

# SAE-FW-5

## MICRO-TELECONTROL STATION

### OUTSTANDING PERFORMANCE IN LIMITED SPACE

The SAE-FW-5 RTU provides cost-effective solutions for telecontrol, station control and automation applications without compromising on quality and functionality. The compact field device in a stable DIN-rail housing contains all the components a high-performance system must provide for monitoring, control, archiving and transmission. The capacity of the FW-5 can be adjusted optimally to the conditions of your application by means of expansion modules for inputs and outputs (I/O) as well as for interface modules. Tailor-made solutions are made possible for virtually any task.



### TYPICAL APPLICATIONS



- Bay unit in transformer substations with link to protective equipment
- Intelligent secondary unit substation including earth fault and short circuit indicators in the outgoing feeders
- Control box for direct marketing of power
- Feed-in management in renewable energy plants
- Intelligent measurement point for wide area control in distribution networks
- Monitoring of infrastructure systems and pipe-bound media
- Control unit for Redispatch 2.0 applications

### IMPORTANT PROPERTIES:

#### SAE-FW-5 Hardware

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

- 8 indication inputs
- 4 command outputs
- 2 measurand inputs, 16 bit, bipolar, multi-range
- Ethernet LAN TCP/IP
- RS-485 field interface
- RS-232/V.24 interface
- Integrated wide range power supply unit, 20 to 72 V DC
- Configuration via LAN, USB, memory stick or SD card
- Removable screw or spring-type terminals

#### SAE-FW-5 Software

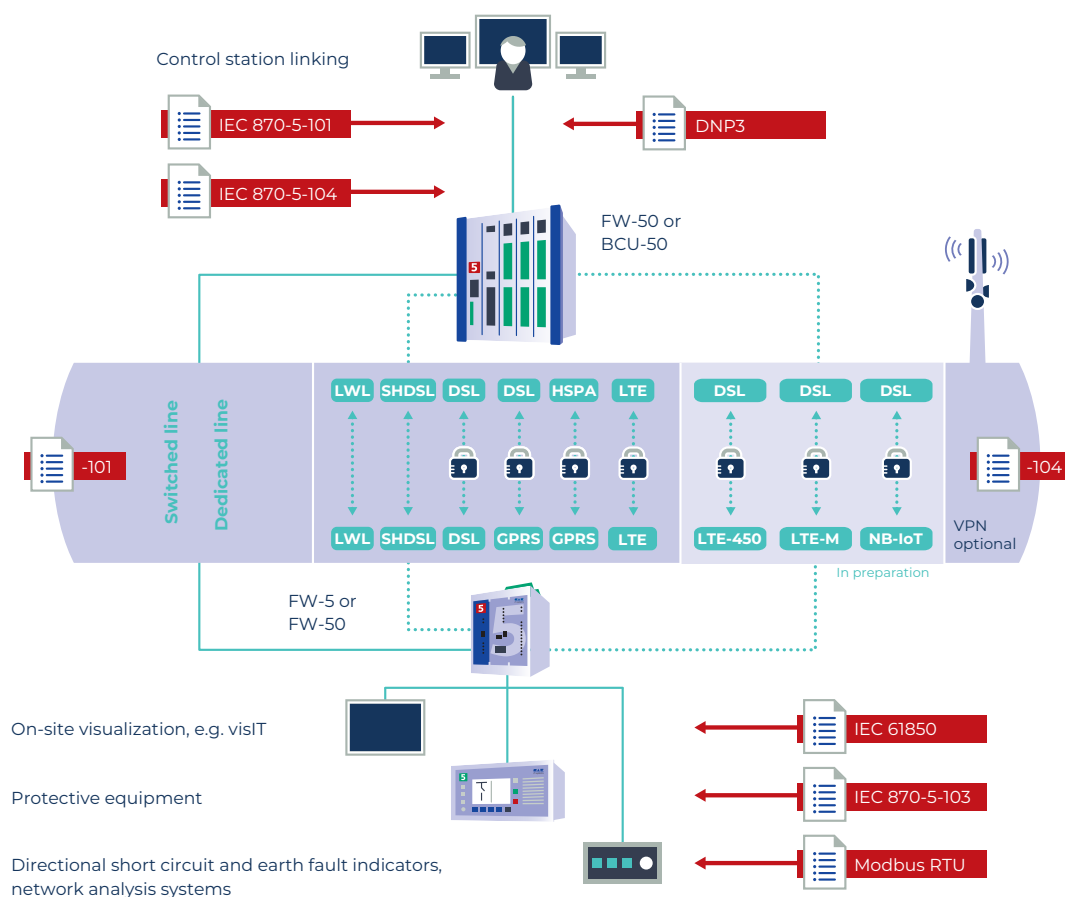
Extremely fast setup and a high level of compatibility thanks to the innovative and well-established setIT parameterization software.



- 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

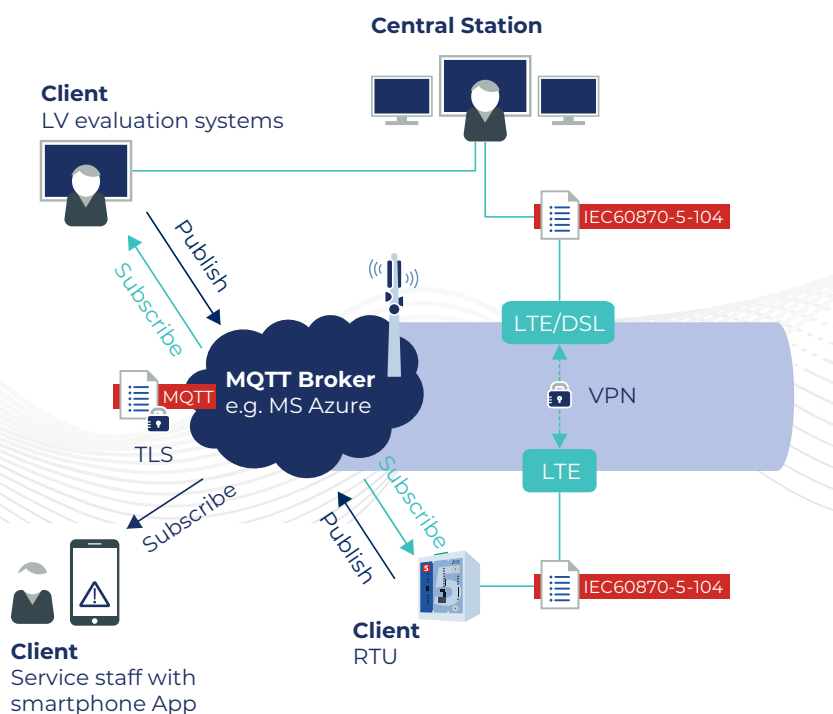
As with all the devices of the series5e products, the link to the control centre can be realised by many communication routes and protocols directly or via master station, backed up with redundant systems if required.



## MOTT

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
Structure	Substation /bay control, telecontrol and automation system in plastic housing, integrated I/O, I/O expansion and communication modules, DIN rail mounting
FW-5 base station capacity	8 digital wide range inputs, $\pm 24$ to $\pm 60$ V DC $\pm 20\%$ , optocoupler, common root; 4 relay closer, 2-pole, 24 to 72 V DC, 2A@24VDC, isolated by channel, 2 measurands, 16 bit, uni-/bipolar, overflow/underrun, multi-range mA
Communication	1 Ethernet LAN TCP/IP, 10/100BaseTx, auto-MDIX, auto-negotiation 1 RS-485 interface, galvanically isolated; 1 RS-232/V.24 interface
Input/output	Temperature sensor for ambient temperature, $-25^{\circ}\text{C}$ to $100^{\circ}\text{C}$ , measuring error $\pm 2^{\circ}\text{C}$ Single-point, double-point, transformer tap position and alarm signals, measurands, metered values, single, double and transformer tap commands, metered value pulse outputs, expandable up to 12 extension modules
Protocols	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 centre DNP3 server · serial/IP IEC 62056-21 · smart meter link (former IEC 1107) SML · smart meter link via Ethernet DSfG · interface for natural gas equipment Modbus RTU/TCP · master/slave, Profibus-DP slave, MPI/3964R/RK512 · fieldbus SNMP · network management NTP/SNTP/DCF clock synchronisation VPN-Tunnel · IPsec (IKEv1/IKEv2), OpenVPN Syslog-ng Server LDAP- and RADIUS-Server MQTT
PLC programming	IEC 61131-3 programming via codeIT, 128 kb program memory
CPU-5E series5e	RISC processor Cortex-A8, 1200MIPS@800 MHz, FPU, watchdog, real-time clock 1 GB memory (512 MB SDRAM, 512 MB SLC Flash)
Memory expansion	1 GB SD-card (up to 8 GB in perspective)
Real-time clock	Deviation max. $\pm 10$ ppm in operation, maintenance-free buffer $\pm 20$ ppm 60 days @ $25^{\circ}\text{C}$ , daylight saving time changeover, leap year correction
Status display	Process status of the PLC, LED in front panel for system, communication and binary process values, diagnostics via integrated web server, visIT plant visualization (optional)
Service interface	Ethernet-LAN 10/100BaseTx, auto-MDIX, USB 2.0 device 480 MBit/s, USB 2.0 host 12 MBit/s (configuration/archive synchronisation via stick)
Fault signal output	To be configured to relay output, configurable sys-LED
Power supply	24 to 60 V DC ( $-15\%/+20\%$ ), insulation 1500 V
Dielectric strength	5 kV surge supply and process I/O to PE, according to class VW3 2.5 kV surge, supply to measurands, EIA/RS-232, USB
Standards	EMC: IEC 60870-2-1, EN 61000-6-2 /61000-6-4, EN 55032, Device class A Insulation: IEC 60870-2-1, IEC 60255-5
Housing	Polyamide V0, IP20, weight: 360 g, Dimensions: 68×105×115 mm (W×H×D), expansion modules: 22.5×105×115 mm (W×H×D)
Installation	DIN rail mounting, DIN-EN 60715 TH35
Terminals	MSTB removable screw-type terminal or Combicon spring terminal, 0.2 - 2.5 mm <sup>2</sup>
Environment	$-25$ to $+70^{\circ}\text{C}$ , $\varnothing 24\text{h}$ max. $55^{\circ}\text{C}$ , max. 3000 m above sea level, relative humidity $<95\%$ , without condensation



# Overview of the expansion modules



The SAE-FW-5 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 Impulseingange, 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

## 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 FW-5 base unit

- FW-5-GATE 2 Ethernet/LAN interfaces, 2 RS-485 field interfaces, 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

- mcPS-1 Power supply module for media converter 24 to 60 V DC ± 20%

- mcFO Media converter, FO coupler with ST or SC connector



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