TGS-9120-M12 Series

TGS-9120-M12 Series

EN50155 12-port managed Gigabit Ethernet switch with 12x10/100/1000Base-T(X) ports, M12 connector

Features

- Leading EN50155-compliant Ethernet switch for rolling stock application
- Support **O-Ring** (recovery time < 30ms over 250 units of connection) and MSTP(RSTP/STP compatible) for Ethernet Redundancy
- **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***NOTE (Media Redundancy Protocol) function
- Support IEEE 1588v2 clock synchronization
- Support IPV6 new internet protocol version
- Support Modbus TCP protocol
- Support IEEE 802.3az **Energy-Efficient Ethernet** technology
- Provided HTTPS/SSH protocol to enhance network security
- Support SMTP client
- Support IP-based bandwidth management
- Support application-based QoS management
- Support Device Binding security function
- Support DOS/DDOS auto prevention
- IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic
- Support SNMP v1/v2c/v3 & RMON & 802.1Q VLAN Network Management
- Support ACL, TACACS+ and 802.1x User Authentication for security
- Supports 9.6K Bytes Jumbo Frame
- Multiple notification for warning of unexpected event
- Web-based ,Telnet, Console (CLI), and Windows utility (Open-Vision) configuration
- Support LLDP Protocol
- Built-in 2 sets of bypass ports (-BP2 model)
- Wall mounting enabled







Introduction

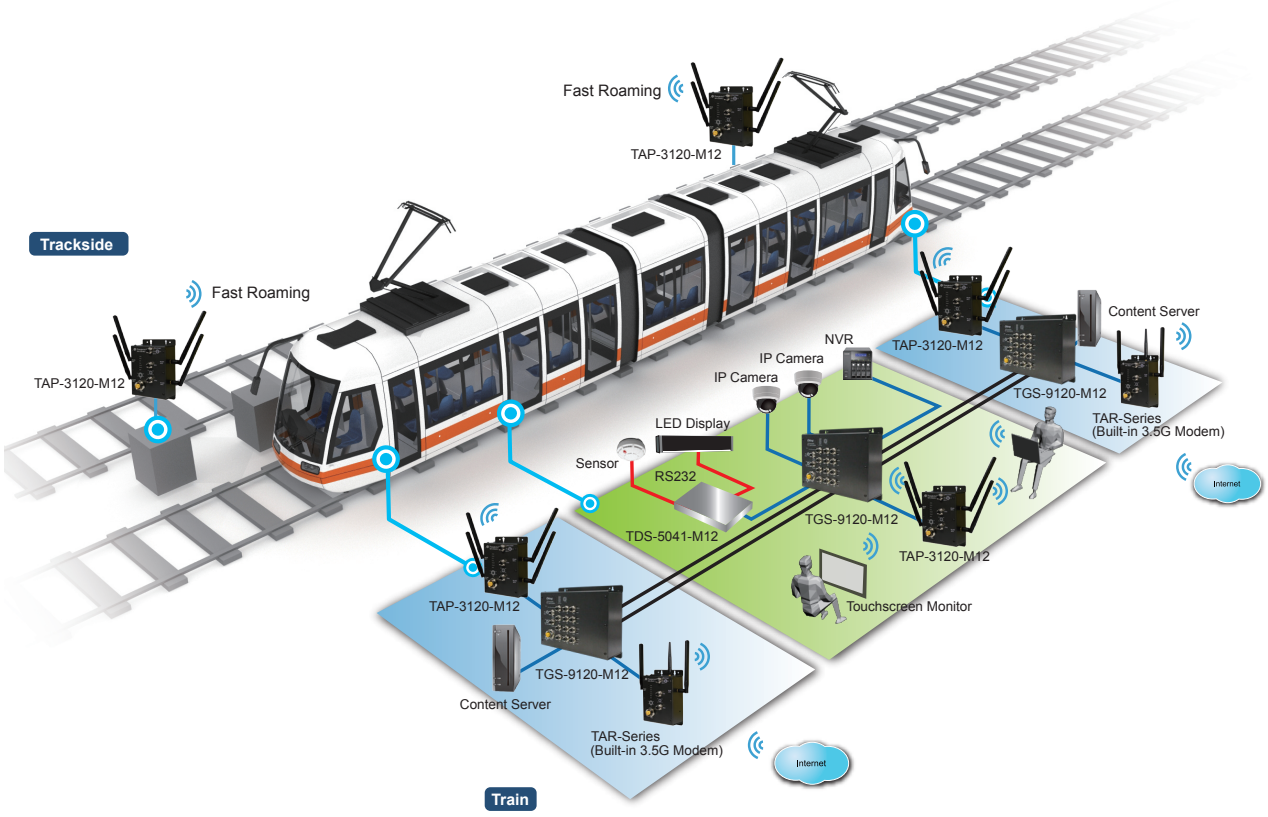
ORing's Transporter™ series managed Ethernet switches are designed for industrial applications such as rolling stock, vehicle, and railway. The TGS-9120-M12, which is compliant with the EN50155 standard, is a managed Gigabit Redundant Ring Ethernet switch with 12x10/100/1000Base-T(X) ports which is specifically designed for the toughest and fully compliant with EN50155 requirement. The switch support Ethernet Redundancy protocol, O-Ring (recovery time < 30ms over 250 units of connection), Open-Ring, O-Chain, MRP*NOTE and MSTP (RSTP/STP compatible) can protect your mission-critical applications from network interruptions or temporary malfunctions with its fast recovery technology. It is specifically designed for the toughest industrial environments. TGS-9120-M12 EN50155 Ethernet switch uses M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. TGS-9120-M12-BP2 includes 2 sets of bypass ports that protect the network from failures and Network maintenance by ensuring network integrity during power loss. And

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

support wide operating temperature from -40 to 70°C. TGS-9120-M12 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 choice for highly-managed and Ethernet application.

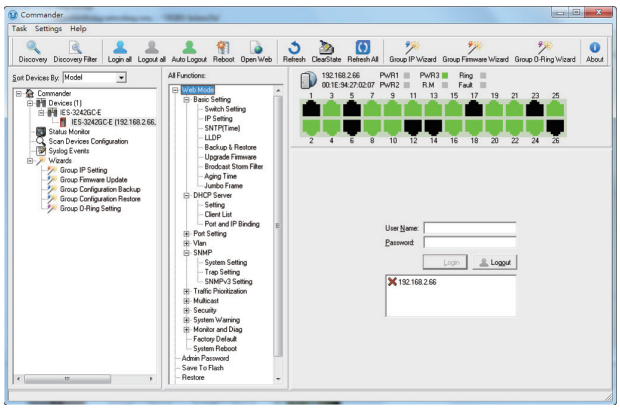
- **O-Ring** : O-Ring is ORing's proprietary redundant ring technology, with recovery time of less 30 milliseconds and up to 250 nodes. The O-Ring r edundant ring technology can protect mission-critical application from network interruptions or temporary malfunction with its fast recover technology.
- **Open-Ring** : Open-Ring is an enhanced redundant technology that makes ORing's switches compatible with other vendor's proprietary redundant ring technologies. It enables ORing's switches to form a single ring with other vendor's switch. In cases where the ring is setup using proprietary technology, ORing offers a compatibility service where ORing can make its switches compatible with your particular network requirements.
- **O-Chain** : 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.
- **MRP*NOTE** : Media Redundancy Protocol (MRP) is a data network protocol standardized by the IEC 62439-2. It allows rings of Ethernet switches to overcome any single failure with recovery time much faster than achievable with Spanning Tree Protocol.
- **IP-based Bandwidth Management** : The switch provide advanced IP-based bandwidth management which can limit the maximum bandwidth for each IP device. User can configure IP camera and NVR with more bandwidth and limit other device bandwidth.
- **Application-Based QoS** : The switch also support application-based QoS. Application-based QoS can set highest priority for data stream according to TCP/UDP port number.
- **Device Binding Function** : ORing special Device Binding function can only permit allowed IP address with MAC address to access the network. Hacker cannot access the IP surveillance network without permission. It can avoid hacker from stealing video privacy data and attacking IP camera, NVR and controllers.
- **Advanced DOS/DDOS Auto Prevention** : The switch also provided advanced DOS/DDOS auto prevention. If there is any IP flow become big in short time, the switch will lock the source IP address for certain time to prevent the attack. It's hardware based prevention so it can prevent DOS/DDOS attack immediately and completely.
- **IEEE 1588v2 Technology** : The IEEE 1588v2 technology can fulfill precision time synchronization requirements for protection and control applications.
- **Modbus TCP** : This is a Modbus variant used for communications over TCP/IP networks.
- **IEEE 802.3az Energy-Efficient Ethernet** : This is a set of enhancements to the twisted-pair and backplane Ethernet family of networking standards that will allow for less power consumption during periods of low data activity. The intention was to reduce power consumption by 50% or more.

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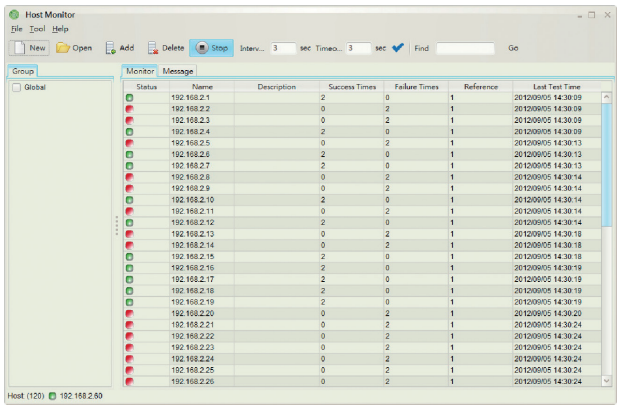


Open-Vision

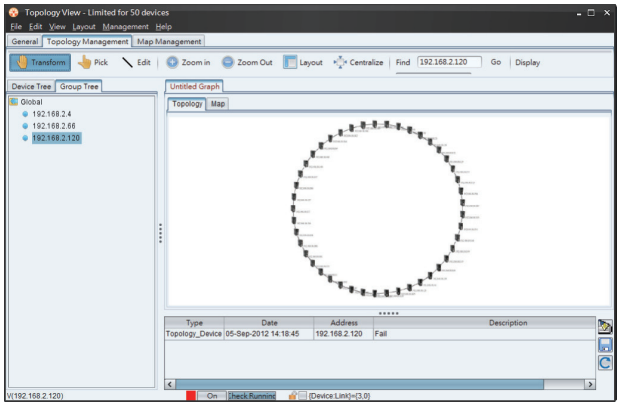
ORing's switches are intelligent switches. Different from other traditional redundant switches, ORing provides a set of Windows utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.



Commander



Host Monitor



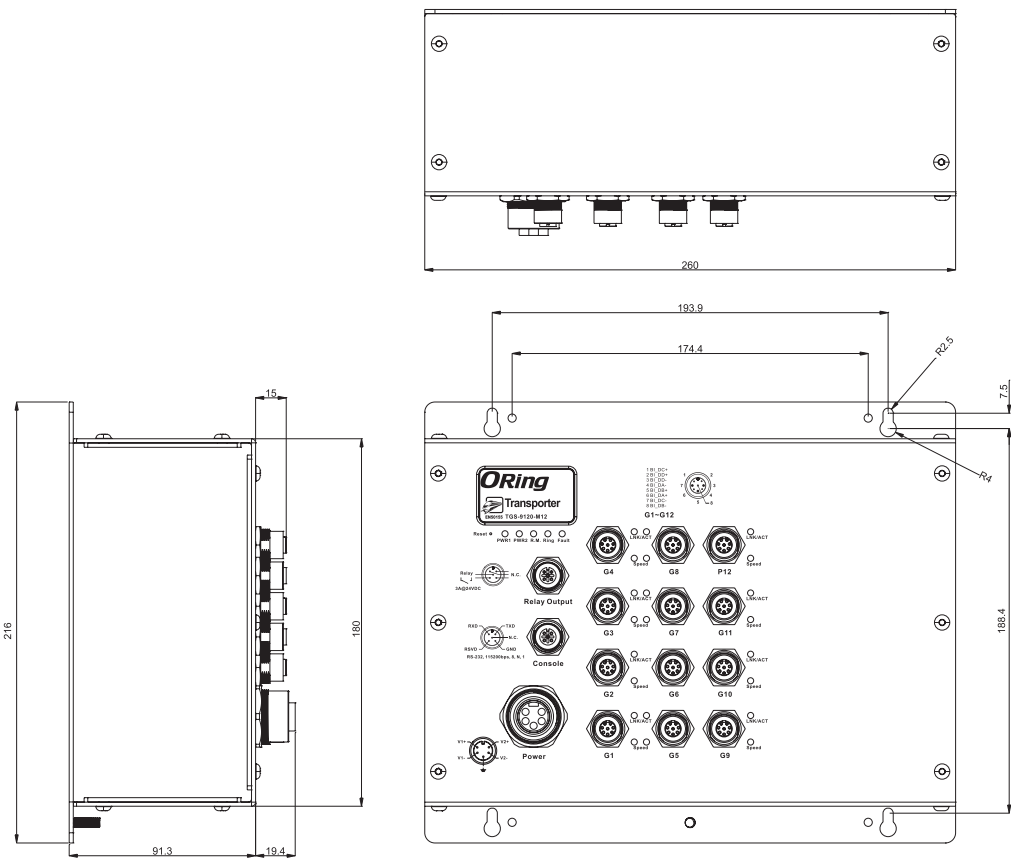
Topology View

PoE Pin Definition

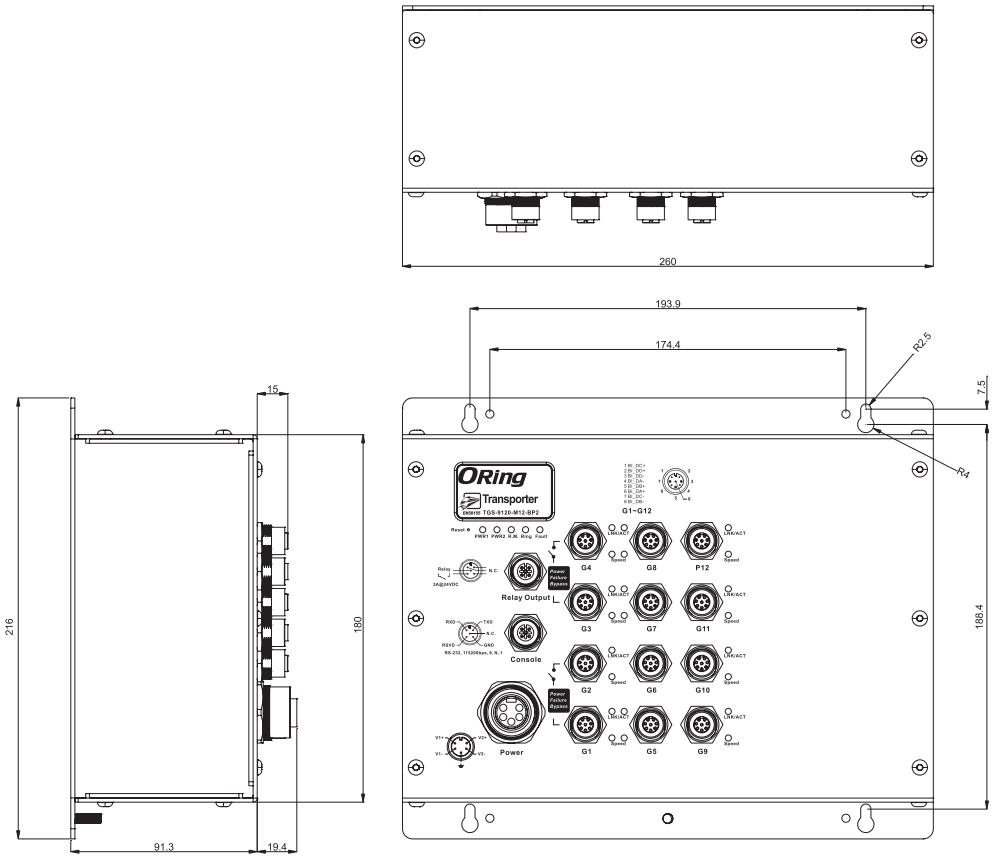
10/100/1000Base-T(X) M12 port	
M12 Pin Definition	
Pin No.	Description
#1	BI_DC+
#2	BI_DD+
#3	BI_DD-
#4	BI_DA-
#5	BI_DB+
#6	BI_DA+
#7	BI_DC-
#8	BI_DB-

Dimensions

TGS-9120-M12



TGS-9120-M12-BP2



Specifications

ORing Switch Model	TGS-9120-M12	TGS-9120-M12-BP2
Physical Ports		
10/100/1000Base-T(X) ports in M12 Auto MDI/MDIX	12 (8-pin A-coding)	12 (8-pin A-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 802.1x for Authentication IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)	
MAC Table	8K	
Priority Queues	8	
Processing	Store-and-Forward	
Switch Properties	Switching latency: 7 us Switching bandwidth: 40Gbps Max. Number of Available VLANs: 4095 IGMP multicast groups: 256 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 Open-Ring O-Chain MRP***NOTE** MSTP (RSTP/STP compatible)	
RS-232 Serial Console Port	RS-232 in M12 (A-coding) connector with console cable. 115200bps, 8, N, 1	
LED Indicators		
Power Indicator (PWR)	Green : Power LED x 2	
Ring Master Indicator (R.M.)	Green : Indicates that the system is operating in O-Ring Master mode	
O-Ring Indicator (Ring)	Green : Indicates that the system operating in O-Ring mode Green Blinking : Indicates that the Ring is broken.	
Fault Indicator (Fault)	Amber : Indicate unexpected event occurred	
10/100/1000Base-T(X) M12 Port Indicator	Top Green LED for Link/Act indicator Bottom dual color LED for Ethernet speed indicator : Green LED for 1000Mbps, Amber for 100Mbps, Off for 10Mbps	
Fault contact		
Relay	Relay output to carry capacity of 3A at 24VDC on M12 connector (A-coding)	
Power		
Redundant Input power	Dual DC inputs. 12~48VDC on 5-pin M23 connector	
Power Consumption (Typ.)	17.3 Watts	17.8 Watts
Overload Current Protection	Present	
Reverse Polarity Protection	Present	
Physical Characteristics		
Enclosure	IP-30	
Dimensions (W x D x H)	260 (W) x 91.3 (D) x216 (H) mm	
Weight (g)	2196 g	2218 g
Environmental		
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	
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, EN61373	
Free Fall	IEC60068-2-31	
Vibration	IEC60068-2-6	
Warranty	5 years	

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

Ordering Information

TGPS-9 AA B -M12-CCC

Code Definition	10/100/1000Base-T(X) P.S.E. Port Number	Additional Port Number	Bypass Function
Option	**- 12:** 12 ports	**- 0:** 0 port	**- BP2:** 2xbypass function included

	Model Name	Description
Available Model	TGS-9120-M12	EN50155 12-port managed Gigabit Ethernet switch with 12x10/100/1000Base-T(X), M12 connector
	TGS-9120-M12-BP2	EN50155 12-port managed Gigabit Ethernet switch with 12x10/100/1000Base-T(X), M12 connector and 2xbypass included

Packing List

- TGS-9120-M12
- Quick Installation Guide
- ORing Tool CD

Optional Accessories

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