

Optical WiFi head for IEC62056-21 compatible electrical meter with ESPHome WOH-01

The WiFi optical head (sometimes referred as optical probe) is a wireless device capable to read data from energy meters equipped with optical IEC62056-21 compatible meters. https://en.wikipedia.org/wiki/IEC_62056



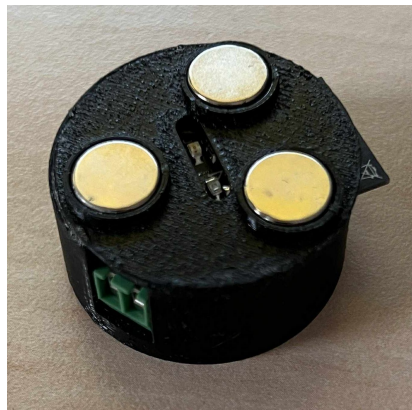
WOH-01 with USB Micro A connector cable

Technical parameters of WOH-01:

- Power supply – 5 to 7.5VDC
- Power consumption – max 650mW/150mA
- Working frequency – WiFi 2.4GHz
- Works with http browser or Home Assistant API
- Data update frequency – every 30s
- Dimensions – $\Phi 36 \times 16$ mm
- Magnetic holder

Name
Active energy total
Active power L1
Active power L2
Active power L3
Current in phase L1
Current in phase L2
Current in phase L3
Voltage in phase L1
Voltage in phase L2
Voltage in phase L3

Picture 1. Data provided by WOH-01



Picture 2. Backside (magnetic holder)

First steps – power, WiFi connection (credentials)

1. Connect a 5-7.5VDC power supply using a small screwdriver to the device (be careful with polarity!) and put the WOH-01 on your energy meter`s optical interface with the small rectangular black PCB (antenna) heading down:



Picture 3. WOH-01 mounted on Energy meter

2. Open your browser and go to <https://www.improv-wifi.com/> and click on “Connect device to Wi-Fi” button (Bluetooth BLE must be switched on during this process on your PC/smartphone):

Improv via BLE

Connect device to Wi-Fi

A pop-up window with discovered device(s) appears, the discovery process may take few seconds. Click on discovered device and provide WiFi credentials for your home network (SSID and password). Save the MAC address (b72750 in this case for later use)

www.improv-wifi.com chce provést spárování

esphome-web-b72750

Prohledávání...

Spárovat
Zrušit

3. Click on “Pair” and input your WiFi network credentials (SSID and password) and wait for succesful credential provisioning message.

Enter the credentials of the Wi-Fi network that you want esphome-web-b72750 to connect to.

Network Name

YOURWIFINETWORK

Password

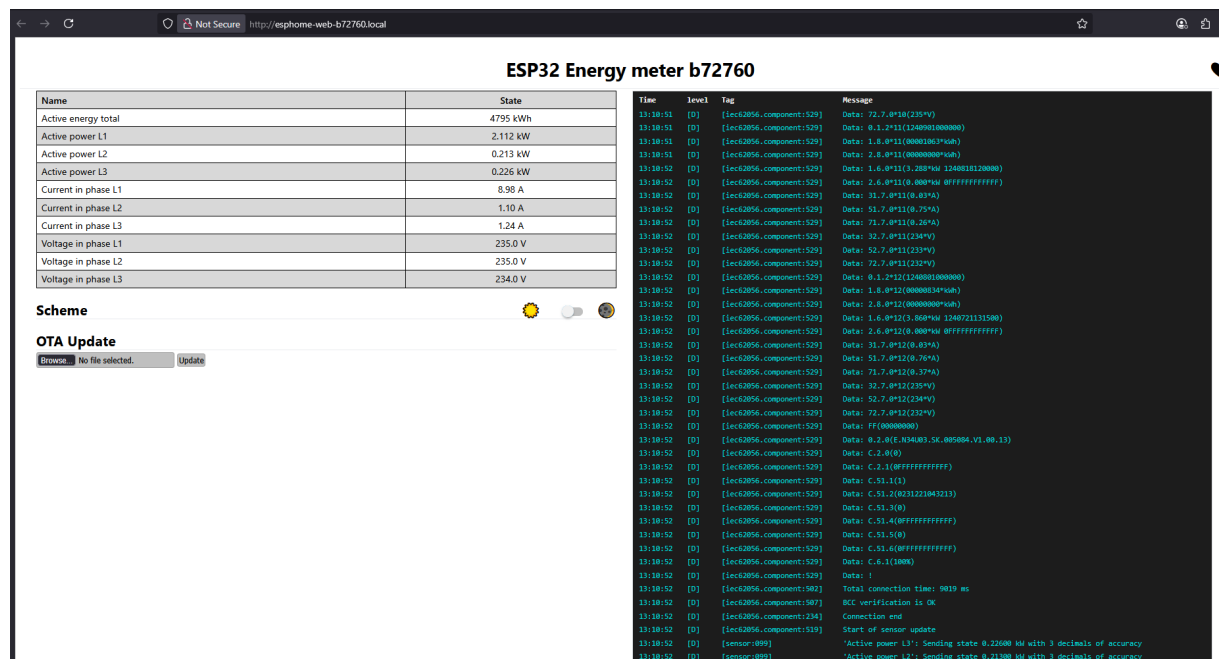
.....



CANCEL

CONNECT

4. Now you can input in your browser the WOH-01's IP address (or "esphome-web-xxxxxx.local" where XXXXXX is the MAC address of WOH-01) of your device and you will get the following webpage generated by WOH-01's internal webserver: Be careful, not every browser support .local IP substitution.



Picture 4. WOH-01 web interface

As a feedback of WOH-01's proper operation you should see a green and red LEDs periodically flashing. If you see only green LED flashing, check WOH-01's position on optical interface. Some energy meters may have optical interface disabled by default and you can check this using a standard TV remote controller – target your TV remote controller on WOH-01's active side, push any button and you should see red LED flashing – this is a sign of WOH-01's proper operation and

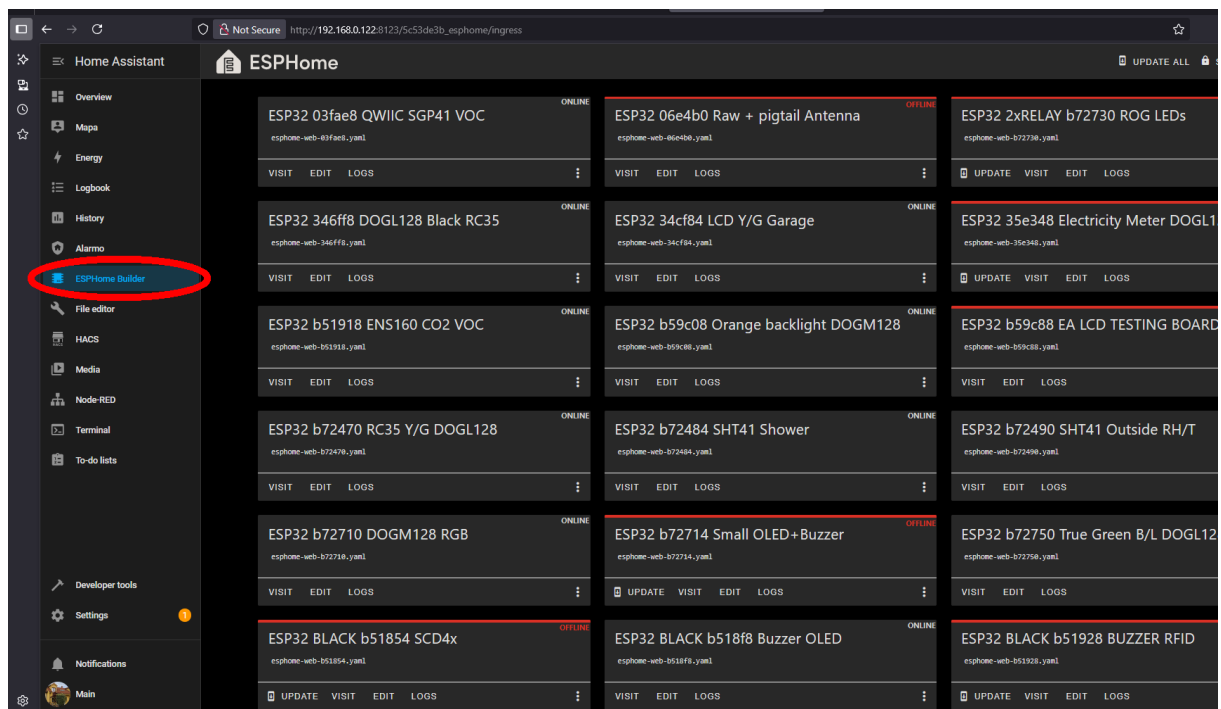
if the red LED does not flashing on your energy meter, that means optical interface is disabled by default or optical interface malfunction. Contact your electricity provider in order to unlock this functionality.

YAML file modification

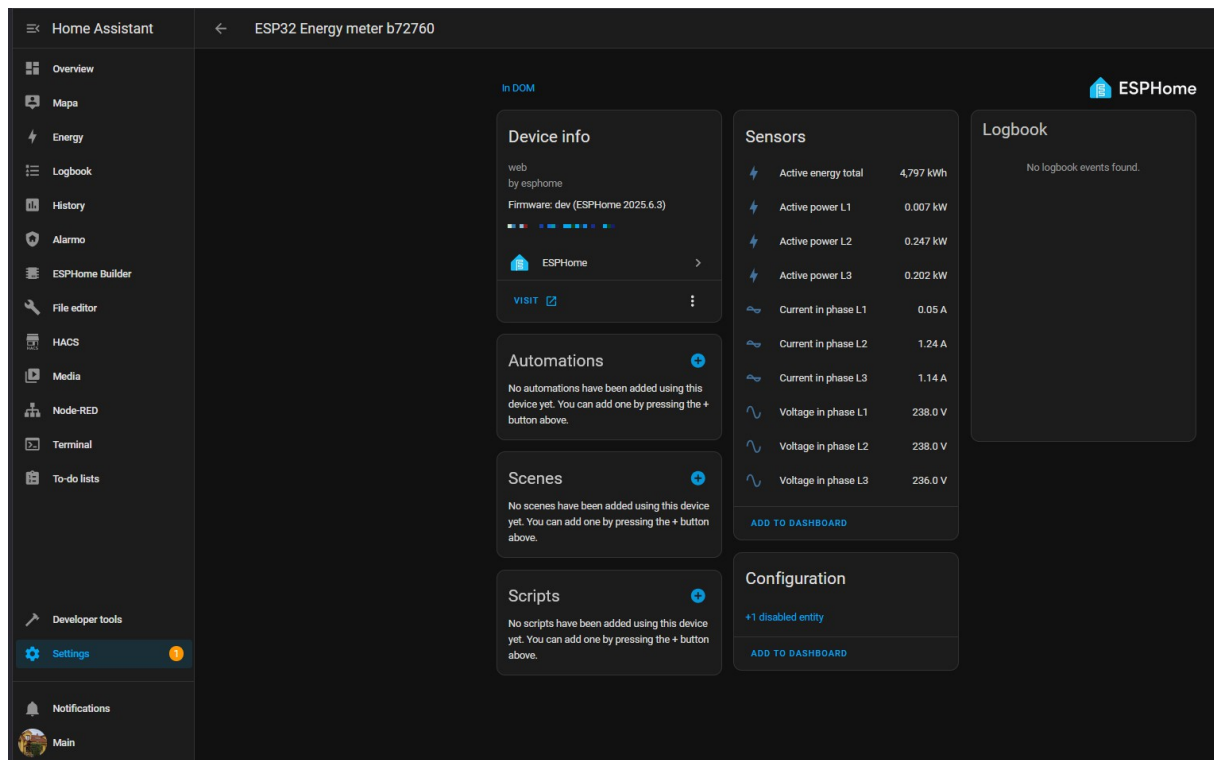
You can modify data, provided by WOH-01 by using ESPHome <https://esphome.io/index.html> and changing parameters in its .yaml file (you can find .yaml file at the end of this document). After .yaml is modified and compiled, it can be uploaded to WOH-01 using OTA/wirelessly.

Home Assistant integration

This device could be easily integrated into your Home Assistant simply by adding it under ESPHome Integration. After connecting WOH-01 to your home network go to your ESPHome menu from Home Assistant:



Picture 3. Home Assistant integration



Picture 5. HA – Settings - Devices & Services – Integrations – ESPHome (API)

Default YAML file

```
esphome:
  name: esphome-web-b72750
  friendly_name: ESP32 Energy meter b72750
  min_version: 2024.6.0
  name_add_mac_suffix: false
  project:
    name: esphome.web
    version: dev
```

```
esp32:
  board: esp32dev
  framework:
    type: arduino
```

```
# Enable logging
logger:
```

```
# Enable Home Assistant API
api:
```

```
# Allow Over-The-Air updates
ota:
  - platform: esphome
  - platform: web_server
```

```
# Allow provisioning Wi-Fi via serial
```

improv_serial:

wifi:

Set up a wifi access point

ap: {}

dashboard_import:

package_import_url: github://esphome/example-configs/esphome-web/esp32.yaml@main

import_full_config: true

Sets up Bluetooth LE (Only on ESP32) to allow the user

to provision wifi credentials to the device.

esp32_improv:

authorizer: none

To have a "next url" for improv serial

web_server:

external_components:

IEC62056 component

- source: github://aquaticus/esphome-iec62056

UART configuration entry

uart:

rx_pin: GPIO22

tx_pin: GPIO21

baud_rate: 9600

data_bits: 7

parity: EVEN

stop_bits: 1

Platform configuration entry for bidirectional communication

iec62056:

update_interval: 30s

baud_rate_max: 9600

battery_meter: False

Sensor configuration entries

sensor:

- platform: iec62056

obis: 1.8.0

name: Active energy total

unit_of_measurement: kWh

accuracy_decimals: 0

device_class: energy

state_class: total_increasing

- platform: iec62056

name: Current in phase L1

obis: 31.7.0

unit_of_measurement: A

accuracy_decimals: 2

device_class: current

state_class: measurement

- platform: iec62056
name: Voltage in phase L1
obis: 32.7.0
unit_of_measurement: V
accuracy_decimals: 1
device_class: voltage
state_class: measurement
- platform: iec62056
name: Active power L1
obis: 21.7.0
unit_of_measurement: kW
accuracy_decimals: 3
device_class: energy
state_class: measurement
- platform: iec62056
name: Current in phase L2
obis: 51.7.0
unit_of_measurement: A
accuracy_decimals: 2
device_class: current
state_class: measurement
- platform: iec62056
name: Voltage in phase L2
obis: 52.7.0
unit_of_measurement: V
accuracy_decimals: 1
device_class: voltage
state_class: measurement
- platform: iec62056
name: Active power L2
obis: 41.7.0
unit_of_measurement: kW
accuracy_decimals: 3
device_class: energy
state_class: measurement
- platform: iec62056
name: Current in phase L3
obis: 71.7.0
unit_of_measurement: A
accuracy_decimals: 2
device_class: current
state_class: measurement
- platform: iec62056
name: Voltage in phase L3
obis: 72.7.0

unit_of_measurement: V
accuracy_decimals: 1
device_class: voltage
state_class: measurement

- platform: iec62056
name: Active power L3
obis: 61.7.0
unit_of_measurement: kW
accuracy_decimals: 3
device_class: energy
state_class: measurement