EN50155
Switch
INDUSTRIAL
MANAGED

Quick Installation Guide

TPS-3044TX-M12

EN50155 8-port managed PoE Ethernet switch

Introduction

ORing's Transporter™ series managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. The **TPS-3044TX-M12** is a managed Redundant Ring PoE Ethernet switch with 4x10/100Base-T(X) P.S.E. and 4x10/100Base-T(X) ports which is compliant with EN50155 requirement. With completely support of Ethernet Redundancy protocol, O-Ring (recovery time < 10ms over 250 units of connection), Open-Ring, O-Chain, MRP 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. Another Open-Ring technology is also supported which can applied for other vendor's proprietary ring. O-Chain is the revolutionary network redundancy technology that provides the add-on network redundancy topology for any backbone network, O-Chain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound network topology. O-Chain providing ease-of-use while maximizing fault-recovery swiftness, flexibility, compatibility, and cost-effectiveness in one set of network redundancy topology. **TPS-3044TX-M12** also supports Power over Ethernet, a system to transmit electrical power, along with data, to remote devices over standard twisted-pair cable in an Ethernet network. Each **TPS-3044TX-M12** switch has 4X10/100Base-T(X) P.SE. (Power Sourcing Equipment) ports. P.S.E. is a device (switch or hub for instance) that will provide power in a PoE setup. It is specifically designed for the toughest industrial environments. **TPS-3044TX-M12** EN50155 Ethernet switch use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. **TPS-3044TX-M12** can be managed centralized and convenient by a powerful windows utility:Open-Vision. In addition, the wide operating temperature range from -40℃ to 70℃ can satisfy most of operating environment. Therefore, the switch is one of the most reliable choices for rolling stock and highly-managed PoE Ethernet application.

Specifications

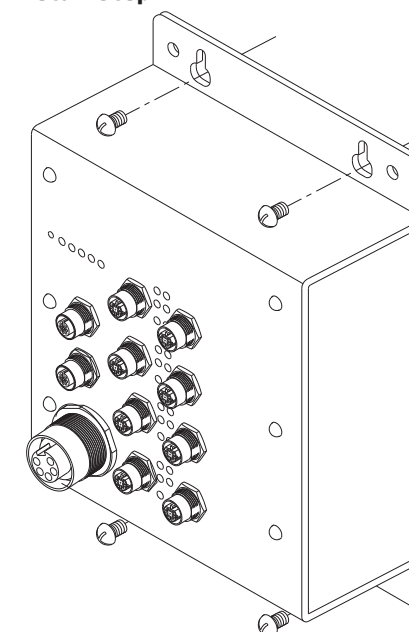| ORing Switch Model	TPS-3044TX-M12
Physical Ports	
10/100 Base-T(X) Ports P.S.E. M12 Auto MDI/MDIX	4 (M12 D-coding)
10/100 Base-T(X) Ports in M12 Auto MDI/MDIX	4 (M12 D-coding)
RS-232 Serial Console Port	RS-232 in M12 connector (5-pin A-coding). Baud rate setting: 9600bps, 8, N, 1
Technology	
Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3ab for 100Base-TX IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.1D for STP (Spanning Tree 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 (up to 15.4 Watts per port for P.S.E.)

MAC Table	8192 MAC addresses
Priority Queues	4
Processing	Store-and-Forward
Switch Properties	Switching latency: 7 μs Switching bandwidth: 1.6Gbps Max. Number of Available VLANs: 4096 IGMP multicast groups: 1024 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 Supports Q-in-Q VLAN for performance & security to expand the VLAN space Radius centralized password management SNMPv3 encrypted authentication and access security
Software Features	STP/RSTP/MSTP (IEEE 802.1D/w/s) Redundant Ring with recovery time less than 10ms 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 Port configuration, status, statistics, monitoring, security SNTP for synchronizing of clocks over network Support **PTP Client**(Precision Time Protocol) clock synchronization DHCP Server / Client support Port Trunk support MVR (Multicast VLAN Registration)support Modbus TCP
Network Redundancy	O-Ring, Open-Ring, O-Chain, MRP, STP, RSTP, MSTP
Warning / Monitoring System	Relay output for fault event alarming Syslog server / client to record and view events Include SMTP for event warning notification via email Event selection support
LED Indicators	
Power Indicator	Green: Power LED x 2
R.M. Indicator	Green: Indicate system operated in O-Ring Master mode
O-Ring Indicator	Green: Indicate system operated in O-Ring mode
Fault Indicator	Amber: Indicate unexpected event occurred
10/100Base-T(X) M12 PoE Port Indicator (Port1~4)	Green for port Link/Act. Green for PoE indicator. Amber for duplex indicator
10/100Base-T(X) M12 Port Indicator (Port5~8)	Green for port Link/Act. Amber for duplex indicator
Fault Contact	
Relay	Relay output to carry capacity of 3A at 24VDC on M12 connector (5-pin M12 A-coding)
Power	
Redundant Input Power	Dual 48 VDC on 5-pin M23 connector
Power Consumption(Typ.)	8.16 Watts (power consumption of P.S.E. is not included)
Overload Current Protection	Present
Reverse Polarity Protection	Not Present
Physical Characteristic	
Enclosure	IP-40
Dimension (W x D x H)	170.1(W) x 75(D) x 196(H) mm (6.70 x 2.95 x 7.72 inch.)
Weight (g)	1345g
Environmental	
Storage Temperature	-40 to 85℃ (-40 to 185℉)
Operating Temperature	-40 to 70℃ (-40 to 158℉)
Operating Humidity	5% to 95% Non-condensing
Regulatory Approvals	
EMI	FCC Part 15, CISPR (EN55022) class A, EN50155 (EN50121-3-2, EN55011, EN50121-4)
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

Features

> **Leading EN50155-compliant Ethernet switch for rolling stock application**
> **4 ports P.S.E. fully compliant with IEEE802.3af standard, provide up to 15.4 Watts per port**
> **Provide PoE power on delay function, users can define delay time for PoE power supply**
> **World's fastest Redundant Ethernet Ring: (O-Ring recovery time < 10ms over 250 units of connection)**
> **Open-Ring support the other vendor's ring technology in open architecture**
> **O-Chain allow multiple redundant network rings**
> **Support standard IEC 62439-2 MRP (Media Redundancy Protocol) function**
> **STP/ RSTP/ MSTP supported**
> **Support PTP Client (Precision Time Protocol) clock synchronization**
> **IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic**
> **SNMP v1/v2c/v3 support for secured network management**
> **RMON for traffic monitoring**
> **Support VLAN and LLDP protocol**
> **Provided hardware bypass function on gigabit ports when power failure occured**
> **Event notification through Syslog, Email, SNMP trap, and Relay Output**
> **Windows utility (Open-Vision) support centralized management and configurable by Web-based, Telnet, and Console (CLI)**
> **M12 connectors to guarantee reliable operation against environmental disturbances**
> **Wall mounting enabled**

Installation

Wall-mounted Install Step

EN50155
Switch
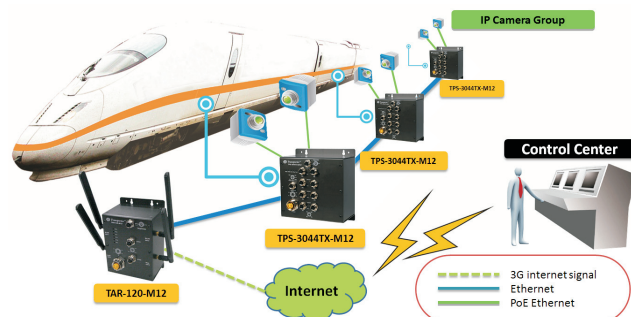INDUSTRIAL
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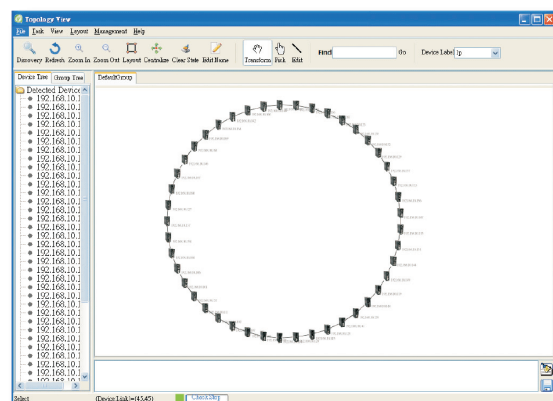
EN50155 8-port managed PoE Ethernet switch

⏚ Open-Vision

ORing's switches are intelligent switches. Different from other traditional redundant switches, ORing provides a set of Windows utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.
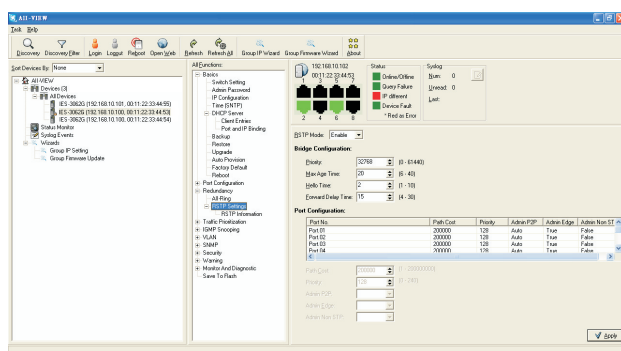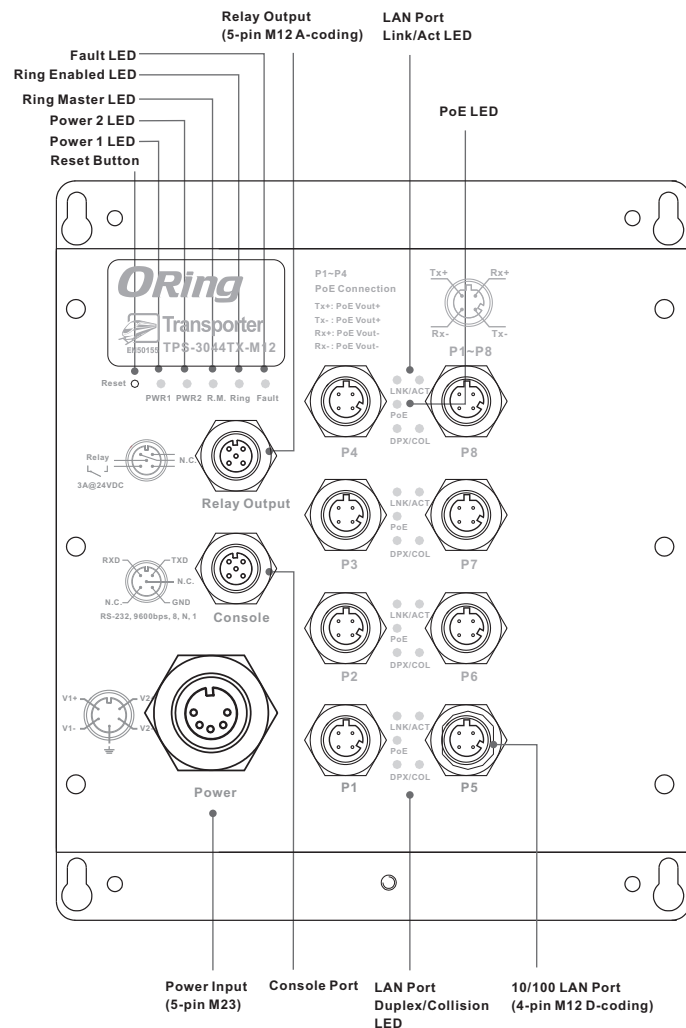
⦿ Network connection

IP Camera Group
TPS-3044TX-M12
Control Center
TPS-3044TX-M12
TPS-3044TX-M12
TAR-120-M12
Internet

- - - 3G internet signal
— Ethernet
— PoE Ethernet

⦿ Topology View

⦿ Monitoring and Configuration interface

⏚ Front Panel

Fault LED
Ring Enabled LED
Ring Master LED
Power 2 LED
Power 1 LED
Reset Button

Relay Output (5-pin M12 A-coding)
LAN Port Link/Act LED
PoE LED

P1~P4
PoE Connection
Tx+ : PoE Vout+
Tx- : PoE Vout+
Rx+ : PoE Vout-
Rx- : PoE Vout-

Relay Output
Console
Power

Power Input (5-pin M23)
Console Port
LAN Port Duplex/Collision LED
10/100 LAN Port (4-pin M12 D-coding)

⏚ PoE Pin Definition

M12 D-coding Pin Definition	
Pin No.	**Description**
# 1	RD+ with PoE Power input -
# 2	TD+ with PoE Power input +
# 3	RD- with PoE Power input -
# 4	TD- with PoE Power input +

⏚ Accessory

① QIG   ② CD
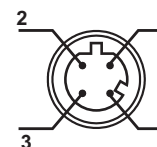
⏚ Packing list

Model name	Description	Accessory
TPS-3044TX-M12	EN50155 8-port managed PoE Ethernet switch with 4x10/100Base-T(X) P.S.E. and 4X10/1000base-T(X), M12 connector	① X 1, ② X 1

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