

Quick Installation Guide

TGRS-T120-M12X-BP2-WV

EN50155 managed router switch

Introduction

ORing's Transporter™ series managed Router switches are designed for industrial applications such as rolling stock, vehicle, and railway. The **TGRS-T120-M12X-BP2-WV**, which is compliant with the EN50155 standard, is a managed Gigabit Redundant Ring Ethernet switch with 12x10/100/1000Base-T(X) ports which is specifically designed for the toughest and fully compliant with EN50155 requirement. The switch support **IEC 61375-2-5 TTDP** (Train Topology Discovery Protocol) and **IEC 61375-2-3 TRDP** (Train Real-Time Data Protocol) for railway application, improving the operational efficiency and minimize configuration errors. It is specifically designed for the toughest industrial environments. **TGRS-T120-M12X-BP2-WV** EN50155 Ethernet switch uses M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. **TGRS-T120-M12X-BP2-WV** EN50155 provides a wide power input range from 24 to 110VDC. **TGRS-T120-M12X-BP2-WV** 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 -25 °C to 70 °C. **TGRS-T120-M12X-BP2-WV** can also be managed centralized and convenient by Open-Vision, as well as the Web-based interface, Telnet and console (CLI) configuration. Therefore, the router switch is one of the most reliable choice for highly-managed and railway 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
TGRS-T120-M12X-BP2-WV		1
QIG		1

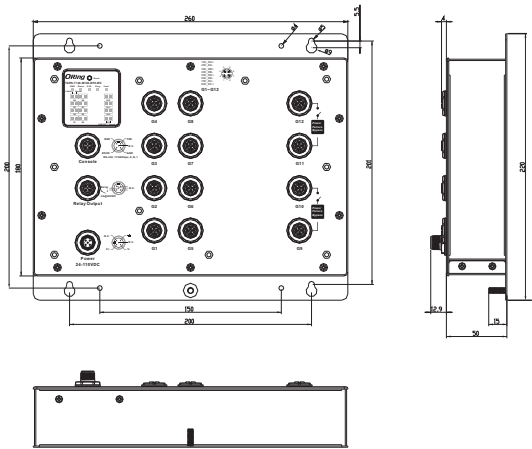
Preparation

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.

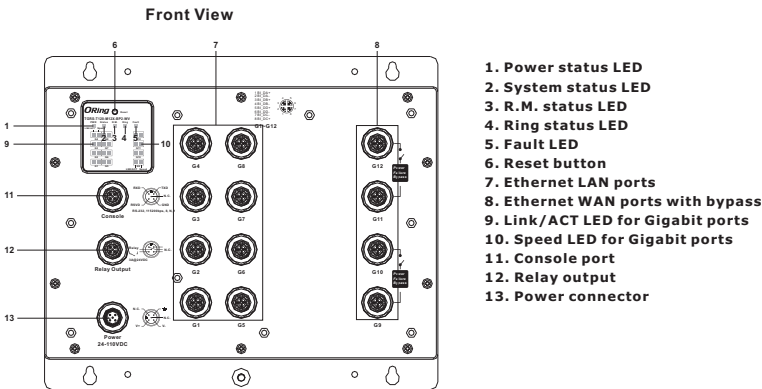
Safety & Warnings

- 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

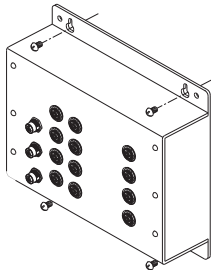


Installation

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

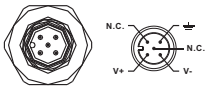
For pin assignments of power, console and relay output ports, please refer to the following tables.

Grounding

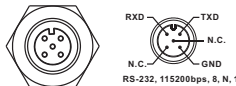
Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the grounding pin on the power connector to the grounding surface prior to connecting devices.

Power port pinouts

The device supports one set of power supply and uses the M12 A-coded 5-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



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 twenty 10/100/1000Base-T(X) 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

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+

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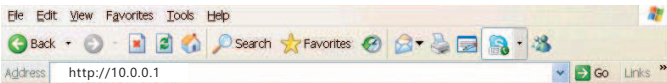
Configurations

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
Status	Green	On	System 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) Ethernet ports			
LNK/ACT	Green	On	Port is linked
		Blinking	Transmitting data
Speed	Green	On	Port is running at 1000Mbps
		Off	Port is running at 10/100Mbps

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 **10.0.0.1**



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

Login

Enter User Name:

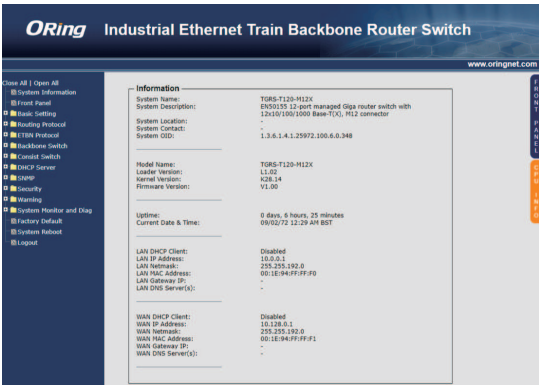
Enter Password:

Login

Current Date & Time

09/02/72 12:26 AM BST

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 reboot the switch, press the **Reset** button less than 5 seconds.

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

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Specifications

ORing Switch Model	TGRS-T120-M12X-BP2-WV
Physical Ports	
10/100/1000Base-T(X) Ports in M12 Auto MDI/MDIX	LAN-8 (8-pin female X-coding) WAN-4 (8-pin female X-coding 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 802.1AB for LLDP (Link Layer Discovery Protocol)
MAC Table	2K (WAN port), 16K (LAN port)
Packet Buffer Size	1MB share
Priority Queues	8
Processing	Store-and-Forward
Switch Properties	Switching latency: 0.9 us Switching bandwidth: 24 Gbps Throughput (packet per second): 17.857Mpps@64Bytes packet Max. Number of Available VLANs: 256 VLAN ID Range: VID 1 to 4095 IGMP multicast groups: 128 for each VLA Port rate limiting: User Define
Jumbo frame	Up to 10K Bytes
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 Https / SSH enhance network security Web and CLI authentication
Software Features	IEC 61375-2-5 TTDp (Train Topology Discovery Protocol) IEC 61375-2-3 TRDP (Train Real-Time Data Protocol) RSTP/MSTP (IEEE 802.1D/w/s) NAT: N-1 NAT, 1-1 NAT TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging IGMP Snooping Port configuration, status, statistics, monitoring, security DHCP Server/Client SMTP Client
Network Redundancy	O-Ring (Pending) O-Chain (Pending) MSTP (RSTP/STP compatible)
RS-232 Serial Console Port	RS-232 in M12 connector (5 pin female A-coding) with console cable. 115200bps, 8, N, 1 (support backup unit)
Fault Contact	
Relay	Relay output to carry capacity of 3A at 24VDC on M12 connector (5-pin M12 A-coding female)
Reset Function	
Reset Button	< 5 sec: System reboot, > 5 sec: Factory default
Power	
Redundant Input Power	24~110 (16.8~137.5) VDC on M12 5-pin A-coding Male connector
Power Consumption(Typ.)	≤17Watts, 24VDC/0.69A (17W), 36VDC/0.45A (16W), 72VDC/0.21A (15W), 110VDC/0.13A (15W)
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristic	
Enclosure	IP-30 Aluminum
Dimension (W x D x H)	260 (W) x 50 (D) x 220 (H)mm (10.24 x 1.97 x 8.66 inch.)
Weight (g)	1.865 Kg
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-25 to 70°C (-13 to 158°F)
Operating Humidity	5% to 95% Non-condensing

Regulatory Approvals	
EMC	CE EMC (EN 55024, EN 55032), FCC Part 15 B, EN 50155(EN 50121-1, EN 50121-3-2)
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 6KV, Air 8KV), IEC/EN 61000-4-3 (RS 80MHz to 1GHz: 20V/m, 1.4-2GHz:10V/m 1kHz 80% AM), IEC/EN 61000-4-4 (EFT Power 2KV, Single 2KV), IEC/EN 61000-4-5 (Surge: Power 2KV, RJ45 2KV), IEC/EN 61000-4-6 (CS 150K-80MHz: 10Vrms 1kHz 80% AM), 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(LVD)
Other	EN 50155 (IEC 61373) compliant
MTBF	155,786hrs
Warranty	5 years

ORing

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