Current Module, 3-channel, MDRC
SM/S 3.16.30, GH Q631 0034 R0111

Load and residual currents can be measured simultaneously using the current module. There are 3 isolated and independent measuring circuits available for this.

The current measured values can be continually sent in the form of EIB telegrams and displayed for example on an LCD screen.

The nominal operating current per channel is max. 16 A for load currents and max. 30 A for residual currents. The device can measure temporary overcurrents up to 25 A (< 1 h, max. one measuring circuit per device).

The current module can be used e.g. for the following applications:
- display of operating states,
- display of mesured values,
- trend analysis for early detection of faults,
- logging of load/time evaluations and
- recording of operating hours.

Technical data

Power supply	– EIB	24 V DC, via the bus line
Measuring accuracy	– +/-2% of upper measurement value (sinus)	
Measuring circuits	– Number	3 isolated measuring circuits
	– Nominal voltage	max. 230/400 V AC
	– Frequency	50 Hz (+/- 10%)
	– Back-up fuse	16 A
Measurement of load current	– Nominal current	16 A AC per measuring circuit (upper measurement value: 25.5 A, resolution: 0.1A)
Measurement of residual current	– Nominal residual current	30 mA AC per measuring circuit (upper measurement value: 51.0 mA, resolution: 0.2 mA)
	– Type of residual current	Type A - sinusoidal a.c. and oscillating d.c.
Operating and display elements	– Red LED and push button	for entering the physical address
Connections	– Per measuring circuit	4 screw terminals, bus connecting terminal (supplied)
	– Wire range	0.5 … 2.5 mm² finely-stranded 0.5 … 4.0 mm² single core
	– EIB	Bus terminal
Type of protection	– IP 20 in accordance with EN 60 529	
Ambient temperature range	– Operation	- 5 °C … 45 °C
	– Storage	-25 °C … 55 °C
	– Transport	-25 °C … 70 °C
Design	– Modular installation device, pro*M*	
Housing, colour	– Plastic housing, grey	
Mounting	– on 35 mm mounting rail, EN 50022	
Dimensions	– 90 x 72 x 64 mm (H x W x D)	
Mounting depth/width	– 68 mm / 4 modules at 18 mm	
Weight	– 0.23 kg	
Certification	– EIB-certified	
CE norm	– in accordance with the EMC guideline and the low voltage guideline	

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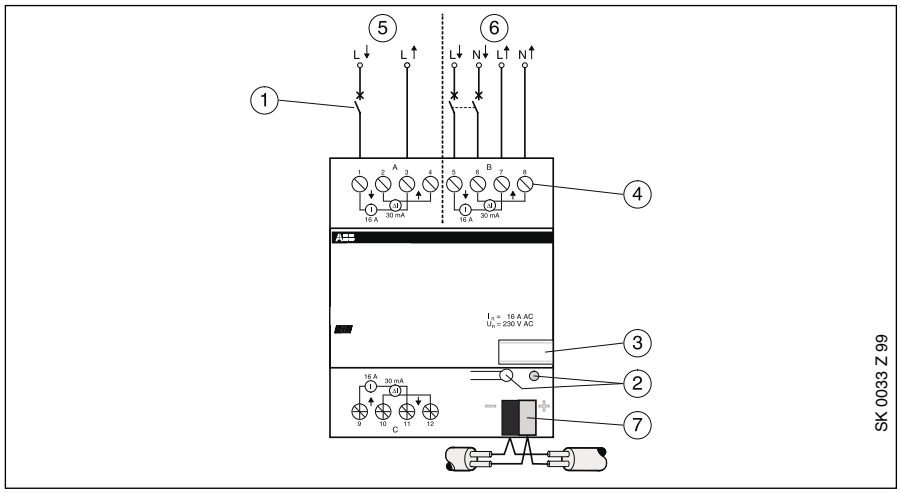
Application programs	Number of communication objects	Max. number of group addresses	Max. number of associations
Current Value Threshold /1	12	12	12

Circuit diagram



1 Back-up fuse
2 Programming push button/LED
3 Marker tag
4 Inputs and outputs
5 Connection for measurement of load current only
6 Connection for measurement of load and/or residual current
7 Bus connecting terminal

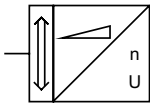
Note

The current module is used solely for measuring load and/or residual currents.

It is not permitted to use the current module in connection with an EIB switch actuator in place of primary protective devices such as miniature circuit-breakers or residual-current operated circuit-breakers.
In order to avoid the danger of electric shock due to feedback from various external conductors, an all-pole disconnection must be complied with.

Continuous currents outside the measurement range of the nominal load current i.e. > 16 A, can lead to the current module being damaged.

Current Value Threshold /1



Selection in ETS2

– ABB
  └Security
    └Current measurement module

Measuring range

The following table indicates the measuring ranges and their respective byte value that are sent to the EIB:

	Byte value	Load current	Residual current
Zero measured current	0	0	0
Upper measurement value (theoretical)	255	25.5 A	51.0 mA
Resolution	1 bit	0.10 A	0.20 mA
Tolerance (±) (sinus)	5 bits	0.51A (2%)	1.02mA (2%)
Upper measurement value (physical)	242	24.2 A	48.4 mA

Current

Various loads can be connected to the current module e.g. pure resistive loads (incandescent lamps or heating elements), mixed loads (incandescent lamps and PCs) or non-linear loads (dimmers or devices with electronic ballast).
The current module measures the average value of the current. As a longer period is required for non-linear loads to determine the average value, there is a parameter available “Accuracy of RMS measurement value”. The more loads of this type in the circuit, the higher this parameter should be set.
If load or residual currents for resistive loads e.g. incandescent lamps are to be specified with the current module, the parameter “Accuracy of RMS measurement value” can be set to “normal”.
If load or residual currents for non-resistive loads are to be measured, the parameter must be set to “increased” or “high”.

Value

The measured load or residual current value is sent as a 1 byte telegram to the EIB. In order to reduce the level of telegram traffic e.g. in installations where the current fluctuates too frequently from the average value (low frequency ripple voltage), the measured value is only sent if there is a definite minimum change from the last sent value. It is possible to parameterise the size of the change. If the setting +/- 0.0 A is selected for load current measurement and
+/- 0.0 mA is selected for residual current measurement, the measured value is sent after each new measurement cycle.

If the setting that is selected for the size of the change is too large, the present current value can differ considerably from the last sent value.

In the table above, the relationship between the measured current and the sent 1 byte value is represented.

If the actual current value lies outside the physical measuring range i.e.
> 24.2 A or > 48.4 mA, the value “255” is sent as an overload signal.

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Threshold

1 bit switching telegrams can also be sent when measuring load or residual currents. If the upper threshold is exceeded, a “1” is sent on the EIB while a “0” is sent when the measured value falls below the lower threshold. The threshold values can be parameterised. They can take the form of a hysteresis i.e. the upper and lower thresholds have different values. If the upper and lower thresholds are not identical, the gap between the threshold values must be passed through in order to trigger a telegram.
The triggering of the threshold can be used for example to indicate the operating states of electrical loads. The state is then recorded directly via the load current. If there is an overshoot in the threshold for residual current, it is possible to trigger an alarm.

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Communication objects
for activated load current circuits

No.	Type	Object name	Function
0	1 byte	Load current Circuit A	Telegr. Value
1	1 byte	Load current Circuit B	Telegr. Value
2	1 byte	Load current Circuit C	Telegr. Value
6	1 bit	Load current Circuit A	Telegr. Switch
7	1 bit	Load current Circuit B	Telegr. Switch
8	1 bit	Load current Circuit C	Telegr. Switch

Communication objects
for activated residual current circuits

No.	Type	Object name	Function
3	1 byte	Residual current Circuit A	Telegr. Value
4	1 byte	Residual current Circuit B	Telegr. Value
5	1 byte	Residual current Circuit C	Telegr. Value
9	1 bit	Residual current Circuit A	Telegr. Switch
10	1 bit	Residual current Circuit B	Telegr. Switch
11	1 bit	Residual current Circuit C	Telegr. Switch

Communication objects
for activated load and residual current circuits

No.	Type	Object name	Function
0	1 byte	Load current Circuit A	Telegr. Value
1	1 byte	Load current Circuit B	Telegr. Value
2	1 byte	Load current Circuit C	Telegr. Value
3	1 byte	Residual current Circuit A	Telegr. Value
4	1 byte	Residual current Circuit B	Telegr. Value
5	1 byte	Residual current Circuit C	Telegr. Value
6	1 bit	Load current Circuit A	Telegr. Switch
7	1 bit	Load current Circuit B	Telegr. Switch
8	1 bit	Load current Circuit C	Telegr. Switch
9	1 bit	Residual current Circuit A	Telegr. Switch
10	1 bit	Residual current Circuit B	Telegr. Switch
11	1 bit	Residual current Circuit C	Telegr. Switch

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Parameters
The default setting for the values is **printed in bold type.**

Common for all measuring circuits:	
– Accuracy of RMS measurement value	**normal** increased high
if “normal” is selected:	
– Suitable for	**ohmic loads e.g. incandescent lamps**
– Duration of a measurement cycle =	**3.3 s * number of activated measurement circuits**
if “increased” is selected:	
– Suitable for	**mixed loads e.g. lighting circuits, PCs**
– Duration of a measurement cycle =	**6.6 s * number of activated measurement circuits**
if “high” is selected:	
– Suitable for	**non-linear loads e.g. dimmers, electr. ballasts**
– Duration of a measurement cycle =	**10 s * number of activated measurement circuits**
Separate for each load current circuit:	
– Function	**none** activated
only if function is activated:	
– Send measured value on change of more than	**+/- 0.0 A** / +/-0.1 A / ... / +/-25.5 A
– Hysteresis for the transmission of switching telegrams	
– Upper threshold value	0.0 A / 0.1 A / ... / **25.5 A**
– Lower threshold value	**0.0 A** / 0.1 A / ... / 25.5 A
Separate for each residual current circuit:	
– Function	**none** activated
only if function is activated:	
– Send measured value on change of more than	**+/- 0.0 mA** / +/- 0.2 mA / ... / +/-51.0 mA
– Hysteresis for the transmission of switching telegrams	
– Upper threshold value	0.0 mA / 0.2 mA / ... / **51.0 mA**
– Lower threshold value	**0.0 mA** / 0.2 mA / ... / 51.0 mA

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