EN

USER AND SAFETY GUIDE
SHELLY PRO EM-50
SINGLE-PHASE ENERGY METER

Read before use

This document contains important technical and safety information about the device, its safe use and installation.

⚠**CAUTION!** *Before beginning the installation, please read carefully and entirely this guide and any other documents accompanying the device. Failure to follow the installation procedures could lead to malfunction, danger to your health and life, violation of law or refusal of legal and/or commercial guarantee (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 of following the user and safety instructions in this guide.*

Product Introduction

Shelly® is a line of innovative microprocessor-managed devices, which allow remote control of electric circuits through a mobile phone, tablet, PC, or home automation system. Shelly® devices can work standalone in a local Wi-Fi network or they can also be operated through cloud home automation services. Shelly Cloud is a service that can be accessed using either an Android or iOS mobile application or with any internet browser at https://control.shelly.cloud/. Shelly® devices can be accessed, controlled, and monitored remotely from any place where the user has internet connectivity, as long as the devices are connected to a Wi-Fi router and the Internet. Shelly® devices have an Embedded Web Interface accessible at http://192.168.33.1 when connected directly to the device access point, or at the device IP address on the local Wi-Fi network. The embedded Web Interface can be used to monitor and control the device, as well as adjust its settings.
Shelly® devices can communicate directly with other Wi-Fi devices through HTTP protocol. An API is provided by Shelly Europe Ltd. For more information, please visit: https://shelly-api-docs.shelly.cloud/#shelly-family-overview.
Shelly® devices are delivered with factory-installed firmware. If firmware updates are necessary to keep the devices in conformity, including security updates,Shelly Europe Ltd will provide the updates free of charge through the device Embedded Web Interface or the Shelly mobile application, where the information about the current firmware version is available. The choice to install or not the device firmware updates is the user's sole responsibility. Shelly Europe Ltd shall not be liable for any lack of conformity of the device caused by failure of the user to install the provided updates in a timely manner.

Shelly® Pro Series

Shelly® Pro series is a line of devices suitable for homes, offices, retail stores, manufacturing facilities, and other buildings. Shelly® Pro devices are DIN mountable inside the breaker box, and highly suitable for new building construction. All Shelly® Pro devices can be controlled and monitored through Wi-Fi and LAN connections. Bluetooth connection can be used for the inclusion process.
Shelly Pro EM-50 (The Device) is a DIN rail mountable single-phase, dual-channel energy meter with a dry contacts relay for contactor control. The Device reports accumulated energy as well as voltage, current, and power factor data in real time. It stores data in non-volatile memory for later retrieval at least 60 days of 1 min data resolution.

Schematic

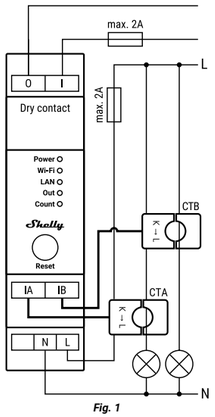


Fig. 1

Legend

Device terminals:
- **O:** Relay output
- **I:** Relay input
- **IA:** Current transformer A (CTA) input
- **IB:** Current transformer B (CTB) input
- **N:** Neutral terminal
- **L:** Live (100-260 VAC) terminal

Cables:
- **N:** Neutral cable
- **L:** Live (100-260 VAC) cable

Installation Instructions

⚠**CAUTION!** *Danger of electrocution. Mounting/installation of the Device to the power grid has to be performed with caution, by a qualified electrician.*
⚠**CAUTION!** *Danger of electrocution. Every change in the connections has to be done after ensuring there is no voltage present at the Device terminals.*
⚠**CAUTION!** *Use the Device only with 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 may damage it.*
⚠**CAUTION!** *Do not connect the Device to appliances exceeding the given max load!*
⚠**CAUTION!** *Connect the Device only in the way shown in these instructions. Any other method could cause damage and/or injury.*
⚠**CAUTION!** *Do not install the Device where it can get wet.*
⚠**CAUTION!** *Plug in or unplug the LAN cable only when the Device is powered off! The LAN cable must not be metallic in the parts touched by the user to plug it in or unplug it.*
⚠**RECOMMENDATION:** *Connect the Device using solid single-core cables or stranded cables with ferrules. The cables should have insulation with increased heat resistance, not less than PVC T105°C (221°F).*
⚠**CAUTION!** *The Device and the load current circuit has to be secured by a cable protection switch in accordance with EN60898-1 (tripping characteristic B or C, max. 2 A rated current, min. 6 kA interrupting rating, energy limiting class 3).*
Before starting the mounting/installation of the Device, check that the breakers are turned off and there is no voltage on their terminals. This can be done with a phase tester or multimeter. When you are sure that there is no voltage, you can proceed to connecting the cables.
Following the diagram in Fig. 1 install the current transformer CTA around the cable of a load circuit and CTB around the cable of another load circuit.
Mount the Device onto the DIN rail.
Plug the cables of the CTA and CTB into the Device IA and IB input connectors respectively.
Connect the Live cable through a circuit breaker to the L terminal. Connect the Neutral cable to the N terminal.
Make sure you have made all the connections correctly and then turn on the circuit breakers.



Initial Inclusion

If you choose to use the Device with the Shelly Smart Control mobile application and cloud service, instructions on how to connect the Device to the Cloud and control it through the Shelly Smart Control app can be found in the mobile application guide.
The Shelly mobile application and Shelly Cloud service are not conditions for the Device to function properly. This Device can be used standalone or with various other home automation platforms and protocols.
⚠**CAUTION!** *Do not allow children to play with the buttons/switches connected to the Device. Keep the devices for remote control of Shelly (mobile phones, tablets, PCs) away from children.*

LED indication

- Power: Red light if power supply is connected.
- Wi-Fi (varies):
  - Blue light if in AP mode
  - Red light if in STA mode, and not connected to a Wi-Fi network
  - Yellow light if in STA mode, and connected to a Wi-Fi network. Not connected to Shelly Cloud or Shelly Cloud disabled
  - Green light if in STA mode, and connected to a Wi-Fi network and the Shelly Cloud
  - The LED will be flashing Red/Blue if OTA update is in progress
- LAN: Green light if LAN is connected.
- Out: Red light if the relay is closed.
- Count: Red light will be flashing when the Device is measuring energy according to settings with frequency dependent to the energy flowing through the measured circuit.

User button

- Press briefly to toggle the state of the built-in relay.
- Press and hold for 5 sec to activate Device AP
- Press and hold for 10 sec to factory reset

Specification

- Dimensions (HxWxD): 94 x19 x 69 mm / 3.70 x 0.75 x 2.71 in
- Mounting: DIN rail
- Ambient temperature: from -20 °C to 40 °C / from -5 °F to 105 °F
- Humidity 30 % to 70 % RH
- Max. altitude 2000 m / 6562 ft
- Power supply: 100 - 260 VAC, 50/60Hz
- Electrical consumption: < 3 W
- Max. switching voltage: 240 VAC
- Max. switching current: 2 A
- Internal temperature sensor: Yes
- Voltmeters (RMS for each phase): 100 - 260 V
- Voltmeters accuracy: ±1 %
- Ammeters (RMS via CT): 0 - 50 A
- Ammeters accuracy:
  - ±1 % (5 - 50 A)
  - ±2 % (1 - 5 A)
- Power and energy meters:
  - Active and apparent power
  - Active and apparent energy
  - Power factor
- Measurement data storage: At least 60 days of 1 min data resolution
- Data export:
  - CSV for PQ recorded values
  - JSON format export through RPC
- External protection: max. 2 A, tripping characteristic B or C, 6 kA interrupting rating, energy limiting class 3
- RF band: 2400 - 2495 MHz
- Max. RF power: < 20 dBm
- Wi-Fi protocol: 802.11 b/g/n
- Wi-Fi operational range (depending on local conditions):
  - up to 50 m / 160 ft outdoors
  - up to 30 m / 100 ft indoors
- Bluetooth protocol: 4.2
- Bluetooth operational range (depending on local conditions):
  - up to 30 m / 100 ft outdoors
  - up to 10 m / 33 ft indoors
- LAN/Ethernet (RJ45): Yes
- CPU: ESP32
- Flash: 16 MB
- Schedules: 20
- Webhooks (URL actions): 20 with 5 URLs per hook
- Scripting: Yes
- MQTT: Yes

Declaration of conformity

Hereby, Shelly Europe Ltd. (former Allterco Robotics EOOD) declares that the radio equipment type Shelly Pro EM-50 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/ProEM-50_DoC

Manufacturer: Shelly Europe Ltd.
Address: 103 Cherni vrah Blvd., 1407 Sofia, Bulgaria
Tel.: +359 2 988 7435
E-mail: support@shelly.cloud
Offizielle Website: https://www.shelly.com

Changes in the contact information data are published by the Manufacturer on the official website.
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