

MiCOM P1 1 1

Three phase and earth fault overcurrent relays



P111 Flush



P111 Rail



Customer Benefits

- Flexible current relay
- Full set of measurement
- Good feature/price ratio

The MiCOM P1 1 1 relays are suitable for all the application where overcurrent and/or earth-fault protection are required. Thanks to its favorable “price vs technical features” ratio, P1 1 1 can be used both in medium voltage and in low voltage applications (specifically where communication facilities are required).

MiCOM P1 1 1 relays provide features for easy adaptation to different applications and operation conditions.

MiCOM is based on the newest technology by using such solution as FRAM memory and sigma - delta A/D converter with over-sampling (1 MHz) - unique application in protection relay. FRAM offers features consistent with RAM technology, but is non-volatile from this reason there is no battery inside of the relay. Sigma-delta A/D converter allows to optimise electronic in analogue inputs of the relay to increase reliability of solution.

The setting software MiCOM S1 allows users an easy configuration and access to all measurements.

Modbus RTU communication protocol allows interfacing substation control or SCADA system.

This MiCOM relay is housed in a small case for rail mounting (panel) or rack mounting.

APPLICATION

The MiCOM P111 provides a wide range of protection functions. Typical applications are:

- Underground MV cables
- Insulated or resistance earthed neutral systems
- MV subscribers, Industry, Transport
- Advanced LV application (specifically where communication facilities are required)

To have good ratio: price to functionality used in the application, there are different models of P111 available.

Differences between models are shown in the Table below

GLOBAL FUNCTIONS

The following functions are generally available in all devices (see table below) :

- Operate in 1, 2, or 3-phase arrangement (the missing phase is not connected)
- Two setting groups, selected from the relay menu, binary input or system
- 35 mm DIN rail or flush mounted case (option)
- True RMS phase current value measurement within a frequency range from 10Hz to 1000Hz
- Earthfault current value measurement within a frequency range from 40Hz to 70Hz
- 4 digit LED display
- 5 button keypad to input settings and configure the relay
- Fault record for the 3 most recent trips

Functions overview		Models				
		A	B	L	E	F
50/51	Three-phase overcurrent I>> (DT)	•	•	•	•	•
50/51	Three-phase overcurrent I> (DT or IDMT)	•	•	•	•	•
50/51	Three-phase overcurrent Ip> (DT or IDMT)	•	•	•	•	•
50N/51N	Earth fault (single phase) overcurrent Io> (DT or IDMT)		•	•	•	•
50N/51N	Earth fault (single phase) overcurrent Io>> (DT or IDMT)		•	•	•	•
38	Input for PTC sensor	•	•		•	•
	External protection trip (via binary input)	•	•		•	•
	CB or contactor control; Local (via input) / Remote				•	•
86	Output relay latching	•	•	•	•	•
	Relay maintenance mode				•	•
	Setting groups (front panel, remote or inputs)	1	2	2	2	2
	Measurements	•	•	•	•	•
	Expanded setting range				•	•
	Fault records (3 most recent)	•	•	•	•	•
	Events records				•	
	Binary inputs/outputs relays	2/2	2/2	0/2	4/4	4/4
	AC current/voltage inputs	3/0	4/0	4/0	4/0	4/0
	Modbus RTU (rear port RS485)		•	option	•	
	Setting software MiCOM S1 (rear port RS485)		•	option	•	



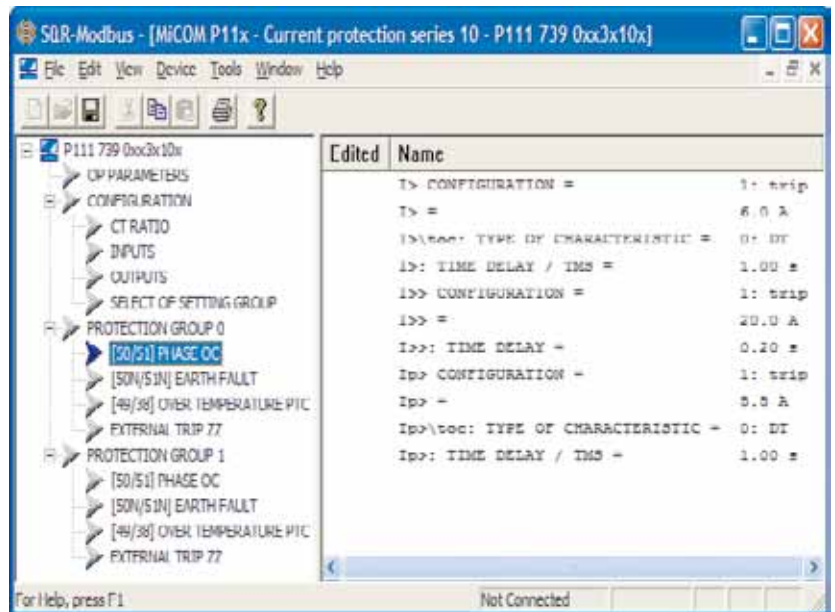
P111 offers scalable solutions to suit precise needs

MAIN FUNCTIONS

The relays of these ranges are comprised of full suite of protection functions and auxiliaries; each function can be individually configured or disabled to suit any particular application.

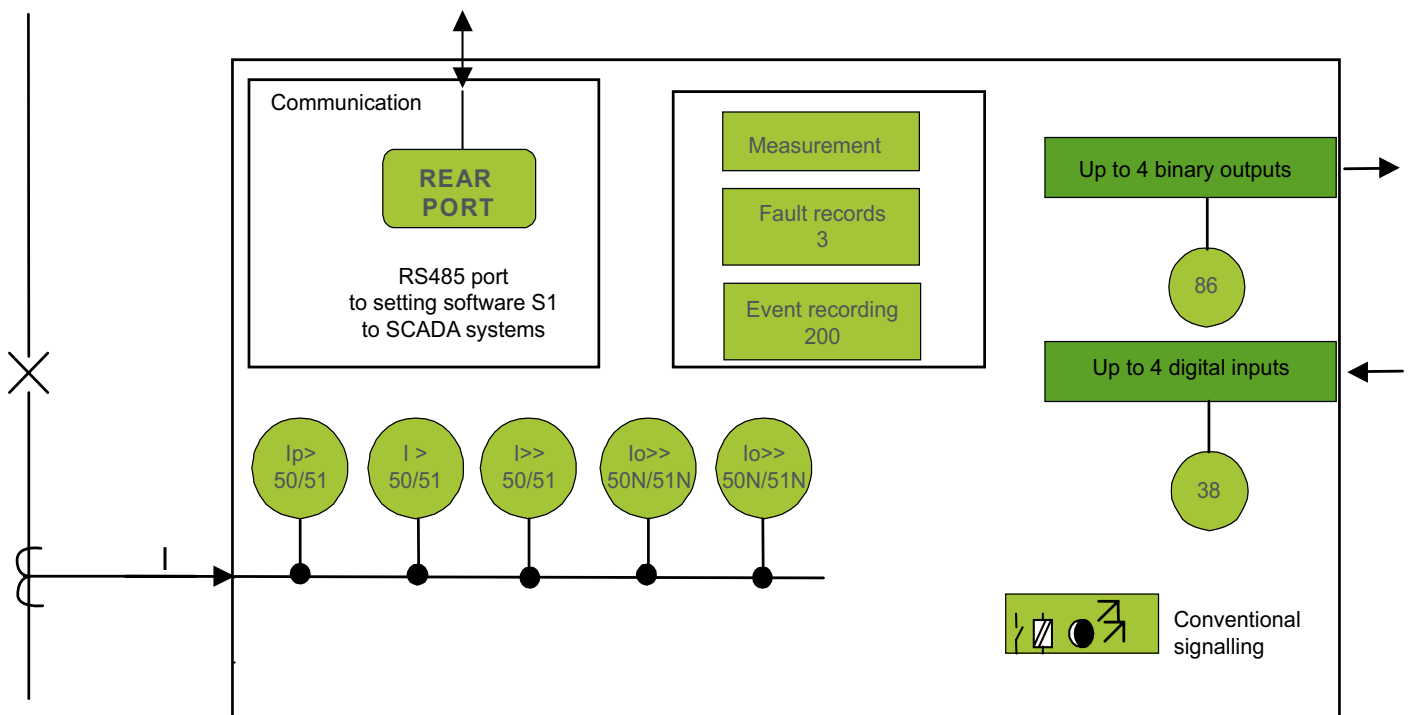
The available functions, including protection, inputs and outputs are easily programmable by means of user friendly front panel interface and the S1 software interface.

The 4 digit LED display provides the user with key information (faults, measurements, settings etc.). The menus have a pull-down structure for easy use and quick access to any data.



FUNCTIONAL OVERVIEW (max hardware version)

(Description of ANSI code nos. see Functions overview)



MiCOM P111 provide simple solution for your specific application.

FUNCTIONS

Three phase overcurrent protection (50/51)

The independent stages are available for phase fault protection. For the first ($I_{p>}$) and second stage ($I_{p>}$) the user may independently select definite time delay or inverse time delay with different type of curves (SI, VI or EI). The third stage can be configured with definite time only.

Each stage and related time delay can be programmed to provide maximum selectivity.

All stages have reset timer to reduce clearance times intermittent faults occur.

All stages can be separately configured to make a trip or alarm.

The MiCOM P111 relays have separate instantaneous and delayed information for all stages.

The range of settings can be selected by ordering code.

Earth fault overcurrent protection (50N/51N) (models : B, L, E and F only)

The independent stages are available for earth fault protection in models B, L, E and F. For the first ($I_{o>}$) and second stage ($I_{o>>}$) the user may independently select definite time delay or inverse time delay with different type of curves (SI, VI or EI).

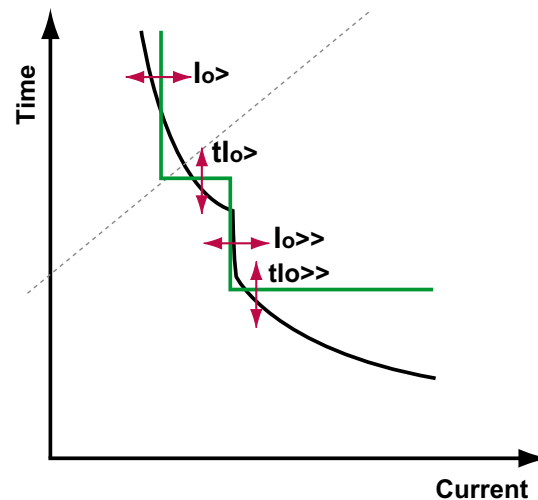
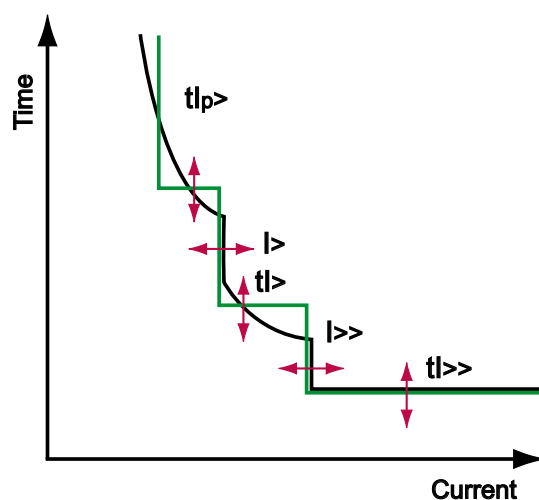
Each stage and related time delay can be programmed to provide maximum selectivity.

All stages have reset timer to reduce clearance times intermittent faults occur.

All stages can be separately configured to make a trip or alarm.

The MiCOM P111 relays have separate instantaneous and delayed information for all stages.

The range of settings can be selected by ordering code.



Proven protection as safe, simple and versatile as your application needs.

Input for PTC sensors (38)

If T1-T2 input is configured as PTC input and resistance of the sensors' loop connected to input : T1- T2 increase, then protection operates instantaneously.

Up to 6 PTC sensors can be connected in series. The PTC input operates instantaneously.

This function can be configured to make a trip or alarm.

External protection trip

The external protection trip operates if an input state, which is programmed to this function (ZZ), changes its state.

The protection can be configured to "trip" or send a "warning signal" (alarm).

Trip operation is instantaneous.

Output relay latching (86)

RL2 and RL3 relays can be latched.

Reset of the latched outputs is possible by logic inputs, front panel operator interface or by remote communication.

CB or Contactor control

MiCOM P111 allows controlling of circuit breaker or contactor. The user may select switch type by programming main output relays. The selection changes logic of control.

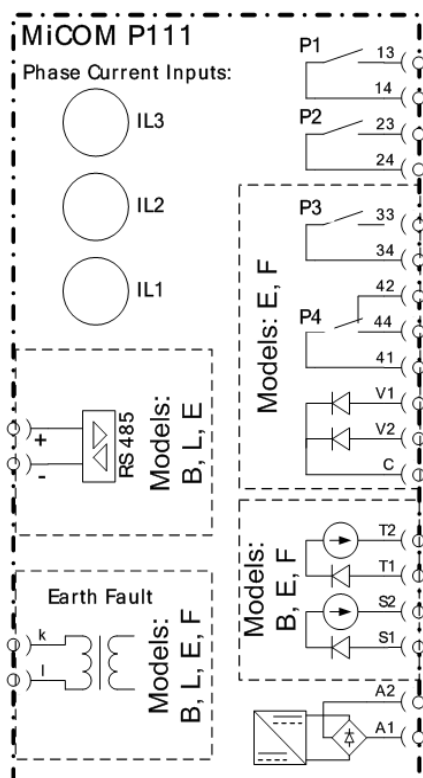
It is possible to make local (via selected binary input) or remote (via RS485) trip or close command. Blocking of remote command could be done via selected binary input (switch : local/remote).

The remote control is not possible in model A and F (which have no RS485 port).

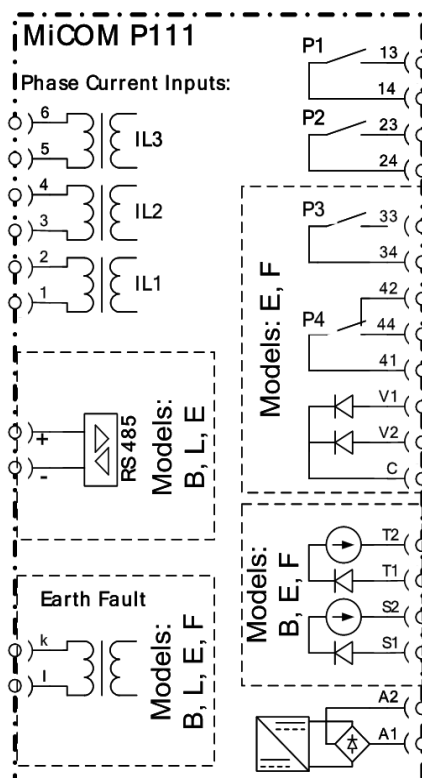
Setting groups

An external condition may request the need for different settings. MiCOM P111 provides two setting group.

The setting group could be changed, after set time delay, by logic inputs, front panel operator interface or by remote communication.



35mm DIN rail case



Flush mounted case

Relay maintenance mode

Selected logic input can put output relays in Maintenance State to allow make testing without any trip or signalling outside of relay.

MEASUREMENTS

MiCOM P111 can operate in 1, 2, or 3-phase arrangement (the missing phase should be not connected).

The measured values are available from the front panel or via RS485 port.

All measurements could be shown in primary or secondary values.

True RMS phase current measurements are made within a frequency range from 10Hz to 1000Hz.

Earthfault current value measurement is made within a frequency range from 40Hz to 70Hz.

Model E and F have expended setting range to be according to old electromechanical relays.

Inputs and outputs

The P111 includes configurable digital inputs and output relays for CB (contactor) control and signalling.

Inputs can be configured for blocking, resetting, control, etc.

The number of binary inputs and output relays can be selected by choosing the type of model.

Model A and B have 2 free-potential logic inputs and 2 relay outputs. Model E and F have additional 2 potential logic inputs and 2 additional relay outputs.

Fault recording

the last 3 faults are stored inside P111 relay.

The fault records are available from the front panel or via RS485.

Each fault includes phase and earthfault currents record together with a fault indication.

Fault indicator helps the user to identify clearly the fault and to monitor relay setting and operation.

Event recording (model E only)

200 logic events are stored in MiCOM P111 model E.

The events are written in non-volatile memory (P111 has no battery).

Events include inputs/outputs, change of status, alarms and contact operation.

All events are time stamped to 10ms.

The events can be read by rear RS485 port by a supervisory control system or EventBrowser software.

USER INTERFACE

All functions, including protection, automation, communication, inputs and output can be programmed and modified using front panel user interface.

The menus have a pull-down structure allowing easy and quick access to any data.

4 digit LED display with 5 additional signalling LEDs informs the user about settings, measurements, faults, etc.



Simple and efficient solution for easy handle.

The P111 has 6 signalling LED on the front panel. LEDs are fixed (not programmable).

They present the reason of trip or alarm (I>, Ip>, I>>, Io> or Io>>, etc).

MiCOM S1 SUPPORT SOFTWARE

Support Software MiCOM S1 is available for the entire MiCOM family, including P111 relays. S1 is fully Windows TM compatible.

This Support Software allows easy setting of any P111 model, preparing, storing, and retrieving setting files for further download on relay. In addition S1 makes possible reading measurements.

The connection to S1 is possible via rear port RS485.

COMMUNICATION

MiCOM P111 relay is equipped with a RS485 halfduplex port.

It supports MODBUS RTU protocol.

Communication port enables:

- Readout of phase and earthfault current values,
- Readout of input and output states,
- Remote reset of LEDs and latched relays,
- Remote contactor or circuit-breaker control via RS485,
- Readout of protections' trigger and trip states,
- Readout and write settings,

- Readout of fault record,
- Reset of fault record,
- Readout of events (model E only)
- Making maintenance state (out of order) or enable of P111,

Communication parameters (equipment number, data rate, parity, etc) can be adjusted by push buttons on the front panel.

HARDWARE & CASE

MiCOM P111 is based on advanced numerical technology.

All the models of P111 can be :

- flush mounting (WxHxD : 106.5x106.5x118)
- or rail mounting ((WxHxD : 100x75x115)

Wiring

External connections are made via screw terminals. The screw terminals allow connection of threaded wires of up to 2.5 mm² or solid wires of 4 mm² of conductor cross section.

Exception: in rail mounting case phase CT wires should be fed directly through the guiding channels in the relay housing.

Weight

~0.5kg



Communication available in P111
can increase your capability.

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