



TES-3162GT-M12-BP1

# TES-3162GT-M12-BP1

EN50155 18-port managed Ethernet switch with 16x10/100Base-T(X) and 2x10/100/1000Base-T(X), M12 connector and 1x bypass included

## Features

- Leading EN50155-compliant Ethernet switch for rolling stock application
- 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** support applications with multiple redundant rings topology
- Support standard IEC 62439 **MRP<sup>NOTE</sup>** (Media Redundancy Protocol) function
- STP/RSTP:2004/MSTP supported
- Support IPV6 new internet protocol version
- Support **PTP Client** (Precision Time Protocol) clock synchronization
- Provided HTTPS/SSH protocol to enhance network security
- 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
- Support TACACS+ and 802.1x User Authentication for security
- 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

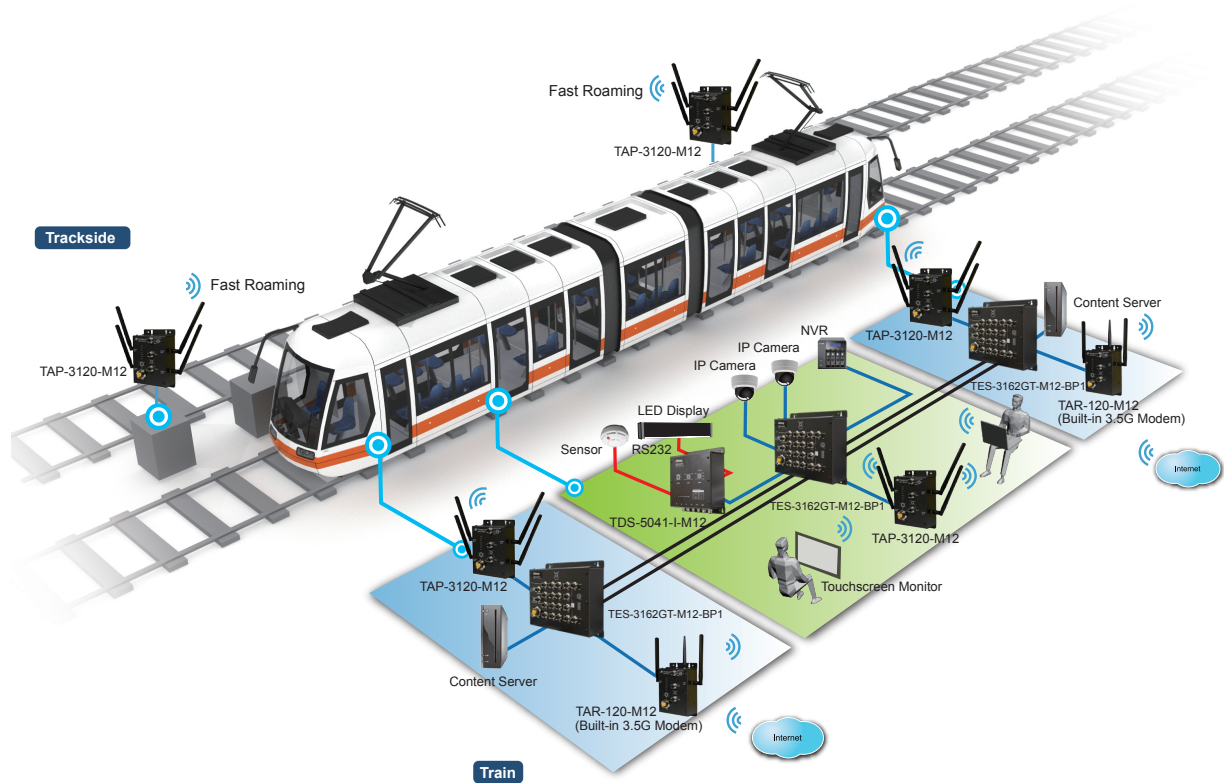


## Introduction

ORing's Transporter™ series managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. The TES-3162GT-M12-BP1 is a managed Redundant Ring Ethernet switch with 16x10/100Base-T(X) 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), Open-Ring, O-Chain and MSTP/RSTP:2004/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. And O-Chain technology is supported which can applied for multiple redundant Ethernet rings. Each TES-3162GT-M12-BP1 switch has 16x10/100Base-T(X) ports. TES-3162GT-M12-BP1 EN50155 Ethernet switch use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. TES-3162GT-M12-BP1 can be managed centralized and convenient by a powerful windows utility ~ Open-Vision. In addition, the wide operating temperature range from -40 to 70°C can satisfy most of operating environment. Therefore, the switch is one of the most reliable choices for rolling stock and highly-managed Ethernet application.

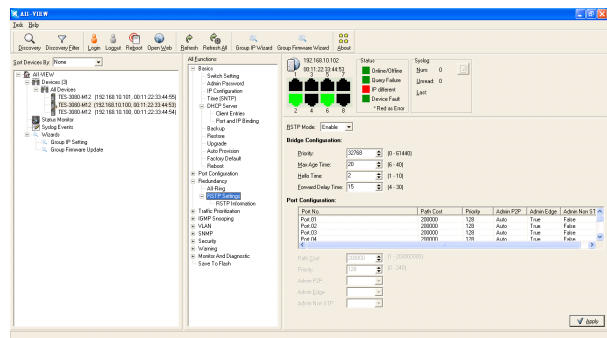
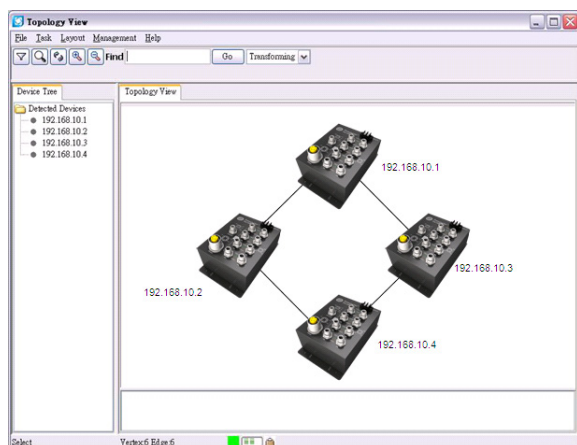
**\*NOTE: This function is available by request only**

## Practical Operation

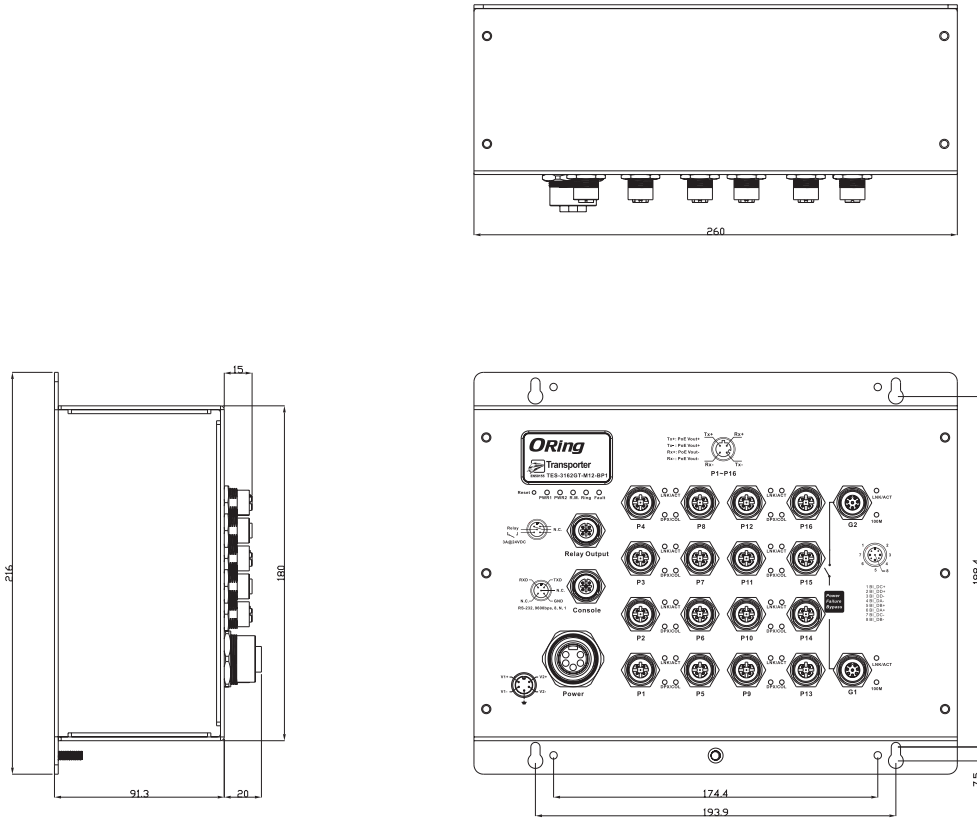


## Open-Vision

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



## Dimensions



(Unit=mm)

## PoE Pin Definition

10/100Base-T(X) M12 port	
M12 D-coding Pin Definition	
Pin No.	Description
#1	TD+
#2	TD-
#3	RD+
#4	RD-

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

## Specifications

ORing Switch Model	TES-3162GT-M12-BP1	
<b>Physical Ports</b>		
10/100Base-T(X) Ports in M12 Auto MDI/MDIX	16 x M12 connector (4-pin D-coding)	
10/100/1000Base-T(X) ports in M12	2 x M12 connector (8-pin A-coding)	
RS-232 Serial Console Port	RS-232 in M12 connector (A-coding). Baud rate setting: 9600bps, 8, N, 1	
<b>Technology</b>		
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 802.1D for STP (Spanning Tree Protocol) IEEE 802.1D-2004 for RSTP:2004 (Rapid Spanning Tree Protocol 2004) 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)	
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 Https / SSH enhance network security	
Software Features	STP/RSTP:2004/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 STP MSTP	Open-Ring MRP* <b>NOTE</b> RSTP:2004
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	
<b>LED Indicators</b>		
Power Indicator	Green : Power LED x 2	
R.M. Indicator	Green : Indicates that the system is operating in O-Ring Master mode	
O-Ring Indicator	Green : Indicates that the system is operating in O-Ring mode	

\*NOTE: This function is available by request only

Fault Indicator	Amber : Indicates unexpected event occurred
10/100Base-T(X) M12 Port Indicator	Green for port Link/Act. Amber for Duplex/Collision
10/100/1000Base-T(X) M12 Port Indicator	Green for Link/Act. Amber for 100Mbps indicator
<b>Fault Contact</b>	
Relay	Relay output to carry capacity of 3A at 24VDC on M12 connector (5-pin A-coding)
<b>Power</b>	
Redundant Input Power	Dual DC inputs. 12~48VDC on 5-pin M23 connector
Power Consumption (Typ.)	12.48 Watts
Overload Current Protection	Present
Reverse Polarity Protection	Not Present
<b>Physical Characteristics</b>	
Enclosure	IP-40
Dimensions (W x D x H)	260 (W) x 91.3 (D) x 216 (H) mm
Weight (g)	2020 g
<b>Environmental</b>	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 70°C (-40 to 158°F)
Operating Humidity	5% to 95% Non-condensing
<b>Regulatory Approvals</b>	
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

## Ordering Information

**TES-3 AA B CC -M12**

Code Definition	10/100Base-T(X) Port Number	Additional Port Number	Additional Port Number
<b>Option</b>	- <b>16</b> : 16 ports	- <b>2</b> : 2 port	- <b>GT</b> : 10/100/1000Base-T(X) port

Available Model	Model Name	Description
	TES-3162GT-M12-BP1	EN50155 18-port managed Ethernet switch with 16x10/100Base-T(X) and 2x10/100/1000Base-T(X), M12 connector and 1xbypass included

### Packing List

- TES-3162GT-M12-BP1
- ORing Tool CD
- Quick Installation Guide
- Console cable

### Optional Accessories (Can be purchased separately)

- Open-Vision M500, Powerful Network Management Windows Utility Suite, 500 IP devices
- DR-75 series : 75 Watts DIN-Rail power supply
- DR-120 series : 120 Watts DIN-Rail power supply
- M12C : M12 cable accessories