

## Quick Installation Guide

## RES-P9242GCL Series

## IEC 61850-3 Managed Ethernet Switch






## Introduction

Compliant with IEC 61850-3 and IEEE 1613 standards, the **RES-P9242GCL** is a rack-mount managed Ethernet switch designed for industrial applications, especially for power substation applications. Featuring twenty-four 10/100Base-T(X) ports and two Gigabit combo ports, the device is able to meet the needs for high port density and high-speed, long-distance transmission. With complete support for Ethernet redundancy protocols such as O-Ring (recovery time < 30ms) O-Chain, MRP(\*NOTE), Fast Recovery and MSTP (RSTP/STP compatible) can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. Featuring a wide operating temperature from -40°C to 85°C, the device can be managed centrally and conveniently via Open-Vision, web browsers, Telnet and console (CLI) configuration, making it one of the most reliable choice for highly-managed and Fiber Ethernet power substation application.

\*NOTE: This function is available by request only

## Package Contents




The device is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.


Contents	Pictures	Number
RES-P9242GCL		X 1
Console Cable		X 1
CD		X 1
QIG		X 1
Rack-mounted kit (L&R)		X 1

## Preparation

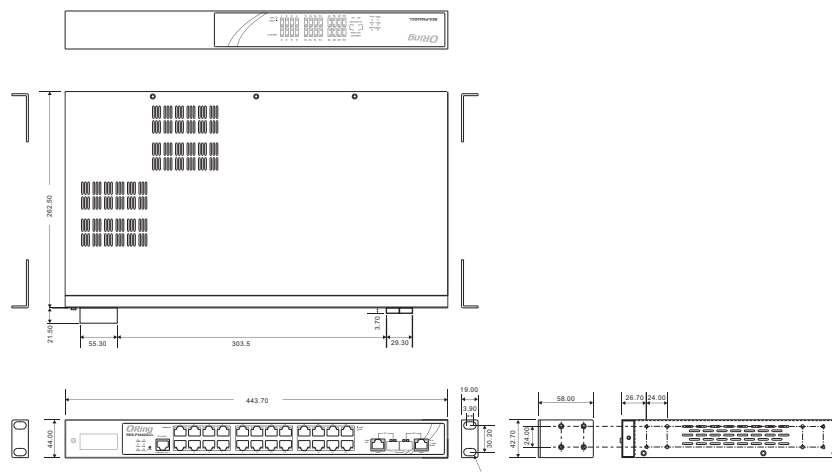
Before you begin installing the switch, make sure you have all of the package contents available and a PC with Microsoft Internet Explorer 6.0 or later, for using web-based system management tools.

## Safety &amp; Warnings

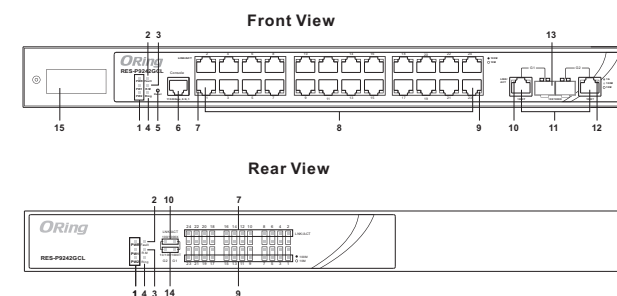
-  **Elevated Operating Ambient:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) 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.

## Dimension



## Panel Layouts



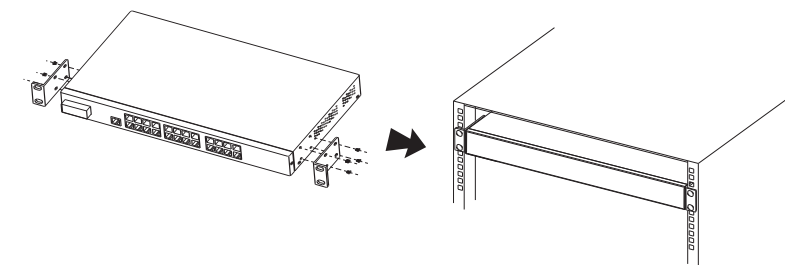
1. Power indicator
2. Fault LED
3. R.M. (Ring master) status LED
4. Ring status LED
5. Reset button
6. Console port
7. Link/ACT LED for Fast Ethernet RJ45 ports
8. Fast Ethernet RJ45 ports
9. Speed LED for Fast Ethernet RJ45 ports
10. Link/ACT LED for Gigabit Ethernet RJ45 ports
11. Gigabit Ethernet RJ45 ports
12. Speed LED for Gigabit Ethernet RJ45 ports
13. SFP port
14. Link/ACT LED for SFP ports
15. Terminal block

## Installation

## Rack-mounting

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

**Step 2:** With front brackets orientated in front of the rack, fasten the brackets to the rack using two more screws.



Note: You can install the brackets on both sides at back of the device and mount it to the rack with the rear panel facing outward if the space for front panel cabling is limited. Remember, when installing the brackets on the front sides, use the four screw holes at the top and bottom. When installing the brackets on the back sides, use the four screw holes at the top and middle.

## Network Connection

The series have 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 (328 ft)	RJ-45

With 10/100BASE-T(X) cables, pins 1 and 2 are used for transmitting data, and pins 3 and 6 are used for receiving data. The device also supports auto MDI/MDI-X operation. You can use a cable to connect the switch to a PC.

For pin assignments for different types of cables, please refer to the following tables.

1000 Base-T RJ-45			10/100 Base-T(X) RJ-45		
Pin Number	Assignment		Pin Number	Assignment	
1	BI_DA+		1	TD+	
2	BI_DA-		2	TD-	
3	BI_DB+		3	RD+	
4	BI_DC+		4	Not used	
5	BI_DC-		5	Not used	
6	BI_DB-		6	RD-	
7	BI_DD+		7	Not used	
8	BI_DD-		8	Not used	

1000base-T MDI/MDI-X			10/100 Base-T(X) MDI/MDI-X		
Pin Number	MDI port	MDI-X port	Pin Number	MDI port	MDI-X port
1	BI_DA+	BI_DB+	1	TD+(transmit)	RD+(receive)
2	BI_DA-	BI_DB-	2	TD-(transmit)	RD-(receive)
3	BI_DB+	BI_DA+	3	RD+(receive)	TD+(transmit)
4	BI_DC+	BI_DD+	4	Not used	Not used
5	BI_DC-	BI_DD-	5	Not used	Not used
6	BI_DB-	BI_DA-	6	RD-(receive)	TD-(transmit)
7	BI_DD+	BI_DC+	7	Not used	Not used
8	BI_DD-	BI_DC-	8	Not used	Not used

## Console cable

To connect the console port to an external management device, you need an RJ-45 to DB-9 cable, which is also included in the package. Please see the table for the console port pin assignment information.

PC pin out (male) assignment	RS-232 with DB9 female connector	DB9 to RJ45
Pin #2 RD	Pin #2 TD	Pin #2
Pin #3 TD	Pin #3 RD	Pin #3
Pin #5 GND	Pin #5 GND	Pin #5

RS-232 baud rate setting: 9600, 8, N, 1

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## RES-P9242GCL Series

## IEC 61850-3 Managed Ethernet Switch

### Specifications

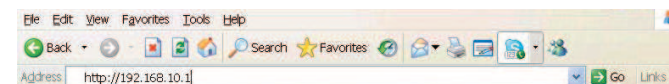
ORing Switch Model	RES-P9242GCL-LV	RES-P9242GCL-HV
<b>Physical Ports</b>		
10/100Base-T(X) Ports in RJ45 Auto MDI/MDIX	<b>24</b>	
Gigabit combo port with 10/100/1000Base-T(X) and 1000Base-X SFP	<b>2</b>	
<b>Technology</b>		
Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3ab for 1000Base-T IEEE 802.3z for 1000Base-X IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.1D for STP (Spanning Tree 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)	
MAC Table	8K	
Priority Queues	8	
Processing	Store-and-Forward	
Switch Properties	Switching latency: 7 us Switching bandwidth: 8.8Gbps Max. Number of Available VLANs: 4095 VLAN ID Range : VID 1 to 4094 IGMP multicast groups: 256 for each VLAN Port rate limiting: User Define	
Security Features	Device Binding security feature Enable/disable ports, MAC based port security Port based network access control (802.1x) MAC-based authentication(802.1x) Guest VLAN VLAN (802.1Q) to segregate and secure network traffic Radius centralized password management SNMPv3 encrypted authentication and access security HTTPS / SSH enhance network security Web and CLI authentication and authorization IP source guard	
Software Features	IEEE 802.1D Bridge, auto MAC address learning/aging and MAC address (static) Multiple Registration Protocol (MRP) MSTP (RSTP/STP compatible) Redundant Ring (O-Ring) with recovery time less than 30ms TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP v2/v3 Snooping Application-based QoS management DOS/DDoS auto prevention Port configuration, status, statistics, monitoring, security DHCP Client/Server Modbus TCP SNTP Client SNTP server	
Network Redundancy	O-Ring O-Chain MRP* <b>Note</b> Fast Recovery MSTP (RSTP/STP compatible)	
RS-232 Serial Console Port in RJ45 connector	RS-232 console cable. 9600bps, 8, N, 1	
<b>Power</b>		
Input power	Dual 24/48VDC (24~72VDC) power inputs at terminal block	Dual 125~370VDC /100~240VAC power inputs
Power consumption (Max)	19W	19.8W
Overload current protection	Present	
Reverse Polarity Protection	Present	
<b>Physical Characteristic</b>		
Enclosure	19 inches rack mountable	
Dimension (W x D x H)	443.7(W) x 262.7 (D) x 44 (H) mm (17.46x10.34x1.73 inch)	
Weight (g)	3,535g	4,050g
<b>Environmental</b>		
Storage Temperature	-40 to 85°C (-40 to 185°F)	
Operating Temperature	-40 to 85°C (-40 to 185°F)	
Operating Humidity	5% to 95% Non-condensing	
<b>Regulatory Approvals</b>		
EMC	CE EMC (EN 55024, EN 55032), FCC Part 15 B, IEC 61850/ IEE1613	
EMI	EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15B class A	
EMS	EN 55024 (IEC/EN 61000-4-2 (ESD), IEC/EN 61000-4-3 (RS), IEC/EN 61000-4-4 (EFT), IEC/EN 61000-4-5 (Surge), IEC/EN 61000-4-6 (CS), IEC/EN 61000-4-8(PFME), IEC/EN 61000-4-11 (DIP))	
Shock	IEC60068-2-27	
Free Fall	IEC60068-2-31	
Vibration	IEC60068-2-6	
Safety	EN60950-1	
Other	IEC 61850-3, IEE1613	
MTBF	297,924hrs	262,968hrs
Warranty	5 years	

\*Note: This function is available by request only

### LED indication table

LED	Color	Status	Description
PWR	Green	On	System power activated
PW1	Green	On	Power module 1 activated
PW2	Green	On	Power module 1 activated
R.M	Green	On	System running as ring master
Ring	Green	On	System running in ring mode
		Blinking	Ring structure is broken
Fault	Amber	On	Errors (power failure or port malfunctioning)
10/100Base-T(X) RJ45 port			
Link/Act	Green	On	Port is linked
Speed	Amber	On	Port runs at 100Mbps
		Off	Port runs at 10Mbps
10/100/1000 Base-T(X) RJ45 port			
Link/Act	Green	On	Port is linked
Speed	Green	On	Port runs at 1000Mbps
	Amber	On	Port runs at 100Mbps
	Green/Amber	Off	Port runs at 10Mbps
100/1000Base-X SFP Port			
Link/Act	Green	On	Port is linked

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



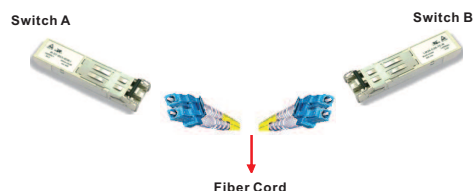
2. Log in with default user name and password (both are **admin**). After logging in, you should see the following screen. For more information on configurations, please refer to the user manual. For information on operating the switch using ORing's Open-Vision management utility, please go to ORing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



### SFP connection

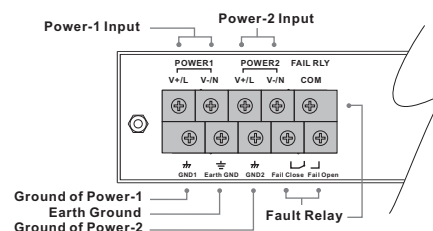
#### SC Connector

The device comes with two SFP ports that can connect to other devices using SFP modules. The SFP modules are hot-swappable input/output devices that can be plugged into the SFP ports to connect the switch with the fiber-optic network. Remember that the TX port of Switch A should be connected to the RX port of Switch B.



1. Insert clean dust plugs into the SFPs after the cables are extracted from them.
2. Clean the optic surfaces of the fiber cables before you plug them back into the optical bores of another SFP module.
3. Avoid getting dust and other contaminants into the optical bores of your SFP modules in cases of malfunction.

### Wiring



#### Power inputs

The switch supports 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 cover designed for protection from the terminal block.
- STEP 2:** Insert the negative/positive wires into the V-/V+ terminals, respectively.
- STEP 3:** To keep the wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.
- STEP 4:** 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 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 switch and connecting cables, start the switch by turning on power. The green power and status LEDs should turn on.

**ORing**

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