

Data Sheet

Profi Line X

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



 Made
 in
 Germany

Overview

The Profi Line X switches from MICROSENS offer maximum performance and flexibility in compact design. Robust and designed for greatest reliability and shortest recovery times, the Profi Line X series has become the first-choice solution for Industrial applications with high security standard. The hardware of the Profi Line X series is designed for future functions which are easy to activate by applying firmware upgrades. This is facilitated through high-performance switching chipsets in combination with a powerful ARM processor. As an established, stable operating system, Linux offers a solid foundation for an intelligent, open and long-term reliable platform.

Highlights

- Highest performance with up to 10 G in smallest dimensions
- MACsec based ring encryption (IEEE 802.1AE with AES128/AES256 encryption method)
- Industrial design for maximum reliability in harsh environments
- Optimised architecture for increased performance with ring topology
- Range of ambient operation temperature from -40 up to +75 °C
- Exchangeable SD-card for firmware and configuration included
- Flexible firmware architecture for simple software upgrades
- Redundant power inputs
- PoE Powered device (PD)

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 1000 MHz 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)
- 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

Compatibility

- Verified to standard CISCO Switches (IEEE 802.1X, QoS, VLAN, CDP, RSTP)

Mounting

- Integrated holder for DIN-rails

Power-over-Ethernet PoE/PoE+

- 1x 10/100/1000Base-T, PoE+ (PD, max. 25 W)

Connectors (Base-Switch)

Up-/Downlinks (Dual Media-Ports)

- 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

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

RS-232 Console Port

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

USB Extension Port

- For optional accessories

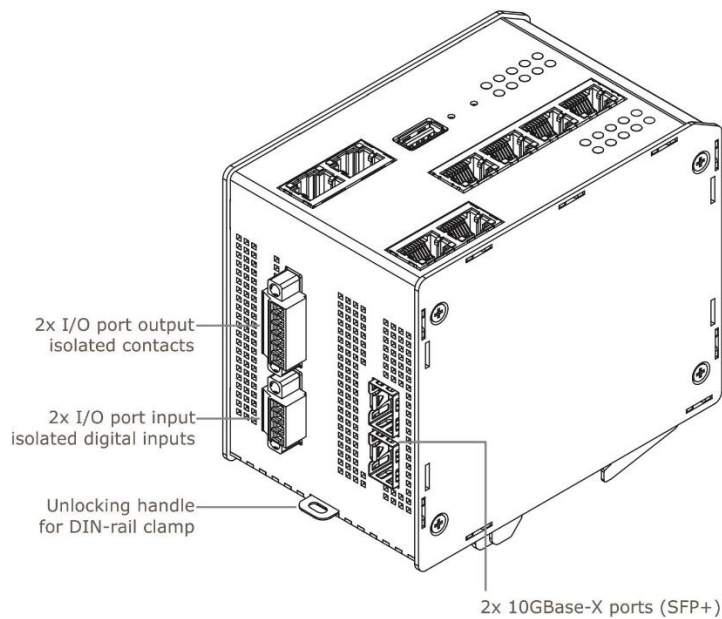
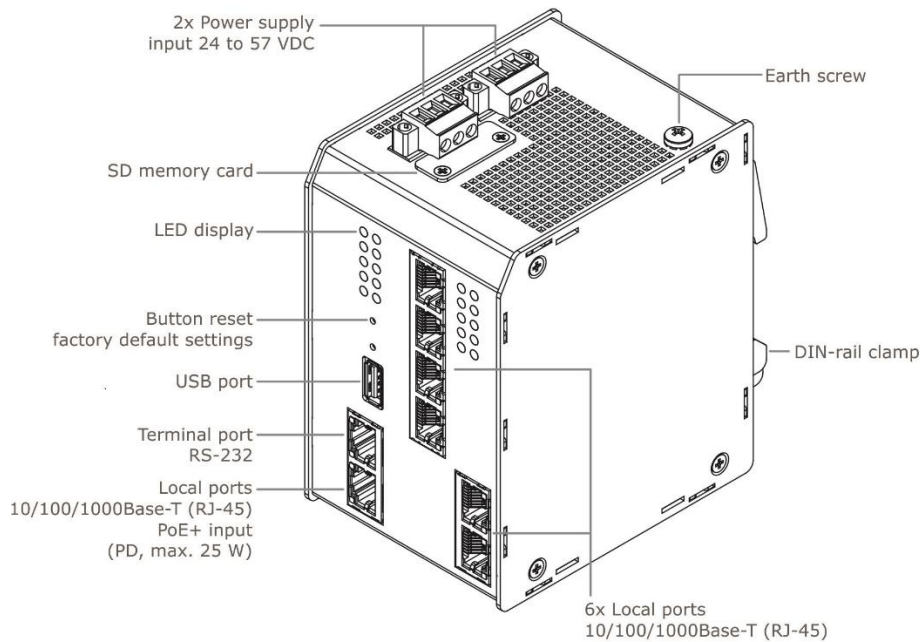
Alarm Contacts / I/O-Ports

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

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

Twisted-Pair Ports

Number	7
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

Fiber Ports (SFP+ slots)

Number	2
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 Singlemode(1310nm) SFP (1.25GbE) or SR Multimode(850nm)/LR Singlemode(1310nm) SFP+ (10.31Gbps)
Flow Control	Pause Frames (IEEE 802.3x), configurable

Control Panel

Reset button	Reset of the switch, new upload of the latest stored configuration (direct hardware function)
Factory button	Request of the IP configuration for management, reset back to factory default settings

LED displays

Number	Device 20 LEDs Port 2 LEDs per port
LED-modes	<i>Dynamic</i> Standard-mode <i>Static</i> Standard without flash <i>Quiet</i> Only ON- and Sys-LED <i>Dark</i> all LEDs off <i>L-show</i> permanent LED test

Port LEDs (integrated in RJ-45)

Ethernet	<i>green</i> Link at port <i>yellow</i> Flashing at data traffic Port blocked (via protocol) <i>red</i> Port Access Control rejected <i>off</i> no link
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Device LEDs

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)
System 1/2	<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, out 1/2	<i>green</i> activated, no signal <i>red</i> S1/S2 activated, alarm <i>off</i> inactive
Ok	<i>green</i> Always on when normal operation
10G	<i>green</i> Link port is running at 10G <i>off</i> Link port is running at lower speed
Enc	<i>green</i> Port encryption is active <i>off</i> Port encryption is inactive
Lnk	<i>green</i> SFP Link is up <i>off</i> SFP Link is inactive
Sys	reserved

Technical Specifications (continued)

Power Supply

Input	24..57 VDC (54 VDC typ.) min. 44 VDC for PoE operation
Power Consumption	Typical: 12 W, minimum: 9 W, maximum: 25 W
Connectors	2x 3 pin screw connector

Mechanical (Base Unit)

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

Environmental Conditions

Temperature	Operation	-40..+75 °C
	Storage	-40..+85 °C
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
Emitted interference	EN 61000-6-3 EN 55032
Electromagnetic Compatibility	EN 61000-6-2 EN 55024

Delivery / Contents

Standard Packaging

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

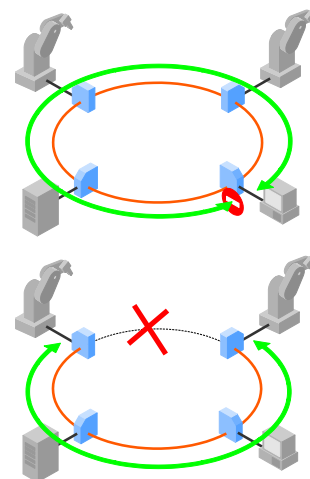
Ring-Topology

Normal operation

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

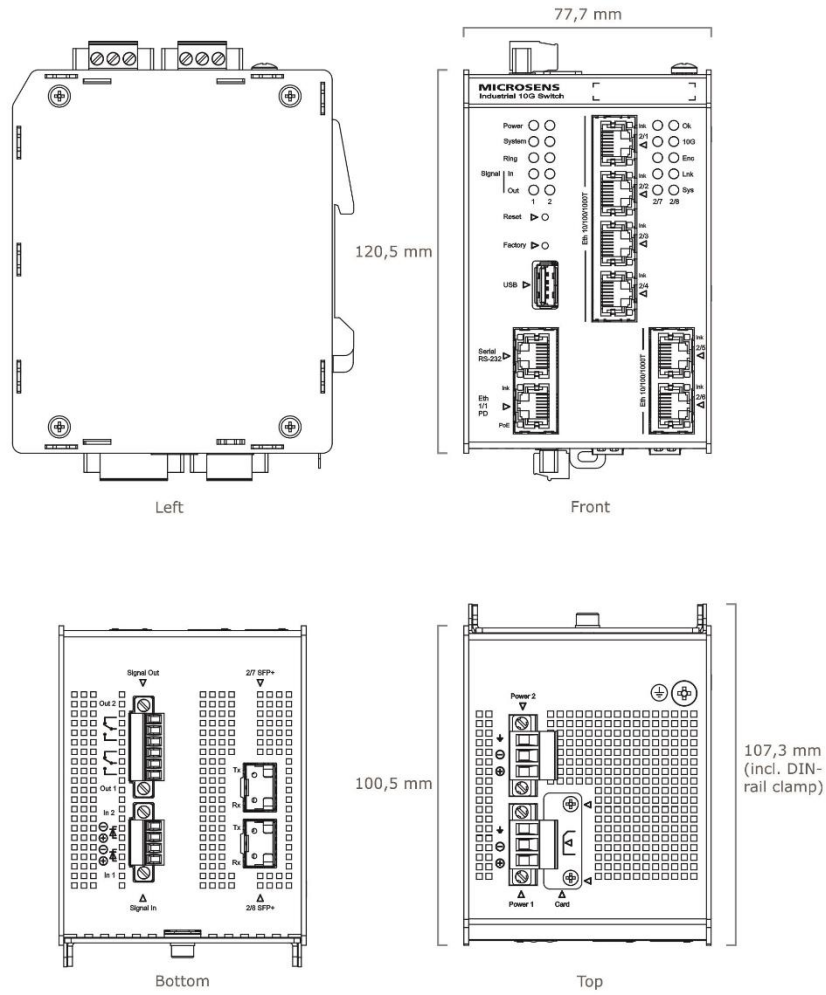
Ring error

- 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

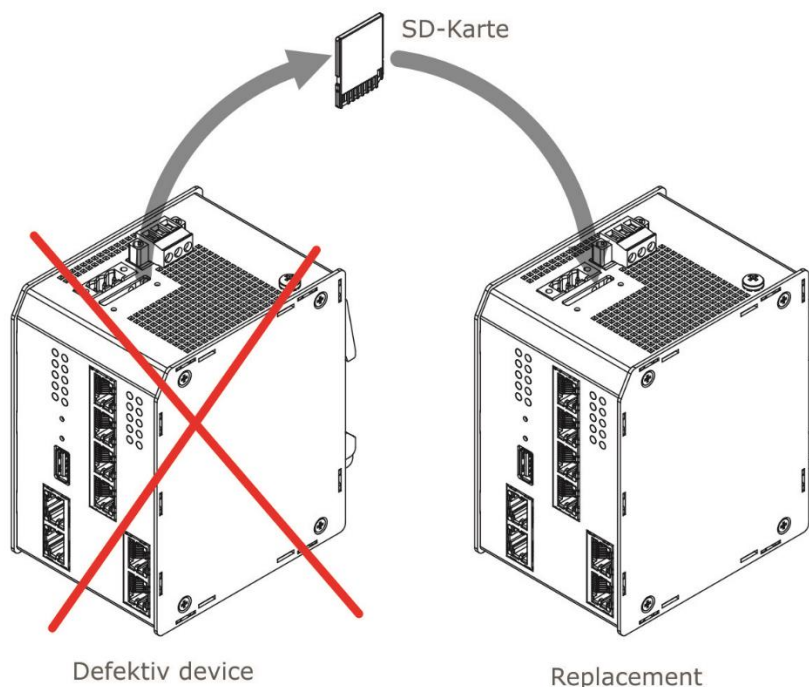


Dimensions

MS652615PM



Memory Card



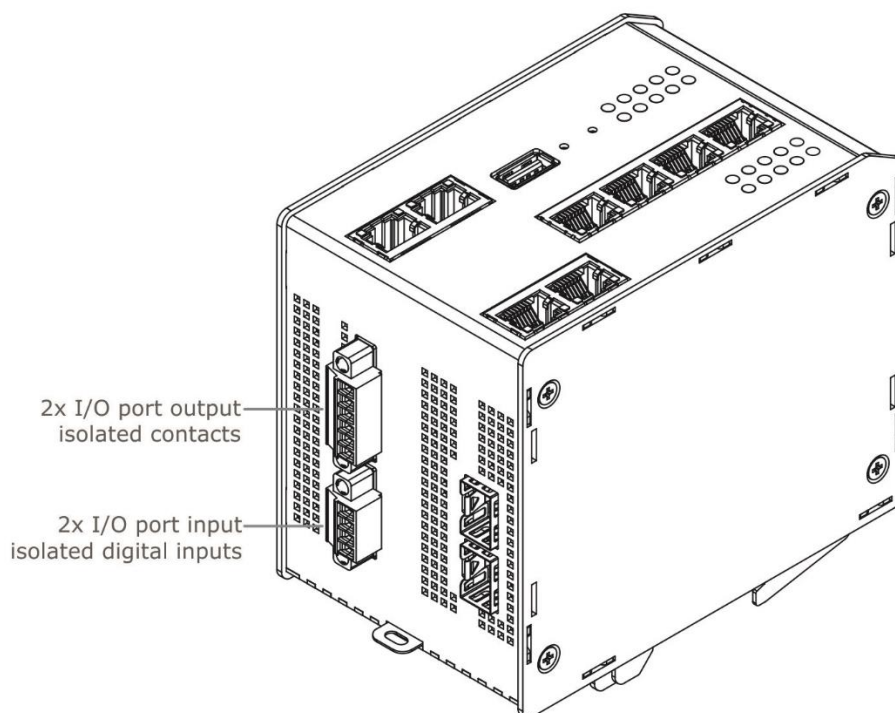
SD Memory Card

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!

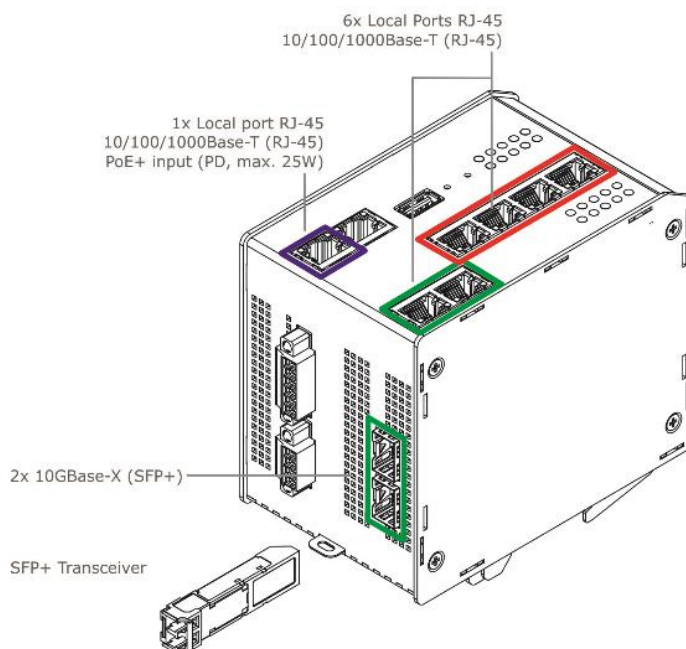
Galvanic isolated digital inputs (2x)

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

Gigabit Ethernet Ports

MS652159PM:



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.

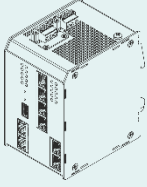
1x Local Port, PD (RJ-45)

This port includes a PoE+ powered device (PD) input. Via this port the switch can be supplied with electrical power.


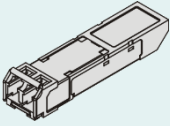
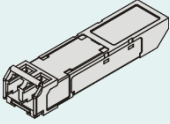
2x SFP/SFP+ Ports

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




Order Information

	Description	Article No.:
	Profi Line X Switch	
	9 Port Industrial Switch with 10G SFP+-Uplinks 2x 10GBase-X SFP+-Slot for Encrypted Ring (MacSec), 2x 10GBase-X (SFP+) Uplink, 6x 10/100/1000Base-T, 1x 10/100/1000Base-T (PoE+ PD), DIN-Rail, 2x 24..57VDC, managed, USB, SD-Card incl., 2x I/O, RS-232 Port (RJ-45)	MS652615PM

Accessories

	Description	Article No.:
	Additional Memory Cards for Profi Line Modular Base Switch	
	SD memory card for MICROSENS PLM-Switches, Extended temperature range -25°C up to +85°C	MS140890X-4GB
	SFP Transceiver (Fast Ethernet & WDM on request)	
	SFP Transceiver, Gigabit Ethernet, Digital Diagnostic 850 nm Multimode, 1000Base-SX, LC duplex Extended temperature range -25°C up to +85°C	MS100200DX
	SFP Transceiver, Gigabit Ethernet, Digital Diagnostic 1310 nm Monomode, 1000Base-LX, LC duplex Extended temperature range -25°C up to +85°C	MS100210DX
	SFP+ Transceiver (10G)	
	SFP+ 10G Transceiver SR Multimode 850nm, DDM, LC, 10.31Gbps, MMF, 300m, LC, -40~85° C, DDMI	MS100700DX
	SFP+ 10G Transceiver LR SingleMode 1310nm, 10km, DDM, LC, -40..+85°C, 10.31Gbps, SMF, 10 km, LC, - 40~85° C, DDMI	MS100702DX

Accessories (continued)

 	NMP 2.x Network Management***	
	NMP 2.x Enterprise Basic package incl. 1 x usage right for NMP Enterprise, 200 x usage rights f. NMP Enterprise Managed Objects, and SW Maintenance for 1 year (download of updates), installation of server SW on max. 1 computer, electronic user manual included	MS200100
	NMP 2.x Enterprise Basic package incl. 1 x usage right for NMP Enterprise, 1000 x usage rights f. NMP Enterprise Managed Objects, and SW Maintenance for 1 year (download of updates), installation of server SW on max. 1 computer, electronic user manual included	MS200102
 (Model: MS700456)	External Power Supplies for industrial use 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 use with PoE / PoE+ 44..57VDC	
	DIN Rail Power Supply 60 Watt 48 VDC / 1.25 A, Adjustment range 48..56VDC Wide 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	

Service

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 \(§9\)](#) of MICROSENS GmbH & Co. KG.

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

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