IPR-AMG2404X-HPR

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

- *Static Routing, RIP v1, RIP v2, OSPF v2, VRRP v2/v3*
- *IEC62439-3 Clause 5 High-Avail-Seamless-Redundancy (HSR)*
- *IEC62439-3 Clause 4 Parallel-Redundancy-Protocol (PRP)*
- *Supports μ-Ring, ERPS, APS, MSTP, RSTP, STP for Redundant Cabling*
- *Supports Maximum up to 14 μ-Rings in One Device*
- *IEC 61850-3, IEEE1613, EN62368-1, EN50121-4, EN61000-6-2/4, CE and FCC Certified*
- *4KV Surge Protection for RJ45 and SFP Ports*



The IEC 61850-3 industrial modular Layer 3 10G Ethernet Switch, IPR-AMG2404X series, adopted an enhanced and hardened design to meet critical and centralized strict requirements. It provides up to 24 Gigabit Ethernet ports, which can be implemented by 2 types of Ethernet module of 8-port Gigabit copper and 8-port SFP slot, and comes with 4 ports of 10G/1G SFP+ slot for uplink or to build up a HSR/PRP seamless redundant networking topology, in addition its isolated redundant power input can improve system reliability and uninterrupted availability of the network backbone. This switch is ideal for smart grids, utilities, and substations.

Features

- 3 modular slots, each supporting 8-port copper or fiber modules
- Redundant isolated high voltage 100/220/240VAC (85~264VAC), 100/110/125/135VDC (88-370VDC) or 24/48VDC (24-72VDC)
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support μ-Ring, u-Chain or Sub-Ring for flexible networking applications
- IEC62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant
- μ-Ring redundancy, recovery time <20ms in 250 devices
- 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 802.3ae	10 Gbit/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)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	ITU-T G.8031 / Y.1342	APS (Automatic Protection Switching)
	IEC62439-2	Media Redundancy Protocol (MRP)
	IEC62439-3	Clause 4 (PRP)
	IEC62439-3	Clause 5 (HSR)
	IEEE 802.1Q	Virtual LANs (VLAN)

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Standard	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)
VLAN ID	4094 IEEE 802.1Q VLAN ID	
Switch Architecture	Back-plane (Switching Fabric): 128Gbps (Full wire-speed)	
Throughput	95.2Mpps 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	
	All SFP support DDMI	
	All RJ45 support Auto negotiation speed, auto MDI/MDI-X function	
Console	USB Type-C or RS-232 (RJ-45)	
Reset	Recessed reset button	
Network Cable	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)	
Protocols	CSMA/CD	
Reverse Polarity	Protection for input power	
Overload Current	Protection Supported	
Power Supply	Redundant 2x High AC/DC input power (-HH model) Redundant 2x DC input power (-DD model) High AC/DC input power(H) : Isolated 110/220VAC (85~264VAC), 100/110/125/135VDC (88~370VDC), Removable Terminal Block DC input power (D) : Isolated 24/48 (24~72VDC), Removable Terminal Block	
Power Consumption	TBD	
LED	System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)	
	IPM-A8GT: UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) IPM-A8GS: SFP Slot: Link/Active (Amber) 10G SFP Slot: 1G/2.5G/5G Link/Active (Amber), 10G Link/Active (Blue)	
Jumbo Frame	9KB	
MAC Address Table	16K	
Memory Buffer	1.5M Bytes 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, 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	356 x 440 x 44mm (D x W x H))	
Weight	TBD	
Installation Mounting	19" rack mount	
MTBF	TBD	
Warranty	5 years	
Certification		
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 4, Criteria B
	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
Power Substation	IEC 61850-3, IEEE1613
Safety	EN62368-1
Hi Pot Protection	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
4KV Surge Protection	Supported for RJ45 and SFP ports
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

Software Specifications

L3	
IPv4/v6 Static Routing	Supported
RIP v1/v2 Dynamic Routing	Supported
OSPF v2, OSPF v3 Dynamic Routing	Supported
L3 Redundancy	VRRP v2/v3
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 (Ethernt, 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)
	Voice VLAN
Link Aggregation (Port Trunk)	Static (IEEE 802.3ad LACP), Maximum trunk group : 14group
	Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 14group
	Per group up-to 8 port
Spanning Tree	IEEE 802.1D STP, IEEE 802.1W RSTP, IEEE 802.1S MSTP
Multiple μ-Ring	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications
	Recovery time <20ms
	The maximum number of device is allowed 250 nodes in a Ring.
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms
	Single Ring, Sub-Ring, Multiple ring topology
ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)	Supported
QoS Features	
Class of Service	IEEE 802.1p 8 active priorities queues 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	Per port based
Bandwidth Control for Egress	Per port based
	Per queue / Per 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, Authorization and 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 RS-232 console
Management Features	
CLI	Cisco® like CLI
Web UI	Supported
Telnet	Server
SNMP	V1, V2c, V3
sFlow	Supported
Modbus/TCP	Supports 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
DNS	Client, Proxy
IEEE 1588 PTP v2	Supports OC (Ordinary Clock) ordinary
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
Other Features	Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link

*Future release

Ordering Information

Model Name	Managed	Total Ports (Max)	Extension Port	Modular Slot	Power Input (Redundant)	Certification			
			1000/10GB Base-X	See Module Selection Table for Optional		EN62368-1	CE FCC	IEC 61850-3 IEEE1613	EN50121-4 EN61000-6-2 EN61000-6-4
IPR-AMG2404X-HPR-HH	Layer 3	28	4x SFP	3	100~240VAC / 100~135VDC	V	V	V	V
IPR-AMG2404X-HPR-DD	Layer 3	28	4x SFP	3	24/48VDC	V	V	V	V

Module Selection

Model Name	100/1000Base-X SFP	10/100/1000Base-T(X) RJ45
IPM-A8GT		8
IPM-A8GS	8	

Optional Accessories

■ Auto Backup Kit

BUK1-USB	Backup kit for USB Type-C Console Managed Switch

■ 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

XDR-240E-48	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 240W, -40 ~ 70°C (For DC type)