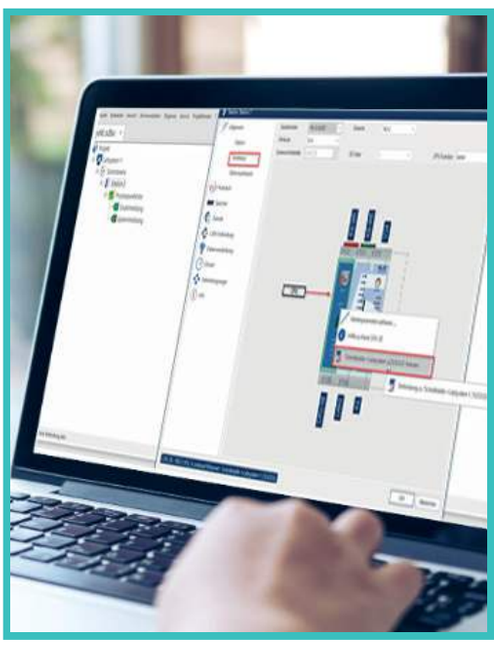
setIT
PARAMETERIZATION

SECURE CONNECTION WITH THE NEW TECHNOLOGY series5X

The innovative and established setIT parameterization software enables intuitive and extremely fast commissioning of our telecontrol and station control technology. Even complex functions are conveniently integrated and can be set up with just a few mouse clicks. Syntax checks prevent errors during input. Extensive commissioning aids and diagnostic functions ensure successful commissioning. We have continuously developed and improved setIT on the basis of customer feedback from the field. The result is a clear and sophisticated tool for parameterization and diagnostics. In summary, setIT can be used as a supplement to our high-performance hardware to easily provide tailor-made solutions for substation control systems, telecontrol technology or plant automation.



REACH YOUR TARGET FASTER

- Quick familiarization thanks to familiar interface
- Early error prevention through syntax checks
- Duplication of stations or entire couplings, e.g. to field devices
- Extensive input aids and diagnostics
- Rollout of the configuration via LAN, USB OTG, SD card
- Diagnostics via automatically generated web server
- Comprehensive IT security measures in accordance with the BDEW white paper and BSI recommendations

IMPORTANT FEATURES

set IT **Version 8**

Brief Profil

- Windows-based tool with tree structure interface.
- Complete system files including embedded operating system for download.
- State-of-the-art technology enables the use of modern services while complying with current communication and security standards
- Generates transmission solutions with monitoring and control functions for new installations in interconnected networks or for local communication facilities based on the standardized control system protocols according to IEC 60870-5-101 or /-104.
- In addition to process data acquisition from field devices, further couplings are available.
  - Integration of protection devices via IEC 60870-5-103
  - Connection of intelligent devices (IED) with IEC 61850
  - Serial or LAN modbus connection (network analysis systems, earth fault/short-circuit indicators, PLCs, controllers, flow control systems, gas chromatographs, data loggers, transducers, flow meters)

Software

- Complex integration of standard protocols for:
  - IEC 60870-5-104
  - IEC 60870-5-101/- 103
  - IEC 61850 client und server, GOOSE Messages (with time restrictions)
  - DNP3 outstation/master
- MQTT (publish & subscribe) for cloud-based communication; optionally with Sparkplug specification
- Meter coupling according to IEC 62056-21
- SNMPv3 protocol for status messages from network components
- SNMP agent for integration into asset management
- Selective archive query via IEC-101/-104
- Flexible archive exports

Dates and Content of the current **setIT Trainings**

The core functions at a glance

Quick & easy parameterization

- Very short implementation times thanks to simple operation via menu, context menus, hotkeys, etc.
- Quick familiarization thanks to structured design
- Visual configuration of devices with interfaces and I/O cards
- Station image in program, diagnostics and report
- Familiar editing mechanisms from the Office world
- copy/paste, do/undo
- Duplication of stations and entire coupling branches, even between different projects
- Intelligent assistant for individual parameterization of system messages
- Dynamic menus and context-sensitive masks prevent incorrect entries
- Quick correction of parameter errors via link to input window in the event of errors in the generator ru
- One-time input and object-oriented inheritance of common parameters (single-point-of-entry)
- High flexibility in the system topology
- Automated memory management, real-time clock, watchdog, system monitoring, etc.

Flexible management

- Download of operating system, system software and configuration. In future, even more convenient management of updates and patches as well as device management via our device management system (LXCONNECT)*
- Storage of parameterization in signed SQL database
- Import/export of parameterization variables via csv files for editing in Excel or for documentation purposes
- Variable export/import structures
- Expandable data records for your own labeling
- Report functions and recording of system events
- Logging of process point changes in the telecontrol report and syslog
- Recording of system events in syslog and separately loadable system report
- Reports can be exported to a csv file
- Memory management and archive processing
- Archive processing with variable archive depths
- Modified memory management with automatic or manual memory allocation

THE TECHNOLOGY series5X

The communication requirements for a telecontrol/station control system in an intelligent network are constantly increasing. At the same time, greater demands are being placed on security in the networks, as increasing networking means that the risks of unauthorized access and manipulation are growing. Thanks to a more modern processor core, the updated operating system, secure boot and an encrypted file system for the configuration partition, series5X offers improved protection against cyber attacks.

- Secure boot and signed base system
- Encapsulation, hidden layer, BGA (tamper protection)
- Unique device certificate for station authentication
- LAN PHYs interfaces can be disabled
- Encrypted file system of the configuration partition
- Signed configuration
- VPN, IPsec, TLS encryption
- Integration into the central device management system (LX CONNECT)*
  - Update of the basic system
  - Ward software & configuration can be updated individually
  - Fallback (AB system) for base system and configuration
  - Certificate exchange via EST (Enrollment over Secure Transport)

*in Preparation

IT security and practicability

As a supplier to critical infrastructure operators, we take the threat of attacks seriously. Therefore we are constantly working to increase the level of security, security functions into the user interface of our setIT parameterization software::

Safety-relevant functions (according to BDEW Whitepaper)

- The secure protocols FTPs/HTTPs are preset in the default settings of new stations
- 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 IKEv2
- The .sdbx database format enables encryption of the entire project database
- Simple definition of extended firewall rules: Services can be activated granularly and limited to different network interfaces
- Special events can be sent as syslog messages and trigger an automatic response from downstream systems
- Access protected by adjustable password quality
- Services and accesses can be switched off:
  - 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 interface and the web server variable or according to role specification BDEW (Role Based Access Control):
  - Administrator
  - Authorized users
  - Parameterization
  - Diagnosis
  - Observer

Diagnostics and project planning help

Online-Help

- Complete manual with context-sensitive jump to information using the <F1> key
- Status display of the connected stations and their process points

Integrated telegram analyzer

- Recording of transmit/receive data in the substation without additional devices
- Time measurement and reception error display
- Trigger functions with start/stop or marking of the character string
- HTML export for easy forwarding of the recording
- Storage of the recording in csv files

Extended commissioning help

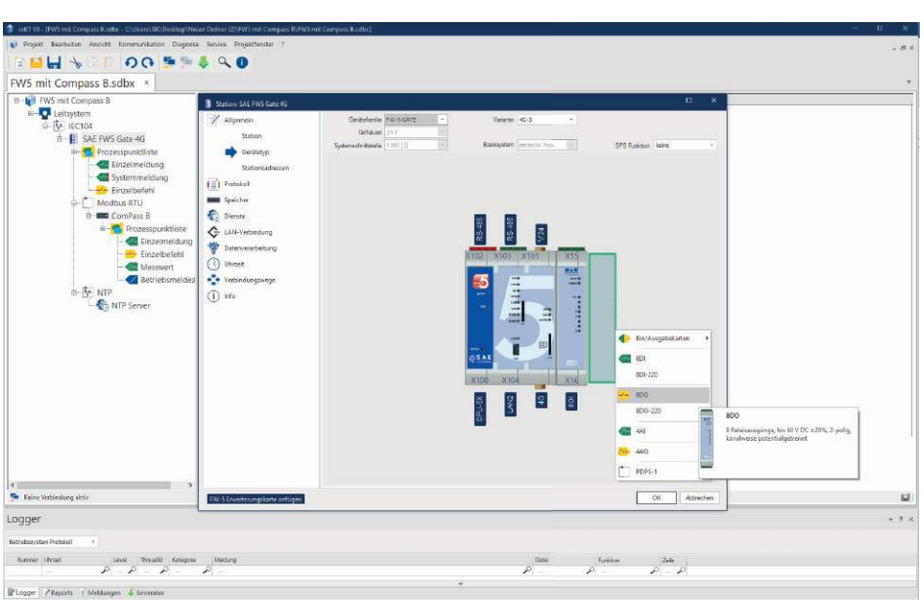
- Coverage analysis
- New value notification
- “General list” for a quick overview of prioritized messages
- Simulation of process values parallel to ongoing operation to test a created configuration

Diagnostics & web server

- TCP/IP dump integrated as listening interface
- Analysis of the VPN tunnel setup with debug log
- Encrypted communication via https
- Web server user profiles according to BDEW whitepaper
- Archive processing based on SQL database
- Free period selection with variable csv export
- Switching via web server
- Value specification and address changes via browser
  - Station address
  - IP address
  - System setpoints (e.g. transformer constant), system setpoints as changeable factors, selective remanence of command status and setpoints
- The expected service life of a parameterized SD card can be monitored and displayed in the online diagnostics

Data flow analysis IEC 60870-5-10x

- Tracking of information paths for telecontrol heads
- Filtering by interfaces, addresses, type identifiers



setIT application: Powerful parameterization application consistently designed for user-friendliness. Allows SAE telecontrol devices to be conveniently adapted to the requirements of the application and extensive structures to be mapped.

Redundancy functions & communication

Redundancy

- Support for redundant control centers
- Duplicated telecontrol heads
- Station redundancy
- Process point redundancy
- Line-by-line hot-standby switching
- Spare path switching and path redundancy
- Intelligent management of main and backup routes
- Process point assignment to definable data groups with prioritized transmission on alternate routes
- Intelligent redundancy concepts without watchdog
- Remote alerting via SMS from the stations

Documentation

- Report generation, e.g. in pdf files
- Archive processing with variable archive depths
- Reloading archive gaps from the station archive

Types of communication

- IEC 60870-5-101 Serial coupling
- IEC 60870-5-102 Remote meter reading - Routing exclusive
- IEC 60870-5-103 Selective protective device coupling
- IEC 60870-5-104 Coupling via TCP-IP/LAN
- IEC 61850 Client with ICD/SCD import
- IEC 61850 Server

Fieldbus + PLC couplings

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

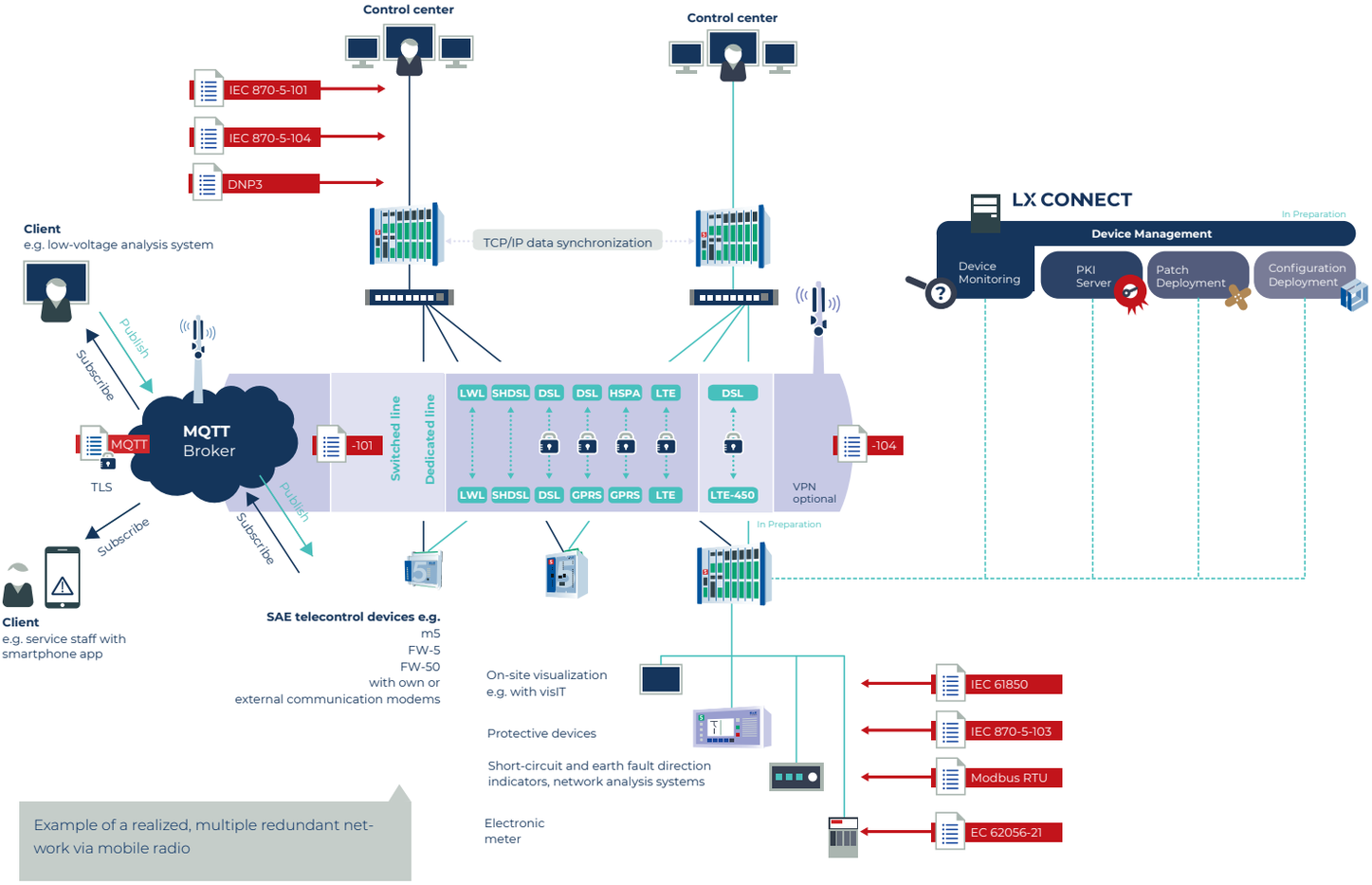
- Profibus-DP
- Modbus RTU Master/Slave
- Modbus TCP Master/Slave

Integration & customization

Control systems or network control centers can be connected directly or integrated into complex networks via meshed structures. Telecontrol routers form the link between control centers and subordinate networks. They manage the data of all subordinate stations in the process image and also make it available on the web server. The data connection is typically made via TCP/IP with IEC 60870-5-104 protocol. Several control systems of different types can be supplied with selected data from transmission lists. Separate structures and addressing of the control systems are also adapted.

Operating modes

- Point-Point
- Partyline, multi-point/shared operation
- Star operation
- Ring structures
- Concentrator connections
- Redundancy paths, replacement paths



Example of a realized, multiple redundant network via mobile radio

Transmission paths

- Leased lines, SHDSL, WT
- LAN networks
- DSL, SDSL, VDSL, ADSL
- GPRS/EDGE/UMTS/HSPA/LTE
- With VPN tunnel or in private address range
- Radio networks: LTE450 MHz

Transmission causes

- Spontaneous on change/limit value
- Cyclically
- Queried by general query
- In the background
- Transmission of counter values spontaneously at intervals
- Hourly synchronous, from 10 s to 8 hours
- Separate transmission for process and archive values

Time synchronization

- Time synchronization can be set in several stages via prioritization:
  - NTP server synchronization
  - Synchronization via the control system
  - Time synchronization via DCF or GPS receiver

Free shunting in the telecontrol network

- The shunting, also known as cross-traffic, copies any messages, measured values and counter values to other stations in the network. There, these control tasks can be fed in or output directly
- Shunting independent of the control center via telecontrol head
- Shunting at any number of stations

Network status information

- SNMP Trap/poll can be used to read network stations from accessible routers and network components and embed them directly in the process image of the station.

PLC control functions

- The optional soft PLC with straton offers additional flexibility and allows the implementation of any PLC program. The PLC quantity structure is integrated selectively

ADDITIONAL FUNCTIONS FOR NETWORK AND STATION CONTROL TECHNOLOGY

Extended control center coupling

- Fast and successful connection to common control systems
- Flexible address structures with up to 6 levels
- Selective data filter for interconnected networks through Transmission lists with possible address restructuring
- Redundancy functions

Command control via special EVU cards

- Command control with 1 out of n monitoring
- Single and double commands, 1.5 or 2-pole
- Command-based setting of press-on time, interference suppression, coupling resistance
- External circuit test from 10 Ω to 100 k Ω
- Cascading of subracks to form a command group

Extended process data acquisition

- Count value restoring via external pulse input
- Variable measurement period archiving
- Binary, BCD and 32-bit transformer stage signal
- Substitute value generation for control commands
- Two measured value transmission cycles to choose from
- Measured value transmissions outside the cycle can be triggered automatically by digital events

Selective protection data coupling

- Selective protective device coupling in accordance with IEC 60870-5-103 or IEC 61850 for digital protection technology
- Preprocessing of process data in the process image
- Conversion of protection device addresses into the address space and structure of the control center
- Archiving of fault records in Comtrade format

TECHNICAL DATA

Main functions	Details	
Structure	Parameterization and diagnostic tool under MS® Windows for telecontrol and station control technology	
System requirements	Windows 10 /64, Windows 11	
Protocols	**IEC 60870-5-101**	Telecontrol and station control technology
	IEC 60870-5-103	Protective device coupling
	IEC 60870-5-104	TCP/IP control center coupling
	IEC 61850 ed2	Stationsbus client / server (optional)
	DNP3	master / outstation, seriel / TCP
	Modbus	RTU / TCP Master / Slave
	MQTTv3	Dataserver publisher / subscriber
	IEC 62056-21	Meter interface (formerly IEC 1107)
	DSfG	Interface for gas
	LACBUS-RTU	Gateway SOFREL Data logger
	Profibus	DP slave
	3964R/RK512 S7	Coupling
	SNMPv3	Status messages via Master / -Agent
	https	Secure communication
	IPsec IKEv1, IKEv2	Encryption / VPN tunnel
	OpenVPN	TLS encryptions
	SYSLOG	Central message server
	LDAP/RADIUS	Central user administration
	DHCP/DNS	dynamic IP address
	NTP- /DCF-	Clock Synchronization
	IEC 61131-3	compatible via straton, program memory 128 kB, PLC programming
Inputs	Single messages, double messages Transformer stage messages 7/8/32 bit, binary, BCD Measured values 8/12/16/32 bit, bit pattern messages Counter value inputs	
Internal notifications	System messages, collective messages through logical links Calculated values and operations, System setpoints, changeable transformer constant, etc., Feedback definitions for command control with EVU cards, Wiper messages with pulse extension	
Outputs	Single commands, double commands, transformer step commands 7/8/32 bit, Command control 1.5/2-pole, 1 out of n with outer circuit check Setpoints 8/12/16/32 bit, bit pattern commands, counter value outputs	
Rankings	Single messages/single commands in command direction Double messages/double commands in command direction Bit pattern messages/bit pattern commands in command direction System messages in command direction, measured values in command direction 16/32 bit count value assignment	
Archive data	Fault message/operating message archive, syslog log messages Interval values, quantity values, equidistant intervals from 1 min to 60 min	
Services	NTP/SNTP/DCF clock synchronization PPP - TCP/IP protocol via serial interfaces http/https - Web browser standard, encrypted FTP/FTPs - file transfer standard, encrypted DHCP - diagnostics on USB device Syslog - recording of log messages	
Diagnostics	Online process point display, plain text message with real-time stamp Scaled online measured values with bar graph, color change in the limit range System monitor, archive memory monitor, syslog monitor, IPsec log Interface monitor, TCP dump, IEC 60870-5 data flow analysis Extended commissioning aids: Coverage analysis, new value message	
Webserver	Online process point display as in the parameterization tool Value entries for addresses and system setpoints Online display of the values of subordinate stations Archive view and free archive export to csv file Firmware download	

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