



SMA Energy Meter Installation Manual
251851.0100

Validity
This document is valid for the SMA Energy Meter* (EMETER-10.GR1) from firmware version 1.02.04.R.

Target Group
Only qualified persons with the following skills are allowed to perform the tasks described in this document:

- Training in the installation and commissioning of electrical devices
- Training in electrical hazards and local safety regulations
- Knowledge of all applicable standards and directives
- Knowledge of and compliance with this document and all safety precautions

Symbols Used

Symbol	Explanation
	Indicates a hazardous situation which, if not avoided, will result in death or serious injury
	Indicates a hazardous situation which, if not avoided, can result in death or serious injury
	Indicates a hazardous situation which, if not avoided, can result in minor or moderate injury
NOTICE	Indicates a situation which, if not avoided, can result in property damage
	Information that is important for a specific topic or goal, but is not safety-relevant
	Indicates a requirement for meeting a specific goal
	Desired result
	A problem that might occur

Intended Use

The Energy Meter is a measuring device which detects electrical measured values at the connection point and makes them available via Speedwire.

The Energy Meter is for private use only. This product is **NOT** an energy meter for the consumption of active power as defined in the EU Directive 2004/22/EC (MID). The Energy Meter must not be used for billing purposes. The data collected by the Energy Meter relating to the power generated by your PV system may deviate from the data of the main Energy Meter.

The Energy Meter must only be connected to the subdistribution of the household on the load side behind the Energy Meter of the electric utility company. For applications > 63 A, current transformers must be connected to the Energy Meter.

The Energy Meter is designed for indoor use only.

The Energy Meter is approved for use in all EU member states. Only use the Energy Meter in accordance with the information provided in the enclosed documentation. Any other use can result in personal injury or property damage.

For safety reasons, it is not permitted to modify the product or install components that are not explicitly recommended or distributed by SMA Solar Technology AG for this product. Any use of the product other than described in the Intended Use section does not qualify as appropriate usage. It is prohibited to make any modifications that are not approved by SMA.

The enclosed documentation is an integral part of the product and must be read and observed. Keep in a convenient place for future reference.

Supported Products

For information on the supported products, see the product page of the Energy Meter at www.SMA-Solar.com.

Safety Precautions

DANGER

Danger to life due to electric shock
Lethal voltages are present in the live components.

- Only use the Energy Meter in a dry environment and keep it away from liquids.
- Install the Energy Meter in the switch cabinet only and ensure that the connection areas for the line conductors and the neutral conductor are behind a cover or have contact protection.
- Disconnect the Energy Meter from voltage sources before cleaning. The Energy Meter must be cleaned with a dry cloth only.
- Observe the prescribed minimum clearance between the network cable and live installation components, or use suitable insulation.

WARNING

Danger to life due to electric shock
If network cables are laid outdoors, they may be subject to overvoltages, e.g. due to flash of lightning. This can result in death or serious injury.

- Network cables laid outdoors must be suitably protected from overvoltage.

NOTICE

Damage to or destruction of the Energy Meter if connected to ISDN

- Do not connect an ISDN cable to the network terminal of the Energy Meter.

Damage to or destruction of the Energy Meter due to inappropriate use

- The Energy Meter must not be operated beyond the values specified in the technical data.

Technical Data	
Communication	Speedwire
Nominal voltage	230 V/400 V AC
Frequency	50 Hz/60 Hz ± 5%
Self-consumption	2 W
Limiting current/line conductor	63 A
Connection cross-section with current transformers	See recommendations of the current transformer manufacturer
Connection cross-section without current transformers	10 mm ² to 25 mm ²
Torque for screw terminals	2 Nm
Weight	0,30 kg
Dimensions (W / H / D)	70 mm x 88 mm x 65 mm
Ambient temperature in operation	- 25 °C to +40 °C
Ambient temperature during transport/storage	- 25 °C to +70 °C
Relative air humidity*	5% to 95%
Protection class	none
Degree of protection**	IP2X

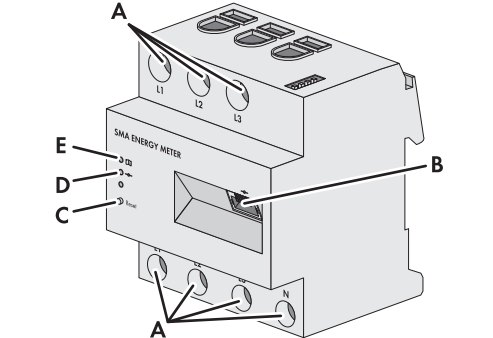
* non-condensing
** in accordance with IEC 60529

Scope of Delivery

- 1 x Energy Meter (EMETER-10.GR1)
- 1 x installation manual

Contact your distributor if the scope of delivery is incomplete or damaged.

Product Description



A	Connection area for line conductors and neutral conductor
B	Network terminal (Speedwire)
C	Reset button
D	Speedwire LED
E	Status LED

LED States

Status LED ():

- **Glowing green:** Energy Meter is switched on.
- **Flashing green slowly:** Energy Meter starting up.
- **Flashing green fast:** firmware update running.
- **Glowing or flashing red or orange:** an error has occurred. Refer to Section "Troubleshooting".

Speedwire LED ():

- **Off:** no Speedwire connection established
- **Glowing green:** Speedwire connection established.

- **Flashing green:** Energy Meter is sending or receiving data.

Information on Connection and Commissioning

The line conductor L1 supplies the Energy Meter with power. At least the line conductor L1 and the neutral conductor must be connected for the Energy Meter to switch on.

DANGER

Danger to life due to electric shock if external disconnect switch is missing

Lethal voltages are present in the live components of the Energy Meter.

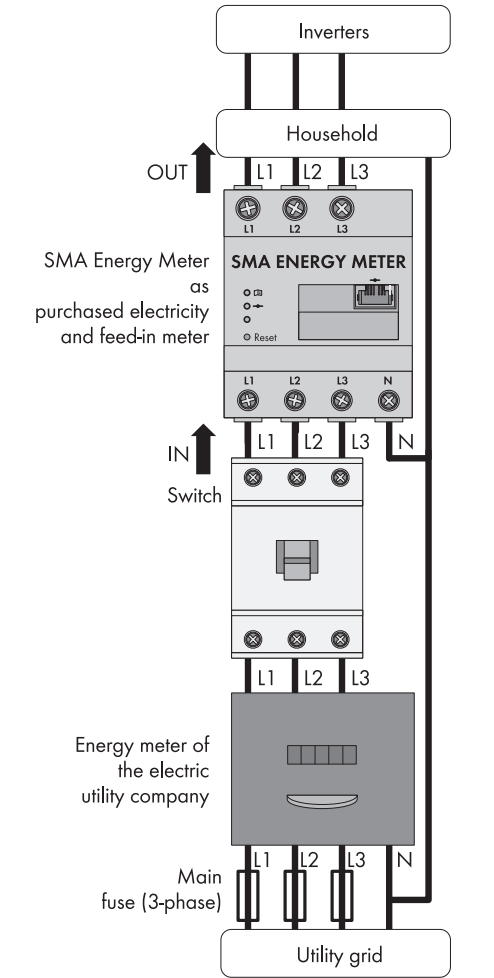
- Install an external disconnect switch between the Energy Meter and the grid-connection point. The external disconnect must be close to the Energy Meter and easily accessible.

Complete Multicast support required

Incomplete Multicast support of individual network components can lead to malfunction of the Energy Meter.

Electrical Connection for Applications < 63 A

The following figure shows a connection example. For exact connection specifications, contact your electric utility company.



Designation	Explanation
L1, L2, L3	Line conductor
N	Neutral conductor
OUT	Meter output, load side
IN	Meter input, grid side

Procedure:

DANGER

Danger to life due to electric shock

Lethal voltages are present in the switch cabinet.

- Disconnect the connection point from voltage sources and make sure it cannot be reconnected.
- Ensure that the conductors to be connected to the Energy Meter are free of voltage.

WARNING

Fire hazard

If a fuse is missing or incorrect and a fault occurs, a fire may be caused. This can result in death or serious injury.

- Protect the line conductors of the Energy Meter with a fuse or a main/selective circuit breaker, max. 63 A.

1. Mount the Energy Meter on the top-hat rail. Hook the Energy Meter into the top edge of the top-hat rail and press down until it snaps into place.

2. Connect the conductors to the Energy Meter. Observe the permitted connection cross-section and torque for screw terminals (see Section "Technical Data"):

- In a three-phase utility grid, connect the line conductors L1, L2 and L3 and the neutral conductor to the Energy Meter in accordance with the wiring diagram.
- In a single-phase utility grid, connect the line conductor L1 and the neutral conductor to the Energy Meter in accordance with the wiring diagram.

Electrical Connection for Applications > 63 A

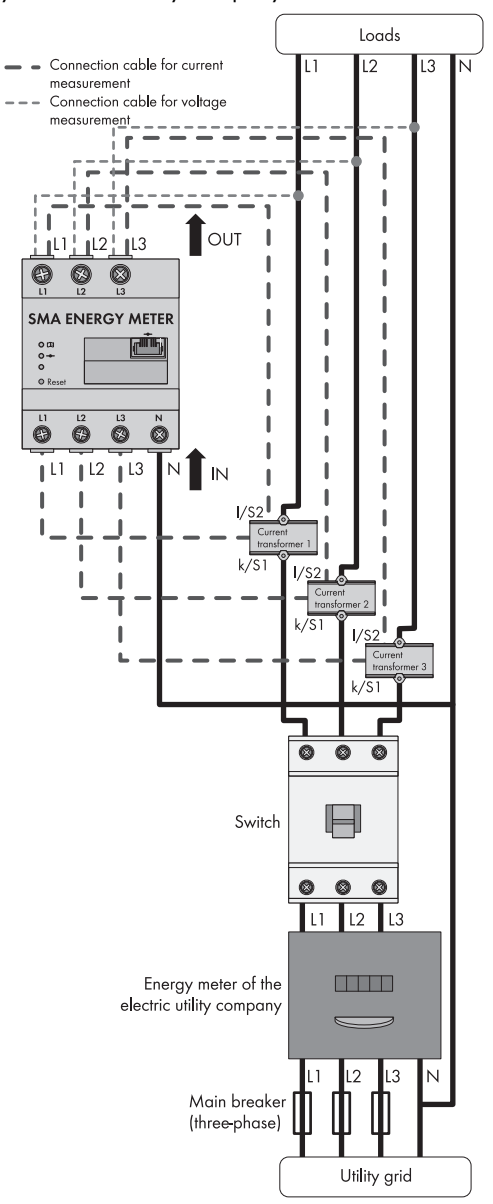
Additionally required material (not included in the scope of delivery):

- 3 x current transformer
- Connection cables for current transformers

Recommendations for the current transformer

SMA Solar Technology AG recommends current transformers designed for a secondary current of 5 A. The current transformers should have at least accuracy class 1.

The following figure shows a connection example. For exact connection specifications, contact your electric utility company.



Designation	Explanation
L1, L2, L3	Line conductor
N	Neutral conductor
OUT	Meter output, load side
IN	Meter input, grid side

* referred to in this document as Energy Meter

Procedure:

⚠ DANGER

Danger to life due to electric shock

Lethal voltages are present in the subdistribution of the household.

- Disconnect the connection point from voltage sources and make sure it cannot be reconnected.
- Ensure that the conductors to be connected to the meter are free of voltage.

⚠ WARNING

Fire hazard

If a fuse is missing or incorrect and a fault occurs, a fire may be caused. This can result in death or serious injury.

- Protect the line conductors of the Energy Meter with a fuse or a main/selective circuit breaker switch, max. 63 A.

1. Connect one current transformer to each line conductor L1, L2 and L3.
2. On each current transformer, connect one connection cable for current measurement to each of the secondary current terminals (**k/S1** and **l/S2**). Observe the permitted connection cross-section of the Energy Meter (see Section "Technical Data"):
3. Connect the connection cables for current measurement to the Energy Meter. Observe the prescribed torque for screw terminals (see Section "Technical Data"):
4. Connect the connection cables for voltage measurement to the Energy Meter. Observe the prescribed torque for screw terminals (see Section "Technical Data"):
5. Connect the connection cables for voltage measurement to the corresponding line conductors.

Network Terminal

i IGMP protocol from version 2 must be supported

The Energy Meter works with Multicasts. For the correct function of the Energy Meter, all network devices used must support the IGMP protocol, minimum required version 2 (IGMP V2).

Additionally required material (not included in the scope of delivery):

- 1 x network cable

Recommended cable types:

- SF/UTP, S-FTP, S/UTP, SF/FTP, S/FTP, S-STP
- For further information on cable types, refer to the Technical Information "SMA Speedwire Fieldbus" at www.SMA-Solar.com.

Procedure:

1. Connect the network cable to the network terminal (Speedwire) of the Energy Meter.
2. Connect the other end of the network cable to a router/network switch. SMA products which are to receive measured values must be integrated in the same local network.

Commissioning

1. Cover the Energy Meter with the cover or the contact protection of the subdistribution.
 2. Switch the power supply to the subdistribution back on.
- The LEDs of the Energy Meter glow during start-up. If there is only one Energy Meter in the system, the Energy Meter connects automatically to SMA communication products in the same local network. For more information on commissioning, see the user manual of the supported devices.

- ✘** The LEDs are not glowing or the Energy Meter is not displayed by the SMA communication products?
- Correct the error (see Section "Troubleshooting").

Resetting the Energy Meter to Default Settings

Procedure:

- Press the reset button with a sharp object and hold it for two to six seconds.

Restarting the Energy Meter

Procedure:

- Press the reset button with a sharp object and hold it for six seconds or longer.

Accessing the User Interface

Procedure:

1. Call up the Internet browser and in the address line enter **http://energymeter“Serial number”.local**, e.g.:
`http://energymeter7435667356.local`
Note: The serial number can be found on the type label of the Energy Meter.
 2. Press Enter.
- The user interface of the Energy Meter opens.
- ✘** The user interface does not open?
- Correct the error (see Section "Troubleshooting").

Configuring the Current Transformer

Procedure:

1. Open the user interface of the Energy Meter (see Section "Accessing the User Interface")
2. On the homepage, select **Device settings > Current Transformer settings**.
3. Activate the checkbox **Use Current Transformers**.
4. Enter the required transformation ratio in the field **Current Transformer ratio**.
5. Select **[Apply]**.

Performing a Firmware Update

Procedure:

1. Download the update file from www.SMA-Solar.com and save it to your computer.
2. Open the user interface of the Energy Meter (see Section "Accessing the User Interface")
3. Follow the instructions in the menu **Firmware update**.

Procedure after Replacing an Energy Meter

Procedure:

- If more than one Energy Meter is installed in your system and you have replaced one or more Energy Meters, you will need to adjust the serial number of the corresponding Energy Meter in the Sunny Island/Sunny Boy Smart Energy. This will avoid inaccurate meter reading data in the Speedwire data module Sunny Island/Sunny Boy Smart Energy:
 - In systems without Sunny Home Manager, enter the serial number of the Energy Meter via Sunny Explorer in the Sunny Island/Sunny Boy Smart Energy (for information on changing device parameters, see user manual of the Sunny Explorer).
 - In systems with Sunny Home Manager, configure the Energy Meter in Sunny Portal (see user manual of the Sunny Home Manager).

Troubleshooting

The status LEDs are off.

The Energy Meter is not supplied with power.

- Make sure that at least the line conductor L1 and the neutral conductor are connected to the Energy Meter.

The status LEDs are glowing or flashing red or orange.

An error has occurred.

- Restart the Energy Meter (see Section "Restarting the Energy Meter").
- Contact the SMA Service Line.

The Speedwire LEDs are not glowing, or

The Energy Meter is not displayed by the SMA communication product.

The network cable has not been correctly connected to the network terminal.

- Make sure that the network cable is correctly connected to the network terminal.

The Energy Meter is not integrated into the same local network as the SMA communication product.

- Connect the Energy Meter to the same router/network switch as the SMA communication product.

The Energy Meter provides unrealistic measured values.

The Energy Meter has been installed the wrong way round.

- Connect and commission again.

The user interface cannot be called up via **http://energymeter“Serial number”.local**.

The name resolution via Avahi (Multicast DNS) is not working.

- Call up the user interface via the current IP address of the Energy Meter. Call up the user interface of the router and read off the IP address of the Energy Meter (see router manual).
- With Windows XP/7/8:
Install Apple Bonjour[®] (download links at www.apple.com. Note: Apple Bonjour[®] is also contained in Apple iTunes[®]).
- Contact your network administrator.

Disposal

Procedure:

- Dispose of the Energy Meter in accordance with the locally applicable disposal regulations for electronic waste.

Open Source Licenses

The license text and corresponding information is displayed in the user interface of the Energy Meter. You can request the source code with modifications from the SMA Service Line.

Contact

If you have technical problems concerning our products, contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Type and serial number of the Energy Meter (see type label of the Energy Meter)
- Type and serial number of the SMA products (e.g. Sunny Home Manager, Sunny Explorer, Sunny Island)
- Error description

SMA Solar Technology AG

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International SMA Service Line
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www.SMA-Solar.com

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