

# SAE-FW-5-GATE

## MICRO-TELECONTROL STATION



### THE COMPACT COMMUNICATION SPECIALIST

The SAE-FW-5-GATE RTU is designed especially for communication-intensive applications in telecontrol, substation control and automation technology. It is based on the successful FW-5. In order to offer more communication possibilities in an even smaller space, integrated inputs/outputs have been omitted. The FW-5-GATE can of course also be supplemented with expansion modules and interface units.



### TYPICAL APPLICATIONS

- Intelligent secondary unit substation with integration of power measurement terminal, earth fault/short circuit indicators and network analysis systems
- Smart meter integration in energy management systems and remote meter reading control centres
- Intelligent measurement for wide area tension control in distribution networks
- Bay unit in transformer substations with link to protective equipment
- Monitoring of infrastructure systems and pipe-bound media
- Interconnection of virtual power plants
- Control box for Redispatch 2.0 applications
- Transparent protocol converter\* for conversion between IEC -101 and -104

\* Function available from setIT V5.4.

### IMPORTANT PROPERTIES:

#### SAE-FW-5-GATE Hardware

The basic system can be expanded according to individual requirements and has impressive electric strength. It offers the following capacity and functions:

- 2 Ethernet LAN connections TCP/IP
- 2 RS-485 field interfaces or CL/S0 meter interface in FW-5-GATE-cl
- RS-232/V.24 interface
- Temperature sensor -25° to 100° C

#### SAE-FW-5-GATE Software

Extremely fast setup and a high level of compatibility thanks to the innovative and well-established setIT parameterization software:

- Intuitive operator guidance
- Almost complete prevention of input errors
- Fault analysis by click and link to inaccurate entry
- Practical copy functions
- Context-sensitive online help
- Calculation and logic functions
- Extensive diagnostic features
- Integrated project documentation
- Integrated soft PLC



## COMMUNICATION ROUTES

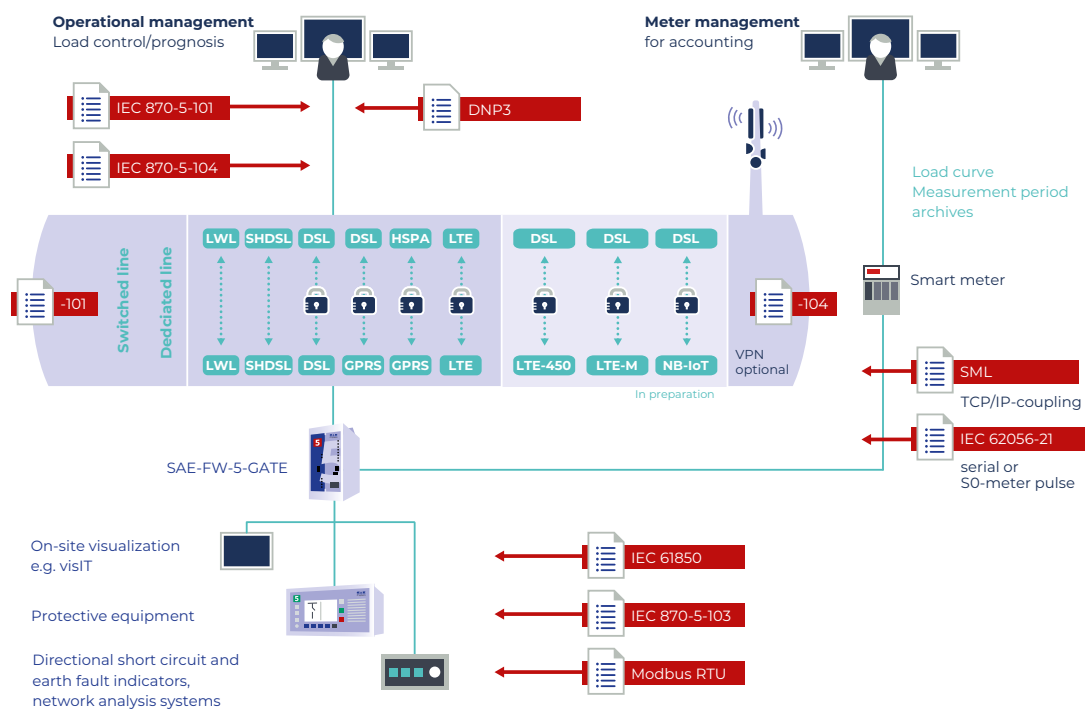
### From the network to the Smart Grid

The SAE-FW-5-GATE is equipped with additional interfaces for coupling of external components to form intelligent networks. As with all the devices of the series5 range of products, the connection to the control centre can be made by many communication routes and protocols directly or with a shell of a telecontrol master station, backed up with redundant systems if required.

Local meter integration is made via a second LAN link with SML protocol or via the additional serial interface with IEC 62056-21 protocol. In the CL variant, S0 meter pulse detection can also be used.

### Example integration of intelligent meters

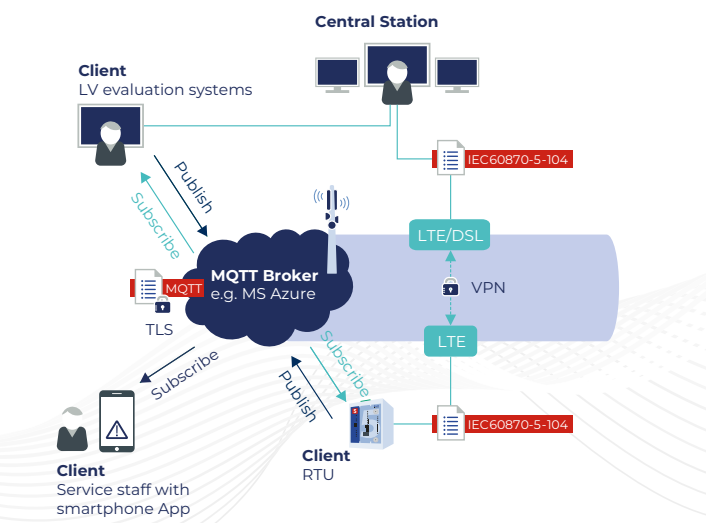
As well as 15-minute load profiles being provided for billing in the meter control centre, the data required for load control and forecast calculations can also be supplied to power system management e.g. in 1-minute measurement periods. Addressing using the OBIS data model and identification by means of the device-specific server ID allow a very quick mapping of extensive information of the four quadrant meters, including the voltages, currents and powers in setIT. Conversion factors and overflow thresholds can be stored here to display the values in a suitable manner. setIT also performs standard mathematical procedures e.g. to calculate an average MV level for LV wide area control.



## MQTT

Especially the comprehensive information from low voltage networks cannot and usually does not have to be integrated into existing control systems. Increasingly, a separate provision of this data via cloud-based systems is being considered.

For this purpose, our telecontrol systems support the MQTT protocol (Message Queuing Telemetry Transport) and can thus transfer selected information securely and reliably into the IoT world.



# TECHNICAL DATA

Main functions	Details
<b>Structure</b>	Substation /bay control, telecontrol and automation system in plastic housing, I/O expansion and communication modules, DIN rail mounting
<b>Communication</b>	2 Ethernet LAN TCP/IP, 10/100BaseTx, auto-MDIX, auto-negotiation 1 RS-485 interface, galvanically isolated 1 RS-485 meter interface or CS/S0 interface, galvanically isolated 1 RS-232/V.24 interface
<b>Input/output</b>	Up to 12 expansion modules for operation of single-/double-point, transformer tap and alarm signals, measurands, metered values, single, double and transformer tap commands, temperature sensor -25° to +100° C ±2° C
<b>Protocols</b>	IEC 61850 · IED and protective equipment IEC 60870-5-101 · telecontrol technology, station control technology IEC 60870-5-103 · protective equipment IEC 60870-5-104 · TCP/IP link to control center DNP3 master/outstation · serial/IP IEC 62056-21 · meter connection (former IEC 1107) SML · smart meter link via Ethernet DSfC · digital interface for natural gas equipment Modbus RTU/TCP · master/slave, Profibus-DP slave, MPI/3964R/RK512 · field bus SNMP · network management NTP-/SNTP-/DCF- clock synchronization VPN-Tunnel · IPsec (IKEv1/IKEv2), OpenVPN, TLSSyslog-ng Server LDAP- and RADIUS-Server MQTT
<b>PLC programming</b>	IEC 61131-3 compatible via straton or codeIT, 128 kB program memory
<b>CPU-5E series5e</b>	RISC processor Cortex-A8, 1200MIPS@800 MHz, FPU, Watchdog, real-time clock 1 GB memory (512 MB SDRAM, 512 MB SLC Flash)
<b>Memory expansion</b>	1 GB microSD card (up to 8 GB in perspective)
<b>Real-time clock</b>	Deviation max. ±10 ppm in operation, maintenance-free buffer ±20 ppm 60 days @25°C, daylight saving time changeover, leap year correction
<b>Status displays</b>	Process status of the PLC, front panel for system, communication and VPN, diagnostics via integrated web server, visIT plant visualization (optional)
<b>Service interface</b>	Ethernet LAN 10/100BaseTx, auto-MDIX, USB 2.0 device 480 MBit/s, USB 2.0 host 12 MBit/s (configuration/archive synchronization via stick)
<b>Fault signal output</b>	to be configured to relay output, configurable sys-LED
<b>Power supply</b>	24 V DC (-15%/+30%), no galvanic isolation With additional expansion module PS-60: 24 to 60 V DC (-15% + 20%), insulation 1500 V
<b>Dielectric strength</b>	5 kV surge supply & process I/O to PE, according to class VW3 2.5 kV surge supply to measurands, RS-232, USB
<b>Standards</b>	EMC: IEC 60870-2-1, EN 61000-6-2 /61000-6-4, EN 55032, Device class B
<b>Housing</b>	Polyamide V0, IP20, weight 240 g, Dimensions: 45×105×115 mm (W×H×D) Expansion modules: 22.5×105×115 mm (W×H×D)
<b>Installation</b>	DIN rail mounting, DIN-EN 60715 TH35
<b>Terminals</b>	MSTB removable screw-type or spring terminal Combicon, 0,2 to 2,5 mm <sup>2</sup>
<b>Ambience</b>	-25 to +70° C, Ø24h max. 55°C, max. 3000 m above sea level relative humidity <95%, without condensation

# Overview of the expansion modules



The SAE-FW-5-GATE can be extended with up to 12 expansion modules. Various modules with different capacities at inputs/outputs allow flexible process integration which meets your requirements. With the TBUS-T and TBUS-R accessories, the modules can also be placed remotely from the base system. For higher power supply requirements, above the capacities of the basic unit, the power supply module PWR-1 can be added.

## Signals and commands

8DI	8 signals
8DO	8 commands
8DI2AI	8 signals, 2 measurands

## Measurands and set points

4AI	4 measurands
2AO	2 set points
4AO	4 set points

## Modules for special tasks

4DI4DO	4 signals, 4 measurands
RES-1	4 S0 Impulseingänge, 2 Messwerte, 4 Befehle
VPP-1	6 signals, 2 measurands, 5 commands, 2 set points
PM-1	Power measurement terminal LV/MV
PM-2	Power measurement terminal LV/MV
ISO-1	4 KMR leakage detection

## Command termination

DSO-1	6 commands, 6 check-back signals, 1,5-pin
DSO-2	4 commands, 2 Rückmeldungen, 2-pin

## Communication

PDPS-1	Profibus-DP slave
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## Other accessories

PWR-1	Power booster with larger capacity
TBUS-T	T-Bus extension transmitter
TBUS-R	T-Bus extension receiver

## PRODUCT VARIANTS & ACCESSORIES

### FW-5-GATE

2 Ethernet/LAN interfaces,  
2 RS-485 field interfaces  
1 RS-232/V.24 interface

### FW-5-GATE CL

2 Ethernet/LAN interfaces,  
1 RS-485 field interface,  
1 CL/S0 meter pulse interface,  
1 RS-232/V.24 interface

### FW-5-GATE-4G

2 Ethernet/LAN interfaces,  
2 RS-485 field interfaces  
1 RS-232/V.24 interface  
4G/LTE mobile router

### FW-5-GATE-450

2 Ethernet/LAN interfaces  
2 RS-485 field interfaces  
1 RS-232/V.24 interface  
450 MHz CDMA radio module

### PS-60

Power supply module  
24 to 60 V DC