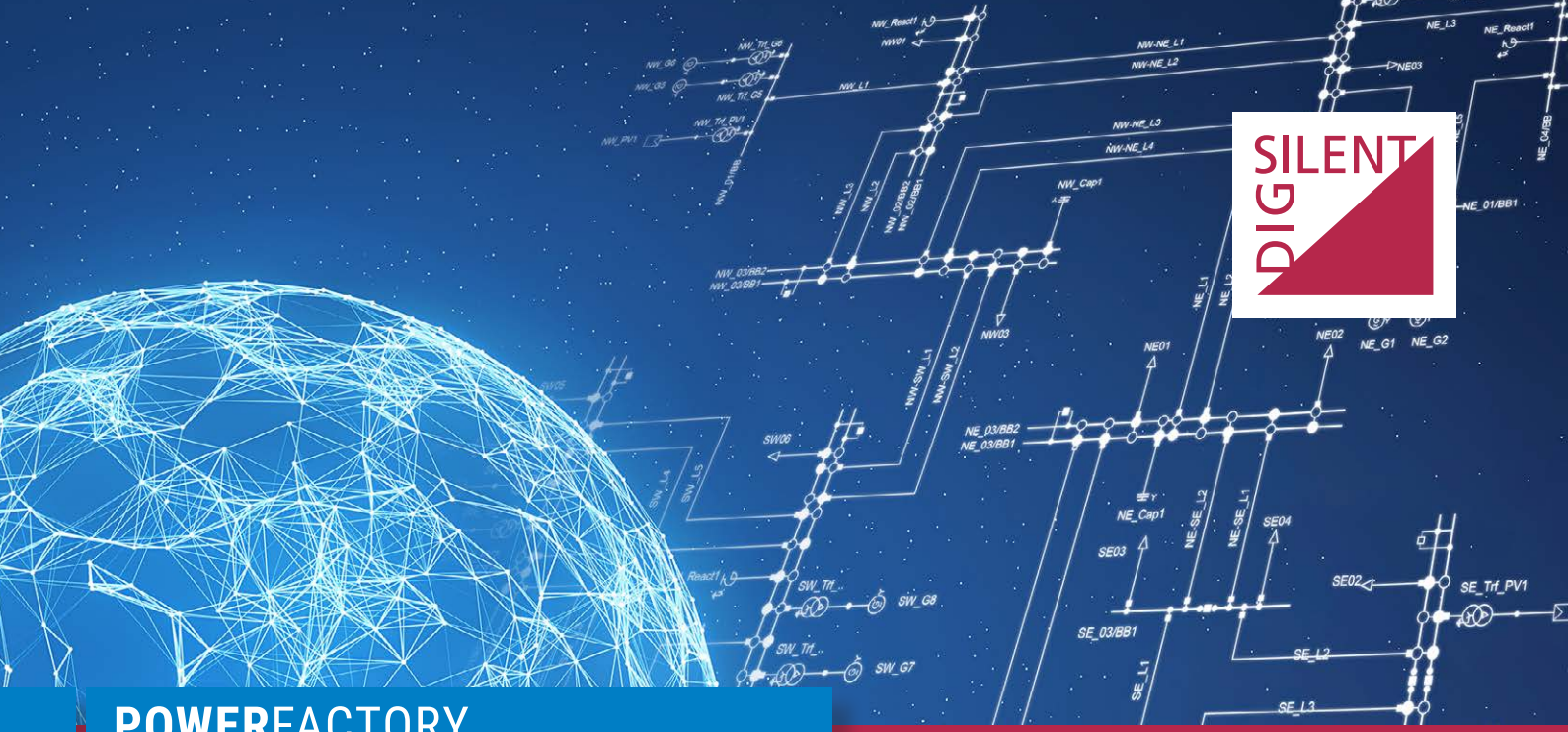

PowerFactory 2021

Technical Reference

Siemens 7SJ70

PF2021

POWER SYSTEM SOLUTIONS

MADE IN GERMANY

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Contents

1 Model information

Manufacturer Siemens

Model 7SJ70

Variants The PowerFactory relay model simulates the features present in the Siemens 7SJ70 relay.

The Siemens 7SJ70 is a first generation static overcurrent protection relay mainly designed for the selective short-circuit and earth fault protection of feeders in secondary distribution networks and for backup protection.

The Siemens 7SJ70 relay has been modeled using one PowerFactory relay model which includes any protective element available in the relay.

The model implementation has been based on the information available in the relay manual [1].

2 Supported features

2.1 Measurement and acquisition

It represents the interface between the power system and the relay protective elements. The currents flowing in the power system are converted by an element which simulates a 3 phase CT; the secondary currents are then measured by one element which models the analog filter of the relay.

2.1.1 Available Units

- One 3ph current transformer (”Ct” block).
- One 3ph measurement element (”Measure” block).

2.1.2 Functionality

The ”Ct-3p” block represents an ideal CT. Using the CT default configuration the current at the primary side are converted to the secondary side using the CT ratio. The CT saturation and/or its magnetizing characteristic are not considered. Please set the ”Detailed Model” check box in the ”Detailed Data” tab page of the CT dialog and insert the data regarding the CT burden, the CT secondary resistance and the CT excitation parameter if more accurate simulation results are required.

The ground current is calculated adding together the phase currents.

The measurement block models a second order low pass analog filter with DC component filter; its time constant is 1 ms.

2.1.3 Data input

The relay nominal current value (relay ”Inom” variable) must be set in the measurement block.

2.2 Protective elements

Two 3 phase definite time elements and one ground definite time element simulate the Siemens 7SJ70 protective functions.

2.2.1 Available Units

- Two 3 phase definite time overcurrent elements (”I>”, and ”I>>” block).
- One ground current definite time overcurrent element (”IE>” block).

2.2.2 Functionality

The PF model contains all the protective elements available in the relay.

2.2.3 Data input

The relationships between the relay settings and the model parameters can be found in the following table (the relay model parameter names are listed between brackets):

Address	Relay Setting	Model block	Model setting	Note
	Instelbereik I>	I>	Pickup Current (Ipset)	
	Instelbereik I>>	I>>	Pickup Current (Ipset)	
	Instelbereik I_E>	IE>	Pickup Current (Ipset)	
	Instelbereik t	I>	Time Setting (Tset)	

2.3 Output logic

It represents the output stage of the relay; it’s the interface between the relay and the power breaker.

2.3.1 Available Units

- one output element (”Logic” block)

2.3.2 Functionality

The ”Logic” block collects the trip signals coming from the protective elements and operates the relay output contact when at least one protective element trips.
The relay output contact is ”yout”.

2.3.3 Data input

To disable the relay model ability to open the power circuit breaker simply disable the ”Logic” block.

3 Features not supported

None.

4 References

[1] Siemens Nederland N.V., Postbus 16068, 2500 BB Den Haag. *Selectief beveiligen met maximstroomtijdrelais 7SJ70 van Siemens Nederland N.V., EV 104 (300-05831)PB*, 1984.