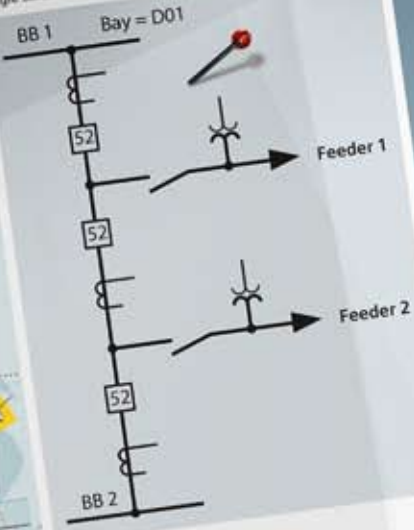
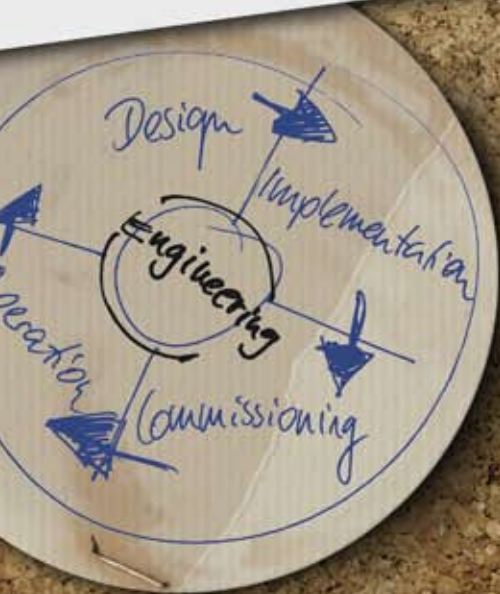


Single Line Diagram



400 kV Switchgear

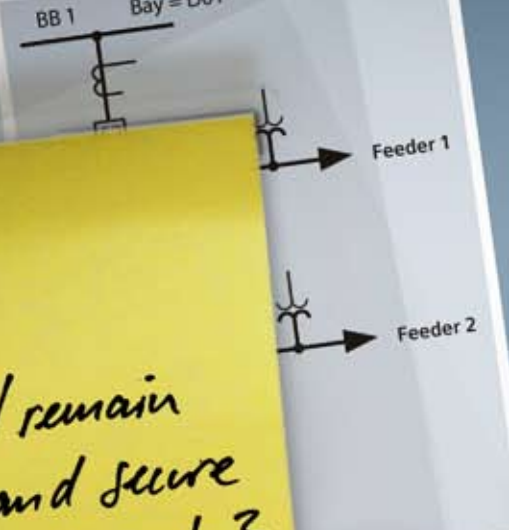


SIPROTEC 5 –
the new benchmark for protection,
automation, and monitoring
of transmission grids



Answers for energy.

SIEMENS




BB 1 Bay = 00.
Feeder 1
Feeder 2

How can I remain flexible and secure my investment?

How can I keep my engineering costs and operating costs to a minimum?


How can I make the advantages of the IEC 61850 work for me?

Who can provide me with all the field data I need for my grid?



400 kV Switchgear

How do I ensure the stability and quality of my grid?



Who can keep me updated on the condition of my system?

SIPROTEC 5 – the new benchmark for protection, automation, and monitoring of your transmission grids

A new, flexible generation of innovative and intelligent field devices

System requirements in daily practice have never been more diverse. While networks are becoming more complex, entire organizations are reducing personnel, and increasing system availability to align themselves towards increased profitability.

Furthermore, distributed power generation and irregular generation output along with the ever-changing governmental specifications and requirements faced by the energy sector at large – not to mention intelligent grids – all make for challenging times in the business.

SIPROTEC 5 has been designed specially to meet the requirements of today and tomorrow, in the ever-evolving energy market. SIPROTEC 5 is part of the new generation of incomparable modular, flexible, and intelligent digital field devices.

SIPROTEC 5, in addition to its reliable and selective protection and complete automation, offers the comprehensive data basis needed for monitoring modern grids successfully. Synchronized display measurement (PMU), grid quality data, and comprehensive system data are supplied as part of this extensive performance package.

The result is high safety levels that protect your investment and enhance system availability.





The perfect SIPROTEC 5 devices for your applications

- 7SA8 distance protection
- 7SD8 line differential protection
- 7SL8 line protection
- 7VK8 breaker management
- 6MD8 bay controller (in preparation)

SIPROTEC 5 – suited to all applications at all times

The new SIPROTEC generation is ideally suited to transmission and sub-transmission applications. Its comprehensive range of functions and the diverse range of applications for which it has been designed mean simple and cost-effective solutions.

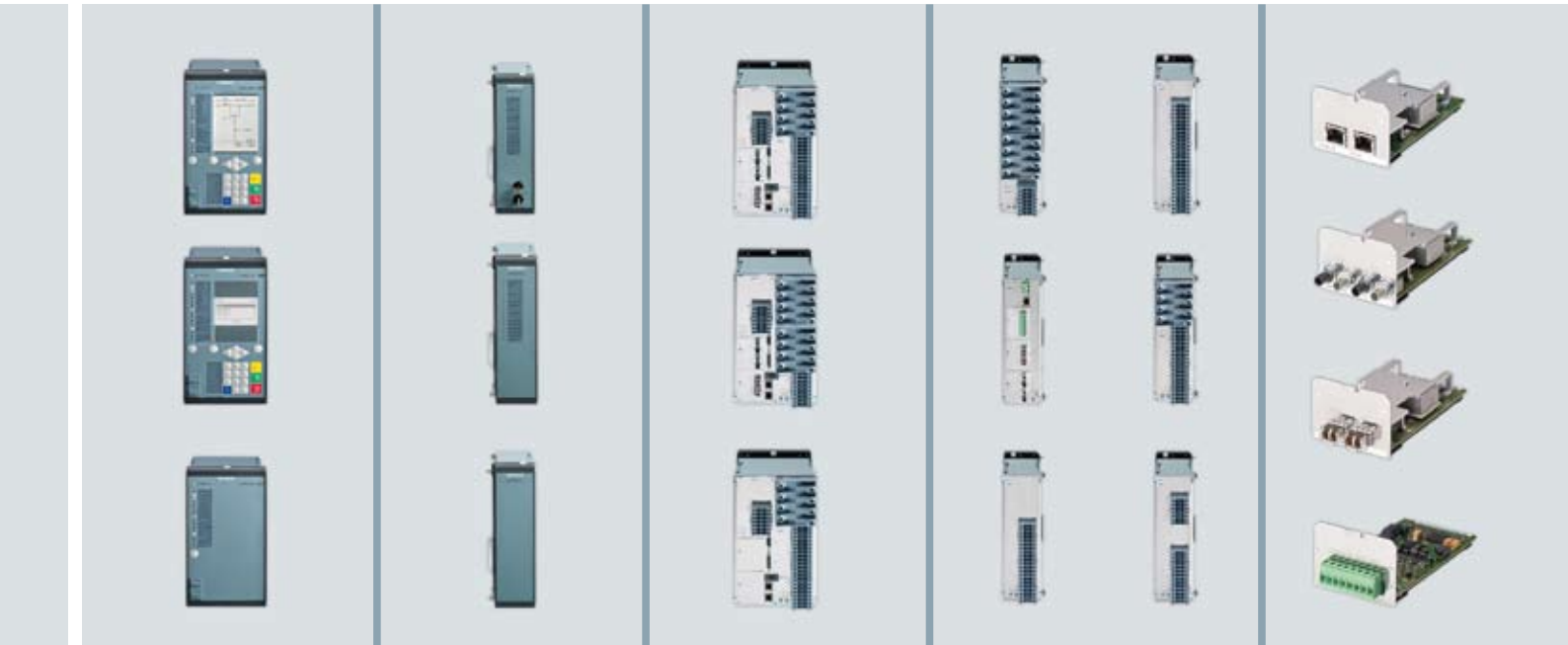
Field devices and functional integration

With modularly designed hardware and software and its high-performance DIGSI 5 engineering tool, the SIPROTEC 5 product family of field devices are perfect for protection, control, monitoring, and measuring applications in electrical energy systems. Their complex capability means they can be functionally integrated into systems at every thinkable level.

The SIPROTEC 5 portfolio ranges from distance protection, line differential protection, line protection, and breaker management to the bay controller itself. Each device is optimally designed to be completely integrated with all others in the product family. The devices can be combined modularly for seamless integration into existing systems.

SIPROTEC 5 hardware modules

A fully modular system with a range of single modules to choose from



Operator panels
for base modules

Operator panels for
expansion modules

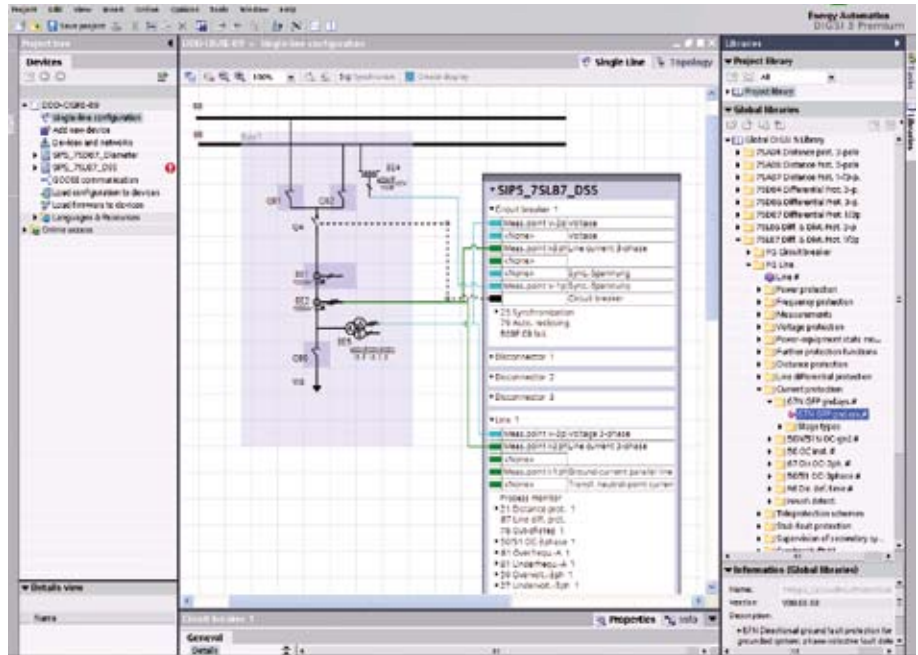
Base module with
various input and
output modules

Expansion module with
various input and output
modules

Plug-in module

Your advantages at a glance

- High-performance protection features guarantee the safety of your systems and that of your employees
- Data security and transparency throughout the entire life cycle of the system save time and reduce costs
- Single configurable hardware components lower costs in a range of areas, from initial investment to the inventory of spare parts, maintenance, expansion, and eventual retrofit in your plant, as required
- Clear and easy-to-use devices and software thanks to user-friendly design
- Increased quality and reliability of the engineering process
- High degree of overall safety and security based on thorough implementation
- High-performance communications components guarantee safe and effective solutions
- Full compatibility with IEC 61850 Edition 1 and 2
- Efficient operation concepts based on flexible engineering IEC 61850 Edition 2
- Comprehensive data for monitoring modern networks
- Optimal smart automation platform for transmission grids based on integrated phasor measurement units (PMU) and power quality functions



Holistic workflow

Consistent engineering processes from plant design to operation streamlines your workflow in every regard

Efficient operation

SIPROTEC 5 enhanced design means even more simplified, optimized workflows than previous versions. SIPROTEC 5 supports all operations comprehensively and makes light work of increasingly subdivided work processes while ensuring that high quality is maintained, despite the pressures of efficiency-driven time constraints.

How we put this into practice:

- Integrated and consistent engineering for system and device from single-line diagram up to device parameterization
- Easy and intuitive graphical linkage of the device with the primary plant
- Application templates for frequently used applications are included
- Libraries for your user-defined configurations and plant elements
- Multi-user concept for parallel engineering
- Open interfaces for seamless integration into the user process world
- User interface – developed and tested in cooperation with many users – that pays off in daily use
- Integrated tools for testing during engineering and commissioning as well as for simulation of operational scenarios, such as network disturbances or switching operation

With SIPROTEC 5 this is:

One single tool from plant design to operation – covering all departments – saves time, provides data security and transparency along the entire life cycle of your plant.



Perfectly tailored fit

Individually configurable devices provide perfectly tailored and cost-efficient solution over the entire life cycle

Suitable for every application

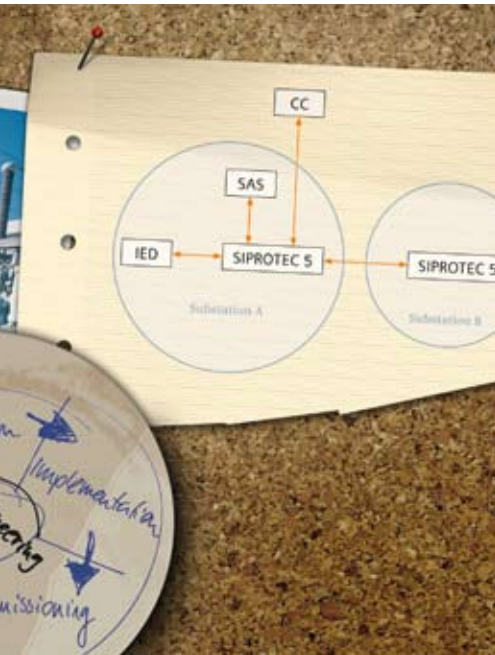
SIPROTEC 5 sets a new benchmark with the modularity and flexibility of its hardware, software, and communications technology for cost-effectiveness and system availability. Unlike any other system, SIPROTEC 5 provides customized solutions for your substation and applications.

How we put this into practice:

- A modular system design regarding hardware, software, and communication enables perfect adaptation to your needs
- Functional integration of various applications, such as protection, control, measurement, power quality, or fault and disturbance recorder
- The same expansion and communication modules throughout the entire family
- Innovative terminal technology guarantees easy connection and mounting and safe exchange
- Usage of the same functions throughout the entire product family reduces training effort and provides more safety
- With easy editing these functions can be individually adapted to your demands
- Innovations are simultaneously available to all devices and can be easily retrofitted via libraries if needed
- Flexible IEC 61850 object models and communication services offer a unique platform for the implementation of manufacturer-independent operation and maintenance concepts

With SIPROTEC 5 this is:

Individually configurable devices lower costs for the initial investment, stock of spare parts, maintenance, expansion, and retrofit of your plant.



Designed to communicate

The trendsetting system architecture gives you peace of mind in communication

Equipped for every requirement

High-performance, flexible, and, above all, reliable communication is of paramount importance in distributed system landscapes, like Smart Grids, for example. In the SIPROTEC 5 system architecture, communication ranks outstandingly high in terms of priority, and we have done everything possible and more to meet your communication requirements today and in the future.

How we put this into practice:

- Adaptation to your communication structure's topology per parameter (whether ring, star, or network)
- Scalable redundancy in hardware and software with protocols that fit your needs
- Several communication channels for integrated solutions
- Communication modules that can be easily plugged in and retrofitted
- Module hardware is independent of applied communication protocol
- Two independent protocols on one module
- Comprehensive routines for testing connections, functionalities, and operating procedures

With SIPROTEC 5 this is:

Communication, being a central component of the system architecture, today and in the future provides the necessary flexibility and security required for highly meshed system landscapes.



Safety and security inside

Multilayered security mechanisms in every link of the safety and security chain offer you maximum possible security and availability

A multilayered concept

Highest safety of personnel and equipment while ensuring maximum system availability is top priority. In an ever more complex and open world of systems, older safety mechanisms have become obsolete. That's why the device architecture of SIPROTEC 5 is based on a safety concept that takes account of multiple levels within systems and implements measures to cope with these accordingly.

How we put this into practice:

- Proven functions for the protection of equipment and humans have been continually enhanced over five generations
- Durable and robust hardware (housing, PCB modules, connectors) and a sophisticated layout of the entire electronics for highest strength regarding voltage, EMC, climate, and mechanical stress
- Sophisticated self-monitoring routines locate and report device disturbances immediately and accurately
- Conforms with the strict cyber security regulations according to the BDEW white paper and NERC CIP
- Security routines according to IEC 62351 for IP protocols such as IED 61850 are implemented
- End-to-end encryption along the entire communication chain from DIGSI to device
- Automatic logging of attempted access and of security-critical actions at plants and devices

With SIPROTEC 5 this is:

With multilayered safety mechanisms already integrated in SIPROTEC 5 your plants and systems obtain the highest degree of safety and availability according to latest and highly demanding international standards and technologies.



Smart automation for transmission grids

The unique spectrum of integrated functionalities for all requirements of your grid

Stability for network structures

Climate change and the depletion of fossil fuels are forcing the world to optimize supplying energy from generation to distribution and final consumption. This has profound implications for the structure and operation of networks.

Smart automation – intelligent energy automation – is a central real-time component in ensuring the stability of such networks while simultaneously saving energy and reducing costs.

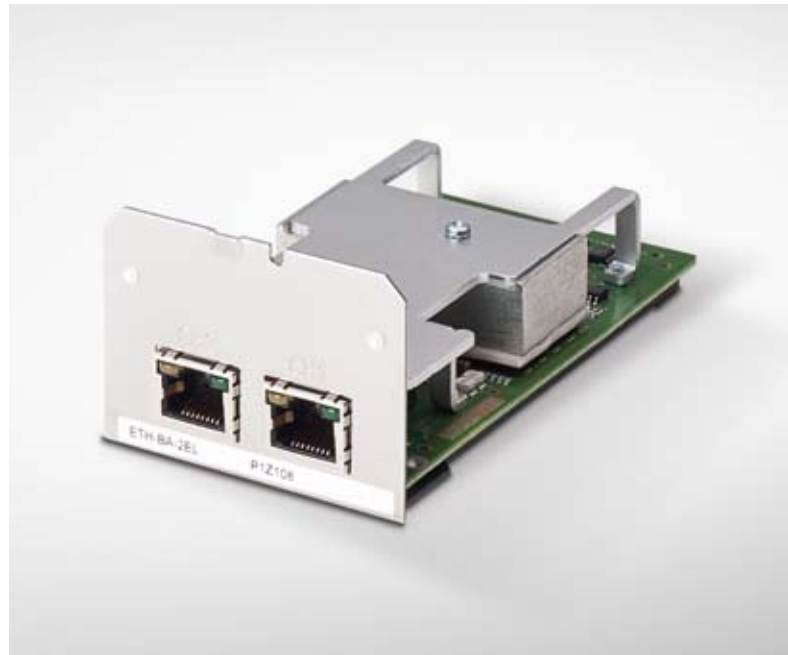
SIPROTEC 5 is the optimum smart automation platform for your grids.

How we put this into practice:

- Protection and automation in the transmission grid
- Open and scalable architecture for IT integration and new functionalities
- Latest communication and cyber security standards
- Intelligent functionalities, e.g. for grid operation, analyzing faults, and power quality (grid monitoring, PMU, fault locating)
- Integrated automation with optimized logic blocks based on IEC 61131-3
- Highly accurate acquisition and processing of process values and transfer to other components in the grid

With SIPROTEC 5 this is:

First device developed for transmission grids, offering the necessary automation platform and investment security.



IEC 61850 – simply usable

Siemens, the IEC 61850 pioneer, unfolds the entire potential of this world standard for you in an easy way

End-to-end implementation

IEC 61850 is more than a substation automation protocol. It comprehensively analyzes data types, functions, and communication in substation networks. Edition 2 extends the implications of the standard to include other fields and applications within the energy sector.

Siemens has played a key role in the standardization process of edition 1. As the manufacturer with the largest installed base worldwide, the company has more experience to offer than any other. In close cooperation with its customers, Siemens has designed and implemented SIPROTEC 5 and made interoperability, flexibility, and compatibility between editions 1 and 2 the utmost priority.

How we put this into practice:

- Siemens is the pioneer and driver for IEC 61850
- Full compatibility with edition 1
- Open interfaces according to IEC 61850 guarantee user-independent system configuration
- Translation of the IEC 61850 data model's complexity into your familiar user language
- Integrated and consistent engineering of system and device from single line diagram to device parameterization
- Consistency between IEC 61850 model and IED functionality
- Flexible object modeling, flexible object address allocation, and flexible communication services guarantee highest interoperability and cost-effective exchange and expansion concepts
- Optimization of usability based on numerous projects and close cooperation with customers of all application areas

With SIPROTEC 5 this is:

The implementation of IEC 61850 edition 2 unfolds the entire potential of this standard by optimally supporting your operational needs and making handling easy.

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