GIGABIT SWITCH MANAGED Rack-Mount

ORing 2TEST

Version 1.2

Quick Installation Guide

RGS-PR9000-A Series

Managed Gigabit Ethernet Switch

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 and rolling stock application, fully compliant with the requirement of IEC 61850-3, IEEE 1613 and EN 50121-4. With completely support of Ethernet Redundancy protocol, O-Ring (recovery time < 30ms 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 °C to 60 °C when running with 10G ports, and up to -40 °C to 85 °C without 10G port, **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 choice for highly-managed and Fiber Ethernet power substation and rolling stock application.

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

Package Contents

Contents	Pictures	Number
RGS-PR9000-A-LV (10G) or RGS-PR9000-A-HV (10G) or RGS-PR9000-A-LV or RGS-PR9000-A-HV		X 1
Console Cable		X 1
CD		X 1
QIG		X 1
Screw (M3 X4)		X 8
Rack-mounted kit (L&R)		X 1

Preparation

Before you begin installing the switch, make sure you have all of the package contents available and a PC with Microsoft Internet Explorer 6.0 or later, for using web-based system management tools.

Safety & Warnings

Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

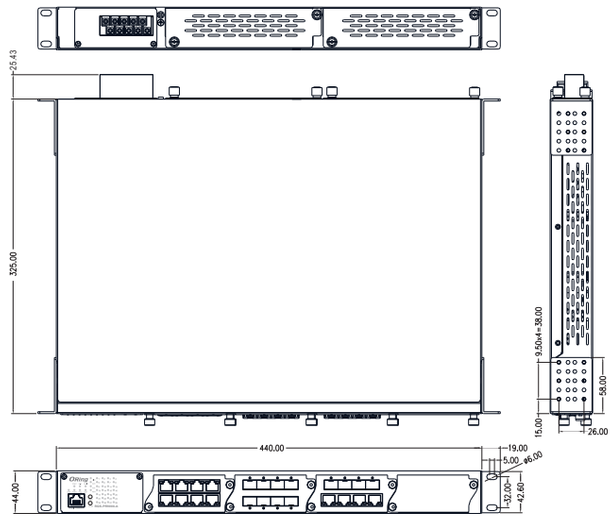
Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

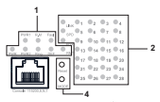
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

External metal parts of this equipment are extremely hot!! Before touching the equipment, be sure to protect your hands and body from serious injury.

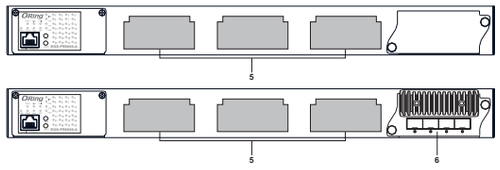
Dimension



Panel Layouts



1. System indication LEDs: PWR/PWR1 /PWR2/R.M/Ring/Fault/DEF
2. Port status LEDs: LINK/ SPD/ FDX/ port number
3. Console port
4. Buttons: Rest/LED Mode (Press Reset for 3 seconds to reset and 5 seconds to return to factory default. To change port LED mode, press the Mode button)
5. RJ-45/SFP module slots
6. 10G Ethernet ports



Non-10G model

10G model

Supported Modules

Modules	Description	
SWM-80GT-A	Industrial 8-port Gigabit Ethernet switch module with 8x10/100/1000Base-T(X) ports	Gigabit Ethernet module
SWM-44GTP-A	Industrial 8-port Gigabit Ethernet switch module with 4x10/100/1000Base-T(X) and 4x100/1000Base-X, SFP socket	Gigabit combo module
SWM-08GP-A	Industrial 8-port Gigabit fiber module with 8x100/1000Base-X, SFP socket	SFP module

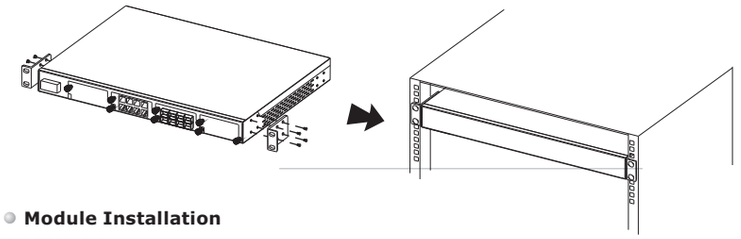
Installation

Rack-mounting

Step 1: Install left and right front mounting brackets to the switch using 4 M3 screws on each side provided with switch.

Step 2: With front brackets orientated in front of the rack, nest front and rear brackets together. Fasten together using remaining M4 screws into counter sunk holes.

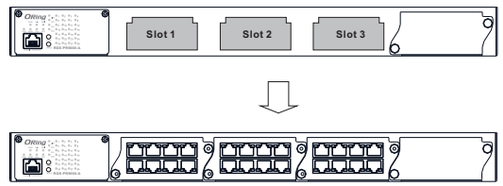
Step 3: Fasten the front mounting bracket to the front of the rack.



Module Installation

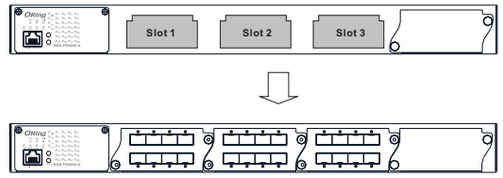
RJ-45 Module

The switch supports maximum three RJ-45 modules, giving you a total of 24 RJ-45 ports. Follow the steps bellows for installation.
Step 1: Switch off the power of the switch.
Step 2: Insert the modules in Slot 1,2, and 3 respectively.
Step 3: Switch on the power of the switch



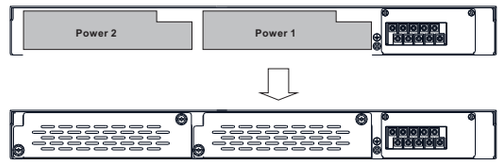
SFP Module

The switch supports maximum three SFP modules, giving you a total of 24 SFP ports. Follow the steps bellows for installation.
Step 1: Switch off the power of the switch.
Step 2: Insert the modules in Slot 1,2, and 3 respectively.
Step 3: Switch on the power of the switch



Power Module

The switch supports maximum two power modules. Follow the steps bellows for installation.
Step 1: Switch off the power of the switch.
Step 2: Insert the modules in Power 1 and 2 slots respectively.
Step 3: Switch on the power of the switch



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Network Connection

The device comes with standard Ethernet ports. According to the link type, the switch uses CAT 3, 4, 5,5e UTP cables to connect to any other network devices (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable Types and Specifications:

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100-ohm	UTP 100 m (328 ft)	RJ-45
100BASE-TX	Cat. 5 100-ohm UTP	UTP 100 m (328 ft)	RJ-45
1000BASE-T	Cat. 5/Cat. 5e 100-ohm UTP	UTP 100 m (328ft)	RJ-45

For pin assignment, please refer to the following tables.

10/100Base-T(X) RJ-45 Port Pin Assignments	
Pin No.	Assignment
1	TD+
2	TD-
3	RD+
6	RD-

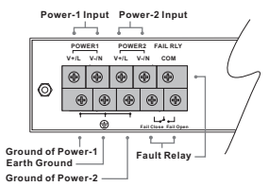
10/100Base-T(X) MDI/MDI-X Pin Assignments		
Pin No.	MDI port	MDI-X port
1	TD+(transmit)	RD+(receive)
2	TD-(transmit)	RD-(receive)
3	RD+(receive)	TD+(transmit)
4	Not used	Not used
5	Not used	Not used
6	RD-(receive)	TD-(transmit)
7	Not used	Not used
8	Not used	Not used

1000Base-T MDI/MDI-X Pin Assignments		
Pin No.	MDI port	MDI-X port
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

Wiring

Power inputs

The RGS-PR9000-A series support dual redundant power supplies, Power Supply 1 (PWR1) and Power Supply 2 (PWR2). The connections for PWR1, PWR2 and the RELAY are located on the terminal block.



STEP 1: Remove the transparent protective cover from the terminal block
STEP 2: Insert the negative/positive DC wires into the V-/V+ terminals, respectively.
STEP 3: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.
STEP4: After wiring is completed, put the transparent cover back to the terminal block.

Relay contact

The switch provides fail open and fail close options for you to form relay circuits based on your needs. If you want the relay device to start operating at power failure, attach the two wires to COM and fail close to form a close circuit, vice versa. The relay contact of the 2-pin terminal block connector will respond to user-configured events according to the wiring.

Grounding

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screws to the grounding surface prior to connecting devices.

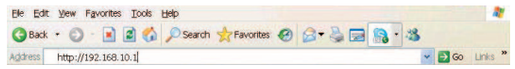
Configurations

After installing the RGS-PR9000-A and connecting cables, start the switch by turning on power. The green power LED should turn on.

LED indication table

LED	Color	Status	Description
PWR	Green	On	DC power on
		Blinking	Upgrading firmware
PW1	Green	On	DC power module 1 activated
PW2	Green	On	DC power module 2 activated
R.M	Green	On	Ring Master
Ring	Green	On	Ring enabled
		Slowly blinking	Ring structure is broken (i.e. part of the ring is disconnected)
		Fast blinking	Ring disabled
Fault	Amber	On	Errors (power failure or port malfunctioning)
DEF	Green	On	System reset to default
RMT	Green	On	Accessed remotely
LNK	Green	On	Port link up
SPD	Green	Blinking	Data transmitted
FDX	Amber	On	Port works under full duplex.

1. Launch the Internet Explorer and type in IP address of the switch. The default static IP address is **192.168.10.1**



2. Log in with default user name and password (both are **admin**). After logging in, you should see the following screen. For more information on configurations, please refer to the user manual. For information on operating the switch using ORing's Open-Vision management utility, please go to ORing website.

Resetting

To reboot the switch, press the **Reset** button for 5 seconds.

To restore the switch configurations back to the factory defaults, press the **Reset** button for 5 seconds.

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 802.3z for 1000Base-X IEEE 802.3ab for 1000Base-T 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	Switch latency: 7 us Switch 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 (801.1x) VLAN (802.1Q) to segregate an secure network traffic SNMPv3 encrypted authentication and access security Https / SSH enhance network security Web and CLI authentication and authorization IP source guard
Software Features	Routing protocols - static routing,RIP v1/2, OSPF, 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 Portocol	Modbus TCP
Network Redundancy	O-Ring O-Chain MSTP/RSTP/STP
RS-232 Serial Console Port	RS-232 in RJ45 connector with console cable. 115200bps, 8, N, 1
Fault contact	
Relay	Relay output to carry capacity of 3A 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 max. / 43.5Watts max.
Overload current protection	Present
Reverse Polarity Protection	Present
Physical Characteristic	
Enclosure	19 inches rack mountable
Weight (g)	4610g / 4950g / 4760g / 5100g
Dimension (W x D x H)	440 (W) x 325 (D) x 44 (H) mm (17.32 x 12.8 x 1.73 inches)
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F) / -20 to 60°C (-4 to 140°F) / -40 to 85°C (-40 to 185°F) / -20 to 60°C (-4 to 140°F)
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	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
Safety	EN60950-1
Power Automation	IEC 61850-3, IEEE 1613 (pending)
Warranty	5 years
MTBF	130, 166hrs