# TGPS-9080-M12A-MV

**ORing**

**EN50155 8-port managed Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X)**

**P.S.E. with A-coded M12 connector, 110VDC power input**

## 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
- **O-Chain** allow multiple redundant network rings
- Support standard IEC 62439-2 **MRP**[*NOTE] (Media Redundancy Protocol) function
- Supports IEEE 802.3at compliant PoE and total power budget is 60 Watts with maximum 30Watts per port
- Support PoE scheduled configuration and PoE auto-ping check 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 and 802.1x User Authentication for security
- Support DBU-01 (Data backup unit for easy configuration backup)
- Supports 9.6K Bytes Jumbo Frame
- Multiple notification for warning of unexpected event
- Web-based ,Telnet, Console (CLI), and Windows utility (**Open-Vision**) configuration
- Wall mounting enabled
- IP-30 housing design

EN50155  G Full  PoE  O-Ring  O-Chain  -40~75°C Temperature

## Introduction

ORing's Transporter[TM] series managed Ethernet switches are designed for industrial applications such as rolling stock, vehicle, and railway.   The TGPS-9080-M12A-MV, which is compliant with the EN50155 standard, is a managed Gigabit Redundant Ring Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. 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), 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.   TGPS-9080-M12A-MV EN50155 Ethernet switch uses M12 connectors to

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

ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock.   TGPS-9080-M12A-MV also support Power over Ethernet, a system to transmit electrical power up to **30 watts**, along with data, to remote devices over standard twisted-pair cable in an Ethernet network.   Each TGPS-9080-M12A-MV switch has 8x10/100/1000Base-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 connection. While TGPS-9080-M12A-MV complies with EN50155, the switch supports wide operating temperature from -40 ℃ to 75 ℃.   TGPS-9080-M12A-MV 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 redundant ring technology can protect mission-critical application from network interruptions or temporary malfunction with its fast recover technology.
- **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 provides 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 supports 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.
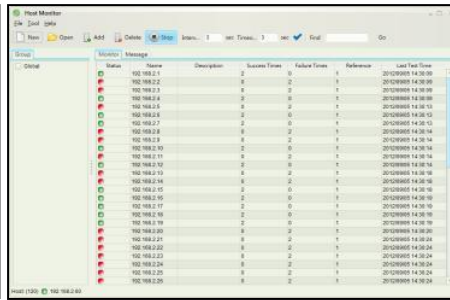
**\*NOTE: This function is available by request only.**
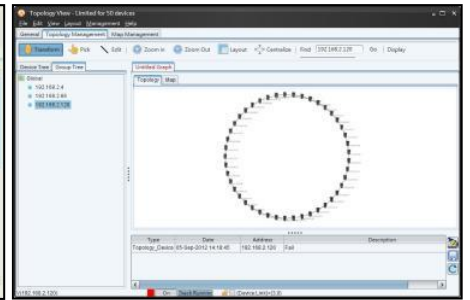
## Open-Vision

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.
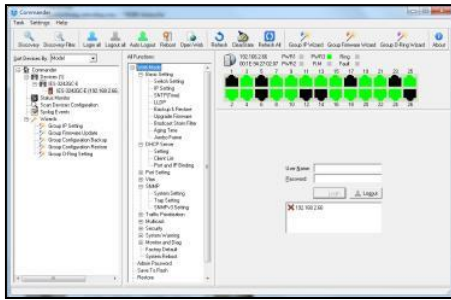
*Commander*


*Host Monitor*


*Topology View*

# Dimension
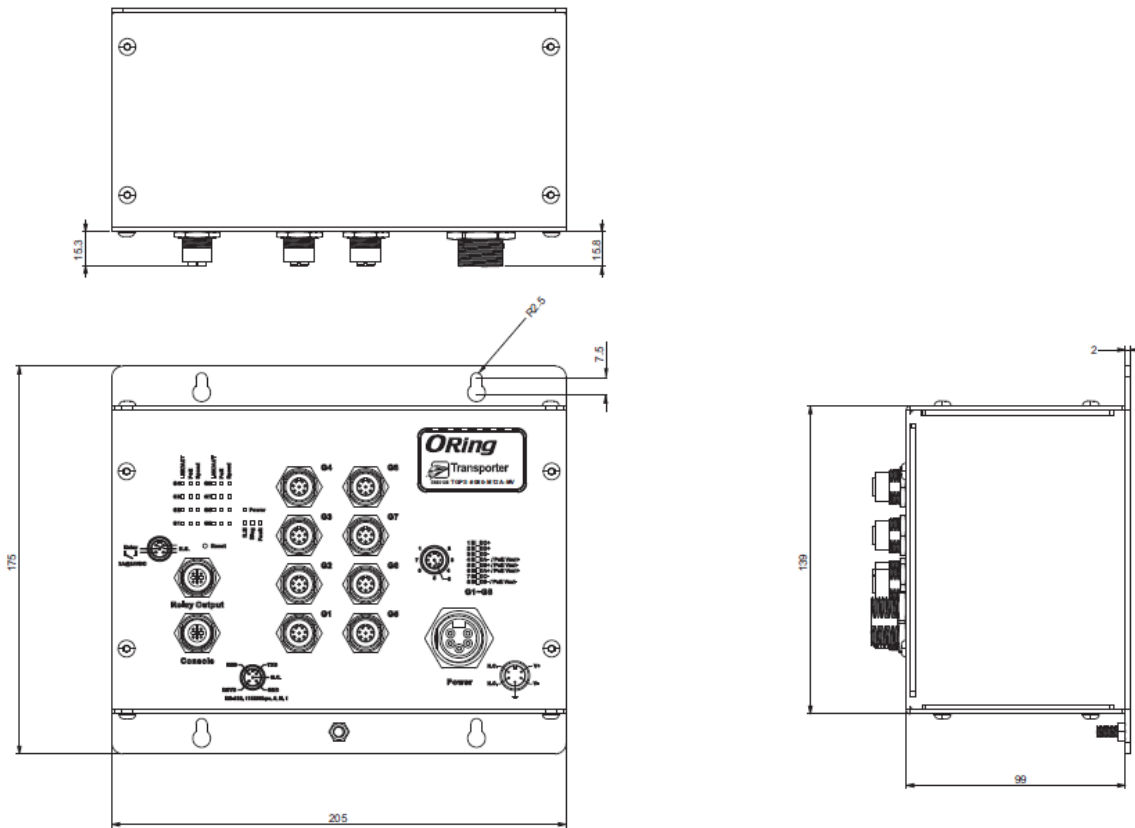


# Pin Definition



**A-Coding M12**

| 10/100/1000Base-T(X) P.S.E. M12 port | |
|---|---|
| Pin No. | Description |
| #1 | BI_DC+ |
| #2 | BI_DD+ |
| #3 | BI_DD- |
| #4 | BI_DA- / PoE Vout+ |
| #5 | BI_DB+ / PoE Vout- |
| #6 | BI_DA+ / PoE Vout+ |

| | #7 | BI_DC- |
|---|---|---|
| | #8 | BI_DB- / PoE Vout- |

## Specifications

| ORing Switch Model | TGPS-9080-M12A-MV |
|---|---|
| **Physical Ports** | |
| 10/100/1000Base-T(X) with P.S.E. Ports in M12 Auto MDI/MDIX | **8 (8-pin female A-coding)** |
| **Technology** | |
| Ethernet Standards | IEEE 802.3 for 10Base-T<br>IEEE 802.3u for 100Base-TX<br>IEEE 802.3ab for 1000Base-T<br>IEEE 802.3x for Flow control<br>IEEE 802.3ad for LACP (Link Aggregation Control Protocol)<br>IEEE 802.1p for COS (Class of Service)<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol)<br>IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol)<br>IEEE 802.1x for Authentication<br>IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)<br>IEEE 802.3at PoE specification (up to 30 Watts per port for P.S.E.) |
| MAC Table | 8k |
| Priority Queues | 8 |
| Processing | Store-and-Forward |
| Switch Properties | Switching latency: 7 us<br>Switching bandwidth: 16Gbps<br>Max. Number of Available VLANs: 4095<br>IGMP multicast groups: 128 for each VLAN<br>Port rate limiting: User Define |
| Jumbo frame | Up to 9.6K Bytes |
| Security Features | Device Binding security feature<br>Enable/disable ports, MAC based port security<br>Port based network access control (802.1x)<br>VLAN (802.1Q) to segregate and secure network traffic<br>Radius centralized password management<br>SNMPv3 encrypted authentication and access security<br>Https / SSH enhance network security |
| Software Features | STP/RSTP/MSTP (IEEE 802.1D/w/s)<br>Redundant Ring (O-Ring) with recovery time less than 30ms over 250 units<br>TOS/Diffserv supported<br>Quality of Service (802.1p) for real-time traffic<br>VLAN (802.1Q) with VLAN tagging and GVRP supported<br>IGMP Snooping<br>IP-based bandwidth management<br>Application-based QoS management<br>DOS/DDOS auto prevention<br>Port configuration, status, statistics, monitoring, security<br>DHCP Server/Client/Relay<br>SMTP Client<br>Modbus TCP |
| Network Redundancy | O-Ring<br>O-Chain<br>MRP*NOTE<br>MSTP (RSTP/STP compatible) |
| RS-232 Serial Console Port | RS-232 in 5-pin M12 female A-coding connector with optional console cable which can be purchased separately.<br>115200bps, 8, N, 1 |
| **LED Indicators** | |
| Power Indicator (PWR) | Green: Power LED x 1 |
| 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<br>Green Blinking: Indicates that the Ring is broken. |

| Fault Indicator (Fault) | Amber: Indicate unexpected event occurred |
|---|---|
| 10/100/1000Base-T(X) M12 P.S.E. Port Indicator | Top Green LED for port Link/Act indicator.<br>Middle Green LED for PoE enable indicator<br>Bottom dual color LED for Ethernet speed indicator: Green LED for 1000Mbps, Amber for 100Mbps, Off for 10Mbps |
| **Power** | |
| Input power | 72/96/110VDC (50.4-137.5VDC). 7/8 inch 5-pin male connector |
| Power consumption (Typ.) | 13 Watts (power consumption of P.S.E. is not included) |
| Total PoE Output Power | 60 Watts |
| Overload current protection | Present |
| Reverse Polarity Protection | Present |
| **Physical Characteristic** | |
| Enclosure | IP-40 |
| Dimension (W x D x H) | 205 (W) x 99 (D) x175 (H) mm |
| Weight (g) | 1790 g |
| **Environmental** | |
| Storage Temperature | -40 to 85°C (-40 to 185°F) |
| Operating Temperature | -40 to 75°C (-40 to 167°F) |
| Operating Humidity | 5% to 95% Non-condensing |
| **Regulatory Approvals** | |
| EMC | CE EMC (EN55024, EN55032), FCC Part 15 B, EN50155 (EN50121-3-2) |
| EMI | EN55032, CISPR32, EN6100-3-2, EN6100-3-3, FCC Part 15 B Class A |
| EMS | EN55024 (IEC/EN61000-4-2 (ESD), IEC/EN61000-4-3 (RS), IEC/EN61000-4-4 (EFT), IEC/EN61000-4-5 (Surge), IEC/EN61000-4-6 (CS), IEC/EN61000-4-8(PFMF), IEC/EN61000-4-11(DIP)) |
| Shock | IEC60068-2-27 |
| Free Fall | IEC60068-2-31 |
| Vibration | IEC60068-2-6 |
| Safety | EN60950-1 |
| Other | EN50155 (EN50121-3-2) |
| MTBF | 430668.9336 hrs |
| **Warranty** | 5 years |

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

## Ordering Information

**TGPS-9AAB-M12A-MV**

| Code Definition | 10/100/1000Base-T(X) P.S.E. Port Number | Additional Port Number |
|---|---|---|
| Option | **- 08:** 8 ports | **- 0:** 0 ports |

| Available Model | Model Name | Description |
|---|---|---|
| | **TGPS-9080-M12A-MV** | EN50155 8-port managed Gigabit PoE Ethernet switch with 8x10/100/1000Base-T(X) P.S.E. with A-coded M12 connector, 110VDC power Input |

## Packing List

- **TGPS-9080-M12A-MV 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**
- **M12 Cable series**