Data Sheet

Profi Line X

Industrial Switch with 10G SFP+ Uplinks and Encrypted Ring (MACsec) support

Made in Germany

MACsec (IEEE 802.1AE)

GCM-AES encrypted 10G LAN communication

10G uplinks (IEEE 802.3ae)

2 x 1/10G uplink ports with SFP+

Network ring redundancy

Feature set for fail-safe redundancy topologies

IT security

Feature set for high level of IT security

Extended operating temperature range

Ambient temperature range -40°..+75°C

Industrial fanless design

Easy to maintain, no noise emission for use in the workstation area

MICROSENS NMP integrated*

Integrated with MICROSENS NMP software for clear administration and easy group configurations

Specifications

Gigabit Ethernet Switch

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

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

Network Management

- Support of common management standards
- High Performance ARM 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)
- Supported by central management software MICROSENS NMP (optional)
- 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

Device Power Supply

- Via external DC-Power Supply Unit(s) (typ. 57 VDC, 2 redundant inputs)
- Alternative supply over the network via PoE+ PD (up to 25 W)
  - External DC-Power input has priority
  - The PoE+ PD supply will be used after failure of both DC- inputs; The device will reboot when switching the supply types

Connectors

Up-/Downlinks

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

Local Ports

- 7x 10/100/1000Base-T (RJ-45) Auto-Negotiation
- Auto MDI/MDI-X function for the use of uniform patch cables

Power Supply Inputs

- 2x 3-pin screw pluggable connector for solid or stranded wires
- RJ-45 (network port 1/1, PoE PD)

RS-232 Console Port

- Serial terminal port for CLI access (outband management)
- RJ-45 connector

USB Extension Port

- For optional accessories

Alarm Contacts / I/O-Ports

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

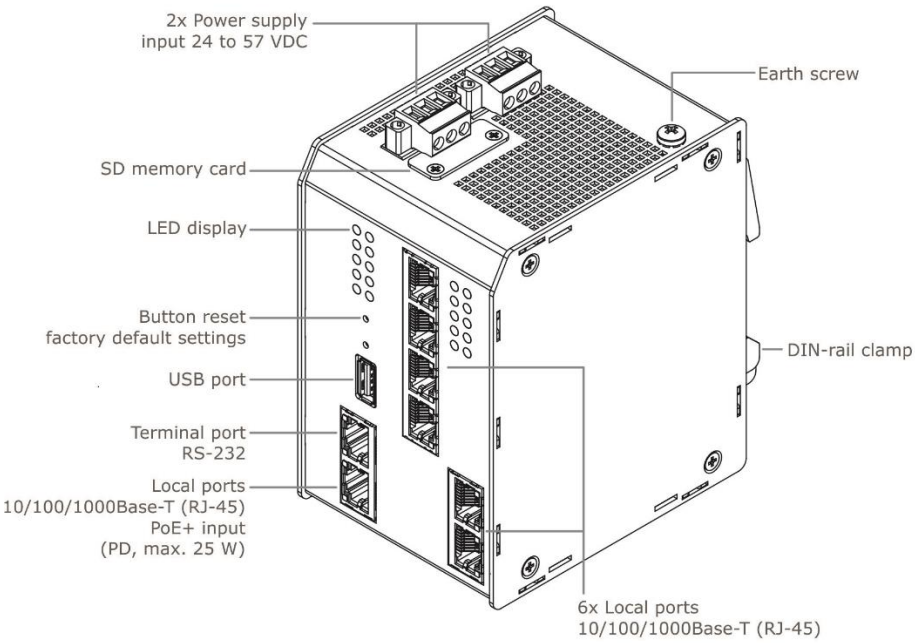
Mounting

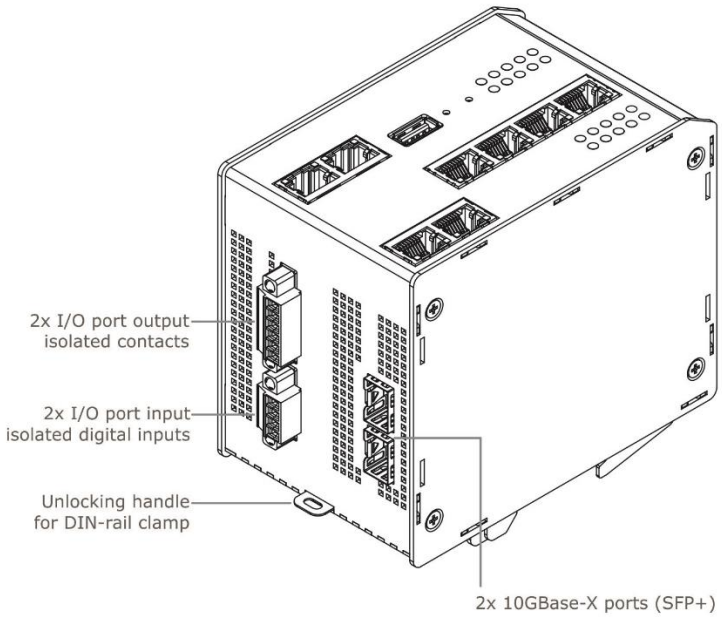
- Integrated holder for DIN-rails (DIN EN 50022)

Feature overview network management

For the latest functional firmware features and supported IEEE / RFC standards, please refer to the document "Firmware Features G6" which can be downloaded from the download center of the particular device home pages at www.microsens.de

Interfaces





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

Fiber Ports (SFP/SFP+ slots)

Number, position	2, housing bottom
Type	1/10 Gigabit Ethernet Dual Speed SFP/SFP+ 1G/10GBase-X, support of SFP digital diagnostics function
Connector	LC (SFP/SFP+ transceiver)
SFP/SFP+	SX Multimode (850nm)/LX Single mode (1310nm) SFP (1.25GbE) or SR Multimode (850nm)/LR Single mode (1310nm) SFP+ (10.31Gbps)
Flow control	Pause Frames (IEEE 802.3x), configurable
Encryption (MACsec)	IEEE 802.1AE with AES-128/AES-256

Twisted-Pair Ports

Number, position	7, front panel
Type	Gigabit Ethernet, Triple Speed 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	1, Powered Device (PD) IEEE 802.3at, max. 25W

Control Panel

Reset button	Reset of the switch, reload of the latest stored configuration (direct hardware function)
Factory button	IP configuration request for management, Restoring the configuration to factory default settings

LED displays

Number	Device Ports	10 LEDs 2 LEDs per TP port 5 LEDs per SFP/SFP+ port
LED-modes	*Dynamic* *Static* *Quiet* *Dark* *L-show*	Standard-mode Standard without flash Only ON- and Sys-LED all LEDs off permanent LED test

Device LEDs

Power 1/2	*green* *yellow*	Power supply 1/2 o.k. Input voltage too low/missing
System 1/2	*active* *off*	System activities (Firmware-Update) Normal operation
Ring 1/2	*green* *yellow* *red* *off*	Ring 1/2 normal Ring backup active Ring backup failure Ring deactivated
Signal in, out 1/2	*green* *red* *off*	activated, no signal S1/S2 activated, alarm inactive

SFP/SFP+ Port LEDs

Ok	*Green* normal	Always on when operation
10G	*green* *off*	Link port is running at 10G Link port is running at lower speed
Enc	*green* *off*	Port encryption is active Port encryption is inactive
Lnk	*green* *off*	SFP Link is up SFP Link is inactive
Sys		reserved

TP port LEDs (integrated in RJ-45)

Ethernet	*green* yellow *red* *off*	Link at port, flashing at data traffic Port blocked (via protocol) Port Access Control rejected no link

Technical Specifications (continued)

Power Supply

DC-Input	24..57 VDC (54 VDC typ.)
Connector(s)	2x 3 pin screw connector
Over the network	PoE+ PD (max. 25 W), (alternatively to DC-Input)
Connector	RJ-45, local Port 1/1 (RJ-45)
Power consumption	Typical: 12 W minimum: 9 W maximum: 25 W

Standards

CE	2014/30/EU (EMC Directive) 2011/65/EU (RoHS Directive)
Safety	EN 62368-1
Emitted interference	EN 61000-6-3 EN 55032
Electromagnetic compatibility	EN 61000-6-2 EN 55024

Environmental Conditions

Temperature	Operation Storage	-40..+75 °C -40..+85 °C
Humidity	10..90%, non condensing	
MTBF	400,000 h	

Mechanical

Dimensions	120.5 mm x 77.7 mm x 100.5 mm (L x B x H, without connectors)
Weight	Approx. 1120g (without SFPs)
Protection Class	IP 30

Delivery / Contents

Package unit	1 pcs., *Standard Packaging*
Contents	1x PLX-Switch 1x SD memory card (inserted) 2x power supply connector 2x I/O connector 1x Quick Start Guide

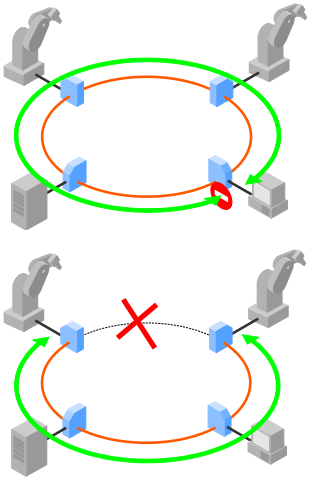
Ring-Topology

Normal operation

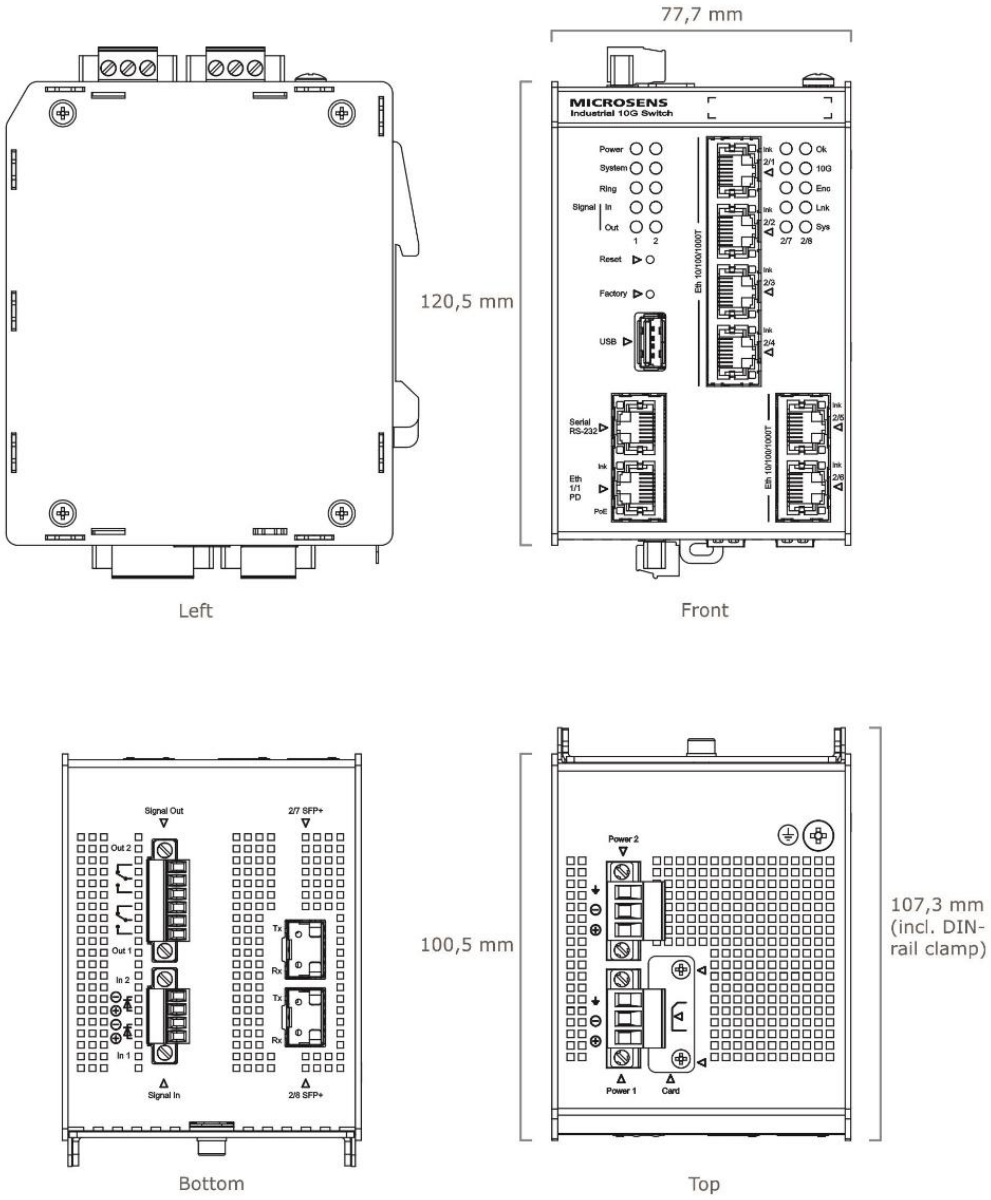
- All switches are configured for ring operation
- One switch is assigned as ring master
- Ring master cuts the ring logically

Ring error

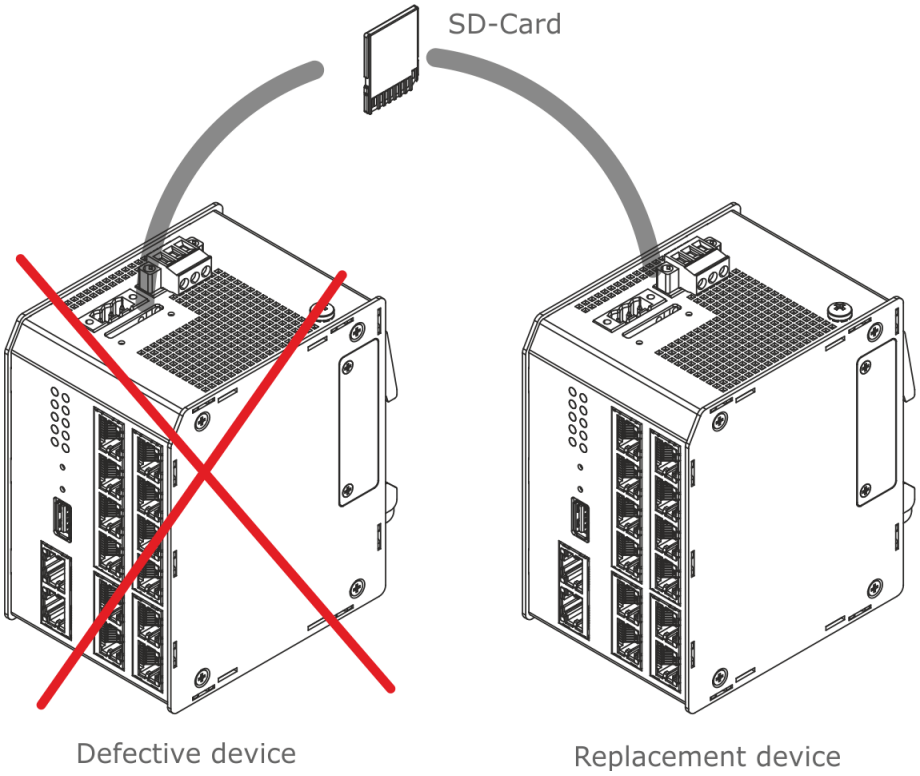
- Switches signalize segment failure via Ethernet (fiber-uplink)
- Master gets that information via Ethernet and closes the logical cut
- Switches re-learn the current network topology (MAC-addresses)
- Network function is re-established in less than 50 ms



Dimensions


77,7 mm
120,5 mm
MICROSENS
Industrial 10G Switch
Power
System
Ring
Signal
In
Out
Reset
Factory
USB
Serial RS-232
Eth 1/1 PD
PoE
Ok
10G
Enc
Lnk
Sys
Left
Front
Signal Out
2/7 SFP+
Out 2
Out 1
In 2
In 1
Tx
Rx
Signal In
2/8 SFP+
100,5 mm
Power 2
Power 1
Card
107,3 mm
(incl. DIN-
rail clamp)
Bottom
Top

Memory Card



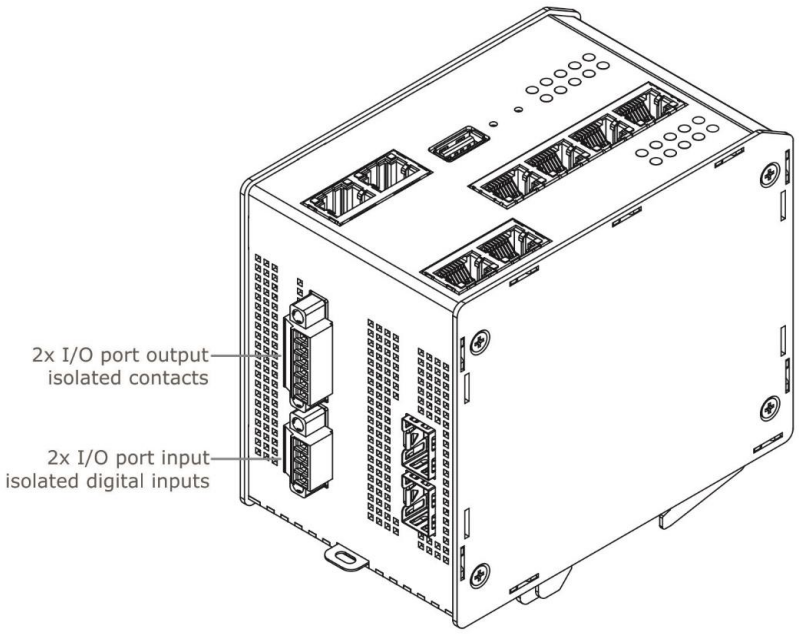
SD Memory Card

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 configuration on 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 configuration
- Fault tolerant journaling file system
- Industrial grade-long term stability
- Only MICROSENS memory cards have to be used. Only with these the wide temperature range can be ensured.

Alarm Contacts



Galvanic isolated ouput contacts (2x)

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

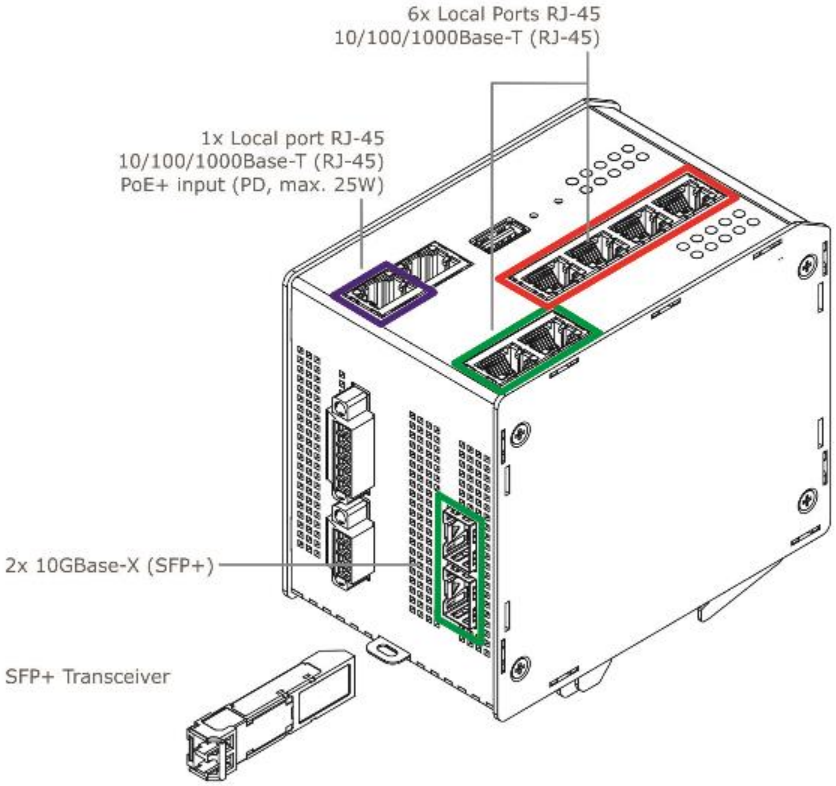
- Relay contact, maximum load 57 VAC or DC / 1A
- Isolation voltage to the device 1500 VDC
- Normally open (NO) and normally closed (NC) contact possible
- The signal status is indicated by an LED
- Attention: Not suitable for the direct connection of 230 VAC devices!

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 kΩ
  - up to 36 VDC: 2.4 kΩ
  - up to 48 VDC: 3.6 kΩ
  - up to 57 VDC: 4,7 kΩ
- Isolation voltage 1500 VDC
- Status monitored via management

Gigabit Ethernet Ports



2x SFP/SFP+ Ports

These ports are to be used with fiber cables. For the use of a fiber cable a suitable SFP/SFP+ transceiver must be plugged into the switch.

1x Local Port, PoE PD (RJ-45)

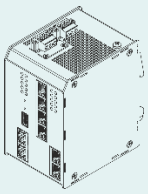
This 1GBE network port offers a PoE+ PD powered device supply input. Via this port the switch can be supplied with up to 25 W of electrical power.

Gigabit Ethernet Ports (RJ-45)

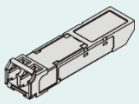
7 Gigabit Ethernet ports are made for the connection of 10, 100 or 1000 Mbps segments via twisted pair cables with RJ-45 connectors.

The integrated auto negotiation and auto crossover functions automatically ensure the technically preferred connection method to the end devices.

Order Information

	Description	Article No.:
	**Profi Line X Switch**	
	9 Port Industrial Switch with 10G SFP+-Uplinks 2x 10GBase-X (SFP+) Uplink, 6x 10/100/1000Base-T Downlink, 1x10/100/1000Base-T (PoE+ PD), DIN-Rail, 2x 24..57VDC, managed, USB, SD-Card incl., 2x I/O, RS-232 Port (RJ-45)	**MS652615M**

Accessories

	Description	Article No.:
	**Additional Memory Cards for Profi Line X Switch**	
	SD memory card for MICROSENS PLM-Switches, Extended temperature range -25°C up to +85°C	**MS140890X-4GB**
	**SFP+ Transceiver (10G)**	
	SFP+ Transceiver Ruggedized 10GB, 850nm 5.1dB, 300m, STM64, Multimode, LC, -40..+85°C	**MS100700DX**
	SFP+ Transceiver Ruggedized 10GB, 1310nm 8.4dB, 10km, STM64, Single Mode, LC, -40..+85°C	**MS100702DX**
	SFP Transceiver	
	SFP Gigabit Ethernet Transceiver 1.25GB, 850nm VCSEL, Multimode, LC, diagnostic, -40..85°C	**MS100200DX**
	SFP Gigabit Ethernet Transceiver 1.25GB, 1310nm Single Mode, LC, diagnostic, -40-85°C	**MS100210DX**
 (Model: MS700456)	**External power supplies for industrial devices 24 VDC**	
	DIN Rail Power Supply 24 Watt 24 VDC / 1.0 A, Wide input range 85..264 VAC, 85…375 VDC	**MS700420**
	External power supplies for industrial devices providing PoE / PoE+ 44..57VDC	
	DIN Rail Power Supply 60 Watt 48 VDC / 1.25 A, Adjustment range 48..56VDC, input range 85..264 VAC	**MS700430**
	DIN Rail Power Supply, 45..55 VDC / 2.5 A (120W), Wide input range 90..132/180..264 VAC Operating temperature range -35..+70°C	**MS700456**
	DIN Rail Power Supply 47..56 VDC / 5 A (240W) Wide input range 90..132/180..264 VAC **For extended temperature range -40..+70°C**	**MS700457**
NMP Enterprise	**NMP 2.x Network Management Software***	
	NMP 2.x Enterprise, SW usage right for 200 Managed Objects, 1 year download of updates, installation of server SW on max. 1 computer	**MS200100**
	NMP 2.x Enterprise SW usage right for 1000 Manage Objects, 1 year download of updates, installation of server SW on max. 1 computer	**MS200102**

* Please refer to the separate data sheet to obtain detailed information on the listed variants.

Service

Description	Article 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.