

# SF4 – 3U 19" Industrial Ethernet Switch

- **Unmanaged 8-port rugged Ethernet switch**
- **3U, 22 HP, 19" rack mountable**
- **8 Fast Ethernet ports (front) on M12 connectors**
- **Power over Ethernet PSE functionality**
- **Service interface via D-Sub**
- **LEDs for port, PoE and board states**
- **Wide input range PSU (14.4 to 154 V), EN 50155 qualified (railways)**
- **-40 to +70(+85)°C according to EN 50155 Class Tx with qualified components**
- **Conformal coating**



The SF4 is a stand-alone, unmanaged industrial Fast Ethernet switch that comes in a compact 3U, 22HP, 19" cassette. It provides eight channels at the front panel accessible through M12 connectors.

The SF4 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.

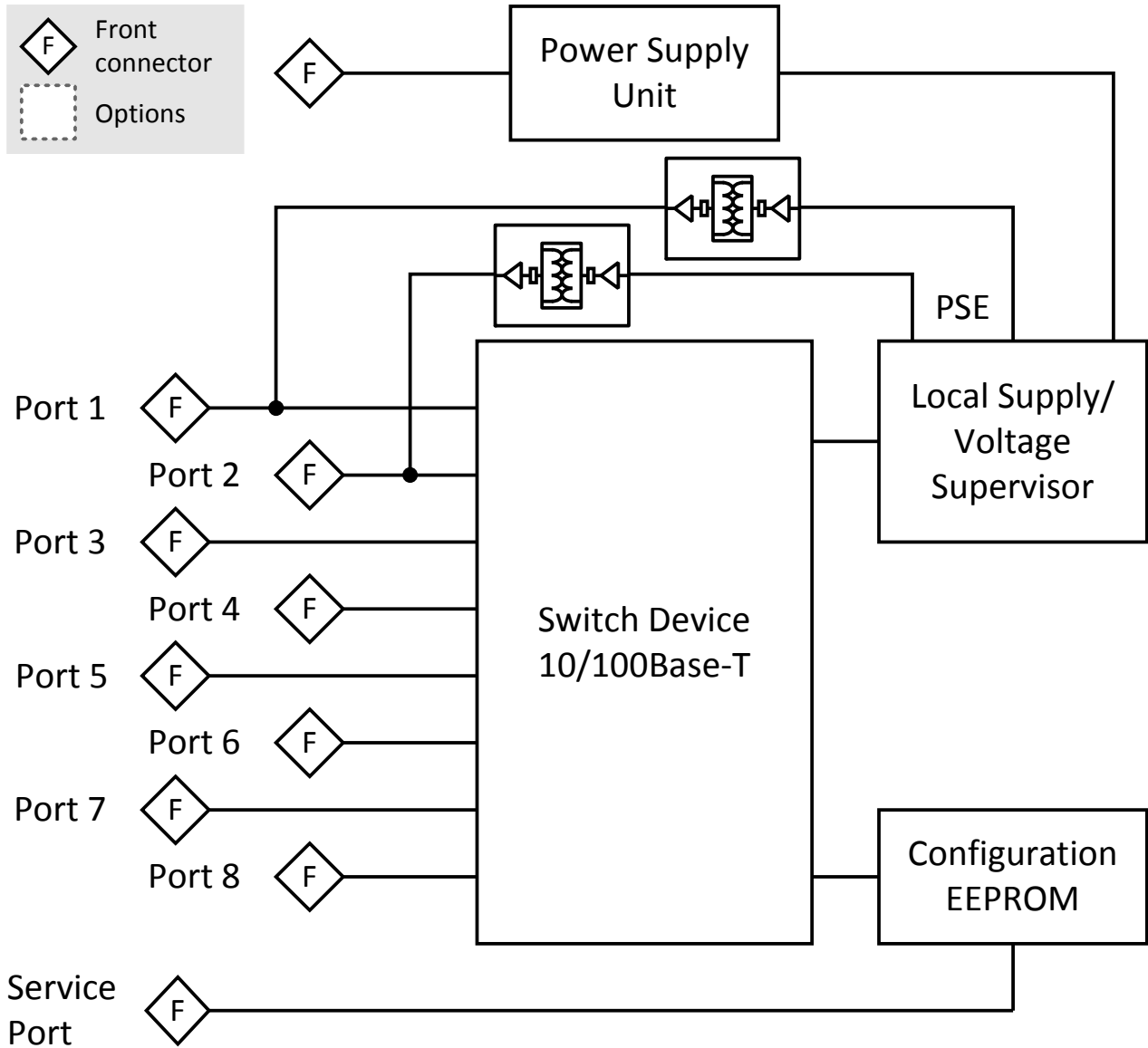
The SF4 supports full-duplex and half-duplex operation with auto-negotiation, high-speed non-blocking store-and-forward switching, Quality of Service (QoS) support with four traffic classes IEEE 802.1p and three-level 802.1x security. The switch is fault tolerant and restores itself on its own: If a 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 SF4 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.

By using an application-specific configuration EEPROM, the SF4 can act similarly to a managed switch with fixed settings. This enables features untypical for unmanaged models like 802.1p priority and port based priority, port based VLAN or IEEE 802.1q VLAN IDs. Additionally, a service port is accessible at the front panel on an M12 connector, enabling authorized personnel to configure the switch via an SPI interface.

The SF4 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 +85°C operation temperature. There are no socketed components, hardening the box against shock and vibration. Its PCBs are conformally coated and the switch has a guaranteed minimum standard availability of 5 years.

# Diagram



## Technical Data

<b>Key Features</b>	<ul style="list-style-type: none"> <li>■ High-speed non-blocking, store-and-forward switching</li> <li>■ Eight 10/100Base-T ports at front panel (Electrical isolation: 1500 Vrms)</li> <li>■ Port configuration: copper, 10/100 Mbit/s</li> <li>■ Auto-negotiation / Auto MDI/MDIX crossover on all ports</li> <li>■ Layer2-based Policy Control List</li> <li>■ 8K MAC address lookup table with automatic learning and aging</li> <li>■ Up to 4096 VLANs</li> </ul>
<b>Supported Protocols and Standards</b>	<ul style="list-style-type: none"> <li>■ Ethernet flow control (IEEE 802.3x)</li> <li>■ Link aggregation LACP / EtherChannel (IEEE 802.3ad, 2005)</li> <li>■ Priority-based switching, Quality of Service/DiffServ, tagged frames, Layer2-based 801.1Q VLAN-ID packet routing (IEEE 802.1p)</li> <li>■ Port-based authentication on registered MAC Address Lists</li> <li>■ Power over Ethernet support (IEEE 802.3af / IEEE 802.3at, Type 1)</li> <li>■ TCP/IP v4 and v6</li> <li>■ VLAN/port-based VLANs GVRP/MVRP (IEEE 802.1Q Rev D5.0, 2005)</li> </ul>
<b>Power Over Ethernet Features</b>	<ul style="list-style-type: none"> <li>■ Power over Ethernet functions on ports 1 and 2 <ul style="list-style-type: none"> <li>□ PSE (Power Sourcing Equipment) function</li> <li>□ Supplies one PD class 0 device or two PD class 2 devices (up to 15W total)</li> </ul> </li> </ul>
<b>Service Interface</b>	<ul style="list-style-type: none"> <li>■ 9-pin D-Sub connector at front</li> <li>■ SPI interface for external SPI programmer</li> </ul>
<b>Front I/O</b>	<ul style="list-style-type: none"> <li>■ Eight Ethernet ports via M12 connectors</li> <li>■ One service interface via 9-pin D-Sub plug connector</li> <li>■ One power input via mixed 7-pin D-Sub plug connector</li> <li>■ Sixteen link and activity Ethernet status LEDs (two per channel)</li> <li>■ Four Power over Ethernet status LEDs, two each for ports 1 and 2</li> <li>■ Status LEDs for power and reset</li> </ul>
<b>Electrical Specifications</b>	<ul style="list-style-type: none"> <li>■ Power supply unit <ul style="list-style-type: none"> <li>□ 14.4..154 VDC wide range according to EN 50155</li> </ul> </li> <li>■ Isolation (according to EN 50155) <ul style="list-style-type: none"> <li>□ Input/output: 1500 Vrms</li> <li>□ Input/shield: 1500 Vrms (7W2 D-Sub power connector: 1000 Vrms)</li> <li>□ Output/shield: 1500 Vrms</li> <li>□ Ground/shield: 1500 Vrms</li> <li>□ Service connector: 1000 Vrms</li> </ul> </li> <li>■ Power consumption: 24 W (incl. 15 W PoE)</li> </ul>
<b>Mechanical Specifications</b>	<ul style="list-style-type: none"> <li>■ 19" rack-mount standard</li> <li>■ Dimensions: 3U, 22HP, 168 mm depth</li> <li>■ Weight: 970 g</li> </ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"> <li>■ Temperature range (operation): <ul style="list-style-type: none"> <li>□ -40..+70°C (qualified components, +85°C for ten minutes according to EN50155 Class Tx)</li> </ul> </li> <li>■ Temperature range (storage): -40..+85°C</li> <li>■ Relative humidity (operation): max. 95% non-condensing</li> <li>■ Relative humidity (storage): max. 95% non-condensing</li> <li>■ Altitude: -300 m to + 3000 m</li> <li>■ Shock: according to EN 60068-2-27</li> <li>■ Bump: according to EN 60068-2-29</li> <li>■ Vibration (sinusoidal): according to EN 60068-2-6</li> <li>■ Conformal coating</li> </ul>
<b>MTBF</b>	<ul style="list-style-type: none"> <li>■ 479 534 h @ 40°C according to IEC/TR 62380 (RDF 2000)</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>■ Flammability <ul style="list-style-type: none"> <li>□ PCBs manufactured with a flammability rating of 94V-0 by UL recognized manufacturers</li> </ul> </li> </ul>

## Technical Data

### EMC Conformity

- EN 55022 (radio disturbance)
- EN61000-4-2 (ESD Immunity)
- IEC 61000-4-4 (burst)
- IEC 61000-4-5 (surge)

## 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 Switch

- Fixed managed version
  - With fixed configuration according to customer requirements

#### Ethernet-powered version without PSU (on request)

- Class 2 Powered Device supplied via Ethernet Port 1
  - No internal power supply unit

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

## Ordering Information

<b>Standard SF4 Models</b>	<b>19SF04-00</b>	Unmanaged Switch with 8 Fast Ethernet ports on M12, PSU, 22HP, -40..+85°C with qualified components, conformal coating
<b>Related Hardware</b>	<b>19SF01-00</b>	Unmanaged Switch with 8 Fast Ethernet ports on RJ45, PSU, 18HP, -40..+85°C with qualified components
	<b>19SF02-00</b>	Managed Switch with 8 Fast Ethernet ports on RJ45, PoE, PSU, 18HP, -40..+85°C with qualified components
	<b>19SF03-00</b>	Managed Switch with 8 Fast Ethernet ports on M12, PoE, PSU, 22HP, -40..+85°C with qualified components, conformal coating
<b>Miscellaneous Accessories</b>	<b>05RS01-03</b>	Cable set for G302, RSx and 19" rack-mountable SFx switches, consisting of: 4 Ethernet cables (M12 to RJ45), 1 service adapter (M12 to D-sub), 1 service cable, 1 dongle adapter (D-Sub to M12), 1 power cable (M12 to open end), -40..+85°C
<b>Documentation</b>		Compare Chart Industrial Ethernet switches for different platforms » <a href="#">Download</a>
	<b>20SF01-00</b>	SF1/SF4 User Manual

## Contact Information

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