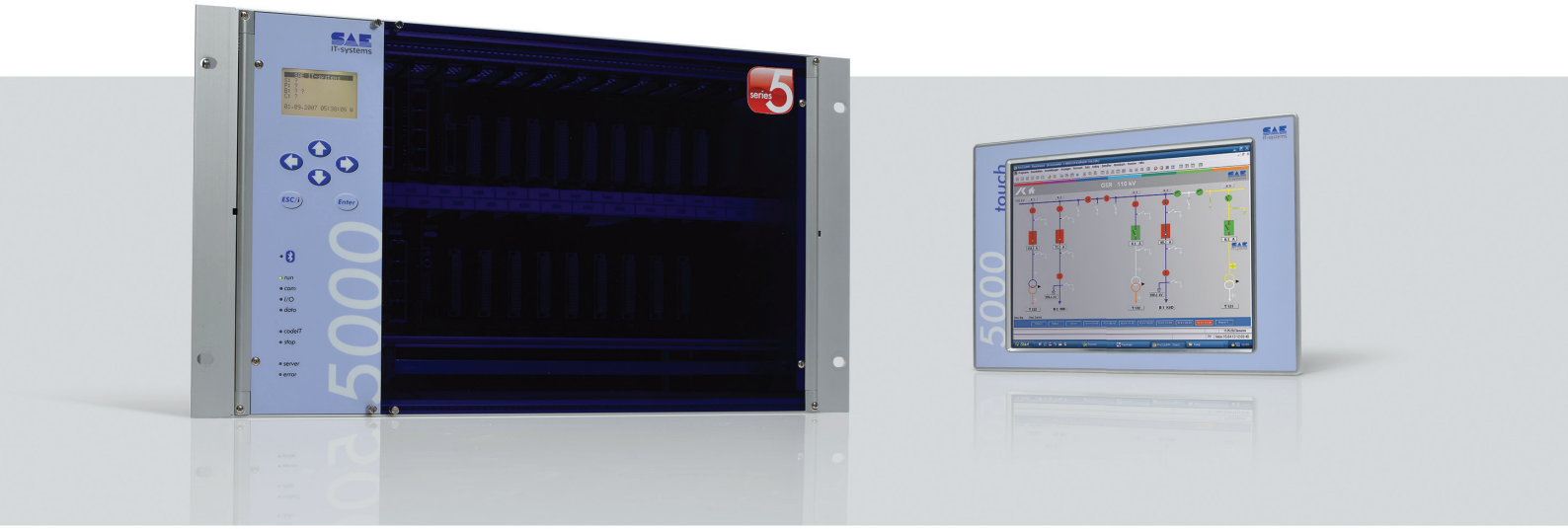


net-line FW-5000
Flexible master station

Powerful communication solution

The net-line FW-5000 is master station, gateway and router for station control and telecontrol technology. It offers 22 slots for seven independent TCP/IP networks and 20 serial interfaces as standard. Different switches with copper or fibre optic connections are available for integration in intelligent networks via TCP/IP. The FW series communication modules can be assembled as required in the terminal compartment of the 19" rack. The device can be used as a telecontrol interface and protocol converter in IEC 60870-5-101/-104 networks or act as a gateway for the IEC 61850 station bus.

The FW-5000-server variant additionally includes a second CPU with Windows Embedded Core for industry-proof integration of a visualisation as a local operator terminal, a station control system or OPC server.

Typical fields of use

- Station control device and local operator terminal in bay and power system control technology
- Front end of control systems in utilities and waste disposal industries
- Protocol gateway serial to LAN /LAN to serial due to high IT-security
- Router for transport and infrastructure applications
- OPC server for industry and supply technology

net-line FW-5000 overview

Modular telecontrol interface in 19" 6U aluminium rack for cabinet installation with 22 slots for 7 independent TCP/IP networks and 20 serial interfaces for standardised linking and protocol conversion of telecontrol systems, PLC and external field devices via Ethernet LAN, dedicated and PSTN lines, GSM, GPRS/EDGE, TETRA or radio as a master station or LAN converter. Protocols IEC 60870-5-101 /-102 /-104 /-103, protective equipment, Modbus RTU/TCP, 3964R, MPI, DSfG. Online interface replacement, integrated cable guide rails.

24 V DC power supply 30 W, optionally with redundant design, replaceable online.

FW-5000-server with additional Windows embedded core CPU for visualisation, OPC server or SCADA.

net-line FW-5000 hardware

- 20 serial interfaces can be assembled individually
- 7 separate LAN segments on 2+2*10 slots
- Precise process data acquisition by means of integrated system monitoring and real-time clock
- Diagnostic display with 6 operator keys
- High noise immunity, high insulation class
- Installation in 19" module frame

net-line FW-5000-Server additionaly features

- 1.6 GHz Atom processor, Windows Embedded Standard e.g. for a local operator terminal, SCADA or OPC server
- VGA and USB connections for monitor, keyboard, mouse
- up to 8 GB CF memory card, industrial environment
- 2 separate network segments can be assembled
- 2 additional serial interfaces can be assembled

net-line FW-5000-touch

- VGA touch colour display for FW-5000-server
- 19" installation frame or front mounted

net-line FW-5000 software

The net-line FW-5000 has impressively fast setup thanks to the innovative and well-established setIT parameterisation software.

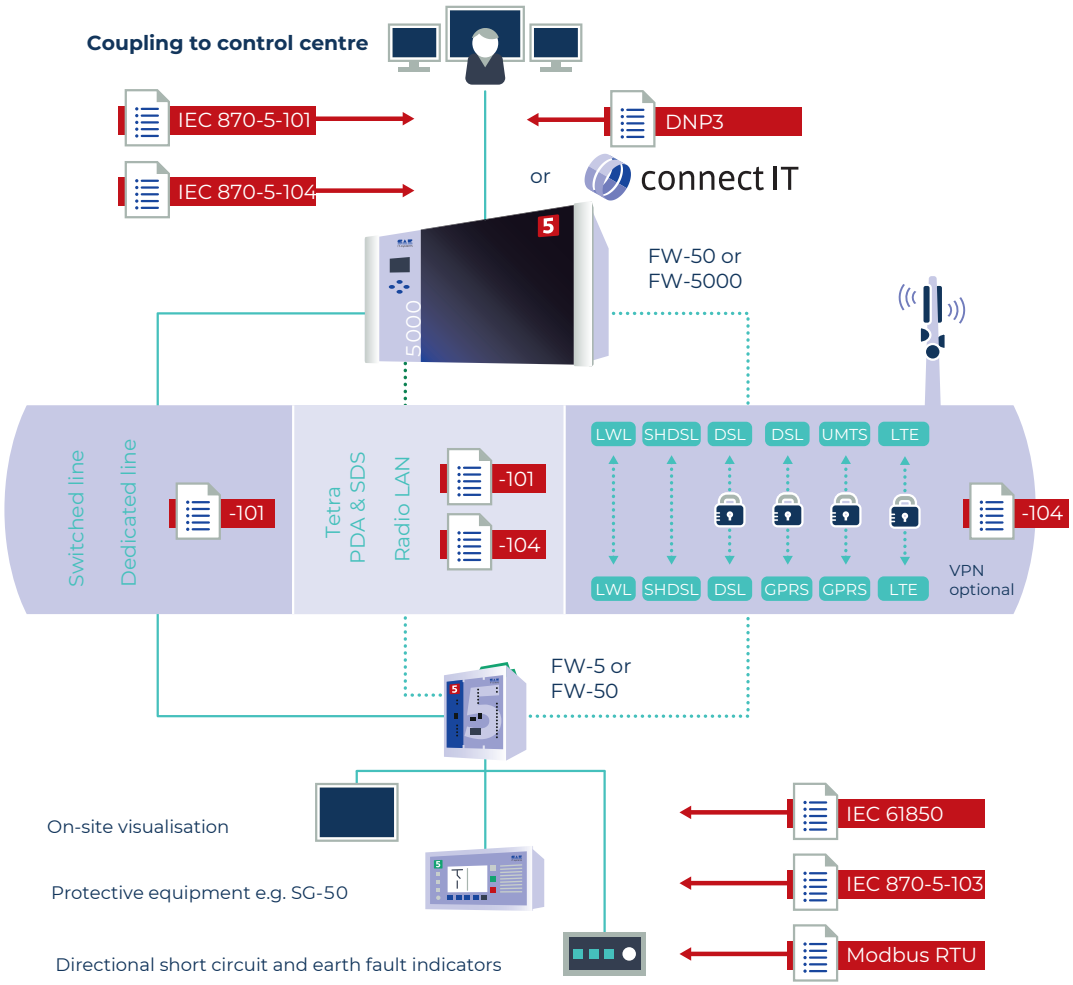
- Intuitive operator guidance
- Almost complete prevention of input errors
- Convenient integration of complex features
- Fault analysis by click and link to inaccurate entry
- Comprehensive copy functionality
- Online help and extensive diagnostic features
- High IT-security according to BDEW Whitepaper

The integrated soft PLC codeIT offers additional flexibility and allows PLC programs to be embedded.

set IT code IT

Communication routes

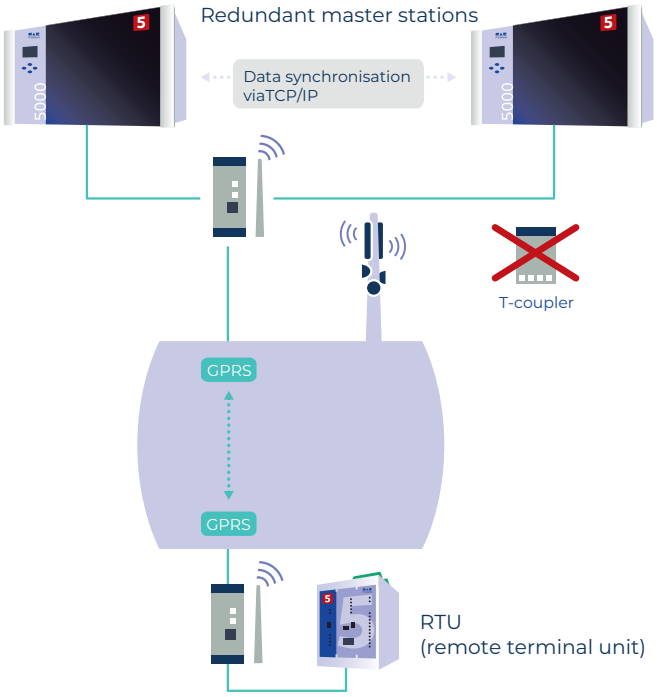
A particular strength of the series5 lies in the large selection of communication possibilities and the redundant backup of routes, stations or process points. Links can be realised via numerous communication routes and protocols directly to the control system or in a controlled manner with a shell of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



Security by redundancy

For applications in which security is particularly important, the net-line FW-5000 can manage a twinned configuration and can be provided with a redundant power supply including separate power failure signalling and load status.
The telecontrol lines are switched in parallel on both interfaces for a link redundancy managed by line. If there is a line fault, the intelligence of the redundancy in the leading interface searches for a connection to the stations via the routes of the second interface.

All party-line-capable interfaces can be used to connect to the network. For external modules with a V.24 connection a special designed V24-3 card is used. Its transmission signal can be switched off. This way several interfaces can be connected in parallel to the communication module, without expensive T-couplers.



Special functions

- Integration of external networks in control systems
- Building of redundant communication networks
- Support for twinned control systems
- Redundant/twinned telecontrol interface without watchdog or T-coupler
- Stand-by transmission routes via PSTN lines
- Protocol conversion from IEC 60870-5-101 to -104
- Connection of protective equipment, IEC 60870-5-103
- Free signal routing in industrial plants (cross connection) to distribute process information in the network
- A number of control systems are supported with their own address structures and transmission lists
- Access protection for PSTN lines
- System signals and communication states can be activated as single-point information
- 6-way structured object and common address

connect IT

Open connection via OPC server

The connectIT OPC server allows completely open connection to control centre and visualisation systems.
By direct coupling of the setIT project database, the OPC server receives all information from the network and makes the station and process point statuses available as tags to all the OPC-DA clients. Interval and fault signal archives are also provided by .csv files.

Communication modules

TCP/IP network

SWI1-5	4-port Ethernet switch 10/100BaseTx, 4 * RJ-45, port mirroring auto negotiation, auto-MDIX, insulation 2.5 kV to VW2
SWI1-6	FO/optical fibre and 2-port Ethernet switch, port mirroring 100BaseFx duplex SC/ST, insulation 5 kV to VW3 IEC 870-2-1 10/100BaseTx, RJ-45, auto neg., auto-MDIX, insulation VW2
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 2-port Ethernet switch such as SWI1-6
SWI2-3	same as SWI2-2 but FO Singlemode SC/ST up to 32 km
F2G-1	GPRS/EDGE/GSM Quadband M2M, insulation 5 kV to VW3

External components

TETRA-1	TETRA radio data transmission, PDA multislot/SDS, 5 kV VW3

PSTN

WM336-3	PSTN modem analogue 33.6 kbit/s (V.34/V42.bis), 1.5 kV
WM336-4	PSTN modem analogue 33.6 kbit/s (V.34/V42.bis), 3 kV
ISDN-1	ISDN terminal adapter B-channel 64 kbit/s (EDSS1, X.31b), 3 kV
GSM-2	GSM/GPRS Quadband, 9600 bit/s /115 kbit/s, 5 kV acc. to VW3

Dedicated line

RS-485-2	EIA/RS-485, symmetrical, max. 115 kbit/s, 1.2 km, insulation 3 kV
RS-422-2	EIA/RS-422, symmetrical, max. 115 kbit/s, 1.2 km, insulation 3 kV
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
BBM-1	Baseband max. 19.2 kbit/s, 10 km, up to 8 users, insulation 3 k V
V24-2	EIA/RS-232/V.24, max. 57.6 kbit/s, point-to-point, insulation 3 kV
V24-3	V.24 redundancy multipoint-to-point, max. 115 kbit/s, 3 kV
V24-4	RJ-45 to ETSI EN 392-300-5, max. 115 kbit/s, P-P, insulation 3 kV

Technical data: net-line FW-5000

Construction	scalable master station, protocol converter, gateway and router, in 6U 19" rack
Communication	Example: max. configuration 2 Ethernet LAN TCP/IP, 10/100BaseTx, auto-MDIX, auto negotiation 4 additional LAN segments via switches with internal USB 4 serial interfaces, 28 FO links serially as star coupler 1 communication component e.g. field bus 7 integrated switches, each with 4 RJ-45 10/100 MBit/s or FO ST/SC 100 Mbit/s + RJ45 20 serial interface cards from FW-50 series pluggable max. 15 interface cards with 7 switches
Protocols	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 · server serial/IP IEC 62056-21 · meter connection (IEC 1107) SML · smart meter connection via Ethernet DSfG · interface for natural gas equipment Modbus RTU/TCP · master/slave MPI/3964R/RK512 · field bus SNMP · network management NTP/SNTP/DCF clock synchronisation VPN-Tunnel · IPsec (IKEv1/IKEv2), OpenVPN
PLC programming	IEC 61131-3 compatible via codeIT, 128 kb program memory
CPU-D5C series5+	RISC processor core, 400MIP@400 MHz, MMU, watchdog, real-time clock 384 MB memory (256 MB SDRAM, 256 MB Flash-EPROM), encryption engine
Memory expansion	1 GB 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, 9 status LEDs in front panel (green, yellow, red, blue) CPU: 12 status LEDs on CPU front (green, yellow, red, blue) Interfaces: Send and momentary contact signals depending on card type Optional: visIT plant visualisation
Service interface	2 Ethernet LAN 10/100BaseTx, auto-MDIX, Bluetooth® class 2 USB device, USB 2.0 host 12 Mbit/s (configuration/archive via stick)
Power supply	+ 24 V DC (-15% + 20%), 110 VDC/115 V AC/230 V AC, UPS and external redundant supply
Dielectric strength	5 kV surge, process I/O to PE, according to class VW3 DIN EN 60870-2-1 2.5 kV surge, supply to PE, RS-232, USB
Tests	EMC: EN 61000-6-2 /61000-6-4, Device class A Insulation: IEC 60870-2-1
Housing	Aluminium rack, eloxated, IP 20' with separate terminal and CPU compartment, CPU door with film keypad, terminal door acrylic blue, Dimensions: 483×266×240 mm (W×H×D), 6U 19" rack
Terminals	MSTBO removable screw-type or spring terminal Combicon, 0.2 to 2.5 mm²
Ambient temperature	20°...+70°C, Relative humidity < 80%, without condensationn

Product accessories

FW-5000-server
Server-board CPU-D5-server
Windows Embedded

FW-5000-touch
VGA 15" colour display, touch
19" installation frame
front installation frame

Light plexi pane
Acrylic pane in light blue for
clear view into connection

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