

# Rugged 14G M12 Managed PoE Switch for Railway Applications

## MP414 Series

### Industrial 14G Managed M12 PoE Switch

MP414 is the ruggedized M12 full Gigabit PoE switch designed for rail public transport. Equipped with 14 rugged Gigabit M12 ports, 8 of which supply intelligent PoE/PoE+ and 2 of which support link bypass function for sustainable connectivity even in case of device/power fault. Full 14 Gigabit ports bring forward an ultra speed connectivity without any bottleneck. The comprehensive Cyber Security design safeguards the network from outside intrusion. ITU-T G.8032 ERPSv2 guarantees network resilience as well as compatibility to 3rd party devices.



### Features & Benefits

#### Full Giga Switching and Ultra High Throughput

- **14-port Full-Giga** Ethernet with 8-port PoE and 2-port **link bypass** function
- **16K** MAC address table
- **1.5MBytes** packet buffer memory for H.264 burst
- **9K** jumbo frame
- Store and forward with non-blocking switch fabric

#### ITU-T G.8032 v1/v2 ERPS Ring Redundancy

- An ITU standard Ring redundancy Protocol
- Provide sub-50ms protection and recovery switching for Ethernet traffic
- **Interoperate** with 3rd party industrial switch and still remain fast recovery time
- Interoperate with commercial switch instead of STP/RSTP
- Efficient network interconnection and topology with **ERPS Chain, multiple chains**

#### Management Features

- Various configuration path including **WebGUI, CLI, SNMP and RMON**
- Support IEEE **1588v1/v2 PTP** time management
- LLDP topology control
- Modbus/TCP, Ethernet/IP for factory automation
- Support USB for field side easy configuration and firmware update
- Software utility interface for LAN devices management
- NetMaster- NMS system for individual component monitoring in network management framework

#### IEC62443-4-2 Cyber Security Compliance

- L2-L7 Access Control List (ACL), parsing up to 128bytes/packet
- DHCP Snooping, IP Source Guard, Dynamic ARP Inspection
- 802.1Q VLAN, Private VLAN, Advanced Port Security
- Multi-Level user passwords
- HTTPS/SSH/SFTP, 256-bit AES encryption
- 802.1X MAB for non-802.1X compliant end devices
- RADIUS/TACACS+ centralized password authentication

#### Extreme PoE Capability

- Provides 8-port IEEE 802.3af/at compliance PoE, up to 30W per port
- Up to **100W** system power budget at **70°C** operating temperature
- Complete PoE management including per-port Power **Budget Control**, PoE **Scheduling** and PoE Status
- Rugged **M12** connectors for harsh environment

#### Rugged Design for Surveillance in Rail, Rolling Stock application

- **EN50155/IEC61373** railway certification compliance
- Outstanding mechanical design: good heat dissipation and lightweight: 100W Power feeding even in 70°C
- Wide range operating temperature from **-40 ~ 70°C**
- CE marking
- Emission: CISPR 22/ FCC part 15B class A



## Interfaces

### Power Connector

- 1 x M12 4 pin A-Code

### IEEE 802.3 af/at PoE

- 8-port 100/1000MBase-T M12 8-pin A-Code or X-Code

### Gigabit Ethernet

- 6-port 100/1000MBase-T M12 8-pin A-Code or X-Code
- 2-port with Bypass Function (Port 13/14)



### System LED

- 1 x Power
- 1 x System Status
- 1 x Ring Status
- 1 x ALM
- 14 x Ethernet Port
- 8 x PoE

Wall Mount Screw Holes for Front/ Back Panel

Ground Screw

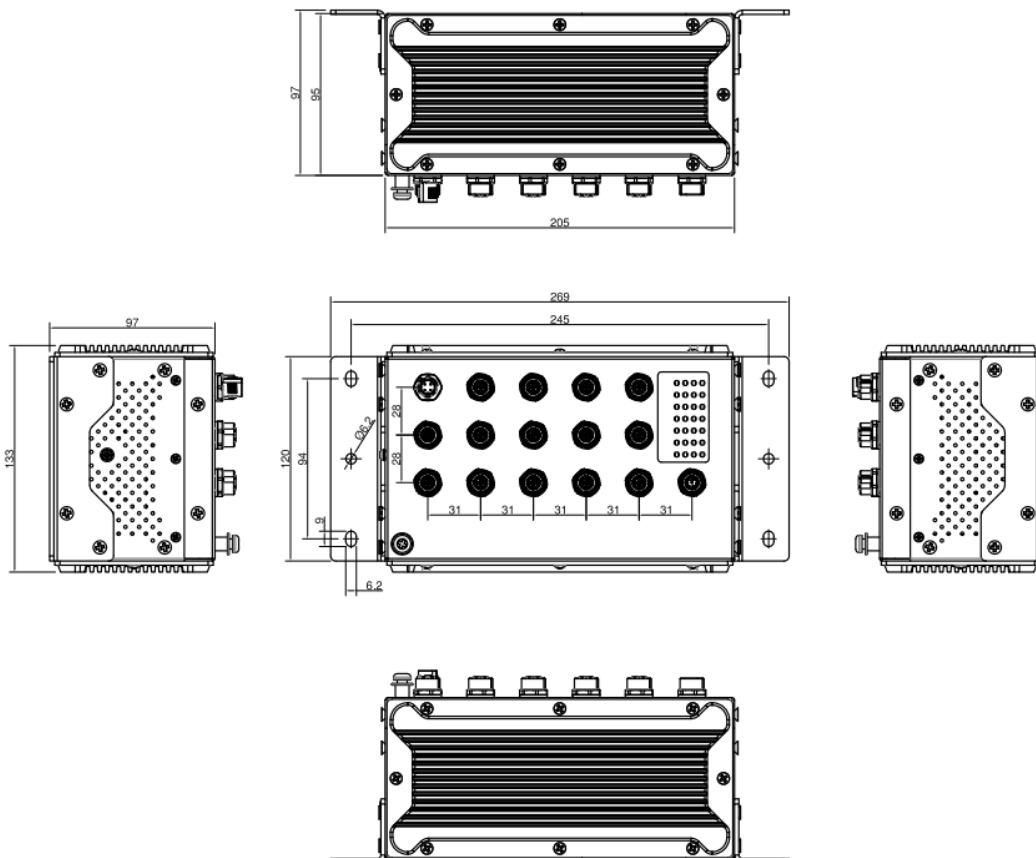
### Easy System Management

- 1 x M12 8 pin A-Code
- USB for Configuration/Firmware update
- RS232 console



## Dimensions

(mm)



Technology	
<b>Standard</b>	IEEE 802.3af/at Power over Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
	IEEE 802.3ab 1000Base-T Gigabit Ethernet Copper
	IEEE 802.3x Flow Control and back-pressure
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
	IEEE 802.1p Class of Service (CoS)
	IEEE 802.1Q VLAN and GVRP
	IEEE 802.1Q Double Tag VLAN (QinQ)
	ITU-T G.8032 Ethernet ring protection switching (ERPS)
	IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
	IEEE 802.1Q-2005 Multiple Spanning Tree Protocol (MSTP)
	IEEE 802.3ad Link Aggregation Control Protocol (LACP)
	IEEE 802.1X Port based Network Access Protocol
	IEEE 1588 Precision Time Protocol v1/v2
	Performance
<b>Switch Technology</b>	Store and Forward Technology with Non-Blocking Switch Fabric
<b>Number of MAC Address</b>	16K
<b>Packet Buffer Memory</b>	1.5MBytes
<b>Jumbo Frame</b>	9216 Bytes
<b>Transfer performance</b>	100Base-TX: 148,800pps, 1000Base-TX: 1,488,100pps
<b>VLAN</b>	256 VLANs
<b>VLAN ID</b>	1~4094
<b>Class of Service</b>	8 Priority Queues per Port
<b>Watchdog</b>	Hardware-based 10 seconds timer
Interface	
<b>Ethernet Port</b>	14 x 100/1000Base-T, M12 8 pin A/X-Code Female, Auto Negotiation, 8 ports (Port 1~8) IEEE 802.3af/at PoE, 2 ports (Port 13/14) link bypass <b>Pin Definition:</b> 8 pin X-Code Female: #1 (D1+/PoE V+), #2 (D1-/PoE V+), #3 (D2+/PoE V-), #4 (D2-/PoE V-), #5 (D4+), #6 (D4-), #7 (D3-), #8 (D3+) 8 pin A-Code Female: #1 (D3-), #2 (D4+), #3 (D4-), #4 (D1-/PoE V+), #5 (D2+/PoE V-), #6 (D1+/PoE V+), #7 (D3+), #8 (D2-/PoE V-) <b>Cable:</b> 1000 Base-T: 4-pair Cat.5E/Cat.6 FTP/STP cable, EIA/TIA 568B 100Ohm, 100Meters *Recommended uses FTP/STP cable for the railway on-board application
<b>System LED</b>	1 x PWR: Green On 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x Ring: Off: Ring disabled, Green On: Ring normal (Not RPL Owner), Green Blinking: Ring normal (RPL Owner), Amber On: Ring abnormal, Amber Blinking: Ring port fail 1 x ALM: Red On 14 x Port: Link (Green On), Active (Green Blinking) 8 x PoE: Amber On
<b>Console</b>	1 x M12 8 pin A-Code Female RS232 Console Baud Rate: 115200.n.8.1
<b>USB</b>	<b>Pin Definition:</b> #1 (Tx/D), #2 (Rx/D), #3 (Signal Ground), #5 (USB DATA+), #6 (USB DATA-), #7 (USB 5V), #8 (USB GND)
<b>Power Input</b>	M12 4 pin A-Code Male with polarity reverse protection <b>Pin Definition:</b> #1 (V-), #2 (V-), #3 (V+), #4 (V+)

Power Requirement	
Operating Voltage	HV: 110VDC (77~137.5VDC) MV: 54VDC (46~57VDC) WV:24/48/110VDC(16.8~137.5VDC)
Reverse Polarity Protect	Yes
Input Current	1.10A@110V
Power Consumption	Max 14.3W@110VDC full traffic without PD loading, suggest to reserve 15% tolerance
PoE	
Power forwarding mode	Alternative A
PoE Power Budget	System: Max.100W @70°C Per Port: Max. 30W
PoE Standard	IEEE 802.3af/at
Management	System/Port Power Budget Control, PD Alive Check, PoE Scheduling, PoE Status
Software	
Management Interface	CGI WebGUI, Command Line Interface (CLI), Telnet, SNMP
Time Management	NTP, IEEE 1588 Precision Time Protocol v1/v2
Network Management	IPv4/IPv6, SNMP v1/v2c/v3/Trap, MIBs, RMON, LLDP, DHCP server/client/Option 82, TFTP, System Log, SMTP
Traffic Management	Flow Control, Port Trunk/802.3ad LACP, VLAN, Private VLAN, GVRP, GMRP, QinQ, QoS, IGMP Snooping v1/v2/v3, Rate Control, Storm Control, Port Mirror
Security	IEEE 802.1X/RADIUS, Private VLAN, ACL(MAC/IP filter), HTTPs/SSH secure login
Redundancy	Rapid Spanning Tree Protocol (RSTP)/Multiple Spanning Tree Protocol (MSTP) ITU-T G.8032 v1/v2 Ethernet Ring Protection Switching (ERPS)
Mechanical	
Installation	Wall Mount
Enclosure Material	Steel Metal with Aluminum
Dimension	205 x 133 x 95mm (W x H x D) without Wall mount plate
Ingress Protection	IP31
Weight	3KG (device) / 3.5KG (full package)
Package	290(W)x220(L)x150(H)mm (package) 6pcs / carton 410(W)x 550(L)x490(H)mm (1.5KG)
Environmental	
Operating Temperature & Humidity	-40°C~70°C , 0%~95% Non- Condensing
Storage Temperature	-40°C~85°C
Hi-Pot Insulation	AC 1KV
MTBF	>485,000 hrs
Warranty	5 years
Standard	
Safety	IEC60950-1 Compliance
EMC	EN61000-6-2/EN61000-6-4
EMI	CISPR 22, FCC part 15B Class A
EMS	EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field
Railway	EN50155 Compliance includes EN50121-3-2 EMC/ IEC61373 Vibration and Shock for railway



## Ordering Information

Model Name	Description
<b>MP414-HV-A</b>	Industrial 14G Managed M12 A-code PoE Switch, 110V
<b>MP414-HV-X</b>	Industrial 14G Managed M12 X-code PoE Switch, 110V
<b>MP414-MV-A</b>	Industrial 14G Managed M12 A-code PoE Switch, 54V
<b>MP414-MV-X</b>	Industrial 14G Managed M12 X-code PoE Switch, 54V
<b>MP414-WV-A</b>	Industrial 14G Managed M12 A-code PoE Switch, 24-110V
<b>MP414-WV-X</b>	Industrial 14G Managed M12 X-code PoE Switch, 24-110V
	<b>Package List</b>
	1 x Product Unit
	1 x Wall Mount Kit (2 x Wall mount plate)
	1 x Quick Installation Guide



## Optional Accessory

Item	
<b>USB-1-4</b>	M12 A-code 4Gb USB disk for device configuration, firmware update
<b>CBL-F9MM12A-1M</b>	Console Cable DB9 Male to M12-A-code Male, 1Meter
<b>MC-1-4</b>	Field assembled M12 connector, 4-pin, A-code