

# Fast Ethernet Switch for industrial use with integrated PoE function

# MICROSENS

## General

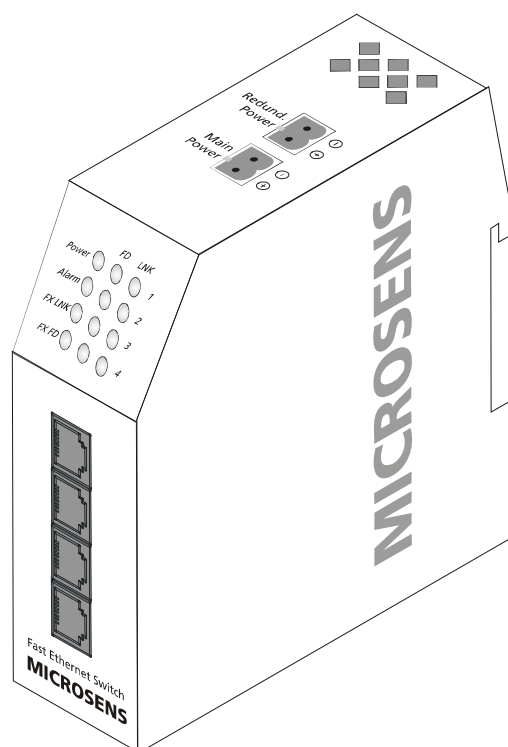
The MICROSENS industrial switch offers the connection of four end devices via twisted-pair cable. An additional port as fiber uplink (100Base-FX) is for the connection to the central distribution.

The industrial switches distinguish themselves with their very robust design. All electrical interfaces are galvanic isolated and protected against over voltage.

The twisted pair ports are adjusting automatically to the correct speed of the connected end device (10/100 autonegotiation). Additionally the copper ports are having the auto crossing feature.

The uplink port for the connection to the central distribution is working with 100 Mbit/s and can be configured to half- or full-duplex mode, depending on the requirements. By the use of the fiber, the galvanic isolation and protection against electromagnetic interferences is given.

The chassis is designed that the device can be mounted on 35 mm hat rails. The power supply is done by external power supplies with a voltage of 24 V DC. Therefore the device can be also used in telecommunication or power distribution centres.



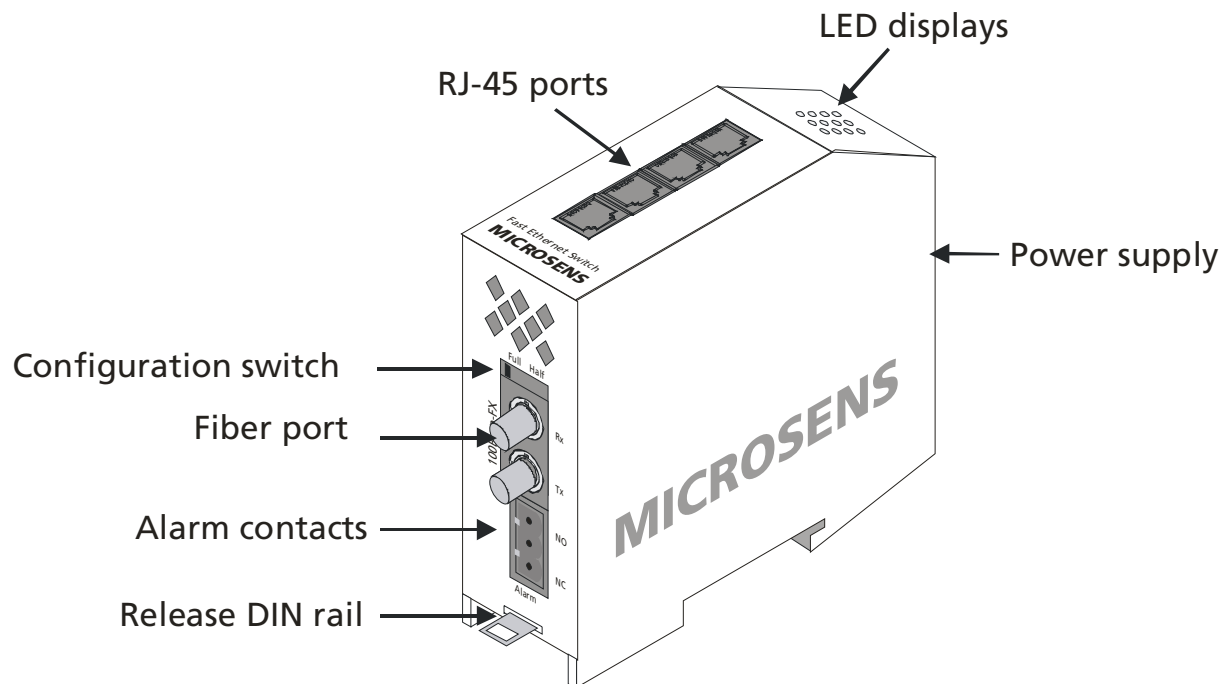
## Technical Specifications

<b>Type</b>	Fast Ethernet Switch 4 x 10/100Base-TX with 100Base-FX uplink for industrial use	
<b>Fiber type</b>	Multimode 62.5/125 or 50/125µm, Single mode 9/125µm, duplex	
<b>Cable type</b>	Shielded Twisted Pair cable, 100 Ohm, Category 5, Pin out RJ45-port Auto Crossover	
<b>Data rate</b>	10 or 100 Mbit/s	
<b>LED displays</b>	<i>Power</i>	Ready for operation
	<i>Link</i>	Link status each port
	<i>Act</i>	Data traffic each port
	<i>FDX/HDX</i>	Half- or full-duplex each port
	<i>Alarm</i>	Fiber link interrupted
<b>Mounting</b>	35 mm hat rail, according DIN EN 50 022	
<b>Power supply</b>	48 V DC / max. 1.35 A via external power supply screw terminal connection, redundant ports	
<b>Dimensions</b>	38 x 108 x 116 mm (w x d x h)	
<b>Operating temperature</b>	-20°C to 60°C	
<b>Storage temperature</b>	-20°C to 80°C	
<b>Rel. humidity</b>	5% to 90% non condensing	

## Optical Parameters

<b>Multimode</b>	<i>min. distance:</i>	2 km (full duplex)
	<i>transmit power:</i>	-19 dBm
	<i>sensitivity:</i>	-31 dBm
	<i>wavelength:</i>	1310 nm
<b>Single mode 15km</b>	<i>min. distance:</i>	15 km (full duplex)
	<i>transmit power:</i>	- 15 dBm
	<i>sensitivity:</i>	- 31 dBm
	<i>wavelength:</i>	1310 nm
<b>Single mode 40km</b>	<i>min. distance:</i>	40 km (full duplex)
	<i>transmit power:</i>	- 5 dBm
	<i>sensitivity:</i>	- 34 dBm
	<i>wavelength:</i>	1310 nm

## Connectors



## Features

The switch has a non blocking architecture and is working with the store and forward procedure. To store the data the switch has an integrated memory of 1 Mbit.

The MAC address handling is done by the integrated address management. The switch can store up to 4096 MAC addresses at the same time. The address is stored after receiving a valid data packet. Five to ten minutes after the last data received the related MAC address is deleted again (aging).

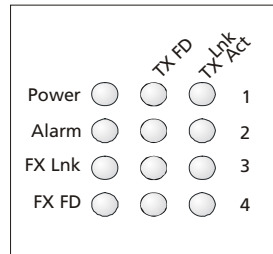
## Connections

The integrated auto-crossing function of all twisted-pair ports makes the use of crossed patch cables unnecessary. The switch automatically detects the pin out 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.

## Transmission speed

The twisted-pair ports are adjusting themselves to the highest possible transmission speed. The LED shows the selected transmission speed.



The transmission in full duplex mode is indicated by the related LED being on. If the half duplex mode is selected, this LED functions as a collision indicator for this segment (flashing).

The transmission mode of the fiber port is selected with a DIP switch. This DIP switch is located direct beside the fiber port at the bottom of the device. It has to be considered that distances of more than 412 m can be realised only in full duplex mode.

## 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.

## Alarm Contacts

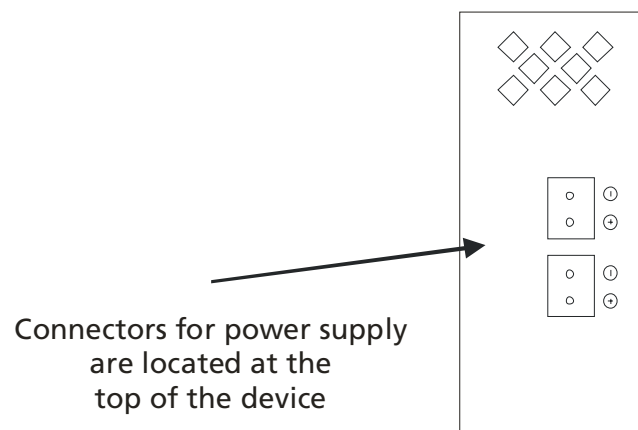
The switch has integrated potential free floating contacts for the connection of external alarm systems. The connection is done by a screw terminal plug at the bottom of the device.

It is possible to select between opening or closing contact (NO/NC). If any of the connections (twisted-pair or fiber) is lost or if the complete device fails, this contact switches.

## Power Supply

The power supply is done by an external power supply with an output voltage of 48 V DC.

The power supply is not included at delivery. The connection is done by screw terminal connectors at the top of the device. The connection of a redundant power supply is possible by the second power connector.



## Management

The integrated http server offers to show status information by using a standard internet browser. A special configuration is not necessary. Additional to the web based management the switch offers a MIB to be used in all standardized Network Management Systems (NMS) supporting SNMPv1 protocol.

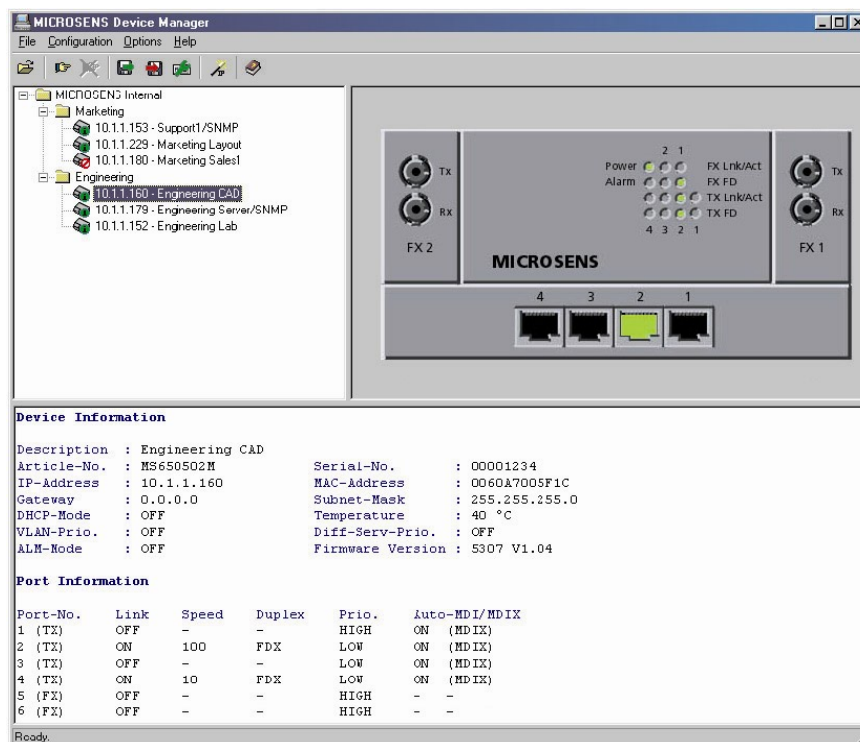
With the PC based management tool Device Manager it is possible to configure all ports of the switch manually. Please refer to the online manual for the Device manager on the disk.

With this tool it is also possible to do the initial TCP/IP setting (IP address, Gateway etc.). This configuration can be changed afterwards using the TCP/IP protocol.

**Attention:** The description for the initial settings can be found in the online manual!

The management information are available inside of the network (inband management). A special connection is not necessary. Due to this all four twisted pair ports are available to connect other devices.

With the deactivation of the autonegotiation function of the twisted pair ports the configuration of the speed to 10 or 100 Mbit/s and full or half duplex mode is done manually.



MICROSENS Device Manager

## Power-over-Ethernet

The Fast Ethernet Switch supports the Power-over-Ethernet function and supplies the 48VDC to devices such as IP phones, wireless access points, Web cameras, access control systems via twisted-pair cables.

The Power-over-Ethernet functionality according to the new IEEE802.3af standard is integrated into the Industrial Switch. The standard defines the functions of both the Power Sourcing Equipment (PSE) and of the Powered Device (PD). A handshake protocol between PSE and PD negotiates the current supply where several levels are possible.

Each of the 4 TP-ports can supply the 48VDC in addition to the data. The power is supplied according to the IEEE 802.3af standard via the unused wires of the RJ45 socket (wire 4 and 5: positive line, wire 7 and 8: negative line).

The switch is designed for a total power consumption of 60 W. This offers a total power of approx. 52 W which can be supplied to the end devices. The PoE Fast Ethernet Switch controls the PoE DC supply with its microprocessor controlled Power Management as specified in the 802.3af standard.

To protect non PoE capable end devices the supply voltage is switched on only after getting a valid PoE signature from the end device. Furthermore the power consumption is monitored permanent. If the limits are passed, the power supply is switched off immediately.

## Mounting

The switch has a solid metal chassis with an integrated holder for the DIN rail mounting. For the mounting of the switch 35 mm DIN rails according DIN EN 50 022 should be used.

The fixation of the device is done by a snap mechanism, which can be released by an eyelet at the bottom of the device. Putting several devices together on one DIN rail is possible, due to the optimised heat sink mechanism of the device.

## Order Information

Art.-No.	Description	Connectors
MS650461PM-48	Fast Ethernet Industrial Switch Multimode 1310 nm, manageable with Power-over-Ethernet function	2 x ST, 4 xRJ45 Power supply, Relay Contacts
MS650462PM-48	Fast Ethernet Industrial Switch Multimode 1310 nm, manageable with Power-over-Ethernet function	2 x SC, 4 xRJ45 Power supply, Relay Contacts
MS650464PM-48	Fast Ethernet Industrial Switch Single mode 1310 nm Laser, min. 15 km, manageable with Power-over-Ethernet function	2 x SC, 4 xRJ45 Power supply, Relay Contacts
MS650465PM-48	Fast Ethernet Industrial Switch Single mode 1310 nm Laser, min. 15 km, manageable with Power-over-Ethernet function	2 x ST, 4 xRJ45 Power supply, Relay Contacts
MS650467PM-48	Fast Ethernet Industrial Switch Single mode 1310 nm Laser, min. 40 km, manageable with Power-over-Ethernet function	2 x SC, 4 xRJ45 Power supply, Relay Contacts
MS650468PM-48	Fast Ethernet Industrial Switch Single mode 1310 nm Laser, min. 40 km, manageable with Power-over-Ethernet function	2 x ST, 4 xRJ45 Power supply, Relay Contacts

Further versions on request

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