SAE-FW-50

SCALABLE RTU

MODULAR AND POWERFUL

The SAE-FW-50 modular telecontrol system provides powerful solutions for telecontrol, station control and automation applications. With its compact size and the performance of the series5e range of products, it is made for extremely simple use and fast integration due to a comprehensive set-up, but ensures high IT-security.
The RTU offers a high degree of flexibility in three different module frames, thanks to the large selection of plug-in communication interfaces and input and output modules. In this way, the SAE-FW-50 can be used as a simple communication router or as a telecontrol station with small, medium or large I/O capacity. The system can be installed in any infrastructure thanks to the choice of DIN rail or wall mounting and the 19» mounting bracket.

TYPICAL APPLICATIONS

- Station and bay control device in medium- and high-voltage switchgear systems
- Gateway and communication router between substation buses, field bus and control systems
- Monitoring and control device for utility, waste management and industrial applications
- Data acquisition and communication system in traffic and infrastructure applications

IMPORTANT PROPERTIES

SAE-FW-50 Hardware
The basic system can be expanded according to individual requirements and has impressive electric strength.
It offers the following capacity and functions:

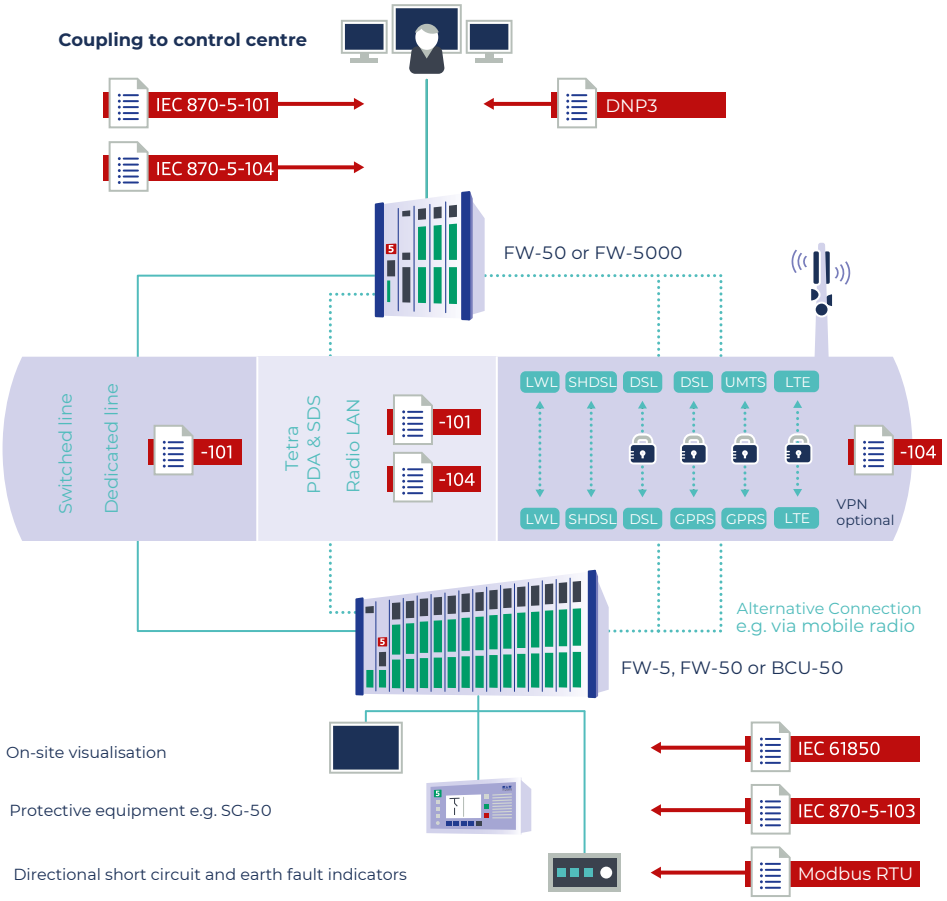
- CPU series5e with 1200 MIPS, 1 GB memory (512 MB SDRAM, 512 MB SLC Flash)
- Large selection of expansion modules:
  - Communication modules
  - Signal/command modules
  - Measurement/set point modules
  - Compatible with expansion modules of previous versions
- Up to 6 separate LAN segments
- High noise immunity, high insulation class
- Cascadable up to 16 racks to form a logic station
- Up to 28 protective equipment connections via integrated FO star coupler

Ideal handling
All components can be accessed and pulled out from the front. The operating state can be assessed quickly via the status LEDs.

- High speed download
- Memory stick for rapid setup or updates
- Backup of configuration, system and archives on SD card allows fast replacement of hardware
- Archive memory expansion via SD card
- Diagnostics and download via browser
- Area roll-out due to optional address allocation in browser
- Easy implementation of high IT security

COMMUNICATION ROUTES

A particular strength of the series5 lies in the large selection of communication possibilities and the redundant backup of routes, stations or process points. Links can be realised via numerous protocols directly to the control system or in a controlled manner with an interconnected telecontrol master station.



SAE-FW-50 Software

Our innovative and well-established setIT parameterisation software allows exceptionally fast setup. The integrated soft PLC via straton offers additional flexibility and allows many kinds of PLC programs to be implemented. A link to the OPC server can be realised by connectIT. The perfect solutions for station control systems, telecontrol technology or plant automation can be provided in this way.

Intuitive parameterization

set IT

Complex features can be integrated easily:

- Syntax checks to prevent input errors
- Fault analysis by click and link to inaccurate entry
- Practical copy functions
- Context-sensitive online help
- Calculation values and logic functions
- Extensive diagnostic features
- Integrated project documentation

SAE IT-SYSTEMS

TECHNISCHE MERKMALE

Main functions	Details
Structure	Modular station control, telecontrol and automation system plastic/V2a/alloy module frame with 4/7/14 slots
Communication	Example: Max. serial configuration 2 Ethernet LAN TCP/IP, 10/100BaseTx auto-MDIX, auto negotiation 4 additional LAN segments via switches 4 serial interfaces, 28 FO links serially as star coupler 1 communication component e.g. field bus
Input/output	Selection of 50 plug-in cards for: Single-point, double-point, transformer tap signals, measurands and metered values, single/double commands (1.5/2-pole), command termination, 1-of-n monitoring, transformer tap commands, set points, metered value outputs
Protocols	IEC 61850 · IED and protective device coupling IEC 60870-5-101 · telecontrol technology, station control technology IEC 60870-5-103 · protective device coupling IEC 60870-5-104 · TCP/IP coupling to control centre DNP3 master/outstation · serial/TCP IEC 62056-21 · meter connection (former IEC 1107) SML · smart meter connection via Ethernet DSfG · interface for natural gas equipment Profibus-DP · master/slave Modbus RTU/TCP · master/slave, MPI/3964R/RK512 · field bus SNMP · network management, NTP/SNTP/DCF clock synchronization VPN-Tunnel · IPsec (IKEv1/IKEv2), OpenVPN Syslog-ng Server LDAP- and RADIUS-Server
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 micro-SD card (up to 8 GB in perspective)
Real-time clock	Errors 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, CPU: 12 LEDs in front panel, green, red I/O cards: card error, status LED of process data (binary) Interfaces: Send and momentary contact signals depending on card type, visIT plant visualization (optional)
Service interface	Ethernet LAN 10/100BaseTx, auto-MDIX, USB device, USB 2.0 host 12 MBit/s (configuration/archive synchronization via stick)
Power supply	24 V DC (-15%/+20%), 24 / 48 / 60 supply via I/O slot optional (redundant for BGT-L)
Dielectric strength	5 kV surge, supply & process I/O to PE, according to class VW3 DIN EN 60870-2-1 2.5 kV surge, supply to measurands, 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 Security: DIN EN 60950-1
Housing	FW-50 module frame, polyamide V0, steel plate, IP 20, Width BGT-M: 228 mm /BGT-L: 432 mm /BGT-S: 152, Height 173 mm, Depth 135 mm
Installation	DIN rail, wall mounting with screw straps, 19" installation rack (for BGT-L)
Terminals	MSTBO removable screw-type or spring terminal Combicon, 0.2 to 2.5 mm²
Ambience	-25 to +70° C, Ø24h max. 55°C, max. 3000 m above sea level relative humidity <95%, without condensation

PRODUCT VARIANTS

FW-50-4 (BGT-S)
4 slots
64 digital I/O*
32 analog I/O*

FW-50-7 (BGT-M)
7 slots
112 digital I/O*
56 analog I/O*

FW-50-14 (BGT-L)
14 slots
224 digital I/O*
112 analog I/O*

* Max. values only apply to limited extent, as some extensions use identical resources.

SAE IT-SYSTEMS

Overview of the expansion modules

Communication modules

Dedicated line

SWI1-5	4-port Ethernet switch 10/100BaseTx, 4 * RJ-45, port mirroring auto negotiation, auto-MDIX, Isolation 1.5 kV AC
SWI1-6	FO/optical fibre 100BaseFx, Multimode SC/ST, port mirroring + 10/100BaseTx, RJ-45, auto neg., auto-MDIX, Isol. 1.5 kV AC
SWI1-7	Same as SWI1-6 but FO Singlemode SC/ST up to 32 km
SWI2-1	Additional LAN-segment via internal USB link 4-port Ethernet switch such as SWI1-5
SWI2-2	Additional LAN-segment via internal USB link FO/optical fibre and 1-port Ethernet switch such as SWI1-6
SWI2-3	Same as SWI2-2 but FO Singlemode SC/ST up to 32 km
SWI3-1	Supports redundant LAN connection with HSR or PRP
RS-485-2	EIA-485 symmetrical, max. 115 kbit/s, 1.2 km
RS-485-3	EIA-485 symmetrical, max. 115 kbit/s, 1.2 km, self-keying
RS-422-2	EIA-422 symmetrical, max. 115 kbit/s, 1.2 km
BBM-1	Baseband max. 19.2 kbit/s, 10 km, up to 8 users
WT12	VFT modem, R&TTE, FSK 1,2 kbit/s, max. 30 km, up to 17 users
WT96	VFT-comp., 9.6 kbit/s, 2-/4-wire max. 20 km, up to 17 users
V24-2	EIA/RS-232, max. 57.6 kbit/s, point-to-point
V24-3	RS-232 redundancy multipoint-to-point, max. 115 kbit/s
V24-4	RJ-45 to ETSI EN 392-300-5, max. 115 kbit/s, point-point
DPM-1	Profibus DP master, 1.2 km, 1 kbytes max. up to 31 users
DPS-1	Profibus DP slave, 1.2 km 386 bytes max.
FO-2	Star coupler serially with 2 FO media converters each, 38.4 kbit/s

Dial-up line

WM336-3	PSTN modem analogue max. 33.6 kbit/s (V.34/V42.bis), 1.5 kV AC
WM336-4	PSTN modem analogue max. 33.6 kbit/s (V.34/V42.bis)
GSM-2	GSM/GPRS Quad-Band, 9600 bit/s /115 kbit/s (V.32/V.110)

Measurand/set point vaiue cards

Measurand inputs

8AE8-2	8 analogue inputs, 8 bit, 0(4) to 20 mA / 0 to 2.5 mA / 0 to 10 V common root, Isolation 3 kV DC
8AE8-3-1	8 analogue inputs, 8 bit, 0(4) to 20 mA / 0 to 10 V, isolated separately, Isolation 3 kV DC
8AE16-3	8 analogue inputs, 16 bit, multi-range ±20/±10/±2,5 mA per channel overflow/underrun ± 110 %, isolated separately, Isol. 3 kV DC

Set point outputs

8AA8-1	8 analogue outputs, 8 bit, 0(4) to 20 mA / 0 to 10 V, common root, insulation 1.5 kV
8AA16	8 analogue outputs, 16 bit, 0(4) to 20 mA or 0 to 10 V, selection by output separately, Isolation 3 kV DC

Signal/command cards

Optocoupler inputs

16OE-5	16 wide range inputs 18...72 V DC/60...130 V DC/150...240 V DC
16OE-6	16 inputs für links to power brakers, wide range inputs 24...60 V DC / 110 V DC / 220 V DC treshold ON at 80%, 5 kV surge pulse signal/logik (S/L) acc. to IEC 61850-3 (h) & EN 60870-2-1 class VW3
16IE-5	16 fast wide range inputs detection 250 µs 18...72 V DC/48 ...130 V DC
8OE-4-110	8 optocoupler inputs, 110 V AC/ DC
8OE-4-230	8 optocoupler inputs, 230 V AC/220 V DC

Relay outputs

16RA-1	16 relay outputs 230 V AC, 1 A, common root
16RA-3	16 relay outputs, 250 V AC, 1 A, isolated separately
16OA-1	16 optocoupler outputs, 24 V DC, 100 mA, insulation 1.5 kV
16OA-3-1	16 FET outputs, 250 V, 130 mA, isolated separately
16OA-3-2	16 FET outputs, 100 V, 320 mA, isolated separately
12RA-1	12 Power relays 220 V DC, 1000 VA ON, 5 A cont., 30 A 0.5 s 5 kV surge pulse signal/logik (S/L), protection class II Can only be operated at up to 75 V

Combination/special cards

OERA-5	8 optocoupler inputs, 18...72 V DC, 8 relay outputs, 230 V AC, 1A, common root
EVU2-I	Check-back card for command termination with EVU-2-O Wide range inputs 18...72 V DC/60...110 V DC/220 V DC, common root
EVU2-O-1	1.5-pole command termination with 1-of-n monitoring, 16 single/8 double commands, command and release relays, channel-by-channel coil resistance, tolerance, post command lag time, suppression of imperfection, ext. meas. circuit: 100 - 20 kΩ
EVU2-O-2	2-pole command termination with 1-of-n monitoring 8 single/4 double commands, command and release relays, channel-by-channel coil resistance, tolerance, post command lag time, suppression of imperfection , ext. meas. circuit: 100 - 20 kΩ
EVU2-O-3	Same as EVU-2-O-1 with external measurement circuit: 1 kΩ - 100 kΩ
EVU2-O-4	Same as EVU-2-O-2 with external measurement circuit: 1 kΩ -100 kΩ
EVU-X	Utility expansion card for cascading a utility command group over several module frames, release and locking via closed ring, ½ card format

Isolation 2.5 kV AC signal/logik accord. IEC 60870-2-1 VW3 unless otherwise noted. Isolation 5 kV surge signal/earth via rack.

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