# Data Sheet
6-Port Gigabit Ethernet Micro Switch
with Twisted Pair Up- and Downlinks, opt. PoE+



## Overview

The Micro Switch G6 with Twisted Pair Up- and Downlinks is a derivative of the successful Micro Switch family from MICROSENS. With its 6 Gigabit Ethernet Twisted Pair (RJ-45) ports, this variant offers the ideal basis for sophisticated and user-oriented port expansions of existing networks in structured cabling.

The variant with PoE+ function can alternatively be supplied by Power-over-Ethernet (PD) via the uplink port.

The Micro Switch G6 Twisted Pair is offered in four basic versions:

| Supply voltage | Mounting type | |
| --- | --- | --- |
| | Horizontal | Vertical |
| 54-57 VDC | 1x RJ-45-Uplink PoE+ (PD) + 5x RJ-45 PoE+ (PSE) | 1x RJ-45-Uplink PoE+ (PD) + 5x RJ-45 PoE+ (PSE) (corresponds to picture above) |
| 230 VAC | 1x RJ-45-Uplink + 5x RJ-45 | 1x RJ-45-Uplink + 5x RJ-45 |

The extremely compact switches are characterized by their very small space requirements and are used in parapet ducts, floor tanks and in individually planned environments such as surface-mounted enclosures. The device has a monolithic design, is fanless and offers shortest installation times with highest robustness and reliability.

The use of Marvell chipset technology for the internal switch and the management CPU provide a future-oriented and highly flexible system platform.

## Features

### Gigabit Ethernet Switch

- Fanless Gigabit Ethernet Switch
- Low power consumption switch-chipset, Energy-Efficient Ethernet
- Layer-2+ store-and-forward, full wire-speed, non-blocking
- Max. 8,192 MAC addresses, automatic learning and aging
- Jumbo-Frames (max. 10,240 Bytes)

### Energy-Efficient Ethernet

- IEEE 802.3az
- Optimised power consumption for each RJ-45 port depending on the actual requirement
- Up to 50% reduced power consumption

### Network Management

- Support of common management standards
- 800 MHz ARM CPU
- Linux operating system with fast system boot
- Web Manager (HTTPS (default)/HTTP)
- Telnet/SSH/Console, incl. standard-commands (ping, traceroute, etc.)
- SNMP v1/v2c/v3
- Central management software as option (MICROSENS NMP)
- IPv4/IPv6 Dual Stack
- Integrated CLI scripting to automate routine processes
- Firmware, script and configuration files can be loaded, saved and executed directly on the "switch".
- Incremental firmware updates possible
- Exchangeable MicroSD memory card for configuration, CLI scripts, firmware, and MAC address (optional)

### Power-over-Ethernet PoE+ (opt.)

- IEEE 802.3at PoE+ (max. 30 W/Port)
- 5x 10/100/1000Base-T, PoE+ (RJ-45)
- Limitation of the total power consumption of the switch to max. 80 W (full power only under suitable installation conditions)
- Ext. Power supply with typ. 54 VDC

### Connectors

#### Uplink
- 1x 1000Base-T (RJ-45) (PoE variant with PoE (PD))
- Auto MDI/MDI-X function for the use of uniform patch cables

#### Local / Downlink
- 5x 10/100/1000Base-T (RJ-45) Auto-Negotiation, PoE (PSE) (PoE variant)
- Auto MDI/MDI-X function for the use of uniform patch cables

#### Extension Port
- RS-232 Console port (mini-USB)
- For optional accessories

#### Power Supply
- 3-pin screw pluggable connector for solid or stranded wires
- Additional grounding (PE) via 6.3 mm flat-pin plug
- Supply via PD port (PoE variant only)

### Mounting

- Snap-in mounting 45 mm (without screw mounting)
- Compatible with all common installation systems due to circumferential support edge
- Bevelled edge allows installation in 2-fold frames
- Extensive range of installation accessories available

### Compatibility

- Compatibility to standard CISCO Switches verified (amongst others: IEEE 802.1X, QoS, VLAN, CDP, RSTP)

## Network management - Feature overview

For the latest functional firmware features, please refer to the document "Firmware Features G6" which can be downloaded from the download center of the particular device home pages at http://www.microsens.com/.
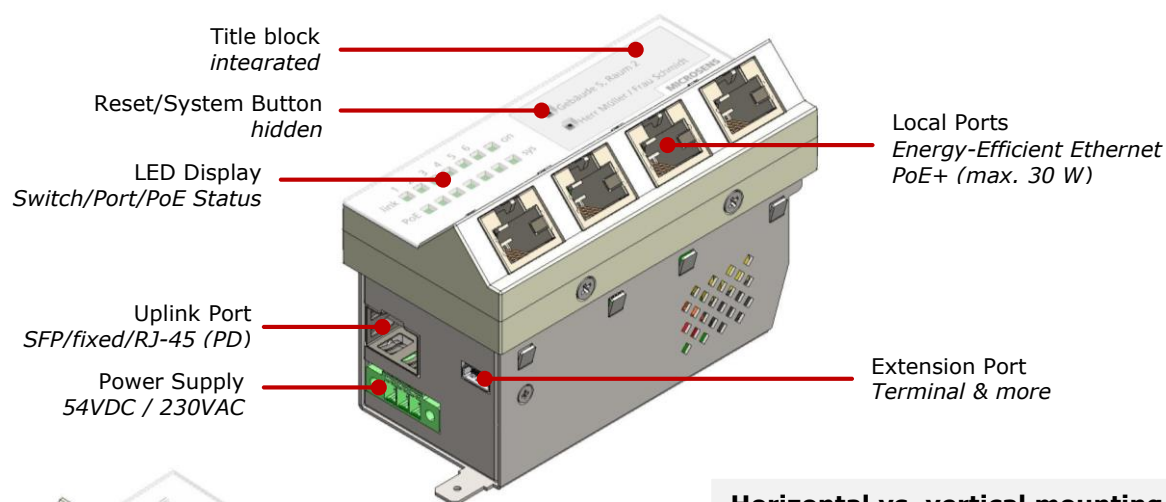
## RFC / IEEE Standards

The IEEE standards and RFCs supported by the Micro Switch G6 can also be found in the document "Firmware Features G6"
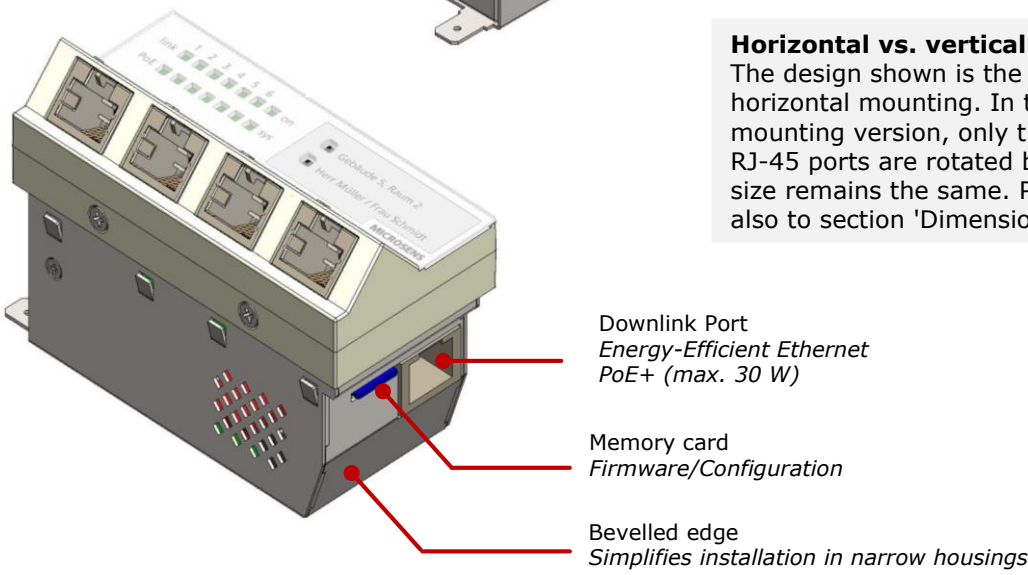
## Quality – Made in Germany

To constantly guarantee a high quality of the Micro Switch Generation 6 all models and versions are manufactured in Hamm, Germany.
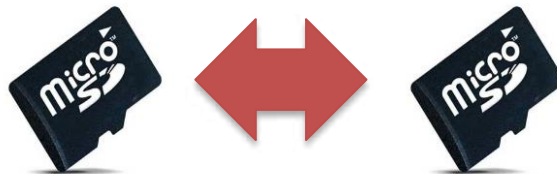
## Interfaces

Title block
*integrated*

Reset/System Button
*hidden*

LED Display
*Switch/Port/PoE Status*

Local Ports
*Energy-Efficient Ethernet
PoE+ (max. 30 W)*

Uplink Port
*SFP/fixed/RJ-45 (PD)*

Power Supply
*54VDC / 230VAC*

Extension Port
*Terminal & more*

**Horizontal vs. vertical mounting**
The design shown is the variant for horizontal mounting. In the vertical mounting version, only the four local RJ-45 ports are rotated by 90°, the size remains the same. Please refer also to section 'Dimensions'.

Downlink Port
*Energy-Efficient Ethernet
PoE+ (max. 30 W)*

Memory card
*Firmware/Configuration*

Bevelled edge
*Simplifies installation in narrow housings*

## Memory Card



- Use is optional
- Stores firmware and configuration
- Change of memory card transfers the **complete** device status
- Firmware update by memory card exchange is possible
- Fault tolerant journaling file system

The optional MicroSD memory card is used for the permanent storage of configuration, script and firmware files.

If no memory card is inserted, the system starts or boots from the internal memory of the device.

With this memory card it is possible to transfer a configuration to a new device in case of a device failure.

Optionally, an individual MAC address can be stored on the MicroSD memory card. This MAC address has priority over the switch's internal MAC address. This allows to provide an exact clone of the device by swapping the memory card.

Only MICROSENS memory cards have to be used. Only with this the long term stability over the complete temperature range can be guaranteed.

## Ring-Topology

**Normal operation**

- All switches are configured for ring operation
- One switch is assigned as ring master
- Ring master cuts the ring logically

**Ring error**

- Switches signalize segment failure via Ethernet
- Master receives that information via Ethernet and closes the logical cut
- Switches relearn the actual network topology (MAC-addresses)

**Configuration**

- Switches can be configured for up to two independent rings
- Ring ports are freely selectable
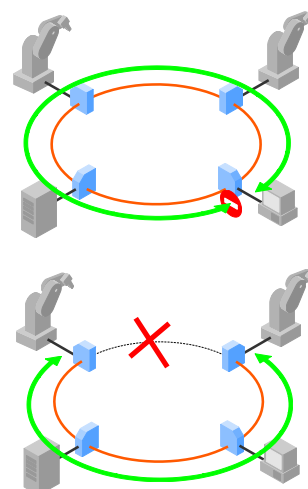
## Technical Specifications

### Switch

| | |
|---|---|
| **Type** | Gigabit Ethernet Switch Layer 2+, IEEE 802.3 compliant |
| **Performance** | Store-and-forward; full wire-speed, non-blocking on all ports |
| **MAC addresses** | 8,192 addresses, automatic learning and aging |
| **Jumbo Frames** | max. 10,240 Bytes |

### Twisted-Pair Ports

| | |
|---|---|
| **Number of ports** | 6 |
| **Type** | Gigabit Ethernet, 1x 1000Base-T Uplink 5x 10/100/1000Base-T |
| **Connector** | RJ-45 port, shielded |
| **Cable type** | Twisted-Pair cable, Category 5e, impedance 100 Ohm, length max. 100 m |
| **Flow Control** | Pause Frames (IEEE 802.3x), configurable |
| **Pin out** | Auto MDI/MDI-X, Auto Polarity |
| **Power-over-Ethernet** | Powered Device (PD) IEEE 802.3at Power Sourcing Equipment (PSE) IEEE 802.3af/at Class 0, max. 30 W Forced-mode (Legacy Devices) |

### Power Supply (DC)

| | |
|---|---|
| **Input** | 44..57 VDC (54 VDC typ.) |
| **Power Consumption** | Typ. 4.5 W (without PoE (PSE)) max. 80 W (incl. PoE (PSE)) (full power only with suitable installation conditions) |
| **Connector** | 3 pin screw connector, PE/-/+ |
| **Grounding (PE)** | 6.3 mm flat-pin plug |

### Power Supply (AC)

| | |
|---|---|
| **Input** | 230 V 50..60 Hz |
| **Power Consumption** | Typ. 4.5 W |
| **Connector** | 3 pin screw connector, PE/N/L |
| **Grounding (PE)** | 6.3 mm flat-pin plug |

### Displays

| | | |
|---|---|---|
| **Type** | 14 LEDs, detachable | |
| **Link** | Twisted pair ports 1..6 | |
| | *green* | Link at port Flashing at data traffic |
| | *orange* | Port blocked (via protocol) |
| | *red* | Port Access Control rejected (port 1..4 and 6 only) |
| **PoE** | Twisted pair ports 1..4 and 6 | |
| | *green* | PoE supplying |
| | *blue* | PoE+ active |
| | *orange* | PoE standby |
| | *red* | PoE failure |
| **On (switch status)** | *green* | ready for operation |
| | *flashing* | starting sequence |
| **Sys** | *blue* | Factory reset without IP reset in progress |
| | *violet* | Factory reset including IP reset in progress |
| | *green* | Process completed |
| | *orange* | Flashing while Firmware update in progress |
| **LED-modes** | *Dynamic* | Standard-mode |
| | *Static* | Standard without flash |
| | *Quiet* | Only ON- and Sys-LED |
| | *Dark* | all LEDs off |
| | *L-show* | permanent LED test |

### Control Panel

| | |
|---|---|
| **Reset button** | Reset of switch, new upload of latest stored configuration (direct hardware function) |
| **System button** | Request of IP configuration for management, reset back to factory default settings (can be switched off) |

### Environmental Conditions

| | | |
|---|---|---|
| **Temperature** | Operation | 0..+40 °C |
| | Storage | -20..+85 °C |
| **Humidity** | 10..90%, non condensing | |

### Mechanical Dimensions

| | |
|---|---|
| **Dimensions** | 90 mm x 45 mm x 58 mm (w x d x h, without connectors) |
| **Mounting depth** | 34 mm |
| **Weight** | 325 g |

## Technical Specifications (continued)

### Standards

| | |
|---|---|
| **CE** | 2014/30/EU (EMC Directive) 2011/65/EU (RoHS Directive) 2015/35/EU (Low Voltage Directive) |
| **Safety** | EN 60950-1 |
| **Emitted interference** | EN 55032 |
| **Immunity** | EN 55024 |

### Reliability

| | |
|---|---|
| **MTBF** | 100.000 h |
| **Method** | MIL-HDBK-217F |

### Delivery / Contents

*Standard Packaging*

| | |
|---|---|
| **Package unit** | 1 pcs. |
| **Dimensions** | 158 mm x 90 mm x 65 mm |
| **Weight** | 400 g |
| **Contents** | 1x Micro Switch 1x Power supply plug 1x Quick Start Guide |

*Bulk Packaging*

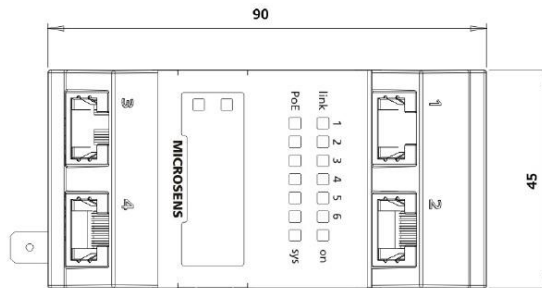| | |
|---|---|
| **Package unit** | 20 pcs. |
| **Dimensions** | 380 mm x 325 mm x 140 mm |
| **Weight** | 7500 g |
| **Contents** | 1x Micro Switch 1x Power supply plug 1x Quick Start Guide |

# Dimensions

Horizontal
mounting
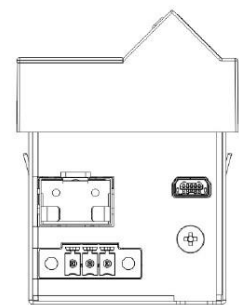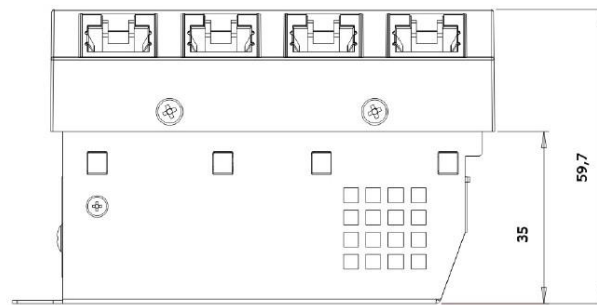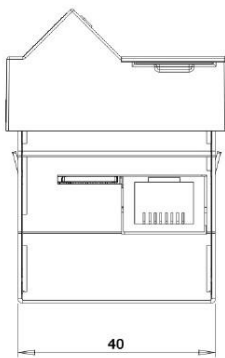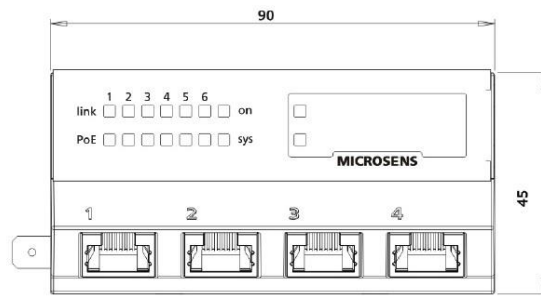


Vertical
mounting
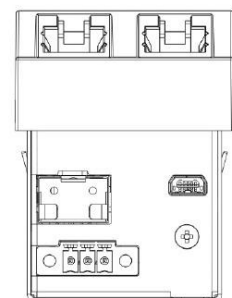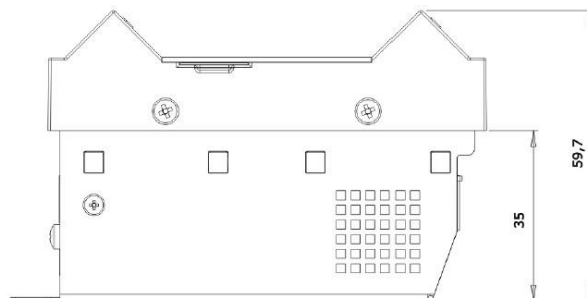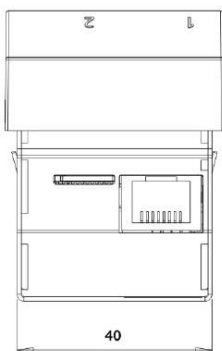
## Order Information

| Designation | Article-No.<br>Horizontal mounting | Article-No.<br>Vertical mounting |
|---|---|---|
| **Micro Switch G6, PoE+, 54 VDC** | | |
| Uplink: Twisted Pair (RJ-45) and PoE function (PD)<br>1x 1000Base-T (PD), 5x 10/100/1000Base-T (PSE)<br>Colour: **pure white** (RAL 9010) | **MS450186PM-48G6+** | **MS450187PM-48G6+** |
| Uplink: Twisted Pair (RJ-45) and PoE function (PD)<br>1x 1000Base-T (PD), 5x 10/100/1000Base-T (PSE)<br>Colour: **graphite** (RAL 7021) | **MS450186PM-48G6+GT** | **MS450187PM-48G6+GT** |
| Uplink: Twisted Pair (RJ-45) and PoE function (PD)<br>1x 1000Base-T (PD), 5x 10/100/1000Base-T (PSE)<br>Colour: **anodised aluminium** (RAL 9006) | **MS450186PM-48G6+AL** | **MS450187PM-48G6+AL** |

## Accessories

| | Designation | Article No.: |
|---|---|---|
| | **Memory Cards for Micro Switch G6 (optional)** | |
| | Micro Storage Media Card (microSD)<br>for Micro Switches, 0..+70°C | **MS140894X-4G** |
| | Micro Storage Media Card (microSD)<br>for Micro Switches, 0..+70°C<br>Variant with its own MAC address | **MS140894X-4G-M** |
| | **Labeling field** | |
| | Labelling sheets Micro Switch G6<br>10 sheets, 80 labels per sheet | **MS140894X-4G** |
| | **NMP 2.x Network Management** | |
| | NMP Enterprise<br>1 x usage right for NMP Enterprise ,<br>200 x usage rights f. NMP Enterprise Managed Objects,<br>and SW Maintenance for 1 year (download of updates) | **to be announced soon** |
| | NMP Enterprise<br>1 x usage right for NMP Enterprise,<br>1000 x usage rights f. NMP Enterprise Managed Objects,<br>and SW Maintenance for 1 year (download of updates) | **to be announced soon** |
| | Expansion packs for NMP Enterprise Managed Objects | **to be announced soon** |
| | NMP Professional<br>1 x usage right for NMP Professional,<br>50 x usage rights f. NMP Professional Managed Objects,<br>and SW Maintenance for 1 year (download of updates) | **to be announced soon** |
| | NMP Professional<br>1 x usage right for NMP Professional,<br>100 x usage rights f. NMP Professional Managed Objects,<br>and SW Maintenance for 1 year (download of updates) | **to be announced soon** |
| | Expansion packs for NMP Professional Managed Objects | **to be announced soon** |
| | **Installation Accessories*** | |
| | Universal M45 installation set for an E2 socket,<br>consisting of an adapter plate and a cover frame,<br>colour: pure white (RAL9010) | **MS140029** |
| | M45 installation set, consisting of a cover frame (168 x 85 mm), an adapter plate and 2x device brackets, pre-assembled, colour: pure white (RAL9010) | **MS140040BR2** |
| | DIN-Rail Adapter for Micro Switch G6<br>rotatable, screws included | **MS140805-G6** |
| | **Power supplies for PoE variants** | |
| | PoE+ Installation power supply unit 54VDC/1.2A 65W for PoE+ Micro-Switches, 3x 1,5mm², 1m feed line, Combicon connector | **MS700710** |
| | PoE+ Installation power supply unit MS700710 (s.a.),<br>mounted on adapter C-profile, 35 mm rail (DIN) | **MS700710-UNI** |

* More installation accessories for all installation situations can be found at FTTO Installation Accessories

## Services

| Designation | Article No. |
|---|---|
| **Warranty extension after 24-month manufacturer's warranty**** | |
| Warranty extension by 1 year | **MSGV01** |
| Warranty extension by 2 years | **MSGV02** |
| Warranty extension by 3 years | **MSGV03** |
| **Custom colour for the port cover (standard colour for Micro-Switch port covers: RAL9010)** | |
| Special colouring of the port cover according to customer specifications (RAL) | **MSSonderbau** |
| **Pre-configuration according to customer requirements** | |
| Pre-configuration of the component according to customer specifications | **MSKonfig** |
| Pre-configuration of the component according to customer specifications (configuration file already exists) | **MSKonfig-OK** |

## More Microsens Micro Switches G6

| Designation | Article-No. Horizontal mounting | Article-No. Vertical mounting |
|---|---|---|
| **Micro Switch G6, PoE+, 54 VDC** | | |
| Uplink 1x 100/1000Base-X SFP Slot, 5x 10/100/1000Base-T RJ-45 (PSE) | **MS440209PM-48G6+** | **MS440219PM-48G6+** |
| **Micro Switch G6, 230 VAC (no PoE)** | | |
| Uplink 1x 100/1000Base-X SFP Slot, 5x 10/100/1000Base-T RJ-45 | **MS440209M-G6+** | **MS440219M-G6+** |
| **Ruggedized Micro Switch G6 -25°..+65°C ready mounted with DIN rail mounting **** | | |
| 1x SFP-Uplink (100/1000Base-X) 5x TP-Ports (10/100/1000Base-T) with PoE+ | **MS440209PMXH-48G6+** | **MS440219PMXH-48G6+** |
| 2x SFP-Uplink (100/1000Base-X) 4x TP-Ports (10/100/1000Base-T) with PoE+ | **MS440207PMXH-48G6+** | **MS440217PMXH-48G6+** |
| 1x TP-Uplink (10/100/1000Base-T) with PD 5x TP-Ports (10/100/1000Base-T) with PoE+ | **MS450186PMXH-48G6+** | **MS450187PMXH-48G6+** |

** The manufacturer's warranty is defined in the general terms and conditions AGB (§9) of MICROSENS GmbH & Co. KG.
*** Please refer to separate data sheets to obtain detailed information on the listed variants.

**DIREKTRONIK**

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