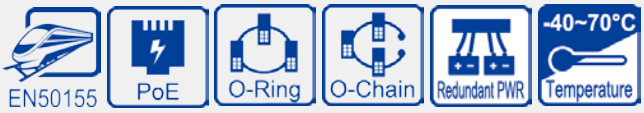
TPS-3162GT-M12-BP1-24V

EN50155 18-port managed PoE Ethernet switch with 16x10/100Base-T(X) P.S.E. and 2x10/100/1000Base-T(X), A-coded M12 connector and 1xbypass included, 24VDC power inputs

Features

- Leading EN50155-compliant Ethernet switch for rolling stock application
- 16 ports P.S.E. fully compliant with IEEE802.3af standard, provide up to 15.4 Watts per port
- World's fastest Redundant Ethernet Ring: **O-Ring** (recovery time < 10ms over 250 units of connection)
- **O-Chain** support applications with multiple redundant rings topology
- Support standard IEC 62439-2 **MRP***NOTE (Media Redundancy Protocol) function
- STP/RSTP/MSTP supported
- Support **PTP Client** (Precision Time Protocol) clock synchronization
- Support Modbus TCP protocol
- 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
- DHCP assign each Equipment IP by each Port
- Provided Relay bypass function with two gigabit ports
- 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



Introduction

ORing's Transporter™ series managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. The TPS-3162GT-M12-BP1-24V is a managed PoE Redundant Ring Ethernet switch with 16x10/100Base-T(X) P.S.E. and 2x10/100/1000Base-T(X) ports which is specifically designed for the toughest and fully compliant with EN50155 requirement. With completely support of Ethernet Redundancy protocol, O-Ring (recovery time < 10ms over 250 units of connection), O-Chain 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. And O-Chain technology is supported which can applied for multiple redundant Ethernet rings. TPS-3162GT-M12-BP1-24V 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-3162GT-M12-BP1-24V switch has 16X10/100Base-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 setup. TPS-3162GT-M12-BP1-24V EN50155 Ethernet switch use M12 connectors to ensure tight, robust connections, and

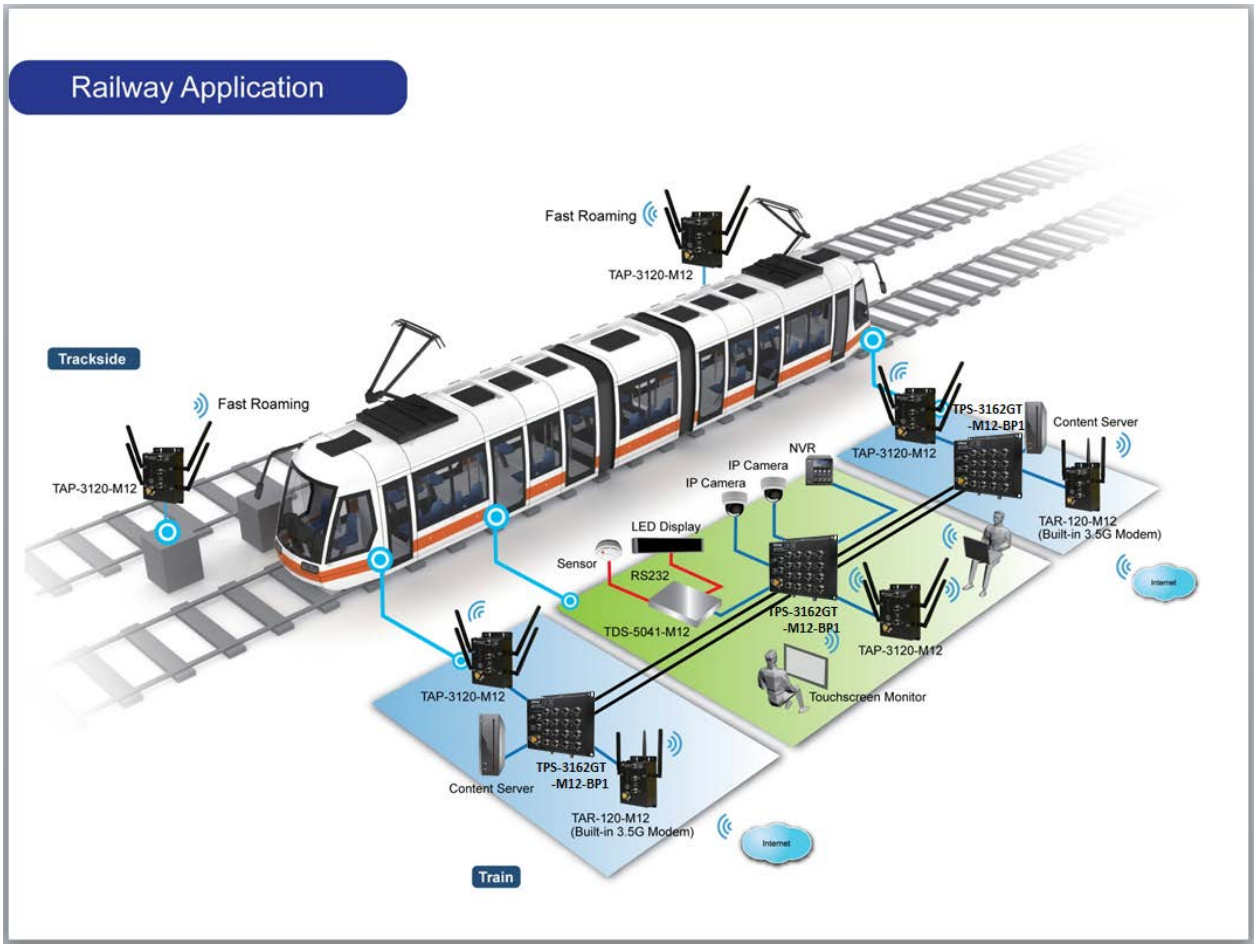
***NOTE: This function is available by request only.**

guarantee reliable operation against environmental disturbances, such as vibration and shock.

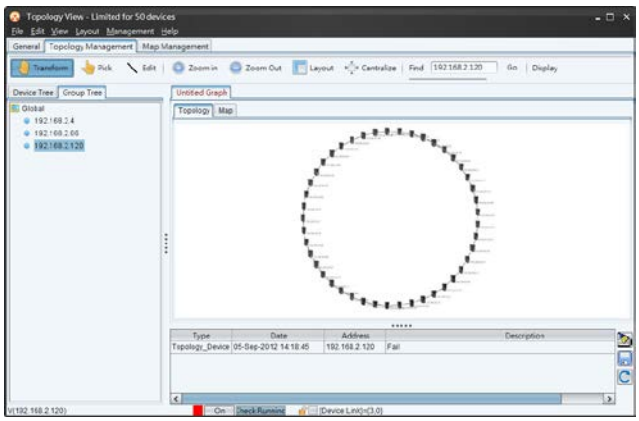
TPS-3162GT-M12-BP1-24V can be managed centralized and convenient by a powerful windows utility ~ Open-Vision. In addition, the wide operating temperature range from -40 ºC to 70ºC can satisfy most of operating environment. Therefore, the switch is one of the most reliable choices for rolling stock and highly-managed PoE Ethernet application.

Open-Vision

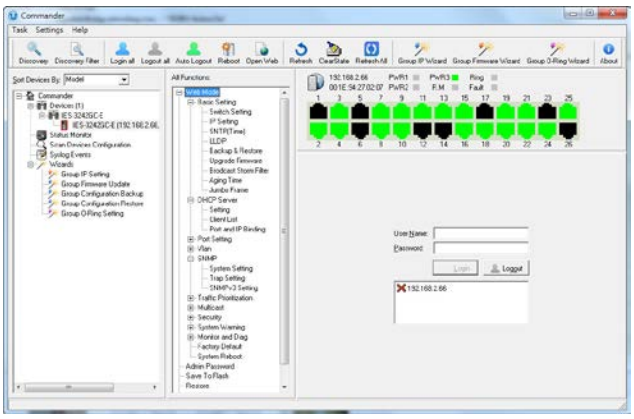
ORing's switches are intelligent switches. Different form other traditional redundant switches, ORing provides a set of Windows utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.



Network connection

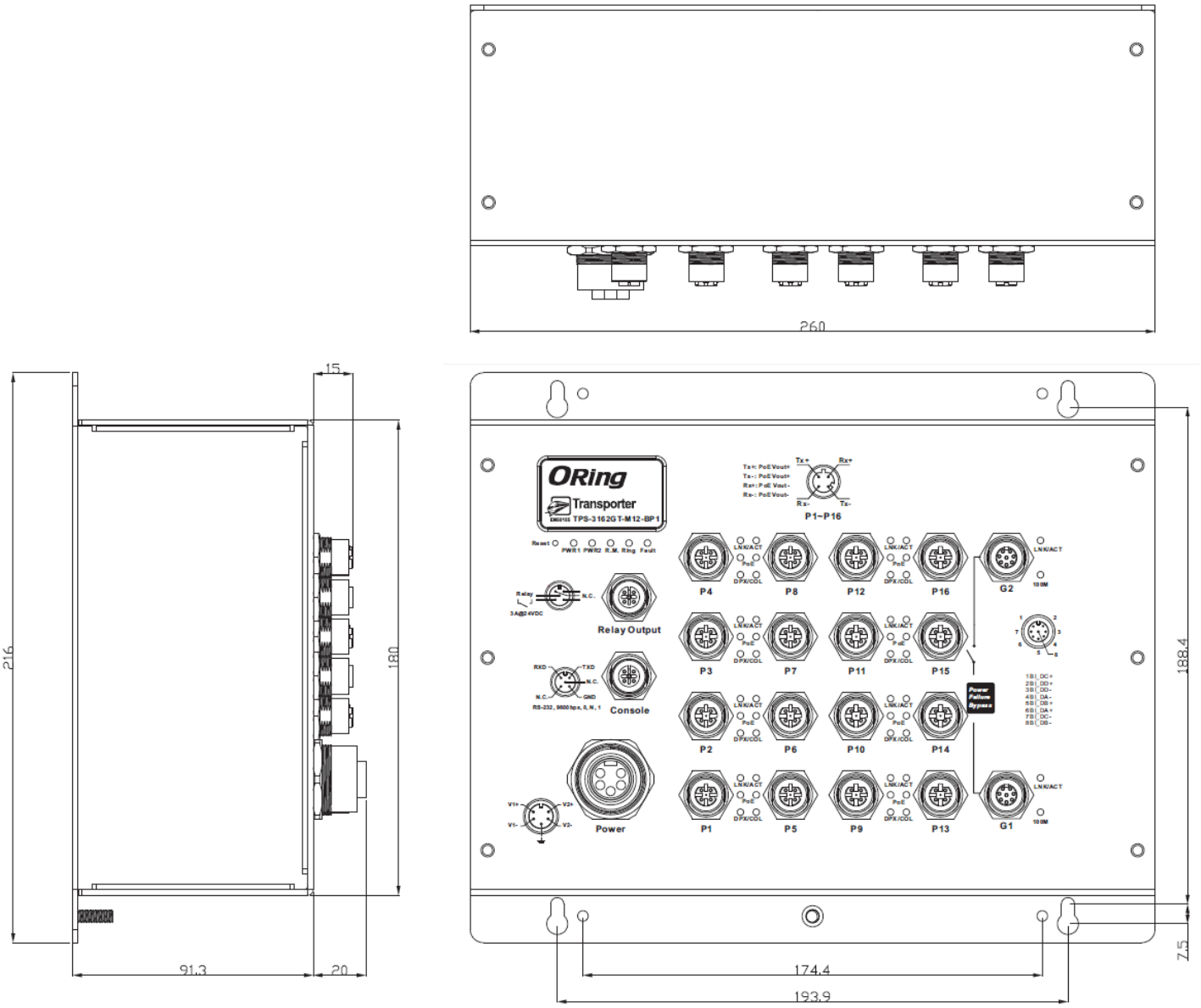


Topology View

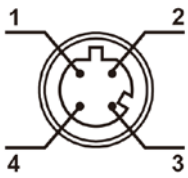


Monitoring and Configuration interface

Dimension

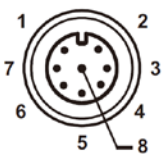


Pin Definition



D-Coding M12

10/100Base-T(X) P.S.E. M12 port	
Pin No.	Description
#1	Tx+ with PoE Vout+
#2	Rx+ with PoE Vout-
#3	Tx- with PoE Vout+
#4	Rx- with PoE Vout-
#5	N.C.

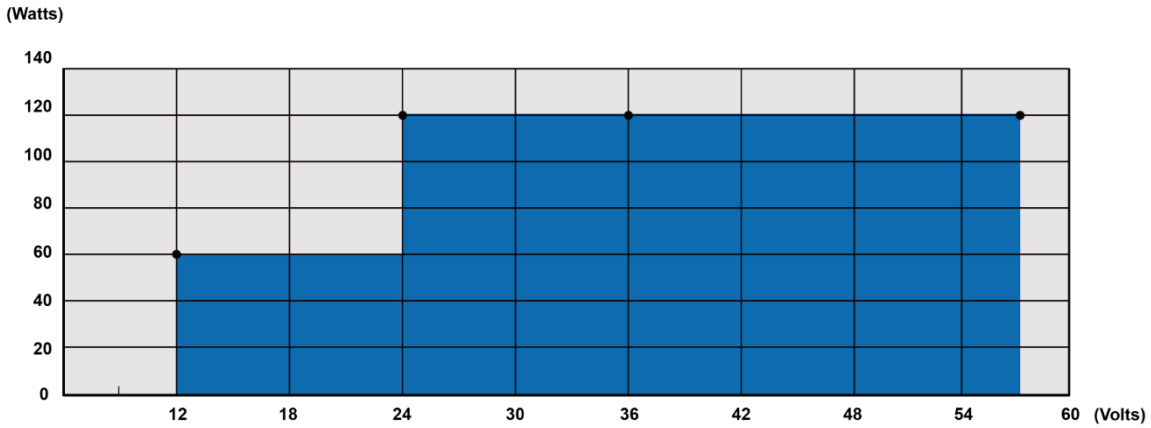


A-Coding M12

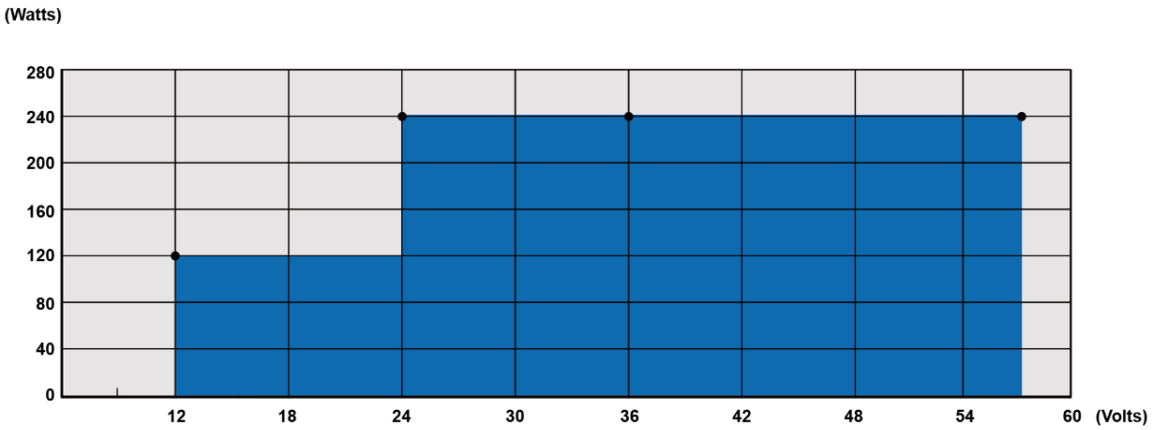
10/100/1000Base-T(X) M12 port	
Pin No.	Description
#1	BI_DC+
#2	BI_DD+
#3	BI_DD-
#4	BI_DA-
#5	BI_DB+

	#6	N.C.		#6	BI_DA+
	#7	N.C.		#7	BI_DC-
	#8	N.C.		#8	BI_DB-

PoE Power Distribution



P1~P8 / P9~P16 PoE Power Distribution (respectively)



Total PoE Power Distribution

Specifications

ORing Switch Model	TPS-3162GT-M12-BP1-24V
Physical Ports	
10/100Base-T(X) Ports in M12 Auto MDI/MDIX with P.S.E.	**16 x M12 female connector (4-pin D-coding)**
10/100/1000Base-T(X) ports in M12	**2 x M12 female connector (8-pin A-coding)**
RS-232 Serial Console Port	RS-232 in M12 female connector (A-coding). Baud rate setting: 9600bps, 8, N, 1
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 802.1D 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 us Switching bandwidth: 7.2Gbps 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 SNMP v1/v2c/v3 encrypted authentication and access security
Software Features	STP/RSTP/MSTP (IEEE 802.1D/w/s) Redundant Ring (O-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 O-Chain MRP***NOTE** 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	Top Green for port Link/Act. Middle Green for PoE indicator. Bottom Amber for Collision/Duplex indicator.
10/100/1000Base-T(X) M12 Port Indicator	Green for Link/Act. Amber for 100Mbps indicator
Fault contact	
Relay	Relay output to carry capacity of 3A at 24VDC on M12 female connector (5-pin A-coding)
Power	
Redundant Input Power	Dual DC inputs. 24 (12~57VDC) VDC on 5-pin M23 female connector
Power Consumption (Typ.)	14.88 Watts (power consumption of P.S.E. is not included)
PoE Output Power	120 Watts (12~24VDC) / 240 Watts (24~57VDC)

Overload Current Protection	Present
Reverse Polarity Protection	Not Present
Physical Characteristic	
Enclosure	IP-30
Dimension (W x D x H)	260 (W) x 91.3 (D) x216 (H) mm
Weight (g)	2220 g
Environmental	
Storage Temperature	-40 to 85ºC (-40 to 185ºF)
Operating Temperature	-40 to 70ºC (-40 to 158ºF)
Operating Humidity	5% to 95% Non-condensing
Regulatory approvals	
EMC	CE EMC (EN 55024, EN 55032), FCC Part 15 B, EN 50155(pending)
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), 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) (pending)
MTBF	267612 hrs.
Warranty	5 years

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

Ordering Information

TPS-3AABCC-M12-DDD-24V

Code Definition	10/100Base-T(X) P.S.E. Port Number	Additional Port Number	Additional Port Type	Bypass Function
Option	**- 16: 16** ports	**- 2:** 2 ports	**- GT:** 10/100/1000Base-T(X) port	- **BP1:** 1xbypass function included

	Model Name	Description
Available Model	**TPS-3162GT-M12-BP1-24V**	EN50155 18-port managed PoE Ethernet switch with 16x10/100Base-T(X) P.S.E. and 2x10/100/1000Base-T(X), A-coded M12 connector and 1xbypass included, 24VDC power inputs

Packing List

- **TPS-3162GT-M12-BP1-24V x 1**
- **ORing Tool CD x 1**
- **Quick Installation Guide x 1**

Optional Accessories

- **Open-Vision M500: Powerful Network Management Windows utility Suit, 500 IP devices**
- **M12C: M12 cable accessories**