	IEC-62439-3	Clause 4 PRP (Parallel Redundancy Protocol)
	IEC-62439-3	Clause 5 HSR (High-availability Seamless Redundancy)
	IEEE1588v2	PTP (Hardware-based)
VLAN ID	4094 IEEE 802.1Q VLAN ID	
Switch Architecture	Back-plane (Switching Fabric): 128Gbps (Full wire-speed)	
Throughput	95.24Mpps maximum	
Data Processing	Store and Forward	
Network Connector	3x modular slot + 4x 1000/10GBase-X SFP+	
	Provide various type of module for modular slot:	
	8x 10/100/1000Base-T RJ45 module	
	8x 100/1000Base-X SFP module	
	4x 10/100/1000Base-T RJ45 with HSR/PRP module	
	4x 100/1000Base-X SFP with HSR/PRP module	
	All SFP support DDMI	
All RJ45 support Auto negotiation speed, auto MDI/MDI-X function		
Console Port	RS232 (RJ45)	
Network Cable	UTP/STP Cat.5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Power Supply (For Device)	Redundant 2x AC input power (-AA model)	
	Redundant 2x HV input power (-HH model)	
	Redundant 2x DC input power (-DD model)	
	AC input power : 100/240VAC (85VAC~264VAC)	
	HV input voltage : 120~380VDC	
DC input power : 24~120VDC		
Power Consumption	70W max (For AC model) / 62W max (For HV model) / 64W max (For DC model)	
LED (System)	Power 1 (Green), Power 2 (Green)	
	Run (Green)	Blinking: Normally operate OFF: Not ready
	Ring (Green)	ON: Rings in normal / OFF: Ring is disabled / Blinking: port link down in Ring
	R.M (Green)	ON: The device is a Master of the Ring / OFF: Slave of the ERPS Ring
	Alarm (Red)	ON: Alarm is triggered by user defined / OFF: Alarm is not triggered
	10G SFP	Amber : ON: 10G or 1000M Link Green: ON: Link / Blink: Link & Active / OFF: No Link
LED (Module)	Per RJ-45 port	
	Amber: ON: 1000M Link / Blink: 100M Link / OFF: 10M Green: ON: Link / Blink: Link & Active / OFF: No Link	
LED (Module)	Per SFP Fiber port	
	Amber: ON: 1000M Link / Blink: 100M Link Green: ON: Link / Blink: Link & Active / OFF: No Link	
Jumbo Frame	9216Byte	
MAC Address Table	16K	
Memory Buffer	1.5M 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, 2-Pin removable terminal block	
Operating Temperature	-40 ~ 85°C	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection and Fanless	
Dimensions	355 x 440 x 44mm (D x W x H)	
Weight	5kg (Not include module)	
Installation Mounting	19" rack mount	
MTBF	20 Years (MIL-HDBK-217)	

Certification

EMC	CE (EN55032, EN55035)
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE
EMS (Electromagnetic Susceptibility) Protection Level	EN61000-4-2 (ESD) Level 4, Criteria B EN61000-4-3 (RS) Level 4, Criteria A EN61000-4-4 (Burst) Level 4, Criteria A EN61000-4-5 (Surge) Level 4, Criteria B EN61000-4-6 (CS) Level 4, Criteria A
Power Substation	IEC61850-3 EMC, IEEE1613
Safety	EN62368-1
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

Software Specifications**Topology**

VLAN	IEEE 802.1q VLAN, up to 4094 802.1Q VLAN ID MAC-based VLAN GARP GVRP (GARP VLAN Registration Protocol) GMRP
HSR Seamless Redundancy	IEC62439-3 Clause 5 (Support by IPM-4GT-HPR, IPM-4GS-HPR module)
PRP Parallel-Redundancy	IEC62439-3 Clause 4 (Support by IPM-4GT-HPR, IPM-4GS-HPR module)
Link Aggregation (Port Trunk)	Static, Dynamic (IEEE 802.3ad LACP)
Spanning Tree	IEEE 802.1D STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP, IEC62439-2 MRP (Client)
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms Single Ring

QoS

QoS	Supported
GOOSE Message	Complies with IEC61850 standard to achieve zero packet loss

IP Multicasting Feature

IGMP	IGMP v1, v2, v3 / IGMP Snooping
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Security Features

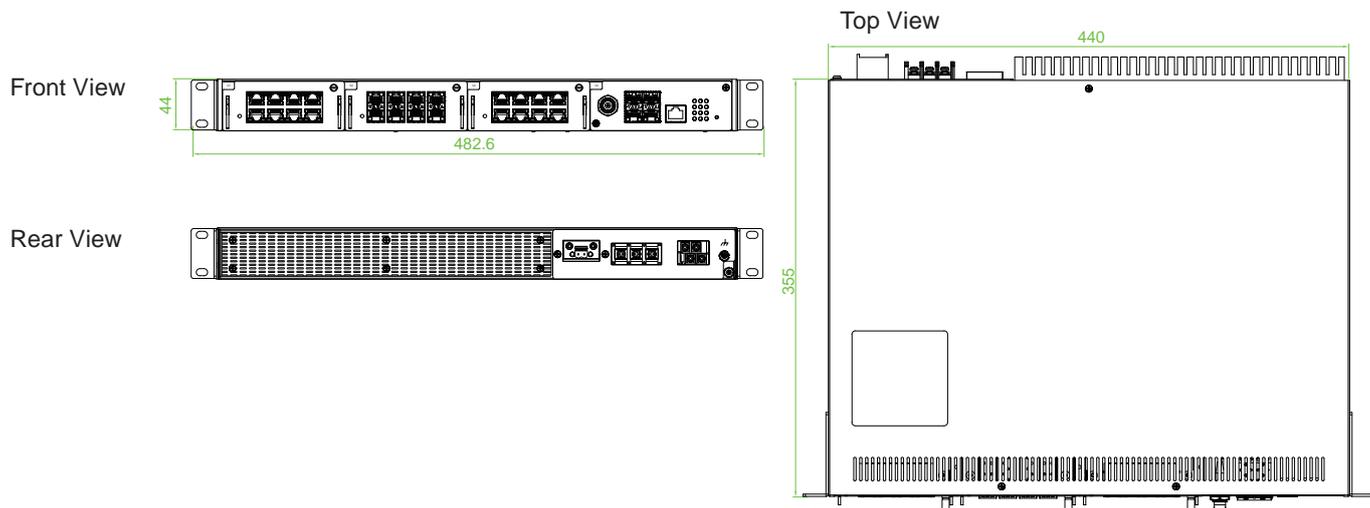
IEEE 802.1X	Port-Based
ACL	Supported
RADIUS	Authentication & Accounting
TACACS+	Authentication, Authorization and Accounting
HTTPS, HTTP	Supported
SSH	Supported
Management Interface Access Filtering	Web, Telnet / SSH, CLI RS-232 console

Management Features

CLI	Supported
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
SMTP	SMTP, SMTP (Gmail)
Automation Profile	Profinet v2 conformance Modbus/TCP status registers

SW & Configuration Upgrade	TFTP
RMON	RMON I (1, 2, 3, 9 group)
MIB	RFC1213 MIB II, Private MIB
DHCP	Server, Client, Relay, DHCP option 66/67/82
BootP	Supported
RARP	Supported
Mirroring	Supported
Event Syslog	Client
Warning Message	System syslog, SMTP e-mail, alarm relay
IEEE1588 PTP v2	Supports BC, TC mode (Hardware base) 25ns accuracy Supports Power profile C37.238. power profile (2017) Supports IEC61850-9-3 power profile (2016)
NTP V4.0, SNTP	NTP (server/ Client), SNTP (Client)
LLDP (IEEE 802.1ab)	Link Layer Discovery Protocol

Dimensions



Ordering Information

Model Name	Managed	Total Ports (Max)	Extension Port	Modular Slot	Power Input (Redundant)	Certification		
			1000/10GBase-X	See Module Selection Table for Optional		IEC61850-3 IEEE1613	EN62368-1	CE FCC
IPS-MG2404XS-AA	V	28	4x SFP	3	100~240VAC	V	V	V
IPS-MG2404XS-DD	V	28	4x SFP	3	24~120VDC	V	V	V
IPS-MG2404XS-HH	V	28	4x SFP	3	120~380VDC	V	V	V

Module Selection

Model Name	100/1000Base-X SFP	10/100/1000Base-T(X) RJ45	HSR/PRP
IPM-8GT		8	
IPM-8GS	8		
IPM-4GT-HPR		4	Y
IPM-4GS-HPR	4		Y



IPM-8GT



IPM-8GS



IPM-4GT-HPR



IPM-4GS-HPR

Optional Accessories

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 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber), wave length 850nm, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, 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)

Industrial Power Supply

NDR-120-48	Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ 70°C (For DC type)
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