

Infrastructure & Cities Sector Smart Grid Division

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For Smart Transmission Grids: Siemens launches new protection device series for high-voltage networks

Following a trial phase with various grid operators, Siemens Infrastructure & Cities has brought the new protection device series Siprotec 5 onto the market. These numerical bay units with their modular-structure hardware and software are the first in the world to be specifically developed for protection, automation, measurement and monitoring in high voltage power transmission systems. The main innovations include end-to-end engineering, individual configurability and safety mechanisms in all links of the safety chain. Intelligent automation functions and communication as a central part of the system architecture are also featured, along with implementation of Edition 2 of the international communication standard IEC 61850 for energy automation.

Climate change and a scarcity of fossil fuels call for optimization of power supplies, all the way from generation through transmission to consumption. This will exert more and more influence on the structure and operation of electrical power supply grids. Intelligent energy automation can stabilize these systems and at the same time help to save on both energy and costs. That is why Siemens developed the protection device range Siprotec 5. "We conceived the devices for the requirements of a changing energy market. In protection relaying and automation, the challenges can be met by energy trading and by increasing infeed from renewable and decentralized energy sources into the high-voltage grids", explained Jan Mrosik, CEO of the Smart Grid Division of the Siemens Infrastructure & Cities Sector.

The Siprotec 5 devices cover the entire range of applications in high-voltage transmission, such as distance protection, line differential protection, bay control and breaker management. They also form a data basis for power quality and for monitoring of electrical power supply equipments. The modular-structure hardware and software enable the configuration of application-specific devices. To protect the equipment, Siemens has integrated complex safety mechanisms, ensuring a high

level of safety and reliability. The protection functions have been constantly further developed through five relay generations and meet the requirements of the latest international standards and technologies.

The Digsy 5 tool forming part of the protection device range allows integrated, uniform system and device engineering, all the way from the circuit diagram of a substation to device parameter setting and the graphic linking of primary and secondary equipment. Open interfaces enable integration into the user's processes. All devices of the Siprotec 5 range are mutually coordinated and individually configurable; they enable the creation of customized solutions. The functions for such applications as protection, control, measurement, monitoring, power quality and fault recording are integrated.

In development of the system architecture the focus was on communication, with the result that the devices can be adapted via plug-in and add-on modules to the topology of the user's communication structure. The requirements in terms of necessary cyber security were incorporated in the system design of Siprotec 5, in order to take account of the worldwide trend toward IP-based communication.

In implementation of the communication standard IEC 61850, Edition 2, in the Siemens protection devices, the requirements of application-oriented users and of IEC 61850 specialists were given equal consideration. Available to these users are graphic editors and overview representations for editing, whereas IEC 61850 specialists can adapt the object-oriented structures of this standard to operational requirements by way of flexible engineering. Open interfaces to IEC 61850 enable vendor-independent system configuration.

Energy-efficient, eco-friendly solutions for setting up intelligent power supply networks (Smart Grids) are part of Siemens' Environmental Portfolio. In fiscal 2011, revenue from the portfolio totalled nearly EUR30 billion, making Siemens one of the world's largest suppliers of eco-friendly technologies. In the same period, the company's products and solutions enabled customers to reduce their carbon dioxide (CO₂) emissions by nearly 320 million tons, an amount equal to the total annual CO₂ emissions of Berlin, Delhi, Hong Kong, Istanbul, London, New York, Singapore and Tokyo.

The **Siemens Infrastructure & Cities Sector** (Munich, Germany), with approximately 87,000 employees, offers sustainable technologies for metropolitan areas and their infrastructures. Its offerings include integrated mobility solutions, building and security technology, power distribution, smart grid applications, and low- and medium-voltage

products. The Sector comprises the Divisions Rail Systems, Mobility and Logistics, Low and Medium Voltage, Smart Grid, and Building Technologies. For more information, visit <http://www.siemens.com/infrastructure-cities>

The **Siemens Smart Grid Division** (Nuremberg, Germany) supplies power providers and network operators, industrial enterprises, infrastructure elements and cities with products and solutions for intelligent and flexible network infrastructures. To meet growing energy needs, the networks of today and tomorrow must integrate more and more renewable energy sources and ensure bi-directional energy and communication flows. Smart Grids help make it possible to generate and use power efficiently and on demand. For more information, visit <http://www.siemens.com/smartgrid>



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Caption:

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