Grid Solutions
a GE and Alstom joint venture

P154
Feeder protection relay

The P154 feeder protection relay is the latest offering from Grid Solutions' P50 Agile series, serving the distribution and industrial markets.

P50 Agile series: Compact relay

Thanks to its versatility and features for easy adaptation to different applications/ operating conditions, the P154 Agile represents the ideal choice for optimised protection and monitoring for feeders.

The **P154** is an economical choice, designed for deployment in volume, in lower-voltage systems. It offers non directional overcurrent and earth fault protection, with its functions designed to cover a wide range of applications in the protection of cables and overhead lines deployed in industrial installations, public distribution networks, and substations.

P154 relays offer essential supervision like measurement, monitoring and recording functions. Communication protocols are available for transmitting relay data to a supervisory control system via communication networks. The user-friendly operator interface allows easy reading of measured values and simple configuration of the relay. The setting software allows for user easy configuration and access to all the stored information for monitoring, maintenance and troubleshooting purposes. The P154 relay is housed in a robust metal case suitable for panel mounting.

CUSTOMER BENEFITS
- Optimised protection for feeder applications
- Cost effective
- Measurement/protection/ monitoring in one box
- Front USB port for local communication
- Flexible SCADA communication options
- Diagnostic/maintenance facilities
- Wide range of universal auxiliary supply

APPLICATION

The P154 provides a wide range of feeder protection functions and can be applied for the following applications:

- Cables and overhead lines deployed in MV/LV networks
- Backup in HV systems
- Different types of earthing systems
- MV industrial installations, public distribution networks and substations

PROTECTION & CONTROL

- Timed and instantaneous phase and earth fault protection (3 independent stages)
- Wide range of IEC/IEEE curves
- Thermal overload
- Cold load pickup
- Inrush blocking
- Undercurrent/Loss of load detection
- Negative sequence overcurrent
- Broken conductor
- Circuit breaker Fail
- Restricted earth Fault
- Trip circuit supervision
- 6 Digital inputs
- 6 Digital output (c/o)
- 1 A/5 A CTs selection
- SEF option
- Latching of output contacts
- Universal auxiliary power supply range
- 2 setting groups
- Password protection
- Self-supervision & internal diagnostics

FUNCTIONAL OVERVIEW

ANSI	FUNCTION OVERVIEW	FEEDER
	PROTECTION	**P154**
50	Definite time overcurrent	
50N	Neutral/Earth definite time overcurrent	
51	IDMT overcurrent	
51N	Neutral/Earth IDMT overcurrent	
68	Inrush blocking	
49	Thermal overload	
37	Undercurrent detection/Loss of load	
46	Negative sequence overcurrent	
46BC	Broken conductor	
50BF	Circuit breaker fail	
CLP	Cold load pick-up	
64R	Restricted earthfault	
86	Latching of output contacts (Lock out)	
	Control Functions	
74	Trip circuit supervision	
	Watchdog function	
	Self monitoring & diagnostics	
	Test/Commisioning facilities	
	HMI	
	Back-lit LCD display	
	8 x Touch keys	
	8 x Status LEDs	
	Communication	
	USB port	
	Modbus/IEC 60870-5-103 (RS485) (or) DNP 3.0 (RS485)	
	Binary Input / Output	
	Binary Input	
	Binary Output	

| PROTECTION	P154
Analogue input	
Phase current input 3x 1 ph	
Earth current input 1x 1 ph (or) SEF Earth current input 1x 1 ph	
General	
Setting groups	2
Measurements	
Event records	
Fault records	
Disturbance records	
Configurable BI/BO/LEDs	
Hardware	
Auxiliary supply	24-230 V AC/DC
Climatic conditions	Operating : - 25ºC to + 55 ºC Storage : -25ºC to + 70 ºC
Housing	Front IP52
	Rear IP20

MEASUREMENTS
- Metering of Phase currents
- Metering of Neutral currents-derived and measured
- Measurement of thermal state
- Positive and negative sequence current
- Ratio of negative to positive sequence current
- Breaker operation counter
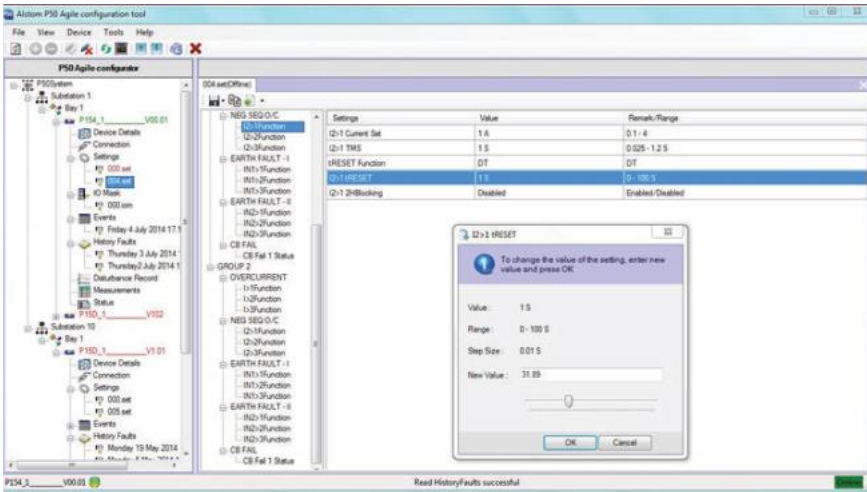- Breaker trip counter
- Breaker operating time

RECORDING & POST FAULT ANALYSIS
- Up to 5 fault records
- Up to 512 time tagged event records
- Up to 5 disturbance records

CONNECTION DIAGRAM
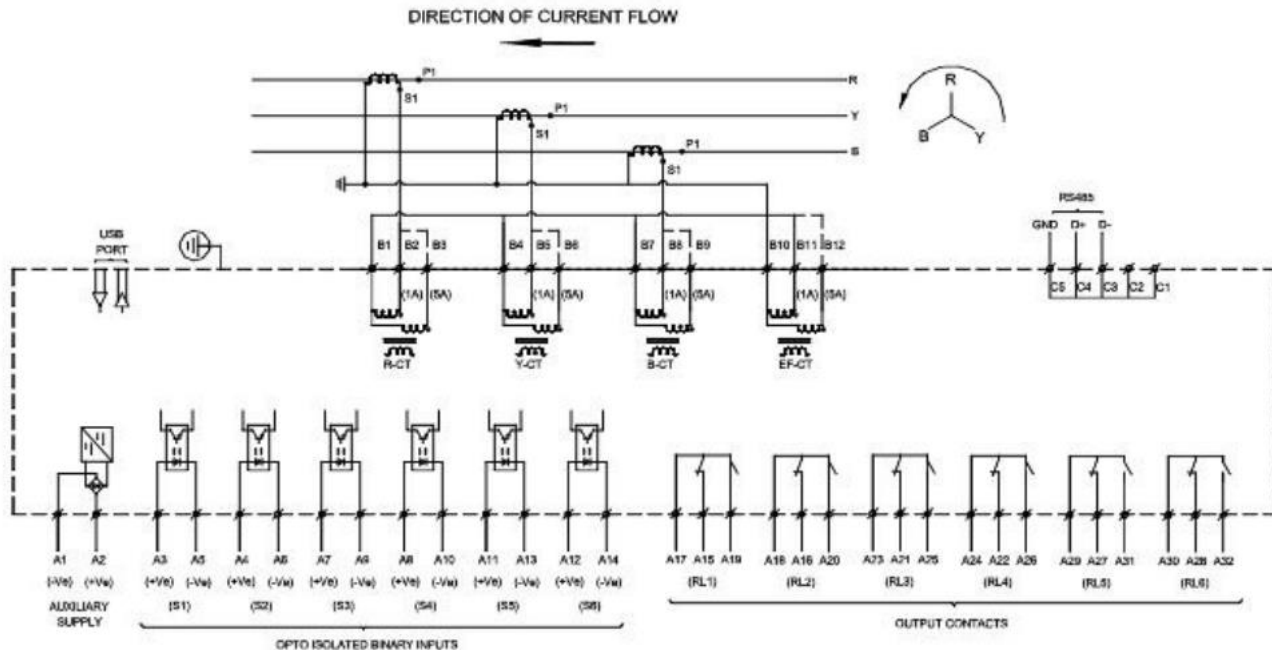
RELAY CONFIGURATION SOFTWARE
(For setting, viewing & parameterisation)

BINARY INPUT/OUTPUT/ LED ASSIGNMENT

P154 supports 6BI/6BO and 4 programmable LEDs, and the facility exists to assign any of the logical / physical statuses to BI/BO and programmable LEDs. This provides user flexibility to program the relay as per the application requirements.

All the output contacts are changeover type and can be configured as SR (self-reset) or HR (hand reset) through the I/O configuration setting from the front panel or through relay setting software.

FRONT PANEL INTERFACE

- Eight LEDs for status indication
- Back-Lit LCD display (16x2)
- Eight navigation keys for setting and interrogation

LOGIC EQUATIONS

P154 supports up to 4 independent Boolean equations. Each equation offers the possibility to use an AND logical gate. The output of the equation can be time delayed, reused in another equation and assigned to any output relays, trip, trip latching and/or HMI LEDs. This function facilitates customisation of the product based on the customer's application.
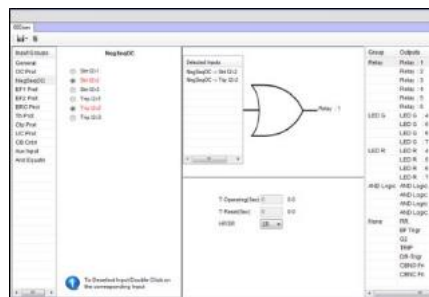
CIRCUIT BREAKER COMMAND

The P154 supports a menu option to allow the operator to issue open/close commands to the circuit breaker through the relay HMI.

COMMUNICATIONS

- Front USB port for viewing, parameter setting, downloading.
- Rear RS 485 port for SCADA communication
- Multiple protocol Modbus /
- IEC60870-5-103 (user selectable) or DNP3.0 (ordering option)

COMMISSIONING

P154 provides facility to test relay operation during commissioning / maintenance activity. Facilities include :
- Binary inputs /output status monitoring
- Test Mode- allows secondary injection testing to be performed on the relay without operation of the trip contacts
- Binary output contacts test
- LED Test

For more information please contact GE Grid Solutions

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