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SIPROTEC 7SJ81

Feeder and overcurrent protection

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Description

The SIPROTEC 7SJ81 has been designed for a cost-effective and compact protection of feeders and lines in medium-voltage systems. With its flexibility and the powerful DIGSI 5 engineering tool, the SIPROTEC 5 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.

Main function	Feeder and overcurrent protection
Inputs and outputs	4 current transformers, 11 binary inputs, 9 binary outputs 4 current transformers, 18 binary inputs, 14 binary outputs 4 current transformers, 4 voltage transformers, 11 binary inputs, 9 binary outputs 4 current transformers, 4 voltage transformers, 16 binary inputs, 11 binary outputs
Hardware flexibility	Different hardware quantity structures for binary inputs and outputs are available in the 1/3 base module. 1 plug-in module position, available with large or small display
Housing width	1/3 × 19 inches

Applications

- Detection and selective 3-pole tripping of short circuits in electrical equipment of star networks, lines with infeed at one or two ends, parallel lines and open-circuited or closed ring systems of all voltage levels
- Detection of ground faults in isolated or arc-suppression-coilground power systems in star, ring, or meshed arrangement
- Backup protection for differential protection devices of all kind for lines, transformers, generators, motors, and busbars
- Universal power protection

SIPROTEC 7SJ81

- Simple load shedding applications
- Detection and recording of power-quality data in the mediumvoltage and subordinate low-voltage power system

Functions

DIGSI 5 permits all functions to be configured and combined as required.

- Directional and non-directional overcurrent protection with additional functions
- Detection of ground faults of any type in isolated or arc-suppression-coil-ground power systems using the following functions: 3I0>, V0>, transient ground-fault function, cos ϕ, sin ϕ, dir. detection of intermittent ground faults, harmonic detection, and admittance measurement
- Detection of intermittent ground faults with automatic blocking of statically measuring functions to avoid message and fault-record floodingArc protection (note the resulting communication restrictions)
- Overvoltage and undervoltage protection
- Frequency protection and frequency change protection for load shedding applications

Compact and flexible

- Power protection, configurable as active or reactive power protection
- Directional reactive power undervoltage protection (QU protection)
- Control with switchgear interlocking protection
- Synchrocheck
- Circuit-breaker failure protection
- Detection of current and voltage signals up to the 50th harmonic with high accuracy for selected protection functions and operational measured values
- PQ - Basic: Voltage unbalance; voltage changes: overvoltage,
- dip, interruption; TDD, THD, and harmonics
- Graphical logic editor to create powerful automation functions in the device
- Single-line representation in small or large display
- Integrated electrical Ethernet RJ45 for DIGSI 5 and IEC 61850 (reporting and GOOSE)
- 1 optional, plug-in module for a) communication protocols or b) for arc protection
- Redundant and simple communication protocols according to IEC 61850-8-1, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PROFINET IO
- Reliable data transmission via PRP and HSR redundancy protocols
- Extensive cybersecurity functionality, such as role-based access control (RBAC), logging of security-related events, signed firmware, or authenticated IEEE 802.1X network access
- Simple, fast, and secure access to the device via a standard Web browser to display all information and diagnostic data, vector diagrams, singleline and device display pagesTime synchronization using IEEE 1588
- Standard fault recording (buffer for a max. record time of approx. 40 sec. at 2 kHz)
- Auxiliary functions for simple tests and commissioning

Benefits

- Compact and low-cost overcurrent protection
- Safety due to powerful protection functions
- Purposeful and easy handling of devices and software thanks to a user-friendly design
- Cybersecurity according to NERC CIP and BDEW Whitepaper requirements (for example, logging security- related events and alarms)
- Highest availability even under extreme environmental conditions by standard coating of the modules
- Full compatibility between IEC 61850 Editions 1, 2.0, and 2.1

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