

IPS-AG804SM-HPR

8x GbE RJ45 + 4x 100M/1G/2.5G SFP

Preliminary

- ◆ IEC62439-3 Clause 5 High-Avail-Seamless-Redundancy (HSR)
- ◆ IEC62439-3 Clause 4 Parallel-Redundancy-Protocol (PRP)
- ◆ Supports μ -Ring, ERPS, APS, MRP, MSTP, RSTP, STP
- ◆ EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified
- ◆ 4KV Surge Protection for RJ45 and SFP Ports
- ◆ Supports Secure Boot



The managed industrial-grade IEC61850 Gigabit Ethernet switch with 8 Gigabit UTP ports and 4 100/1000/2.5G SFP slots, it is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provides a variety of redundant functions to increase the reliability of your communications system, including power supply of 24/48 VDC and 110/220V AC/DC and link redundancy functions of PRP/HSR STP/RSTP/MRP/MSTP/ERPS and a proprietary ring protocol, features of IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring. Supports wide temperature operation of -40~85°C, fanless and rugged enclosure specifically designed for harsh substation network environments.

Features

- 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
- μ -Ring for redundant cabling, recovery time<20ms in 250 devices
- Power input 100/220/240VAC(85-264VAC) or 100/110/125/135VDC (88-370VDC) or 24/48VDC (24-72VDC)
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS), MRP for network redundancy
- IEC62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant

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 802.3cb		2.5GBase-X
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		APS (Automatic 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)

IEC 61850-3 Ethernet Switch



Standard	IEC62439-2	Media Redundancy Protocol (MRP)
	IEC62439-3	Clause 4 (PRP)
	IEC62439-3	Clause 5 (HSR)
Switch Architecture	Back-Plane (Switching Fabric): 36Gbps (Full Wire-Speed)	
Forwarding Rate	26.7Mpps	
Data Processing	Store and Forward	
Flow Control	IEEE 802.3x for full duplex mode Back pressure for half duplex mode	
Network Connector	8x 10/100/1000Base-T RJ-45 + 4x 100M/1G/2.5G SFP	
	RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function	
	SFP port supports 100M/1G/2.5G speed with DDMI	
Storage Port	USB type A	
Console Port	USB type C	
Network Cable	UTP/STP Cat. 5e cable or above	
	EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity Protection	Supported for power input	
Overload Current Protection	Supported	
CPU Watch Dog	Supported	
Power Supply	AC input power (AC) : 110/220VAC (85VAC~264VAC) High DC input power (HV) : 100/110/125/135VDC (88~370VDC) DC input power (LV) : 24/48VDC (24~76VDC)	
Power Consumption	TBD	
LED	System: Power (Green), Alarm (Amber), CPU Act (Green), Ring Master (Green)	
	UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)	
	SFP Slot: 100M/1G Link/Active (Green), 2.5G Link/Active (Amber)	
Jumbo Frame	10KB	
MAC Address Table	16K	
Memory Buffer	12Mb for packet buffer	
Device Memory	4G Bytes eMMC, 2G Bytes RAM	
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 1 terminal block for Alarm relay, redundant power PWR1 and PWR2	
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	TBD	
Weight	TBD	
Installation Mounting	DIN Rail mounting or wall mounting (Optional)	
MTBF (MIL-HDBK-217)	TBD	
Certification		
Industrial Cybersecurity	IEC 62443-4-1, IEC 62443-4-2*	
EMC	CE (EN55032, EN55035)	
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
Safety	EN62368-1
Power Substation	EN61850-3, IEEE1613
Surge Protection	4KV for UTP and Fiber ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6

*Future release

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
	Private VLAN for port isolation
	GVRP (GARP VLAN Registration Protocol)
	MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Voice VLAN
	Static (Hash with SA, DA, IP, TCP/UDP port), up to 6 trunk group
Spanning Tree MRP (IEC62439-2)	Dynamic (IEEE 802.3ad LACP), up to 6 trunk group
	IEEE 802.1D STP, IEEE 802.1W RSTP, IEEE 802.1S MSTP
Multiple μ-Ring	Supported
	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 <20ms The maximum number of devices in the ring supports 250 nodes.
Loop Protection ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Supported
	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported

QoS Features

Class of Service	IEEE 802.1p 8 active priorities queues for per port
Traffic Classification QoS	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
Bandwidth Control for Ingress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
Bandwidth Control for Egress	100~1,000,000 when the "Unit" is "kbps", and 1~1,000 when the "Unit" is "Mbps"
	Per queue / Port shaper
DiffServ (RF 2474) Remarking	
Storm Control	for Unicast, Broadcast, 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, Authorization, Accounting
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 USB console

Management Features

CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Supports for management and monitoring
SW & Configuration Upgrade	SFTP, TFTP, HTTPS, HTTP, FTP
	Redundant firmware in case of upgrade failure
FTP client	Supports for upload/download configuration
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP v4	Server, Client, Relay, Relay option 82, Snooping
ARP Inspection	Supported
IP Source Guard	Supported
Port Mirroring	Supported
Event Syslog	Syslog server (RFC3164) (Support 4 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
NTP V4.0, 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 SIP, Subnet (32bit) L4: TCP/UDP
IPv6 Source Guard	Supported
DHCPv6	Relay, Snooping

Others Features

Green Ethernet	Determine the cable length and lowering the power for ports with short cables
	Lower the power for a port when there is no link

Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		Input Power			Certification		
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP	110/220 VAC	110/135 VDC	24/48 VDC	EN62368-1	CE FCC	EN50121-4 EN61000-6-2 EN61000-6-4
IPS-AG804SM-HPR-AC	V	12	8	4	1			V	V	V
IPS-AG804SM-HPR-HV	V	12	8	4		1		V	V	V
IPS-AG804SM-HPR-LV	V	12	8	4			1	V	V	V

Optional Accessories**■ Auto Backup Kit**

BUK1-USB	Backup kit for USB Type-C Console Managed Switch
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■ Wall Mount Kit

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

MDR-40-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ 70°C
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