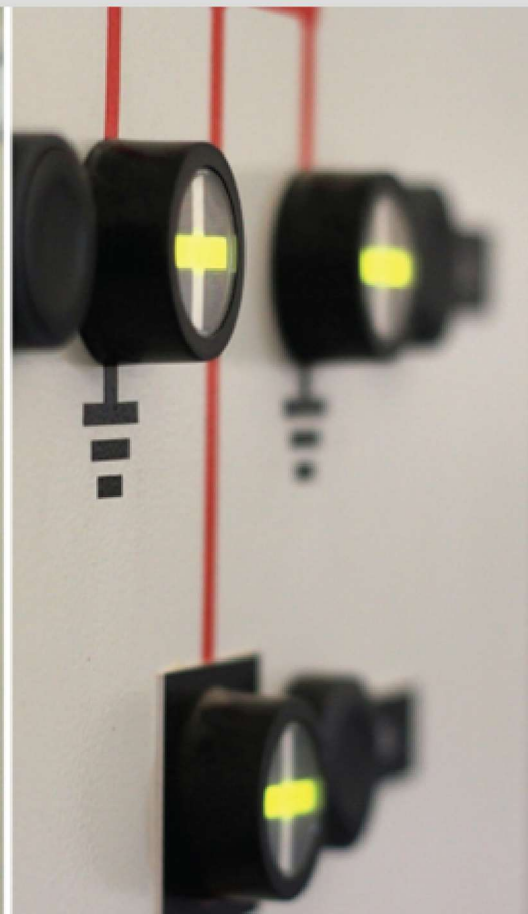
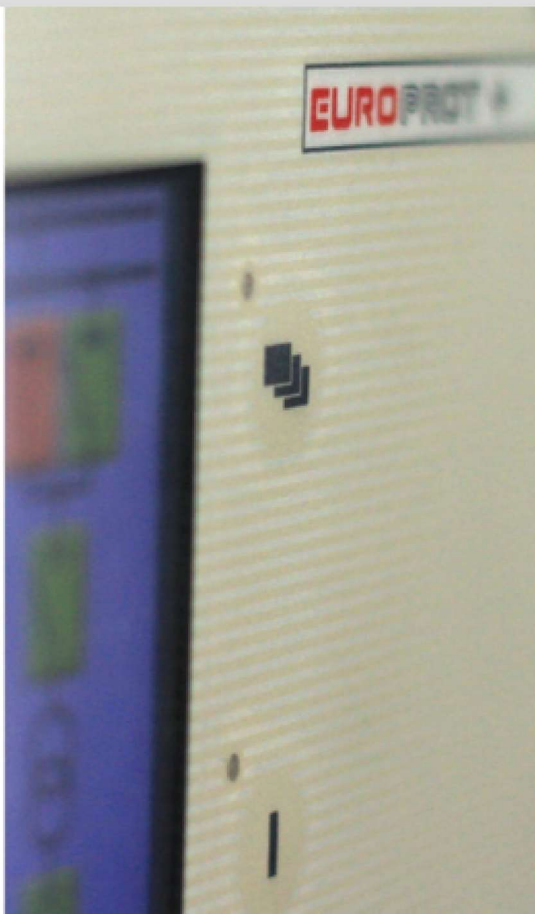


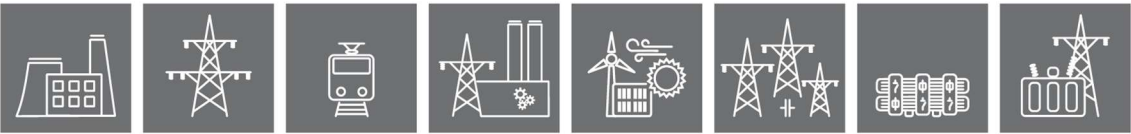


FUNCTION BLOCK DESCRIPTION

Fault Locator

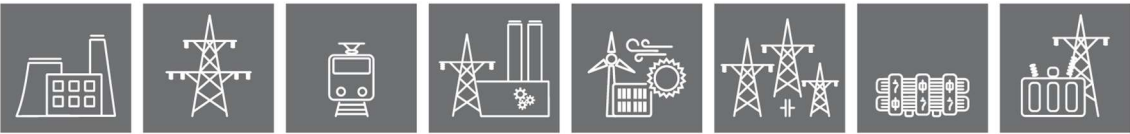
STANDALONE DISTANCE-TO-FAULT CALCULATION





VERSION INFORMATION

VERSION	DATE	MODIFICATION	COMPILED BY
1.0	2026-04-09	First edition	Papdi



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USED SYMBOLS

USED SYMBOLS



Additional information



Useful information for settings.



Important part for proper usage.



1 Application

The Fault Locator function selects first the faulty loop and then it calculates the distance-to-fault based on the measured positive sequence reactance and the total reactance of the line. This reference value is given as a parameter setting line reactance. The calculated percentage value facilitates displaying the distance in kilometers if the total length of the line is correctly set by the parameter line length.

In the standalone fault locator function, between 15ms and 20ms after the start signal, the function calculates the mean value of the measured reactance of the fault loop. This delay is applied to avoid the possible signal processing transients in the beginning of a fault. The distance is calculated by the calculated reactance and the line reactance setting parameter. The measured distance is valid only if the start signal lasts at least for 30ms.

Note, that in the built-in Fault Locator function of the Distance Protection function, the fault location calculation starts at the right moment inside the function and the contribution between the distance zone and the fault locator is harmonized by the software.

2 Overview

The graphic appearance of the function block of the Fault Locator function is shown in the figure below.

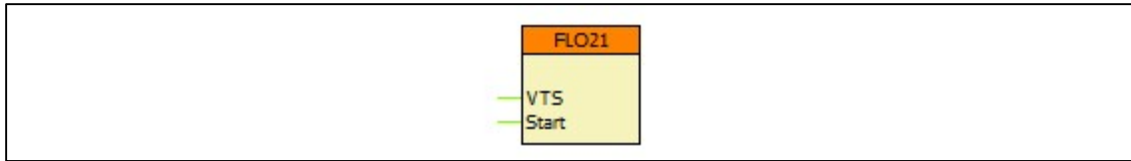


Figure 2-1 The graphic appearance of the fault locator function block

2.1 Settings

2.1.1 Parameters

The parameters are listed as they are seen on the local or remote HMI.

Table 2-1 The enumerated parameter settings of the Fault Locator function

PARAMETER NAME	TITLE	SELECTION RANGE	DEFAULT
FLO21_NetType_EPar	Network type	Solidly Earthed, Isolated	Solidly Earthed

Table 2-2 The floating point parameter settings of the Fault Locator function

PARAMETER NAME	TITLE	DIM.	MIN	MAX	STEP	DEFAULT
DIS21_Z1aX_FPar	(Xo-X1)/3X1	-	0	5	0.01	1
DIS21_Z1aR_FPar	(Ro-R1)/3R1	-	0	5	0.01	1
FLO21_Lgth_FPar	Line length	km	0.1	1000	0.1	100
FLO21_LReact_FPar	Line react. (secondary)	ohm	0.01	200	0.01	10

2.2 Function Inputs and Outputs

This section briefly describes the analogue and binary inputs and outputs of the function block.

2.2.1 Analogue Inputs

The function uses the following analogue signals as inputs:

- Sampled values of the three phase voltages
- Sampled values of the three phase currents
- Basic Fourier components of the three phase voltages
- Basic Fourier components of the three phase currents
- Calculated line-to-line values of the three phase voltages
- Calculated positive, negative and zero-sequence values of the three phase voltages
- Calculated line-to-line values of the three phase currents
- Calculated positive, negative and zero-sequence values of the three phase currents

2.2.2 Analogue Outputs

The measured analogue output values of the Fault Locator function are listed in the table below.

Table 2-3 The measured analogue values of the Fault Locator function

MEASURED VALUE	DIMENSION	EXPLANATION
Fault location	km	Calculated distance of the last fault
Fault react.	ohm	Measured reactance of the last fault

2.2.3 Binary Input Signals (Graphed Output Statuses)

The conditions of the binary inputs are defined by the user, applying the graphic equation editor (*Logic Editor*). Parts written in **bold** are seen on the left side function block in the Logic editor.

Table 2-4 The binary input signals of the Fault Locator function

BINARY INPUT SIGNAL	EXPLANATION
FLO21_ VTS _GrO_	Output status of a graphic equation defined by the user to disable the function due to VT failure signal.
FLO21_ Start _GrO_	Started state of the Fault Locator function.

2.2.4 Binary Output Signals (Graphed Input Statuses)

The Fault Locator function has no binary output signal.

2.2.5 Online Data

Visible values on the *online data* page.

Table 2-5 Online displayed data of the Fault Locator function

SIGNAL TITLE	DIMENSION	EXPLANATION
Fault location	km	Calculated distance of the last fault
Fault react. (primary)	ohm	Measured reactance of the last fault

2.2.6 Events

The following events are generated in the event list, as well as sent to the SCADA according to the configuration. Events in *grey* are not actually shown in the Event Recorder, they merely serve as triggers for IEC61850 reporting.

Table 2-6 Generated events of the Fault Locator function

EVENT	VALUE	EXPLANATION	IEC61850 DATA ATTRIBUTES
Fault Loc. km	[measured distance]	Calculated distance of the last fault	FLORFLO1\$MX\$FItDiskm\$mag
<i>Fault Loc. ohm</i>	<i>[measured reactance]</i>	Measured reactance of the last fault	FLORFLO1\$MX\$FItZ\$cVal\$mag