Technical Information
Fieldgate SFG500

Intelligent Ethernet/PROFIBUS gateway

Parallel access to PROFIBUS networks
Monitoring of PROFIBUS device status

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 diagnosis
- HART Support via PROFIBUS:
  HART device support and device diagnosis
- 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)

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Function and System Design

<table>
<tr><td>Function</td><td>

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).

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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.
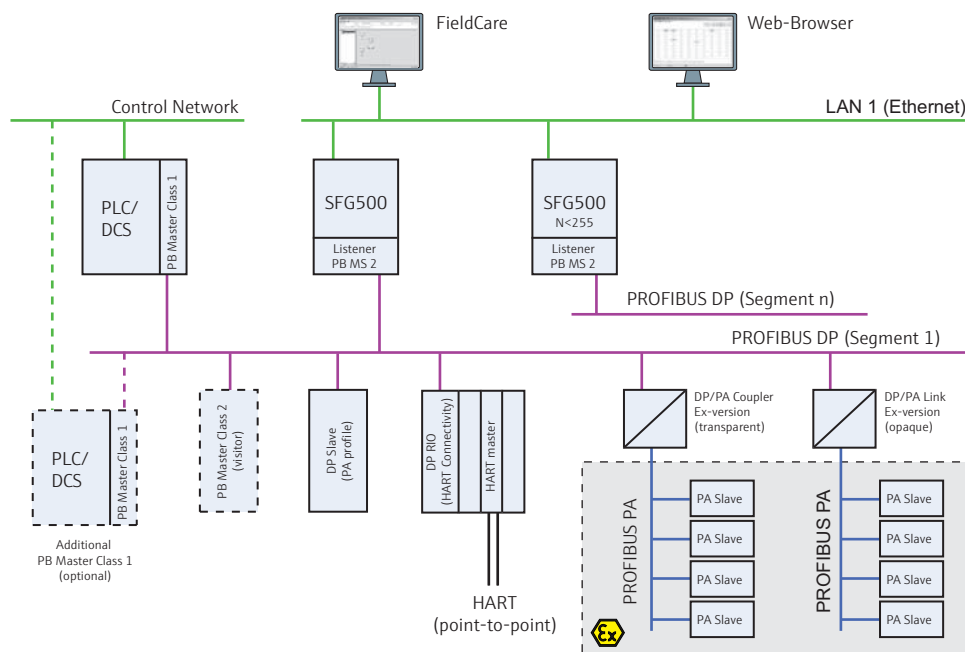

Fig 1: System architecture for Fieldgate SFG500 operating as an access point

IT-security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

Output

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

Digital Communication Interface

PROFIBUS DP

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

Ethernet (100 BASE-T/100 BASE TX)

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

RS-485 serial interface

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

Power Supply

Supply voltage	18 VDC - 36 VDC: the supply voltage must be carried out by an SELV power supply
Current	0.35 A - 0.20 A
Power	7.2 W
Connection facilities	• Two 3-port terminal blocks • Screw terminals: 0.2 mm^2 to 4 mm^2 for solid wire, 0.2 mm^2 to 2.5 mm^2 for stranded wire
Battery (for memory)	3V lithium manganese dioxide battery type CR2450: • Operating temperature range:-20°C – +85°C (-4°F – +178°F) • Nominal voltage: 3 V • Nominal capacity: 610mAh • Maximum current: 15mA • UL Recognition: e.g. MH12568

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")

Caution: allow 50 mm (2") clearance all round to ensure adequate ventilation
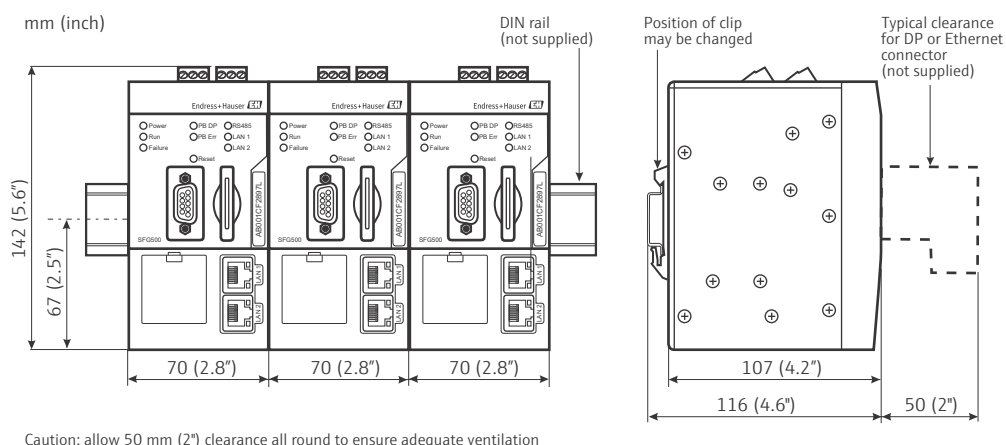
Fig 2: Mounting of Fieldgate SFG500

Environment

Ambient temperature range	−0°C to +60°C, +32°F to 140°F
Storage temperature	▪ With lithium battery installed: −20°C to +60°C, −4°F to +140°F ▪ Without lithium battery −25°C to +70°C, −13°F to +158°F
Relative humidity	10% to 90%, non-condensing; both for use and storage
Altitude	Max. 2000 m (6500 ft) above sea level
Vibration resistance	EN/IEC 61131-2:2007: 5Hz - 8.4 Hz: 3.5 mm; 8.4Hz - 150Hz: 10 ms^{-2}
Shock resistance	EN/IEC 61131-2:2007:15 g, 11 ms
Electromagnetic compatibility	Complies with the requirements of the EC Directive 2004/108/EG "Electromagnetic Compatibility". ▪ Electromagnetic compatibility to EN/IEC 61131-2: 2007 (Programmable Controllers) – Immunity: EN 61000-6-2:2006, industrial environment – Emission: EN 61000-6-4:2007
MTBF	▪ 15 years at an ambient temperature of 25°C (77°F) – Battery must be changed every five years ▪ Relay contact dependent upon the number of switching events ▪ All connectors designed for min. 100 connections/disconnections

Mechanical Construction

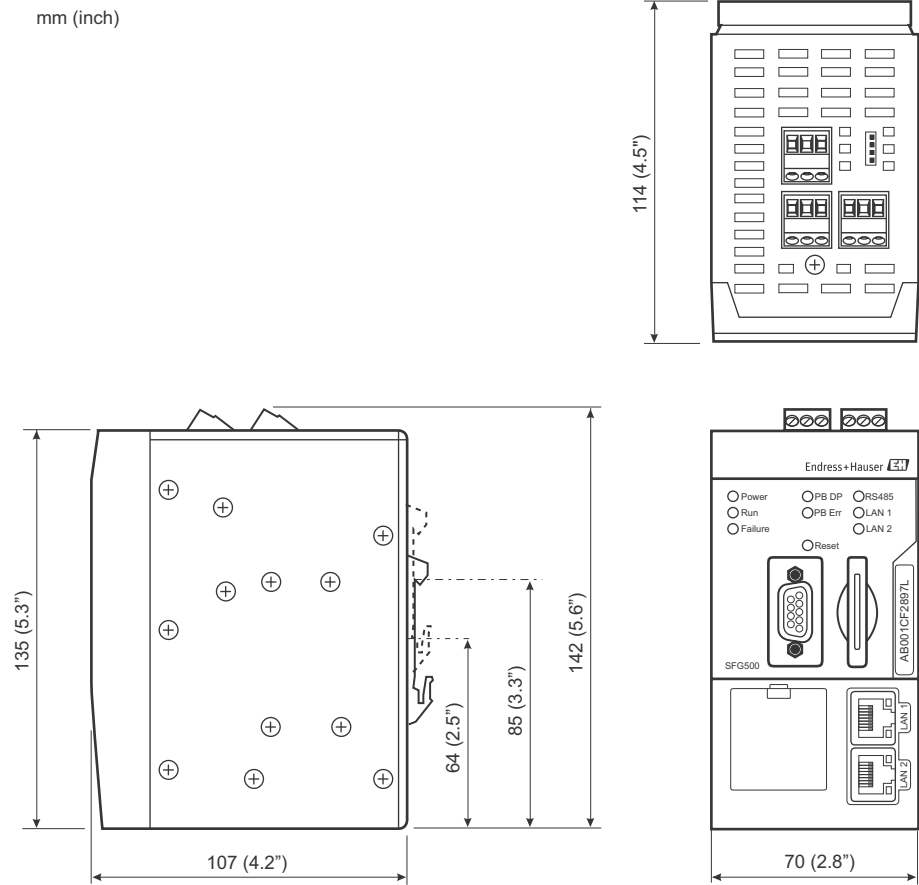**Overall dimensions** W x H x D: 142 mm x 70 mm x 114 mm (5.6" x 2.8" x 4.5")

mm (inch)

Fig 3: Dimensions of Fieldgate SFG500

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

Operability

Operating mode	• Basic mode: Access Point • Other operating modes require the use of a Fieldgate Module SFM500
Configuration	Web browser via Ethernet or SFGNetwork DTM
Operating elements	• 1x Reset push button for interrupting operation or hardware reset • 8x LEDs for indicating current operating modes and fault status • 4x LEDs in Ethernet ports indicating communication status
IP address	• LAN1: Configurable via Web browser, default 192.168.253.2 • LAN2: Fixed, 192.168.253.1 • LAN2 has a DHCP server for automatic assignment of IP address to connected computers
Web-Server	• Device information page • Ethernet settings (IP address) and firmware download • PROFIBUS settings and PROFIBUS live list
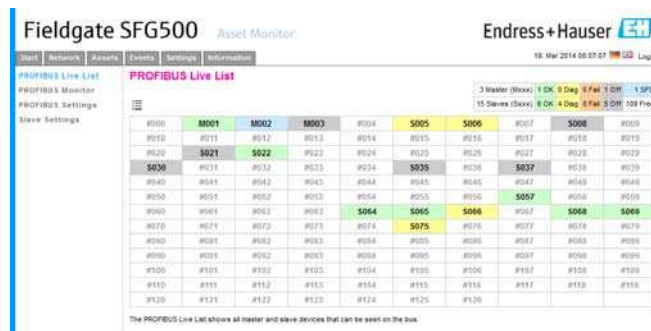
Certificates and Approvals

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

Ordering Information

Fieldgate SFG500	Order Code: 71116672
Fieldgate Module SFM500	• Asset Monitor: SFM500-A1 • Process Monitor: SFM500-B1 (in preparation)

Documentation

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

❑ Fieldgate SFG500:
Operation as Process Monitor
Operating Instructions BA00074S/04/EN
(in preparation)

❑ Fieldgate SFG500
Getting Started BA00073/04/A2

FieldCare

❑ FieldCare
Competence Brochure CP00001S/04/EN

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