

Introduction

IGS-RX164GP+ advanced Layer 3 managed redundant ring Ethernet switch with 16x10/100/1000Base-T(X) ports and 4x10GBase-X SFP ports. The IGS-RX164GP+ supports routing protocols such as static routing, RIP v1/v2, OSPF and PIM which are suitable for large scale network environment. The hardware Layer 3 switch is optimized to transmit data as fast as Layer-2 switches. 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 75°C. **IGS-RX164GP+** 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 application.

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
IGS-RX164GP+		X 1
CD		X 1
DIN-rail Kit		X 1
Wall-mount Kit		X 2
Console Cable		X 1
QIG		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 (T_{ma}) 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.

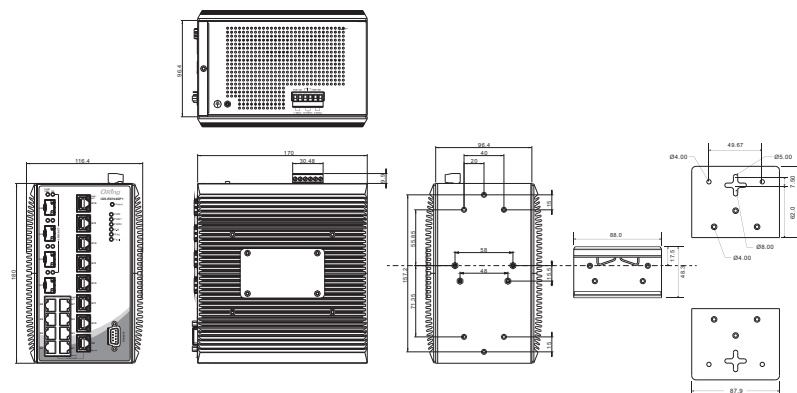


Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

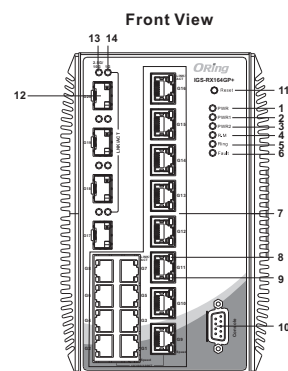


Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this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

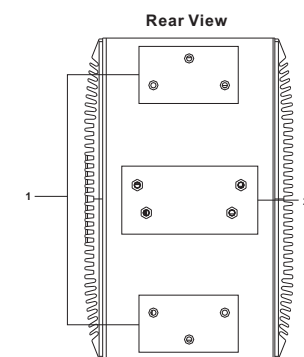
Dimension Unit =mm (Tolerance ±0.5mm)



Panel Layouts

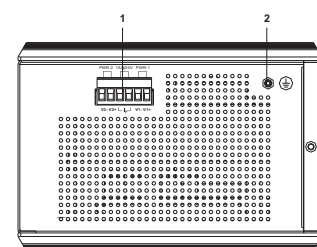


1. Power LED
2. Power1 LED
3. Power2 LED
4. R.M. status LED
5. Ring status LED
6. Faulty relay indicator
7. Gigabit LAN ports
8. Link/action LED for LAN ports
9. Speed indicator for LAN ports
10. Console port
11. Reset button
12. 1G/2.5G/10GBase-X SFP+ ports
13. Link/Act LED for SFP+ ports (2.5Gbps/10Gbps)
14. Link/Act LED for SFP+ ports (1Gbps)



1. Wall-mount screw holes
2. Din-rail screw holes

Top Panel



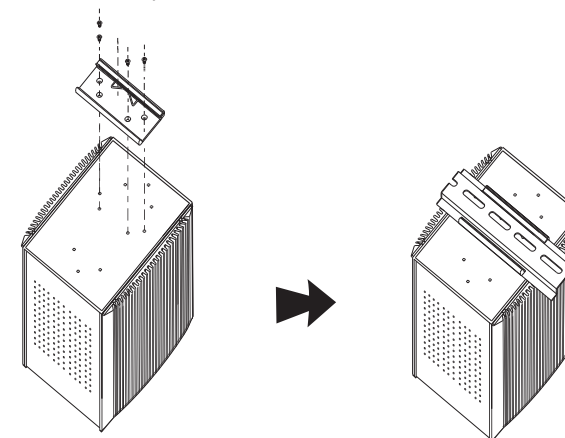
1. Terminal blocks: PWR1, PWR2 (12-48V DC), Relay
2. Ground wire.

Installation

DIN-rail Installation

Step 1: Slant the switch and screw the Din-rail kit onto the back of the switch, right in the middle of the back panel.

Step 2: Slide the switch onto a DIN-rail from the Din-rail kit and make sure the switch clicks into the rail firmly.

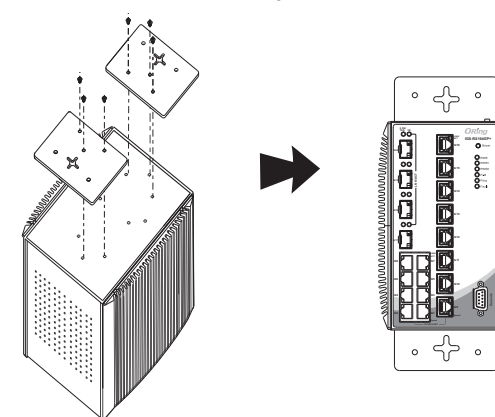


Wall-mounting

Step 1: Screw the two pieces of wall-mount kits onto both ends of the rear panel of the switch. A total of six screws are required, as shown below.

Step 2: Use the switch, with wall mount plates attached, as a guide to mark the correct locations of the four screws.

Step 3: Insert four screw heads through the large parts of the keyhole-shaped apertures, and then slide the switch downwards. Tighten the four screws for added stability.



Network Connection

The switch provides 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

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

1000Base-T RJ-45 Port		10/100 Base-T(X) RJ-45 Port	
Pin Number	Assignment	Pin Number	Assignments
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

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

Note: "+" and "-" signs represent the polarity of the wires that make up each wire pair.

Console Port Pin Definition

To connect the console port to an external management device, you need an DB-9 cable, which is also supplied in the package. Below is the console port pin assignment information.

PC RS-232 to DB9 (male) pin assignment	RS-232 with DB9 (female) pin assignment
PIN#2 RxD	PIN#2 RxD
PIN#3 TxD	PIN#3 TxD
PIN#5 GND	PIN#5 GND

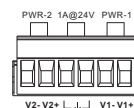
Wiring

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: Insert the negative/positive wires into the V-/V+ terminals, respectively.

STEP 2: 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.



Relay contact

The two sets of relay contacts of the 6-pin terminal block connector are used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured when an event is triggered. If a user-configured event does not occur, the fault circuit remains closed.

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.

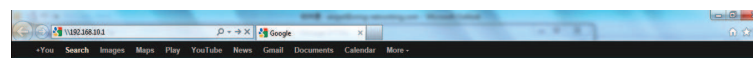
Configurations

After installing the switch card, the green power LED should turn on. Please refer to the following table for LED indication.

LED	Color	Status	Description
PWR	Green	On	DC power on
PW1	Green	On	DC power module 1 activated
PW2	Green	On	DC power module 2 activated
R.M	Green	On	System running in Ring Master mode
Ring	Green	On	System running in Ring mode
		Blinking	Ring structure is broken
Fault	Amber	On	Faulty relay (power failure or port malfunctioning)
10/100/1000Base-T(X) Ethernet ports			
LNK/ACT	Green	On	Port is connected
		Blinking	Transmitting data
Speed	Green	On	Port is running at 1000Mbps
		On	Port is running at 100Mbps
		Off	Port is running at 10Mbps
1G/2.5G/10GBase-X SFP+ ports			
LNK/ACT	Green	On	Port is connected

Follow the steps to set up the card:

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 2-3 seconds.

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

Specifications

ORing Switch Model	IGS-RX9164GP+
Physical Ports	
10/100/1000Base-T(X) Ports in RJ45 Auto MDI/MDIX	16
1G/2.5G/10GBase-X with SFP+ port	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 802.3z 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	16K
Priority Queues	8
Packet Buffer Size	16Mbit
Flash Memory	512Mbits
DRAM Size	8Gbits

Jumbo frame	Up to 12K Bytes
Processing	Store-and-Forward
Switch Properties	Switch latency: 7 us Switch bandwidth: 112Gbps Throughput (packet per second) : 83.32Mpps@64Bytes packet 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	Enable/disable ports, MAC based port security Port based network access control (802.1x) VLAN (802.1Q) to segregate and secure network traffic Radius centralized password management SNMPv3 encrypted authentication and access security Web and CLI authentication and authorization IP source guard Https / SSH enhance network security DOS/DDOS auto prevention
Software Features	TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging IGMP Snooping Application-based QoS management Port configuration, status, statistics, monitoring, security Port mirroring DHCP Server/Client/Relay SNTP Client
Routing Protocols	Unicast Routing - Static routing, RIP v1/v2, OSPF Multicast Routing - PIM-SM, PIM-DM, Routing Redundancy - VRRP
TSN protocols	IEEE 802.1AS, Qav, Qat
Network Redundancy	O-Ring with recovery time less than 30ms O-Chain MSTP /RSTP/STP
RS-232 Serial Console Port	RS-232 in DB9 connector with console cable. 115200bps, 8, N, 1
Fault Contact	
Relay	Relay output to carry capacity of 1A at 24VDC
Reset Function	
Reset Button	< 5 sec: System reboot, > 5 sec: Factory default
Power	
Redundant Input power	Dual DC inputs, 12~48VDC on 6-pin terminal block
Power consumption(Typ.)	23 Watts
Overload current protection	Present
Reverse polarity protection	Present
Physical Characteristic	
Enclosure	IP-30
Dimension (W x D x H)	116.4 (W) x 170(D) x 180(H) mm (4.58 x 6.69x 7.08 inches)
Weight (g)	1530 g
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 75°C (-40 to 167°F)
Operating Humidity	5% to 95% Non-condensing
Regulatory Approvals	
EMC	CE EMC (EN 55024, EN 55032), EN 50121-4 (compliant), FCC Part 15 B
EMI	EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15 B class A
EMS	EN 55024 (IEC/EN 61000-4-2 (ESD: Contact 8KV, Air 10KV), IEC/EN 61000-4-3 (RS: 3V), IEC/EN 61000-4-4 (EFT Power 2KV, Signal 2KV), IEC/EN 61000-4-5 (Surge: Power 4KV, Signal 4KV), IEC/EN 61000-4-6 (CS: 3V), IEC/EN 61000-4-8(PFMF))
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-31
Vibration	IEC 60068-2-6
Safety	EN60950-1
MTBF	323,539 hrs
Warranty	5 years



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