

MiCOM Agile P154

Feeder Protection Relay

The P154 feeder protection relay is the latest offering from GE's 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.



Protection & Control

- Optimised protection for feeder/motor applications
- Measurement / protection / monitoring in one box
- Diagnostic / maintenance facilities

Monitoring & Metering

- Accurate metering for feeder applications including phase & neutral current, thermal state, positive & negative sequence current
- Circuit Breaker monitoring including operation counter, trip counter, and operating time
- Metering for motor applications including load current, time to thermal trip, total motor running hours
- Motor start monitoring including number of starts, number of emergency starts

Communications

- Front USB port for local communication
- Rear RS 485 port for SCADA communications
- Flexible SCADA communication options supporting Modbus / IEC 60870-5-103 (user selectable) or DNP3.0 (ordering option)

Application Flexibility

- Universal, wide-range auxiliary supply
- Identical form factor for feeder / motor relays



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 and 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

ANSI Function Overview		Feeder
Protection Functions		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/Commissioning facilities	•
HMI		
	Back-lit LCD display	•
	8 x Touch keys	•
	8 x Status LEDs	•
Communications		
	USB port	•
	Modbus/IEC 60870-5-103 (RS485) (or) DNP 3.0 (RS485)	•
Binary Input / Output		
	Binary Input	•
	Binary Output	•

ANSI Function Overview

Feeder

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 :	- 25°C to + 55°C	
- Storage :	-25°C to + 70°C	
Housing		
	Front IP52	
	Rear IP20	

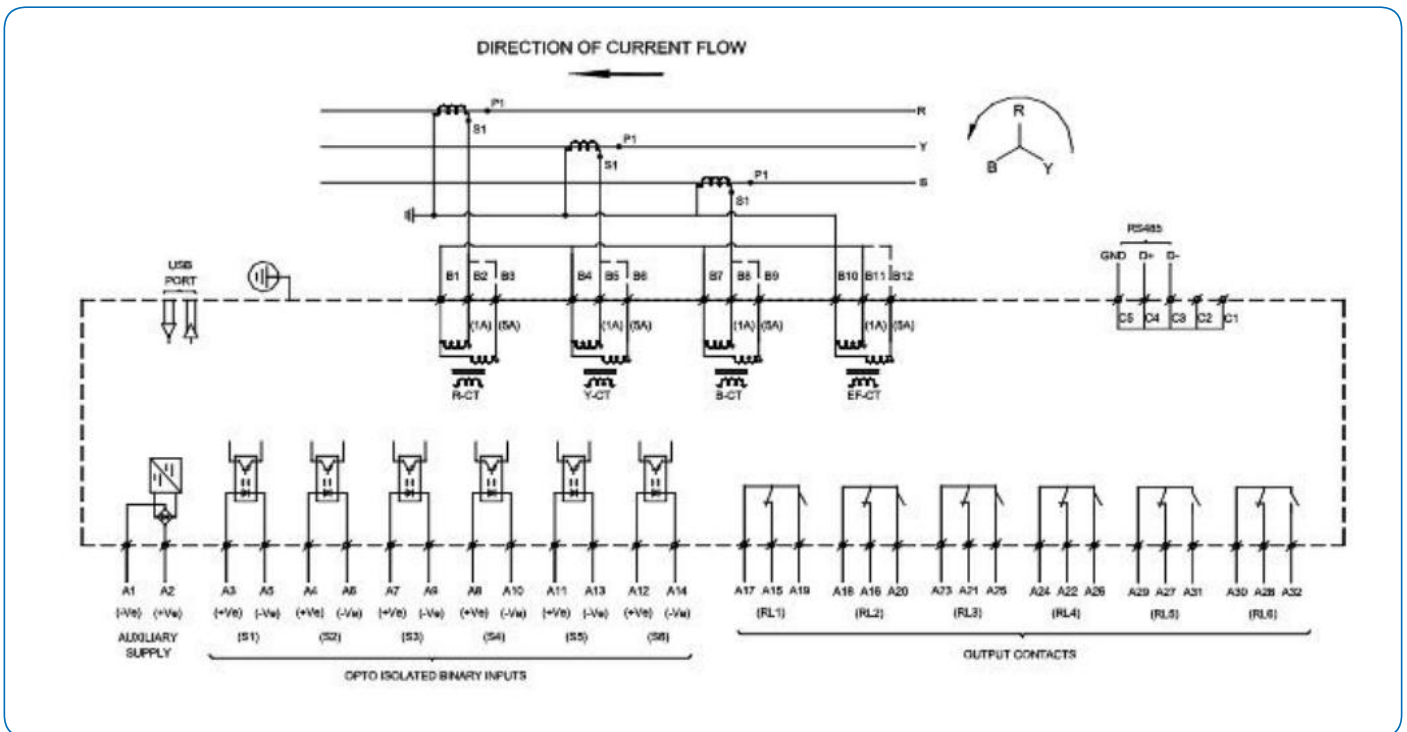
Measurements

- 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 P154



Relay Configuration Software

(For setting, viewing & parameterisation)

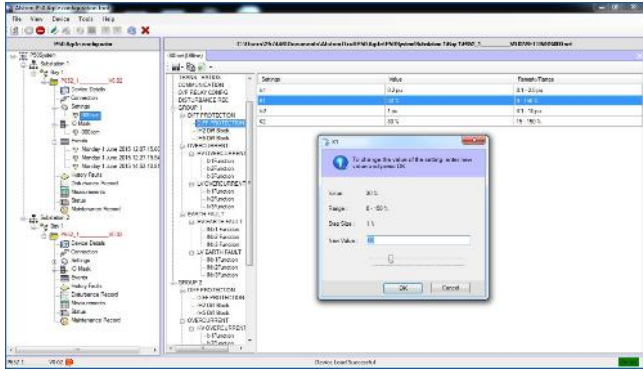


Figure 3: Relay configuration software – PC screenshot illustrating editing of a threshold

Binary Input/Output and LED Assignment

P154 offers 6 inputs, 6 outputs and 4 programmable LEDs, with the ability to customize their assignment and function in the application scheme.

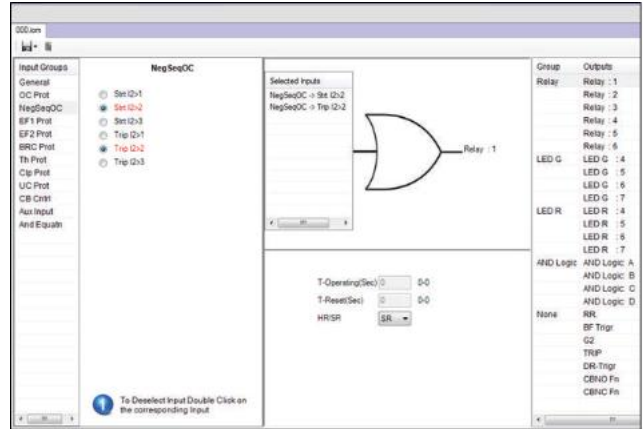
All the output contacts are changeover type and can be configured as SR (self-reset) or HR (hand reset) through the I/O configuration setting via the front panel or using the relay setting software.

Front Panel Interface

- Eight LEDs for status indication
- Back-Lit LCD display (16x2 characters)
- 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 has a menu option to allow the operator to issue open/close commands to the HV and LV circuit breakers through the relay HMI.

Communications

- Front USB port for relay access, setting and download actions.
- Rear RS485 port for SCADA communication
- Protocol options – MODBUS / IEC 60870-5-103 (user selectable) or DNP3.0 (ordering option)

Commissioning

P154 provides a suite of commissioning / maintenance assistance facilities:

- Binary input/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

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