SAE-FW-5-GATE-4G

WITH INTEGRATED LTE MODEM

SECURE CONNECTION

The comprehensive monitoring and control of supply networks and other large infrastructures is not economically viable without a mobile radio connection. The SAE-FW-5-GATE-4G combines powerful telecontrol technology with an LTE modem for flexible mobile radio connection.

As with all FW-5 series remote terminal units, the SAE-FW-5-GATE-4G can be extended with I/O extension boards and interface modules in a top-hat rail housing. This makes it easy to implement compact telecontrol systems with the exact required capacity. The SAE-FW-5-GATE-4G allows for a high degree of IT security in harmony with the requirements of the BDEW whitepaper and BSI recommendations.

TYPICAL APPLICATIONS

- Intelligent local network stations with integration of power measurement terminals, earth fault-/ short circuit indicators, network analysis systems and protective equipment
- Feed-in management in renewable energy plants
- Control box for direct marketing and balancing energy
- Intelligent measurement point for wide range regulation in distribution networks
- Monitoring of media and infrastructure systems in pipelines
- Controls for street lighting
- Merging virtual power stations
- Control box for Redispatch 2.0 applications

IMPORTANT PROPERTIES:

SAE-FW-5-GATE-4G Hardware

The high performance of the SAE-FW-5-GATE-4G has a particularly positive impact on the network communication via IEC 61850 and process point treatment according to IEC 60870-5-10x standards. The base system comprises:

- LTE wireless mobile modem 4G/3G/2G
- 2 Ethernet LAN TCP/IP connections
- 2 RS-485 field interfaces
- CL/S0 meter interface with FW-5-GATE-4G CL and FW-5-GATE-4G-D CL (reduces the number of RS-485 field interfaces)
- RS-232/V.24 interface
- Temperature sensor -25° to +100° C

The PS-60 expansion module provides an external power supply (24 to 60 V DC (-15%/+ 20%)), both galvanically isolated or reduntant implementation.

SAE-FW-5-GATE-4G Software

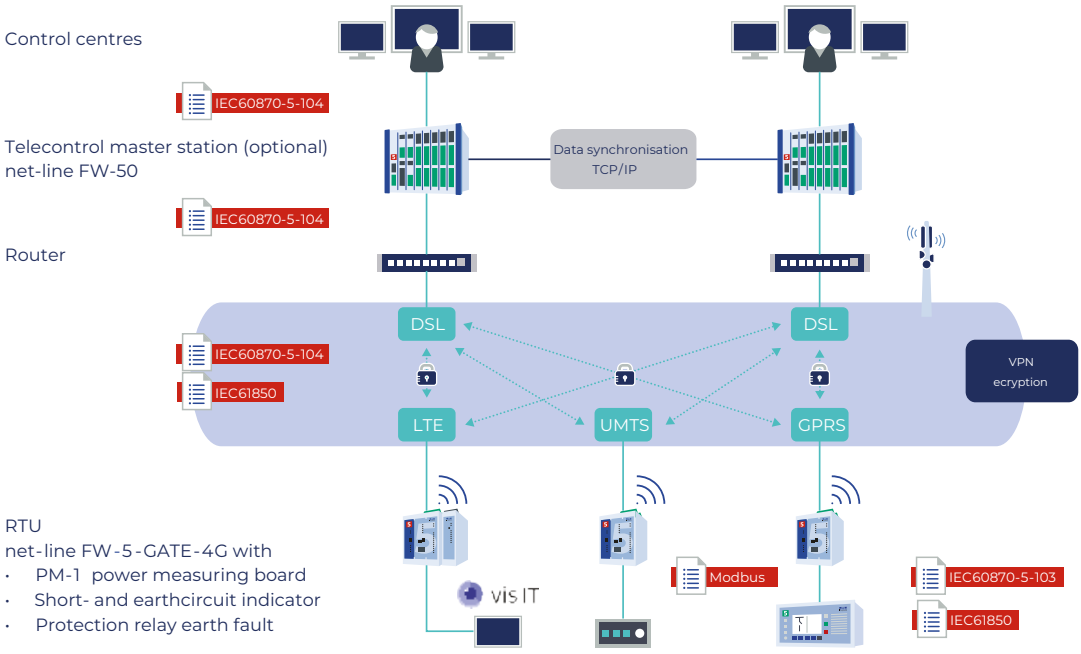
The parametrization software setIT provides quick launch and high compatibility with telecontrol systems. Full configuration of all components of the SAE-FW-5-GATE-4G device in setIT means that there is no need to integrate or adapt an external modem, which can be time-consuming. Up to 8 VPN tunnels with end-to-end-encryption can be set up from the station. In addition, all available information from the mobile radio module can be used in the setIT diagnostics functions.

The optional soft-PLC straton offers additional flexibility and allows for the implementation of diverse PLC programs according to IEC 61131-3.

visIT, a web-based plant visualization tool allows user interfaces to be created conveniently by importing process variables from setIT. It runs as a runtime in the remote terminal unit, has access to its process data/logged values and can display information relevant for service and operation.

SAE - YOUR SOLUTIONS PROVIDER

On request, we can assist you with complete project processing. From selecting the best fitting components and coordinating all project participants, to practical integration of systems into existing infrastructures. In all these areas, you can take advantage of our extensive know-how.



SECURE COMMUNICATION ACCORDING TO THE BDEW WHITEPAPER

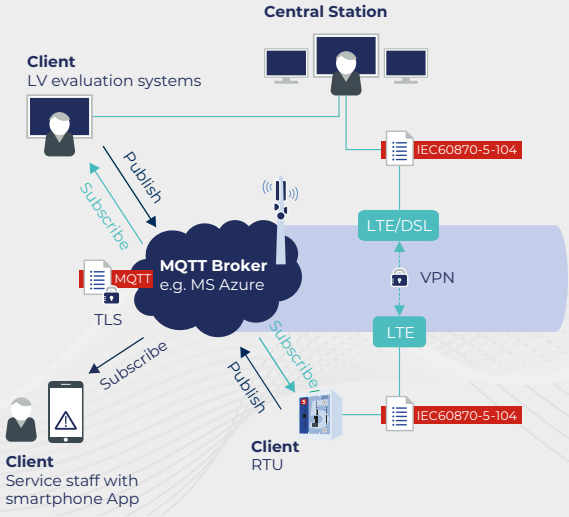
As with all series5e remote control technology devices, the FW-5-GATE-4G offers a high level of IT security and expertly addresses the complex security requirements in the real world.

- Secure encryption and hashing algorithms, e.g. for encrypting project files with AES-256
- User profiles with individual assignment of rights (Role Based Access Control (RBAC))
- VPN tunnel from the station (end-to-end encryption with IPsec IKEv1/IKEv2 or OpenVPN protocols)
- Secure file transfer via FTPS, e.g. for the Station update
- More secure web communication through HTTPS
- Disabling of accesses and services like USB port, USB Ethernet, web server
- Integrated firewall (whitelist concept)
- Syslog for central recording of events

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.



SAE IT-SYSTEMS

TECHNICAL DATA

Main functions	Details
Structure	Substation /bay control, telecontrol and automation system in plastic housing, I/O expansion and communication modules, DIN rail mounting
Communication	LTE modem 4G, 3G/2G backup, standard or MIMO antenna, 2 Ethernet LAN TCP/IP, 10/100BaseTx, auto-MDIX, auto-negotiation 1 RS-485 interface, galvanically isolated 1 RS-485 meter interface or CL/S0 interface, galvanically isolated 1 RS-232/V.24 interface
Input/output	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
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 center DNP3 master/ outstation · serial/IP IEC 62056-21 · meter connection (former IEC 1107) SML · smart meter link via Ethernet DSfG · digital interface for natural gas equipment Modbus RTU/TCP · master/slave, Profibus-DP slave, MPI/3964R/RK512 · field bus SNMPv3 · network management NTP-/SNTP-/DCF clock synchronization VPN-Tunnel · IPsec (IKEv1/IKEv2), OpenVPN, TLS Syslog-ng Server, LDAP- und RADIUS-Server MQTT
PLC programming	IEC 61131-3 compatible via straton or 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 microSD card (up to 8 GB in perspective)
Real-time clock	Deviation max. ±10 ppm in operation, maintenance-free buffer ±20 ppm 60 days @25°C, daylight saving time changeover, leap year correction
Status displays	Process status of the PLC, front panel for system, communication and VPN, 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 480 MBit/s (configuration/archive synchronization via stick)
Fault signal output	to be configured to relay output, configurable sys-LED
Power supply	24 V DC (-15%/+20%), no galvanic isolation Power failure management with power fail buffering With additional expansion module PS-60: 24 to 60 V DC (-15% + 20%), insulation 1500 V
Dielectric strength	5 kV surge supply & process I/O to PE, according to class VW3 2.5 kV surge supply to measurands, RS-232, USB
Standards	EMC: IEC 61000-6-2, IEC 61000-6-3, Device class B, ETSI EN 301 489-1 , 7, 24 Radio: ETSI EN 301 511, ETSI 301 908-1, 2, 13 Security: DIN EN 62368-1, EN 62311, EN 50383 Insulation: IEC 60870-2-1, IEC 60255-5
Housing	Polyamide V0, IP20, weight 310 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 or spring terminal Combicon, 0.2 to 2.5 mm^2
Ambience	-25 to +70° C, Ø24h max. 55°C, max. 3000 m above sea level relative humidity <95%, without condensation

SAE IT-SYSTEMS

Expansion modules

The SAE-FW-5-GATE-4G 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.

LTE MOBILE RADIO MODULE:

The LTE module radio module offers flexible coupling to the conductor and energy management systems thanks to its double antenna offers MIMO transmission (Multiple Input Multiple Output) and 3G/2G network fallback capability. The basis module allows 3GPP cat3 communication up to 100 Mbit/s.

FW-5-GATE-4G	Mobilfunkrouter LTE-IoT
Transmission	LTE 10 MBit/s down, 5 MBit/s up HSPA+ 42 MBit/s down, 5,76 MBit/s up, WCDMA 384 kBit/s, DGE 236,8 kBit/s, GPRS 85,6 kBit/s
Bands	4G FDD LTE:B1/B3/B5/B7/B8/B20 3G WCDMA: B1/B5/B8 2G GSM: B3/B8 900/1800 MHz
Antenna	MIMO DL , SMA-f

PRODUCT VARIANTS & ACCESSORIES

FW-5-GATE-4G
RTU with 4G modem
2 LAN interfaces, separated
2 RS-485 field & meter interfaces
1 RS-232/V.24 interface

FW-5-GATE-4G CL
RTU with 4G modem
2 Ethernet/LAN interfaces,
1 RS-485 field interface,
1 CL/S0 meter pulse interface,
1 RS-232/V.24 interface

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