SF2 – 3U 19" Industrial Ethernet Switch

- Managed 8-port rugged Ethernet switch
- 3U, 18 HP, 19" rack mountable
- 8 Fast Ethernet ports on RJ45 connectors
- Power over Ethernet PSE functionality
- Configuration via Telnet CLI, SNMP ver. 3 or external dongle
- Service interface via D-Sub
- LEDs for port, PoE and board states
- Wide input range PSU (14.4 to 154 V), EN 50155 qualified
- -40 to +70(+85)°C according to EN 50155 Class Tx with qualified components

The SF2 is a stand-alone, managed industrial Fast Ethernet switch that comes in a compact 3U, 18HP, 19" cassette. It provides eight channels at the front panel accessible through RJ45 connectors.
It is supplied by its integrated, rugged power supply unit (PSU), with a power connector at the front panel. The entire switch consumes less than 7 W and needs no cooling.
The SF2 is managed by its own PowerPC® CPU that integrates the management firmware. A service port is accessible at the front panel on a D-Sub connector, providing an easy way to configure the switch. A command line interface is available via the RS232 at the service port and over Ethernet via Telnet or Secure Shell (SSH). The switch can also be configured via SNMP (version 3). Additionally, the service connector can be used to attach an external dongle to store or update the switch configuration. This makes it easy to exchange the unit for service purposes.
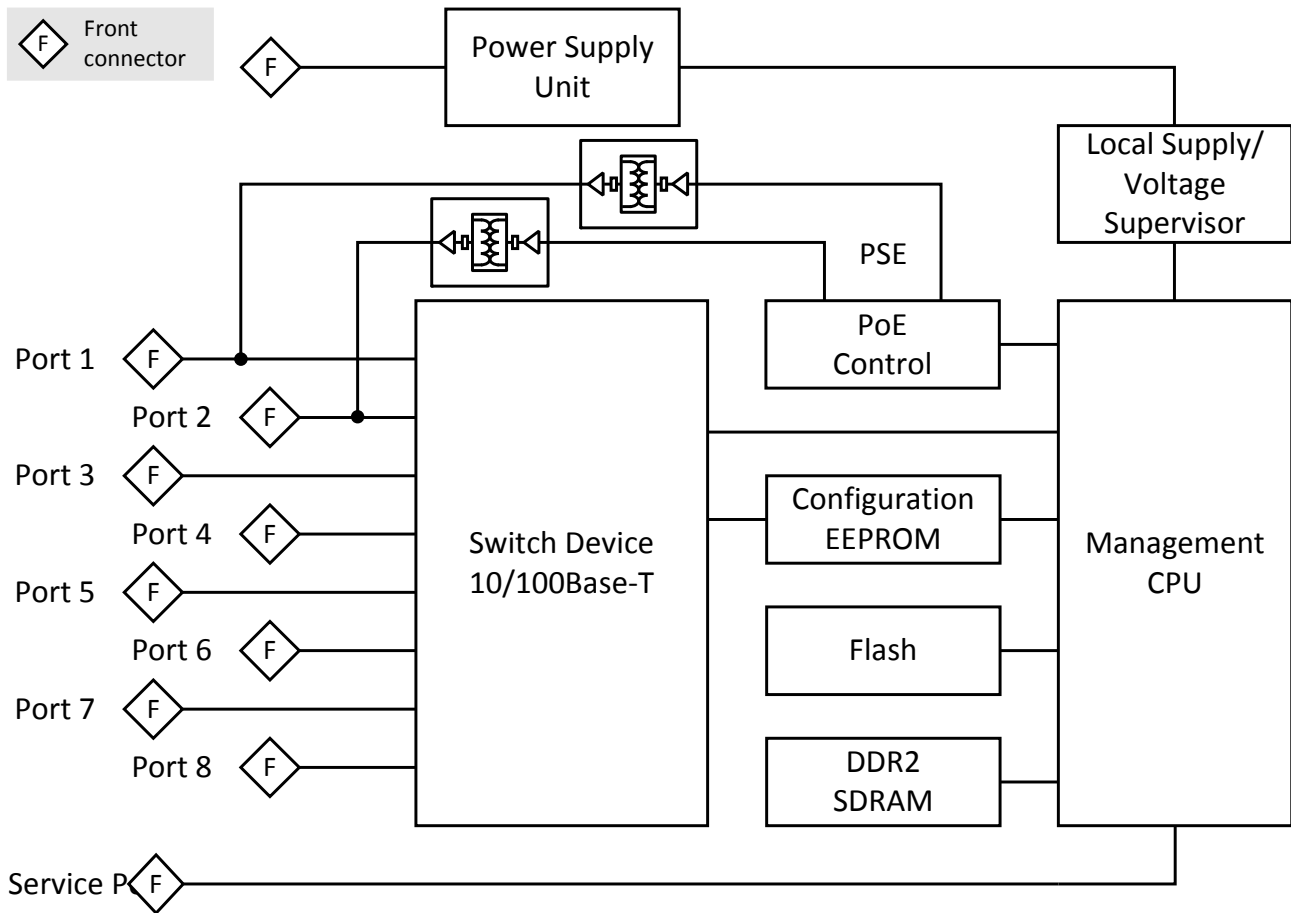All of the ports are individually configurable. The SF2 supports full-duplex and half-duplex operation with auto-negotiation, high-speed non-blocking store-and-

forward-switching, Quality of Service (QoS) support with four traffic classes IEEE 802.1p and three-level 802.1x security as well as the logical segmentation of ports (802.1q VLANs). The switch is fault tolerant and restores itself on its own: If a link is temporarily unavailable, frames can be sent via backup/redundant links (spanning tree protocol / link aggregation) and no data loss occurs. Its built-in test mechanisms make the SF2 an even more reliable component in the communication system.
In addition, the switch can act as Power over Ethernet (PoE) Power Sourcing Equipment (PSE), supplying other devices on ports 1 and 2 with power.
The SF2 was specifically designed for rugged mobile communication systems with high demands. It is thus for example fully compliant with the EN 50155 railway standard. All components inside the cassette are specified for a -40 to +70°C operation temperature (+85°C for ten minutes according to EN 50155 Class Tx). There are no socketed components, hardening the box against shock and vibration. Its PCBs are ready for coating and the switch has a guaranteed minimum standard availability of 5 years.

Diagram

Front connector — F

Power Supply Unit

Local Supply/ Voltage Supervisor

PSE

PoE Control

Port 1 — F
Port 2 — F
Port 3 — F
Port 4 — F
Port 5 — F
Port 6 — F
Port 7 — F
Port 8 — F

Switch Device 10/100Base-T

Configuration EEPROM

Flash

DDR2 SDRAM

Management CPU

Service P — F

Technical Data

Key Features	■ Simple Switch replacement: configuration can be done via external dongle without any tools ■ High-speed non-blocking, store-and-forward switching ■ Eight 10/100Base-T ports at front panel (Electrical isolation: 1500 Vrms) ■ Port configuration: copper, 10/100 Mbit/s ■ Auto-negotiation / Auto MDI/MDIX crossover on all ports / manual configuration possible ■ Layer2-based Policy Control List ■ 8K MAC address lookup table with automatic learning and aging ■ Up to 4096 VLAN ■ Rapid Spanning Tree Protocol and Multiple Spanning Tree Protocol to ensure loop free topology formation ■ Reducing multicast traffic in the network through multicast snooping - IGS (IPv4) and MLDS (IPv6)

Management Firmware System Features	■ Saving and restoring user configurations
	■ Software upgrades through TFTP
	■ System logs (syslog) and e-mail alerts for critical events
	■ Remote monitoring (RMON) and alarm generation
	■ Displaying the running configuration in the form of CLI commands
	■ Management interfaces through
	  □ CLI (RS232 console, Telnet, SSH)
	  □ SNMP v3
	■ Switch configuration can be loaded from external dongle

Management Firmware Security Features	■ User authentication using IEEE 802.1x ■ Controlling management access through SNMP and CLI only from authorized managers ■ MAC based and IP based access list (ACL) for traffic filtering ■ Rate-limiting and storm control to prevent packet flooding from malicious peers
Supported Protocols and Standards	■ DHCP client / server / relay (IEEE 1394) ■ Ethernet flow control (IEEE 802.3x) ■ GARP (VLAN-aware bridging) ■ GVRP/GMRP support (IEEE 802.1D, 2004) ■ Hypertext Transport Protocol (HTTP) Server for Remote Management and Monitoring (RFC2626) ■ HTTP Secure (HTTPS) - HTTP-based Remote Management over encrypted data channel (RFC2818) ■ IGMP snooping / IGMP proxy / IGMP Querier / MLD Discovery (RFC 4541) ■ Link aggregation LACP / EtherChannel (IEEE 802.3ad, 2005) ■ Link Layer Discovery Protocol LLDP (IEEE 802.1ab, 2005) ■ Multiple Spanning Tree (MSTP) (IEEE 802.1s) ■ Path MTU Discovery Protocol (PMTUD) (RFC 1984) ■ Priority-based switching, Quality of Service/DiffServ, tagged frames, Layer2-based 801.1Q VLAN-ID packet routing (IEEE 802.1p) ■ Port-based authentication with EAP (IEEE 802.1x - REV2004/RFC3748) ■ Port-based authentication on registered MAC Address Lists ■ Power over Ethernet support (IEEE 802.3af / IEEE 802.3at, Type 1) ■ Rapid Spanning Tree Protocol (RSTP IEEE 802.1w) ■ Remote Network Monitoring Information Base v1 (RFC2819) ■ Secure Shell (SSH) for Remote Configuration (CLI) over secure channel ■ Secure Sockets Layer - Encrypted Data Exchange (RFC5246) ■ SNMP v1, v2c, v3 management ■ Syslog (RFC 5424) ■ TCP/IP v4 and v6 ■ TFTP (RFC 1350) ■ VLAN/port-based VLANs GVRP/MVRP (IEEE 802.1Q Rev D5.0, 2005)

Power Over Ethernet Features	■ Power over Ethernet functions on ports 1 and 2
	  □ PSE (Power Sourcing Equipment) function
	  □ Supplies one PD class 0 device or two PD class 2 devices (up to 15W total)

Service Interface	■ 9-pin D-Sub connector at front ■ RS232 / V24 ■ I²C interface for external dongle

Technical Data

Front I/O	- Eight Ethernet ports via RJ45 connectors - One service interface via 9-pin D-Sub plug connector - One power input via mixed 7-pin D-Sub plug connector - Sixteen link and activity Ethernet status LEDs (two per channel) - Four Power over Ethernet status LEDs, two each for ports 1 and 2 - Status LEDs for power, reset and error codes
Electrical Specifications	- Power supply unit 14.4..154 VDC wide range according to EN 50155 - Isolation (according to EN 50155) - Input/output: 1500 Vrms - Input/shield: 1500 Vrms (7W2 D-Sub power connector: 1000 Vrms) - Output/shield: 1500 Vrms - Ground/shield: 1500 Vrms - Service connector: 1000 Vrms - Power consumption: 24 W (incl. 15 W PoE)
Mechanical Specifications	19" rack-mount standard - Dimensions: 3U, 18HP, 168 mm depth - Weight: 870 g
Environmental Specifications	- Temperature range (operation): -40..+70°C (qualified components, +85°C for ten minutes according to EN50155 Class Tx) - Temperature range (storage): -40..+85°C - Relative humidity (operation): max. 95% non-condensing - Relative humidity (storage): max. 95% non-condensing - Altitude: -300 m to + 3,000 m - Shock: according to EN 60068-2-27 - Bump: according to EN 60068-2-29 - Vibration (sinusoidal): according to EN 60068-2-6
MTBF	381 460 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	- Flammability - PCBs manufactured with a flammability rating of 94V-0 by UL recognized manufacturers
EMC Conformity	- EN 55022 (radio disturbance) - EN61000-4-2 (ESD Immunity) - IEC 61000-4-4 (burst) - IEC 61000-4-5 (surge)
Software Support	Firmware for configuration and management included

Configuration & Options

Standard Configurations

Article No.	Connectors	Front Panel	Management	Power over Ethernet
19SF01-00	RJ45	18 HP	Unmanaged	Yes (PSE on ports 1 and 2)
19SF02-00	RJ45	18 HP	Managed	Yes (PSE on ports 1 and 2)
19SF03-00	M12	22 HP	Managed	Yes (PSE on ports 1 and 2)
19SF04-00	M12	22 HP	Unmanaged	Yes (PSE on ports 1 and 2)

Options

Ethernet-powered version without PSU (on request)	■ Class 2 Powered Device supplied via Ethernet Port 1 □ No internal power supply unit
Environmental specifications	■ Conformal coating on request

Ordering Information

Standard SF2 Models	**19SF02-00**	Managed Switch with 8 Fast Ethernet ports on RJ45, PoE, PSU, 18HP, -40..+85°C with qualified components
Related Hardware	**05SF02-00**	I2C dongle for F302, G302 and managed SFxx switches, 512Kb, D-Sub, -40..+85°C
	19SF01-00	Unmanaged Switch with 8 Fast Ethernet ports on RJ45, PSU, 18HP, -40..+85°C with qualified components
	19SF03-00	Managed Switch with 8 Fast Ethernet ports on M12, PoE, PSU, 22HP, -40..+85°C with qualified components, conformal coating
	19SF04-00	Unmanaged Switch with 8 Fast Ethernet ports on M12, PSU, 22HP, -40..+85°C with qualified components, conformal coating
Miscellaneous Accessories	**05SF02-00**	I2C dongle for F302, G302 and managed SFxx switches, 512Kb, D-Sub, -40..+85°C
Software: Firmware/BIOS	**14ETSW-00**	Ethernet Switch Firmware for managed RSx, SFx, F302 and G302 models

For operating systems not mentioned here contact MEN sales.

Documentation	Compare Chart Industrial Ethernet switches for different platforms » Download	
	20SF02-00	SF2/SF3 User Manual
	21ETSW-ER	14ETSW-00 Managed Ethernet Switch Firmware Errata
	21ETSW-00	Managed Ethernet Switch Quick Start Guide
	21ETSW-01	Managed Ethernet Switch Command Line Interface User Manual - Command Reference

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