



RGS-P9000 Series

RGS-P9000 Series

➤ Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots

Features

- Designed for power substation / Railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- Modular designed makes network planning easy
- Supports **O-Ring** (recovery time < 30ms) and MSTP (RSTP/STP compatible) for Ethernet Redundancy
- **O-Chain** allow multiple redundant network rings
- Supports standard IEC 62439-2 MRP^{NOTE 1} (Media Redundancy Protocol) function
- Supports IEEE 1588v2 clock Synchronization
- Supports IPV6 new internet protocol version
- Supports Modbus TCP protocol
- VLAN unaware : Supports priority-tagged frames to be received by specific IEDs
- Provided HTTPS/SSH protocol to enhance network security
- Supports IEEE 802.3az **Energy-Efficient Ethernet technology**
- Supports SMTP client and SNTP server protocol
- Supports application-based QoS management
- Supports Device Binding security function
- Supports DOS/DDOS auto prevention
- IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic
- Supports SNMP v1/v2c/v3 & RMON & 802.1Q VLAN Network Management
- Supports port mirror function to monitor port data
- Support ACL and 802.1x User Authentication for security
- Supports 10K Bytes Jumbo Frame
- Multiple notification for warning of unexpected event
- Web-based ,Telnet, Console (CLI), and Windows utility (**Open-Vision**) configuration
- Support LLDP Protocol
- Support **DBU-01** backup unit device to quickly backup/restore configuration
- Supports redundant power inputs with optional voltage range
- 19 inches rack mountable design

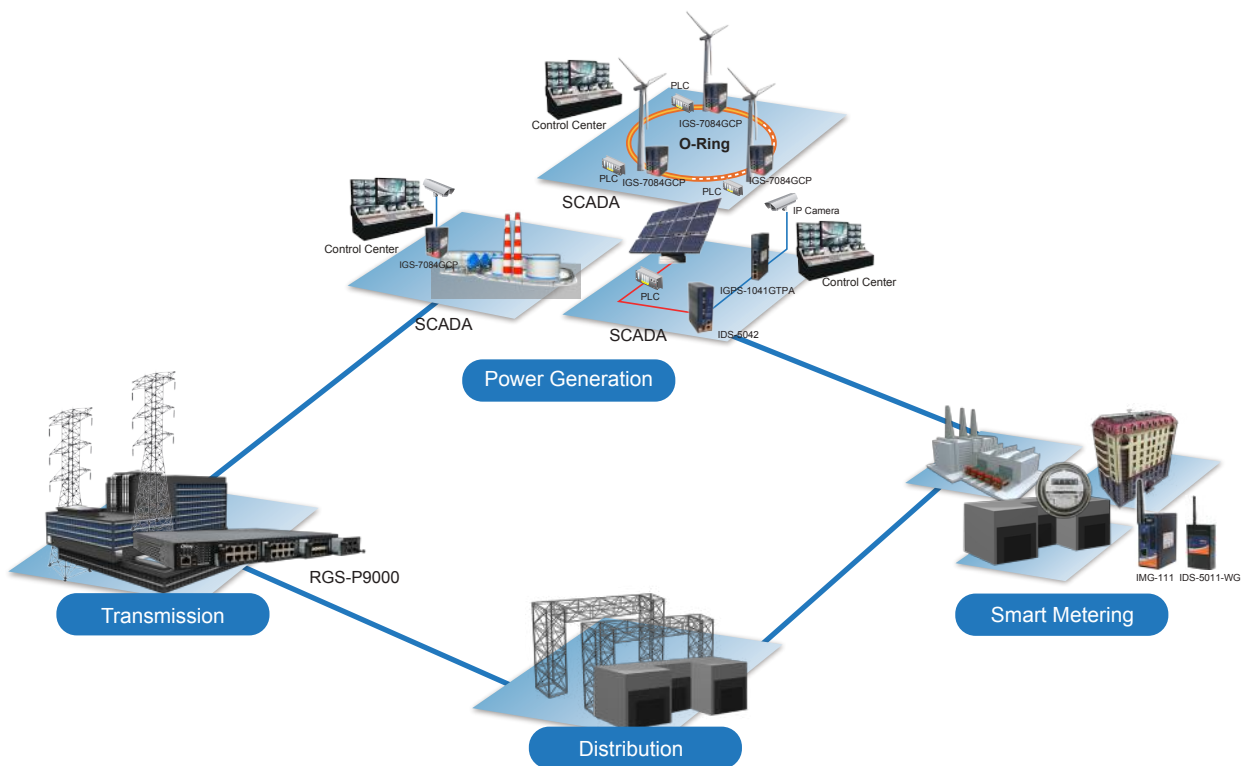


Introduction

RGS-P9000 is modular managed redundant ring Ethernet switch with 4 slots. The switch is designed for power substation application and rolling stock application, fully compliant with the requirement of IEC 61850-3 and IEEE 1613. With completely support of Ethernet Redundancy protocol, **O-Ring** (recovery time < 30ms) and MSTP (RSTP/STP compatible) can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. And support wide operating temperature from -40°C to 85°C (**If use 10G SFP module then operating temperature is -20°C ~ 60°C**). RGS-P9000 can also be managed centralized and convenient by Open-Vision, as well as 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.

*Note1: This function is available by request only

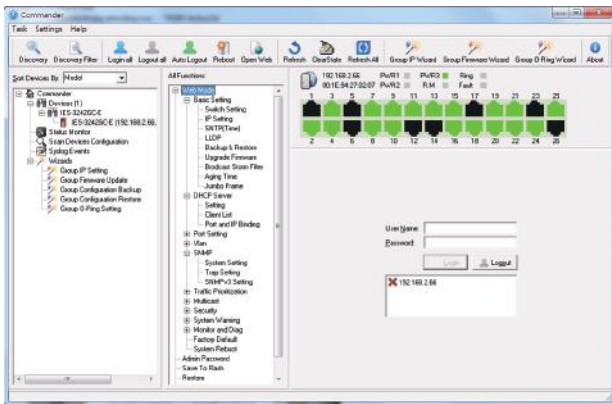
- **O-Ring** : O-Ring is ORing's proprietary redundant ring technology, with recovery time of less 30 milliseconds and up to 250 nodes. The O-Ring redundant ring technology can protect mission-critical application from network interruptions or temporary malfunction with its fast recover technology.
- **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.
- **MRP^{NOTE 1}** : Media Redundancy Protocol (MRP) is a data network protocol standardized by the IEC 62439-2. It allows rings of Ethernet switches to overcome any single failure with recovery time much faster than achievable with Spanning Tree Protocol.
- **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.
- **Device Binding Function** : ORing special Device Binding function can only permit allowed IP address with MAC address to access the network. Hacker cannot access the IP surveillance network without permission. It can avoid hacker from stealing video privacy data and attacking IP camera, NVR and controllers.
- **Advanced DOS/DDOS Auto Prevention** : The switch also provided advanced DOS/DDOS auto prevention. If there is any IP flow become big in short time, the switch will lock the source IP address for certain time to prevent the attack. It's hardware based prevention so it can prevent DOS/DDOS attack immediately and completely.
- **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.
- **IEEE 1588v2 Technology** : The IEEE 1588v2 technology can fulfill precision time synchronization requirements for protection and control applications.
- **Modular Designed** : Modular designed can makes network planning easy and allow greater flexibility by letting you install other Ethernet/Optical fiber modular.



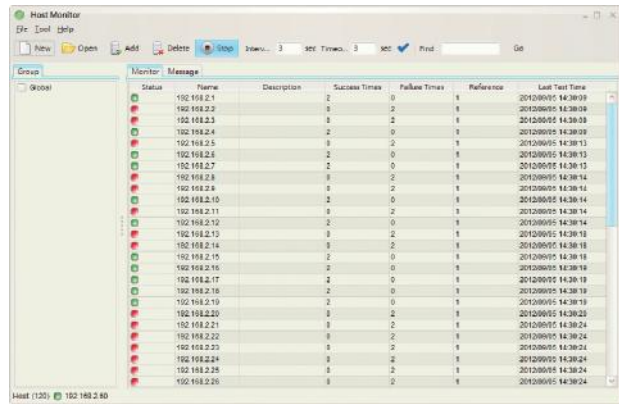
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Open-Vision

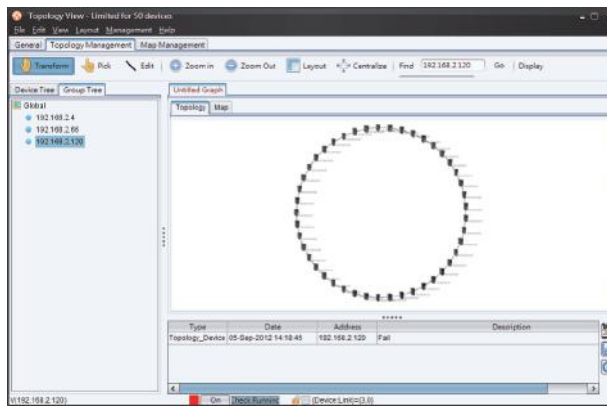
ORing's switches are intelligent switches. Different from other traditional redundant switches, ORing provides a set of Windows utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.



Commander

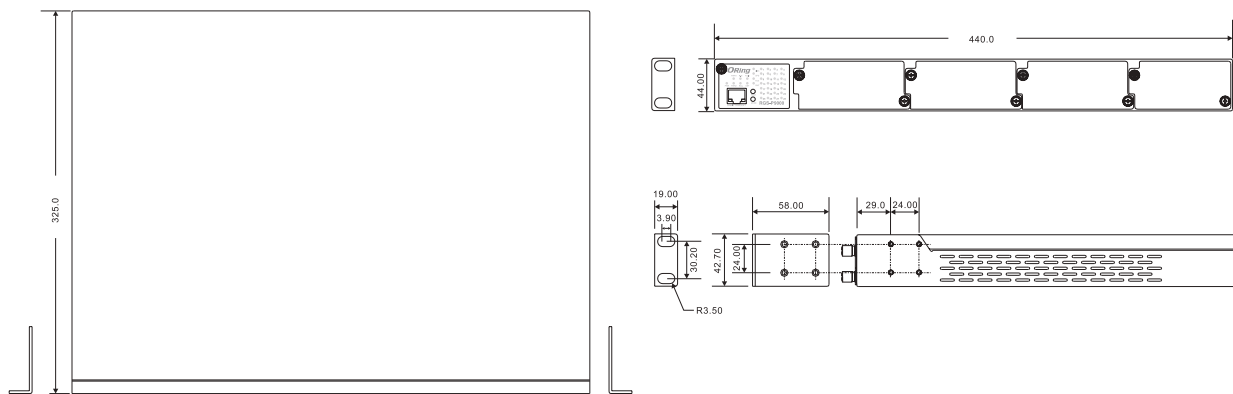


Host Monitor



Topology View

Dimensions



(Unit=mm)

Specifications

| ORing Switch Model | RGS-P9000-LV | RGS-P9000-HV |
|----------------------------|--|--------------|
| Physical Ports | | |
| Slot Number | 4 (up to 3 slots for 8x1G ports and 1 slot for 4x10G port) | |
| 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) | |
| MAC Table | 8k | |
| Packet Buffer | 32Mbits | |
| Flash Memory | 128Mbits | |
| DRAM Size | 1Gbits | |
| Jumbo frame | Up to 10K Bytes | |
| Priority Queues | 8 | |
| Processing | Store-and-Forward | |
| Switch Properties | Switching latency: 7 us Switching bandwidth: 128Gbps Max. Number of Available VLANs: 4095 VLAN ID range: VID 1 to 4094 IGMP multicast groups: 128 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) 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 1588v2 clock synchronization 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 Guest VLAN GVRP IGMP v2/v3 Snooping Application-based QoS management DOS/DDOS auto prevention Port configuration, status, statistics, monitoring, security DHCP Server/Client/Relay Modbus TCP SMTP Client SNTP server Firmware upgrade and configuration backup and restore | |
| Network Redundancy | O-Ring O-Chain MRP**NOTE 1 MSTP (RSTP/STP compatible) ERPS | |
| RS-232 Serial Console Port | RS-232 in RJ-45 connector with console cable. 115200bps, 8, N, 1 | |

*NOTE 1 : This function is available by request only

| 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/Act(LINK) / Speed(SPD) / Duplex(FDX) / Remote (RMT) green LED indicator x 4 Mode select Button (MODE) : Link/Act(LINK) / Speed(SPD) / Duplex(FDX) / Remote (RMT) mode select button Port 1 ~ 28 Link/Act(LK/ACT) 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 *NOTE 2 | Dual 100~240VAC / 100~370VDC power inputs at terminal block |
| Power consumption (Typ.) | 46Watts max. | 43.5Watts max. |
| Overload current protection | Present | |
| Physical Characteristic | | |
| Enclosure | 19 inches rack mountable | |
| | IP-30 | |
| Weight (g) | 6,450g | 6,600g |
| Dimension (W x D x H) | 440 (W) x 325 (D) x 44 (H) mm (17.32x12.8x1.73 inch) | |
| Environmental | | |
| Storage Temperature | -40 to 85°C (-40 to 185°F) | |
| Operating Temperature | 24VDC~36VDC | 10G SFP+ module absent : -40 to 75°C 10G SFP+ module used: -20 to 50 °C |
| | 36VDC~72VDC | 10G SFP+ module absent : -40 to 85°C 10G SFP+ module used: -20 to 60 °C |
| Operating Humidity | 5% to 95% Non-condensing | |
| Regulatory Approvals | | |
| EMC | EN 55032, EN 55024 (CE EMC), EN 50121-1, EN 50121-4, FCC Part 15 B, EN 61000-6-2, EN 61000-6-4, IEC 61000-3-2, IEC 61000-3-3 | |
| EMI | CISPR 32, EN 55032, FCC Part 15 B 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 | IEC 60950-1, UL 60950-1, EN60950-1 | |
| Power Automation | IEC 61850-3, IEEE 1613 | |
| Transport | NEMA TS1&TS2 | |
| MTBF ^{*NOTE 3} | 246,537 hours | 316,958 hours |
| MTBF ^{*NOTE 4} | 608,907 hours | 647,420 hours |
| Warranty | 5 years | |

***NOTE1: This function is available by request only**

***NOTE2: Different DC power inputs have different operating temperature.**

***NOTE3: The value is calculated under the combination of 3 SWM-80GT and 1 SWM-04GP+ module. (Worst case)**

***NOTE4: The value is calculated without any module slot.**

Ordering Information

| | Model Name | Description |
|---|-----------------|--|
| Available Model | RGS-P9000-LV | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, low-voltage power input |
| | RGS-P9000-HV_US | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, high-voltage power input, US power cord |
| | RGS-P9000-HV_UK | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, high-voltage power input, UK power cord |
| | RGS-P9000-HV_EU | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, high-voltage power input, EU power cord |
| | RGS-P9000-HV_JP | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, high-voltage power input, JP power cord |
| | RGS-P9000-HV_AU | Industrial IEC 61850-3 modular rack mount managed Gigabit Ethernet switch with 4 slots, high-voltage power input, AU power cord |
| Packing List | | Optional Accessories (Can be purchased separately) |
| <ul style="list-style-type: none"> RGS-P9000 x 1 Rack-mount Kit x 1 ORing Tool CD x 1 Console Cable x 1 Quick Installation Guide x 1 | | <ul style="list-style-type: none"> Open-Vision M500 : Powerful Network Management Windows Utility Suit, 500 IP devices SFP100 series : 100Mbps SFP optical transceiver SFP 1G series : 1Gbps SFP optical transceiver SFP 10G series : 10Gbps SFP optical transceiver DR/SDR/DRP Series DIN-Rail power supply DBU-01 : backup unit device |

Optional Module



For 10G slot:
SWM-02GP+_4
 Industrial 2-port 10G SFP+ module with 2x10GBase-X, SFP+ socket



For 1G slot:
SWM-04GF-MM/SS-SC
 Industrial 4-port Gigabit fiber module with 4x1000Base-FX SC Fiber ports



For 10G slot:
SWM-04GP+_4
 Industrial 4-port 10G SFP+ module with 4x10GBase-X SFP+ ports



For 1G slot:
SWM-04FX-MM/SS-SC
 Industrial 4-port fiber module with 4x100Base-FX SC Fiber ports



For 10G slot:
SWM-04GP_4
 Industrial 4-port Gigabit fiber module with 4x1GBase-X SFP ports



For 1G slot:
SWM-04GF-MM/SS-ST
 Industrial 4-port Gigabit fiber module with 4x1000Base-FX ST Fiber ports



For 10G slot:
SWM-04GF-MM/SS-SC_4
 Industrial 4-port Gigabit fiber module with 4x1000Base-FX SC Fiber ports



For 1G slot:
SWM-04FX-MM/SS-ST
 Industrial 4-port fiber module with 4x100Base-FX ST Fiber ports



For 10G slot:
SWM-04GF-MM/SS-ST_4
 Industrial 4-port Gigabit fiber module with 4x1000Base-FX ST Fiber ports



For 1G slot:
SWM-60GT-M12
 Industrial 6-port Gigabit Ethernet switch module with 6x10/100/1000Base-T(X), M12 connector



For 1G slot:
SWM-80GT
 Industrial 8-port Gigabit Ethernet switch module with 8x10/100/1000Base-T(X) ports



For 1G slot:
SWM-40GT-M12
 Industrial 4-port Gigabit Ethernet switch module with 4x10/100/1000Base-T(X), M12 connector



For 1G slot:
SWM-08GP
 Industrial 8-port Gigabit fiber module with 8x100/1000Base-X, SFP socket