MICROSENS

Data Sheet
Ruggedized 19" Gigabit Ethernet Switch with
10 Gigabit Uplink Ports

Overview

MICROSENS family of ruggedized 19" switches offers highest performance and flexibility in the network in a compact design. Ruggedized and designed for highest reliability and shortest recovery times, MICROSENS Ethernet switches have become the solution of choice for industrial applications. The hardware of these devices is based on a high performance switching chipset combined with a powerful ARM processor.

Following their tradition of offering innovative best-in-breed products and solutions, MICROSENS offers two different models of this fan-less ruggedized 19" switch with 10 Gigabit uplinks: the well-known device type for Layer 2 networks is now accompanied by a variant with additional support for Layer 3 applications.

Highlights

- Industrial design for maximum reliability in harsh environments
- 4x 1G/10GBase-X SFP+ ports
- 24x 10/100/1000Base-T ports
- Product variant with Layer 3 support available
- PoE+ PSE (max. 30 W per port)
- 420 W total PoE+ (PSE) budget
- Flexible firmware compatible with industrial standard
- Redundant DC power inputs

Specifications

Gigabit Ethernet Switch

- Fanless 10 Gigabit / 1 Gigabit Ethernet Switch
- DNS-Client
- IPv4/IPv6 Dual Stack
- Max. 16.384 MAC-addresses, automatic learning and aging
- Jumbo-Frames (max. 9k Bytes)
- Port Mirroring

Layer 3 Support (MS653430MX)

- OSPF, RIP, VRRP
- Static Routing
- L3 DHCP Relay, Proxy ARP

Management Interfaces

- Supports common management standards
- Web Manager (HTTP/HTTPS), to cover basic management areas
- Industry standard-like command-line-interface CLI, accessible via Telnet, SSH and local console port (outband)
- ICMP
- RMON
- SNMP v1/v2c/v3
- SNTP
- Flow Monitoring (sFlow)

Power-over-Ethernet PoE/PoE+

- IEEE 802.3af PoE (max. 15 W/Port), power supply with typ. 48 VDC
- IEEE 802.3at PoE+ (max. 30 W/Port), power supply with typ. 54 VDC
- 24x 10/100/1000Base-T w. PoE+ (PSE)
- 420 W PoE+ (PSE) budget

Connectors

Link Ports
- 4x 1G/10GBase-X (SFP+)

Local Ports
- 24x 10/100/1000Base-T (RJ-45)
- Auto-Negotiation
- Auto MDI/MDI-X function
- Energy-Efficient Ethernet (EEE)

Power Supply
- 2-pin pluggable connector for solid or stranded wires

RS-232 Console Port
- Serial terminal port for CLI access (outband management)

USB Extension Port
- For exchange and backup of files like configuration data

Mounting
- Mounting into 19" racks requiring 1U vertical space

Gigabit Ethernet Ports

4x 10 Gigabit Ethernet Ports (SFP+)

All 10 Gigabit Ethernet SFP+ ports are for the uplink connection of 10 Gbps segments via LC fiber connectors. Alternatively, compatible 1 Gigabit SFP's can also be used instead of 10 Gbps SFP+.

24x Gigabit Local Ports, PSE (RJ-45)

All Gigabit Ethernet ports are 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 best connection method to the end devices.

Additionally, these ports include PoE+ Power Sourcing Equipment (PSE) functionality. With this the switch can supply the connected end devices with electrical power. This is often used for VoIP-telephones, IP-cameras and WLAN-Access Points

Feature Overview Network Management

Layer 3 Network Management

- Supported Device: MS653430MX
- VRRP Virtual Router Redundancy Protocol
- Static Routing
- Routing Information Protocol (RIP)
- Open Shortest Path First (OSPF)
- L3 DHCP Relay
- Proxy ARP for IP Routing
- Directed Broadcast
- UDP Relay

IP Stack

- Up to 4094 VLAN's
- Dual Stack
- IPv4 Stack
- Ping, Trace Route
- IPv6 Management Access
- IPv6 Transport
- Dynamic ARP Inspection
- Secondary IPv4 Address

Ethernet Port Features

- Administration
- Ethernet Twisted-Pair
- Cable Tester
- Ethernet SFP
- Dual Media Ports
- Loop Protection
- SFP Auto Speed

Power-over-Ethernet (PoE)

- PoE and PoE+ support
- PoE Control
- PoE+ Enable

SFP/SFP+

- Digital Diagnostic Monitoring (DDM)
- Power Monitoring

Ring Protocol

- Redundant Ring Protocol (RRP)

Spanning Tree Protocols

- Spanning Tree (STP)
- Rapid Spanning Tree (RSTP)
- Multiple Spanning Tree (MSTP)
- BPDU Guard

VLAN Support

- Up to 4094 VLAN's
- VLAN Filter
- GARP VLAN Registration Protocol (GVRP)
- Access Mode
- Trunk Mode
- Hybrid Mode
- Stacked VLANs (Q-in-Q)
- Voice VLAN
- RSTP VLAN
- Unauthorized VLAN

Quality of Service (QoS)

- Priority Queues
- Prioritization Scheme
- Layer1 Priority
- Layer2 Priority (802.1p)
- Layer3 Priority (IPv4/IPv6) (MS653430MX)
- Egress Rate Shaping
- Ingress Rate Shaping

Link Layer Discovery Protocol (LLDP)

- LLDP reception
- LLDP transmission
- LLDP-MED

Link Aggregation Control Protocol (LACP)

- Static Link Aggregation
- Dynamic Link Aggregation
- Load Balancing and Trunking

Feature Overview Network Management (ctd.)

Network Time Protocol (NTP)

- SNTP Client

Switch / MAC

- MAC Table
- MAC Filter
- SNMP Access
- MAC Limit
- Configurable MAC Aging Time

Port Access Control

- IEEE 802.1X Authentication
- RADIUS MAC Authentication
- MAC locking
- MAC learning
- Limited number of MACs
- Learned MAC time out
- Dynamic VLAN
- Allowed Outgoing Port (Port based VLANs)

Access Control Lists (ACL)

- Access Control Lists (ACL)
- Dynamic ACL via RADIUS

Login Access Protection

- General access rights
- Disable insecure Interfaces
- Interface Restrictions
- Public key encrypted passwords
- View Model for SNMP
- Firewall with Black and White List
- TACACS+ Authentication
- RADIUS access verification

RADIUS Client

- Access
- Accounting
- Redundancy
- Tunnel Attributes

IGMP

- IGMP Snooping
- IGMP Snooping per VLAN
- MLD Snooping

DHCP

- DHCP Snooping
- IP-MAC Binding Table
- DHCP relay agent with option 82
- Dynamic ARP Inspection

Simple Network Management Protocol (SNMP)

- SNMP V1/V2c
- SNMP V1/2c Security
- SNMP V3
- Traps (SNMP V1/V2c/V3)
- Private Traps
- Private and Public MIBs

File Management

- Firmware Download
- Secure Firmware Update
- Firmware and Configuration Export and Import
- Script Files
- Configuration Files

RMON Statistics

- RMON counters

Event Logging

- Syslog to CLI
- Local Logfile

Test Functions

- Ping, Trace Route
- Port Mirroring
- ARP Cache
- Port Mirroring

Technical Specifications

Switch

Type	Gigabit Ethernet Switch Layer 2+, IEEE 802.3 compliant
MAC addresses	16.384 addresses, automatic learning and aging
Jumbo Frames	max. 9k Bytes

Twisted-Pair Ports

Number	24
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	Supported for full-duplex links (IEEE 802.3x)
Power-over-Ethernet	Power Sourcing Equipment (PSE) IEEE 802.3af/at Class 0-4, max. 15 W / 30 W
Pin out	Auto MDI/MDI-X, Auto Polarity; PoE: Alternative A

SFP/SFP+ Ports

Number	4
Type	10 Gigabit Ethernet
Connector	SFP/SFP+ Slot

Control Panel

Reset button	Reset of the switch; soft reset via CLI

Environmental Conditions

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

Power Supply

Input	2x 44..57 VDC PoE: 48 VDC typ. PoE+: 54 VDC typ.
Connectors	2x 2 pin screw connector, conductor cross-section: max. 2.5mm²
Power Consumption	Without PoE: approx. 30 W Including PoE+: approx. 450 W
PoE+ (PSE) Budget	420 W

Standards

CE	2014/35/EU (EMC) 2011/65/EU (RoHS)
Safety	EN 62368-1
Electromagnetic Compatibility	EN 61000-6-2 EN 61000-6-4 EN 55024 EN 55032 (Class A)[1]

Mechanical

Dimensions	435 x 220 x 43.5 mm³ (w x d x h, without connectors; width incl. mounting brackets: 481 mm)
Weight	Approx. 3900 g (without SFPs)
Protection Class	IP 30

Delivery / Contents

Standard Packaging

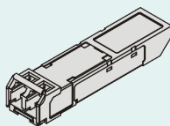|	
Package unit	1 pcs.
Contents	1x Ruggedized 19" switch 1x Quick Start Guide 2x Power supply connector 2x I/O connector 1x Console Cable

Order Information

Description	Article No.:
Ruggedized 19" GBE Switch with 10 GBE Uplink Ports	
Ruggedized 19" 10G Ethernet Layer 2 Switch, 4x 1G/10GBase-X SFP+ Slots, 24x 10/100/1000Base-T PoE+ (PSE), Serial Port, USB Port, SD Memory Card Slot, I/O: 2x in, 2x out, 2x power input 44..57 VDC	**MS653410MX**
Ruggedized 19" 10G Ethernet Layer 3 Switch, 4x 1G/10GBase-X SFP+ Slots, 24x 10/100/1000Base-T PoE+ (PSE), Serial Port, USB Port, SD Memory Card Slot, I/O: 2x in, 2x out, 2x power input 44..57 VDC	**MS653430MX**

Accessories

Description	Article No.:
SFP+ Transceiver	
SFPx Transceiver, Gigabit Ethernet, Digital Diagnostic 850 nm Multimode, 10GBase-SR, LC duplex Extended temperature range -40°C up to +85°C	**MS100700DX**
SFPx Transceiver, Gigabit Ethernet, Digital Diagnostic 1310 nm Monomode, 10GBase -LR, LC duplex Extended temperature range -40°C up to +85°C	**MS100702DX**
NMP 2.x Enterprise	
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 and install of updates), installation of server SW on max. 1 computer, electronic user manual included (.pdf)	**MS200100**
NMP 2.x Enterprise Expansion Pack, SW usage right for add'l 200 NMP Enterprise Managed Objects	**MS200110**
NMP 2.x Professional	
NMP 2.x Professional Basic package incl. 1 x usage right for NMP Professional, 50 x usage rights f. NMP Professional Managed Objects, and SW Maintenance for 1 year (download and install of updates), installation of server SW on max. 1 computer, electronic user manual included (.pdf)	**MS200070**
NMP 2.x Professional Expansion Pack, SW usage right for add'l 25 NMP Professional Mgd. Objects, 1 year right to download and install of updates	**MS200080**
Further software variants Further variants of the Basic and Expansion packages as well as maintenance packages are listed in the NMP data sheet; please refer to www.microsens.de	

Service

Description	Art.-No.	
Warranty Extension following the 24-Month Manufacturer Warranty[2]		
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**	

[1] WARNING: This equipment is compliant with Class A of EN55032. In a residential environment this equipment may cause radio interference.
[2] Manufacturer Warranty is defined in General Terms and Conditions of Sale (§10) of MICROSENS GmbH & Co. KG.