Outstanding performance in limited space

The net-line 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 net-line 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
**net-line 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

**net-line FW-5 software**
The net-line FW-5 supports 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 by click and link to inaccurate entry
- Practical copy functions
- Context-sensitive online help
- Calculation and logic functions
- Extensive diagnostic features
- Integrated project documentation

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

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**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.

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**Coupling to control centre**
- IEC 870-5-101
- IEC 870-5-104
- DNP3
- FW-50 or FW-5000
- FO
- SHDSL
- DSL
- UMTS
- LTE
- VPN (optional)

**Switched line**
- Dedicated line
- Switched line
- -101
- -104

**Tetra PDA & SDS Radio LAN**
- -101
- -104

**On-site visualisation e.g. visIT**

**Protective equipment e.g. SG-50**

**Directional short circuit and directional earth fault indicators**

**IEC 61850**

**IEC 870-5-103**

**Modbus RTU**

**LTE**
Technical data: net-line FW-5 series5e

Structure
Substation / bay control, telecontrol and automation system in plastic housing, integrated I/O, I/O expansion and communication modules, DIN rail mounting

Capacity base station
8 digital wide range inputs, ±24 to ±60 V DC ±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
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, temperature sensor for ambient temperature, -25°C to 100 °C, measuring error ±3°C max.

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
Profibus-RTU/TCP · master/slave,
Profibus-DP slave, MPI/3964R/RKS12 · fieldbus
SNMP · network management, NTP/SNTP/DCF clock synchronisation
VPN-Tunnel · IPSec (IKEv1/IKEv2), OpenVPN

PLC programming
IEC 61131-3 programming via codeIT, 128 kb program memory

CPU-SE series5e
RISC processor Cortex-A8, 1200 MIPS@800MHz, FPU, watchdog, real-time clock
1GB memory (512 MB SDRAM, 512 MB SLC Flash)

Memory expansion
1 GB microSD 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,
LED in front panel for system, communication and binary process values,
diagnostics via integrated web server,
optional: visIT plant visualisation

Programming 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 bis 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 mm²

Ambience
-25° to +70°C , ø24h max. +55° C, max. 3000 m above sea level, humidity < 95%, without condensation
**Overview of the expansion modules**

The net-line 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 EUs 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. All modules have the dimensions of 22.5 × 105 × 115 mm (W×H×D).

**Signals and commands**
- 8DO  8 commands
- 8DI  8 signals
- 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 pulse inputs, 2 measurands, 4 commands
- VPP-1*  6 signals, 2 measurands, 5 commands, 2 set points
- PM-1  Power measurement terminal
- PM-2  Power measurement terminal
- ISO-1*  Leakage detection

**Command termination**
- DSO-1  6 commands, 6 check-back signals
- DSO-2  4 commands, 2 check-back signals

**Online**
- PDPS-1  Profibus-DP slave

**Other accessories**
- PWR-1  Power booster with larger capacities
- TBUS-T  T-BUS extension transmitter
- TBUS-R  T-BUS extension receiver

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**Product variants & accessories**

**FW-5**
FW-5 base unit

**FW-5-GATE**
Variant without integrated I/O on the base unit with 2nd Ethernet interface and additional interface for smart meter read out

**FW-5-GATE-4G**
Variant without integrated I/O on the base unit with 2nd Ethernet interface and additional interface for smart meter read out
4G/LTE mobile router

**FW-5-GATE-450**
Variant without integrated I/O on the base unit with 2nd Ethernet interface and additional interface for smart meter read out
450 MHz CDMA radio module

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

**mcFO**
Media converter FO coupler with ST or SC connector

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