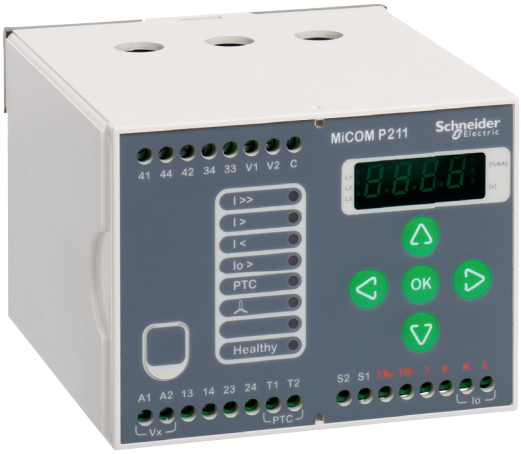
MiCOM P211

Feeder Management Relay



P211 Rail

The MiCOM P211 relay is made for motor application. It is designed for a wide range of protection, supervision and control functions relating to motor applications.

Thanks to the many technical features and cost efficient design, P211 can be used both in medium voltage and in low voltage applications, specifically where communication facilities are required.

MiCOM P211 relay provides features for easy adaptation to different applications and operation conditions.

The setting software MiCOM S1 Studio 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.

CUSTOMER BENEFITS

- Flexible motor protection relay
- Optimizes the motor's thermal image monitoring
- Good feature/price ratio

APPLICATION

The MiCOM P211 provides a wide range of protection functions for an asynchronous motor.

Typical applications are:

- MV Industry, Transport
- Advanced LV application (specifically where communication facilities are required)
- Simple LV application

For best cost efficiency, several models of P211 enable you to tailor the device to your specific needs.

Differences between models are shown in the Functions Overview Table (page 2).

Schneider Electric

GLOBAL FUNCTIONS

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

- True RMS phase current value measurement within a frequency range from 10Hz to 1000Hz
- Earth Fault current value measurement within a frequency range from 40Hz to 70Hz
- 35 mm DIN rail or flush mounted case (option)
- 4 digit LED display
- 5 button keypad to input settings and configure the relay
- Fault record for the 3 most recent trips
- Direct connection of phase currents up to 80A nominal current of the motor in LV application (rail mounting case)

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 MiCOM S1 Studio software interface.

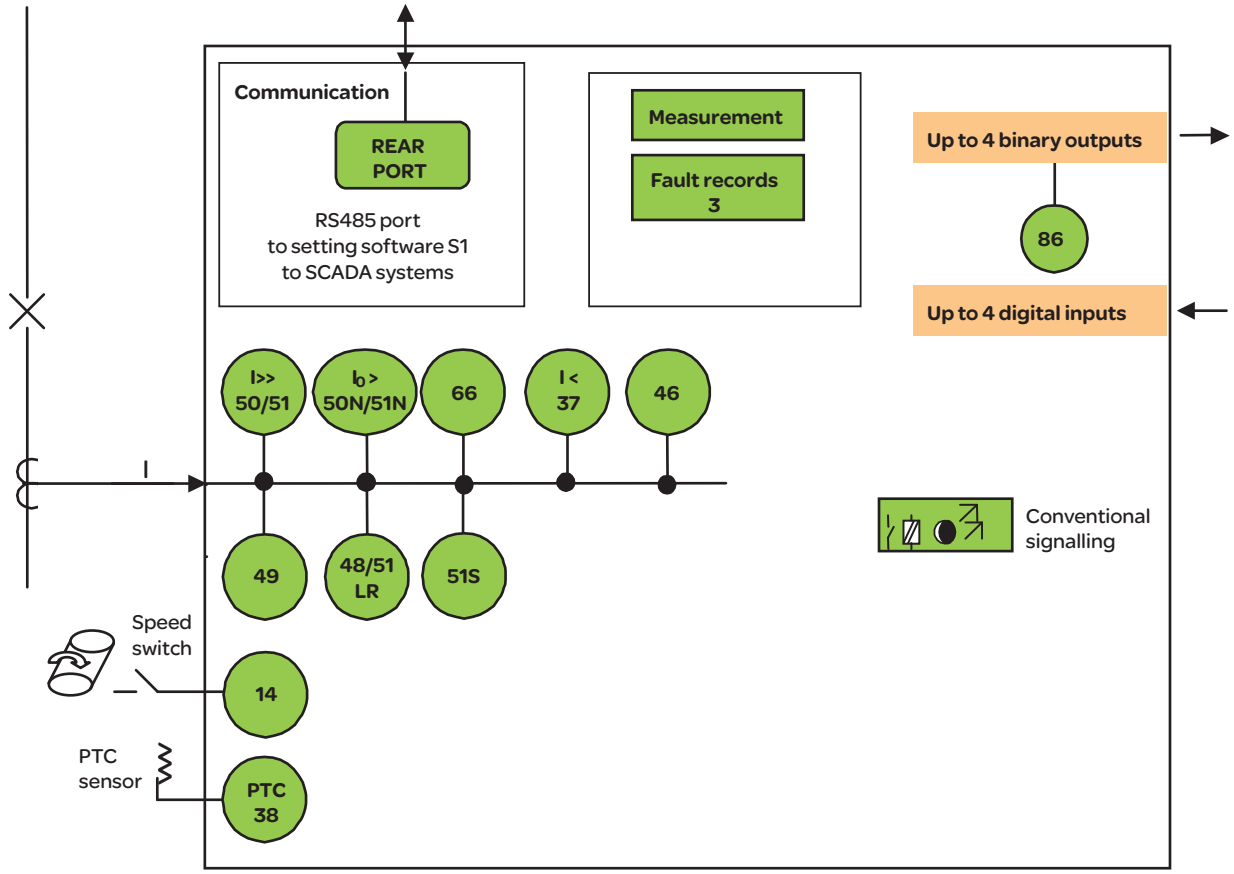
The 4 digit LED display provides the user with key information (faults, measurements, settings etc.).

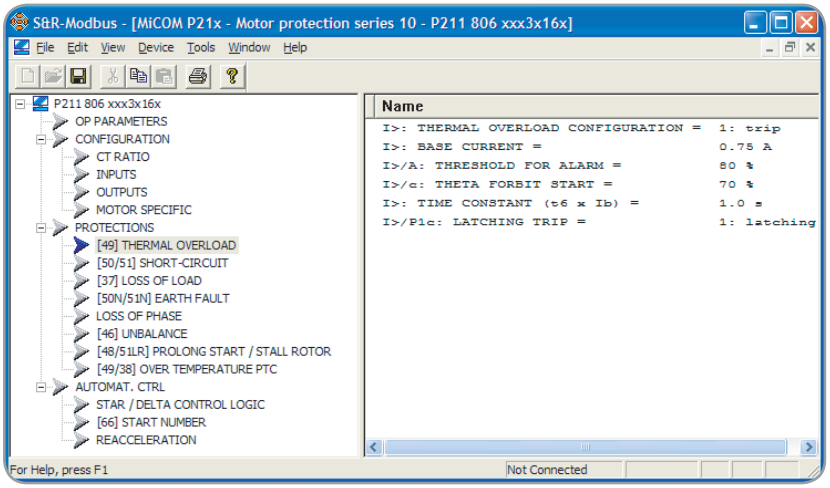
The menus have a pull-down structure for easy use and quick access to any data.

Functions Overview		Models		
		A	B	C
50/51	Short circuit (DT)	•	•	•
50N/51N	Earth fault overcurrent Io> (DT)		•	•
66	Number of starts limitation	•	•	•
37	Loss of load/undercurrent	•	•	•
	Loss of phase	•	•	•
46	Unbalance (asymmetry)	•	•	•
49	Thermal overload	•	•	•
48/51LR	Start/Stalled protection	•	•	•
51S	Locked rotor during starting	•	•	•
14	Speed switch input	•	•	•
38	PTC input	•	•	•
	CB or contactor control; Local (via input) / Remote		•	•
	Restart of motor logic (caused by drop of voltage)	•	•	•
	Star / delta logic control			•
86	Output relay latching	•	•	•
	Measurements	•	•	•
	Fault records (3 most recent)	•	•	•
	Binary inputs/outputs relays	2/2	2/2	4/4
	AC current/voltage inputs	3/0	4/0	4/0
	Modbus RTU (rear port RS485)		•	•
	Setting software MiCOM S1 Studio (rear port RS485)		•	•

P211 offers scalable solutions to suit precise needs

Functional Overview (Description of ANSI code nos. see Function Overview)





MiCOM P211 provides a simple solution for your specific application.

FUNCTIONS

Short Circuit (50/51)
The stage with definite time delay protects against phase short circuit faults, which are responsible of overheating damage.

Earth Fault Overcurrent Protection (50N/51N) (Models: B and C Only)
The earth fault current, which can appear following a stator earth fault, can be detected by non-directional overcurrent protection element using earth current measured from a sensitive current input.

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

Protection element can be configured to make a trip or alarm.

The range of settings can be selected by ordering code.

Number of Starts (66)
Starts are supervised during a settable period.

Loss of Load/Undercurrent (66)
The current stage, along with a pick-up time delay, is used to detect a loss of load due to a shaft failure or a pump running unprimed.

Loss of Phase
This feature monitors phase current values. Any phase current of a value below setable current stage is recognised by the relay as a lost phase. The relay trips a motor after a set time delay (DT).

Unbalance (46)
Running motors in unbalanced conditions results in overheating, even at current values below the nominal.

Principle of operation is based on monitoring of the percentage of the current unbalance in the three subsequent phases.

Thermal Overload (49)
The protection feature is based on mathematical model of motor thermal image. The model utilises heating constant time values.

It is input to the relay by means of T6xIB parameter, which describes the maximum period of time when actual motor current value is allowed to reach a sixfold increase of its nominal value.

Cooling constant time value is calculated on the basis of the heating constant.

Configuring procedure of the model includes setting of the motor base current (nominal motor current) and T6xIB.

Alarm and trip stages can be selected.

It is possible to set a separate reset stage, which is activated after trip command, and up to this threshold the trip signal is present. This feature prevents from close command if motor is overheated.

Start / Stall Protection N (48/51LR)
This monitors the starting sequence of the motor and the P211 relay provides excessive start time protection / locked rotor protection.

The detection of the start-up is based on current criteria only. If start-up phase is too long (greater than set time delay) there is trip command or alarm signal. If the starting of motor is finished, start protection is blocked.

During normal motor operation, an overcurrent threshold detects rotor stalling, and the shorter (than for starting) time delay is used. The normal motor operation, after starting, is detected by watching current stages.



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

Locked Rotor During Starting (51S)

During motor start-up, a locked rotor is detected with the help of a speed switch signal, connected via the logic input. During the start-up phase, if the input is not shorted, meaning that the motor has stopped, then the shorter time delay setting is used.

This protection can be set to trip or alarm.

Input for PTC Sensors (38)

If T1-T2 input is configured as PTC input with the sensor connected, then any increase in sensor loop resistance will result in the protection operating instantaneously.

Up to 6 PTC sensors can be connected in series. The PTC input operates instantaneously and 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, changes its state. Trip operation is instantaneous

Restart of Motor Logic

This function is used for the motors' selfstarting. If there is no voltage on the busbar (controlled via logic input) this function is triggered.

Calculation of the time delay (authorisation time of reacceleration) is commenced.

If Voltage returns to the busbar before the timing is completed, the restart time delay for close command is calculated. After that time the motor is started.

If P211 is supplied from the AC auxiliary voltage of the busbar, the maximum time of reacceleration is limited to 3s.

Such feature is very useful for contactor advanced LV applications.

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 P211 allows controlling of circuit breakers or contactors. The user may select switch type by programming main output relays.

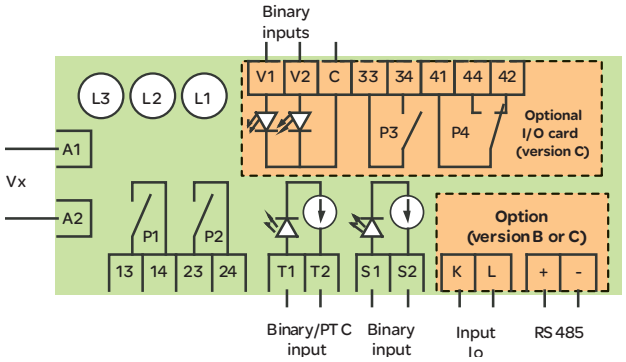
The selection changes the control logic. It is possible to make local (via binary input) or remote (via RS485) trip or close commands. Blocking of remote commands can also be done via binary input (switch: local / remote).

Remote control is not available in models without RS485-ports (Model A).

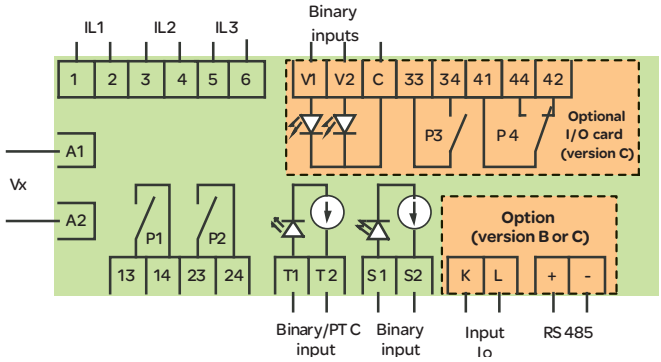
Relay Maintenance Mode (Model C Only)

This function may be used in CB applications only. A selected logic input can configure the output relays to be in maintenance state, allowing testing without trip or alarm signalling.

Simple and efficient solution



35 mm DIN rail case



Flush mounted case

MEASUREMENTS

MiCOM P211 can operate in 1, 2, or 3-phase arrangement (the missing phase should be not connected) but for 1 and 2-phase arrangement, unbalance, loss and loss of load protection should be set off.

It is possible to read on the display:

- Phase current: Ia, Ib, Ic
- Neutral current: Io
- Thermal state
- State of the motor
- Last start time
- Last starting current

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

Earth Fault current value measurement is made within a frequency range from 40Hz to 70Hz

Inputs and Outputs

The P211 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 relays is available as an ordering option.

Model A and B have 2 free-potential logic inputs and 2 relay outputs. Model C has 2 additional potential logic inputs and 2 additional relay outputs.

Fault Recording

The last 3 faults are stored inside P211 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.

Monitoring of motor by measurements

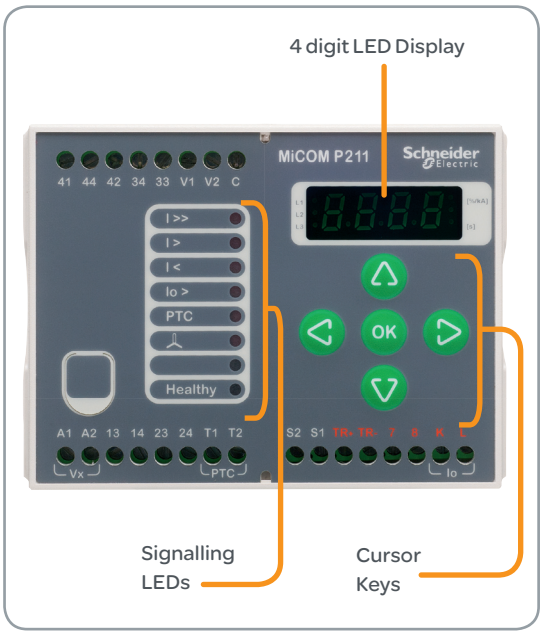
USER INTERFACE

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.

The P211 has 6 signalling LED on the front panel. LEDs are fixed (not programmable). They present the reason of trip or alarm (I>>, I>, I<, Io>, PTC and Asymmetry or Loss of Phase)



MiCOM S1 Studio Support Software

Support Software MiCOM S1 Studio is available for the entire MiCOM family, including P211 relays. S1 Studio is fully Windows™ compatible.

This Support Software allows easy setting of any P211 model, preparing, storing, and retrieving setting files for further download on relay. In addition MiCOM S1 Studio makes possible reading measurements. The connection to S1 Studio is possible via rear port RS485.

Communication

MiCOM P211 relay is equipped with a RS485 half-duplex port.

It supports MODBUS RTU protocol.

Communication port enables:

- Readout of phase and earthfault current values
- Readout of thermal state
- Readout of state of motor
- 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
- Enabling/Disabling maintenance state (out of order)

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

Hardware and Case

MiCOM P211 is based on advanced numerical technology.

All the models of P211 can be :

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

Wiring

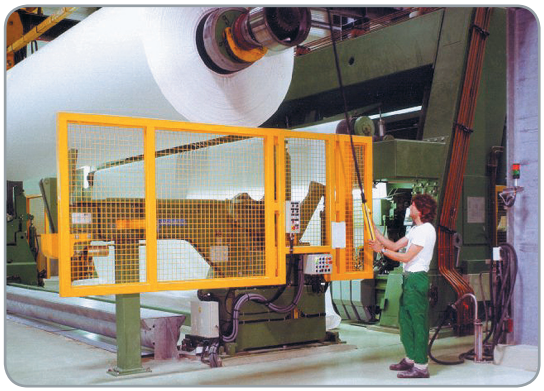
External connections are made via screw terminals.

The screw terminals allow connection of threaded wires of up to 2.5 mm^2 or solid wires of 4 mm^2 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 MiCOM P211 can increase your capability.

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