

## Product Overview

### Gigabit Ethernet Micro Switch 6 Port PoE+ Generation 6



## Description

The 6 port GBE Micro Switch Generation 6 constitutes an extension of the Gigabit Ethernet Micro Switch. In addition to the 1000Base-X fiber optic uplink, for linking to the central distributor, this switch has an additional RJ-45 downlink 10/100/1000Base-T. This additional connection is positioned at the rear of the switch and is also covered after the installation. This additional connection can, amongst other things, be used for cascading other Micro Switches in order to obtain additional connection capacities.

The interconnection of two switches via the TP port offers to increase the reliability of the network. If one fiber connection is interrupted the neighbouring switch handles the data traffic via RSTP.

All five RJ-45 ports (4 user ports and 1 downlink) support the complete Powerover-Ethernet functionality according the IEEE Std. 802.3af and 802.3at (min. 54VDC needed). A powerful Linux-OS offers additional services and feature for future use.

The use of memory-card shortens maintenance and service windows. The whole configuration of the Micro Switch can be moved to another system, just by changing the SD-card. A fault-tolerant journaling file-system is used. An encryption of the SD-Card is as option available.

Intelligent power management monitors the active current consumption of connected end equipment. The switches are powered by an external 54 V DC power supply.

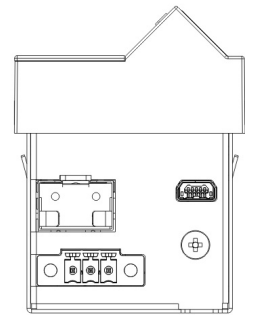
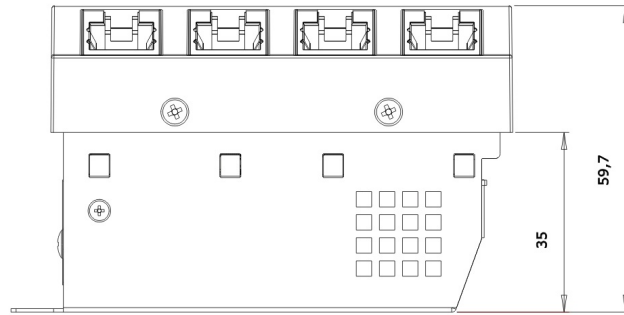
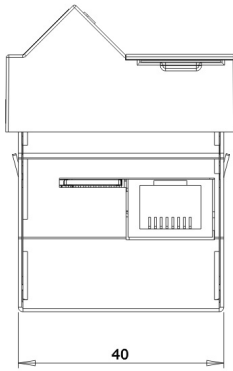
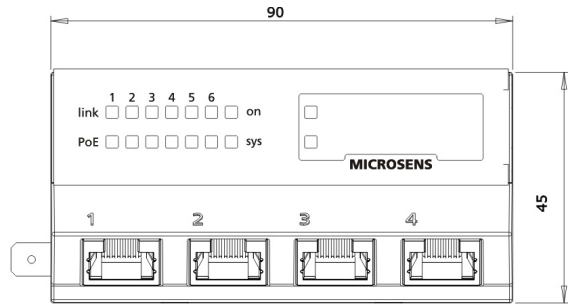
The GBE Micro Switch supports Compact-SFP-Transceivers (C-SFP) for two redundant fiber-uplink.

## Properties

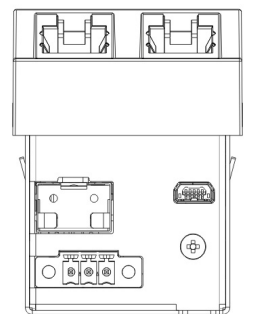
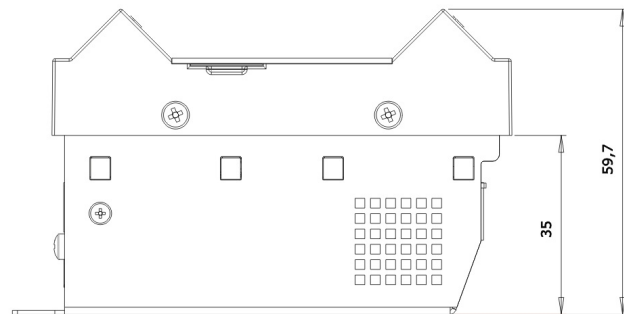
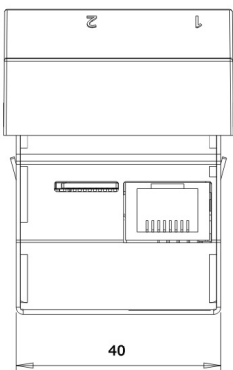
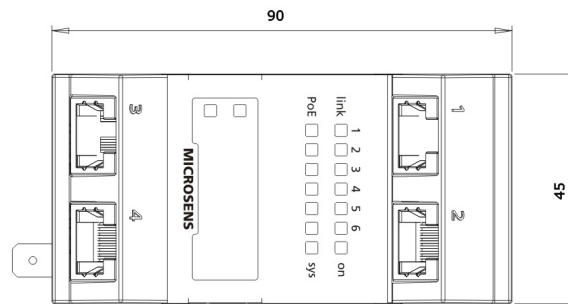
- High performance, full Gigabit Ethernet design
- Energy efficiency by modern chipsets
- RJ-45 downlink-port for hidden connection of Ethernet devices (10/100/1000T)
- Power-over-Ethernet Plus up to 30W at all five RJ-45 ports
- Comfortable administration (Web-, Telnet-, SNMP-interface and NMP-Software)
- High security through VLANs, 802.1X, SSH, HTTPS, accounting etc.
- Fast, tool-free mounting by snap-in installation
- Optional SFP-uplink with dual speed 100/1000 Mbps
- MicroSD Memory-Card
- Extension-Port for future use
- Dual-Fiber-Link support by C-SFP

# Dimensions

## Horizontal Version



## Vertical Version



# Specifications

## General

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<b>Type</b>	Gigabit Ethernet Switch Layer 2+, IEEE 802.3 compliant
<b>Performance</b>	Store-and-forward, Full wire-speed, non-blocking on all ports
<b>MAC-Addresses</b>	8,192 addresses, automatic learning and aging
<b>Jumbo Frames</b>	max. 10,240 bytes
<b>VLANs</b>	Tagging IEEE 802.3ac Priorisation IEEE 802.1p VLAN IDs 0..4095 256 VLANs Static and dynamic VLAN table VLAN-Modes: access, trunk, hybrid
<b>Quality of Service</b>	4 hardware-queues per port prioritisation according to: * IPv4/IPv6 * VLAN priority IEEE 802.1p * port queue weighting strict or weighted, configurable
<b>Management</b>	CLI: telnet, ssh Web: http, https SNMPv1, SNMPv2c, SNMPv3 Microsens NMP-Software

## Local Ports (other)

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<b>Number of Ports</b>	1
<b>Type</b>	RS 232
<b>Connector</b>	Mini-USB

## Uplink (Fixed Optical Transceiver)

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<b>Number of Ports</b>	1
<b>Type</b>	Gigabit Ethernet Multimode: 1000Base-SX Single Mode: 1000Base-LX
<b>Connector</b>	ST or DC duplex
<b>Fiber Cable Type</b>	Multimode: 50 or 62.5/125 µm fiber Single Mode: 9/125 µm fiber
<b>Distance</b>	Multimode: 550 m Single Mode: 10 km, 20 km (optional) actual distance may depend on fiber performance
<b>Output Optical Power</b>	Multimode 850nm: -9,5..-4 dBm Single Mode 1310nm 10 km: -9,5..-3 dBm Single Mode 1310nm 20 km: -9,5..+3 dBm

## Local Ports (Twisted-Pair)

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<b>Number of Ports</b>	4
<b>Type</b>	Gigabit Ethernet, triple speed 10/100/1000Base-T
<b>Connector</b>	RJ-45 jack, shielded
<b>Cable Type</b>	Twisted-Pair cable, category 5e, impedance 100 Ohm, length max. 100 m
<b>Flow Control</b>	Pause frames (IEEE 802.3x), configurable
<b>Pinout</b>	Auto MDI/MDI-X, auto polarity
<b>Power-over-Ethernet</b>	Power Sourcing Equipment (PSE) IEEE 802.3at and 802.3af, max. 30 W

## Uplink (Pluggable Transceiver)

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<b>Number of Ports</b>	1 (only MS440209PM-48G6 & MS440219PM-48G6) C-SFP Uplink available (only MS440208PM-48G6 & MS440218PM-48G6)
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Please use transceiver with extended temp. range, only!

<b>Type</b>	Fast/Gigabit Ethernet, 100/1000Base-X
<b>Connector</b>	SFP-Slot
<b>Flow Control</b>	Pause frames (IEEE 802.3x), configurable

<b>Receiver Sensitivity</b>	Multimode 850nm: -18 dBm (max. 0 dBm) Single Mode 1310nm 10 km: -20 dBm (max. -3 dBm) Single Mode 1310nm 20 km: -23 dBm (max. -3 dBm)
<b>Flow Control</b>	Pause frames (IEEE 802.3x), configurable

### Downlink (Twisted-Pair)

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<b>Number of Ports</b>	1
<b>Type</b>	Gigabit Ethernet, triple speed 10/100/1000Base-T
<b>Connector</b>	RJ-45 jack, shielded
<b>Cable Type</b>	Twisted-Pair cable, category 5e, impedance 100 Ohm, length max. 100 m
<b>Flow Control</b>	Pause frames (IEEE 802.3x), configurable
<b>Pinout</b>	Auto MDI/MDI-X, auto polarity
<b>Power-over-Ethernet</b>	Power Sourcing Equipment (PSE) IEEE 802.3at and 802.3af, max. 30 W

### Control Panel

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<b>Reset Button</b>	Reset of device, last saved configuration is reloaded
<b>Config Button</b>	Pressed separately: Request IP-configuration for management agent.  Pressed together with reset-button: Reset to factory default settings, can be disabled

### Environment

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<b>Operating Temperature</b>	0..40 °C
<b>Storage Temperature</b>	-20..85 °C
<b>Relative</b>	10..90%, non condensing

### Uplink (Twisted-Pair)

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<b>Number of Ports</b>	1 (MS450186PM-48G6 and MS450187PM-48G6 only)
<b>Type</b>	Gigabit Ethernet, triple speed 10/100/1000Base-T
<b>Connector</b>	RJ-45 jack, shielded
<b>Cable Type</b>	Twisted-Pair cable, category 5e, impedance 100 Ohm, length max. 100 m
<b>Flow Control</b>	Pause frames (IEEE 802.3x), configurable
<b>Pinout</b>	Auto MDI/MDI-X, auto polarity
<b>Power-over-Ethernet</b>	Powered Device (PD) IEEE 802.3at and 802.3af, max. 30 W

### Display

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<b>Power</b>	Local ports 1 to 4: green: PoE sourcing blue: PoE+ active orange: PoE standby red: PoE error
<b>Link</b>	Local ports 1 to 4: blinking: activity green: authorized/forwarding orange: blocked red: unauthorized
<b>Status</b>	Switch Status (S) green: device ready  Status uplink (5) downlink (6) blinking: activity green: authorized/forwarding orange: blocked red: unauthorized  Power Downlink(P) green: PoE sourcing blue: PoE+ active orange: PoE standby red: PoP error
<b>Type</b>	14 LEDs LED-Modes (generally): dynamic: LED display static states and blink when data is present on a port static: LED display static states but do not blink with data quiet: Display is reduced to sys and on LED. Port LEDs remain off dark: All leds are off

### Power Supply (DC)

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<b>Input Voltage</b>	44..57 VDC (54 VDC typ.) For 802.at services 54VDC (min.) is required.
<b>Power Consumption</b>	Typ. 4 W (device only), max. 80 W (incl. PoE+)

**Humidity****Connector** 3 pin screw clamp, PE/-/+ AWG 16**Ground Terminal (PE)** 6.3 mm flat-pin plug**Standards Compliance**

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<b>CE Mark</b>	2004/108/EC (EMC) 2006/95/EG (Low Voltage)
<b>Safety</b>	EN 60950-1:2011-1
<b>Electromagnetic Emission</b>	EN 55022:2011-12
<b>Electromagnetic Immunity</b>	EN 55024:2011-09
<b>IEEE (Ethernet)</b>	802.3i 10Base-T 802.3u 100Base-T 802.3z 1000Base-X 802.3ab 1000Base-T 802.3az Energy Efficient Ethernet 802.3x Flow Control 802.3ac VLAN Tagging 802.3af PoE 802.3at PoE+ 802.1AB LLDP 802.1D Spanning Tree 802.1Q Tagged VLANs 802.1p Packet Prioritisation 802.1w Rapid Spanning Tree 802.1X Network Access Control

**RFC**

- IPv4:
- RFC 791 (IPv4)
  - RFC 826 (ARP)
  - RFC 792 (ICMP)
  - RFC 2131 (DHCP)
  - RFC 2474/3260 (IPv4 DiffServ/IPv6 Traffic Class)
  - RFC 4541 (IGMP)
- IPv6:
- RFC 2460/2464/3484/3513 (IPv6)
  - RFC 2462 (Address Configuration)
  - RFC 2463 (ICMPv6)
  - RFC 2461 (Neighbor Discovery Protocol)
  - RFC 3315 (DHCPv6)
  - RFC 3810/4604 (MLD)
  - RFC 4330 (NTP)
  - RFC 1155/1156/1157 (SNMPv1)
  - RFC 1901/1905/1906 (SNMPv2)
  - RFC 3411/3412/3584 (SNMPv3)
  - RFC 2574/3414 (USM)
  - RFC 2575/3415 (VACM)
  - RFC 2865 (RADIUS)
  - RFC 2866 (Accounting)
  - RFC 2868 (Tunnel Attributes)
  - RFC 5424 (Syslog)

**Mechanical**

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<b>Dimensions</b>	90 mm x 45 mm x 58 mm (l x w x d, without connectors) bevelled edge
<b>Mounting depth</b>	35 mm
<b>Weight</b>	320 g
<b>Housing Color</b>	Standard color: pure white (alternative colors on request)

**Reliability**

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<b>MTBF</b>	100.000 h
<b>Method</b>	calculated, MIL-HDBK-217F

## Additional Features

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<b>Hardware</b>	C-SFP support (MS440208PM-48G6 and MS440218PM-48G6)
<b>Software</b>	<ul style="list-style-type: none"><li>- Dual Stack IPv4/IPv6</li><li>- Port Monitor</li><li>- CDP v1, v2</li></ul>

## Packaging

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<b>Standard</b>	<ul style="list-style-type: none"><li>1x Micro Switch</li><li>1x MicroSD Card (extra part-no.)</li><li>1x Grounding-cable, 20cm</li><li>1x Power-plug</li><li>1x Quick Installation Guide</li><li>1x Set piktogramm-labels</li></ul>
<b>Bulk</b>	<ul style="list-style-type: none"><li>20x Micro Switch</li><li>20x MicroSD Card (extra part-no.)</li><li>20x Grounding-cable, 20cm</li><li>20x Power-plug</li><li>1x Quick Installation Guide</li><li>20x Set piktogramm-label</li></ul>

## Order Information

Description	Article Number
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### Horizontal Mounting

GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x1000Base-SX, ST Multimode 850nm, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, horizontal version, 44..57 VDC power supply	<b>MS440200PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x1000Base-SX, SC Multimode 850nm, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, horizontal version, 44..57 VDC power supply	<b>MS440201PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x1000Base-LX, SC Single mode 1310 nm, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, horizontal version, 44..57 VDC power supply	<b>MS440202PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x1000Base-LX, ST Single mode 1310 nm, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, horizontal version, 44..57 VDC power supply	<b>MS440203PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x 100/1000Base-X/ 1x 1000Base-X by Compact SFP Slot, horizontal version, 44..57 VDC power supply	<b>MS440208 PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x 1000Base-X SFP Port, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, horizontal version, 44..57 VDC power supply	<b>MS440209PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x10/100/1000Base-TX, Downlink: 1x10/100/1000Base-TX + PoE/PoE+ (PD), horizontal version, 44..57 VDC power supply	<b>MS450186PM-48 G6</b>
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### Vertical Mounting

GBE Installation Switch 4x10/100/1000Base-T + PoE/PoE+, Uplink: 1x1000Base-SX, ST Multimode 850nm, Downlink: 1x10/100/1000Base-T + PoE/PoE+, vertical version, 44..57 VDC power supply	<b>MS440210PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-T + PoE/PoE+, Uplink: 1x1000Base-SX, SC Multimode 850 nm, Downlink: 1x10/100/1000Base-T + PoE/PoE+, vertical version, 44..57 VDC power supply	<b>MS440211PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-T + PoE/PoE+, Uplink: 1x1000Base-LX, SC Single mode 1310 nm, Downlink: 1x10/100/1000Base-T + PoE/PoE+, vertical version, 44..57 VDC power supply	<b>MS440212PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x1000Base-LX, ST Single mode 1310 nm, Downlink: 1x10/100/1000Base-TX + PoE/PoE+, vertical version, 44..57 VDC power supply	<b>MS440213PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink:Uplink: 1x 100/1000Base-X/ 1x 1000Base-X by Compact SFP Slot, vertical version, 44..57 VDC power supply	<b>MS440218 PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-T + PoE/PoE+, Uplink: 1x1000Base-SX,1x 1000Base-X SFP Port , Downlink: 1x10/100/1000Base-T + PoE/PoE+, vertical version, 44..57 VDC power supply	<b>MS440219PM-48 G6</b>
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GBE Installation Switch 4x10/100/1000Base-TX + PoE/PoE+, Uplink: 1x10/100/1000Base-TX, Downlink: 1x10/100/1000Base-TX + PoE/PoE+ (PD), horizontal version, 44..57 VDC power supply	<b>MS450187PM-48 G6</b>
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## Accessories

<b>Description</b>	<b>Article Number</b>
Micro Storage Media Card 4GB for MICROSENS G6-Switches, incl. Firmware, -25..+85°C	<b>MS140894X-4G</b>
Labeling-Sheet (DIN-A4) with 80 labels for G6-Switches, suitable for laser-printers, perforated, 10 sheets per sheet. Form generaoatr by NMP-Software	<b>MS140005</b>
Mounting set or Ackermann sub floor tanks, triple box with covers, suitable for 45x45 micro switch	<b>MS140027</b>
Mounting set for cable trunks, frame S99 + MS mounting plate, suitable for 45x45 micro switch	<b>MS140029</b>
Universal installation kit for cable ducts with C-profile, incl. masking frame	<b>MS140040BR</b>
Tehalit cable channel mounting set, front fixed incl. power supply 110-230 VAC / 48 VDC, 65 W	<b>MS700675-EKTH</b>
Switching power supply 48V/1.35A 65W for Power-over-Ethernet devices	<b>MS700680</b>
Power supply 100-230 VAC / 54 VDC, 1.35 A, 65 W	<b>MS700701</b>
Power supply 100-230 VAC / 54 VDC, 1.35 A, 65 W, open wire ends, fixed cable, conducted grounding	<b>MS700710</b>
FP Gigabit Ethernet Transceiver 1000Base-SX, Multimode 850nm, digital Diagnostics, exten. temp.-range: -40..85°C	<b>MS100200DX</b>
SFP Gigabit Ethernet Transceiver 1000Base-LX, Single Mode 1310nm, digital Diagnostics, -40..85°C	<b>MS100210DX</b>
SFP Fast Ethernet Transceiver 100Base-FX, Multimode 1310nm, digital Diagnostics, -40..85°C	<b>MS100190DX</b>
SFP Fast Ethernet Transceiver 100Base-FX, Monomode 1310nm, digital Diagnostics, -40..85°C	<b>MS100191DX</b>
nmp Professional - MICROSENS Network Management Platform - java software and one year update license	<b>MS200160-1</b>
nmp Standard - MICROSENS Network Management Platform - java software and one year update license	<b>MS200162-1</b>
NMP Server - management software with 1 year update licence, incl. 5 clients	<b>MS200164-1</b>

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