

Quick Installation Guide

Introduction

The IGS-P9164 series is a managed industrial Ethernet switch designed for power substation and rolling stock applications as it is fully compliant with the requirements of IEC 61850-3 and IEEE 1613. The series consists of three models: IGS-P9164GF, IGS-P9164FX, and IGS-P9164GC, each comes with 16x10/100/1000Base-T(X) ports and differ numbers or types of optical fiber ports. The devices 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 85°C, the switch can meet the demanding requirements of power substations and rolling stock applications.

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

| Contents | Pictures | Number |
|---|----------|--------|
| IGS-P9164GF or IGS-P9164FX or IGS-P9164GC | | X 1 |
| CD | | X 1 |
| DIN-rail Kit | | X 1 |
| Wall-mount Kit | .н. | X 2 |
| Console Cable | | X 1 |
| QIG | | X 1 |
| Power Cable (For HV only) | | X 2 |

Preparation

Before you begin installing the device, 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 environment, make sure the operating ambient temperature is compatible with the maximum ambient temperature (Tma) specified by the manufacturer.



Reduced Air Flow: Make sure the amount of air flow required for safe operation of the equipment is not compromised during installation.



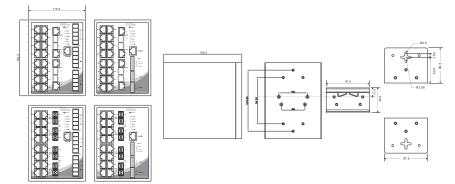
Mechanical Loading: Make sure the mounting of the equipment is not in a hazardous condition due to uneven mechanical loading

IGS-P9164 Series



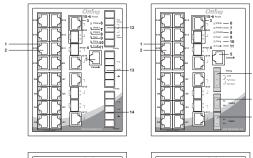
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this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

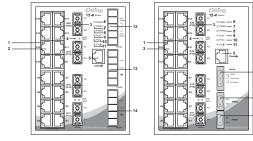
Dimension

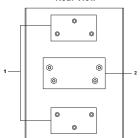


Panel Layouts

Front View







1. LNK/ACT port for Ethernet ports 2. 10/100/100Base-T(X) Ethernet ports

- 3. Fiber ports (IGS-P9164GF/FX) or
- Combo ports (IGS-P9164GC)
- 4. LNK status LED for fiber/combo ports
- 5. Console port
- 6. Power LED
- 7. PWR1 LED 8. PWR2 LED
- 9. R.M status LED
- 10. Ring status LED 11. Fault indicator
- 12. Relay output
- 13. Power 2 module 14. Power 1 module
- 15. Reset button

IEC 61850-3 Industrial Managed Ethernet Switch

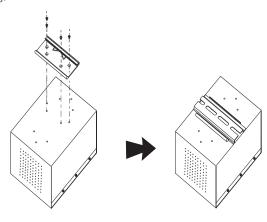
Installation

Use the mounting kits attached with the package and follow the steps below to install the switch to a rail or to the wall.

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

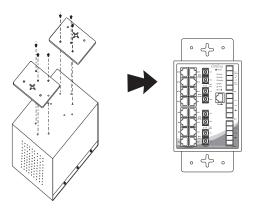


Wall-mounting

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 a screw head through the large parts of the keyhole-shaped apertures, and then slide the switch downwards. Tighten the screw 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.

Rear View

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



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Cable Types and Specifications:

| Cable | Туре | 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

| 1000 Base-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- | | |

| 10/100 Base-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 | |

| 10/100 Base-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 | | |

| 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- | | |

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

of the connector.

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 front panel along with LAN ports. Follow the steps below to wire power cables. STEP 1: Insert the negative/positive wires into the V-/V+



terminals, respectively. STEP 2: To keep the wires from pulling loose, use a small flatblade screwdriver to tighten the wire-clamp screws on the front

IGS-P9164 Series

IEC 61850-3 Industrial Managed Ethernet Switch

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 3-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.

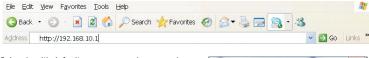
Configurations

After installing the 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 |
| Ring | Green | Blinking | Ring structure is broken |
| Fault | Amber | On | Faults occurs |
| 10/100/1000 | Base-T(X) Fast Et | nernet ports | |
| LNK/ACT | Green | On | Port is connected and running at 1000Mbps |
| | Amber | On | Port is connected and running at 100Mbps |
| | Green/Amber | Off | Port running at 10Mbps |
| 1000Base-X | fiber ports | | |
| LNK/ACT | Green | On | Ethernet links connected |
| LINIVACI | Green | Blinking | Transmitting data |
| 100Base-FX | fiber ports | | |
| LNK/ACT | Green | On | Ethernet links connected |
| LNNACI Green | | Blinking | Transmitting data |
| 100/1000Bas | se-X SFP ports | | |
| LNK/ACT | Green | On | Ethernet links connected |
| LNN/ACT Green | | Blinking | Transmitting data |

Follow the steps below to log in and access the system

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 | IGS-P9164GF-MM | IGS-P9164FX-MM | IGS-P9164GF-SS | IGS-P9164FX-SS | IGS-P9164GC |
|--|----------------|----------------|----------------|----------------|-------------|
| Physical Ports | | | | | |
| 10/100/1000Base-T(X) Ports in RJ-45 Auto MDI/MDIX | | | 16 | | |
| Gigabit Combo Port with 10/100/1000Base-T(X) and 100/1000Base-X SFP Port | | - | | | 4 |

62.5/125 μm 50/125 μm 62.5/125 μm 50/125 μm 9/125 µm 9/125 µm Fiber Optical Con Typical Distance (Km 850 nm 1310 nm Min. Output Optical I (dbm) Optical Input Power--9.5 dbm -23.5 dbm -9.5 dbm -15 dbm Optical Input Po maximum (Satu 0 dbm 0 dbm -0 dbm

| Ethernet Standards | IEEE 80.2.3 for 1000Base X IEEE 80.2.3 for 1000Base T IEEE 80.2.3 for Those control IEEE 80.2.3 for Those control IEEE 80.2.3 for Those control IEEE 80.2.1 for Those control IEEE 80.2.1 for Those control IEEE 80.2.1 for TAULA Tagging IEEE 80.2.1 for TAULA TA |
|--------------------|--|
| MAC Table | 8К |
| Packet Buffer | 4Mbits |
| Priority Queues | 8 |
| Processing | Store-and-Forward |
| Switch Properties | Switch latency: 7 us Switch bandwidth: 40Gbps Max. Number of Available VLANs: 256 IGNP multicast groups: 128 for each VLAN Port rate limiting: User Define |
| Processing | Up to 9.6K Bytes |
| Security Features | Device Binding security feature Enabledisable ports, MAC based port security Port based network access control (802.1s) VALN (802.1s) to segregate and secure network traffic Radius centralized password management. SNMPv3 encrypted suthentication and access security Http://SSIe nibance network security |

| are Features | Redundant Ring (O-Ring) with recovery time less than 30ms over 250 units TOS/Olffers rupported Quality of Service (802.1p) for real-time traffic VLAN (802.1g) with VLAN tagging and GVBR supported IGMP Snooping for multicast filtering IP-based handwidth tamangement Application-based QSc management DOS/DDOS autor prevention Port configuration, status, statistics, monitoring, security DCCF Server (Cilient support |
|----------------|---|
| | |
| ork Redundancy | O-Ring, Open-Ring, O-chain, MRP, MSTP (RSTP/STP compatible), Fast Recovery |
| | |

| Fault Contact | | | | | | |
|-----------------------------|---|--|--------|--|--|--|
| Relay | Relay output to carry capacity of 1A at 24VDC on 3 pin terminal block | | | | | |
| Power | | | | | | |
| Redundant Input power | | LV model : Dual power inputs with 12-48VDC on dual 2 pin terminal block HV model : Dual power inputs with 85-264VAC/88~373VDC on dual 3-pin terminal block | | | | |
| Power consumption(Typ.) | LV: 18Watts LV: 21Watts LV: 18Watts LV: 21Watts LV: 17Watts HV: 18.5Watts HV: 20.7Watts HV: 18.5Watts HV: 19.3Watts HV: 18Watts | | | | | |
| Overload current protection | Present | | | | | |
| Reverse polarity protection | Present | | | | | |
| Physical Characteristic | | | | | | |
| Enclosure | IP-30 | | | | | |
| Dimension (W x D x H) | 115.0 (W) x 159.0(D) x 154 | 1.0(H) mm (4.52x 6.26 x 6.00 | Sinch) | | | |
| Weight (g) | LV:1780 g LV:1796 g LV:1780 g LV:1796 g LV:1780 g HV:2216 g HV:2205 g HV:2216 g HV:2205 g HV:2186 g | | | | | |
| Environmental | | | | | | |
| | | | | | | |

| Operating Temperature | -40 to 75°C (-40 to 167°F) |
|-----------------------|---|
| Operating Humidity | 5% to 95% Non-condensing |
| Regulatory Approvals | |
| Power Automation | IEC 61850-3, IEEE 1613 |
| EMI | FCC Part 15, CISPR (EN55022) class A, EN50155 (EN50121-3-2, EN55011, EN55012-4) |
| EMS | EN6100-4-2 (ESD) EN6100-4-3 (RS) EN6100-4-4 (EFT) EN6100-4-4 (EFT) EN6100-4-6 (CST) EN6100-4-6 (CS) EN6100-4-9 EN6100-4-9 EN6100-4-9 EN6100-4-9 |
| Shock | IEC60068-2-27 |
| Free Fall | IEC60068-2-32 |
| Vibration | IEC60068-2-6 |
| Safety | EN60950-1 |