MRF102

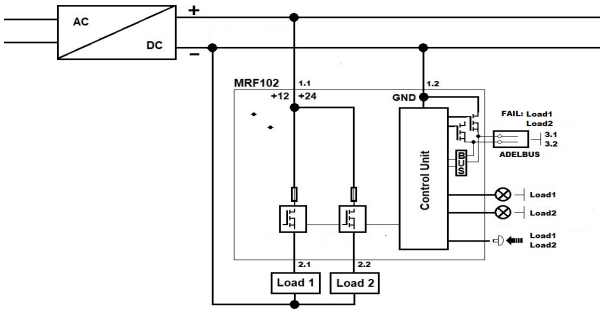
2- Channels Electronic Circuit Breaker

Instruction Manual

Thank you for having chosen one of our products for your work.
We are certain that it will give the utmost satisfaction and be a notable help on your job and application.

1 Product Description

The MRF102 2-channel electronic circuit breaker with Din Rail and Wall mounting is designed for current distribution and protection of 12V or 24V load circuits.



2 Safety and warning notes

WARNING – Explosion Hazard Do not disconnect Equipment unless power has been switched off or the area is known to be non-hazardous.
WARNING – Explosion Hazard. Substitution of components may impair suitability for class I, Division 2.

WARNING – Switch off the system before connecting the module. Never work on the machine when it is live. The device must be installed in according to EN61010 or EN62368-1. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to idle. Danger of fatal Injury!
WARNING – The device is equipped whit an internal fuse. If the internal fuse blows Up (fails opens), it is most probable that there is a fault in the device. If this failure occurs, the device must be returned to the factory.

3 How to Install

3.1 Mounting

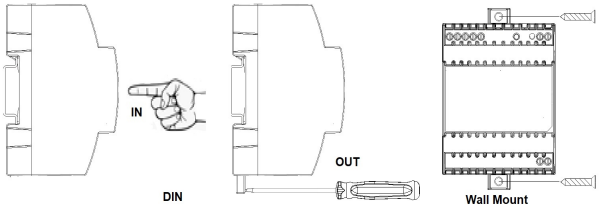


Fig. 1 – Drawing of the MRF102

3.2 Din Rail or Panel Mounting

Fig. 1 shows a dimensional drawing of the MRF102. It is possible to mount the device on Din rail or in panel and fix it by 4 screws 2.9x8-16. There is no limit for the Panel thickness.

3.3 How to Supply MRF102

The MRF102 is supplied directly from the power source which provide power to the load. The device it is protected by internal physical fuse, also in worst case situations. The input rating is 8 – 35Vdc.

3.4 Device Connection (Fig.2)

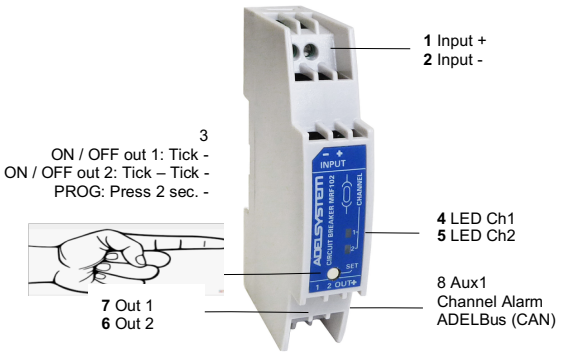


Fig. 2 – Connections to MRF102

The following cable cross-sections may be used:

	Solid (mm2)	Stranded (mm2)	AWG	Torque (Nm)	Stripping Length
In:	0.2–2.5	0.2–2.5	24 – 14	0.5–0.6	7 mm
Out:	0.2–2.5	0.2–2.5	24–14	0.5–0.6	7 mm
Signal:					AMP Modu II

Connection by the screw, type 2.5 mm2. Wiring terminal shall be marked to indicate the proper connection for the power supply. Use copper cables only, for supply connections use wires suitable for at least 75°C

3.5 Connection terminal and wiring

Reference	Description
1	+ Input Power
2	- Input Signal
3	Push button: ON / OFF Channel 1 and 2 / Config.Mode
4	LED Green, Orange, Red: Channel controls / Config.Mode
5	LED Green, Orange, Red: Channel controls / Config.Mode
6	Output Channel 1
7	Output Channel 2
8	AUX1: Output Alarm Ch1 and Ch2 or ADELBus connection (CAN)

4 Drive a Channel

4.1 ON - OFF Channel and LED Indications

	State	LED	Push button
Channel: ON	current is <80% than tripping point	Blinking: Green	
Channel: ON	current is >80% of the switch tripping point	Blinking: Orange	
Channel1: ON - OFF	Channel open ⇔ closed	Blinking: Red	One Click
Channel2: ON - OFF	Channel open ⇔ closed	Blinking: Red	Two Clicks
Channel: OFF	Channel in protection Note 1	ON: Red	Not Enabled for switch ON
Channel: OFF	Channel in protection Note 1	Blinking: Red	Enabled for switch ON

At first power up all channels are OFF.
Channels cannot be enabled / disabled while the device is in configuration mode.
Note 1: Channel is in protection due to: Overcurrent, Overtemperature, Over/Under voltage (<8.5V or >32.5V).

5 Control and Programming

5.1 How to verify the trip current set

Press the set button for more than 2 sec. until LED channel 1 starts to blink Orange.

- The number of Orange blinks indicates the number of Ampere set for the trip current: 1 Blink = 1A … 10 Blink 10A
- Press the push button for more than 2 sec. until LED channel 2 starts to blink Orange.
- The number of Orange blinks indicates the number of Ampere set for the trip current: 1 Blink = 1A … 10 Blink 10A
- End the procedure by holding down the button for 2 seconds until the LEDs resume their regular flashing.

If the button is not pressed for 20 seconds, the procedure ends automatically and the LEDs resume their regular flashing.

5.2 How to set the Trip Current

Press the push button for more than 2 sec. until LED channel 1 start to blink Orange.

1. At this time it is possible to count the number of orange blinks according to the number of Ampere set for the trip current: 1 Blink = 1A … 10 Blinks = 10A
2. Press the push button for a number of times equal to the desired number of tripping Ampere.
3. Verify option: after selecting the desired Ampere, the device will return the set number after 2 sec
4. Correction option: correction of the current setting by pressing one more time the set button: e.g., 6A + 1A more = 7A. When 10A is reached, the counter restarts from 1A.
5. To confirm the New Trip Current setting, press the push button for 2 sec. until LED channel 2 starts flashing orange.
6. Set the current limit for channel 2 in the same way as for channel 1.
7. Confirm the new Trip Current of the channel 2 and finish the Configuration procedure by holding the button for 2 seconds until the LEDs start flashing regularly again.

- Mandatory: to ensure the new value is set, the procedure must be completed. If the button is not pressed within 20 seconds, the procedure automatically ends and the LEDs resume flashing regularly. The device retains the old values.
- Note: at first power up the device is programmed at 3A for each channel.

5.3 How to configure the MRF102 for best performance

The following procedure is for the configuration of:

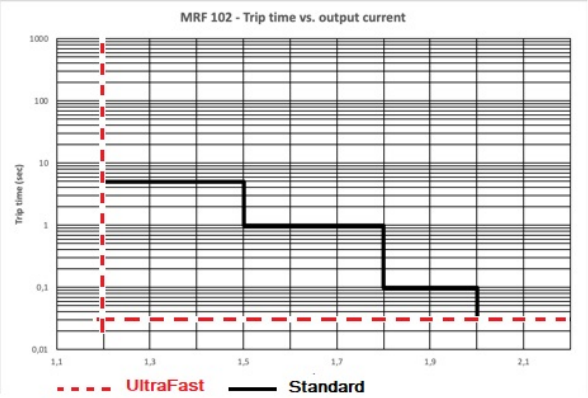
- Output Alarm Configuration
- Selection Normal scale or Half scale
- Standard or Ultrafast Current Trip Sensibility
- Reset the device to factory default

5.3.1 Action:

- Power up the device while keeping the button pressed.
- The two LEDs will blink alternatively red and green. Keep the button pressed for 2 seconds until LED 2 turns orange and LED 1 flashes.

Mode:	LED 1 "STATE"	LED 2 "SELECTION"	Push button
Output Configuration	Blinking: GREEN 1 time	RED: Alarm open collector GREEN: ADELBus	1 Click to select > 2 sec. to confirm
Scale Selection: Normal or Half	Blinking: GREEN 2 time	RED: 1 – 10 A (step 1A) GREEN: 1 – 5A (step 0.5A)	1 Click to select > 2 sec. to confirm
Action Speed Trip Current	Blinking: GREEN 3 time	RED: Standard GREEN: Ultrafast	1 Click to select > 2 sec. to confirm
Reset the device to factory default	Blinking: GREEN 4 time	RED: No Changes GREEN: Reset to factory	1 Click to select > 2 sec. to confirm

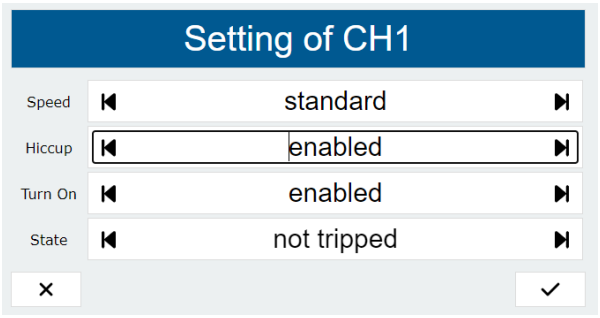
- Settings will be saved and the device returns to normal operation.
- Mandatory: the procedure must be completed for the settings to be saved. If the button is not pressed for 15 sec, the device resumes its normal operation without saving the new settings.



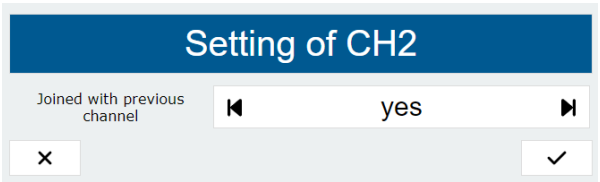
5.4 Advanced configuration

With the device connected to ADELBus additional configurations are possible via the web server of the master device:

- **Hiccup** mode: if enabled, when a channel is in protection (tripped) it will be switched ON again automatically after a few seconds for cooling down.



- Channel 2 can be joined with channel 1. This configuration should be used with the terminals Out 1 and Out 2 connected together and to the same load: in that case the settings of channel 1 will apply to both channels and the trip current will be the sum of the trip currents of channels 1 and 2. It is recommended to set the trip currents to the same value and to use cables of same size and length on both channels to balance the currents through them.



6 Technical Data

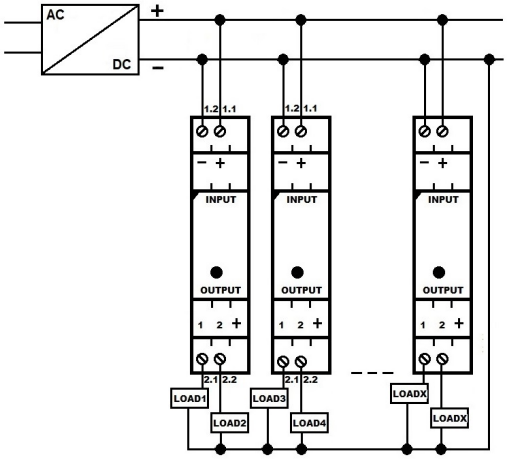
6.1 Please Refer to Data Sheet product

7 Accessory

- RTConn: connector cable for the connection to AUX1. This is needed for data exchange with the DC UPS through the ADELBus (if supported by the DC UPS).
- Line Terminator 120 Ohm present inside the Kit of the RTConn.

8 Connection diagrams

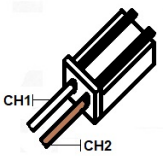
8.1.1 Multiple Devices



8.1.2 Open channel alarm output

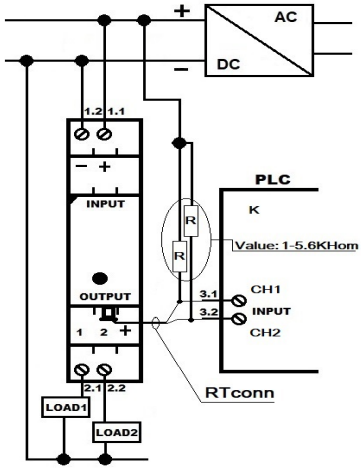
When configured as "Alarm open collector" the two open collector outputs will reflect the state of channel 1 and channel 2:

- Channel ON: output closed to ground
- Channel OFF: output open

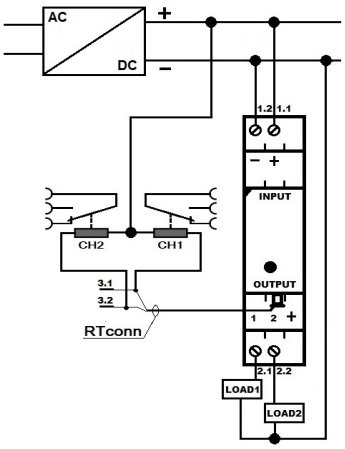


Note: If the MRF102 is configured for ADELBus, the open channel alarm outputs are not available.

8.1.2.1 : Connection to PLC



8.1.2.2 Connection to Relay



8.1.3 CBI60 – MRF102 ADELbus connection