ORing RGS-PR9000-A Series

Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed

Gigabit Ethernet switch up to 24 1G ports plus 4 10G ports

Features

➤ Designed for power substation fully compliant with the requirement of IEC 61850-3 and IEEE 1613

➤ Modular designed makes network planning easy

➤ Support static routing and route redistribution for IPv4 and IPv6

➤ Support routing protocols – RIP v1/v2, OSPF, DVMRP, PIM-SM, PIM-DM

➤ Support VRRP for router redundancy

➤ Support **O-Ring** (recovery time < 30ms) and MSTP (RSTP/STP compatible) for Ethernet Redundancy

➤ **O-Chain** allow multiple redundant network rings

➤ Support Modbus TCP

➤ Provided HTTPS/SSH/SSL protocol to enhance network security

➤ Support IEEE 802.3az **Energy-Efficient Ethernet** technology

➤ Support SMTP client and SNTP server protocol

➤ Support TFTP transmission protocol

➤ Support IP-based bandwidth management

➤ Support application-based QoS management

➤ IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic

➤ Support SNMP v1/v2c/v3 & 802.1Q VLAN Network Management

➤ Support multicast MIB (RFC 2932)

➤ Support port mirror function to monitor port data

➤ Support ACL, TACACS+ and 802.1x User Authentication for security

➤ Support 10KBytes Jumbo Frame

➤ Multiple notification for warning of unexpected event

➤ Web-based ,Telnet, Console (CLI), and Windows utility (**Open-Vision**) configuration

➤ Support multiple levels of CLI user privileged

➤ Support backup unit device **DBU-01** to quickly configuration backup/restore

➤ Support redundant power inputs with optional voltage range
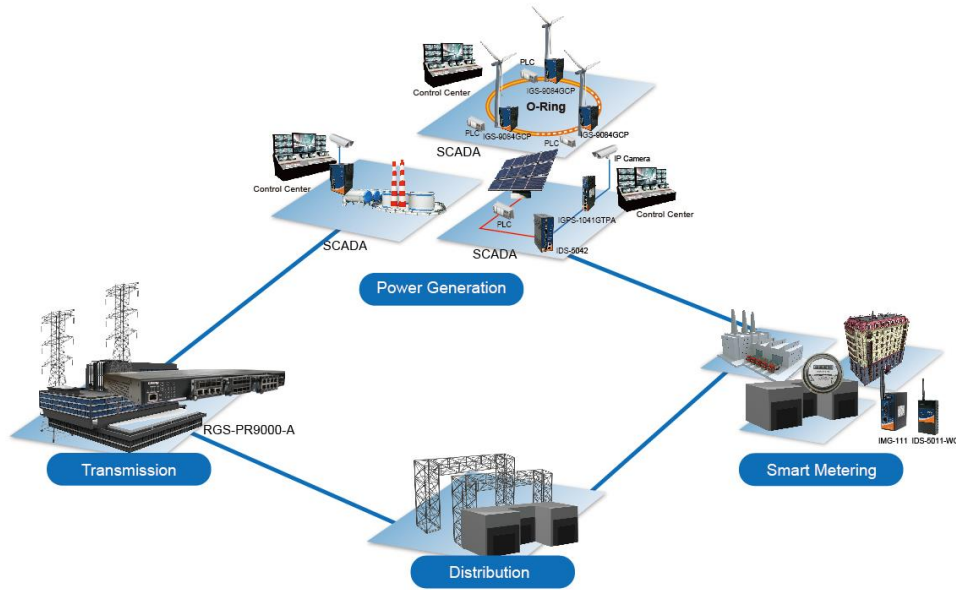
➤ 19 inches rack mountable design

Introduction

RGS-PR9000-A is advanced Layer 3 modular managed redundant ring Ethernet switch with 3 module slots. The switch is designed for power substation application, fully compliant with the requirement of IEC 61850-3, IEEE 1613. It also supports routing protocols OSPF which are suitable for large scale network environment. With completely support of Ethernet Redundancy protocol, **O-Ring** (recovery time < 20ms) and MSTP (RSTP/STP compatible) can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. Otherwise, support wide operating temperature from -20℃ to 60℃ when running with 10G ports, and it's up to -40℃ to 75℃ without 10G ports. RGS-PR9000-A can also be managed centralized and convenient by Open-Vision, besides the Web-based interface, Telnet and console (CLI) configuration. Therefore, the switch is one of the most reliable choices for power substation application.
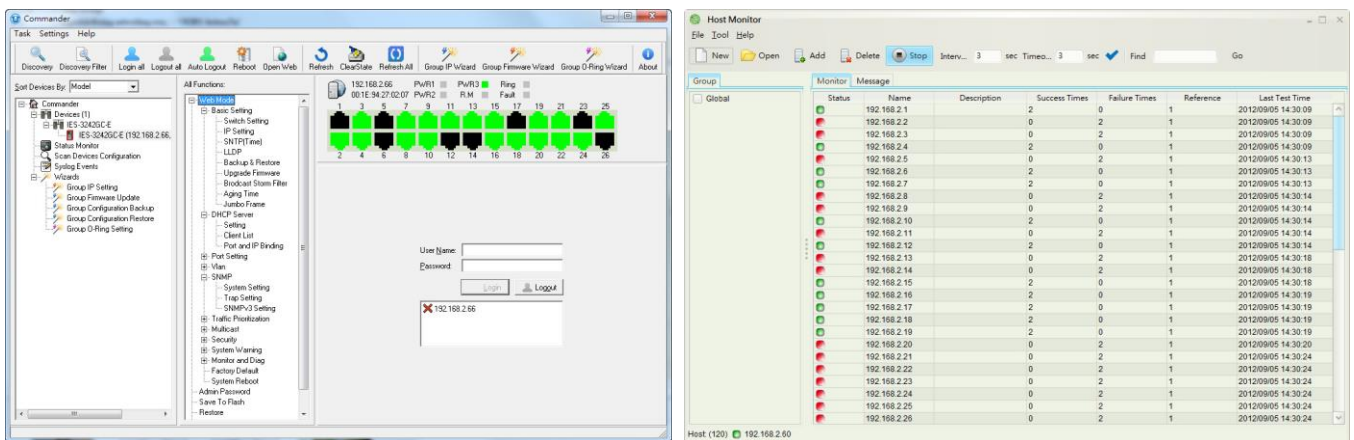
- **O-Ring :** O-Ring is ORing's proprietary redundant ring technology, with recovery time of less 30 milliseconds. The O-Ring redundant ring technology can protect mission-critical application from network interruptions or temporary malfunction with its fast recover technology.
- **O-Chain :** O-Chain is the revolutionary network redundancy technology that provides the add-on network redundancy topology for any backbone network, O-Chain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound network topology. O-Chain providing ease-of-use while maximizing fault-recovery swiftness, flexibility, compatibility, and cost-effectiveness in one set of network redundancy topology.
- **Application-Based QoS :** The switch also support application-based QoS. Application-based QoS can set highest priority for data stream according to TCP/UDP port number.
- **Modbus TCP :** This is a Modbus variant used for communications over TCP/IP networks.
- **IEEE 802.3az Energy-Efficient Ethernet :** This is a set of enhancements to the twisted-pair and backplane Ethernet family of networking standards that will allow for less power consumption during periods of low data activity. The intention was to reduce power consumption by 50% or more.
- **Modular Designed :** Modular designed can makes network planning easy and allow greater flexibility by letting you install other Ethernet/Optical fiber modular.

Note : The product is unsupported hot plug function, if need to change switch module must be power off then can change.
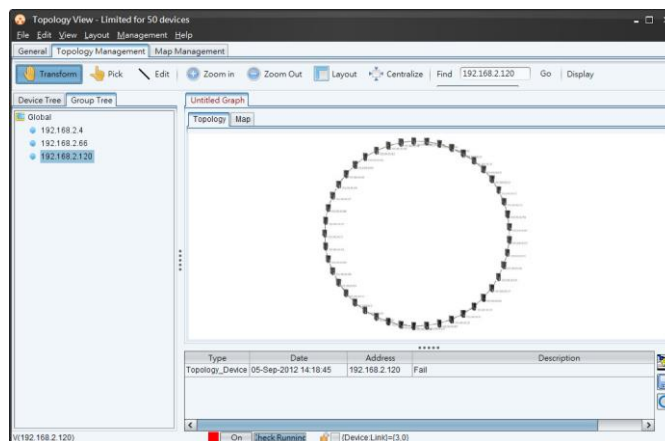
Open-Vision

ORing's switches are intelligent switches. Different from other traditional redundant switches, ORing provides a set of Windows utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.
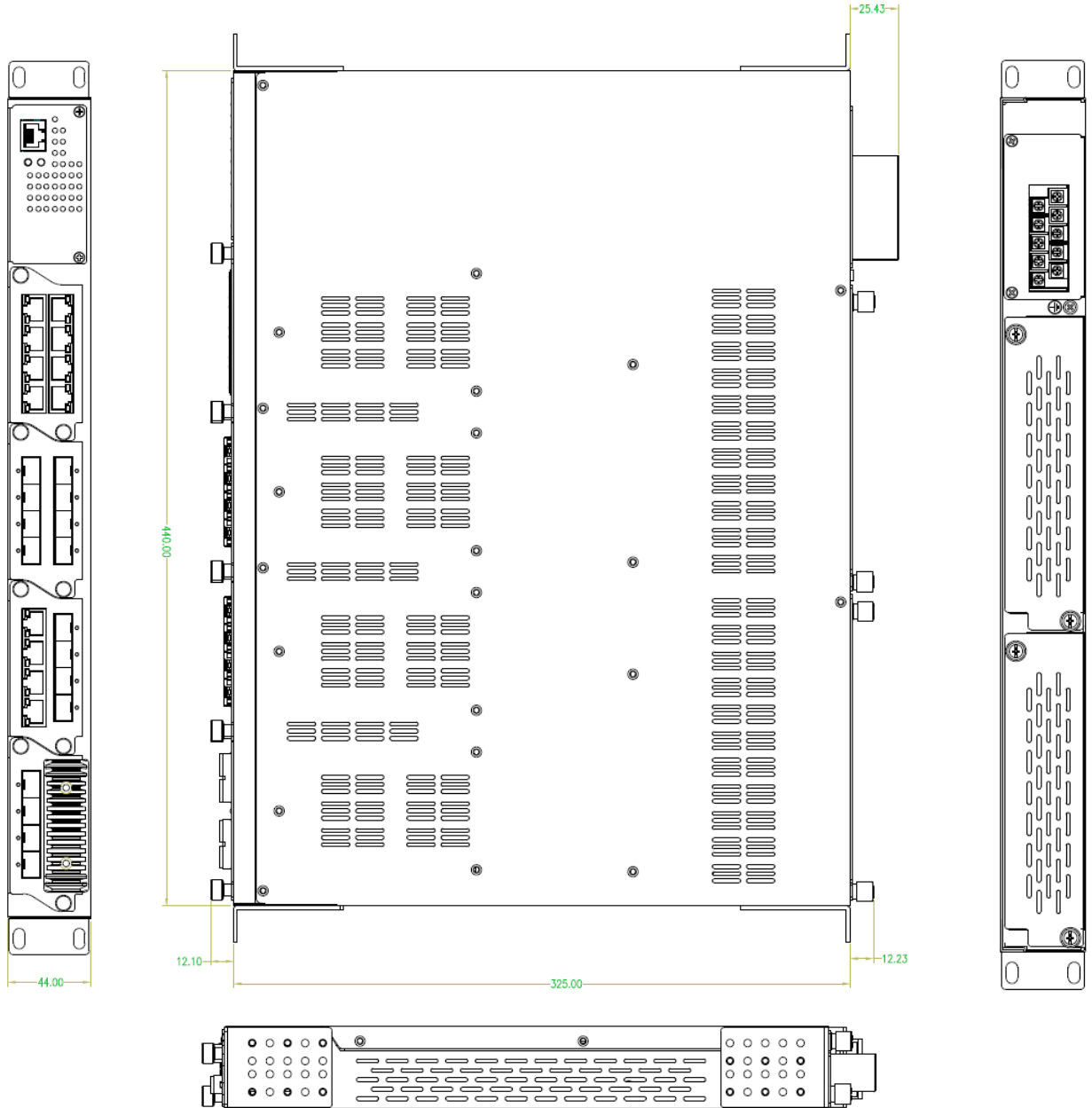

Commander

Host Monitor

Topology View

Dimension

Unit = mm

Specifications

ORing Switch Model	RGS-PR9000-A-LV	RGS-PR9000-A-LV (10G)	RGS-PR9000-A-HV	RGS-PR9000-A-HV (10G)
Physical Ports				
Slot Number	3			
10G Base-X with SFP+ port	NA	4	NA	4
Technology				
Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX and 100Base-FX IEEE 802.3ab for 1000Base-T IEEE 802.z for 1000Base-X IEEE 802.3ae for 10Gigabit Ethernet IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.1p for COS (Class of Service) IEEE 802.1Q for VLAN Tagging IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol) IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol) IEEE 802.1x for Authentication IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)			
CPU	Core clock 800MHz			
SDRAM Size	DDR2 512MBytes			
Flash ROM Size	64MBytes NAND Flash			
MAC Table	16k			
Priority Queues	8			
Processing	Store-and-Forward			
Switch Properties	Switching latency: 7 us Switching bandwidth: 128Gbps Max. Number of Available VLANs: 256 IGMP multicast groups: 128 for each VLAN Port rate limiting: User Define			
Jumbo frame	Up to 10K Bytes			
Security Features	Enable/disable ports, MAC based port security Port based network access control (802.1x) MAC-based authentication VLAN (802.1Q) to segregate and secure network traffic SNMPv3 encrypted authentication and access security Https / SSH / SSL enhance network security Web and CLI authentication and authorization IP source guard			
Software Features	Routing protocols – static routing, RIP v1/v2, OSPF, BGP, DVMRP, PIM-SM, PIM-DM VRRP for router redundancy IEEE 802.1D Bridge, auto MAC address learning/aging and MAC address (static) MMRP and MVRP MSTP/RSTP/STP Ethernet redundancy Redundant Ring (O-Ring) with recovery time less than 30ms over 250 units TCP/IP stack for IPv4 and IPv6 (including ARP, ICMP, ND, UDP) GARP, GMRP and GVRP TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic Private VLANs PVRST+ (Per VLAN Rapid Spanning Tree Protocol - enhanced) Q-in-Q VLAN tunneling and provider bridging IGMP snooping/filtering/Proxy RADIUS client SNMP v1/v2c/v3 agent and MIB support IP-based bandwidth management Application-based QoS management DHCP Server/Client/Relay for IPv4 SMTP Client SNTP Server TFTP			
Industrial Protocol	Modbus TCP			
Network Redundancy	O-Ring			

	O-Chain MSTP/RSTP/STP			
RS-232 Serial Console Port	RS-232 in RJ-45 connector with console cable. 115200bps, 8, N, 1, and support backup unit			
LED Indicators				
System Ready Indicator (PWR)	Green: Indicates that the system ready. The LED is blinking when the system is upgrading firmware			
Power Indicator (PWR1 / PWR2)	Green: Power LED x 2			
Ring Master Indicator (R.M.)	Green: Indicates that the system is operating in O-Ring Master mode			
O-Ring Indicator (Ring)	Green : Indicates that the system operating in O-Ring mode Green Blinking: Indicates that the Ring is broken.			
Fault Indicator (Fault)	Amber: Indicate unexpected event occurred			
Reset To Default Running Indicator (DEF)	Green: System resets to default configuration			
Supervisor Login Indicator (RMT)	Green: System is accessed remotely			
Smart LED Display system	Link (LINK) / Speed(SPD) / Duplex(FDX) / Remote (RMT) green LED indicator x 4 Mode select Button (MODE) : Link(LINK) / Speed(SPD) / Duplex(FDX) / Remote (RMT) mode select button Port 1 ~ 28 Link LED show : Green x 28			
Fault Contact				
Relay	Relay output to carry capacity of 1A at 24VDC			
Power				
Redundant power input modular	Dual 24/48VDC (24~72VDC) power inputs at terminal block		Dual 100~240VAC / 100~370VDC power inputs at terminal block	
Power consumption (Typ.)	46watts		43.5watts	
Overload current protection	Present			
Reverse Polarity Protection	Present			
Physical Characteristic				
Enclosure	19 inches rack mountable			
Weight (g) without modules	4610g	4,950g	4760g	5,100g
Dimension (W x D x H)	440(W) x 325(D) x 44(H) mm (17.32x12.8x1.73 inches)			
Environmental				
Storage Temperature	-40 to 85ºC (-40 to 185 ºF)			
Operating Temperature	-40 to 75 ºC (-40 to 158 ºF)	-20 to 60ºC(-40 to 140 ºF)	-40 to 75 ºC(-40 to 158 ºF)	-20 to 60ºC(-40 to 140 ºF)
Operating Humidity	5% to 95% Non-condensing			
Regulatory Approvals				
EMC	EN 55022, EN 55024 (CE EMC), EN 50121-1, EN 50121-4, FCC, IEC 61000-3-2, IEC 61000-3-3			
EMI	CISPR 22, FCC Part 15B Class A			
EMS	IEC 61000-4-2 (ESD), IEC 61000-4-3 (RS), IEC 61000-4-4 (EFT), IEC 61000-4-5 (Surge), IEC 61000-4-6 (CS), IEC 61000-4-8 (PFMF), IEC 61000-4-11 (DIP)			
Shock	IEC 60068-2-27,			
Free Fall	IEC 60068-2-31			
Vibration	IEC 60068-2-6			
Safety	EN60950-1			
Power Automation	IEC 61850-3, IEEE 1613 (pending)			
Warranty	5 years			
MTBF	130,166hrs			

Ordering Information

	Model Name	Description
Available Model	**RGS-PR9000-A-LV**	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 3x8-ports slots, low-voltage power input
	RGS-PR9000-A-HV_US	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 3x8-ports slots, high-voltage power input, US power cord
	RGS-PR9000-A-HV_UK	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 3x8-ports slots, high-voltage power input, UK power cord
	RGS-PR9000-A-HV_EU	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 3x8-ports slots, high-voltage power input, EU power cord
	RGS-PR9000-A-HV_JP	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 3x8-ports slots, high-voltage power input, JP power cord
	RGS-PR9000-A-LV (10G)	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4x10G, and 3x8-ports slots, low-voltage power input
	RGS-PR9000-A-HV_US (10G)	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4x10G, and 3x8-ports slots, high-voltage power input, US power cord
	RGS-PR9000-A-HV_UK (10G)	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4x10G, and 3x8-ports slots, high-voltage power input, UK power cord
	RGS-PR9000-A-HV_EU (10G)	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4x10G, and 3x8-ports slots, high-voltage power input, EU power cord
	RGS-PR9000-A-HV_JP (10G)	Industrial advanced Layer 3 IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4x10G, and 3x8-ports slots, high-voltage power input, JP power cord

Optional Ethernet Module

For 1 G slot:

	SWM-80GT-A	
	Industrial 8-port Gigabit Ethernet switch module with 8x10/100/1000Base-T(X) ports	
	Weight:	272g
	MTBF:	TBD

	SWM-08GP-A	
	Industrial 8-port Gigabit fiber module with 8x100/1000Base-X, SFP socket	
	Weight:	192g
	MTBF:	TBD

	SWM-44GTP-A	
	Industrial 8-port Gigabit Ethernet switch module with 4x10/100/1000Base-T(X) and 4x100/1000Base-X, SFP socket	
	Weight:	232g
	MTBF:	TBD

Packing List

- **RGS-PR9000-A x 1 /**
  RGS-PR9000-A (10G) x1
- **ORing Tool CD x 1**
- **Console Cable x 1**
- **Quick Installation Guide x 1**
- **Rack-mount Kit x 1**

Optional Accessories

- **Open-Vision M500 : Powerful Network Management Windows Utility Suit, 500 IP devices**
- **SFP 1G series : 1Gbps SFP optical transceiver**
- **SFP 10G series : 10Gbps SFP+ optical transceiver**
- **DR-75 series : 75 Watts DIN-Rail power supply**
- **DR-120 series : 120 Watts DIN-Rail power supply**