GIGABIT SWITCH INDUSTRIAL

Quick Installation Guide

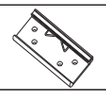
IGS-9164GF/FX Series — Industrial Managed Gigabit Switch

Introduction

The **IGS-9164GF/FX series** is a managed industrial Ethernet switch with 16x10/100/1000Base-T(X) ports and 4 fixed optical fiber ports. The IGS-9164GF provides 4x1000Base-X fiber ports and the IGS-9164FX provides 4x100Base-FX fiber ports. The cost-effective device with a high port density can be managed centrally via web browsers, TELNET, Console or other third-party SNMP software as well as Oring's proprietary Open-Vision management utility. With complete support for Ethernet redundancy protocols such as O-Ring (recovery time < 30ms over 250 units of connection) and MSTP (RSTP/STP compatible), the devices can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. Boasting a wide operating temperature from -40°C to 75°C, the switch can meet the demanding requirements of power substations and rolling stock applications.

Package Contents

The **IGS-9164GF/FX eries** are 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-9164GF/FX		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

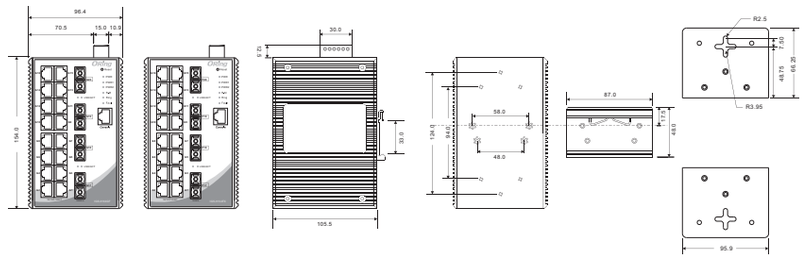
Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature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

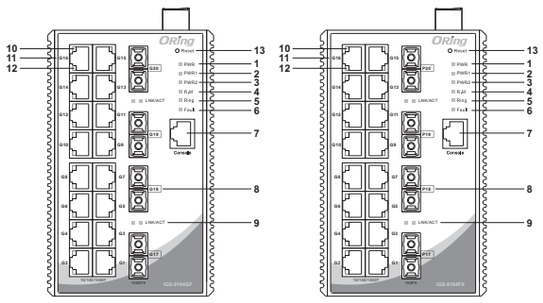
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this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

Dimension



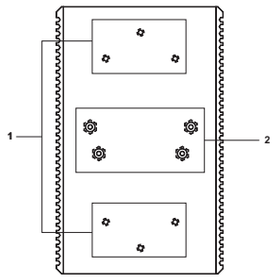
Panel Layouts

Front View



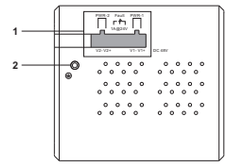
1. Power LED
2. PWR1 LED
3. PWR2 LED
4. R.M. status LED
5. Ring status LED
6. Faulty relay indicator
7. Console port
8. Optical fiber ports
9. LNK/ACT indicator for fiber ports
10. LNK/ACT indicator for LAN ports
11. Ethernet LAN ports
12. Speed indicator for LAN ports
13. Reset button

Rear View



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

Top Panel

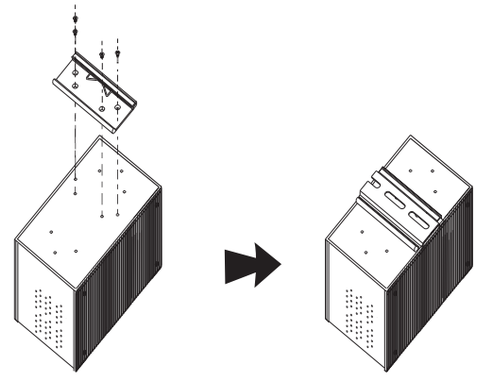


1. Terminal blocks: PWR1, PWR2 (12-48V DC), Relay
2. Ground wire.

Installation

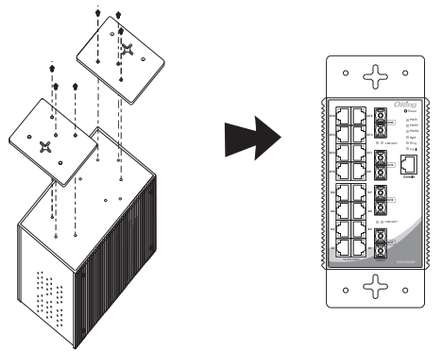
DIN-rail Installation

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

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

1000Base-T RJ-45	
Pin Number	**Assignment**
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

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

1000Base-T MDI/MDI-X		
Pin Number	**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-

10/100Base-T(X) MDI/MDI-X		
Pin Number	**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

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

Console Port Pin Definition

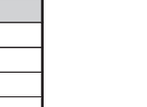
To connect the console port to an external management device, you need an RJ-45 to DB-9 cable, which is also supplied in the package. Below is the console port pin assignment information.

PC (male) pin assignment	RS-232 with DB9 (female) pin assignment (RJ45-DB9 cable)	RJ45 pin assignment
PIN#2 RxD	PIN#2 RxD	PIN#2 RxD
PIN#3 TxD	PIN#3 TxD	PIN#3 TxD
PIN#5 GND	PIN#5 GND	PIN#5 GND

Wiring

Power inputs

The switch supports dual redundant power supplies, Power Supply1 (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 close circuit when a user-configured event is triggered. If a user-configured event does not occur, the fault circuit remains opened.

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.

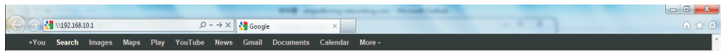
Configurations

After installing the switch card, the green power LED should turn on. Please refer to the following tablet 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
	Amber	On	Port is running at 100Mbps
		Off	Port is running at 10Mbps
1000Base-X or 100Base-FX fiber ports			
LNK/ACT	Green	On	Port is connected
		Blinking	Transmitting data

Follow the steps to set up the device:

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.

ORing Industrial Networking Corp.
TEL: +886-2-2218-1066 Website: www.oring-networking.com
FAX: +886-2-2218-1014 E-mail: support@oring-networking.com

Specifications

ORing Switch Model		IGS-9164GF-MM-SC	IGS-9164GF-SS-SC	IGS-9164FX-MM-SC	IGS-9164FX-SS-SC
Physical Ports					
10/100/1000Base-T(X) Ports in RJ-45 Auto MDI/MDIX		16			
Fiber Port Specification	Fiber Ports Number	4			
	Fiber Ports Standard	1000Base-SX	1000Base-LX	100Base-FX	100Base-FX
	Fiber Mode	Multi-mode	Single-mode	Multi-mode	Single-mode
	Fiber Diameter (μm)	62.5/125 μm 50/125 μm	9/125 μm	62.5/125 μm 50/125 μm	9/125 μm
	Fiber Optical Connector	SC	SC	SC	SC
	Typical Distance (Km)	0.55 Km	10 Km	2 Km	30 Km
	Wavelength (nm)	850 nm	1310 nm	1310 nm	1310 nm
	Max. Output Optical Power (dbm)	-4 dbm	-3 dbm	-14 dbm	-8 dbm
	Min. Output Optical Power (dbm)	-9.5 dbm	-9.5 dbm	-23.5 dbm	-15 dbm
	Optical Input Power-minimum (Sensitivity)	-18 dbm	-20 dbm	-31 dbm	-34 dbm
	Optical Input Power-maximum (Saturation)	0 dbm	-3 dbm	0 dbm	-0 dbm
	Link Budget (db)	8.5 db	10.5 db	7.5 db	19 db
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 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.3x for Flow control 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		Switch latency: 7 us Switch bandwidth: 40Gbps Max. Number of Available VLANs: 256 IGMP multicast groups: 128 for each VLAN Port rate limiting: User Define			
Processing		Up to 9.6K Bytes			
Security Features		Device Binding security feature 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 Https / SSH enhance network security			
Software Features		STP/RSTP/MSTP (IEEE 802.1D/w/s) Redundant Ring (O-Ring) with recovery time less than 30ms over 250 units TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP Snooping for multicast filtering IP-based bandwidth management Application-based QoS management DOS/DDOS auto prevention Port configuration, status, statistics, monitoring, security DHCP Server / Client support SMTP Client Modbus TCP			
Network Redundancy		O-Ring, Open-Ring, O-chain, MRP, MSTP (RSTP/STP compatible), Fast Recovery			
RS-232 Serial Console Port		RS-232 in RJ45 connector with console cable. Baud rate setting: 115200bps, 8, N, 1			
Fault Contact					
Relay		Relay output to carry capacity of 1A at 24VDC			
Power					
Redundant Input power		Dual DC inputs. 12-48VDC on 6-pin terminal block			
Power consumption(Typ.)		16.32 Watts	18.5 Watts		
Overload current protection		Present			
Reverse polarity protection		Present			
Physical Characteristic					
Enclosure		IP-30			
Dimension (W x D x H)		96.4 (W) x 105.5(D) x 154(H) mm (3.8 x 4.15 x 6.06 inch)			
Weight (g)		1243 g	1228 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					
EMI		FCC Part 15, CISPR (EN55022) class A			
EMS		EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge),EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11			
Shock		IEC60068-2-27			
Free Fall		IEC60068-2-32			
Vibration		IEC60068-2-6			
Safety		EN60950-1			
Warranty		5 years			