



net-line FW-5 micro telecontrol station



Outstanding performance in limited space

The net-line FW-5 telecontrol unit 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 net-line FW-5 can be adjusted optimally to the conditions of your application by means of inputs and outputs (I/O), expansion modules and interface modules and thus makes tailor-made solutions possible for virtually any task.

Typical fields of use

- Field device in transformer substations with protection device coupling
- Intelligent secondary unit substation including earth fault and short circuit indicators in the outgoing circuits
- Control unit for feed-in management in renewable energy plants
- Intelligent measurement point for wide range regulation in distribution networks
- Monitoring of infrastructure systems and pipe-bound media

net-line FW-5 overview

Small maintenance-free field device in micro-housing for DIN-rail mounting with 8 signals, 4 command outputs, 2 measurands integrated. Integrated Ethernet LAN 10/100BaseTx, RS-485 and RS-232/V.24 interfaces for integration of communication drivers to IEC 61850, IEC 60870-5-101/-104, -103, protective device coupling, Modbus etc.

PLC programming via IEC 61131-3 Configuration via LAN, USB, memory stick, SD card or Bluetooth®. Wide range power supply, 20 to 72 V DC.

Expansion with external modem modules e.g. SWT-12/SWT-96, GPRS, TETRA or dial-up modem. Expansion with up to 10 I/O modules.

net-line FW-5 hardware

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

- 8 signal 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, SD card or Bluetooth® with FW-5-BT
- Withdrawable screw or spring-type terminals

net-line FW-5 software

The net-line FW-5 has impressively fast setup and high level of compatibility thanks to the innovative and well-established setIT parameterisation software.

- Intuitive operator guidance
- Almost complete prevention of input errors
- Fault analysis with link to error source
- Practical copy functions
- Context-sensitive online help functions
- Calculation and logic functions
- Extensive diagnostic functions
- Integrated project documentation

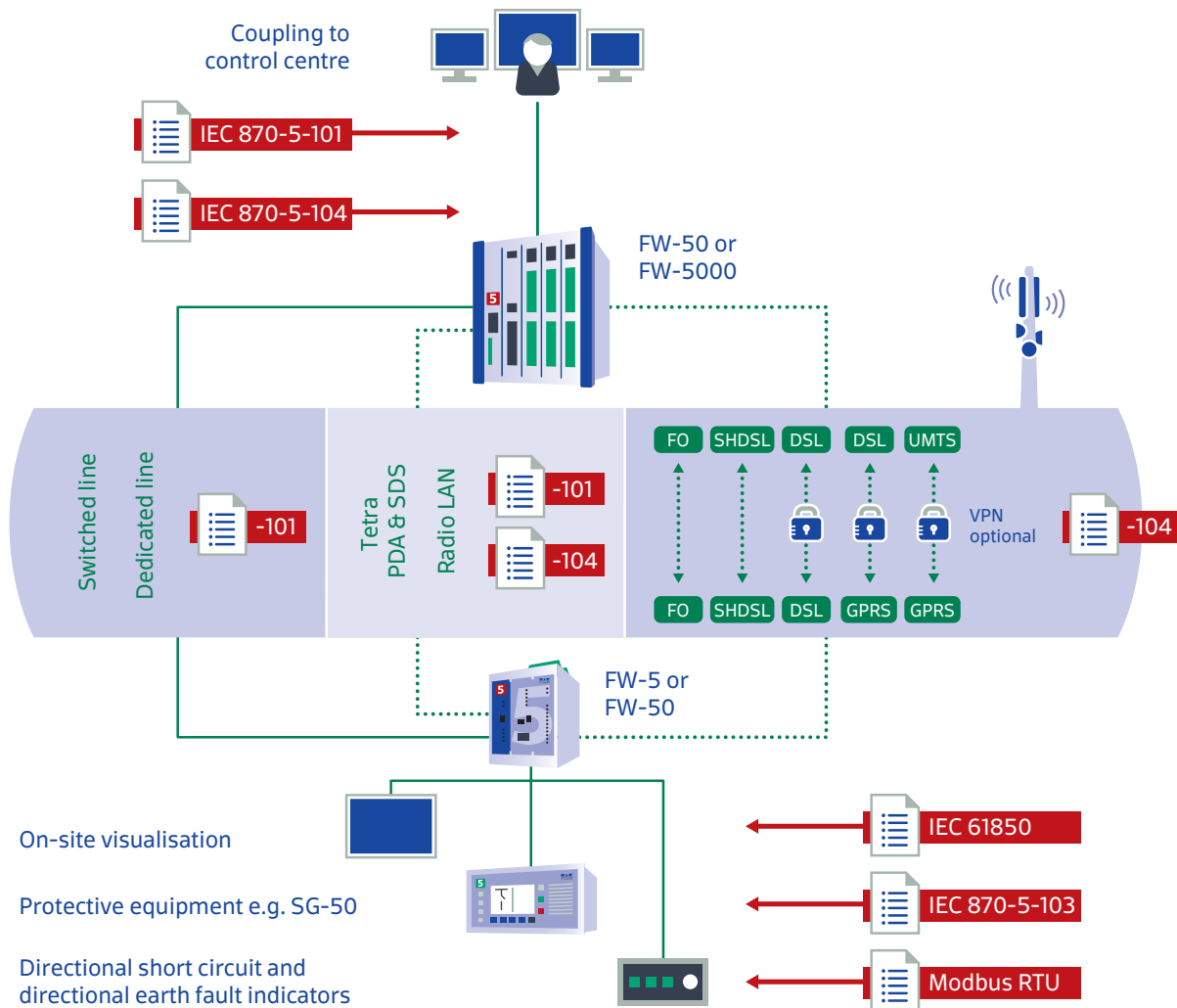
The integrated soft PLC offers additional flexibility and allows many kinds of PLC programs to be implemented.



Communication routes

As with all the devices of the series5 products, the connection to the control centre can be made by many com-

munication routes and protocols directly or via master station, backed up with redundant systems if required.



Expansion modules

The net-line FW-5 can be extended with up to 10 expansion modules. Various modules with different capacities at inputs/outputs allow flexible process integration which meets your requirements exactly.

The bus system is expanded with a special plug connector. Like the base unit, all the modules are equipped with screw or spring-type terminals.



8DI: 8 signals



8 signals
digital wide-range inputs
24 to 60 V DC $\pm 20\%$ (18 to 72 V DC)
common root
switching threshold 12 V DC
detection 1 ms
Supply: 85 mA per module, up to 10 modules

8DO: 8 commands



8 command outputs
relay outputs up to 72 V DC, 150 V AC
isolated by channel, 2-pole
operating range:
DC: 1 A up to 48 V DC, 0.4 A at 60 V DC
AC: 1 A up to 150 V AC
Supply: max. 200 mA per module, up to 5 modules

4AI: 4 measurands



4 measurands, 16 bit
multi-range $\pm 2.5 / \pm 10 / \pm 20$ mA, overflow $\pm 110\%$
ripple rejection 50 Hz, detection 100 ms
 $\pm 0.1\%$ at 5°C to +55°C, max. error $\pm 0.25\%$
isolated by channel, 2-pole
Supply: approx. 150 mA per module, up to 7 modules

4AO: 4 set points



4 analogue outputs, 16 bit set points
uni-/bipolar ± 20 mA, max. load impedance 500 Ω
 $\pm 0.1\%$ /10 K over entire range
isolated by channel, 2-pole
*Supply: approx. 75 mA per module, up to 10 modules
additional external supply 24 to 60 V DC max. 3.7 W*

8DI2AI: 8 signals, 2 measurands



8 signals, wide range, 24 to 60 V DC
common root
switching threshold 12 V DC, detection 1 ms
2 measurands, 16 bit
multi-range $\pm 2.5 / \pm 10 / \pm 20$ mA
overflow $\pm 110\%$, ripple 50 Hz
Supply: 120 mA per module, up to 8 modules

RES-1: 4 SO pulse inputs, 2 measurands, 4 commands



4 SO pulse/meter inputs, active, 10 ms
2 x 16 bit measurands, multi-range
 $\pm 2.5 / \pm 10 / \pm 20$ mA
overflow $\pm 110\%$, detection 100 ms
4 command relays, 72 V DC, 1A up to 48 V DC
isolated by channel, 2-pole
Supply: 400 mA per module, up to 2 modules

DSO-1: 6 commands, 6 check-back signals



6 command relays, 1.5-pole, up to 72 V DC
1-of-n, external circuit testing, cascadable,
for 6 single/3 double commands
2 internal release relays
6 check-back signals, 24 to 60 V DC $\pm 20\%$
switching threshold 12 V DC, common root
Supply: max. 250 mA per module, up to 4 modules

DSO-2: 4 commands, 2 check-back signals



4 command outputs, 2-pole, up to 72 V DC
1-of-n, external circuit testing, cascadable,
for 2 double commands
2 internal release relays
2 check-back signals, 24 to 60 V DC $\pm 20\%$
switching threshold 12 V DC, common root
Supply: max. 280 mA per module, up to 3 modules

Technical data: net-line FW-5

Structure	Station control, telecontrol and automation system in plastic housing, integrated I/O and communication modules for DIN rail mounting
Capacity base station	8 digital wide range inputs, 24 to 60 V DC $\pm 20\%$, optocoupler, common root; 4 relay NO contacts, 2-pole, up to 72 V DC, 150V AC, 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 EIA/RS-485 interface, isolated; 1 EIA/RS-232/V.24 interface
Input/output	Integrated I/O for: single-point, double-point, transformer tap position and alarm signals, measurands, metered values, single, double and transformer tap commands, metered value pulse 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 IEC 62056-21 · meter connection (IEC 1107) SYM ² /SML · meter connection via Ethernet DSFG · Gas interface Modbus RTU/TCP · master/slave MPI/3964R/RK512 · field bus NTP/SNTP/DCF clock synchronisation
PLC programming	IEC 61131-3 programming via codeIT, 128 kb program memory
CPU series5+	RISC processor core, 400MIP@400 MHz, MMU, watchdog, real-time clock 384 MB memory (128 MB SDRAM, 256 MB Flash-EEPROM)
Memory expansion	optional SD card up to 8 GB
Real-time clock	Errors max. ± 20 ppm over entire temperature range, maintenance-free buffer, daylight saving time changeover, leap year correction
Status displays	LED in front panel for system, communication and binary process values further diagnostics via integrated web server
Operational controls	PLC switch in front panel RUN/RUN-P/STOP USB pushbutton for configuration/backup/recovery functions
Programming interface	Bluetooth® 2.0 class 2, for wireless configuration at FW-5-BT Ethernet LAN 10/100BaseTx, auto-MDIX, USB 2.0 device 12 Mbit/s, USB 2.0 host 12 Mbit/s (configuration/archive synchronisation via stick)
Fault signal output	can be configured to relay output
Power supply	+20 to 72 V DC max. 5W, (24 V DC 0.2 A/60 V DC 0.1 A) without expansion; Power fail management with power failure buffering, 110/220 V DC and 230 V AC via FW-5-230 or external module
Dielectric strength	5kV surge supply & process I/O to PE, according to class VW3 2.5kV surge, supply to measurands, EIA/RS-232, USB
Standards	EMC: EN61000-6-2 (03/2000), EN61000-6-4 (03/2000), EN55022, Insulation: DIN EN 60870-2-1, IEC 60255-5 R&TTE: ETSI EN 300328, EN 301489, NSRL: DIN EN 60950
Housing	FW-5 Micro, polyamide V0, IP20, dimensions, basic system: 68×105×115 mm (W×H×D); expansion module: 22.5×105×115 mm
Installation	DIN rail mounting, DIN-EN 60715 TH35
Terminals	MSTB screw-type terminal or spring-type terminal, 0.2 - 2.5 mm ²
Ambient temperature	-20° to +70°C, when supply > 48 V DC max +55° C
Relative humidity	< 80%, without condensation

Product variants

FW-5
FW-5 base unit

FW-5-BT
FW-5 base unit with Bluetooth®

FW-5-230
FW-5 base unit
Power supply 140 - 230 V AC/DC

FW-5-230-BT
FW-5 base unit
Power supply 140 - 230 V AC/DC
with Bluetooth®

FW-5-GATE
Version without inputs and outputs
on the base unit with 2nd Ethernet
interface and additional interface
for meter connection

FW-5-GATE-230
As FW-5-GATE
Power supply 140 - 230 V AC/DC



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