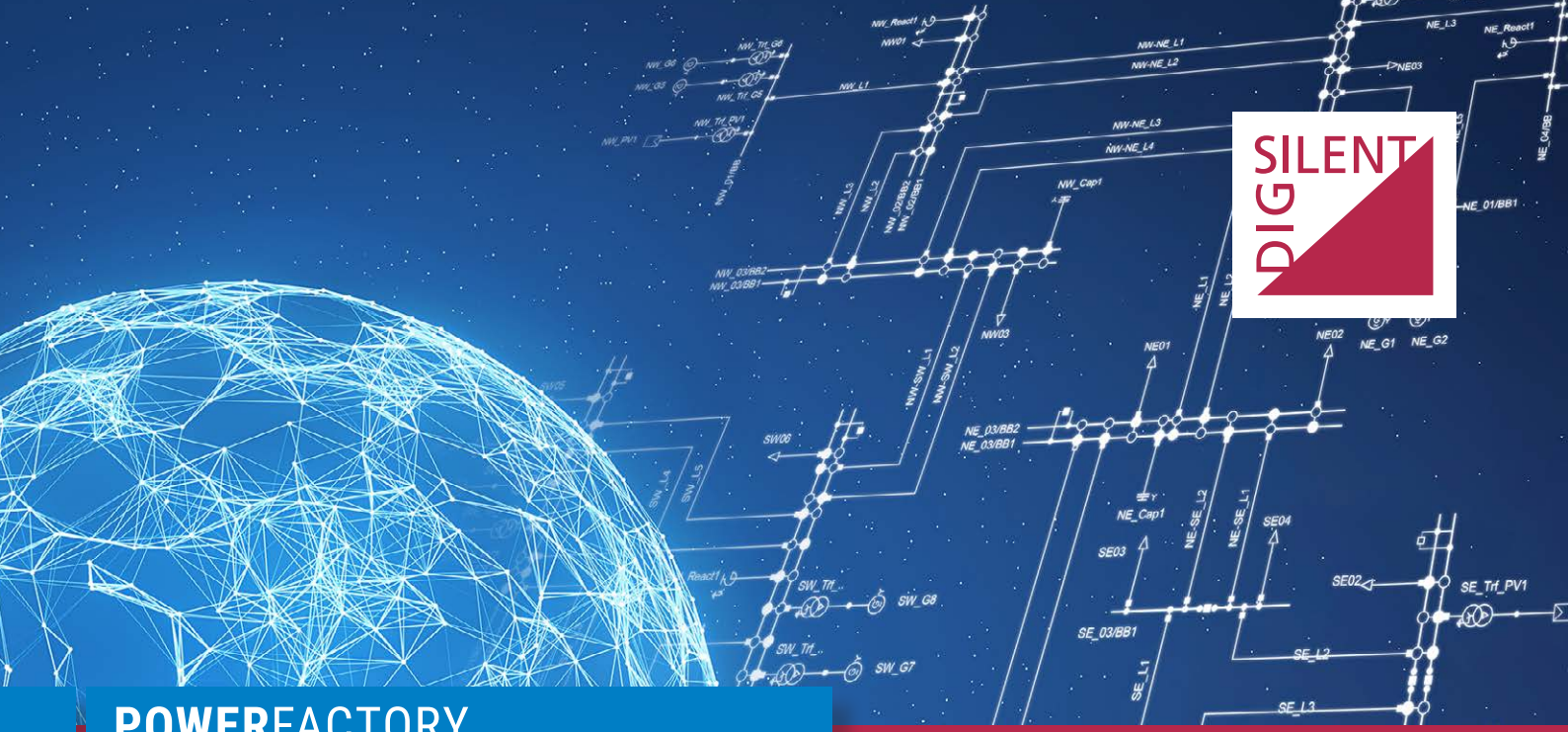

POWERFACTORY

PowerFactory 2021

Technical Reference

DIgSILENT F81R Rate of frequency change Generic R

PF2021

POWER SYSTEM SOLUTIONS

MADE IN GERMANY

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November 15, 2019
PowerFactory 2021
Revision 924

Contents

1 F81R Rate of frequency change

1.1 Intent

To simulate a set of rate of frequency change protective functions with minimum voltage activation threshold.

1.2 Functionality

- A set of rate of frequency change functions with over rate threshold or dead band threshold and with minimum voltage threshold.
- A set of rate of frequency change functions with under rate threshold and with minimum voltage threshold.

Each function belonging to the first set of frequency change functions can be independently set to operate using an over rate threshold or a dead band threshold.
Please notice that each protective element has is own minimum voltage threshold.

1.3 Inputs

- One 3 phase VT (”Phase Vt” block, *StaVt* class).

The following blocking signals are available:

- *iblock_1* blocking ”df/dt<> 1”.
- *iblock_2* blocking ”df/dt<> 2”.
- *iblock_3* blocking ”df/dt<> 3”.
- *iblock_4* blocking ”df/dt<> 4”.
- *iblock_5* blocking ”df/dt< 1”.
- *iblock_6* blocking ”df/dt< 2”.
- *iblock_7* blocking ”df/dt< 3”.
- *iblock_8* blocking ”df/dt< 4”.

1.4 Available Units

Measurement

- One frequency measurement element (”Measurement Freq” block, [RelFmeas class]].
- One 3phase measurement element (”Measurement” block, *RMS Calculation* enabled, *Filter* disabled [RelMeasure class]).

Protective elements

- Four inverse time/definite time dead band/positive rate of frequency change elements (”df/dt <> 1”, ”df/dt <> 2”, ”df/dt <> 3” and ”df/dt <> 4” block, [*RelChar* class]).
- Four definite time phase-ground undervoltage elements blocking the dead band/positive rate of frequency change elements(”df/dt <> 1 min V”, ”df/dt<> 2 min V”, ”df/dt<> 3 min V” and ”df/dt<> 4 min V” block, [*RelUlim* class]).
- Four dead band/positive rate of frequency change operation mode selectors (”df/dt<> 1 Logic”, ”df/dt<> 2 Logic”, ”df/dt<> 3 Logic”, ”df/dt<> 4 Logic” block, [*RelLogdip* class]).
- Four inverse time/definite time negative rate of frequency change elements (”df/dt < 1”, ”df/dt < 2”, ”df/dt < 3” and ”df/dt < 4” block, [*RelChar* class]).
- Four definite time phase-ground undervoltage elements blocking the negative rate of frequency change elements(”df/dt < 1 min V”, ”df/dt< 2 min V”, ”df/dt< 3 min V” and ”df/dt< 4 min V” block, [*RelUlim* class]).

  Please notice that ”df/dt <> 1”, ”df/dt <> 2”, ”df/dt <> 3” and ”df/dt <> 4” block operation mode (over rate threshold or a dead band threshold activation) must be set using the *DEADBAND* variable in the ”Logic” tab page of the ”df/dt<> 1 Logic”, ”df/dt<> 2 Logic”, ”df/dt<> 3 Logic”, ”df/dt<> 4 Logic” block dialog: when *DEADBAND* is set equal to 1 the dead band threshold is active; in that case the relevant block trips for an absolute value of the frequency change greater than block trip threshold; when *DEADBAND* is set equal to 0 the positive rate of frequency change is active and the relevant block trips for a value of the frequency change greater than block trip threshold.

Output logic

- One relay trip element (”Output logic” block, *RelLogdip* class).

1.5 Outputs

- *yout* associated by default to any protective element trip.
- *yout1* associated by default to the dead band/positive rate of frequency change element trip (”df/dt <> 1”, ”df/dt <> 2”, ”df/dt <> 3” and ”df/dt <> 4” block block).
- *yout2* associated by default to the negative rate of frequency change element trip(”df/dt < 1”, ”df/dt < 2”, ”df/dt < 3” and ”df/dt < 4” block).

The output logic can be configured in the ”Logic” tab page of the ”Output Logic” block.