

Expert Line Managed Industrial Switch with M-Ring Function and PoE 8x 10/100 Base-TX, 2x 10/100/1000Base-T (100/1000 Base-X SFP Ports)

General

Ethernet is an international standard that has been proven in millions of applications worldwide, ensuring the compatibility of components from various vendors. The IP protocol has already left the in-house environment and is using also in harsh environments (industrial solutions). What is more the integration of the industrial network with the data network is easily done without protocol conversion.

The new Managed Expert Line Industrial Switches meet the high reliability requirements demanded by industrial applications. Using fiber port can extend the connection distance that increases the network elasticity and performance. The devices are very compact and include:

- 8 Port Gigabit Ethernet switches
- 10 Port Gigabit Ethernet switches
- 18 Port Gigabit Ethernet switches

For particularly demanding uses, the industrial switches are designed in a suitably robust construction with an integrated clamping device for direct assembly on 35 mm DIN rails.

This new Expert Line Switches are providing also extensive management function and offering the possibility to build fiber optic m-rings for redundancy. The ultra-fast protection mechanism provides short reaction time for missing critical and fail sensitive applications.



Fig. 1: Gigabit Ethernet Switch

Benefits

System Interface/Performance

- RJ-45 port support Auto MDI/MDI-X Function
- SFP(Mini-GBIC) supports 100/1000 Dual Mode
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 5.6Gbps
- 1Mbits Packet Buffer
- 8K MAC Address Table
- Support Wide Operating Temperature

Spanning Tree

- Support IEEE802.1d Spanning Tree
- Support IEEE802.1w Rapid Spanning Tree

Power Supply

- Wide-range Redundant Power Design
- Power Polarity Reverse Protect

Case/Installation

- IP-30 Protection
- DIN Rail and Wall Mount Design

VLAN

- Port Based VLAN
- Support 802.1 Q Tag VLAN
- GVRP
- Double Tag VLAN (Q in Q)*

M-Ring

- M-Ring Function, Dual Homing, Couple Ring and dual Ring Topology
- Provide redundant backup feature and the recovery time below 20ms

Port Trunk with LACP

Support 802.1 ab LLDP**

Qos (Quality of Service)

- Support IEEE 802.1p Class of Service,
- Per port provides 4 priority queues
- Port Base, Tag Base and Type of Service Priority

Bandwidth Control

- Ingress Packet Filter and Egress Rate Limit
- Broadcast/ Multicast Packet Filter Control

Port Mirror: Monitor traffic in switched networks.

- Tx Packet only
- Rx Packet only
- Both of Tx and Rx Packet

System Event Log

- System Log Server/Client
- SMTP e-mail Alert
- Relay Alarm Output System Events

Security

- Port Security : MAC address entries/filter
- IP Security : IP address security management to prevent unauthorized intruder
- Login Security: IEEE802.1X/RADIUS

SNMP Trap

- Device cold start
- Power status
- Authentication failure
- X-Ring topology changed
- Port Link up/Link down

IGMP

- Query mode for Multi Media Application

TFTP Firmware Update and System Configure Restore and Backup

Provides EFT protection 3000 VDC for power line

Supports 4000 VDC Ethernet ESD protection

Standard Compliance

IEEE Standards

- IEEE 802.3 10Base-T Ethernet
- IEEE 802.3u 100Base-TX
- IEEE802.3ab 1000Base-T
- IEEE802.3z Gigabit fiber
- IEEE802.3x Flow Control and Back Pressure
- IEEE802.3ad Port trunk with LACP
- IEEE802.3af Power over Ethernet
- IEEE802.1d Spanning Tree/ IEEE802.1w Rapid Spanning Tree
- IEEE802.1p Class of Service
- IEEE802.1Q VLAN Tag
- IEEE 802.1x User Authentication (Radius)
- IEEE 802.1ab LLDP**

Technical specifications

| | |
|------------------------------------|--|
| Type | Gigabit Ethernet switch with 8x 10/100 Base-TX, 2x 10/100/1000Base-T and 2 x SFP slot (100 Mbps and 1 Gbps) for industrial use with management and Ring Function |
| Switch Architecture | Back-plane (Switching Fabric): 5.6Gbps Packet throughput ability (Full-Duplex): 8.3Mpps @64bytes |
| Transfer Rate | 14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Fiber Ethernet port |
| Packet Buffer | 1Mbits |
| Mac Address | 8K MAC address table |
| Flash ROM | 4Mbytes |
| DRAM | 32Mbytes |
| Connector | 10/100T: 8 x RJ-45 10/100/1000T/ Mini-GBIC Combo: 2 x RJ-45+2 x 100/1000SFP sockets RS-232 connector: RJ-45 type |
| Network Cable | 10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable EIA/TIA-568 100-ohm (100m) 100Base-TX: 2-pair UTP/STP Cat. 5 / 5E cable EIA/TIA-568 100-ohm (100m) |
| Optical Cable | Multi-mode: 50/125um~62.5/125um Single mode: 9/125um Available distance: 550m (Multi-mode)/ up to 120km (Single-mode) Wavelength: 850nm/1310nm/1550nm |
| Protocol | CSMA/CD |
| LED displays | Per unit: Power (Green), Power 1 (Green), Power 2 (Green), Fault (Red), Master (Green) 8 10/100TX : Link/Activity (Green), Full duplex/Collision (Yellow) Giga Copper: Link/Activity (Green), Speed (1000Mbps Green) SFP: Link/Activity (Green) |
| Mounting | 35 mm hat rail, according DIN EN 50 022 and wall mount |
| Reserve polarity protection | Present |
| Power supply | DC 12~48V, Redundant power with polarity reserve protect function and removable terminal block |
| Power Consumption | 116 W (full load) |
| Dimensions | 69 x 132 x 176 mm (w x d x h) |
| Operating temperature | -10°C to 60°C; Wide Operating Temperature (-40°C to 75°C) |
| Storage temperature | -40°C to 85°C |
| Rel. humidity | 5% to 95% non condensing |
| EMI | FCC Class A, CE EN61000-4-2, CE EN61000-4-3, CE EN-61000-4-4, CE EN61000-4-5, CE EN61000-4-6, CE EN61000-4-8, CE EN61000-4-11, CE EN61000-4-12, CE EN61000-6-2, CE EN61000-6-4 |

| | |
|--------------------------|--|
| Safety | UL, cUL, CE/EN60950-1 |
| Stability Testing | IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration) |

Software Features

| | |
|--|---|
| Management | SNMP v1 v2c, v3/ Web/Telnet/CLI/NMP |
| SNMP MIB | RFC 1215 Trap, RFC1213 MIBII, RFC 1157 SNMP MIB, RFC 1493 Bridge MIB, RFC 2674 VLAN MIB, RFC 1643 , RFC 1757, RSTP MIB, Private MIB, LLDP MIB** |
| VLAN | Port Based VLAN IEEE 802.1Q Tag VLAN (256 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096.) GVRP (256 Groups) Double Tag VLAN (Q in Q)* |
| Port Trunk with LACP LLDP | LACP Port Trunk: 4 Trunk groups/Maximum 4 trunk members Support LLDP to allow switch to advise its identification and capability on the LAN |
| Spanning Tree Ring | IEEE802.1w Rapid Spanning Tree Support ring function, Dual Homing, and Ring and Dual Ring topology Provide redundant backup feature and the recovery time below 20ms |
| Quality of Service | The quality of service determined by port, Tag and IPv4 Type of service, IPv4/IPv6 Different Service |
| Class of Service | Support IEEE802.1p class of service, per port provides 4 priority queues |
| Port Security | Support 100 entries of MAC address for static MAC and another 100 for MAC filter |
| Port Mirror | Support 3 mirroring types: "RX, TX and Both packet". |
| IGMP | Support IGMP snooping v1,v2, v3 256 multicast groups and IGMP query |
| IP Security | Support 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder. |
| Login Security | Support IEEE802.1X Authentication/RADIUS |
| Bandwidth Control | Support ingress packet filter and egress packet limit The egress rate control supports all of packet type and the limit rates are 100K~250Mbps Ingress filter packet type combination rules are Broadcast/Multicast/Unknown Unicast packet, Broadcast/Multicast packet, Broadcast packet only and all of packet. The packet filter rate can be set from 100k to 250Mbps |
| Flow Control | Support Flow Control for Full-duplex and Back Pressure for Half-duplex |
| System Log | Support System log record and remote system log server |
| SMTP | Support SMTP Server and 6 e-mail accounts for receiving event alert |
| Relay Alarm | Provides one relay output for port breakdown, power fail and alarm. Alarm Relay current carry ability: 1A @ DC24V |
| SNMP Trap | Up to 3 Trap stations Cold start, Port link up, Port link down, Authentication Failure, Private Trap for power status, Port Alarm configuration, Fault alarm, Ring topology change |
| DHCP | Provide DHCP Client/ DHCP Server/ IP Relay functions |
| DNS | Provide DNS client feature and support Primary and Secondary DNS server. |
| SNTP | Support SNTP to synchronize system clock in Internet |
| Firmware Update | Support TFTP firmware update, TFTP backup and restore. |
| Configuration upload and download | Support binary format configuration file for system quick installation |

*Future release

** Optional

Switch Features

The integrated switch has a store-and-forward architecture and can transmit all packets non-blocking between the five ports at full wire speed. For data buffering the switch incorporates 1MBit of memory.

Up to 8192 different MAC addresses can be stored simultaneously in the internal switch address tables. An automatic aging mechanism updates the tables max. 5 min. after the last reception of data.

Twisted Pair Connections

The integrated auto-crossing function of all Twisted-Pair ports makes the use of crossed patch cables unnecessary. The switch automatically detects the pinout of the connected cable and adapts the port accordingly. For all connections standard 1:1 Twisted Pair cables can be used.

The Autonegotiation mechanism detects automatically the speed and transmission mode (full or half duplex) between connected ports. A manual configuration is not required.

Power supply

The power supply is done by an external power supply with an output voltage from 12 to 48 V DC. This power supply is not included at delivery, but can be ordered separately (MS700430). The connection is done by the pluggable screw terminals on the top of the device. The connection of a redundant power supply can be done by the second screw terminal.

Safety Notes

WARNING: Infrared radiation as used for data transmission within the fiber optic, although invisible to the human eye, can nevertheless cause damage.

To avoid damage to the eyes:

- never look straight into the output of fiber optic components – danger of blinding!
- cover all unused optical connections with caps.
- commission the transmission link only after completing all connections.

The active laser components used with this product comply with the provisions of **Laser Class 1**.

DANGER: Conductive components of power and telecommunications networks can carry dangerously high voltage.

To avoid electric shock:

- Do not carry out installation or maintenance work during lightning storms.
- All electric installations must be carried out in accordance with local regulations.

Order Information

| Art.-No. | Description | Connectors |
|-----------------|--|---|
| MS651220PM-48 | Industrial Gigabit Ethernet Switch with M-Ring 8x 10/100Base-TX PoE 2x 100/1000Base-X SFP Combo Port | 2x SFP slot 10x RJ-45 2x Power, 1x Console |

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