Shelly EM Gen3 By Monitoring The Energy Usage User Manual

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A compact smart energy meter that uses up to two current transformers for contactless current measurement. It features internal data storage and a dry contact switch for contactor control.

Contents

Safety information

For safe and proper use, read this guide, and any other documents accompanying this product. Keep them for future reference. Failure to follow the installation procedures can lead to malfunction, danger to health and life, violation of law, and/or refusal of legal and commercial guarantees (if any). Shelly Europe Ltd. is not responsible for any loss or damage in case of incorrect installation or improper operation of this device due to failure to follow the user and safety instructions in this guide.

⚠ This sign indicates safety information.

ⓘ This sign indicates an important note.

⚠**WARNING**! Risk of electric shock. Installation of the Device to the power grid must be performed carefully by a qualified electrician.

⚠**WARNING**! Before installing the Device, turn the circuit breakers off.
Use a suitable test device to make sure there is no voltage on the wires you want to connect. When you are sure that there is no voltage, proceed to the installation.

⚠**WARNING**! Before making any changes to the connections, ensure there is no voltage present at the Device terminals.

⚠**CAUTION**! Connect the Device only to a power grid and appliances that comply with all applicable regulations. A short circuit in the power grid or any appliance connected to the Device can cause fire, property damage, and electric shock.

⚠**CAUTION**! The Device may be connected to and control only electric circuits and appliances that comply with the applicable standards and safety norms.

⚠**CAUTION**! Do not connect the Device to appliances that exceed the specified maximum electric load,

⚠**CAUTION**! Connect the Device only in the way shown in these instructions. Any other method could cause damage and/or injury.

⚠**CAUTION**! The Device and the appliances connected to it, must be se-cured by a cable protection switch in accordance with EN60898-1 (trip-ping characteristic B or C, max. 2 A rated current, min. 6 kA interrupting rating, energy limiting class 3).

⚠**CAUTION**! Do not use the Device if it shows any sign of damage or defect

⚠**CAUTION**! Do not attempt to repair the Device yourself.

⚠**CAUTION!** The Device is intended only for indoor use.

⚠**CAUTION!** Keep the Device away from dirt and moisture.

⚠**CAUTION**! Do not allow children to play with the buttons/switches connected to the Device. Keep the devices (mobile phones, tablets, PCs) for remote control of Shelly away from children.

Product description

Shelly EM Gen3 (the Device) is a compact smart energy meter that uses up to two current transformers for contactless current measurement. It monitors the energy consumption of electric appliances and reports the data to a mobile phone, tablet, PC, or home automation system. The Device can operate standalone in a local Wi-Fi network or through cloud home automation services. It features real-time internal data storage in non-volatile memory that can retain data for a period of up to 10 days in 1-minute intervals. Additionally, the Device has a dry contact switch for contactor control.

The Device can be accessed, controlled, and monitored remotely from any place with internet connectivity, if it is connected to a Wi-Fi access point and the Internet.

Shelly EM Gen3 can be retrofitted into standard electrical wall boxes, near electrical appliances, power sockets, or other limited spaces.

The Device has an embedded web interface used to monitor, control, and adjust the Device. The web interface is accessible at **http://192.168.33.1** when connected directly to the Device access point or at its IP address when you and the Device are connected to the same network.

The Device can access and interact with other smart devices or automation systems if they are in the same network infrastructure. Shelly Europe Ltd. provides APIs for the devices, their integration, and cloud control. For more information, visit **https://shelly-api-docs.shelly.cloud**.

The Device comes with factory-installed firmware. To keep it updat-ed and secure, Shelly Europe Ltd. provides the latest firmware updates free of charge. Access the updates through either the embedded web interface or the Shelly Smart Control mobile application. Installation of firmware updates is the user's responsibility. Shelly Europe Ltd. shall not be liable for any lack of conformity of the Device caused by the failure of the user to install the available updates in a timely manner.

Wiring diagram

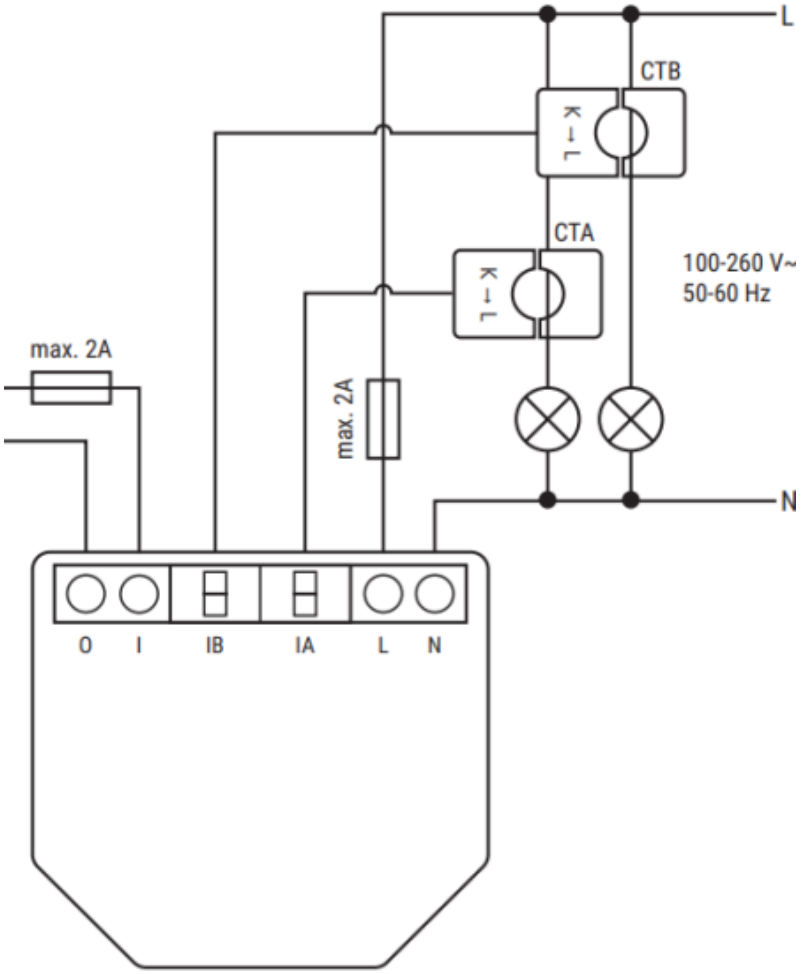

Fig. 1: Basic wiring diagram

Legend

Device terminals

- **0**: Switch output terminal
- **I:** Switch input terminal
- **IA:** Channel A current transformer input terminal
- **IB:** Channel B current transformer input terminal
- **L:** Live terminal (100-260 V~)
- **N:** Neutral terminal

Wires

- **L:** Live wire (100-260 V~)
- **N:** Neutral wire

Current transformers*

- **CTA:** Channel A current transformer
- **CTB**: Channel B current transformer

Installation instructions

To connect the Device, we recommend using solid single-core wires or stranded wires with ferrules. The wires should have insulation with increased heat resistance, not less than PVC T105°C (221°F).

When connecting wires to the Device terminals, consider the specified conductor cross section and stripped length. Do not connect multiple wires into a single terminal.

For security reasons, after you successfully connect the Device to the local Wi-Fi network, we recommend that you disable or password-protect the Device AP (Access Point).

To perform a factory reset of the Device, press and hold the Reset/control button for 10 seconds.

To enable the access point of the Device, press and hold the Reset/control button for 5 seconds.

Installing current transformers

1. Install the current transformer CTA around the wire of the first load circuit as shown in Fig. 1.
2. Install the current transformer CTB around the wire of the second load circuit.*
3. Plug the cables from the CTA and CTB into the Device IA and IB input terminals respectively.

Connecting the Device to power supply

1. Connect the Live wire through a circuit breaker to the L terminal.
2. Connect the Neutral wire to the N terminal.

Connecting a contactor

Connect the contactor control circuit to the Device I and O terminals.
Instead of a contactor, you can switch other loads up to 2 A.
Make sure that the wiring is correct with all wires firmly connected into the terminals. Then, turn on the circuit breakers.
*The Device comes with one current transformer CT 50A included in the package. You can purchase and install an additional CT 50A or CT80A current transformer, depending on your needs.

LED indications

- LED (monocular) indication
  - **AP (Access Point) enabled and Wi-Fi disabled**: 1 second ON / 1 second OFF
  - **Wi-Fi enabled, but not connected to a Wi-Fi network**: 1 second ON / 3 seconds OFF
  - **Connected to a Wi-Fi network**: Constantly ON
  - **Cloud is enabled, but not connected:** 1 second ON /5 seconds OFF
  - **Connected to Shelly Cloud:** Constantly ON
  - **OTA (Over-the-Air update):** 1½ sec ON / ½ second OFF
  - **Button pressed and held for 5 seconds:** ½ second ON / ½ second OFF
  - **Button presses and held for 10 seconds:** ¼ second ON / ½ second OFF

The list above starts with the initial device status and the lowest priori-ty. Every next state cancels the previous one.

Specifications

Physical

- **Size (HxWxD):** 37x42x16 mm / 1.46×1.65×0.63 in
- **Weight:** 23 g/0.81 oz
- **Screw terminals max torque**: 0.4 Nm / 3.5 lbin
- **Conductor cross section:** 0.2 to 2.5 mm² / 24 to 14 AWG (solid, stranded, and bootlace ferrules)
- **Mounting:** Wall console / In-wall box
- **Conductor stripped length:** 6 to 7 mm / 0.24 to 0.28 in
- **Shell material:** Plastic
- **Shell color**: White
- Connector's color Black

Environmental

- **Ambient working temperature:** -20°C to 40°C / -5°F to 105°F
- **Humidity:** 30% to 70% RH
- **Max. altitude**: 2000 m / 6562 ft

Electrical

- **Power supply:** 100-260 V~50/60 Hz
- **Power consumption:** < 1.2 W

Output circuits ratings

- **Max. switching voltage:** 240 V~
- **Max. switching current:** 2 A

Sensors, meters

- **Voltmeter (AC):** 100-260 V
- **Voltmeter accuracy:** ±2%
- **Ammeter (AC):**
  - 0-50A (CT 50A)
  - 0-80A (CT 80A)
- **Ammeter accuracy:**
  - ±2% (2-80 A),
  - ±5% (0-1A)
- **Compatible current transformers:**
  - CT 50A
  - CT 80A
- **Power and energy meters:**
  - Active and apparent power
  - Active and apparent energy

    - Power factor
    - Fundamental active and fundamental reactive energy
- **Channel-to-channel calibration minimum load:** 500 W
- **No load threshold**: 30 VA per channel
- **Measurement data storage**: At least 10 days of 1 min data resolution
- Data export:
    - CSV for PQ recorded values
    - JSON format export through RPC
- **Internal-temperature sensor:** Yes

Radio Wi-Fi

- **Protocol:** 802.11 b/g/n
- **RF band:** 2401-2483 MHz
- **Max. RF power**: < 20 dBm
- **Range:** Up to 50 m / 164 ft outdoors, up to 30 m / 98 ft indoors (depending on local conditions)

Bluetooth

- **Protocol:** 4.2
- **RF band:** 2400-2483.5 MHz
- **Max. RF power:** <4 dBm
- **Range:** Up to 30 m / 98 ft outdoors, up to 10 m/33 ft indoors (depending on local conditions)

Microcontroller unit

- **CPU:** ESP-Shelly-C38F
- **Flash:** 8 MB

Firmware capabilities

- **Schedules:** Yes
- **Webhooks (URL actions):** 20 with 5 URLs per hook
- **Wi-Fi range extender:** Yes
- BLE Gateway Yes
- **Scripting:** Yes
- **MQTT**: Yes
- **Encryption:** Yes

Shelly Cloud inclusion

The Device can be monitored, controlled, and set up through our Shelly.
Cloud home automation service. You can use the service through either our Android, iOS, or Harmony OS mobile application or through any internet browser at **https://control.shelly.cloud/**. If you choose to use the Device with the application and Shelly Cloud service, you can find instructions on how to connect the Device to the Cloud and

control it from the Shelly app in the application guide:
https://shelly.link/app-guide.

The Shelly mobile application and Shelly Cloud service are not conditions for the Device to function properly. This Device can be used stand-alone or with various other home automation platforms.

Troubleshooting

In case you encounter problems with the installation or operation of the Device, check its knowledge base page:
https://shelly.link/EM_Gen3

Declaration of Conformity

Hereby, Shelly Europe Ltd. declares that the radio equipment type Shelly EM Gen3 is in compliance with Directive 2014/53/EU, 2014/35/EU, 2014/30/EU, 2011/65/EU. The full text of the EU declaration of conformity is available at the following internet address:**https://shelly.link/EM_Gen3_DoC**

Disposal and recycling

This refers to the waste of electrical and electronic equipment. It is applicable in the EU, US and other countries to collect waste separately.

This symbol on the Device or in the accompanying literature indicates that it should not be disposed of in the daily waste.
The Device must be recycled to avoid possible damage to the environment or human health from uncontrolled waste disposal and to promote the reuse of materials and resources.
It is your responsibility to dispose of the Device separately from general household waste when it is already unusable.

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Tel.: +359 2 988 7435
E-mail: support@shelly.cloud
Official website: https://www.shelly.com
Changes in contact information are published by the Manufacturer on the official website.

For UP PSTI Act Statement of Compliance scan the QR code.

Documents / Resources

	Shelly EM Gen3 By Monitoring The Energy Usage [pdf] User Manual S3EM-002CXCEU, EM Gen3 By Monitoring The Energy Usage, EM Gen3 By, Monitoring The Energy Usage, Energy Usage, Usage

References

- User Manual