SMA Energy Meter CT
Installation Manual

EN

Rev.0001

VALIDITY

This document is valid for the SMA Energy Meter CT* :
- EM-1CT63A-21
- EM-3CT63A-21

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.
☑	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 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, which is used for billing purposes.
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. The Energy Meter must be installed in a switch cabinet.
The Energy Meter is designed for indoor use only.
The Energy Meter is approved for use in all EU and UK member states.
The products from SMA Solar Technology AG are not suitable for use in:
• Medical devices, in particular products for supplying life-support systems and machines;
• Aircraft, the operation of aircraft, the supply of critical airport infrastructure and airport systems;
• Rolling stocks, the operation and supply of rail vehicles and their critical infrastructure.
The above list is not exhaustive. Contact us if you are unsure whether products from SMA Solar Technology AG are suitable for your application.
Only use the Energy Meter if it is undamaged and in accordance with the information provided in the enclosed documentation and with the locally applicable laws, regulations, standards and directives. Any other use as well as using damaged devices may cause personal injury or property damage.
Alterations to the SMA products (except those described here), e.g., changes or modifications, are only permitted with the express written permission of SMA Solar Technology AG. Unauthorized alterations as well as failure to observe the documentation will void guarantee and warranty claims and in most cases terminate the operating license. SMA Solar Technology AG shall not be held liable for any damage caused by such alterations.
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. Keep the documentation in a convenient, dry place for future reference.
This document does not replace any regional, state, provincial, federal or national laws, regulations or standards that apply to the installation, electrical safety and use of the product. SMA Solar Technology AG assumes no responsibility for the compliance or non-compliance with such laws or codes in connection with the installation of the product.

* Referred to as Energy Meter or product in this document.

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 https://developer.sma.de.

SAFETY INFORMATION

This section contains safety information that must be observed at all times when working on or with the product.
To prevent personal injury and property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

⚠ 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 performing 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 moisture.
- 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.

⚠ 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 protection.
- Ensure that all devices in the same network are integrated into the existing overvoltage protection.
- When laying the network cable outdoors, attention must be given to suitable overvoltage protection 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 ampacity of the live terminals, thereby increasing the transition resistances. This can cause components 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

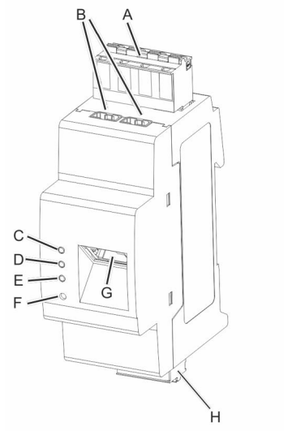
Risk of fire
If a fuse is missing or incorrect and a fault occurs, a fire may be caused. This can result in death or serious injury.
- Secure the voltage inputs of the Energy Meter (L1, L2, L3) with 16 A type B each.

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: voltage input L1, L2, L3, N
B: reserved
C: status LED
D: COM LED
E: no function
F: reset button
G: network connection (Ethernet)
H: connection CT L1/L2/L3

SCOPE OF DELIVERY

EM-1CT63A-21
- 1 x Energy Meter CT
- 1 x installation manual
- 1 x connection plug voltage input
- 1 x connection plug current transformer
- 1 x current transformer (63 A)

EM-3CT63A-21
- 1 x Energy Meter CT
- 1 x installation manual
- 1 x connection plug voltage input
- 1 x connection plug current transformer
- 3 x current transformer (63 A)

Contact your specialist dealer if you find any damage.

TECHNICAL DATA

Communication	Ethernet (10/100 Mbit)
Weight	0.30 kg
Dimensions (W x H x D)	35 mm x 88 mm x 65 mm
Ambient temperature in operation	-25°C to +55°C
Ambient temperature during transport/storage	-25°C to +70°C
Relative humidity*	Up to 75% on an annual average, up to 95% on up to 30 days/year
Maximum operating altitude above mean sea level	2000 m
Protection class (according to IEC 62103)	II
Degree of protection (according to IEC 60529)	IP20
Mains power supply	
Supply voltage	85 V to 250 VAC
Frequency	50 Hz / 60 Hz
Self-consumption, Pmax	≤ 2 W
Measuring circuit for measuring category CAT III	
Frequency range	50/60 Hz (± 5%)

* Non-condensing

LED STATES

Status LED (i):
- **Glowing green**: Energy Meter is switched on.
- **Orange flashing slowly twice**: device has been reset to default setting successfully.
- **Glowing red**: an error has occurred (see paragraph "Troubleshooting").

COM LED (—●—):
- **Off**: no Speedwire connection established.
- **Glowing green**: Speedwire connection established.
- **Flashing green quickly**: Energy Meter is sending or receiving data.
- **Flashing red slowly**: communication error

INSTALLATION

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

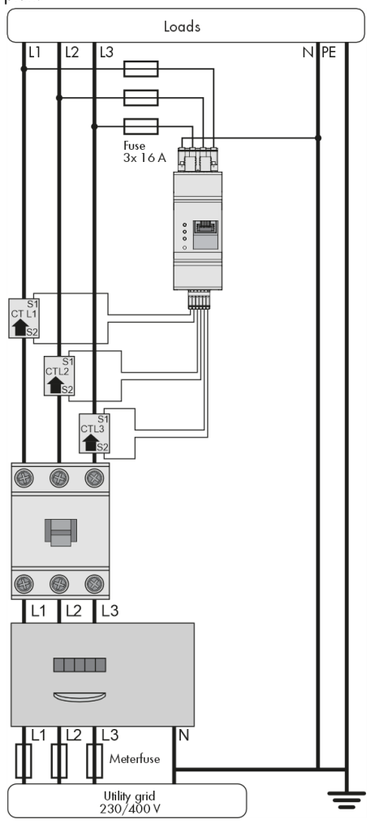
INFORMATION ON CONNECTION AND COMMISSIONING

☐ Ensure that the line conductors are correctly assigned and that the direction of flow is correct. Take the arrow direction of the converters into account.
☐ Secure the voltage inputs of the Energy Meter (L1, L2, L3) with 16 A type B each.

ELECTRICAL CONNECTION

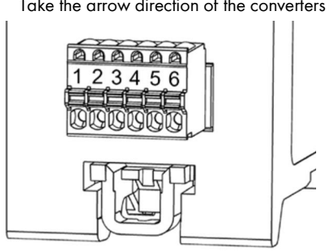
The following figure shows a connection example in TN and TT grid con figurations in the case of installation at the grid-connection point. For exact connection specifications, contact your electric utility company.

Connection plan:



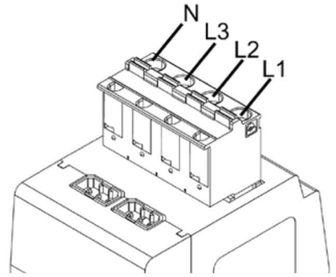
Ensure correct assignment of the line conductors and direction of flow
Ensure that the line conductors are correctly assigned and that the direction of flow is correct. Otherwise, the Energy Meter provides incorrect measured values.

Current inputs and converters:
1. Only use the supplied current transformers.
2. Connect the current transformers to the device first and then to the conductor.
3. Connect the connection cables of the current transformers according to the following figure.
4. Open the current transformer for L1, place around the insulated conductor and close until it audibly clicks into place. Repeat this step for line conductors L2, L3. Take the arrow direction of the converters into account; see connection plan.



Pos.	Phase	Insulated conductor
1	L1	S1 (red)
2		S2 (black)
3	L2	S1 (red)
4		S2 (black)
5	L3	S1 (red)
6		S2 (black)

Voltage inputs:
1. Connect the connection cables L1, L2, L3 and N to the Energy Meter.
2. Permissible cable cross-sections: 0.20 to 2.50 mm^2



Designation	Explanation
L1, L2, L3	Line conductor
N	Neutral conductor

NETWORK PORT

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). Also refer to the technical data of the network components.

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 (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 into 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.
   ☑ After successful connection and active remote terminal, the COM LED glows green.

COMMISSIONING

1. Cover the Energy Meter with the cover or the contact protection of the sub-distribution.
2. Switch the power supply to the subdistribution back on.
   ☑ After successful commissioning, the status LED glows green permanently. 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").

RESETTING THE ENERGY METER TO DEFAULT SETTINGS

Using a sharp object push the reset button as follows:
- Once quickly (0.5 s)
- Then press and hold once within one second (3 to 5 seconds)
- The status LED flashes orange twice if the entry was successful.

RESTARTING THE ENERGY METER

- Press the reset button with a sharp object for at least six seconds.

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 N are connected to the Energy Meter.

Is the status LED glowing permanently red?
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?
Check the following points:
- Connection of the voltages of L1, L2, L3, N
- Assignment of the current transformers to the line conductors: does CT L1 also measure the current of line conductor L1?
- Current transformer connected in the correct direction? See Section "Electrical Connection".

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.

Procedure:
1. Remove all conductors connected to the Energy Meter.
2. Remove the Energy Meter from the DIN rail. Tilt the lower edge of the Energy Meter forward and lift off the DIN rail.

DISPOSAL

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

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 assistance:
- 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

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