PLANET Networking & Communication

WGS-5225-8MT

DIREKTRONIK

Industrial L2+ 8-Port 10/100/1000T M12 Wall-mount Managed Switch

Easily-deployed and Expanded Network

PLANET WGS-5225-8MT managed switch offers eight 10/100/1000BASE-T M12 ports and is housed in an IP40-rated enclosure with redundant 9-48 VDC power inputs. Designed to be deployed in the industrial environments, the WGS-5225-8MT offers wire-speed throughput, shock and vibration proofing, and a wide -40° to 75°C operating temperature range.

The WGS-5225-8MT offers IPv6/IPv4 dual stack management, **intelligent Layer 2 management functions**, and **user-friendly interface**. The WGS-5225-8MT is able to operate reliably, stably and quietly in railway and other industrial applications subject to shock, vibration and other extreme conditions without affecting its performance. Besides, the WGS-5225-8MT with bypass relay ports ensure non-stop data flow even in the event of a power outage.

Bypass Relay Prevents Link Failure During Power Loss

Bypass relay is set to bypass the failed switch to the next normal switch to prevent the network from power loss. The WGS-5225-8MT supports the bypass relay function on the one pair of Gigabit ports. When the switch is operating normally, the Gigabit ports operate in the same way as the other ports, processing and forwarding Ethernet packets. Bypass relay ports allow network traffic to continue to flow in the event of a power outage. It also can go back to the normal mode when power is back and the switch is completely booting up to avoid another network loss.

Physical Port

- **8-port 10/100/1000BASE-T, vibration-proof and dustproof** M12 X-coded female connectors

Industrial Hardened Design

- **1 pair** of bypass protection
- IP40-rated metal case
- Redundant power design
  - **9** to **48V** DC, redundant power with reverse polarity protection
  - Active-active redundant power failure protection
  - Backup of catastrophic power failure on one supply
  - Fault tolerance and resilience
- DIN-rail and wall-mount designs
- Supports 6000V DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

Industrial Protocol

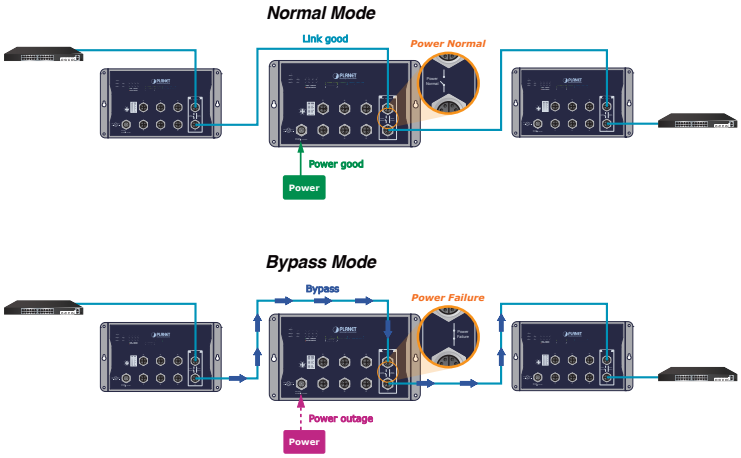
- **Modbus TCP for real-time monitoring in SCADA system**
- **IEEE 1588v2 PTP (Precision Time Protocol)**

Layer 3 IP Routing Features

- Supports maximum 32 static routes and route summarization

Layer 2 Features

- High performance of Store-and-Forward architecture, and runt/CRC filtering that eliminates erroneous packets to optimize the network bandwidth
- Storm control support
  - Broadcast/Multicast/Unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Provides Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Protocol-based VLAN
  - MAC-based VLAN
  - IP subnet-based VLAN
  - Voice VLAN
  - GVRP (GARP VLAN Registration Protocol)
- Supports **Spanning Tree Protocol**
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP),

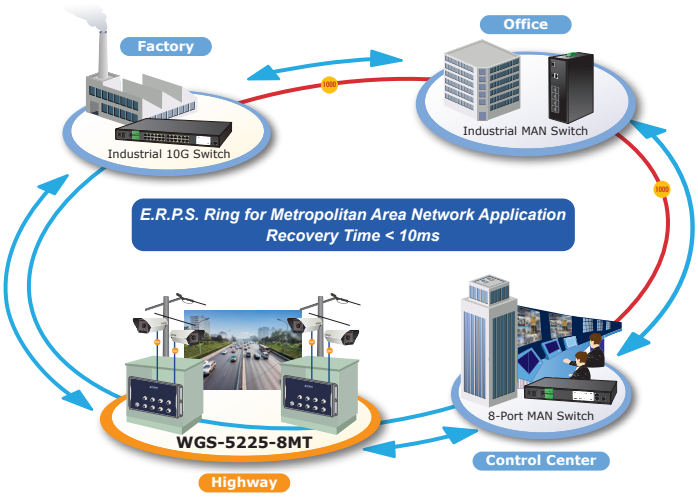


Vibrationproof and Dustproof M12 Ethernet Connector

The WGS-5225-8MT is equipped with 8-port 10/100/1000BASE-T, auto-negotiation, vibration-proof, waterproof and dustproof M12 connector. The M12 connector provides tight and strong connection, and guarantees stable Ethernet operating performance in a high vibration and shock environment. It comes with the industrial protection rating of IP67 capable of withstanding humidity, dirt, dust, shock, vibrations, heat and cold.

Redundant Ring, Fast Recovery for Critical Network Applications

The WGS-5225-8MT supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** technology, Spanning Tree Protocol (802.1s MSTP), and **redundant power** input system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. In a certain simple Ring network, the recovery time of data link can be as fast as 10ms.



spanning tree by VLAN
  - BPDU Guard
- Supports **Link Aggregation**
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
  - Maximum 4 trunk groups, with 8 ports for each trunk
  - Up to 16Gbps bandwidth (full duplex mode)
- Provides port mirror (many-to-1)
- Port mirroring monitors the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)
- Compatible with Cisco **Uni-directional link detection** (UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices
- Link Layer Discovery Protocol (LLDP)

Quality of Service

- Ingress shaper and egress rate limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - ToS/DSCP/IP precedence of IPv4/IPv6 packets
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Traffic-policing on the switch port
- DSCP remarking

Multicast

- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD snooping v1 and v2
- Querier mode support
- IPv4 IGMP snooping port filtering
- IPv6 MLD snooping port filtering
- MVR (Multicast VLAN Registration)

Security

- Authentication
  - IEEE 802.1x port-based/MAC-based network access authentication
  - IEEE 802.1x authentication with guest VLAN

Network with Cybersecurity Helps Minimize Security Risks

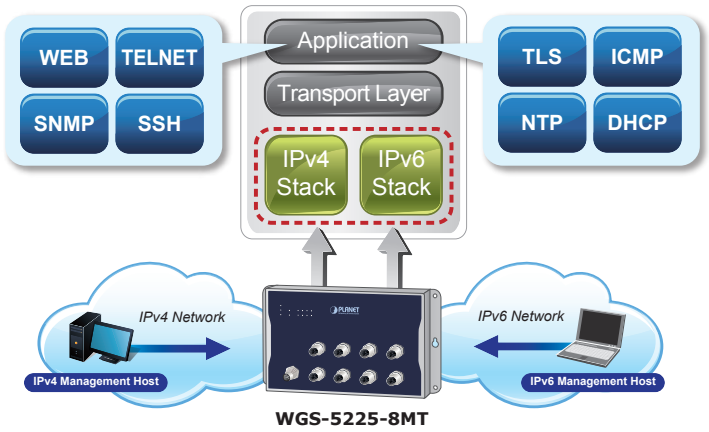
The WGS-5225-8MT comes with enhanced cybersecurity to fend off cyberthreats and cyberattacks. It supports SSHv2 and TLSv1.2 protocols to provide strong protection against advanced threats. Served as a key point to transmit data to customer's critical equipment in a business network, the cybersecurity feature of the WGS-5225-8MT protects the switch management and enhances the security of the mission-critical network without any extra deployment cost and effort.

Layer 3 IPv4 and IPv6 Software VLAN Routing for Secure and Flexible Management

To help customers stay on top of their businesses, the WGS-5225-8MT not only provides high transmission performance and excellent Layer 2 technologies, but also IPv4/IPv6 software VLAN routing feature which allows to cross over different VLANs and different IP addresses for the purpose of having a highly-secure, flexible management and simpler networking application.

IPv6/IPv4 Dual Stack Management

Supporting both IPv6 and IPv4 protocols, the WGS-5225-8MT helps the SMBs to step in the IPv6 era with the lowest investment as its network facilities need not be replaced or overhauled if the IPv6 edge network is set up.



Robust Layer 2 Features

The WGS-5225-8MT can be programmed for advanced switch management functions such as dynamic port link aggregation, 802.1Q VLAN, **Q-in-Q VLAN**, **Multiple Spanning Tree Protocol (MSTP)**, Loop and **BPDU Guard**, **IGMP Snooping**, and MLD Snooping. Via the link aggregation, the WGS-5225-8MT allows the operation of a high-speed trunk to combine with multiple ports such as a 4Gbps fat pipe, and supports fail-over as well. Also, the **Link Layer Discovery Protocol (LLDP)** is the Layer 2 protocol included to help discover basic information about neighboring devices on the local broadcast domain.

- Built-in RADIUS client to cooperate with the RADIUS servers
- RADIUS/TACACS+ users access authentication

- Access Control List
  - IP-based Access Control List (ACL)
  - MAC-based Access Control List (ACL)
- Source MAC/IP address binding
- DHCP Snooping to filter distrusted DHCP messages
- Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding
- IP Source Guard prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

Management

- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
  - Telnet command line interface
  - Web switch management
  - SNMP v1, v2c, and v3 switch management
  - SSHv2 and TLSv1.2 secure access
- SNMP Management
  - Four RMON groups (history, statistics, alarms, and events)
  - SNMP trap for interface Link Up and Link Down notification
- **IPv6** address/NTP management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System Maintenance
  - Firmware upload/download via HTTP/TFTP
  - Reset button for system reboot or reset to factory default
  - Dual images
- DHCP relay and option 82
- DHCP server
- User privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- Network diagnostic
  - Cable diagnostic technology provides the mechanism to detect and report potential cabling issues
  - ICMPv6/ICMPv4 remote ping
- SMTP, Syslog and SNMP trap remote alarm
- System Log
- PLANET UNI-NMS (Universal Network Management) and Smart Discovery Utility for deployment management

Efficient Traffic Control

The WGS-5225-8MT is loaded with robust QoS features and powerful traffic management to enhance services to business-class data, voice, and video solutions. The functionality includes broadcast/multicast/unicast **storm control**, per port **bandwidth** control, 802.1p/CoS/IP DSCP QoS priority and remarking. It guarantees the best performance in VoIP and video stream transmission, and empowers the enterprises to take full advantage of the limited network resources.

Powerful Security from Layer 2 to Layer 4

The WGS-5225-8MT offers comprehensive Layer 2 to Layer 4 **Access Control List (ACL)** for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises **802.1X Port-based** and **MAC-based** user and device authentication. With the **private VLAN** function, communication between edge ports can be prevented to ensure user privacy.

Advanced IP Network Protection

The WGS-5225-8MT also provides **DHCP Snooping**, **IP Source Guard** and **Dynamic ARP Inspection** functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

Efficient Management

For efficient management, the WGS-5225-8MT is equipped with console, Web and SNMP management interfaces.

- With the built-in **Web-based** management interface, the WGS-5225-8MT offers an easy-to-use, platform-independent management and configuration facility.
- For text-based management, it can be accessed via Telnet and the console port.
- For standard-based monitor and management software, it offers SNMPv3 connection which encrypts the packet content at each session for secure remote management.

SMTP/SNMP Trap Event Alert

The WGS-5225-8MT provides event alert function through SMTP email and SNMP trap function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, or the rebooting response.

Modbus TCP provides Flexible Network Connectivity for Factory Automation

With the supported Modbus TCP/IP protocol, the WGS-5225-8MT can easily integrate with SCADA systems, HMI systems and other data acquisition systems in factory floors. It enables administrators to remotely monitor the industrial Ethernet switch's operating information, port information and communication status, thus easily achieving enhanced monitoring and maintenance of the entire factory.

1588 Time Protocol for Industrial Computing Networks

The WGS-5225-8MT is ideal for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

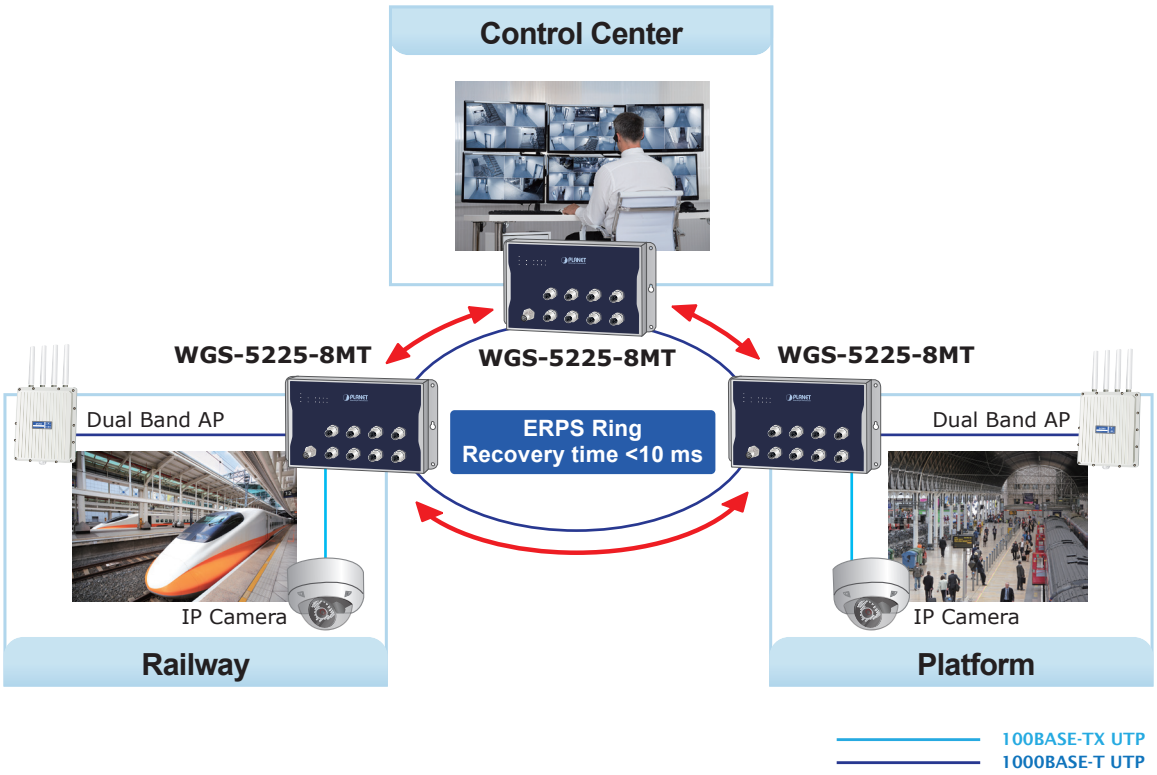
Dual Power Input for High Availability Network System

The WGS-5225-8MT features a strong dual power input system (Dual 9V~48V DC) incorporated into customer's automation network to enhance system reliability and uptime. For example, when DC Power 1 fails to work, the hardware failover function will be activated automatically to keep powering the WGS-5225-8MT via DC Power 2 alternatively without any loss of operation.

Applications

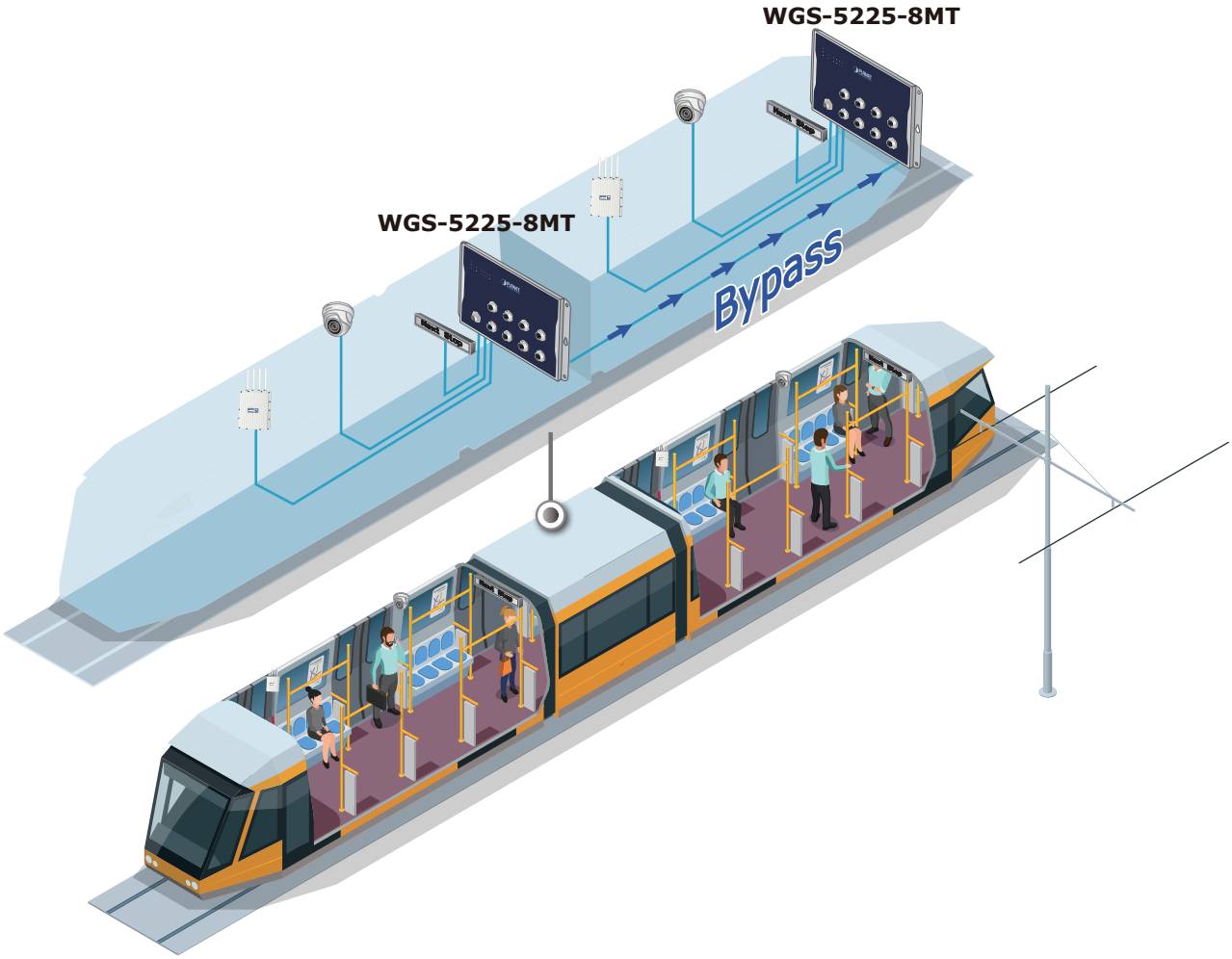
High Availability Networking with Excellent Redundancy for Surveillance System

The WGS-5225-8MT features strong, rapid, self-recovery capability to prevent interruptions and external intrusions. It incorporates **ITU-T G.8032 ERPS (Ethernet Ring Protection Switching)** into customer's automation network to enhance system reliability and uptime. The WGS-5225-8MT is the ideal solution for surveillance system to build redundant connection and establish high bandwidth for public transmission system and railway transmission.



Bypass Relay Solution for Daisy Chain Topology

In a daisy chain topology, if there is one failed node, it will cause the failed links of other switches. For railway communication systems with interconnected networks, the failed upstream link in one train car will impact on the downstream link in other train cars. To prevent such a failure, the WGS-5225-8MT offers two ports with a bypass relay function. If one of the switches has power loss, the other ports of the swithc will bypass the failed relay circuit, enabling the network traffic to continue to flow smoothly to assure continuous system operation.



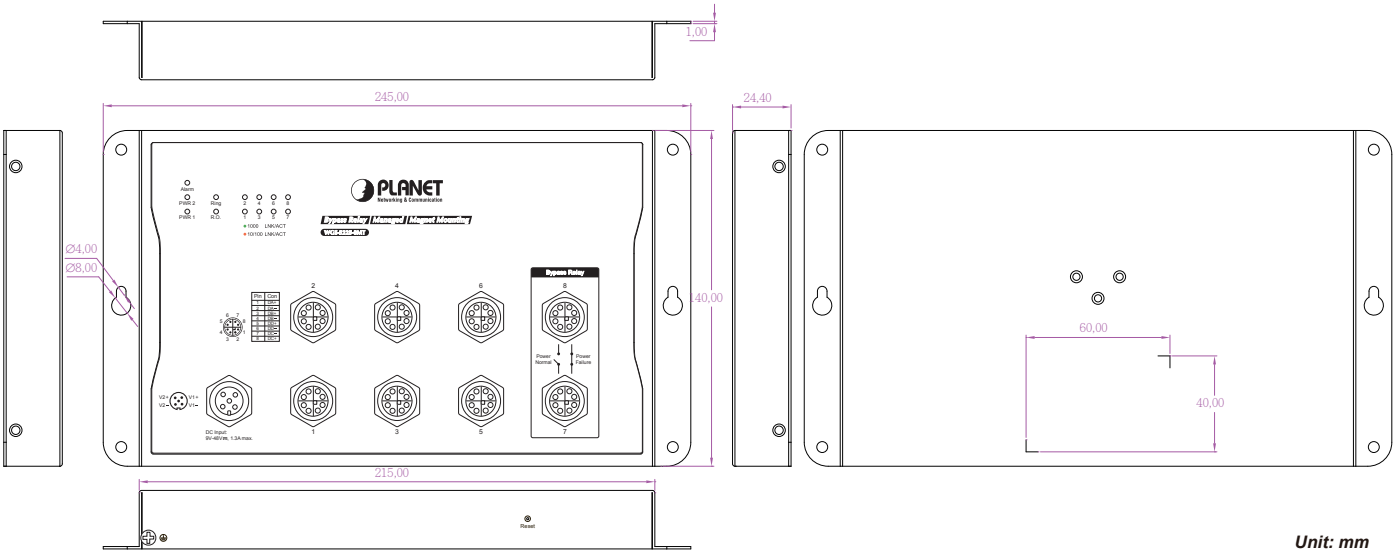
Specifications

Product	WGS-5225-8MT
Hardware Specifications	
Copper Ports	8 x M12, 8-pin X-coded female connector, 10/100/1000BASE-T auto-MDI/MDI-X ports
Power Connector	1 x M12, 5-pin A-coded male connector
Bypass Function (Pair)	1
Dimensions (W x D x H)	245 x 140 x 24.4 mm
Weight	1 kg
Enclosure	IP40 metal case
Installation	Wall-mount kit, magnetic-mount kit or DIN-rail kit
Power Consumption	System on: Max. 7.68 watts/ 26.21 BTU Full loading: Max. 11.04 watts/37.67 BTU
Power Requirements	Dual 9~48V DC
ESD Protection	6KV DC
LED	System: PWR1 (Green), PWR2 (Green), Alarm (Red) Ring (Green), R.O. (Green) 10/100/1000 RJ45 Interfaces : 1000 LNK/ACT (Green) 10/100 LNK/ACT (Amber)
Switching Functions	
Switch Architecture	Store-and-Forward
Switch Fabric	16Gbps/non-blocking
Throughput	11.9Mpps@64bytes
Address Table	4K entries, automatic source address learning and aging
Shared Data Buffer	4M bits
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	10K bytes
Layer 2 Management Functions	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable
Port Status	Display each port's speed duplex mode, link status, flow control status, auto-negotiation status, trunk status
Port Mirroring	TX/RX/Both Many-to-1 monitor
VLAN	IEEE 802.1Q tagged VLAN IEEE 802.1ad Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN Voice VLAN IP Subnet-based VLAN MVR (Multicast VLAN registration) GVRP Up to 4K VLAN groups, out of 4095 VLAN IDs
Link Aggregation	IEEE 802.3ad LACP/static trunk 4 groups with 8 ports per trunk
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
QoS	Traffic classification based strict priority and WRR 8-level priority for switching: - Port number - 802.1p priority - 802.1Q VLAN tagging - DSCP/ToS field in IP packet
IGMP Snooping	IGMP (v1/v2/v3) snooping, up to 255 multicast groups IGMP querier mode support
MLD Snooping	MLD (v1/v2) snooping, up to 255 multicast groups MLD querier mode support
Bandwidth Control	Per port bandwidth control Ingress: 100Kbps~1000Mbps Egress: 100Kbps~1000Mbps

RING	Supports ERPS, and complies with ITU-T G.8032 Recovery time < 10ms
Synchronization	IEEE 1588v2 PTP (Precision Time Protocol) - Peer-to-peer transparent clock - End-to-end transparent clock
Security Functions	
Access Control List	IP-based ACL/MAC-based ACL ACL based on: - MAC Address - IP Address - Ethertype - Protocol Type - VLAN ID - DSCP - 802.1p Priority Up to 256 entries
Security	Port security IP source guard Dynamic ARP inspection Command line authority control based on user level
AAA	RADIUS client TACACS+ client
Network Access Control	IEEE 802.1x port-based network access control MAC-based authentication Local/RADIUS authentication
Layer 3 Functions	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
Switch Management	
Basic Management Interfaces	Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.2, SNMPv3
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote Syslog System log LLDP protocol NTP PLANET Smart Discovery Utility
SNMP MIBs	RFC 1213 MIB-II RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2737 Entity MIB RFC 2618 RADIUS Client MIB RFC 2863 IF-MIB RFC 2933 IGMP-STD-MIB RFC 3411 SNMP-Frameworks-MIB RFC 4292 IP Forward MIB RFC 4293 IP MIB RFC 4836 MAU-MIB IEEE 802.1X PAE LLDP
Standards Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE
Stability Testing	IEC 60068-2-32 (free fall) IEC 60068-2-27 (shock) IEC 60068-2-6 (vibration)

Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab Gigabit 1000T IEEE 802.3x flow control and back pressure IEEE 802.3ad port trunk with LACP IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1p Class of Service IEEE 802.1Q VLAN tagging IEEE 802.1X Port Authentication Network Control IEEE 802.1ab LLDP RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP v1 RFC 2236 IGMP v2 RFC 3376 IGMP v3 RFC 2710 MLD v1 RFC 3810 MLD v2
Switching Specifications	
Operating	Temperature: -40 ~ 75 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Storage	Temperature: -40 ~ 80 degrees C Relative Humidity: 5 ~ 95% (non-condensing)
Standard Accessories	
Packet Contents	1 x 8-pin X-coded M12-to-RJ45 UTP cable (2m) 1 x M12 5-pin A-coded female connector power cable (1.2m) 1 x Wall-mount Kit 1 x DIN-rail Kit 1 x Magnet Kit 1 x Quick Installation Guide 8 x M12 Female Dust Cap 1 x M12 Power Waterproof Cap

Dimensions



Unit: mm

Ordering Information

WGS-5225-8MT	Industrial L2+ 8-Port 10/100/1000T M12 Wall-mount Managed Switch

Related Product

IGS-5227-6MT-X	Industrial IP67-rated 6-Port 10/100/1000T M12 Managed Ethernet Switch
IGS-5227-6T	Industrial IP67-rated 6-Port 10/100/1000T Managed Ethernet Switch
IGS-604HPT-M12	Industrial IP67-rated 4-Port 10/100/1000T 802.3at PoE + 2-Port 10/100/1000T Managed Ethernet Switch
ISW-808PT-M12	Industrial IP67-rated 8-Port 10/100TX M12 802.3at PoE+ Switch
WGS-4215-16P2S	Industrial 16-Port 10/100/1000T 802.3at PoE + 2-Port 100/1000X SFP Wall-mounted Managed Switch

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