

Data Sheet

Profi Line X

16-Port Industrial 10G Switch PoE++

 Made
 in
 Germany



10G Uplinks (IEEE 802.3ae)

4x 1/10G uplink for maximum performance and flexibility in the FTTO network



1/2.5/5/10G Downlink (IEEE 802.3bz, IEEE 802.3an)

Multi Gigabit port optimised for camera and Wi-Fi 6 network operation



PoE++ PSE Local Port (IEEE 802.3bt)

480W power budget (2x Ports up to 90W, 6x Ports up to 60W)



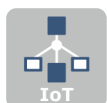
IT Security

MICROSENS SECURE feature set for a high level of IT security



Fanless Design

No noise emission at the workplace



IOT Support

MICROSENS SmartOffice, Scripting, APPS, MODBUS, MQTT



Standardised Network Redundancy (ERPS nach G.8032v2)^[1]

Feature set for special redundancy topologies in the FTTO network

Specifications

Gigabit Ethernet Switch

- Fanless 10 Gigabit Ethernet Switch
- Low power consumption switch-chipset, Energy-Efficient Ethernet
- Store-and-forward
- Jumbo-Frames (max. 10,240 Bytes)

Connectors

Uplinks

- 2x SFP/SFP+ Slot 1/10GBase-X

Local Ports PoE/PoE+

- 12x 10/100/1000Base-T (RJ-45) Auto-Negotiation PoE+ Ports up to 30W

Combo Ports (PoE++)

2x Combo either

- 1/2.5/5/10GBase-T (RJ-45) PoE++ Ports up to 90W or
- SFP/SFP+ Slot 1/10GBase-X

Power Supply

- 2x 3-pin screw pluggable connector for solid or stranded wires

USB-C Console Port

- Virtual COM port for CLI access (out-band management)

USB-A Extension Port

- For optional accessories

Alarm Contacts / I/O-Ports

- Potential free digital input/output ports
- 2x output (relay)
- 2x input (optocoupler)

Energy-Efficient Ethernet

- EEE according to IEEE 802.3az
- Reduced power consumption for each RJ-45 port up to 80% depending on the actual requirement

NOTE

For the latest functional firmware features and supported IEEE / RFC standards, please refer to the document [Firmware Features](#) which can be downloaded from the download center of the particular device's home pages at www.microsens.com

Network Management

- Support of common management standards
- Single Core Arm® High Performance CPU and Linux operating system with fast system boot
- Web Manager (HTTP/HTTPS)
- Telnet/SSH/Console, incl. standard-commands (ping, traceroute etc.)
- SNMP v1/v2c/v3 with View-based Access Control Model (VACM) and User-based Security Model (USM)
- Central management platform (MICROSENS NMP)
- IPv4/IPv6 Dual Stack
- Integrated CLI scripting for the automation of routine processes
- Firmware-, script- and configuration files can be loaded, stored and executed directly from the switch
- Incremental firmware updates
- Exchangeable SD memory card for configuration, CLI scripts, firmware (SD card optional accessory)

IOT Support

- MICROSENS SmartOffice
- Scripting
- APPS
- MODBUS
- MQTT Broker

Mounting

- Integrated holder for DIN-rails (EN 60715:2017)

Technical Specifications

Switch		Control Panel	
Type	10 Gigabit Ethernet Switch, IEEE 802.3 compliant	Reset Button	Reset of the switch, reload of the latest stored configuration (direct hardware function)
Performance	Store-and-forward Full wire-speed, non-blocking on all ports	Factory Button	Request of the IP configuration for management, reset back to factory default settings
Jumbo Frames	max. 10,240 Bytes	LED Displays	
Gigabit / PoE+ Ports		Number	Device Port 12 dual color LEDs 2 dual color LEDs per port (integrated in RJ-45)
<ul style="list-style-type: none">12x 10/100/1000Base-T, PoE+<ul style="list-style-type: none">Speed selection via Auto-NegotiationRJ-45 shielded connectorPoE+ PSE power sourcing max. 30W at each port (IEEE 802.3at)PSE type 2, 2 pairsFull power available under suitable installation conditions onlyTotal device PoE Budget 480W		LED-Modes	Dynamic Static Quiet Dark L-show Standard-mode Standard without flash Only ON- and Sys-LED All LEDs off Permanent LED test
		Port LEDs (integrated in RJ-45)	
		Ethernet (Lnk)	green Link at port Flashing at data traffic
			yellow Port blocked (via protocol)
			red Port Access Control rejected
Multigig (Combo) / PoE++ Ports			off no link
<ul style="list-style-type: none">2x 1/2.5/5/10GBase-T, PoE/PoE++ (PSE, max. 90 W)<ul style="list-style-type: none">Speed selection via Auto-NegotiationRJ-45 shielded connectorPoE++ PSE power sourcing max. 90W at each port (IEEE 802.3bt)PSE type 4, 4 pairsFull power available under suitable installation conditions onlyTotal device PoE Budget 480W		PoE	green PoE power active
			yellow PoE not active
			red PoE failure
			off PoE deactivated
		M (Media)	SFP-Port (in use)
Fiber Ports (Combo) (SFP/SFP+ slots)		(This LED is not available in port 1/7 and port 2/7)	green Link at port Flashing at data traffic
Number	2x SFP/SFP+ 2x Combo SFP/SFP+		yellow Port blocked (via protocol)
Type	1/10 Gigabit Ethernet Dual Speed SFP/SFP+ 1/10GBase-X, support of SFP digital diagnostics function		red Port Access Control rejected
Connector	typ. LC (SFP/SFP+ transceiver)		off no link

Technical Specifications (continued)

LED Displays (continued)

Device LEDs (central)

Power 1/2	<i>green</i>	Power supply 1/2 ok
	<i>yellow</i>	Input voltage too low/missing
System 1	<i>active</i>	System activities (Firmware update)
	<i>off</i>	Normal operation
System 2	<i>off</i>	Normal operation
Ring 1/2	<i>green</i>	Ring 1/2 normal
	<i>yellow</i>	Ring backup active
	<i>red</i>	Ring backup failure
	<i>off</i>	Ring deactivated
Signal In 1/2	<i>green</i>	activated, no signal
	<i>red</i>	S1/S2 activated, alarm
	<i>off</i>	inactive
Signal Out 1/2	<i>green</i>	activated, no signal
	<i>red</i>	S1/S2 activated, alarm
	<i>off</i>	inactive

Mechanical

Dimensions	127.5 mm x 88 mm x 160 mm (L x B x H, without connectors)
Weight	1620g (without SFPs)
Protection Class	IP 20

Delivery / Contents

Standard Packaging

Package Unit	1 pcs.
Contents	1x Profi Line X-Switch 2x Power supply connector 2x I/O connector 1x Quick Start Guide

Power Supply

Input	24..57 VDC (54 VDC typ.) min. 50 VDC for PoE++ operation
Power Consumption	Typical: 12 W, minimum: 9 W, maximum: 500 W (including PoE)
Connectors	2x 3 pin screw connector

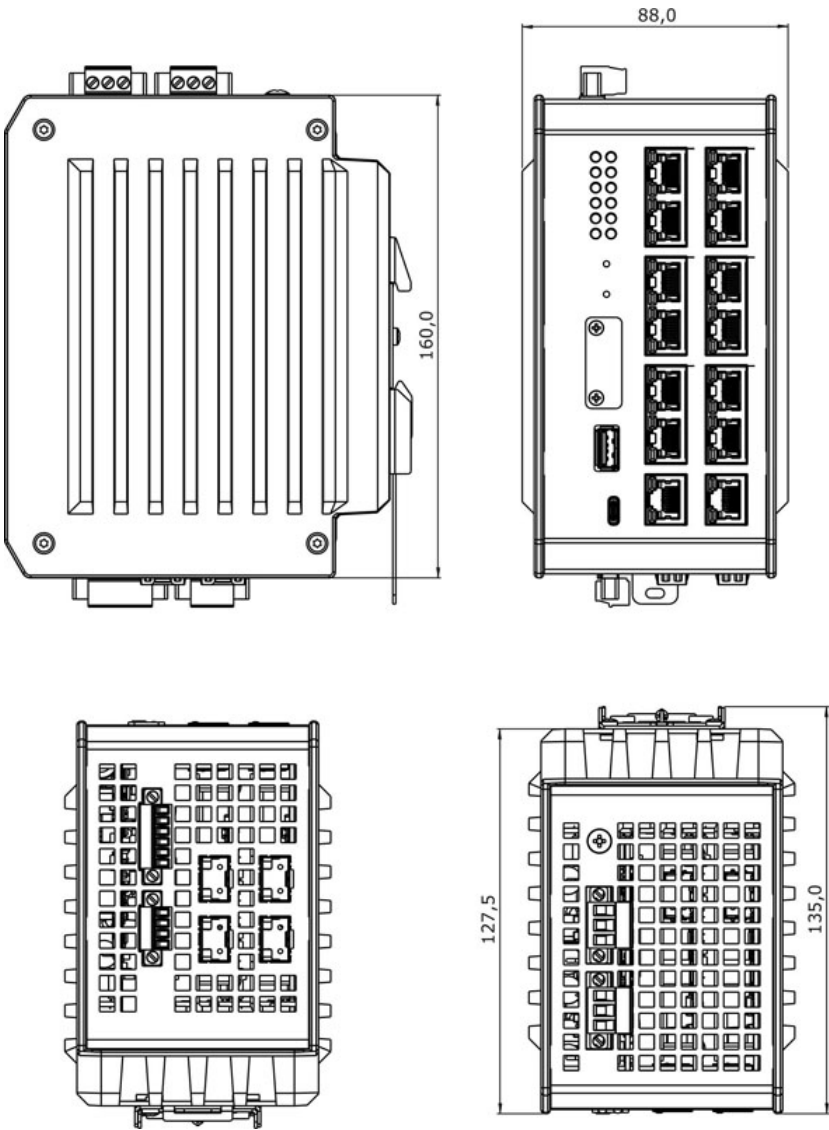
Environmental Condition

Temperature	Operation -40..+75 °C Storage -40..+75 °C
	In case of failure, one-time emergency operation without POE for max. 48h at an ambient temperature of max. 85°C is possible, provided SFPs and SD card are suitable for industrial temperature range. Multiple emergency operation at +85°C can lead to accelerated aging.
Humidity	10..90%, non condensing
MTBF Time	400.000 h

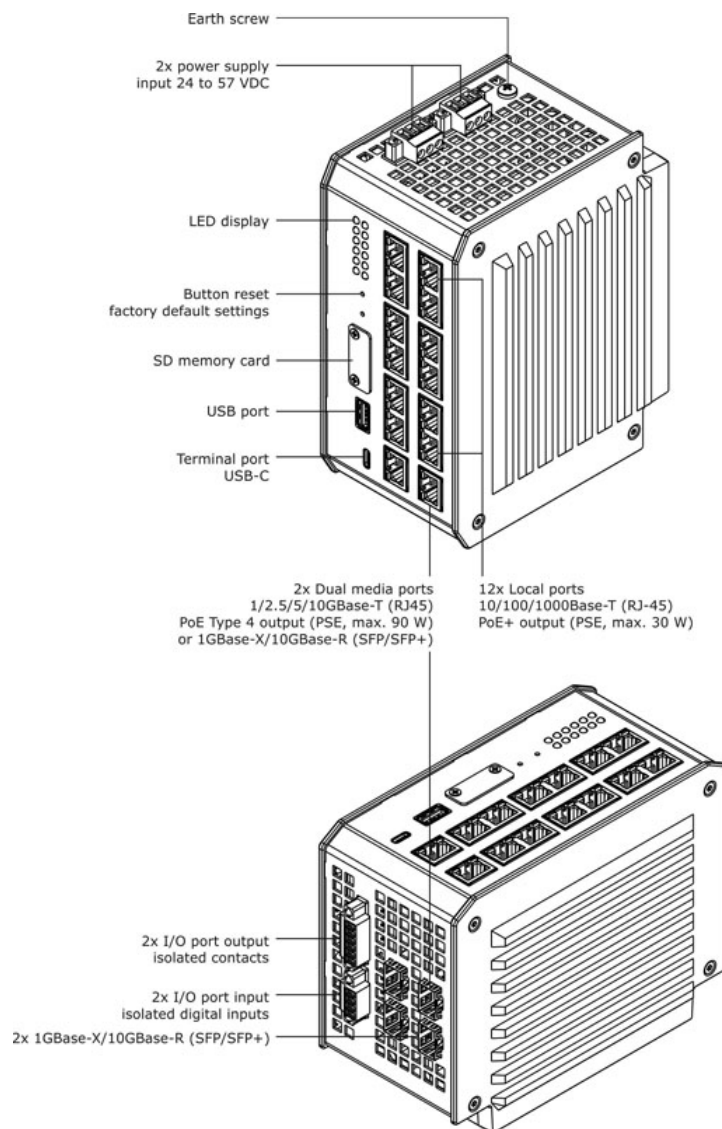
Standards

CE	2014/30/EU (EMC Directive) 2011/65/EU (RoHS Directive)
Safety	EN 62368-1:2020
Emitted Interference	EN 61000-6-3:2007, EN 61000-6-3:2007/A1:2011/AC:2012, EN 61000-6-3:2007/A1:2011 EN 55032:2015+A11:2020
Electromagnetic Compatibility	EN 61000-6-2:2005+AC:2005 EN 55035:2017+A11:2020

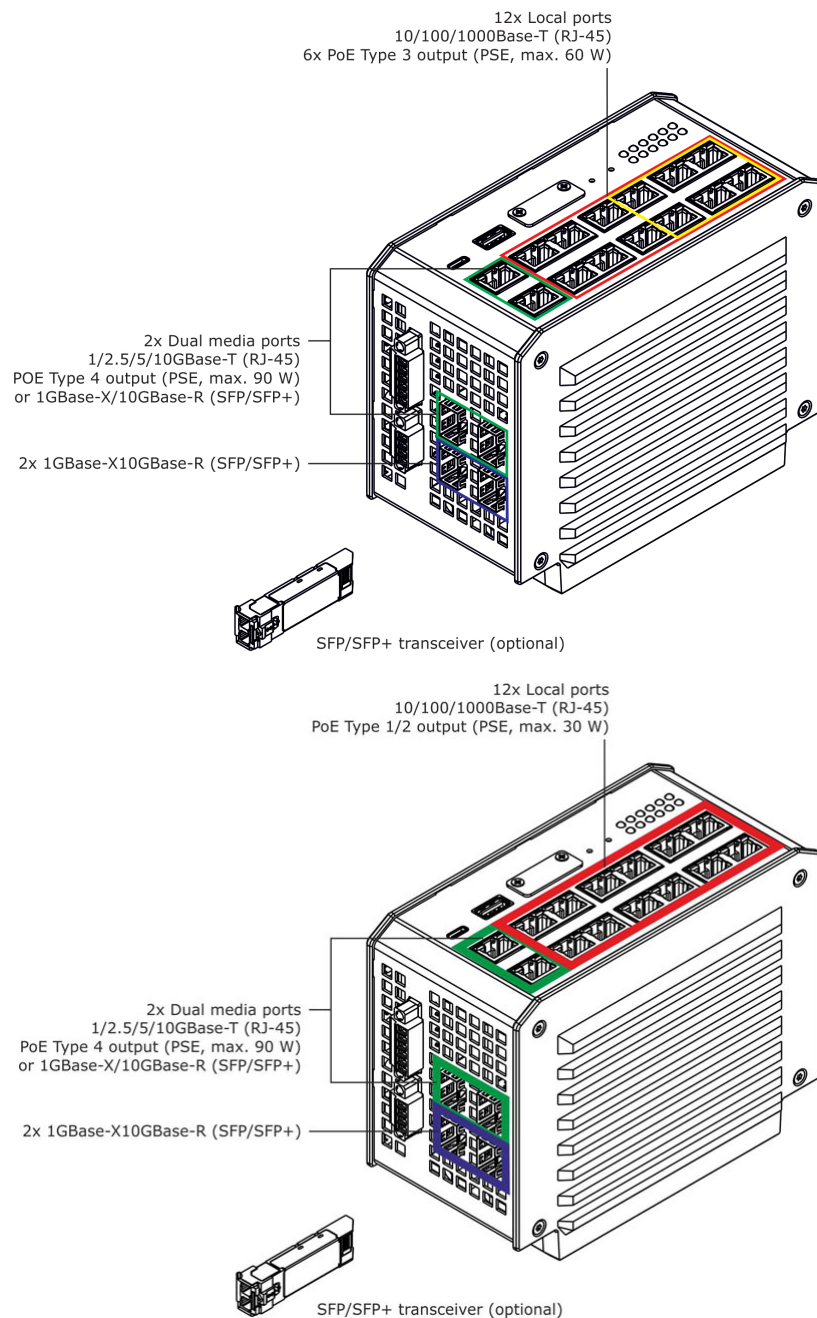
Dimensions



Connectors



PoE Ports



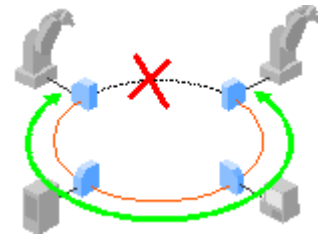
Ring Topology

Normal Operation

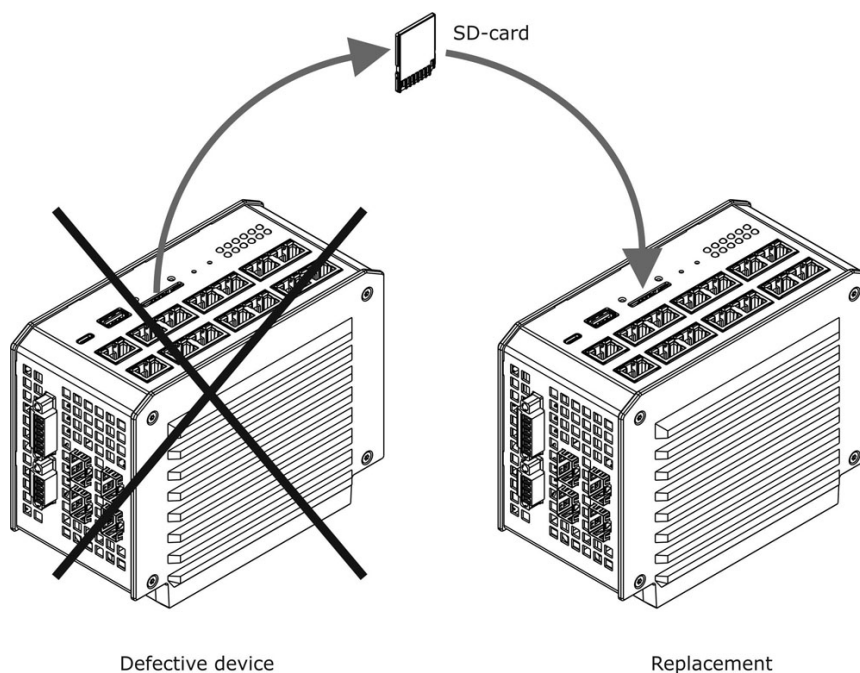
- All switches are configured for ring operation
- One switch is assigned as ring master
- Ring master cuts the ring logically

Ring Error

- Switches signalize segment failure via Ethernet (fiber-uplink)
- Master gets that information via Ethernet and closes the logical cut
- Switches re-learn the current network topology (MAC-addresses)
- Network function is re-established



Memory Card



SD Memory Card

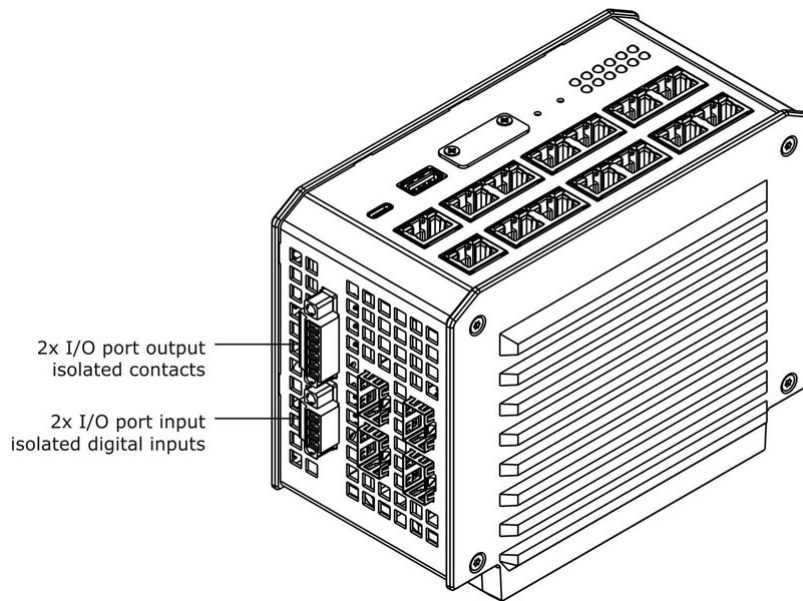
The included SD memory card is used for the permanent storage of configuration, script and firmware files. With this memory card it is possible to transfer a configuration to a new device in case of a device failure.

Optionally it is possible to write an own MAC address to the SD memory card. This one has priority compared to the MAC address in the switch.

This allows to provide an exact clone of the device by swapping the memory card.

- Change of memory card transfers the complete device status
- Fault tolerant journaling file system
- Industrial grade-long term stability
- Only MICROSENS memory cards have to be used. Only with these the long term stability over the complete temperature range can be ensured.

Alarm Contacts



Galvanic Isolated Contacts (2x)

The potential free output contacts (I/O out) allow to control external signalling devices to show the alarm and operation status.

- Relay contact, maximum load 57 V/1 A
- Isolation voltage to the device 1500 VDC
- Normally open (NO) and normally closed (NC) contact possible
- The signal status is indicated by an LED


ATTENTION: Not suitable for the direct connection of 230 VAC devices!

Galvanic Isolated Digital Inputs (2x)

The potential free input contacts (I/O in) allow the direct monitoring of external systems, e.g. a rack or door monitoring system.

- 2x galvanic isolated, digital input
- Internal optocoupler, Input voltages greater than 12 VDC require a serial resistor. Valid Voltage ranges:
 - 0 - 12 VDC: no serial resistor
 - up to 15 VDC: 300 Ω
 - up to 24 VDC: 1.2 k Ω
 - up to 36 VDC: 2.4 k Ω
 - up to 48 VDC: 3.6 k Ω
 - up to 57 VDC: 4,7 k Ω
- Isolation voltage 1500 VDC
- Status monitored via management


Ordering Information

	Description	Art.-No.
	16-Port 10G Industrial Switch Multigigabit PoE+/++ managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C) 4x 1/10GBase-X SFP+-Slots, thereof 2x 1/2.5/5/10GBase-T Combo PoE++, 12x 10/100/1000T PoE+, 2x DC Input 24..57VDC, redundant, max. 500W	MS652819PMX

Accessories

	Console Cable for Switches w. USB-C connector USB-C female to USB-A male, 2,0m	MS190412-02,0
	Power Supply Modules	
	Industrial DIN-Rail PoE+ Power Supply 54VDC / 65W Input 85...264VAC, Output 48..56VDC, -30..+70°C	MS700475
	Industrial DIN-Rail PoE+ Power Supply 54VDC / 150W Input 85...264VAC, Output 48..56VDC, -30..+70°C	MS700476
	Industrial DIN-Rail PoE+ Power Supply 54VDC / 240W Input 85...264VAC, Output 48..56VDC, -30..+70°C	MS700477
	Industrial DIN-Rail PoE+ Power Supply 54VDC / 480W Input 85...264VAC, Output 48..56VDC, -30..+70°C	MS700479
	Industrial DIN-Rail PoE+ Power Supply 24VDC / 65W Input 85...264VAC, Output 24..28VDC, -30..+70°C	MS700441
	SFP Transceiver	
	LPC SFP+ 10G Transceiver SR Multimode 850nm, DDM, LC duplex, -40..+85°C	MS100700DX-V2
	LPC SFP+ 10G Transceiver LR SingleMode 1310nm, 10km, DDM, LC duplex, -40..+85°C	MS100702DX-V2
	LPC SFP+ 10G Transceiver LR SingleMode TX 1270nm, RX 1330nm, 10km, DDM, LC simplex, -40..+85°C	MS100702DXA-V2
	LPC SFP+ 10G Transceiver LR SingleMode TX 1330nm, RX 1270nm, 10km, DDM, LC simplex, -40..+85°C	MS100702DXB-V2

Accessories (continued)

Software for Management and Configuration of Networks		
	NMP Web+ Enterprise Base Installation, 1 x usage right for NMP Web+ Enterprise, incl. download and installation of updates, installation of server SW on max. 1 computer, electronic user manual included (.pdf)	MS200500
	NMP Web+ Professional Base Installation, 1 x usage right for NMP Web+ Professional, incl. download and installation of updates, installation of server SW on local computer, electronic user manual included (.pdf)	MS200501
	One year device license grants the right to administrate a MICROSENS device via NMP Web+ for one year	MS200509-01
	Two year device license grants the right to administrate a MICROSENS device via NMP Web+ for two years	MS200509-02
	Additional Software-Variants Additional variants of the device licenses are listed in the data sheet for NMP Web+; please refer to www.microsens.de	

Services

Description	Art.-No.
Warranty Extension following the 24-Month Manufacturer Warranty	
1 year warranty extension	MSGV01
2 year warranty extension	MSGV02
3 year warranty extension	MSGV03
Custom-made Pre-configuration	
Custom-made pre-configuration of a component	MSKonfig
Custom-made pre-configuration (configuration file already available)	MSKonfig-OK
Manufacturer Warranty is defined in General Terms and Conditions of Sale (§10) of MICROSENS GmbH & Co. KG	

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[1] Will be available soon