



EN

SMA Energy Meter Installation Manual

Rev.0007

VALIDITY

This document is valid for the SMA Energy Meter* (EMETER-20) from firmware ver-

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 information

SYMBOLS USED

▲ DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
▲ WARNING	Indicates a hazardous situation that, if not avoided, can result in death or serious injury.
▲ CAUTION	Indicates a hazardous situation that, if not avoided, can result in minor or moderate injury.
NOTICE	Indicates a situation that, if not avoided, can result in property damage.
i	Information that is important for a specific topic or goal, but is not safety-relevant.
	Indicates a requirement for meeting a specific goal.
1	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 Ethernet.

This roduct is not an energy meter for the consum tion of active power as defined in the EU Directive 2004/22/EC (MID). The Energy Meter must not be used for billing ur oses. The data collected by the Energy Meter relating to the ower generated by your PV system may deviate from the data of the main Energy Meter, which is used for billing ur oses.

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 com any. The Energy Meter must be installed in a switch cabinet. For a lications bigger than 63 A, current transformers must be connected to the Energy Meter.

The Energy Meter is designed for indoor use only.

The Energy Meter is a roved for use in all EU member states, in Great Britain, Australia and selected other countries. Only use the Energy Meter in accordance with the information rovided in the enclosed documentation. Any other use can result

in personal injury or property damage.
For safety reasons, it is not ermitted to modify the product or install components that are not ex licitly recommended or distributed by SMA Solar Technology AG for this product. Any use of the product other than that described in the Intended Use section does not qualify as appropriate.

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

When the Energy Meter is used in delta IT grids, the cumulative power values are correctly measured. Due to the measuring rinci le of the Energy Meter, other measured values may be incorrect. The Energy Meter can be used in SMA SMART HOME a lications in delta IT grids.

i Recommendations for future upgrades

To enable a registration process for future upgrades of the Energy Meter, the documentation ackage is delivered with an RID and PIC label. Store the label in a safe location for later use.

Alternatively, the RID and PIC are printed on the type label of the Energy Meter. Ty e labels are, however, difficult to read when installed.

SUPPORTED PRODUCTS

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

A publication about the meter protocol being used is available at http:// www.sma.de/ artner/sma-develo er.html

SAFETY INFORMATION

This section contains safety information that must be observed at all times when working on or with the product.

To revent ersonal injury and roperty damage and to ensure long-term operation of the roduct, read this section carefully and observe all safety information at all

DANGER

Danger to life due to electric shock

Lethal voltages are present in the live components.

- · Disconnect the connection point from voltage sources and make sure it cannot be reconnected.
- · Before erforming any work on the Energy Meter, disconnect the grid
- side from all voltage sources using the installed disconnect switch. • Ensure that the conductors to be connected are de-energized.
- Only use the Energy Meter in a dry environment and keep it away from
- · 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 rotection.
- 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 com onents, or use suitable insulation.

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 disconnector must be close to the Energy Meter and easily accessible.

WARNING

Danger to life due to electric shock

Overvoltages (e. g. in the case of a flash of lightning) can be further conducted into the building and to other connected devices in the same network via the network cable if there is no overvoltage rotection.

- Ensure that all devices in the same network are integrated in the existing overvoltage rotection.
- When laying the network cable outdoors, attention must be given to suitable overvoltage rotection at the network cable transition outdoors to the network inside the building.

WARNING

Risk of fire due to dirty or oxidized contact surfaces of live aluminum conductors

Connecting dirty or oxidized contact surfaces with aluminum conductors reduces the am acity of the live terminals, thereby increasing the transition resistances. This can cause com onents to overheat and catch fire.

• The contact surfaces are to be cleaned, brushed, and treated with acidic and alkaline substances (e.g. petroleum jelly or special thermal grease).

WARNING

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.

NOTICE

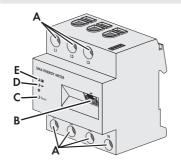
Damage to or destruction of the Energy Meter if connected to ISDN

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.

PRODUCT DESCRIPTION



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

SCOPE OF DELIVERY

- 1 x Energy Meter (EMETER-20)
- 1 x installation manual

Contact your s ecialist dealer if you find any damage

TECHNICAL DATA

Communication	Ethernet
Nominal voltage:	110 / 230 / 400 VAC
Frequency	50 / 60 Hz (± 5 %)
Self-consumption	2 W
Limiting current/line conductor	63 A
Connection cross-section without current transformers	10 mm ² to 16 mm ²
Connection cross-section with current transformers	10 mm ² to 25 mm ²
Max. cable length with current transformers	3 m
Torque for screw terminals	2 Nm
Weight	0.30 kg
Dimensions (W x H x D)	70 mm x 85 mm x 65 mm
Ambient temperature in operation	-25°C to +40°C
Ambient temperature during transport/storage	-25°C to +70°C
Relative humidity*	5% to 90%
Maximum operating altitude above mean sea level	2000 m
Protection class	II
Degree of protection**	IP20

- * non-condensina
- ** in accordance with IEC 60529

LED STATES

Status LED (i):

- 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 (see Section Troubleshooting").

- COM LED ():
 Off: no Speedwire connection established.
- Glowing green: Speedwire connection established.
- Flashing green: Energy Meter is sending or receiving data.

MOUNTING

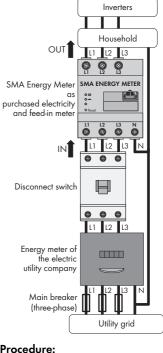
• Mount the Energy Meter on the to -hat rail. Hook the Energy Meter into the top edge of the top-hat rail and press down until it snaps into place.

INFORMATION ON CONNECTION AND COMMISSIONING

- ☐ The line conductor L1 su lies the Energy Meter with ower. At least the line conductor L1 and the neutral conductor must be connected for the Energy Meter
- ☐ When using fine stranded wire, bootlace ferrules must be used.
- ☐ The screw terminals must be retightened after six to eight weeks.

ELECTRICAL CONNECTION FOR APPLICATIONS < 63 A

The following figure shows a connection example in TN and TT grid con figurations in the case of installation at the grid-connection point. For exact connection specifications, contact your electric utility com any.



L1, L2, L3: Line conductor N: Neutral conductor **OUT**: Meter output, load side IN: Meter input, arid side

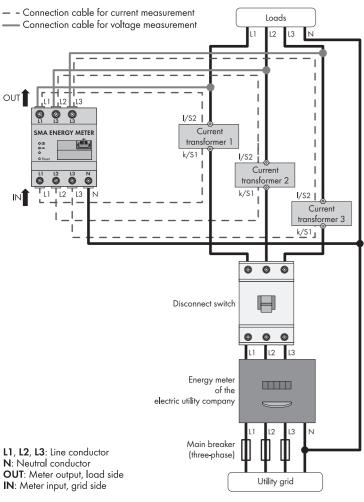
- 1. Connect the conductors to the Energy Meter. Observe the permitted connection cross-section and torque for screw terminals (see Section "Technical data"):
 - In a three-phase utility grid, connect the line conductors L1, L2 and L3 and the neutral conductor to the Energy Meter in accordance with the wiring
- 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.



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ELECTRICAL CONNECTION FOR APPLICATIONS > 63 A

The following figure shows a connection example in TN and TT grid configurations in the case of installation at the grid-connection point. For exact connection specifications, contact your electric utility company.



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

- ☐ 3 x current transformer
- ☐ Connection cables for current transformers

i Recommendations for the current transformer

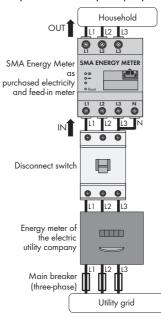
SMA Solar Technology AG recommends current transformers designed for a secondary current of 5 A. The current transformers should have at least accuracy class 1.

Procedure:

- 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
- 3. Connect the connection cables for current measurement (dashed gray line) to the Energy Meter. Observe the prescribed torque for screw terminals (see Section "Technical data").
- 4. Connect the connection cables for voltage measurement (solid gray line) 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

ELECTRICAL CONNECTION FOR 3-PHASE APPLICATIONS IN DEL-TA IT NETWORKS

The following figure shows a connection example in delta IT networks in the case of installation at the grid-connection point. For exact connection specifications, contact your electric utility company.



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

Procedure:

. Connect the line conductors L1, L2 and L3 and the neutral conductor to the Energy Meter in accordance with the wiring diagram. Observe the permitted connection cross-section and torque for screw terminals (see Section "Technical

NETWORK PORT

i IGMP protocol from version 2 must be supported

Data transmission with 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:

- Connect the network cable to the network terminal (Ethernet) 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. If multiple SMA products in the local network require the measured values from the Energy Meter, do not connect the network cable directly to an individual SMA product.

COMMISSIONING

- 1. Cover the Energy Meter with the cover or the contact protection of the sub-distribution
- 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 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")

ACCESSING THE USER INTERFACE

1. Call up the web browser and in the address line enter http://SMA"Serial number".local, e.g.:

http://SMA7435667356.local

Note: The serial number can be found on the type label of the Energy Meter.

2. Select user group and enter the password. Tip: The standard password for the user group User is "0000." The standard password for the user group Installer is "1111."

- ☑ The user interface of the Energy Meter opens.
- ★ The user interface does not open?
- Correct the error (see Section "Troubleshooting").
- 4. Create a personal password after your first login.

CONFIGURING THE CURRENT TRANSFORMER

- Call up the user interface of the Energy Meter.
- 2. Call up the menu **Device Parameters**
- 3. Select [Editing Parameters].
- 4. Set the parameter external transformer in the parameter group Device > Device to Yes.
- 5. Enter the desired transmission ratios for the parameters **Primary current** and Secondary current.
- 6. Select [Save all] to save the changes.

UPDATING THE FIRMWARE

AUTOMATIC UPDATE (RECOMMENDED)

- 1. Call up the user interface of the Energy Meter.
- 2. Select the option Yes in the menu Device Parameters > Update > Automatic

MANUAL FIRMWARE UPDATE

- 1. Download the update file from www.SMA-Solar.com and save it to your com-
- Call up the user interface of the Energy Meter. Select the menu Device Configuration
- 4. Select [Settings].
- 5. In the context menu, select [Updating the Firmware].
- 6. Follow the instructions in the dialog.

RESETTING THE ENERGY METER TO DEFAULT SETTINGS / RESET-TING THE PASSWORD

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

RESTARTING THE ENERGY METER

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

PROCEDURE AFTER REPLACING AN ENERGY METER

- 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 inverter or in the communication product. This will avoid inaccurate meter reading data in the Speedwire data module:
 - In systems without Sunny Home Manager, enter the serial number of the Energy Meter via Sunny Explorer or the user interface in the inverter or in the communication product (for information on changing device parameters, see manual of the respective product).
 - 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?

There is an error.

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

The Speedwire LED is 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.

· Check the connection and commissioning, and perform again if necessary.

The user interface cannot be called up via http://SMA"Serial number".lo-

- 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).
- Contact your network administrator.

The password for the user interface has been forgotten?

· Reset the password (see Section "Resetting the Energy Meter to Default Settings / Resetting the password").

DECOMMISSIONING

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 disconnected from the Energy Meter are de-energized.

A

- Remove all conductors connected to the Energy Meter.
- 2. Remove the Energy Meter from the top-hat rail. Tilt the lower edge of the Energy Meter forwards and lift off the top-hat rail.

DISPOSAL

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

OPEN SOURCE LICENSES

The licenses for the software modules used can be called up on the user interface of the product. You can request the source code with modifications from the Service

CONTACT

If you experience any technical problems with our products, please contact the Service. The following data is required in order to provide you with the necessary as-

- Type and serial number of the Energy Meter
- Type and serial number of the SMA products Error description
- Firmware version

You can find your country's contact information at:



https://go.sma.de/service

SMA Solar Technology AG

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