EN50155 SWITCH INDUSTRIAL

ORing

Quick Installation Guide

TGPS-9164GT-M12X-BP2-MV

EN50155 20-port managed Gigabit PoE Ethernet switch

Introduction

ORing's Transporter™ series managed PoE Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. **TGPS-9164GT-M12X-BP2-MV** is managed Redundant Ring Ethernet switch with 16x10/100/1000Base-T(X) P.S.E. and 4x10/100/1000Base-T(X) ports which is specifically designed for the toughest and fully compliant with EN50155 requirement. The switch support Ethernet Redundancy protocol, O-Ring (recovery time < 30ms over 250 units of connection), O-Chain, MRP***NOTE** and MSTP/RSTP/STP (IEEE 802.1s/w/D) can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. **TGPS-9164GT-M12X-BP2-MV** also support Power over Ethernet, a system to transmit electrical power up to 30 watts, along with data, to remote devices over standard twisted-pair cable in an Ethernet network. Each **TGPS-9164GT-M12X-BP2-MV** switch has 16x10/100/1000Base-T(X) P.S.E. (Power Sourcing Equipment) ports. P.S.E. is a device (switch or hub for instance) that will provide power in a PoE connection. **TGPS-9164GT-M12X-BP2-MV** includes 2 sets of bypass ports that protect the network from failures and Network maintenance by ensuring network integrity during power loss. And support wide operating temperature from -40 °C to 75 °C. **TGPS-9164GT-M12X-BP2-MV** can also be managed centralized and convenient by Open-Vision, Except the Web-based interface, Telnet and console (CLI) configuration. Therefore, the switch is one of the most reliable choices for EN50155 highly-managed Ethernet 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
TGPS-9164GT-M12X-BP2-MV		1
CD		1
QIG		1

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

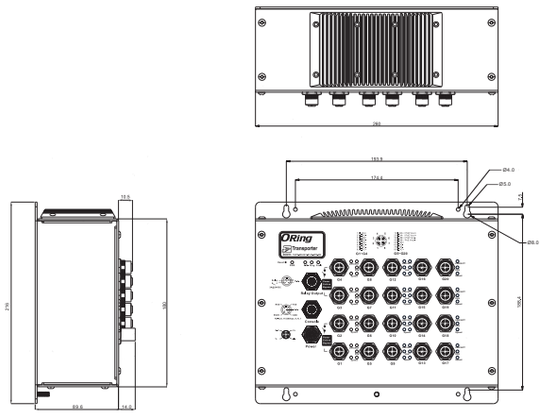
Elevated Operating Ambient: If installed in a closed environment, make sure the operating ambient temperature is compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

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.

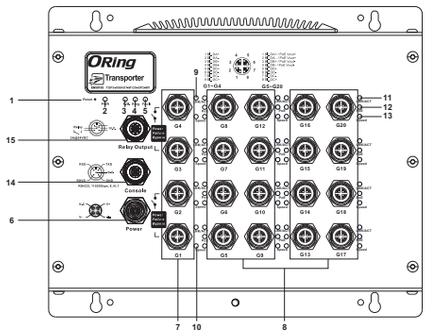
Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this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

Dimension Unit =mm (Tolerance ±0.5mm)



Panel Layouts

Front View

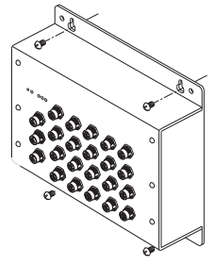


1. Reset button
2. Power status LED
3. R.M. status LED
4. Ring status LED
5. Fault LED
6. Power connector
7. Non-PoE Gigabit Ethernet ports with bypass
8. PoE-enabled Gigabit Ethernet ports
9. Link/ACT LED for non-PoE Gigabit ports
10. Speed LED for non-PoE Gigabit ports
11. Link/ACT LED for PoE-enabled Gigabit ports
12. PoE indicator for PoE-enabled Gigabit ports
13. Speed LED for PoE-enabled Gigabit ports
14. Console port
15. Relay output port

Installation

Wall-mount

The device can be fixed to the wall. Follow the steps below to install the device on the wall.
Step 1: Hold the device upright against the wall
Step 2: Insert four screws through the large opening of the keyhole-shaped apertures at the top and bottom of the unit and fasten the screws to the wall with a screwdriver.
Step 3: Slide the device downwards and tighten the four screws for added stability.



Instead of screwing the screws in all the way, it is advised to leave a space of about 2mm to allow room for sliding the switch between the wall and the screws.

Wiring

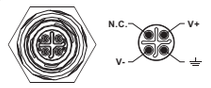
For pin assignments of power, console and relay output ports, please refer to the following tables.

Grounding

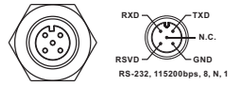
Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the grounding pin on the power connector to the grounding surface prior to connecting devices.

Power port pinouts

The device supports one set of power supply and uses the M12 S-coded 4-pin male connector on the front panel for power input.
Step 1: Insert a power cable to the power connector on the device.
Step 2: Rotate the outer ring of the cable connector until a snug fit is achieved. Make sure the connection is tight.



Console port pinouts



RS-232, 115200bps, 8, N, 1

Relay output port pinouts

The switch uses the M12 A-coded 5-pin female connector on the front panel for relay output. Use a cable with an M12 A-coded 5-pin male connector to connect the relay. The relay contacts will detect user-configured events and form an close circuit when an event is triggered.

Network Connection

The switch has sixteen 10/100/1000Base-T(X) PoE and four 10/100/1000Base-T(X) non-PoE Ethernet ports in the form of M12 connector. Depending on the link type, the switch uses CAT 3, 4, 5,5e UTP cables to connect to network devices (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100-ohm	UTP 100 m (328 ft)	8-pin female M12 X-coding connector
100BASE-TX	Cat. 5 100-ohm UTP	UTP 100 m (328 ft)	8-pin female M12 X-coding connector
1000BASE-T	Cat. 5/Cat. 5e 100-ohm UTP	UTP 100 m (328 ft)	8-pin female M12 X-coding connector

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For pin assignments of the Ethernet ports, please refer to the following tables.

10/100/1000Base-T(X) M12 X-coding	
Pin No.	Pin Definition
#1	BI_DA+
#2	BI_DA-
#3	BI_DB+
#4	BI_DB-
#5	BI_DD+
#6	BI_DD-
#7	BI_DC-
#8	BI_DC+

10/100/1000Base-T(X) P.S.E. M12 X-coding	
Pin No.	Pin Definition
#1	BI_DA+ with PoE Vout+
#2	BI_DA- with PoE Vout+
#3	BI_DB+ with PoE Vout-
#4	BI_DB- with PoE Vout-
#5	BI_DD+
#6	BI_DD-
#7	BI_DC-
#8	BI_DC+

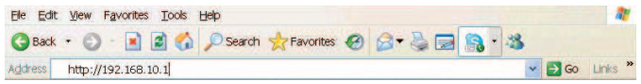
Configurations

After installing the switch and connecting cables, the green power LED should turn on. Please refer to the following tablet for LED indication.

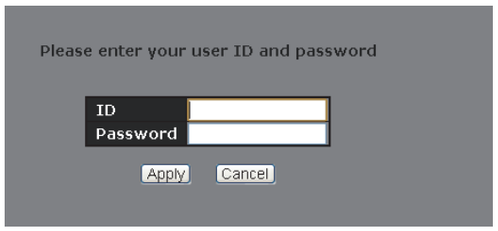
LED	Color	Status	Description
PWR	Green	On	DC power module activated
R.M	Green	On	Device operating in Ring Master mode
Ring	Green	On	Ring enabled
		Blinking	Ring structure is broken
Fault	Amber	On	Errors occur (i.e. power failure or port malfunctioning)
10/100/1000Base-T(X) P.S.E Ethernet ports			
LNK/ACT	Green	On	Port is linked
		Blinking	Transmitting data
PoE	Green	On	Power supplied over Ethernet
Speed	Green	On	Port is running at 1000Mbps
	Amber	On	Port is running at 100Mbps
	Green/Amber	Off	Port is running at 10Mbps
10/100/1000Base-T(X) Ethernet ports			
LNK/ACT	Green	On	Port is linked
		Blinking	Transmitting data
Speed	Green	On	Port is running at 1000Mbps
	Amber	On	Port is running at 100Mbps
	Green/Amber	Off	Port is running at 10Mbps

Follow the steps below to log in and access the system:

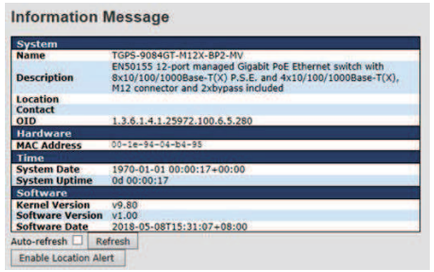
1. Launch the Internet Explorer and type in IP address of the device. The default static IP address is **192.168.10.1**



2. Log in with default user name and password (both are **admin**).



3. 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 device using ORing's Open-Vision management utility, please go to ORing website.



Resetting

To restore the device configurations back to the factory defaults, press the **Reset** button for a few seconds. Once the power indicator starts to flash, release the button. The device will then reboot and return to factory defaults.

Specifications

ORing Switch Model	**TGPS-9164GT-M12X-BP2-MV**
Physical Ports	
10/100/1000 Base-T(X) Ports in M12 Auto MDI/MDIX with P.S.E.	**16 (8-pin female X-coding connector)**
10/100/1000Base-T(X) ports in M12	**4 (8-pin female X-coding connector with 2 x bypass function included)**
Technology	
Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX IEEE 802.3ab for 1000Base-T 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) IEEE 802.3af PoE specification IEEE 802.3at PoE specification
MAC Table	8K
Priority Queues	8
Processing	Store-and-Forward
Switch Properties	Switching latency: <4.9 us Switching bandwidth: 40 Gbps Max. Number of Available VLANs: 4095 IGMP multicast groups: 128 for each VLAN Port rate limiting: User Define
Jumbo frame	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 IP-based bandwidth management Application-based QoS management DOS/DDOS auto prevention Port configuration, status, statistics, monitoring, security DHCP Server/Client/Relay SMTP Client Modbus TCP
Network Redundancy	O-Ring O-Chain MRP***Note** MSTP (RSTP/STP compatible)
RS-232 Serial Console Port	RS-232 in M12 (female A-coding) connector with console cable. 115200bps, 8, N, 1

Fault Contact	
Relay	Relay output to carry capacity of 3A at 24VDC on M12 connector (5-pin female A-coding connector)
Power	
Redundant Input Power	72/110 (50.4~137.5) VDC on 4-pin male S-coding connector
Power Consumption(Typ.) ***P.S.E. is not included**	≤8Watts, 72VDC/0.35A (7.56W), 96VDC/0.28A (7.56W), 110VDC/0.25A (7.56W)
Total PoE budget	95 Watts
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristic	
Enclosure	IP-30
Dimension (W x D x H)	260(W) x 89.6(D) x 216(H) mm (10.24 x 3.53 x 8.50 inch.)
Weight (g)	2650g
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), FCC Part 15B, EN 50155(EN 50121-1, EN 50121-3-2)
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(PFMF), IEC/EN 61000-4-11 (DIP))
Shock	IEC60068-2-27
Free Fall	IEC60068-2-31
Vibration	IEC60068-2-6
Safety	EN60950-1
Other	EN 50155 (IEC 61373) Compliant
MTBF	201,768 hrs
Warranty	5 years

***Note: This function is available by request only.**

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