

**eNet radio energy detector 4-gang, for rail mounting**

Art. No. : FMES36804REG

**Operating instructions****1 Safety instructions**

Electrical devices may only be mounted and connected by electrically skilled persons.

**Serious injuries, fire or property damage possible. Please read and follow manual fully.**

**Danger of electric shock. Always disconnect before carrying out work on the device or load. In so doing, take all the circuit breakers into account, which support dangerous voltages to the device and or load.**

**Danger of electric shock. During installation and cable routing, comply with the regulations and standards which apply for SELV circuits.**

**Fire hazard! Operation exclusively with the power supplies listed under accessories**

**These instructions are an integral part of the product, and must remain with the end customer.**

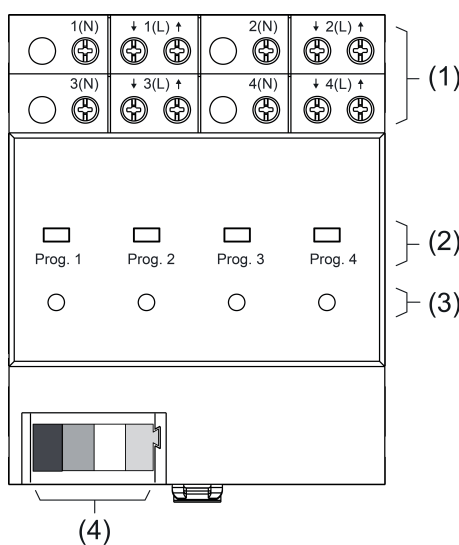
**2 Device components**

Figure 1: RMD energy sensor

- (1) Terminals
- (2) Button **Prog** 1...4
- (3) Status LED, red 1...4
- (4) Bus line connection

**3 Function****Intended use**

- Energy sensor to determine voltage, current and energy values
- Transfer of the measured values to the eNet server
- Operation with power supply RMD and receiver module RMD cover or eNet server (see accessories)
- Installation in distribution boxes on DIN rail according to EN 60715

- i** The energy sensor is not officially calibrated and may not therefore be used for invoicing purposes.

### Product characteristics

- Detection of the current and voltage of four separate circuits
- Separate calculation of the effective, idle, apparent power and the active energy for each measuring channel
- Event or time-controlled transmission of measured value telegrams to the eNet server
- Fully encrypted radio transmission (AES-CCM) from eNet Server software version 2.0
- Update of the device software

### Functional description

The energy sensor records and calculates various characteristic electrical values of the connected consumers. It is possible to indicate these values using the **eNet SMART HOME app**. All the energy sensors available in the building installation can be monitored using the eNet serve.

### Time and event-controlled data transmission

The energy sensor determines the current consumption data every 0.2 seconds. The data can be transmitted at a configurable transmission of 1...60 minutes.

In addition, data transmission can be coupled to the change in effective power. If the effective power exceeds a value of 1...2000 W and the deviation to the most recently transmitted value is 1...50 %, the data is transferred again, but only after at least one minute.

#### Default setting

Time-controlled transmission, transmission interval: 15 minutes

Event-controlled transmission:

Rel. threshold value, effective power: 10 %

Abs. threshold value, effective power: 1 W

### Transferred characteristic electric values

- Current
- Voltage
- Average effective power  
Interval for average formation configurable between 0.2...300 s.
- Apparent power
- Fundamental oscillation idle power
- Active energy  
The total active energy is saved to power failure-proof memory.

## 4 Information for electrically skilled persons

### 4.1 Fitting and electrical connection

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#### **DANGER!**

**Electrical shock when live parts are touched.**

**Electrical shocks can be fatal.**

**Before working on the device, disconnect the power supply and cover up live parts in the working environment.**

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#### Fitting the device

- Mount device on DIN rail. Output terminals must be at the top.

**Connect bus line**

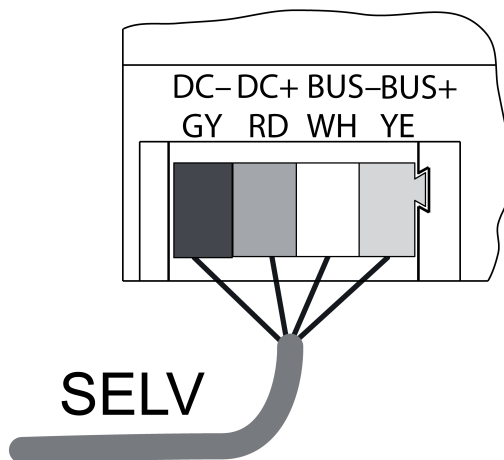


Figure 2: Connection diagram of bus line

| Labelling / Colour | Connection     |
|--------------------|----------------|
| DC- / GY dark grey | Power supply - |
| DC+ / RD red       | Power supply + |
| Bus- / WH white    | Data cable -   |
| Bus+ / YE yellow   | Data cable +   |

As bus line, use e.g. J-Y(St)Y 2x2x0.8

- Connect the device with bus line (figure 2) to the RMD reception module and power supply (see instructions of RMD reception module and power supply).

**Connecting load lines to be monitored**

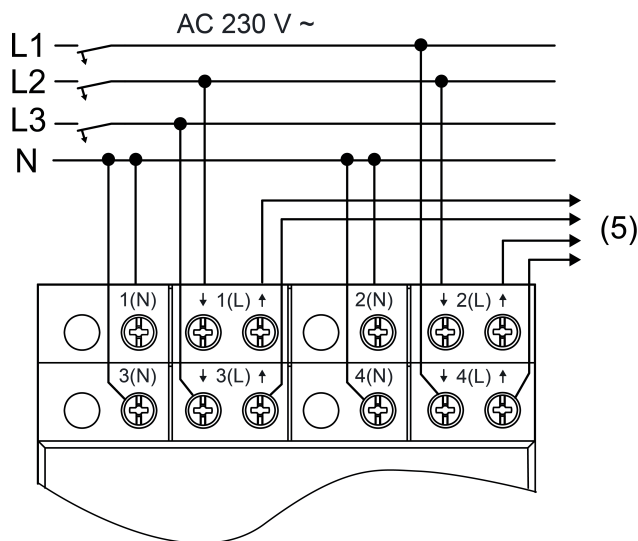


Figure 3: Connection example, energy sensor

(5) To the monitored consumers

- Connect the circuits to be monitored according to the energy sensor connection example (figure 3). Connect the energy sensor behind the circuit breakers.
- i** The neutral conductor must be connected separately for each monitored circuit. This means that the circuits can also be a part of different residual current protection circuits.

## 4.2 Commissioning

### Integrating an energy sensor into the project

The energy sensor must be read in using a system scan of the eNet server and integrated into a project.

To do this, the eNet server must be connected correctly and connected to a computer (see the instructions of the eNet server).

- Start the commissioning interface of the eNet server. Create or open the project into which the energy sensor is to be integrated (see technical documentation of the eNet server).
- Start the system scan in the commissioning interface of the eNet server.
- Press one of the buttons **Prog** (2) of the energy sensor for longer than 4 seconds.  
The status LED flashes after 4 seconds. The measuring channel is in programming mode for approx. 1 minute.  
The eNet server finds the energy sensor and displays it on the commissioning interface.  
The status LED of the energy sensor goes out.
- Assign the energy sensor to the installation location using the commissioning interface.

### Removing an energy sensor from the project

- In the commissioning interface of the eNet server, delete the energy sensor from the current project (refer to the technical documentation of the eNet server).  
The energy sensor is removed from the project and the parameters reset to the default setting.

### Resetting the measuring channel to the default setting

The connection to the eNet server is disconnected and parameters are reset to default setting.

- Press the **Prog** button of the corresponding measuring channel for at least 20 seconds.  
The status LED flashes after 4 seconds. After 20 seconds the status LED flashes faster.
- Release **Prog** button and press briefly once again within 10 seconds.  
The status LED flashes more slowly for approx. 5 seconds.  
The measuring channel is reset to the default setting.

### Resetting the device to the factory setting

- Reset all the measuring channels (see Resetting the measuring channel to the default setting).  
All the status LEDs flash, as soon as the last measuring channel was reset. Device is reset to default setting.

## 5 Appendix

### 5.1 Technical data

|   |                           |
|---|---------------------------|
| Rated voltage                                   | AC 230 V ~                |
| Mains frequency                                 | 50 / 60 Hz                |
| Rated load current                              | 16 A (I <sub>L</sub> )    |
| Peak current (1 s)                              | 80 A                      |
| Peak current (1 min)                            | 24 A                      |
| Power consumption per channel                   | 225 mW                    |
| Ambient temperature                             | -5 ... +45 °C             |
| Transmission interval                           | 1 ... 60 min              |
| Connection of load terminals<br>single stranded | 1.5 ... 4 mm <sup>2</sup> |

|  |   |
|--|---|
| Finely stranded without conductor sleeve | 0.75 ... 4 mm <sup>2</sup>                    |
| Finely stranded with conductor sleeve    | 0.5 ... 2.5 mm <sup>2</sup>                   |
| Fitting width                            | 72 mm / 4 modules                             |
| Bus line                                 |   |
| Rated voltage                            | DC 12 V SELV                                  |
| Current consumption                      | 10 mA   |
| Connection, Bus                          | device connection terminal                    |
| Cable length                             | max. 3 m                                      |
| Measuring ranges per channel             |   |
| Current                                  | 0 mA ... 16 A                                 |
| Accuracy (current)                       | ± 0.5 % of the current value and ± 8 mA       |
| Voltage                                  | 207 ... 250 V                                 |
| Accuracy (voltage)                       | ± 0.5 % of curr. val.                         |
| Transmitted power and output values      |   |
| Effective output                         | -4000 ... 4000 W                              |
| Apparent output                          | 0 ... 4000 VA                                 |
| Idle output                              | -4000 ... 4000 var                            |
| Accuracy (power)                         | ± 0.5 % of the current value and ± 2 W/VA/var |
| Effective energy                         | -99999 ... 99999 kW·h                         |

## 5.2 Parameter list

The device parameters can be changed with the eNet server:

### Device and channels

| Parameters | Setting options, Basic setting          | Explanations   |
|------------|---|--|
| Function   | Energy, Unused<br>Basic setting: Energy | Energy<br>The channel works as an energy sensor.<br><br>Unused<br>The channel is not displayed in the <b>eNet SMART HOME app</b> and is disabled for use in the commissioning interface. |

### Advanced device settings

| Parameters           | Setting options, Basic setting          | Explanations   |
|----------------------|---|--|
| Manual commissioning | On, Off<br>Basic setting: On            | Disables manual commissioning for all device channels. In the "Off" setting, the device cannot be reset to the factory setting.  |
| Transmission mode    | Single, Double<br>Basic setting: Double | The transmission of all measured value telegrams is repeated to guarantee increased transmission security (no unsecured transmission). It is possible to switch over to simple transmission. |

### Channel settings

| Parameters | Setting options, Basic setting | Explanations |
|------------|--------------------------------|--------------|
|------------|--------------------------------|--------------|

|               |  |  |
|---------------|--|--|
| Active energy | -1073741823...1073741823 Wh<br>Basic setting: 0 Wh (Current value) | Displays the currently cumulated active energy. The value can be reset to 0 or set to any other value. |
|---------------|--|--|

**Extended channel settings**

| Parameters                            | Setting options, Basic setting        | Explanations  |
|---------------------------------------|---------------------------------------|---|
| Manual commissioning                  | On, Off<br>Basic setting: On          | Blocks manual commissioning for the device channel. In the "Off" setting, the device cannot be reset to the factory setting.  |
| Transmit voltage                      | On, Off<br>Basic setting: On          | Transmits the current voltage value.  |
| Transmit current                      | On, Off<br>Basic setting: On          | Transmits the current current value.  |
| Transmit effective power              | On, Off<br>Basic setting: On          | Transmits the average effective power. If negative values are displayed, then effective power is fed in, e.g. via a photovoltaic system.  |
| Transmit reactive power               | On, Off<br>Basic setting: On          | Sends the current fundamental oscillation idle power value. If negative values are displayed, this is capacitive reactive power. Positive values show an inductive reactive power.  |
| Transmit apparent power               | On, Off<br>Basic setting: On          | Transmits the current apparent output value.  |
| Transmit absolute active energy       | On, Off<br>Basic setting: On          | Transmits the cumulative value of the active energy. If negative values are displayed, then effective energy is fed in, e.g. via a photovoltaic system.   |
| Transmission interval                 | 1 ... 60 min<br>Basic setting: 15 min | The current consumption data is transmitted at the interval set here at the latest. Changes to the effective power cause fresh transmission, however only after one minute at the earliest.   |
| Rel. threshold value, effective power | 1 ... 50 %<br>Basic setting: 10 %     | The transmission of the consumption data can be coupled to the change in effective power. The basis is always the most recently transmitted effective output value. If the percentage change entered here is exceeded, then all the measured values are resent. |

|                                       |                                       |  |
|---------------------------------------|---------------------------------------|--|
| Abs. threshold value, effective power | 0 ... 2000 W<br>Basic setting: 1 W    | A lower threshold value of the effective power can be entered here, to avoid frequent transmission in the lower power range. Event-controlled transmission is only active above this threshold value.  |
| Suppression length, effective power   | 0 ms ... 300 s<br>Basic setting: 0 ms | Triggers for event-controlled transmission are often switch-on and switch-off operations. In order to avoid incorrect measured values due to switch-on peaks, this parameter can be used to enter a suppression period. The measured values are only transmitted if the effective power is still above or below the relative threshold value after the set time. |
| Averaging length                      | 0.2 ... 300 s<br>Basic setting: 1 s   | In the case of effective power, it is not the current value which is transmitted, as with other measured values, but the average value. It is possible to set the period for average value formation here.   |

### Information window

During channel selection in the Information window, the following values are displayed.

| Display value          | Explanations  |
|------------------------|---|
| Voltage                | Displays the current voltage value.   |
| Current                | Displays the current current value.   |
| Effective power        | Displays the current effective power.   |
| Reactive power         | Displays the current reactive power. If negative values are displayed, this is capacitive reactive power. Positive values show an inductive reactive power. |
| Apparent power         | Displays the current apparent power.  |
| Absolute active energy | Displays the current absolute active energy. If negative values are displayed, then effective energy is fed in, e.g. via a photovoltaic system.             |
| Active energy          | Displays the cumulated active energy. Meter reading can be set via settings window.   |

## 5.3 Troubleshooting

### Negative effective output or energy values are displayed.

Cause 1: This is an energy source, e.g. a photovoltaic system, feeding in energy.

Cause 2: The energy sensor is connected in reverse polarity.

Connect the energy sensor with the correct polarity.

- i** If negative reactive power values are displayed, this is a capacitive idle power. Positive values show an inductive reactive power.

## 5.4 Accessories

Power supply 12 V, for rail mounting  
eNet master receiver for rail mounting  
eNet server for rail mounting

Art. No. NT1220REGVDC  
Art. No. FMFK32REG  
Art. No. ENET-SERVER

## 5.5 Warranty

The warranty follows about the specialty store in between the legal framework as provided for by law.

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