# TES-W9124GT-M12X-BP2-24V-IP54

ORing WEB-site

***EN50155 16-port managed Ethernet switch with12x10/100Base-T(X) and 4x10/100/1000Base-T(X), X-coded M12 connector and 2xbypass included, 24VDC power inputs, IP-54 grade***

## Features

- Leading EN50155-compliant Ethernet switch for rolling stock application
- IEC 62443-4-1 Certified, with cybersecurity features aligned to IEC 62443-4-2
- 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
- Supports standard IEC 62439-2 MRP (Media Redundancy Protocol) function
- Supports standard ITU-T G.8032 ERPS v1/v2 for Ethernet Redundancy
- Isolation power included
- Supports IEEE 802.3af/at compliant PoE with maximum 15.4/30Watts per port
- Supports PoE scheduled configuration and PoE auto-ping check function
- Supports IEEE 1588v2 clock synchronization
- Supports IPV6 new internet protocol version
- Supports Modbus TCP protocol
- Supports IEEE 802.3az Energy-Efficient Ethernet technology
- Provided HTTPS/SSH protocol to enhance network security
- Supports IP-based bandwidth management
- Supports application-based QoS management
- Supports Device Binding security function
- Supports DOS/DDOS auto prevention
- IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic
- Supports SNMP v1/v2c/v3 & RMON & 802.1Q VLAN Network Management
- Supports 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
- Supports LLDP Protocol
- Wall mounting enabled
- Supports IP-54 grade waterproof design



EN50155 | Isolation | O-Ring | O-Chain | Redundant PWR | -40~75°C Temperature | IPv6 READY | ROHS | CE | FC

## Introduction

ORing's Transporter™ series managed Ethernet switches are designed for industrial waterproof applications, such as rolling stock, vehicle, and railway applications. TES-W9124GT-M12X-BP2-24V-IP54 is managed Redundant Ring Ethernet switch with 12x10/100Base-T(X) and 4x10/100/1000Base-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 < 10/30ms over 250 units of connection), 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. TES-W9124GT-M12X-BP2-24V-IP54 includes 2 sets of bypass ports that protect the network from failures and Network maintenance by ensuring network integrity during power loss. And support wide operating temperature from -40°C to 75°C. TES-W9124GT-M12X-BP2-24V-IP54 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 choices for EN50155 waterproof highly-managed Ethernet application.

- **O-Ring:** O-Ring is ORing's proprietary redundant ring technology, with recovery time of less 10/30 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.

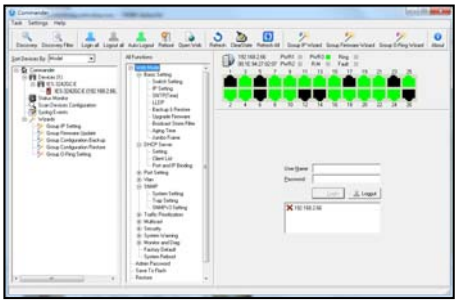
**NOTE 1.** Fast Ethernet ports supports less 10 milliseconds recovery time.

**NOTE 2.** Gigabit Ethernet ports supports less 30 milliseconds recovery time.

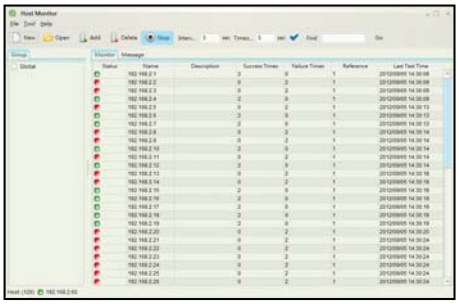
- **O-Chain:** O-Chain is the revolutionary network redundancy technology that provides the add-on network redundancy topology for any backbone network, O-Chain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger and more robust compound 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: 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.
- **ERPS: ERPS (Ethernet Ring Protection Switching)** prevents network loops and ensures fast recovery in ring topologies. When a link fails, ERPS quickly redirects traffic with a typical recovery time under 50 milliseconds, minimizing communication disruption and enhancing network reliability.
- **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.

## Open-Vision

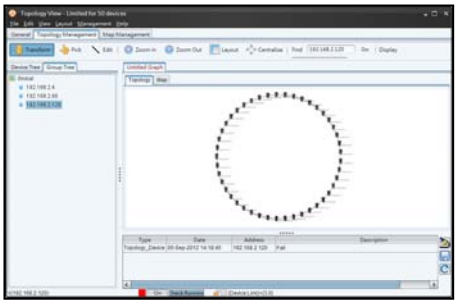
ORing's switches are intelligent switches. Different from other traditional redundant switches, ORing provides a set of Windows Utility (Open-Vision) for user to manage and monitor all of industrial Ethernet switches on the industrial network.



Commander



Host Monitor

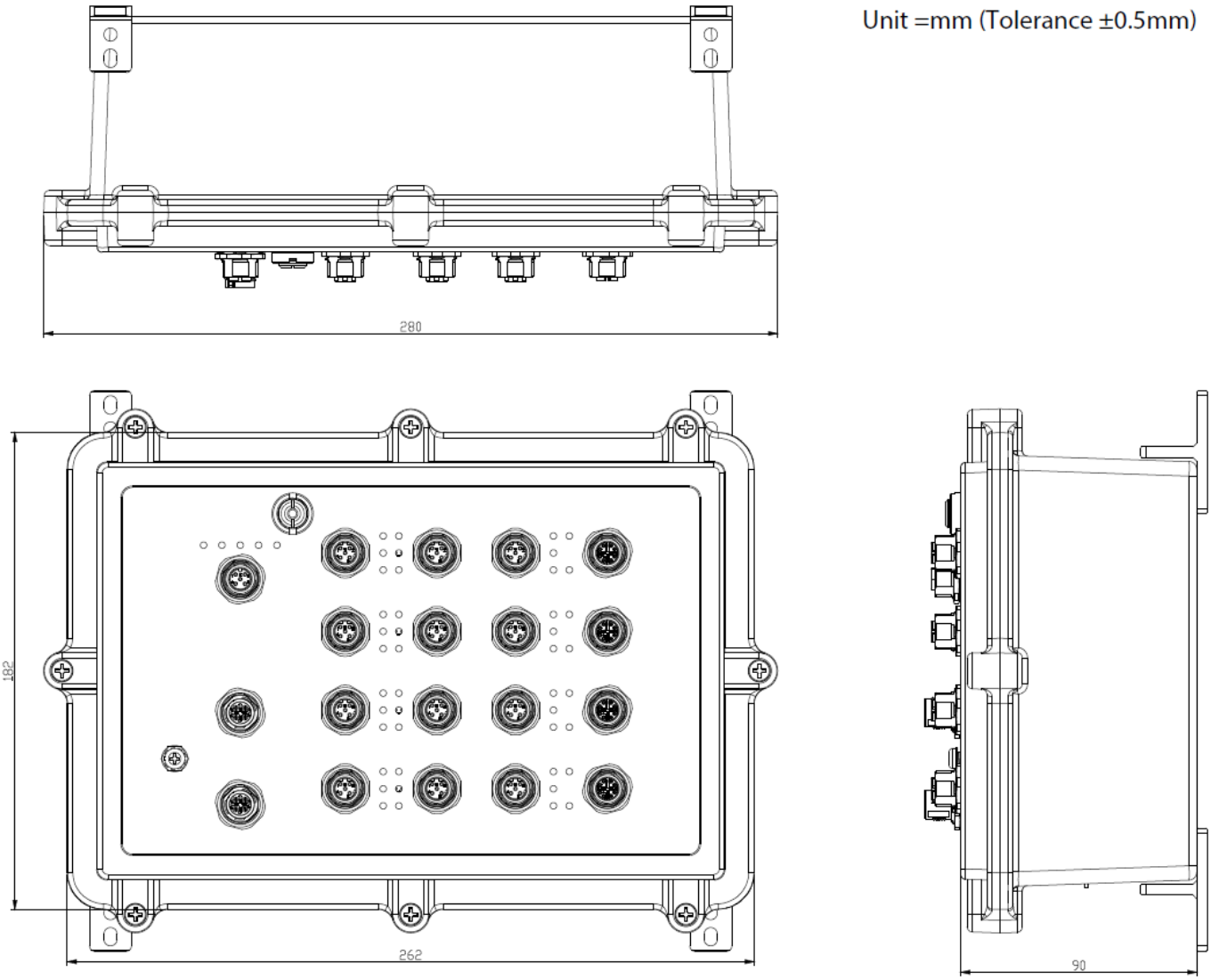


Topology View

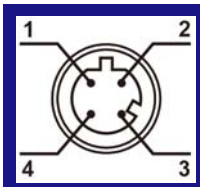


## Dimensions

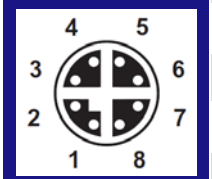
Unit =mm (Tolerance ±0.5mm)




## Pin Definition




D-Coding M12




X-Coding M12

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

## Specifications

| ORing Switch Model | TES-W9124GT-M12X-BP2-24V-IP54 |
|---|---|
| **Physical Ports** | |
| 10/100Base-T(X) with Ports in M12 Auto MDI/MDIX | 12 (4-pin female D-coding) |
| 10/100/1000Base-T(X) Ports in M12 Auto MDI/MDIX | 4 (8-pin female X-coding with 2xbypass function included) |
| **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) |
| MAC Table | 8k |
| Packet Buffer Size | 4Mbits |
| Priority Queues | 8 |
| Processing | Store-and-Forward |
| Switch Properties | Switching latency: <7 µs<br>Switching bandwidth: 10.4Gbps<br>Throughput (packet per second): 7.738Mpps@64Bytes packet<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 10/30ms over 250 units<br>**NOTE 1.** Fast Ethernet ports supports less 10ms milliseconds recovery time<br>**NOTE 2.** Gigabit Ethernet ports supports less 30ms milliseconds recovery time<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<br>ERPS v1/v2<br>MSTP (RSTP/STP compatible) |
| RS-232 Serial Console Port | RS-232 in M12 connector (female A-coding). Baud rate setting: 115200bps, 8, N, 1 |
| **LED Indicators** | |
| Power Indicator (Power) | 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<br>Green Blinking: Indicates that the Ring is broken. |
| Fault Indicator (Fault) | Red: Indicate unexpected event occurred |

| | |
|---|---|
| 10/100Base-T(X) M12 Port Indicator | Top Green LED for Link/Act indicator: Green for link-up, Off for link-down, Blinking for Act.<br>Bottom dual color LED for Ethernet speed indicator: Amber for 100Mbps, Off for 10Mbps |
| 10/100/1000Base-T(X) M12 Port Indicator | Top Green LED for Link/Act indicator: Green for link-up, Off for link-down, Blinking for Act.<br>Bottom dual color LED for Ethernet speed indicator: Green for 1000Mbps, Amber for 100Mbps, Off for 10Mbps |
| **Reset Function** | |
| Reset Button | < 5 sec: System reboot, > 5 sec: Factory default |
| **Power** | |
| Input Power | Dual 24VDC (power rating: 16.8~30VDC) on dual 4-pin male S-coding connector |
| Power Consumption (Typ.) | 20Watts |
| Overload Current Protection | Present |
| Reverse Polarity Protection | Present |
| **Physical Characteristic** | |
| Enclosure | IP-54 |
| Dimension (W x D x H) | 280 (W) x 90 (D) x 182 (H) mm<br>11.02 (W) x 3.54 (D) x 7.17 (H) inch |
| Weight (g) | 3215 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 (EN 55035, EN 55032), FCC Part 15 B, EN 50155(EN 50121-1, EN 50121-3-2) |
| EMI | EN 55032, CISPR32, EN 61000-3-2, EN 61000-3-3, FCC Part 15 B class A |
| EMS | EN 55035 (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 | EN 62368-1 (LVD) |
| Other | EN 50155 (IEC 61373) |
| MTBF | 177,214 hrs. |
| Warranty | 5 years |

## Ordering Information

**TES-W9AABCC-M12X-BP2-24V-IP54**

| Code Definition | 10/100Base-T(X) Port Number | Additional Port Number | Additional Port Type |
|---|---|---|---|
| **Option** | **- 12:** 12 ports | **- 4:** 4 ports | **-GT:** 10/100/1000Base-T(X) ports |

| Available Model | Model Name | Description |
|---|---|---|
| | TES-W9124GT-M12X-BP2-24V-IP54 | EN50155 16-port managed Ethernet switch with 12x10/100Base-T(X) and 4x10/100/1000Base-T(X), X-coded M12 connector and 2xbypass included, 24VDC power inputs, IP-54 grade |

**Packing List**

- TES-W9124GT-M12X-BP2-24V-IP54 x 1
- ORing Tool CD Card x 1
- Quick Installation Guide x 1

**Optional Accessories**

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