

## Data Sheet

### Ruggedized 19" Gigabit Ethernet Switch MS400890MX-BS/2 Series for Power Substation Applications with Ring Function



## Description

Based on a robust design, the hardened Ruggedized 19" Gigabit Fiber Switch from MICROSENS provides maximum performance and flexibility in smallest spaces. Engineered to achieve highest reliability and shortest recovery times, this MICROSENS switch family has become the first-choice solution for Industrial Ethernet infrastructures for Power Substation applications.

The hardware of the Ruggedized 19" Gigabit Ethernet Switch is already designed to deploy future functions which can be activated easily by firmware upgrades. This is facilitated by the latest high-performance switching chipsets in combination with a powerful processor. As a well-established and stable operating system, Linux provides a solid foundation for an intelligent, open, secure, and long-term reliable platform.

## Highlights

- Highest Hardware flexibility through 6 slots for media line modules
- Highest Gigabit performance with smallest dimensions
- 2x QSFP slot with 40G
- Up to 48x 1 Gigabit RJ 45 or SFP ports on only 1U in 19" racks
- Certified for Power Substation applications
- Optimised architecture for increased performance with redundant ring topology
- Range of ambient operation temperature from -40 up to +85 °C
- Exchangeable SD memory card for firmware and configuration
- Flexible firmware architecture for simple software upgrades

## Software Features

### Gigabit Ethernet Switch

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- Fan less Gigabit Ethernet Switch
- Low power consumption switch-chipset, Energy-Efficient Ethernet
- Layer-3
- Max. 8,192 MAC-addresses, automatic learning and aging
- Jumbo-Frames (max. 10,240 Bytes)

### System Management

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- WEB GUI (http, https)
- CLI (Telnet, SSH, console)
- SNMP v1/v2c/v3
- Central management platform (NMP)
- IP interface configuration per VLAN
- MAC address table
- Syslog
- Configuration upload/download
- Firmware upgrade
- Factory Default Reset
- System reboot
- User right settings
- Port mirroring
- System status and traffic statistics
- SNTP/NTP (Network Time Protocol)
- Exchangeable SD memory card for configuration, CLI scripts, firmware

### Port Configuration

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- Port enable/disable
- Speed settings
- Half or full duplex
- Flow control
- Port isolation
- Storm control

### IP Service

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- IPv4 or IPv6
- DHCP Client/Relay

### IP Routing

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- Static Routing
- RIP v1/v2
- OSPF v1/v2
- IDRP
- BGP-4
- Routing table settings and status

### Virtual LANs (VLANs)

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- Access and trunk mode
- IEEE 802.1Q settings
- Private VLANs
- Inter VLAN IP routing

### Quality of Service (QoS)

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- Layer 1 priority (port-based)
- Layer 2 priority based on 802.1Q VLAN tags
- Layer 3 priority based on 802.1p (DSCP)
- 8 priority levels
- Strict priority or WRR (Weighted Round Robin)

### Link Aggregation

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- LACP according to IEEE 802.3ad

### IP Multicast

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- IGMP Snooping
- PIM-SM (Protocol Independent Multicast)

## Software Features (continued)

### Reliability

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- Spanning Tree (STP) according to IEEE 802.1D
- Rapid Spanning Tree (RSTP) according to IEEE 802.1w
- PVRST+ Per-VLAN Rapid Spanning Tree Plus
- eRSTP™ (enhanced RSTP)
- Multiple Spanning Tree (MSTP) according to 802.1Q
- VRRP (Virtual Redundant Route Protocol)

### Security

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- RADIUS Client (802.1X)
- TACAS+
- Static MAC locking
- Access Control List (ACL)

### Power Supply

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- 2x 125 VDC Power supply modules, hot-swap backup
  - universal high voltage Input range from 80-300VDC
  - True dual redundant parallel and load sharing capability

## Technical Specifications

### Switch

<b>Type</b>	Gigabit Ethernet Switch Layer 3, IEEE 802.3 compliant
<b>Performance</b>	Store-and-forward Full wire-speed, non-blocking on all ports
<b>MAC Address</b>	8,192 addresses, automatic learning and aging
<b>Jumbo Frames</b>	max. 10,240 Bytes

### Uplink Ports (SFP+ Slots)

<b>Number</b>	4 ports
<b>Type</b>	Dual Speed SFP+ 1/10GBase-X, support of SFP+ digital diagnostics function
<b>Connector</b>	LC (SFP+ transceiver)

### Uplink Ports (QSFP+ Slots)

<b>Number</b>	2 ports
<b>Type</b>	Dual Speed QSFP+ 40GBase-X, support of SFP+ digital diagnostics function
<b>Connector</b>	LC (SFP+ transceiver)

### CLI Console

<b>Number</b>	1
<b>Connector</b>	USB-C

### LED Display

<b>Location</b>	Front and rear side
<i>Power LEDs (rear)</i>	
<i>off</i>	The power board is power off, can not provide power.
<i>green</i>	Power supply in normal operation.

#### Port Status LEDs (front)

<b>Service boards</b>	<i>off</i>	Link down, no connection.
	<i>green</i>	Link up, when the LED mode is "static".
	<i>green blinking</i>	Link up, when the LED mode is "dynamic".
<b>SFP/SFP+ (1000/10G Base-X)</b>	<i>off</i>	Link down, no connection.
	<i>green</i>	Link up, when the LED mode is "static".
	<i>green blinking</i>	Link up, when the LED mode is "dynamic".
<b>QSFP+ (40GBase-X)</b>	<i>off</i>	Link down, no connection.
	<i>green</i>	Link up, when the LED mode is "static".
	<i>green blinking</i>	Link up, when the LED mode is "dynamic".

### Alarm Relay Input

<b>Number Input Relay</b>	2
<b>Current</b>	1A
<b>Voltage</b>	0..60 VDC

## Technical Specifications (continued)

### Module Slots

**Media Module Slots** 6 slots on front side

**Power Supply Slots** 2 slots on rear side

### Buttons

**Reset Button** Reset of the switch, new upload of the latest stored configuration (direct hardware function)

### Environment Conditions

**Temperature** Operation -40..+85 °C  
Storage -40..+85 °C

NOTE: Maximum continuous operation temperature is up to +75 °C.

**Humidity** 10..90%, non condensing

### Mechanical

**Dimensions** 435 x max. 338 x 43.5 mm (w x d x h, without connectors; width incl. mounting brackets: 481 mm)

**Weight** Approx. 3.300g (without SFPs)

**Protection Class** IP 41

**Mounting** 19" Rack, 1U

### Standards

**CE** 2014/30/EU (EMC Directive)  
2011/65/EU (RoHS Directive)

**Safety** EN 62368-1

**Emitted Interference** EN 61000-6-4  
EN 55032

**Electromagnetic Compatibility** EN 61000-6-2  
EN 55024

**Power Substation** IEC 61850-3:2013  
IEC 61000-6-5 Ed. 1.0:2015-08  
IEEE 1613: 2009 (Class 2)

### Delivery / Contents

#### Standard Packaging

**Package unit** 1 pcs.

**Contents** 1x Switch  
1x SD memory card (inserted)  
2x power supply connector  
4x RS-485 connector  
1x Quick Start Guide

### Power Supply

**Input Voltage** 80...300 VDC

## Media Line Modules

### Fiber Ports Module

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<b>Number</b>	8 slots
<b>Type</b>	Dual Speed SFP 100/1000Base-X, support of SFP digital diagnostics function
<b>Connector</b>	LC (SFP transceiver)

### RJ45-Ports Module

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<b>Number</b>	8 ports
<b>Type</b>	100/1000BaseT
<b>Connector</b>	RJ-45 port, shielded
<b>Cable Type</b>	Twisted-Pair cable, Category 5e, impedance 100 Ohm, length max. 100m
<b>Pin Out</b>	Auto MDI/MDI-X, Auto Polarity

### RJ45-Ports Module PoE

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<b>Number</b>	8 ports
<b>Type</b>	100/1000BaseT
<b>Connector</b>	RJ-45 port, shielded
<b>Cable Type</b>	Twisted-Pair cable, Category 5e, impedance 100 Ohm, length max. 100m
<b>PoE</b>	802.3bt (60 W)
<b>Pin Out</b>	Auto MDI/MDI-X, Auto Polarity

## Ordering Information

	Description	Art.-No.
	Switch Mainframe with Power Substation Cert. 6 module slots, 4x 1/10GBase-X / 2x40GBase-X Combo ports, Serial Port, SD-Card, 2x power supply, typ. 48/125 VDC Input	<b>MS400890MX-BS/2</b>
	<b>Modules</b>	
	8x 100/1000Base-X module for MS401880MX-BS and MS401881MX-BS	<b>MS401883MX-BS</b>
	8x 10/100/1000Base-T module for MS401880MX-BS and MS401881MX-BS	<b>MS401884MX-BS</b>
	8x 10/100/1000Base-T module, 802.3at 30W for MS401881MX-BS	<b>MS401885MX-BS</b>
	Power supply module for MS400890MX-BS/2 125 VDC, Prim. 80...300 VDC	<b>MS400890DC-BS/2</b>
	Power supply module for MS400890MX-BS/2 54 VDC, Prim. 40...70 VDC	<b>MS400891DC-BS/2</b>

## Accessories

	Description	Art.-No.
	R-S485 cable RJ-45 to open ends 0.5 m	<b>MS180285</b>

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