

Data Sheet

28-Port 10G L2/L3 Switch 19" PoE+



Layer3

Layer3 feature set for broad application diversity



10G uplinks (IEEE 802.3ae)

4 x 1/10G uplink ports in SFP/SFP+ version



PoE+ PSE Local Port (IEEE 802.3at)

PoE+ up to 740W power budget (up to 30W per port)



Stacking

With max. 4 switches in a stack



IT Security

Feature set for a high level of IT security



Standardised Network Redundancy (ERPS according to G.8032)

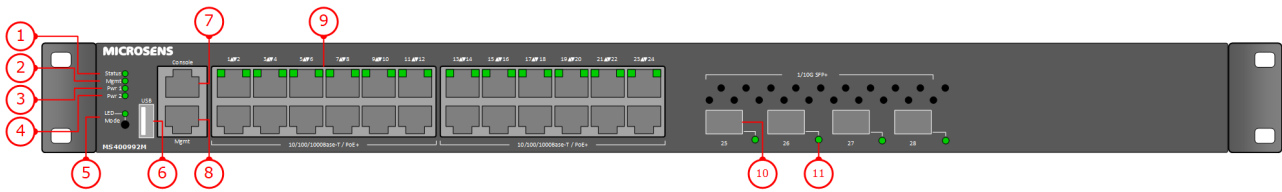
Feature set for special redundancy topologies



MICROSENS NMP integrated^[1]

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

Interfaces



1. System Status LED
2. Management Port LED
3. PWR1 Status LED
4. PWR2 Status LED
5. LED Mode Indicator and Button
6. USB A-Port
7. Console Port
8. Management Port
9. 10/100/1000Base-T Ethernet Ports
10. 10GBase-X SFP+ Ports
11. Port LED



1. Grounding Stud
2. Power Supply Module Slot 1 (A filler panel is required if the slot is vacant.)
3. Power Supply Module Slot 2 (A filler panel is required if the slot is vacant.)



The switch can operate with a single power supply. An additional power supply module can be optionally installed. The switch supports 1+1 power redundancy when the PoE power consumption is less than 370 W and both power supply modules are installed.

Utilizing a second power supply unit offers the advantage of significantly increasing the PoE+ power budget. In addition to providing redundancy, the second power supply also enhances the available power. With a single power supply module installed, the PoE power budget per port is 15W, whereas with two power supply modules, it increases to 30W.

RFC Standards

RFC 768	UDP	RFC 2439	BGP Route Flap Damping
RFC 783	TFTP Protocol (revision 2)	RFC 2460	IPv6
RFC 792	ICMP	RFC 2461	Neighbor Discovery for IPv6
RFC 793	TCP	RFC 2462	IPv6 Stateless Address Auto configuration
RFC 813	Window and Acknowledgement Strategy in TCP	RFC 2463	ICMPv6
RFC 815	IP datagram reassembly algorithms	RFC 2545	Use of BGP 4 Multiprotocol Extensions for IPv6 Inter Domain Routing
RFC 826	Ethernet ARP	RFC 2571	SNMP Management Frameworks
RFC 854	Telnet Protocol	RFC 2711	IPv6 Router Alert Option
RFC 959	FTP	RFC 2787	Definitions of Managed Objects for the Virtual Router Redundancy Protocol
RFC 1058	RIP	RFC 2863	The Interfaces Group MIB
RFC 1157	SNMP	RFC 2865	RADIUS
RFC 1305	NTPv3	RFC 2918	Route Refresh Capability for BGP4
RFC 1349	IP	RFC 2925	Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)
RFC 1350	TFTP (revision 2)	RFC 2934	Protocol Independent Multicast MIB for IPv4
RFC 1519	CIDR	RFC 3046	DHCP Option82
RFC 1583	OSPFv2	RFC 3065	Autonomous System Confederation for BGP
RFC 1591	Domain Name System Structure and Delegation	RFC 3101	OSPF Not so stubby area option
RFC 1643	Ethernet Interface MIB	RFC 3137	OSPF Stub Router Advertisement sFlow
RFC 1757	RMON	RFC 3417	(SNMP Transport Mappings)
RFC 1812	IPv4 Router Requirements	RFC 3418	MIB for SNMP
RFC 1901	Introduction to Community-based SNMPv2	RFC 3509	Alternative Implementations of OSPF Area Border Routers
RFC 1902-1907	SNMPv2	RFC 3513	IPv6 Addressing Architecture
RFC 1918	Address Allocation for Private Internet	RFC 3575	IANA Considerations for RADIUS
RFC 1981	Path MTU Discovery for IPv6	RFC 3579	RADIUS Support For EAP
RFC 1997	BGP Communities Attribute	RFC 3623	Graceful OSPF Restart
RFC 2131	DHCP		
RFC 2132	DHCP Options and BOOTP Vendor Extensions		
RFC 2236	IGMP		
RFC 2328	OSPFv2		
RFC 2385	Protection of BGP Sessions via the TCP MD5 Signature Option		

RFC Standards (continued)

RFC 3768	VRRP
RFC 3810	MLDv2 for IPv6
RFC 3973	PIM Dense Mode
RFC 4022	MIB for TCP
RFC 4271	BGP 4
RFC 4273	Definitions of Managed Objects for BGP 4
RFC 4360	BGP Extended Communities Attribute
RFC 4456	BGP Route Reflection: An Alternative to Full Mesh IBGP
RFC 4486	Subcodes for BGP Cease Notification Message
RFC 4552	Authentication/Confidentiality for OSPFv3
RFC 4724	Graceful Restart Mechanism for BGP
RFC 4750	OSPFv2 MIB partial support no SetMIB
RFC 4760	Multiprotocol Extensions for BGP 4
RFC 4940	IANA Considerations for OSPF
RFC 5065	Autonomous System Confederation for BGP
RFC 5187	OSPFv3 Graceful Restart
RFC 5340	OSPFv3 for IPv6
RFC 5492	Capabilities Advertisement with BGP 4
RFC 6620	FCFS SAVI

IEEE Standards

IEEE 802.2	Logical Link Control	IEEE 802.1Q	Bridged VLAN
IEEE 802.1ab	LLDP	IEEE 802.1s	MSTP
IEEE 802.1ad	Provider Bridges	IEEE 802.1w	RSTP
IEEE 802.1ax / IEEE802.3ad	Link Aggregation	IEEE 802.3ad	LACP
IEEE 802.1D	MAC Bridges	IEEE 802.3at	PoE enhancements (25.5 W)
IEEE 802.1D	STP	IEEE Std 802.3x	Full Duplex and flow control

Technical Specifications

Switch

Type	10G Ethernet L2/L3 Switch PoE+, IEEE 802.3 compliant
Performance	Store-and-forward
Switching Capacity	154 Gbps
Packet For- warding Rate	115 Mpps
Packet Buffer	3 MB
MAC Addresses	32 k, automatic learning and aging
Jumbo Frames	max. 9,216 Bytes

Mechanical

Dimensions (in mm)	442 x 420 x 43.6 (W x D x H, without connectors)
Weight	4.3 kg
Mounting	19" Rack, 1U

Standards

CE	2014/30/EU (EMC Directive) 2014/35/EU (Low Voltage Directive) (EU) 2015/863 amending Annex II to 2011/65/EU (RoHS Directive)
Safety	EN 62368-1:2014+A11:2017
Emitted Interference	EN 55032:2015+A1:2020
Immunity	EN 55035:2017+A11:2020
Ethernet	IEEE 802.3 IEEE 802.3ab (1000Base-T) IEEE 802.3z (1000Base-X) IEEE 802.3ae (10GBase-X) IEEE 802.3ad (LACP) IEEE 802.3x (flow control) IEEE 802.3af/at (PoE/PoE+)

Environmental Condition

Temperature	Operation: 0..+45 °C Storage: -40..+70 °C
Humidity	10..90%, non condensing

Twisted-Pair Ports

Number	24x 10/100/1000Base-T Ports
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	Power Sourcing Equipment (PSE) IEEE 802.3af/at Class 0-4, max. 15 W / 30 W
Total PoE Budget	370 W (when 1 power supply module is installed) 740 W (when 2 power supply mod- ules are installed)
PoE Lines	1/2 (+), 3/6 (-)

Fiber Ports (SFP+ slots)

Number	4x 1/10GBase-X SFP+ slots
Type	1/10GBase-X SFP+ slot, support of SFP digital diagnostics function
Connector	LC (SFP+ transceiver, not included in the scope of delivery)
Flow Control	Pause Frames (IEEE 802.3x), configurable

CLI Console

Number	1
Type	RS-232
Connector	RJ-45 port

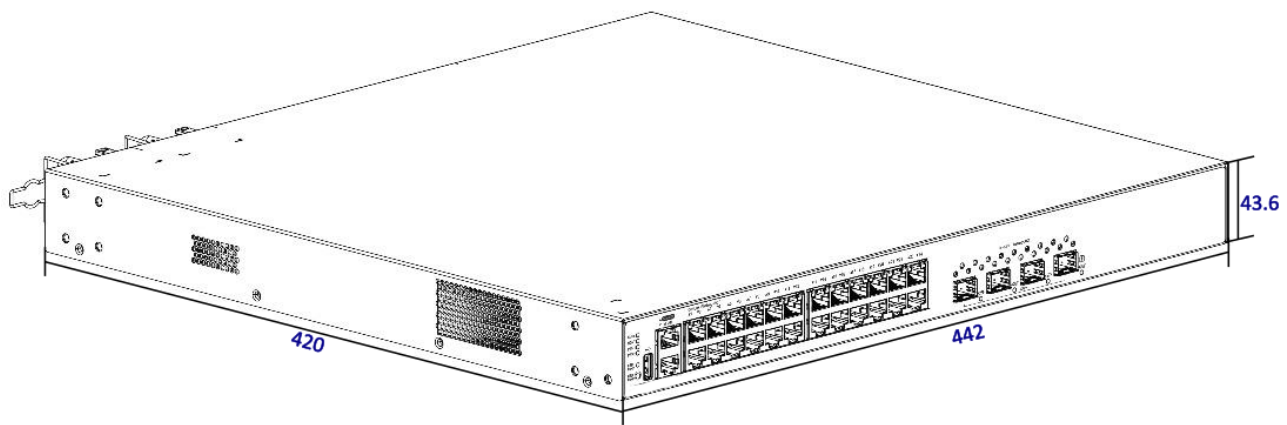
Technical Specifications (continued)

OoB Port		Power Supply	
Number	1	Type	AC power supply module
Type	Ethernet	Input Voltage	90..264 VAC
Connector	RJ-45 port	PoE Output Power	370 W (when 1 power supply module is installed) 740 W (when 2 power supply modules are installed)
USB Port		Power Consumption	max. 810 W (including PoE) max. 65 W (without PoE)
Number	1	NOTE: The switch supports 1+1 power redundancy when the PoE power consumption is less than 370 W and both power supply modules are installed.	
Type	USB Type-A		
Connector	USB 2.0 port		



For information on the firmware specifications of the device, please refer to the "**Firmware Features**" document.

Dimensions



Ordering Information

	Description	Art.-No.
	28-Port 10G L3 Ethernet Switch 19" 1U 4x 1/10GbE SFP+ Slots, managed L3, 24x 10/100/1000Base-T PoE+, OOB-Port (RJ-45), int. 100~240VAC (C14), 370W, Console Port (RJ-45)	MS400992M-1A
	28-Port 10G L3 Ethernet Switch 19" 1U 4x 1/10GbE SFP+ Slots, managed L3, 24x 10/100/1000Base-T PoE+, OOB-Port (RJ-45), 2x 100~240VAC (C14), 370W, Console Port (RJ-45)	MS400992M-2A
	28-Port 10G L3 Ethernet Switch 19" 1U 4x 1/10GbE SFP+ Slots, managed L3, 24x 10/100/1000Base-T PoE+, OOB-Port (RJ-45), Console port (RJ-45)	MS400992M
	Power Supply Module 600W AC for MS400992M Input: 200-240VAC, 50-60Hz	MS400992-AC

Accessories

	SFP / SFP+ Transceivers	
	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
	SFP+ 10G WDM-Transceiver Bidi-LR SingleMode TX1270nm / RX1330nm, 10km, DDM, LC simplex, max. 0.67W, -40..+85°C	MS100702DXA-V2
	SFP+ 10G WDM-Transceiver Bidi-LR SingleMode TX1330nm / RX1270nm, 10km, DDM, LC simplex, max. 0.67W, -40..+85°C	MS100702DXB-V2
	SFP GbE Transceiver 1,25GB SX Multimode 850nm, DDM, LC, -40..+85°C	MS100200DX
	SFP GbE Transceiver 1.25G LX SingleMode 1310nm, 10km, DDM, LC, -40..+85°C	MS100210DX
	SFP GbE WDM-Transceiver 1.25G BX SingleMode TX1310nm / RX1550nm, 10km, DDM, LC simplex, -40..+85°C	MS100221DXA
	SFP GbE WDM-Transceiver 1.25G BX SingleMode TX1550nm / RX1310nm, 10km, DDM, LC simplex, -40..+85°C	MS100221DXB
	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] In preparation