



set IT

setIT parameterisation Telecontrol & substation automation

Characteristics

Our innovative and well-established setIT parameterisation software allows intuitive and exceptionally fast commissioning of installations and entire projects. Even complex functions are conveniently integrated and can be set up with a few mouseclicks. The syntax checks prevent errors during input. Extensive setup aids and diagnostic functions ensure a successful commissioning. Based on customer feedback from practice, we have continuously developed and improved setIT. The result is a clear and sophisticated tool for parameterisation and diagnostics. In summary, setIT can be used as a supplement to our high-performance hardware to provide tailor-made solutions for station control systems, telecontrol technology or plant automation. Thanks to continuous improvements according to the wishes of our customers, we have produced a clear and well-developed tool. The perfect solutions for station control systems, telecontrol technology or plant automation can be provided in this way.

Achieving aims faster

- Fast integration thanks to the familiar interface
- Early prevention of errors by means of syntax checks
- Duplicate of stations or whole couplings e.g. to field devices
- Extensive input aids and diagnostics
- High speed download
- Parameterisation via USB memory stick
- Configuration via USB device cable
- Diagnostics via automatically generated web server
- High IT-security standard according to BDEW Whitepaper

setIT overview

Parameterisation and diagnostic tool for telecontrol and station control technology of the product range net-line series from System4[®], series5, series5+ and series5e.

Intuitive graphical interface in tree structure. Numerous configuration aids and checks to avoid errors, copy functions and parameterisation assistance. Complete management and creation of firmware systems with download via online connection, update firmware at all LAN stations and memory stick transfer.

Extensive diagnostic functions, interface monitor, memory monitor, archive management, syslog, IEC 60870-5 data flow analysis, wire-shark and debug log, web server.

The core functions at a glance

Future-proof thanks to modern platform and hardware

setIT is a Windows-based parameterisation tool with the familiar interface in tree structure. It creates complete system files including an embedded operating system for download. The state-of-the-art technology allows the use of modern services while maintaining current communication and security standards. setIT supports the established and new SAE product generations:

- System-4¹⁾
- series5
- series5+
- series5e

Open & standardised communication

setIT creates transmission solutions with monitoring and control functions for new installations in interconnected networks or for local communication devices on the basis of the standardised protocols according to IEC 60870-5-101 or /-104. As well as process data acquisition from field devices, other couplings are available:

- Integrating protective equipment via IEC 60870-5-103
- Connecting intelligent devices (IED) with IEC 61850
- Connecting meters serially or via LAN
- Integrating external components via field bus/Modbus
 - Network analysis systems, earth fault/short circuit indicators
 - PLC, controllers
 - Rate regulation systems, gas chromatographs (DSfG)
 - Data loggers, measuring transducers, flow meters

A secure investment

setIT provides a fast return on investment thanks to considerable time savings in engineering. Investment security is ensured by the long service life of the field devices, free updates within the main version and fair, application-oriented licence modules:

- Licence-free demo version
- Single user licence, multi user licence and company licence

Seminars

In order to fully exploit the possibilities of our parameterisation software "setIT", we offer practice-oriented seminars:

- setIT Basic
- setIT Professional
- IT security

All dates and further seminars can be found on www.sae-it.com/seminare

Simple & fast parameterisation

- Very short implementation times
 - thanks to simple mouse operation using menu, context menus, hot keys, ...
 - Fast integration thanks to structured setup
- Visual assembly with interfaces and I/O cards
 - Station map
 - also between different projects
- Intelligent assistant for the individual parameterisation of system information
- Prevention of input errors with dynamic menus and context-sensitive masks
- Quick correction of parameter errors by link to input window when there are errors in the generator cycle
- Single input and object-oriented inheritance of common parameters (single-point-of-entry)
- High flexibility in topology of installations
- Automated memory management, real-time clock, watchdog, system monitoring ...

Flexible management

- Download of operating system, system software, configuration and add-on modules
- Storage of parameterisation in signed SQL database
- Import/export of parameterisation variables per .csv files for processing in Excel or documentation
 - Variable export/import structures
 - Expandable data sets for in-house designations
- Report functions und recording of system events
 - Logging of process point changes in telecontrol report and syslog
 - Recording of system events in syslog and separately loadable system report
 - Reports can be exported in .csv file
- Memory management and archive processing
 - Archive processing with variable archive depths
 - Modified memory management with automatic or manual partition

IT Security & Practicability

As a supplier for operators with critical infrastructures, we are taking the threat of hacker attacks seriously. Therefore, in order to continuously increase the security level, we are constantly working on integrating extended security functions in the user interface of our setIT parameterisation software:

Security-relevant functions according to BDEW whitepaper

- The default settings of new stations now default to the secure protocols FTPs/HTTPs
- Access to service functions in the station can be temporarily activated
- The station configuration can be encrypted using a project-specific system password.
- VPN encryption via IPsec with IKEv2²⁾
- The database format .sdbx allows the entire project database to be encrypted
- Number of possible process data for FW-5000, FW-50 and BCU-50 increased to 20,000 ³⁾
- Simple definition of advanced firewall rules: Services are granularly activatable and can be
 - limited to various network interfaces
- Special events can be sent as a syslog message and thus trigger an automatic reaction of downstream systems
- Hardening of the OS kernel and conformity testing
- Access protected with adjustable password quality
- Switchable services and accesses:
 - USB device, USB host
 - FTP server, online diagnostics, PLC programming access
 - Web server, firmware update,
 - Web server session timeout
- User profiles with password for setIT user interface and the web server variable or according to Role Based Access Control (BDEW):
 - Administrator
 - Authorised operator
 - Configuration
 - Diagnosis
 - Observer



The latest series5e technology

The communication requirements of a telecontrol and station control system in intelligent networks are becoming increasingly demanding. At the same time, greater demands are being placed on network security, because the growing interconnectedness also increases the security risks. Our new version of our telecontrol technology series5e masterfully meets the complex safety and practical requirements of tomorrow:

Even better performance with 1,200 MIPS, the hardware performs at three to five times the processing speed compared to the previous version. The improved performance in particular has a positive impact on network communication via IEC 61850 and process point treatment according to IEC 60870-5-10x standards. This increase is due to the new 32-bit RISC processor (ARM Cortex-A8) with floating point unit and the 1 GB memory.

High IT security according to BDEW white paper - State-of-the-art encryption algorithms (e.g. IKEv2), Role Based Access Control (RBAC) user profiles to prevent unauthorized or unwanted changes to settings, Syslog to record operational messages and processes, encryption of project files with the secure AES-256 algorithm, etc. For the protection of your systems, we integrated numerous other safety-relevant functions in our telecontrol technology!

Optimisation of the basic functionalities, Optimum diagnostic capabilities through LEDs at the front, further improved immunity and isolation concept, real-time clock buffered with Li-Ion battery, etc.

Compatibility with the hardware of series5e and series5+ is of course still provided.



Types of communication

Communication takes place via international standard protocols between control centres, telecontrol units and external components. High functional coverage and maximum interoperability is ensured while largely avoiding private definitions.

IEC 60870-5

- IEC 60870-5-101 Serial coupling
- IEC 60870-5-102 Remote meter reading
 - exclusive routing
- IEC 60870-5-103 Selective protective device coupling
- IEC 60870-5-104 Coupling via TCP/IP/LAN

IEC 61850

- IEC 61850 Client with ICD/SCD import
- IEC 61850 Server^{r4)}

Field bus + PLC couplings

External components are integrated and monitored as dedicated station objects. The process points are assigned via free I/O declaration in the nomenclature of the data segments, treated like dedicated process points and made available to all functions.

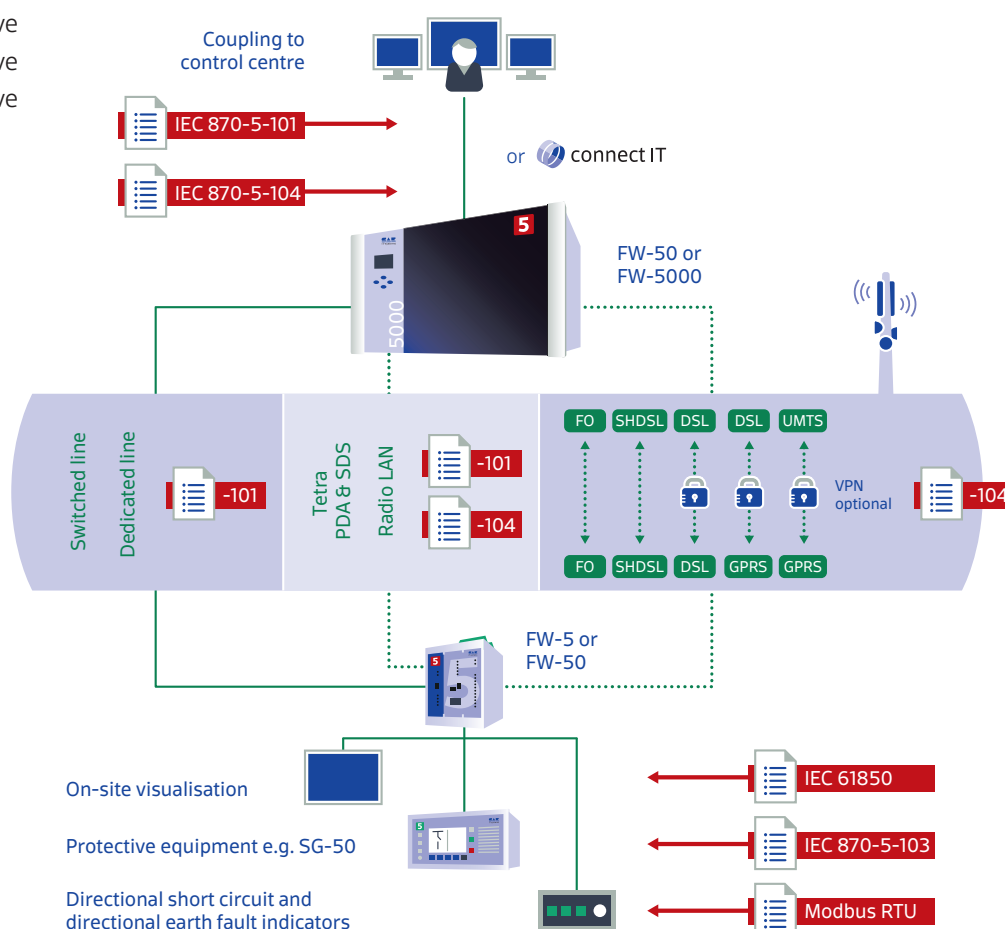
- Profibus DP: Master / slave
- Modbus RTU: Master / slave
- Modbus TCP: Master / slave
- MPI 3964R/RK512

Integration & adaptation

Flexible connection types and communication routes are supported. Control systems or network control centres can be connected directly or integrated into complex networks via meshed structures. Telecontrol routers form the link between control centres and lower level networks. The latter manage the data of lower level stations in the process image and make it available in the web server. The data connection is typically made via TCP/IP with IEC 60870-5-104 protocol, via the serial variant -101 or via OPC servers, f.e. connectIT. Several control systems of different types can be supplied in a targeted manner with selected data from transmission lists. Separate structures and addresses of the control systems are also adapted.

Modes

- Point-to-point
- Party line, multi-point operation
- Star operation
- Ring structures
- Concentrator connections & routing
- Redundant routes, stand-by routes



Transmission routes

- Dedicated lines, VFT, SHDSL, ...
- Dial-up connections, analogue, ISDN, GSM
- LAN networks
- DSL, SDSL, VDSL, ADSL
- GPRS/EDGE/UMTS/HSPA/LTE with VPN tunnel or within private address range
- Radio networks
 - CDMA 450 MHz
 - TETRA radio networks

Cause of transmission

- Spontaneous at change/limit value
- Cyclic
- Queried by GA
- In the background
- Transmission of metered values at intervals, spontaneously and synchronously, from 10 s to 8 hours
- Separate transmission for process and archive values

Time synchronisation

- Time synchronisation can be set in several stages by prioritisation:
 - NTP server synchronisation
 - Synchronisation via the control system
 - Time synchronisation via DCF or GPS receiver

Free routing in telecontrol network

The routing referred to as lateral communication copies any signals, measurands, metered values to other stations in the network. These control tasks can be supplied or directly output there:

- Routing independently of control centre by routers
- Routing to any number of stations

Network status information

Adding SNMP as TRAP or polling will supervise network status information, given by routers or ext. devices, operated as standard process data.

PLC control functions

The optional soft PLC with codeIT offers additional flexibility and allows any PLC programs to be implemented. The PLC capacity can be integrated selectively.

Additional functions in the field of power system and station control technology:

Expanded control centre coupling

- Fast and easy connection to control systems manufactured by BTC, Kisters, PSI, SAT, ids, ABB, repas ...
- Flexible address structures up to 6 levels
- Selective data filters for interconnected networks by means of transmission lists with possible address restructuring
- Redundancy functions

Command termination via special utility cards

- Command termination with 1-of-n monitoring
- Single and double commands, 1.5 or 2 pole
- Command-by-command setting of post command lag time, operating delay suppression, coupling resistance
- External circuit testing from 10 Ω to 100 k Ω
- Cascading of module frames to form command groups

Expanded process data acquisition

- Faster metered value acquisition max. 10 kHz pulses
- Metered value restorage by means of external input
- Variable measurement period archiving
- Transformer tap signal binary, BCD and 32 bit
- Substitute value formation for control commands
- Two measurement value transmission cycles to choose from
- Measurement value transmissions outside the cycle readings can be triggered automatically by digital events

Selective protective data coupling

Selective coupling of protective devices to IEC 60870-5-103 or IEC 61850 for digital protective technology:

- Preprocessing of process data in the process image
- Conversion of addresses of protective devices into the address range and structure of the control centre
- Archiving of fault recordings in Comtrade format

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 clients. Interval and fault signal archives are also provided as .csv files.

Diagnostic, project planning aids & redundancy functions

Online help

- Complete manual with context-sensitive link to information by <F1> key
- Status display of connected stations and process data states scaled or in plain text

Integrated telegram analyser

- Recording of transmit/receive data in substation without additional devices
- Chronometry and display of receive errors
- Trigger functions with start/stop or marking of character strings
- HTML export for easy transfer of the recording
- Recording storage in .csv files

Extended help at installation

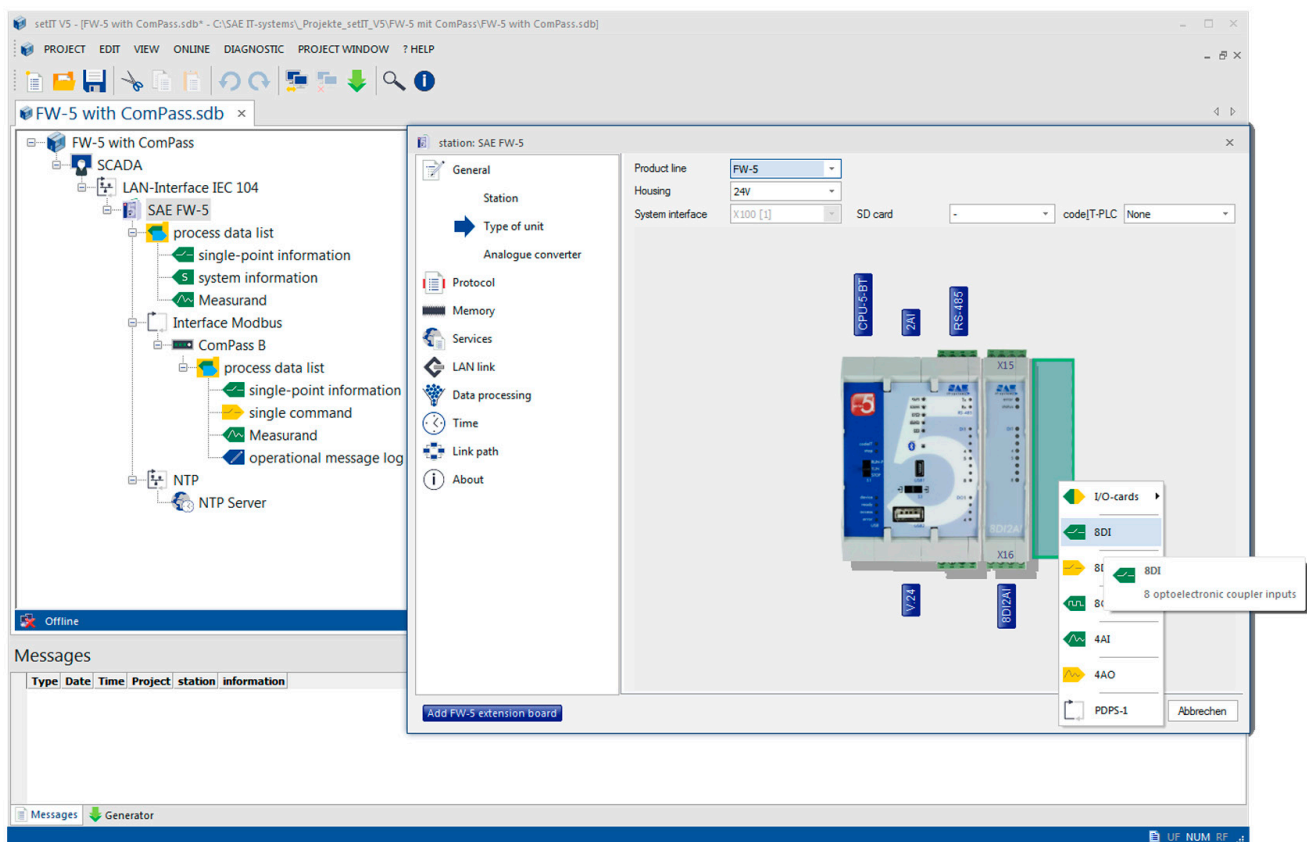
- Analysis of coverage
- New value signal
- "General list" for quick overview of prioritised signals
- Simulation of process values parallel to the current operation to test a created configuration

Diagnostics & web server

- TCP/IP dump integrated as a monitoring interface
- Analysis of the VPN tunnel setup with debug log
- Encrypted communication via https
- Web server user profiles according to BDEW white paper
- Archive processing based on SQL database
 - Free period choice with variable .csv export
- Second IP address for communication with external IEC stations with redundant connection
- Switching via web server
- Value settings and address changes via browser
 - Station address
 - IP address
 - System setpoints (e.g. converter constant), system setpoints as modifiable factors, selective retention of command status and setpoints
- The expected lifetime of a parametrised
- SD card can be monitored and displayed in the online diagnostics

IEC 60870-5 data flow analysis

- Tracking of information routes with routers
- Filtering for interfaces, addresses, type identifiers



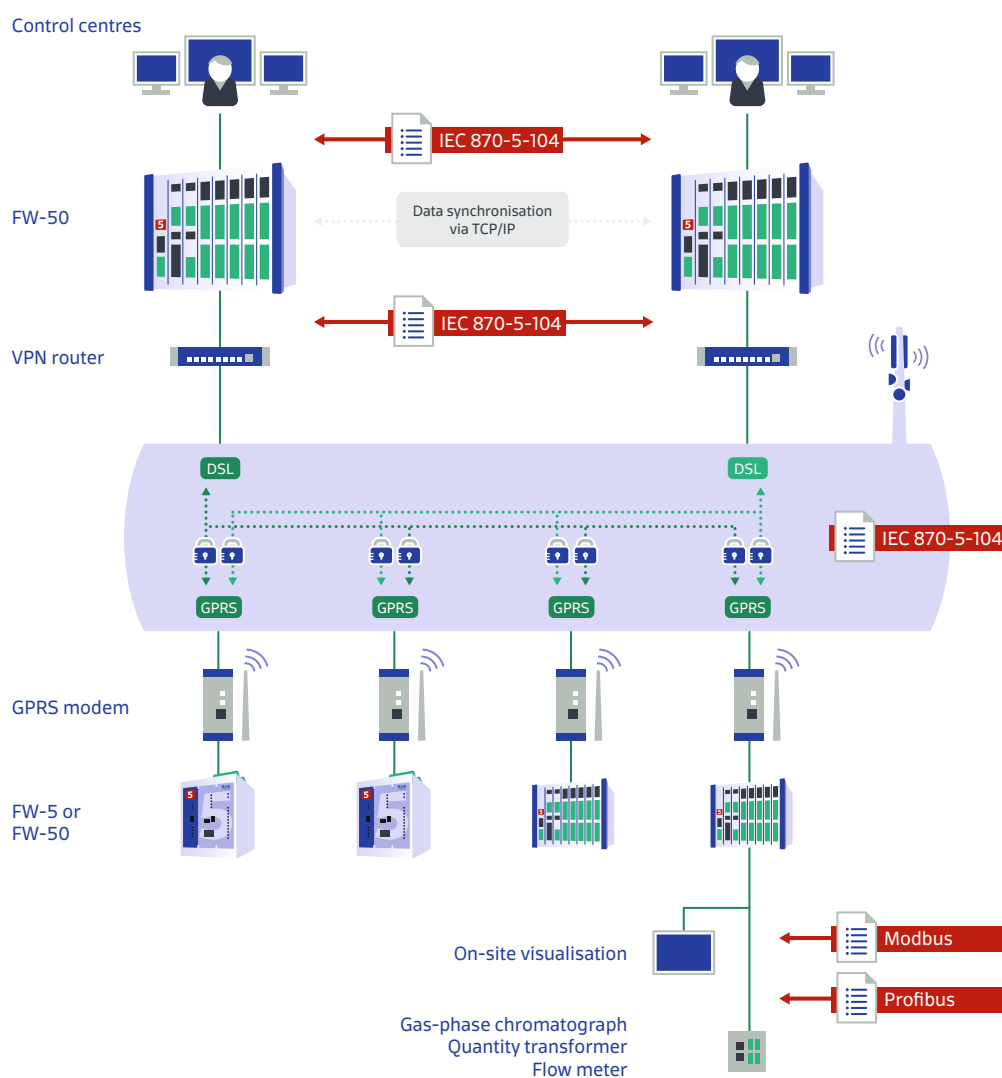
setIT user interface with graphical population and setup of systems

Redundancy functions

- Support of redundant control centres
- Twinned telecontrol interfaces
- Station redundancy
- Process point redundancy
- Line-by-line hot standby switching
- Standby route circuits and route redundancy
- Dial-up line redundancy and pool formation
- Preferred interface, prioritisation, alternative numbers
- Intelligent management of main and standby routes
- Process point assignment to definable data groups with prioritised transmission on standby routes
- Remote alarm via SMS from the stations

Documentation

- Report creation on printer or as .pdf file
- Archive processing with variable archive depths
 - optional memory expansion up to 8 GB ³⁾
 - Subsequent loading of archive gaps from the station archive ³⁾



Example of an implemented, multiple-redundancy network over mobile radio

Technical data: setIT

Construction	Parameterisation and diagnostic tool in MS® Windows for net-line series telecontrol and substation automation
System requirements	MS Windows 7 32/64, Windows 8 32/64, Windows 10 32/64 Standard VGA graphics card, approx. 400 MB to HD
Stations series5e, series5+, series5	net-line FW-5 net-line FW-5-GATE, FW-5-GATE-230, FW-5-GATE-4G, FW-5-GATE-450 net-line FW-50, FW-50-4, FW-50-14 net-line FW-5000
System4	net-line FW-4, FW-10-S4, FW-40, FW-4000 ¹⁾
Process point types Inputs	Single-point, double-point information Transformer tap signals, 7/8/32 bit, binary, BCD Measurands, 8/12/16/32 bit, bit pattern signals, Metered value inputs
Internal signals	System signals, Group indication with logical connection Calculation values and operations System set points, changeable converter constants etc. Check-back definitions for command termination with utility cards Transient indication with pulse extension
Outputs	Single commands, double commands, transformer tap commands 7/8/32 bit, command termination, 1.5/2-pole, 1-of-n with external circuit testing Set points 8/12/16/32 bit, bit pattern commands Metered value outputs
Routing	Single-point information/single commands in command direction Double-point information/double commands in command direction Bit pattern signals/bit pattern commands in command direction System signals in command direction Measurands in command direction Metered value routing, 16/32 bit
Archive data	Fault signal/operating signal archive, Syslog reports, interval values, rate values, equidistant intervals from 1 min to 60 min
Protocols	IEC 61850 · IED and protective device coupling IEC 60870-5-101 · telecontrol technology, station control technology IEC 60870-5-102 · remote meter reading routing IEC 60870-5-103 · protective device coupling IEC 60870-5-104 · TCP/IP coupling to control centre IEC 62056-21 · meter connection (IEC 1107) UNIP-light · basic protocol for easy-line and profi-line series DSfG · German interface for natural gas Modbus RTU/TCP · master/slave, MPI/3964R/RK512 · field bus Profibus-DP · master/slave SNMP · network management IPsec(IKEv1/IKEv2), OpenVPN ³⁾ , VPN-Tunnel, GRE ³⁾ DNP3 · serial/TCP
Services	NTP/SNTP/DCF clock synchronisation PPP · TCP/IP protocol over serial interfaces http/https · web browser standard, encrypted FTP/FTPs · file transfer standard, encrypted DHCP for diagnostics on USB device Syslog · Recording log reports
Diagnostics	Online process point display, plain text message with real-time stamp Scaled online measurands with bar chart, colour change in limit range System monitor, Syslog monitor ²⁾ , IPsec-Log ²⁾ , interface monitor, TCP-Dump ²⁾ , archive memory monitor Interface monitor, IEC 60870-5 data flow analysis Extended help at installation: Coverage analysis, new value signal
Web server	Online process point display as in parameterisation tool Value inputs for addresses and system set points Online displays of values of lower level stations Archive view and free archive export in .csv file Firmware download

Product variants

setIT SUL
Single user licence, expanded diagnostics included

setIT MUL
Multiple user licence for simultaneous operation of n users, expanded diagnostics included

setIT CUL
Company licence, unlimited use, expanded diagnostics included

setIT demo
30-day test licence, expanded diagnostics included

- ¹⁾ System4 stations remain functional at setIT V4.005
²⁾ available from series5+
³⁾ available from series5e



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