



Level



Pressure



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Temperature

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## Technical Information

# Fieldgate SFG500

## Intelligent Ethernet/PROFIBUS gateway



### Application

Fieldgate SFG500 is a system component that provides an independent access route to a PROFIBUS network. It may be used in a variety of applications that are supported by specific operating modes. The operating modes are determined by the use of an optional memory card (Fieldgate Module SFM500).

Without a memory card, Fieldgate SFG500 operates as a plant access point. In this case, it acts as an Ethernet gateway with adaptive PROFIBUS Master Class 2 capabilities to support FDT-based plant asset management host applications, e.g. FieldCare. Applications which require a memory card are in preparation.

### Features and Benefits

- PROFIBUS listener and Master Class 2: automatically integrates itself into a PROFIBUS network and finds all connected devices
- PROFIBUS observer: monitors network traffic and device diagnostics
- Web Server: provides a clear presentation of network and diagnosis information via Web Browser or FDT/DTM frame application
- SFGNetwork DTM: finds all SFG500 Fieldgates present in an Ethernet domain and displays their PROFIBUS connections
- Fieldgate Module SFM500: activates additional operating modes as well as the associated outputs (Modbus RS-485 interface and relay output)

## Function and System Design

### Function

#### Access Point

When no Fieldgate Module SFM500 is inserted in the Fieldgate SFG500, it acts as a Access Point. Here it is used together with FieldCare, Endress+Hauser's plant asset management system. FieldCare accesses all devices in the PROFIBUS DP segment through the Fieldgate SFGNetwork DTM. Apart from setting the IP address, and in certain circumstances the bus parameters, no configuration is necessary.

#### Fieldbus Module SFM500

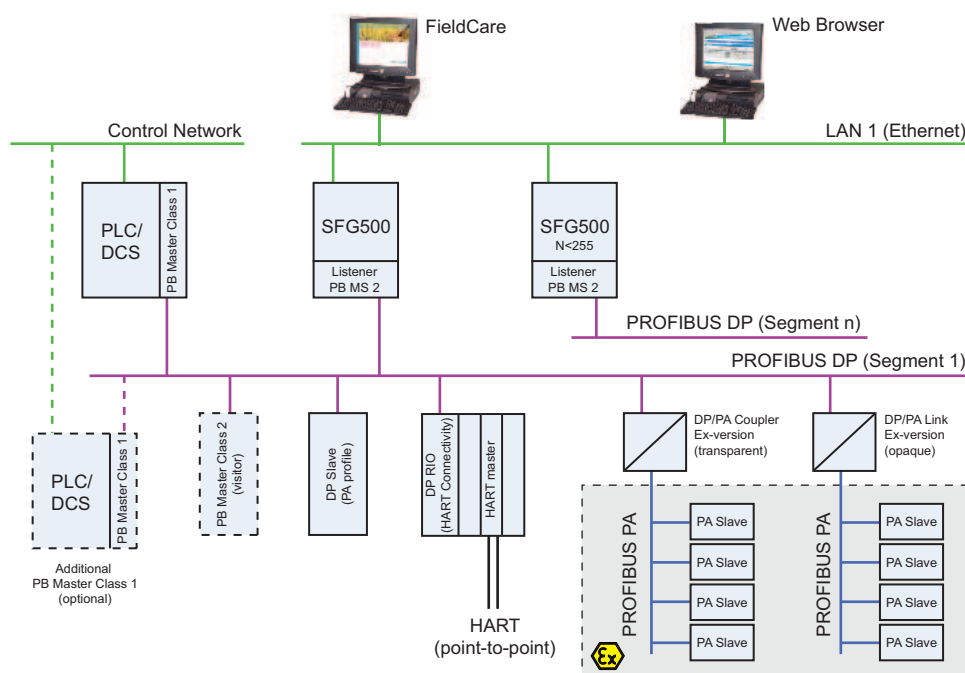
With the appropriate Fieldbus Module SFM500 inserted, Fieldgate SFG500 can be used for other applications. The SFM500 activates the corresponding operating mode and enables the associated outputs (Modbus RS485 interface, relay output).

### System design

The control network comprises for example, a PLC or DCS system and one or more PROFIBUS DP segments. Depending upon the actual circumstances it is possible that additional Class 1 masters are connected to the network. Also connected to the PROFIBUS DP segment are PROFIBUS DP slaves, Remote I/Os and segment couplers or links. Remote I/Os allow e.g. HART devices to be integrated into the PROFIBUS DP network. Segment couplers or links provide a connection to PROFIBUS PA slaves and also supply them with power.

Through its Ethernet port (LAN1), Fieldgate SFG500 allows host applications to access data from the PROFIBUS DP segment independent of the control system. The local area network in which they operate may be separate from the control network or be an integral part of it. Fieldgate SFG500 connects to a single PROFIBUS DP segment only. If there is more than one segment in the PROFIBUS DP network, a separate Fieldgate SFG500 is required for each.

Fieldgate SFG500 can be configured by a web browser, e.g. Internet Explorer, from any computer in the local area network or via its second Ethernet port (LAN2). In the latter case, Fieldgate SFG500's DHCP server will supply an IP address to the connected computer.



*System architecture for Fieldgate SFG500 operating as an access point*

## Output

<b>Output type</b>	Relay
<b>Activation</b>	Enabled through Fieldgate Module SFM500 and corresponding operating mode (disabled for Access Point)
<b>Arrangement</b>	Single changeover contact
<b>Operating voltage range</b>	18 VDC to 36 VDC: the relay circuit must be powered by a SELV power supply
<b>Load current</b>	$1 \text{ mA} < I_L < 0.5 \text{ A}$
<b>Max. switching capacity</b>	18 W
<b>Dielectric strength</b>	Coil to contact: Min. 1500 VAC for 1 minute
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>■ 3-port terminal block</li> <li>■ Screw terminals: <math>0.2 \text{ mm}^2</math> to <math>4 \text{ mm}^2</math> for solid wire, <math>0.2 \text{ mm}^2</math> to <math>2.5 \text{ mm}^2</math> for stranded wires</li> </ul>

## Digital Communication Interface

### PROFIBUS DP

<b>Protocol</b>	PROFIBUS DP
<b>Physical layer</b>	RS485
<b>Transmission rate</b>	<ul style="list-style-type: none"> <li>■ Automatic detection and matching of system baudrate</li> <li>■ Configuration via Web Server or FDT/DTM if required</li> </ul>
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Maximum bus length</b>	1200 m (1230 yds), depending upon cable and transmission rate
<b>Input variables</b>	<ul style="list-style-type: none"> <li>■ All variables of connected PROFIBUS DP devices</li> <li>■ All variables of PROFIBUS PA devices connected via DP/PA coupler or link</li> <li>■ All variables of HART devices connected to selected Remote I/Os</li> </ul>
<b>Additional functions</b>	Mapping of process values to Modbus registers for acquisition by Modbus OPC client
<b>Connection facilities</b>	9-pin MIN Sub D female connector

## Ethernet (100 BASE-T/100 BASE TX)

<b>Ports</b>	LAN1 for operation, LAN2 for service
<b>Protocol</b>	LAN1 configurable for Ethernet TCP/IP and MODBUS TCP communication
<b>Transmission rate</b>	Selectable 10/100 Mbit/s (max. cable length 100 m at 25 °C ambient temperature)
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Maximum bus length</b>	100 m (110 yds) depending upon cable
<b>Connection facilities</b>	RJ-45 socket

## RS-485 serial interface

<b>Protocol</b>	MODBUS RTU
<b>Activation</b>	Enabled through Fieldgate Module SFM500 and corresponding operating mode (disabled for Access Point)
<b>Transmission rate</b>	Software configurable between 1200 bit/s to 115200 bit/s
<b>Type of protection</b>	None
<b>Galvanic isolation</b>	Fully isolated from all other circuits
<b>Maximum bus length</b>	1200 m (1230 yds), depending upon cable and transmission rate
<b>Terminal resistor</b>	Integrated, settable by hardware (DIP-switch) or software
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>■ Two 3-port terminal blocks, allowing series connection of several gateways</li> <li>■ Screw terminals: 0.2 mm<sup>2</sup> to 4 mm<sup>2</sup> for solid wire, 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> for stranded wire</li> </ul>

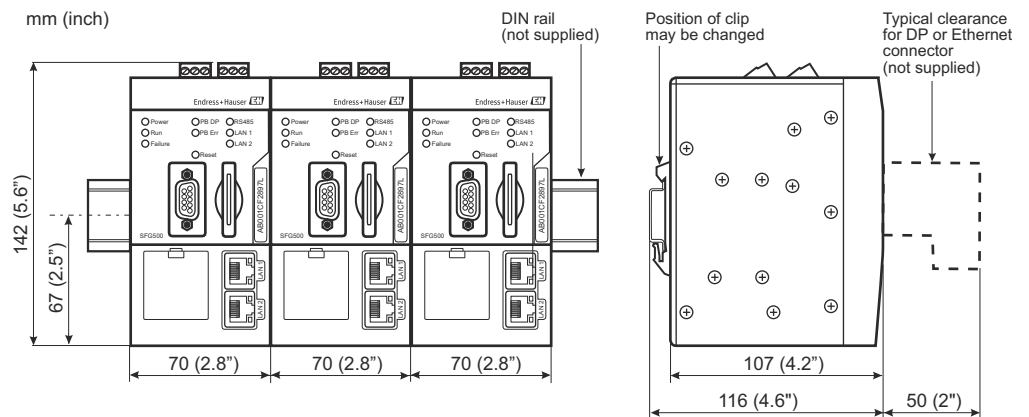
## Power Supply

<b>Supply voltage</b>	18 VDC - 36 VDC
<b>Current</b>	0.35 A - 0.20 A
<b>Power</b>	7.2 W
<b>Connection facilities</b>	<ul style="list-style-type: none"> <li>■ Two 3-port terminal blocks</li> <li>■ Screw terminals: 0.2 mm<sup>2</sup> to 4 mm<sup>2</sup> for solid wire, 0.2 mm<sup>2</sup> to 2.5 mm<sup>2</sup> for stranded wire</li> </ul>
<b>Battery (for memory)</b>	<p>3V lithium manganese dioxide battery type CR2450:</p> <ul style="list-style-type: none"> <li>■ Operating temperature range: -20°C – +85°C (-4°F – +178°F)</li> <li>■ Nominal voltage: 3 V</li> <li>■ Nominal capacity: 610mAh</li> <li>■ Maximum current: 15mA</li> <li>■ UL Recognition: e.g. MH12568</li> </ul>

# Operating Conditions

## Installation

- Location**
- Fieldgate SFG500 must be mounted in a permanent and weather-protected location in a safe area.
  - Recommended is a metal cabinet or an installation frame with a well grounded mounting plane.
- Mounting:**
- Vertical mounting on DIN rail, height of DIN rail clip adjustable
  - Fieldgate SFG500 requires no lateral clearance between modules and can be mounted directly against any other non-Ex module
  - To ensure adequate ventilation and prevent overheating, the vertical and lateral clearance between modules and the cabinet ducting or wall must be at least 50 mm (2")



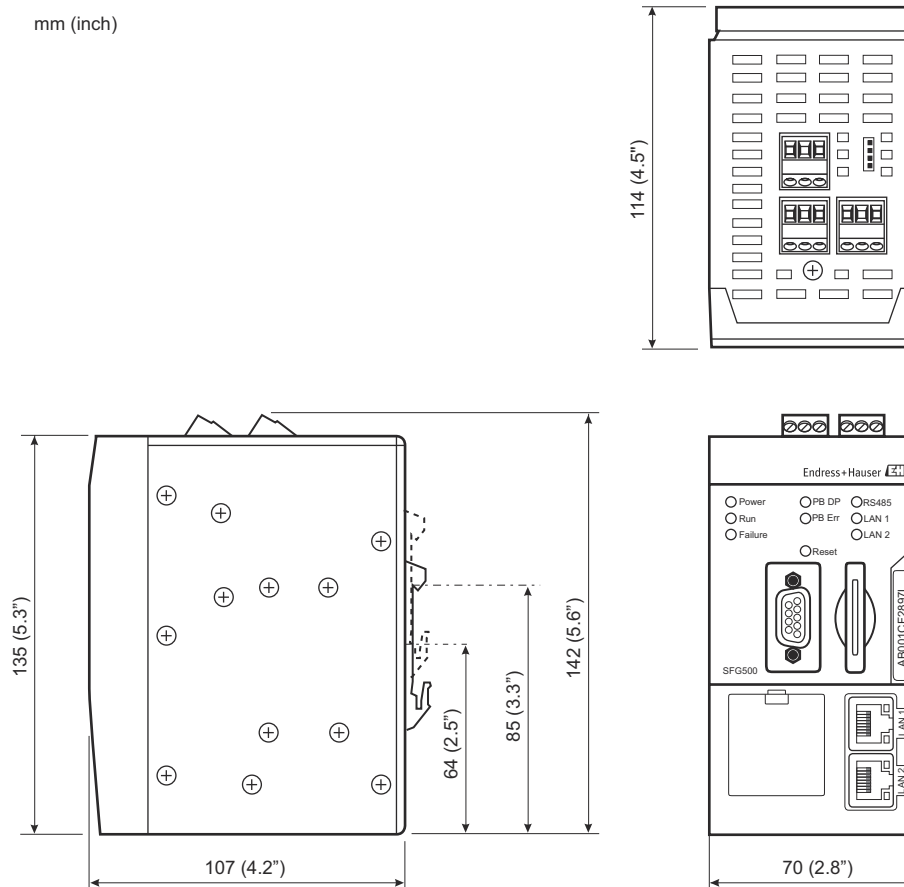
*Mounting of Fieldgate SFG500*

## Environment

<b>Ambient temperature range</b>	-0°C to +60°C, +32°F to 140°F
<b>Storage temperature</b>	<ul style="list-style-type: none"> <li>With lithium battery installed: -20°C to +60°C, -4°F to +140°F</li> <li>Without lithium battery: -25°C to +70°C, -13°F to +158°F</li> </ul>
<b>Relative humidity</b>	10% to 90%, non-condensing; both for use and storage
<b>Altitude</b>	Max. 2000 m (6500 ft) above sea level
<b>Vibration resistance</b>	EN/IEC 61131-2:2007: 5Hz - 8.4 Hz: 3.5 mm; 8.4Hz - 150Hz: 10 ms <sup>-2</sup>
<b>Shock resistance</b>	EN/IEC 61131-2:2007: 15 g, 11 ms
<b>Electromagnetic compatibility</b>	<p>Complies with the requirements of the EC Directive 2004/108/EG "Electromagnetic Compatibility".</p> <ul style="list-style-type: none"> <li>Electromagnetic compatibility to EN/IEC 61131-2: 2007 (Programmable Controllers) <ul style="list-style-type: none"> <li>Immunity: EN 61000-6-2:2006, industrial environment</li> <li>Emission: EN 61000-6-4:2007</li> </ul> </li> </ul>
<b>MTBF</b>	<ul style="list-style-type: none"> <li>15 years at an ambient temperature of 25°C (77°F) <ul style="list-style-type: none"> <li>Battery must be changed every five years</li> </ul> </li> <li>Relay contact dependent upon the number of switching events</li> <li>All connectors designed for min. 100 connections/disconnections</li> </ul>

## Mechanical Construction

**Overall dimensions** W x H x D: 142 mm x 70 mm x 114 mm (5.6" x 2.8" x 4.5")



*Dimensions of Fieldgate SFG500*

<b>Weight</b>	Approx. 0.7 kg
<b>Housing material</b>	Body: Aluminium alloy (EN AW 5754) with transparent passivated surface finish (conducting) Front panel: ABS
<b>Degree of protection</b>	IP 20; NEMA Type 1 (General Purpose)
<b>Type of protection</b>	None
<b>Operational safety</b>	IEC 61010-1: Protection Class III

## Operability

<b>Operating mode</b>	<ul style="list-style-type: none"> <li>Basic mode: Access Point</li> <li>Other operating modes require the use of a Fieldgate Module SFM500</li> </ul>
<b>Configuration</b>	Web browser via Ethernet or SFGNetwork DTM
<b>Operating elements</b>	<ul style="list-style-type: none"> <li>1x Reset push button for interrupting operation or hardware reset</li> <li>8x LEDs for indicating current operating modes and fault status</li> <li>4x LEDs in Ethernet ports indicating communication status</li> </ul>
<b>IP address</b>	<ul style="list-style-type: none"> <li>LAN1: Configurable via Web browser, default 192.168.253.2</li> <li>LAN2: Fixed, 192.168.253.1</li> <li>LAN2 has a DHCP server for automatic assignment of IP address to connected computers</li> </ul>
<b>Web-Server</b>	<ul style="list-style-type: none"> <li>Device information page</li> <li>Ethernet settings (IP address) and firmware download</li> <li>PROFIBUS settings and PROFIBUS live list</li> </ul>

The screenshot shows the 'PROFIBUS Live List' page. The table contains the following data:

Address	Module	Status	Address	Status	Address	Status	Address	Status	Address	Status
#500	M001	M002	#503	#504	#505	#506	S007	#508	#509	
#510	#511	#512	#513	#514	#515	#516	#517	#518	#519	
#520	#521	#522	#523	#524	#525	#526	#527	#528	#529	
#530	#531	#532	#533	#534	#535	#536	#537	#538	#539	
#540	#541	S042	#543	#544	#545	#546	#547	#548	#549	
#550	#551	#552	#553	#554	S055	#556	#557	#558	#559	
#560	#561	#562	#563	#564	#565	#566	#567	#568	#569	
#570	#571	#572	#573	#574	#575	#576	#577	#578	#579	
#580	#581	#582	#583	#584	#585	#586	#587	#588	#589	
#590	#591	#592	#593	#594	#595	#596	#597	#598	#599	
#600	#601	#602	#603	#604	#605	#606	#607	#608	#609	
#610	#611	#612	#613	#614	#615	#616	#617	#618	#619	
#620	#621	#622	#623	#624	#625	#626	#627	#628	#629	

## Certificates and Approvals

<b>CE Mark</b>	CE to EN/IEC 61131-2: 2007
<b>Safety approval</b>	TÜV NRTL to EN/IEC/UL/CAN/CSA C22.2-No 61010-1

## Ordering Information

<b>Fieldgate SFG500</b>	Order Code: 71116672
<b>Fieldgate Module SFM500</b>	<ul style="list-style-type: none"> <li>Asset Monitor: SFM500-A1 (in preparation)</li> <li>Process Monitor: SFM500-B1 (in preparation)</li> </ul>

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## Documentation

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### Fieldgate SFG500

- Fieldgate SFG500  
Innovation Brochure IN00015S/04/en
- Fieldgate SFG500: Installation and Commissioning  
Operating Instructions BA00070S/04/en
- Fieldgate SFG500: Operation as Access Point  
Operating Instructions BA00071S/04/en
- Fieldgate SFG500: Operation as Asset Monitor  
Operating Instructions BA00072S/04/en  
(in preparation)
- Fieldgate SFG500: Operation as Process Monitor  
Operating Instructions BA00074S/04/en  
(in preparation)
- Fieldgate SFG500  
Getting Started BA00073/04/a2

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### FieldCare

- FieldCare  
Competence Brochure CP00001S/04/en

### Instruments International

Endress+Hauser  
Instruments International AG  
Kaegenstrasse 2  
4153 Reinach  
Switzerland

Tel. +41 61 715 81 00  
Fax +41 61 715 25 00  
[www.endress.com](http://www.endress.com)  
[info@ii.endress.com](mailto:info@ii.endress.com)

**Endress+Hauser**   
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