Data Sheet (preliminary)
Profi Line 10G
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

1/2.5/5G Downlink (IEEE 802.3bz)
Multi Gigabit port optimised for camera and Wi-Fi 6 network operation

PoE++ PSE Local Port (IEEE 802.3bt)
PoE++ up to 480W power budget (2x Ports up to 90W)

IT Security
MICROSENS SECURE feature set for a high level of IT security

Fanless Design
No noise emission at the workplace

Docker Virtualization Environment
Integrated Docker system for free programming of custom functions

Standardised Network Redundancy (ERPS nach G.8032v2)
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 (outband 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

Network Management

- Support of common management standards
- Dual 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)
- Docker virtualization environment as platform for custom automation

Mounting

- Integrated holder for DIN-rails (EN 50222)

Technical Specifications

Switch

Type	Gigabit Ethernet Switch, IEEE 802.3 compliant
Performance	Store-and-forward Full wire-speed, non-blocking on all ports
Jumbo Frames	max. 10,240 Bytes

Gigabit /PoE+ Ports

- 12x 10/100/1000Base-T, PoE+
- RJ-45 shielded connector
- PoE+ PSE power sourcing max. 30W at each port (IEEE 802.3at)
- PSE type 2, 2 pairs
- Speed selection via Auto-Negotiation
- Full power available under suitable installation conditions only
- Total device PoE Budget 480W

Multigig (Combo) /PoE++ Ports

- 2x 1/2.5/5/10G Base-T, PoE/PoE++ (PSE, max. 90 W)
- RJ-45 shielded connector
- PoE++ PSE power sourcing max. 90W at each port (IEEE 802.3bt)
- PSE type 4, 4 pairs
- Speed selection via Auto-Negotiation
- Full power available under suitable installation conditions only
- Total device PoE Budget 480W

Fiber Ports (SFP/SFP+ slots)

Number	2x SFP/SFP+ 2x Combo SFP/SFP+
Type	1/10 Gigabit Ethernet Dual Speed SFP/SFP+ 1/10GBase-X, support of SFP digital diagnostics function
Connector	Typ. LC (SFP/SFP+ transceiver)

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

LED displays

Number	*Device*	12 LEDs
	Port	2 LEDs per port
LED-modes	*Dynamic*	Standard-mode
	Static	Standard without flash
	Quiet	Only ON- and Sys-LED
	Dark	All LEDs off
	L-show	Permanent LED test
Port LEDs (integrated in RJ-45)		
Ethernet	*green*	Link at port Flashing at data traffic
	yellow	Port blocked (via protocol)
	red	Port Access Control rejected
	off	no link
PoE	*green*	PoE power active
	yellow	PoE not active
	red	PoE failure
	off	PoE deactivated
M (Media)	*SFP-Port*	(in use)
	green	Link at port Flashing at data traffic
	yellow	Port blocked (via protocol)
	red	Port Access Control rejected
	off	no link
Device LEDs (central)		
System 1	*active*	System activities (Firmware update)
	off	Normal operation
System 2	*of*	Normal operation
Power1/2	*green*	Power supply 1/2 ok
	yellow	Input voltage too low/missing
Ring 1/2	*green*	Ring 1/2 normal
	yellow	Ring backup active
	red	Ring backup failure
	off	Ring deactivated
Signal in 1/2	*green*	activated, no signal
	red	S1/S2 activated, alarm
	off	inactive
Signal out 1/2	*green*	activated, no signal
	red	S1/S2 activated, alarm
	off	inactive

Technical Specifications (continued)

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

Environmental Conditions

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

Mechanical

Dimensions	128 mm x 88 mm x 160 mm (L x B x H, without connectors)
Weight	Approx. 1660g (without SFPs)
Protection Class	IP 30

Standards

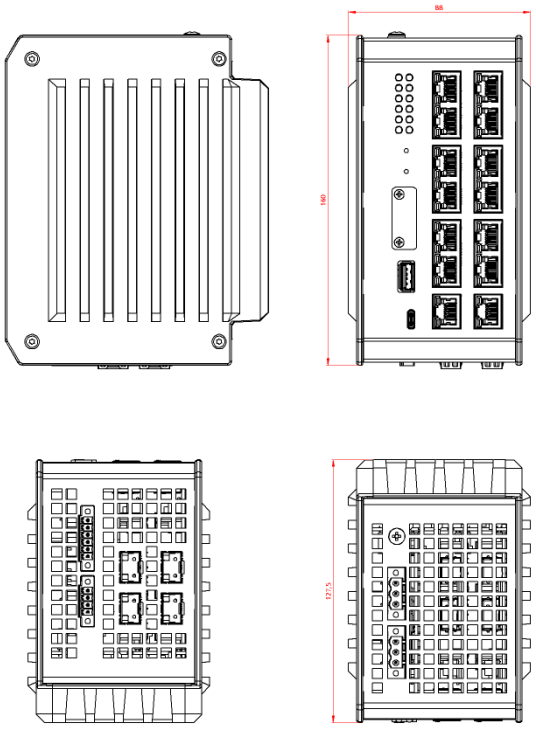
CE	2014/30/EU (EMC Directive) 2011/65/EU (RoHS Directive)
Safety	EN 62368-1:2020
Emitted interference	EN 61000-6-3:2020 EN 55032:2013
Electromagnetic Compatibility	EN 61000-6-2:2016 EN 55024:2015

Delivery / Contents

Standard Packaging

Package unit	1 pcs.
Contents	1x Profi Line 10G-Switch 2x power supply connector 2x I/O connector 1x Quick Start Guide

Dimensions



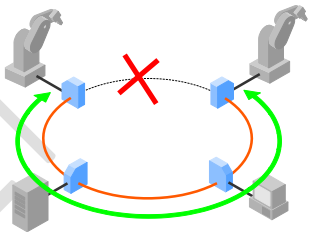
Ring-Topology

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.

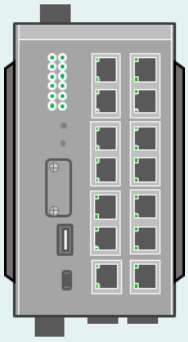
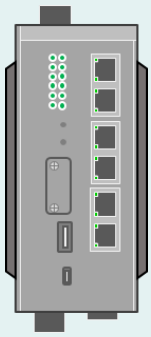
- Relay contact, maximum load 57 V/1 A
- Isolation voltage to the device 1500 VDC
- Normally open (NO) and normally closed (NC) contact possible
- The signal status is indicated by an LED
- Attention: Not suitable for the direct connection of 230 VAC devices!

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 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

Order Information

	Description	Article No.:
	16-Port 10G Industrial Switch Multigigabit PoE+/++ 4x 1/10GBase-X SFP+-Slots, thereof 2x 1/2.5/5/10GBase-T Combo PoE++, 12x 10/100/1000T PoE+, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652819PMX**
	16-Port 10G Industrial Switch Multigigabit PoE++ 4x 1/10GBase-X SFP+-Slots, thereof 2x 1/2.5/5/10GBase-T Combo PoE++, 12x 10/100/1000T, thereof 6x PoE++, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652829PMX**
	16-Port 10G Industrial Switch PoE+ 4x 1/10GBase-X SFP+-Slots, 12x 10/100/1000T PoE+, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652719PMX**
	16-Port 10G Industrial Switch PoE++ 4x 1/10GBase-X SFP+-Slots, 12x 10/100/1000T, thereof 6x PoE++, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652729PMX**
	16-Port 10G Industrial Switch 4x 1/10GBase-X SFP+-Slots, 12x 10/100/1000T, 2x 12..36VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652719MX**
	8-Port 10G Industrial Switch PoE++ 2x 1/10GBase-X SFP+-Slots, 6x 10/100/1000T PoE++, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C	**MS652619PMX**
	8-Port 10G Industrial Switch PoE++ 2x 1/10GBase-X SFP+-Slots, 6x 10/100/1000T, thereof 3x PoE++, 2x 24..57VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652629PMX**
	8-Port 10G Industrial Switch 2x 1/10GBase-X SFP+-Slots, 6x 10/100/1000T, 2x 12..36VDC, managed, DIN-Rail, USB-A, SD-Slot, 2x I/O, console port (USB-C)	**MS652619MX**

Accessories

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**
LPC SFP+ 10G Transceiver LR SingleMode TX 1330nm, RX 1270nm, 10km, DDM, LC simplex, -40..+85°C	**MS100702DXB-V2**

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	Article Number
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	