



SMART GRIDS

Smart solutions for
digitised distribution grids

www.sprecher-automation.com

sprecher
automation

DIGITAL DISTRIBUTION GRID

SECURE AUTOMATION SOLUTIONS FOR INTELLIGENT DISTRIBUTION GRIDS

Around 95 percent of all renewable power generation such as wind farms and photovoltaic plants are connected to the distribution grid. The present distribution grids have to absorb and distribute strongly fluctuating amounts of energy – and often in different directions.

In future they will have to assume even more responsibility for grid stability and thus for the successful implementation of the turnaround in energy policy.

Digitisation supports network operators in their extended tasks in the fields of

- Congestion management
- Voltage stability and reactive power management
- Grid restoration

Sprecher Automation offers a comprehensive product portfolio and experienced system specialists for the setup and safe operation of digitised distribution grids.

IT-SECURITY



SPRECON systems have been developed for use in critical infrastructures such as monitoring and controlling power distribution grids.

They comply with the IT security catalogue (§ 11 Abs. 1a EnWG) of the German Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway (Bundesnetzagentur), the security white paper of the German Association of Energy and Water Industries (BDEW) and the international standards of the ISO/IEC 27000 series (e.g. ISMS), IEC 62351 and IEC 62443.

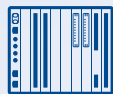
Security Features:

- Secure communication of process data via VPN tunnelling using OpenVPN or IPsec
- Integrated firewall
- Connection to RADIUS/LDAP (directory services) and local access management
- Secure access for commissioning and servicing via role-based access control (RBAC)
- Network monitoring (security logging) via Syslog and SNMPv3
- Network segmentation by means of VPN, VLAN, firewall and independent physical interfaces
- Malware protection via own firmware and application whitelisting

Sprecher Automation is certified to ISO 27001 for the company's information security management system (ISMS) and business processes and also supports customers introducing ISMS.

SPRECON

CONTROL, PROTECTION & MONITORING



You can rely on SPRECON for all areas – from generation in the power plant to reliable electricity for households. With our uniform hardware and software platform, we cover substation automation, grid protection, telecontrol, power plant control technology and grid control technology.

To simplify the differentiation of key applications, the platform has been structured as follows:

- SPRECON-E-**C (Control)** offers multi-functional automation, monitoring and telecontrol devices
- SPRECON-E-**P (Protection)** devices protect your network and equipment
- SPRECON-E-**T3 (Telecontrol)** comprises compact modules for automation and telecontrol technology
- SPRECON-**V460 (Visualisation)** is used in grid control rooms and as local HMI

The SPRECON platform consists of a basic system, involving signalling, command and measured value processing, grid monitoring and intelligent automation and protection functions for a variety of different control tasks. IT security is an integral component of the platform.

The compact SPRECON-E-T3 automation system has a host of functions for the cost-effective and secure development of smart distribution grids. Communication via GPRS/UMTS/LTE, the direct connection of instrument transformers or smart meters and local process control via display or web server are just some of the features of SPRECON-E-T3 that provide optimal support for a step-wise and modular expansion of smart distribution stations.



SPRECON-EDIR

DIRECTIONAL EARTH FAULT &
SHORT CIRCUIT INDICATOR



SPRECON-EDIR is used as an enhanced directional earth fault and short circuit indication using and combining various methods for permanent monitoring in compensated, isolated or solid-earthed medium voltage grids. The individual methods of short circuit detection, which can be executed simultaneously, can be prioritised resulting into one single signal.

The following methods are applied:

- Stationary methods, harmonic methods, transient methods, restriking methods
- Pulse and fast pulse methods
- Differential admittance methods
- Directional short circuit indication
- Directional DT (2-stage)
- Prioritisation
- Logical operations

SPRECON-EDIR is available as a stand-alone device for panel mounting and as a software module for selected SPRECON-E-P devices.

SPREBOX

COMPACT CONTROL CUBICLES



SPREBOX control cubicles are cost-effective and compact turnkey solutions for a variety of automation tasks. In addition to the automation device, they consist of a modern UPS station with a long-lasting battery and standardised industrial plug connectors, including a Modbus interface.

The compact SPREBOX cubicles are designed for indoor and outdoor use and meet all the requirements with regard to hardness and shock resistance, as well as electromagnetic compatibility.



SMART SECONDARY SUBSTATIONS



The further expansion of decentralised power generation requires digitised smart secondary substations to guarantee supply security. Sprecher Automation's smart secondary substations provide significant functionalities for grid operators:

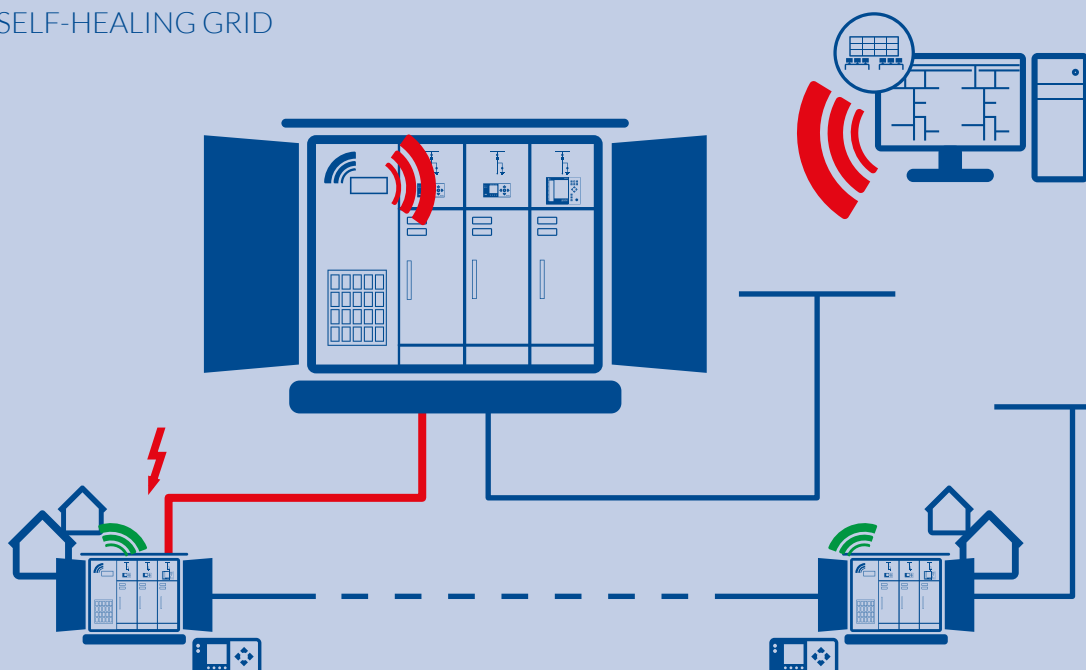
- Acquisition of relevant grid data and control of grid conditions with the SPRECON-E-T3 basic system via IEC 60870-5-101/104, with an optional GPRS/UMTS modem
- IT security features such as encrypted communication via IPsec/OpenVPN, configurable firewall rules and authentication with local and central user management (e.g. control of relevant producers, consumers and storage via RADIUS connection)
- Local management tasks to relieve control centers

Intelligent automation solutions for secondary substations are modular and extendible in order to meet legal and/or operational requirements in the future.

The following functionalities are available:

- Telecontrol functions for acquisition of grid conditions and for control in low and medium voltage grids
- Three-phase measured value acquisition for U/I, effective and reactive power, frequency – with up to 15 measurement modules
- Power grid automation, e.g. automatic voltage control
- Integration into existing systems e.g. through interoperability with SCADA systems
- 2 separate Ethernet interfaces and up to 2 x RS232 or 2 x RS485 interfaces
- Connection of subsystems such as power quality, metering etc. e.g. via Modbus or IEC 62056-21 (IEC 1107)
- Via the integrated web server, the essential station parameters for a mass rollout can be specified simply and without tool installation on the basis of device typicals.
- Monitoring and control via local panel or webserver
- Remote maintenance and remote service via Service Program or webserver

SELF-HEALING GRID



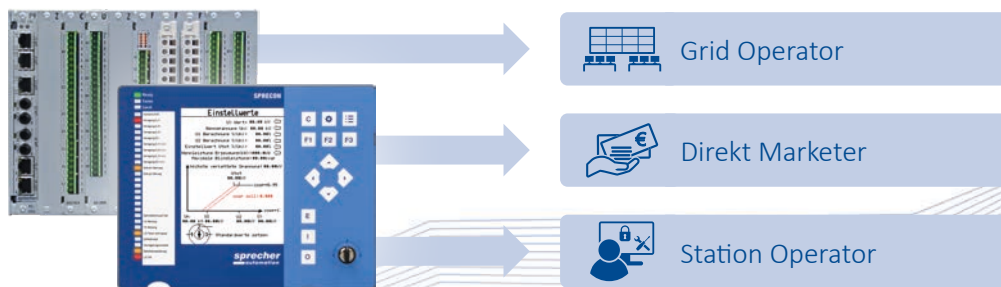
SMART FEED-IN MANAGEMENT

The SPRECON platform provides standard solutions for station-selective and non-discriminating monitoring and control of renewable power generation including the following features:

- SPRECON-E-T3, optionally in a cabinet, with documentation
- 4-stage control of feed-in power
- Analogue power recording via meters or connection of external systems
- IPsec/OpenVPN encrypted communication via IEC 60870-5-104, with GPRS/UMTS modem option
- Integration into existing systems, e.g. through interoperability with SCADA systems
- Modular expansion of standard configurations in accordance with future legal or operational requirements:
 - Power control for effective and reactive power, even above reference values
 - Separate ethernet interfaces for connection to grid operators, direct marketers, virtual power plants and station or plant operators
 - Additional analogue and/or digital inputs and outputs

- Control functions
- Additional interfaces and protocols for connecting external devices such as power quality measuring equipment, inverters, smart meters etc.
- Direct measured value acquisition with
 - 110 VAC / 230 VAC
 - 1/5 A converters
 - Low-power current transformers according to IEC 60044-7/-8
- Via the integrated web server, the essential station parameters for a mass rollout can be specified simply and without tool installation on the basis of device typicals
- Monitoring and control via local panel or via webserver
- Remote maintenance and remote service via Service Program or via webserver

As a device for combined protection and control, SPRECON-E-P provides a turnkey solution for grid connection of local infeeders such as wind farms featuring separate telecontrol interfaces.



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