# SIEMENS



**ENERGY AUTOMATION PRODUCTS**

# Feeder and Overcurrent Protection **SIPROTEC 7SJ82**

**siemens.com/7SJ82**

The SIPROTEC 7SJ82 overcurrent protection has been designed specifically for a cost-effective and compact protection of feeders and lines in medium-voltage and high-voltage systems. With its flexibility and the high-performance DIGSI 5 engineering tool, the SIPROTEC SJ82 device offers future-oriented solutions for protection, control, automation, monitoring, and Power Quality – Basic.



## 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

## Highlights

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

- Graphical logic editor to create powerful automation functions in the device

- Automatic frequency relief for underfrequency load shedding, taking changed infeed conditions due to decentralized power generation into consideration

## Protection Functions

- Directional and non-directional overcurrent protection
- Optimized tripping times due to directional comparison and protection data communication
- Detection of ground faults of any type in compensated or isolated electrical 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
- Ground-fault detection using the pulse-detection method
- Detection of intermittent ground faults with automatic blocking of statically measuring functions to avoid message flooding
- Fault locator plus for accurate fault location with inhomogenous line sections and targeted automatic overhead-line section reclosing (AREC)
- Arc protection
- Overvoltage and undervoltage protection
- Frequency protection and frequency change protection for load shedding applications
- Power protection, configurable as active or reactive
- Protection functions for capacitor banks, such as overcurrent, overload, current unbalance, peak overvoltage, or differential protection
- QU protection
- Control, synchrocheck and switchgear interlocking protection, circuit-breaker failure protection
- Circuit-Breaker Failure Protection
- Circuit breaker reignition monitoring
- Powerful fault recording (buffer for a max. record time of 80 sec. at 8 kHz or 320 sec. at 2 kHz)

## 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-coil-ground power systems
- Backup protection for differential protection devices of all kind for lines, transformers, generators, motors, and busbars
- Protection and monitoring of simple capacitor banks
- Phasor Measurement Unit (PMU)
- Load shedding applications
- Automatic switchover
- Detection and recording of power-quality data

| Main function | Feeder and overcurrent protection for all voltage levels |
|---|---|
| Inputs and outputs | 4 current transformers, 4 voltage transformers (optional), 11 or 23 binary inputs, 9 or 16 binary outputs, or 8 current transformers, 7 binary inputs, 7 binary outputs |
| Hardware flexibility | Different hardware quantity structures for binary inputs and outputs are available in the 1/3 base module. Adding 1/6 expansion modules is not possible; available with large or small display |
| Housing width | 1/3 × 19 inches |

## Communication and Cybersecurity Functions

- PQ – Basic: Voltage unbalance; voltage changes: overvoltage, dip, interruption; TDD, THD, and harmonics
- Integrated electrical Ethernet RJ45 for DIGSI 5 and IEC 61850 (reporting and GOOSE)
- 2 optional, pluggable communication modules, usable for different and redundant protocols (IEC 61850-8-1, IEC 60870-5-103, IEC 60870-5-104, Modbus TCP, DNP3 serial and TCP, PROFINET IO)
- Serial protection data communication via optical fibers, two wire connections and communication networks (IEEE C37.94, and others), including automatic switchover between ring and chain topology
- 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, single-line and device display pagesWhitepaper
- Phasor Measurement Unit (PMU) for synchrophasor measured values and IEEE C37.118 protocol

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