MICROSENS

Data Sheet

28-Port 10G Multi Fiber L2/L3 Switch 19"

Layer3
Layer3 feature set for broad application diversity

10G uplinks (IEEE 802.3ae)
4 x 1/10G uplink ports in SFP/SFP+ version

Multi Fiber Switch
High port density of fiber ports for cost efficient high performance networks

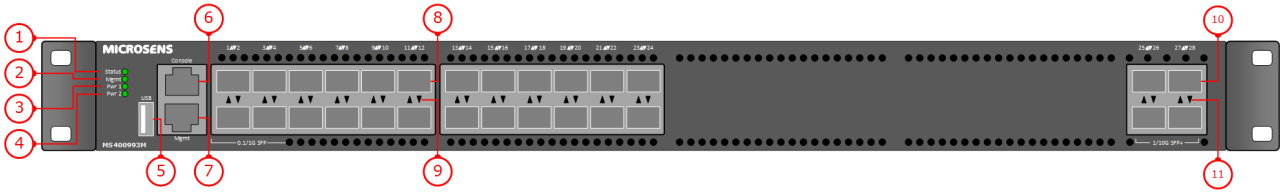
Stacking
With max. 4 switches in a stack

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. USB Port
6. Console Port
7. Management Port
8. 100/1000Base-X SFP Ports
9. 100/1000Base-X SFP Port LEDs
10. 10GBase-X SFP+ Ports
11. 10GBase-X SFP+ Port LEDs

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. When both power supply modules are utilized, the switch operates in power redundancy mode.

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RFC Standards

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

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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 Confed-eration 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 802.1ab	LLDP
IEEE 802.1ad	Provider Bridges
IEEE 802.1ax / IEEE802.3ad	Link Aggregation
IEEE 802.1D	MAC Bridges
IEEE 802.1D	STP
IEEE 802.1Q	Bridged VLAN
IEEE 802.1s	MSTP
IEEE 802.1w	RSTP
IEEE 802.3ad	LACP
IEEE Std 802.3x	Full Duplex and flow con-trol

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Technical Specifications

Switch

Type	10G Ethernet L2/L3 Switch, IEEE 802.3 compliant
Performance	Store-and-forward
Switching Capacity	154 Gbps
Packet Forwarding 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	4.2 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

Fiber Ports (SFP slots)

Number	24x 100/1000Base-X SFP slots
Type	100/1000Base-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

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

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Technical Specifications (continued)

OoB Port

Number	1
Type	Ethernet
Connector	RJ-45 port

USB Port

Number	1
Type	USB Type-A
Connector	USB 2.0 port

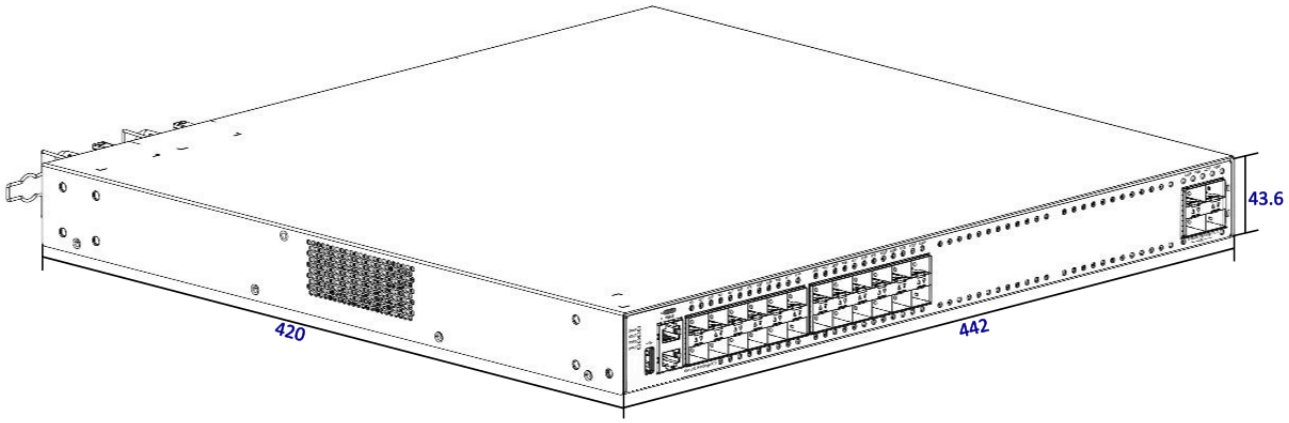
Power Supply

Type	AC power supply module
Input Voltage	90..264 VAC or
Frequency	50/60 Hz
Output Power	70 W
Power Consumption	≤ 85 W

NOTE: If both power supply modules are used, the switch works in the power redundancy mode.

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

Dimensions



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Ordering Information

Description	Art.-No.
28-Port 10G L3 Switch Multi Fiber 19" 1U 4x 1/10GBase-X SFP+-Slots, managed L3, 24x 100/1000Base-X SFP-Slots, OOB-Port (RJ-45), int. 100~240VAC (C14), Console Port (RJ-45)	**MS400993M-1A**
28-Port 10G L3 Switch Multi Fiber 19" 1U 4x 1/10GBase-X SFP+-Slots, managed L3, 24x 100/1000Base-X SFP-Slots, OOB-Port (RJ-45), 2x 100~240VAC (C14), Console Port (RJ-45)	**MS400993M-2A**
28-Port 10G L3 Switch Multi Fiber 19" 1U 4x 1/10GBase-X SFP+-Slots, managed L3, 24x 100/1000Base-X SFP-Slots, OOB-Port (RJ-45), Console Port (RJ-45)	**MS400993M**
Power Supply Module 70W AC for MS400993M Input: 100-240VAC, 50-60Hz	**MS400993-AC**

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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+	**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	

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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