Cyble reader

Description

The device reads data from configured Cyble water meter and sends it to a MQTT server. The data is also available as json through an web API call.

The Cyble water meter has to support **433Mhz** communication.

Range: tested/used at ~14m from an underground watermeter. The reader was placed outside the house for better reception.

Supported watermeter models: **Itron AnyQuest Cyble**. For now was tested just with the watermeter in the pictures below (RADIAN protocol)



Power requirements

Power requirements: 5V DC, 0.5A (phone charger)

Power usage: ~400 mA

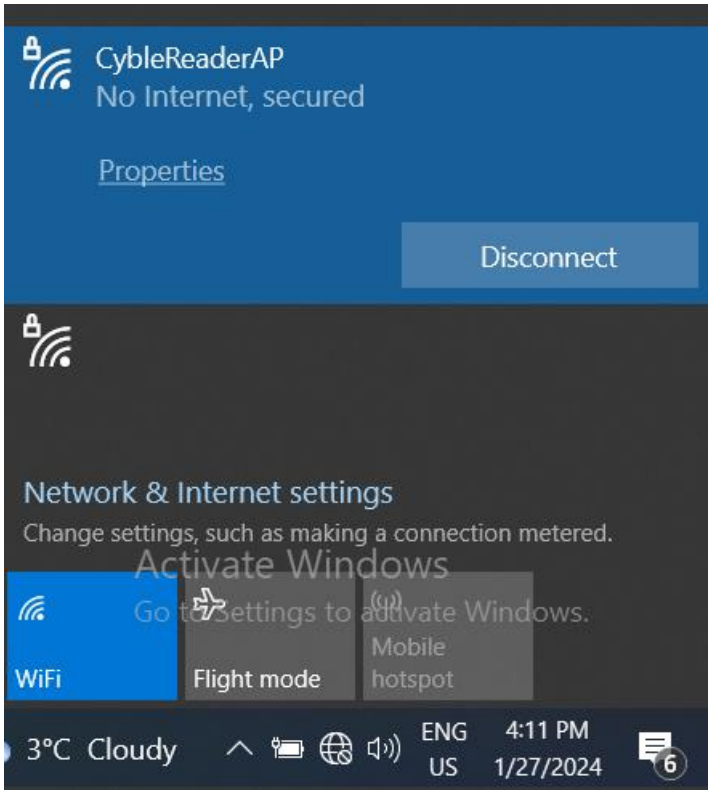
Device has to be powered through a micro-USB cable (not included)

First time use/configuration

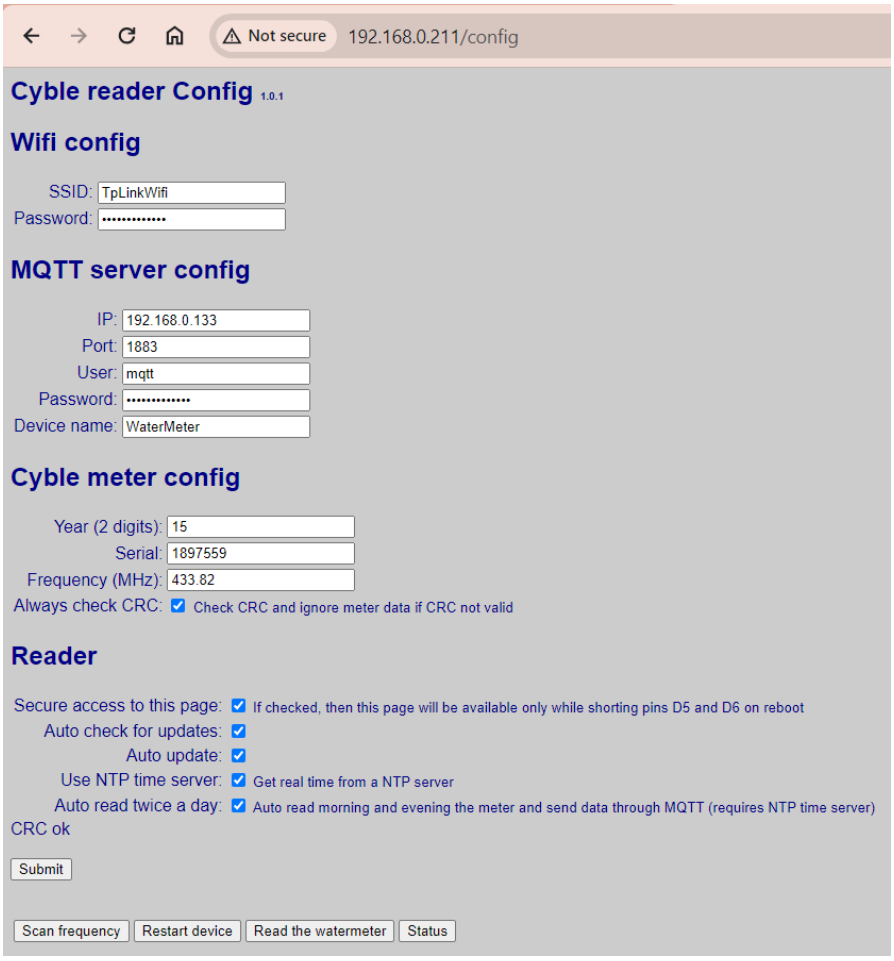
When receiving the device it is not configured to connect to your Wifi, nor to Mqtt, nor to the watermeter, so you have to configure all these settings yourself.

1. **Power the device** by connecting it through micro USB cable to 5V DC power supply (phone charger for example)

2. From your phone/table or PC/laptop, **connect to the WIFI "CybleReaderAp"** with **Password 1234567890**. Whenever the device can't connect to the configured Wifi, or if the Wifi is not configured, it will start in AccessPoint mode allowing you to connect to it by connecting your phone or laptop to the Access point/Hotspot called **CybleReaderAp**



3. From the phone or laptop that you connected to the CybleReaderAp access point, open in a browser http://watermeter.local or http://watermeter. If neither of these 2 are accessible, try accessing explicitly by IP address.
4. Configure all the parameters from this page:



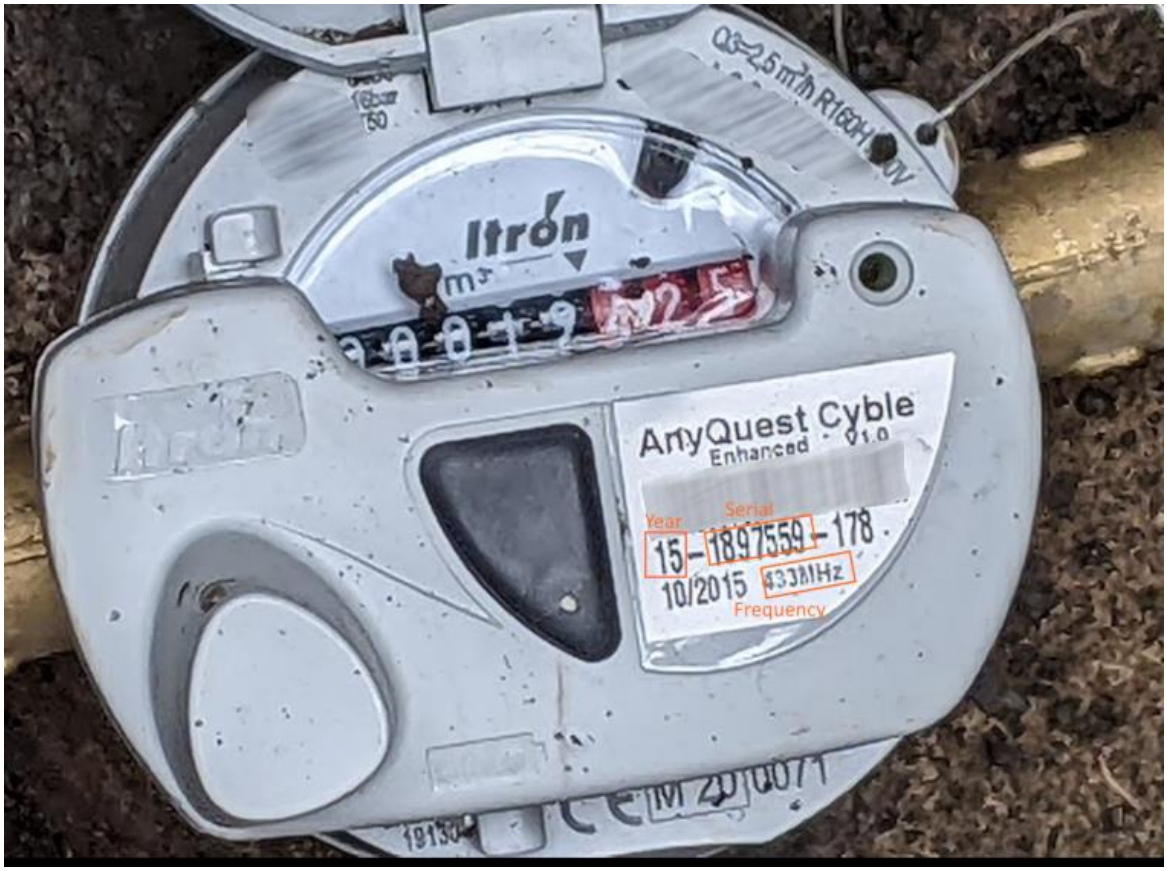
Wifi config section refers to your home wifi, where you want the device to connect to.

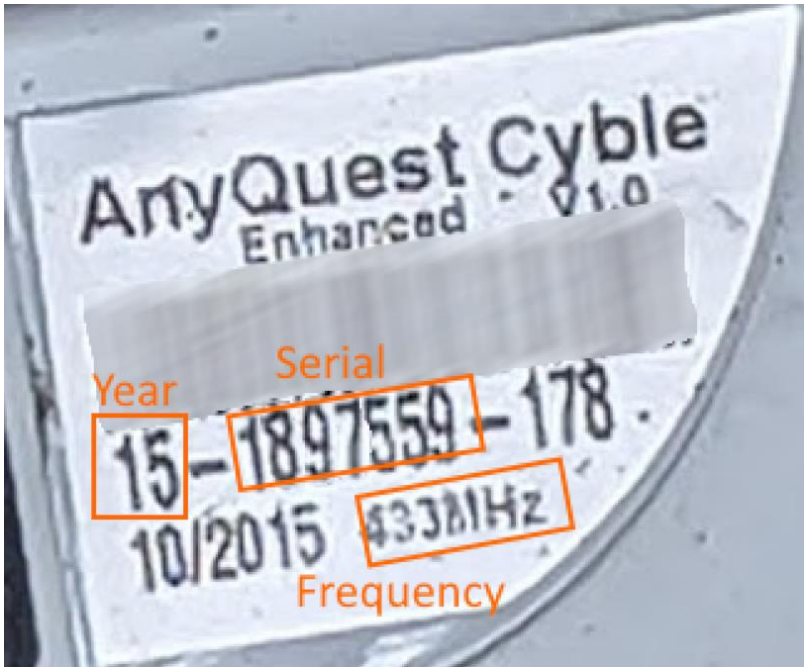
MQTT Broker section allows you to config the MQTT server where you want the data to be sent. Using this will make everything plug&play into home assistant. No other configuration needed from your side on Home Assistant (except having the MQTT broker installed, of course).

Device name should be the name of this device in the MQTT server, and how you will see it reported in HomeAssistant.

Meter Config allows you to configure the details of the Cyble watermeter

Firmware: The 2 checkboxes will allow you to set if device should check online for new firmware updates. The first checkbox will just check and report to you if there are any pending updates. If the second checkbox is also checked it will automatically download and update the latest firmware when available.

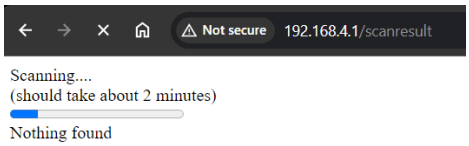


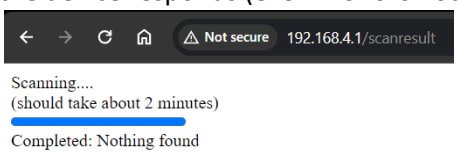


Special attention to be considered here for:

Frequency: The frequency can be anything around 433.8 Mhz. You can either set this manually to a value like the one in the picture, or use the scan button to scan for the watermeter. **BE AWARE** that the

watermeter will respond to data requests or to scan only within weekdays (Mo-Fr) and only in a hourly interval that was configured beforehand by your water supplier company. It is highly recommended to scan for the device within 10AM to 3PM to make sure that the device is awake. Otherwise the device might be deep sleeping and it will not respond to any of your requests. A scan from this webpage will usually try to communicate with the device on frequencies 433.8 to 433.9 Mhz and find the first frequency where the device responds and the CRC is correct, or at least where the device responds (even if CRC is not correct).





Alwayc check CRC: Depending on the distance to the device and other factors that might influence wireless communications with the device, the transmission quality might vary. It might happen that the device will not be able to read correctly the whole amount of data reported by the watermeter, but the data it manages to read it is good enough to get the water consumption. So, with regard to this setting, there are 2 options:

- **Checked**: this means that every time watermeter is interrogated the received data will be validated and if the checksum is not correct, the whole message will be discarded. This is recommended value for this setting when the watermeter is in close range and the communication is very good;
- **Unchecked**: with this setting unchecked, the response form the device will not be validated and the values reported might be erroneous. This might imply that wrong water consumption will be reported once in a while.

It is recommended to start by trying with this setting checked. If reading values from the watermeter fail to come, or fail just sometimes, it is recommended to change the position of the device to have better range to the watermeter. If the Cyble reader can not be positioned in a better place, uncheck this setting, with the consideration that the retrieved value might be wrong once in a while.

Auto read twice a day: If this setting is checked, then the device will automatically read watermeter values in the morning at 6:00 AM, 6:30 AM and 4:00PM. If it detects any water consumption difference between the 6AM and 6:30AM readings, it will publish also an alarm to MQTT raising that it is possible to have water leakage. The times of the readings can not be changed. **BE AWARE** that using this feature will require the device to connect to a time server to synchronize its internal time, so it will require it to be able to access internet. It is not recommended to use this feature as you can trigger externally readings whenever is needed through MQTT request

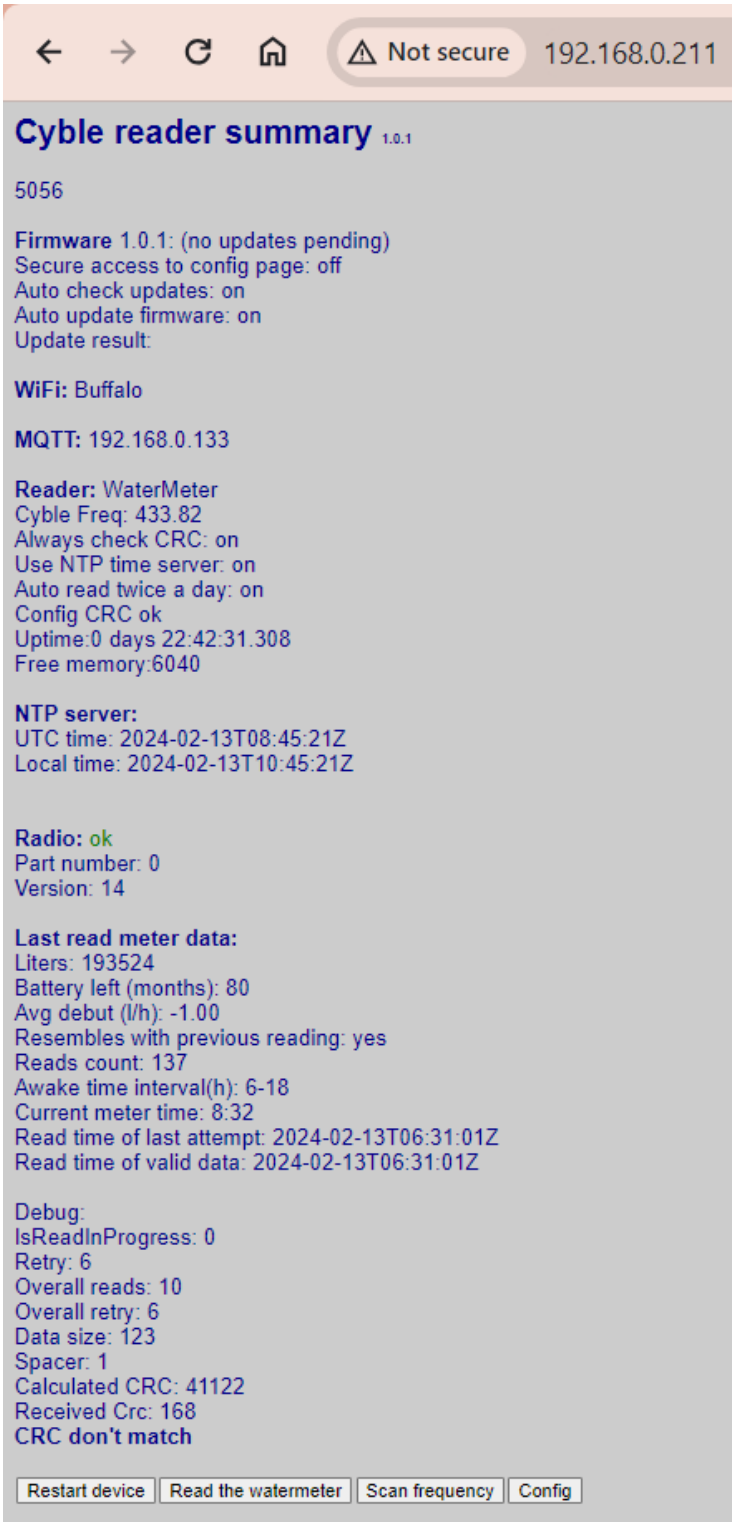
After all settings are configured, press the **Submit** button. You will be redirected to a page that confirms the settings change.

At this point the device needs to be rebooted (either manually or from the Reset button from the web page).

After the reboot, the CybleReaderAp will not be available anymore, as it will connect to the Wifi network you configured in previous steps (Wifi config section).

After the reboot, the device will be part of that network and will get an IP within your network. You can find it from your router or by trying to access from a browser the name you configured previously as device name. Hostname might not always work depending on your network configuration or device name, so its more recommended to get its IP from your router.

From this point on, you will not be able to access the config page again. Every time you will try to access device web page, you will be prompted to the below page that shows some basic info about the device.



In case access to config page is needed, you have to disassemble the device, short the pins D5 and D6 together and restart the device. Keep them shorted for ~5 seconds then release. Accessing the device webpage after that will take you to the config page that you've seen in "First time use" section.

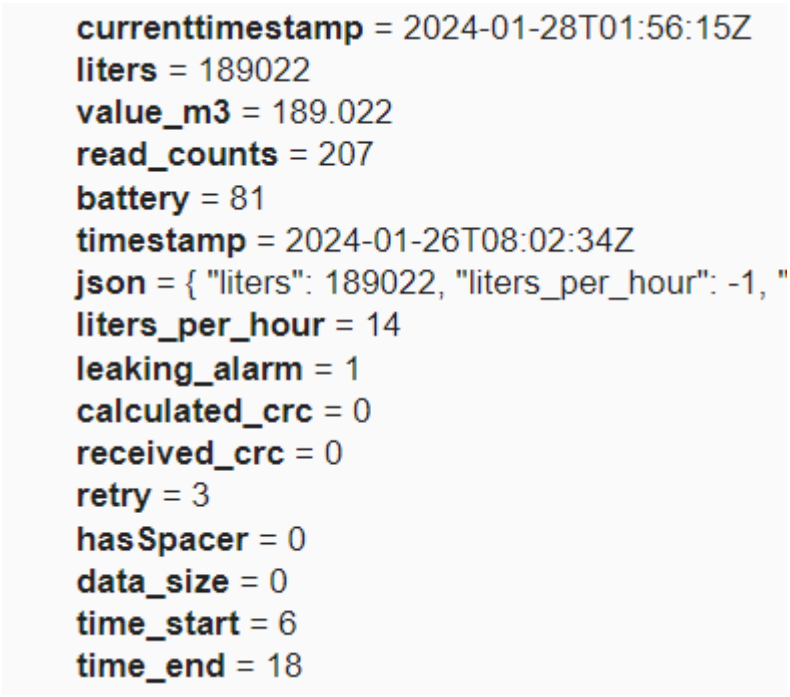
This is a security measure so that other people will not be able to access this page and see your passwords or change your configuration.

MQTT specifications

The device will publish to MQTT the below data. Here you will be able top see the main parameters:

- Liters (the actual value from the watermeter)
- Read counts (the watermeter keeps a count of how many times it was asked to provide the consumption)
- Battery (how much battery is left, in number of months)
- time_start (this is the hour when the meter wakes up and listens for requests)
- time_end (this is the hour when the meter goes to sleep and will not listen for request anymore)
- current_timestamp (this is the actual time from the watermeter. Be aware that might be different than your own time). The time_start and time_stop is relative to this one

Additionally the device publishes to MQTT some calculated parameters, like liters_per_hour, leaking_alarm, but these will depend on the “Auto read twice a day” setting

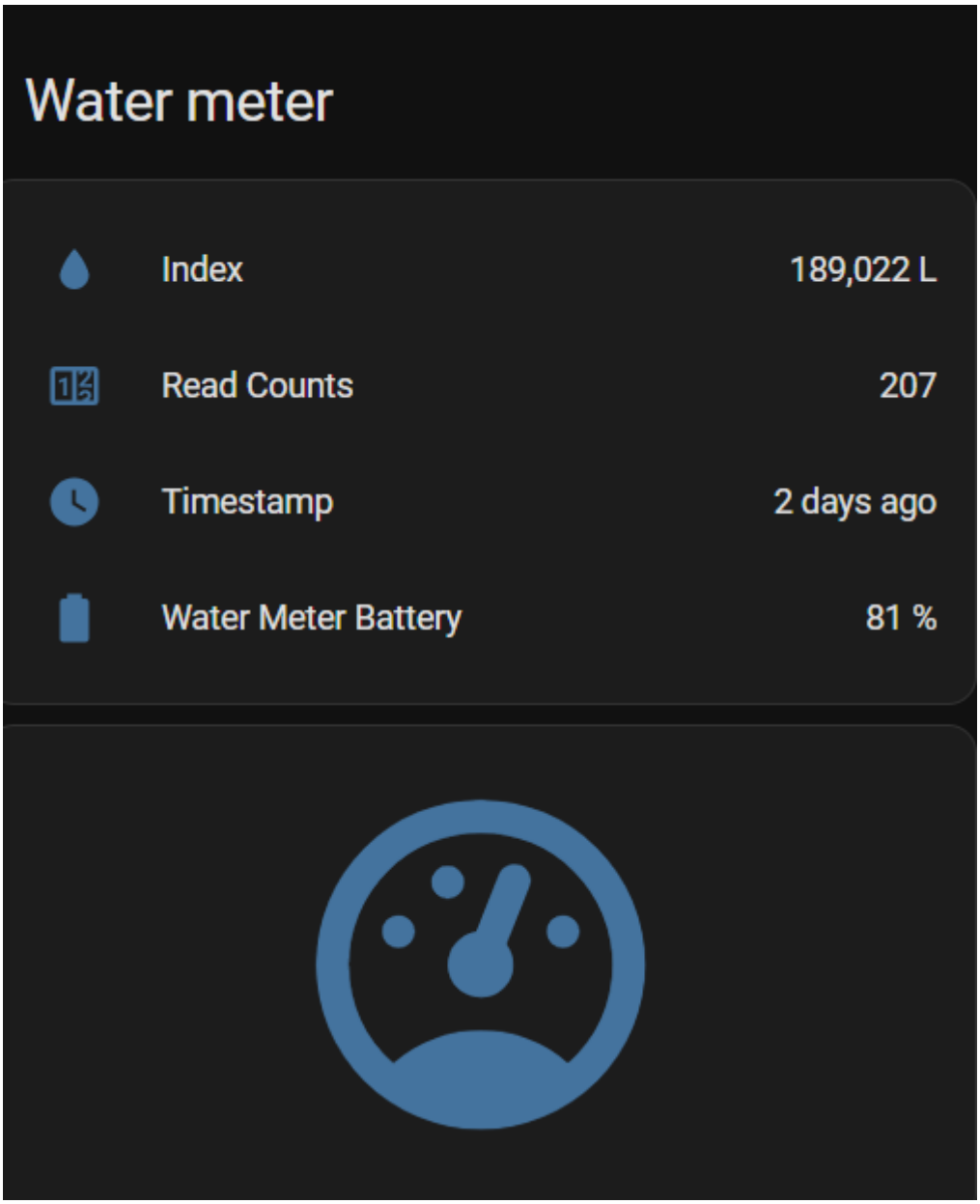


To trigger a request for the reader to read from watermeter, send it through MQTT `/trigger`

Sending “1”to this token will trigger a request and validate the CRC.
Sending “0”to this token will trigger a request and ignore CRC validation.

Home assistant card config example:

```
title: Water meter
type: vertical-stack
cards:
  - type: entities
    entities:
      - entity: sensor.water_meter_value
        name: Index
      - entity: sensor.water_meter_read_counts
        name: Read Counts
      - entity: sensor.water_meter_timestamp
        name: Timestamp
      - entity: sensor.water_meter_battery
  - show_name: true
    show_icon: true
    type: button
    icon: mdi:gauge
    tap_action:
      action: call-service
      service: mqtt.publish
      data:
        topic: cyble/anyquest/trigger
        payload: '1'
      target: {}
```

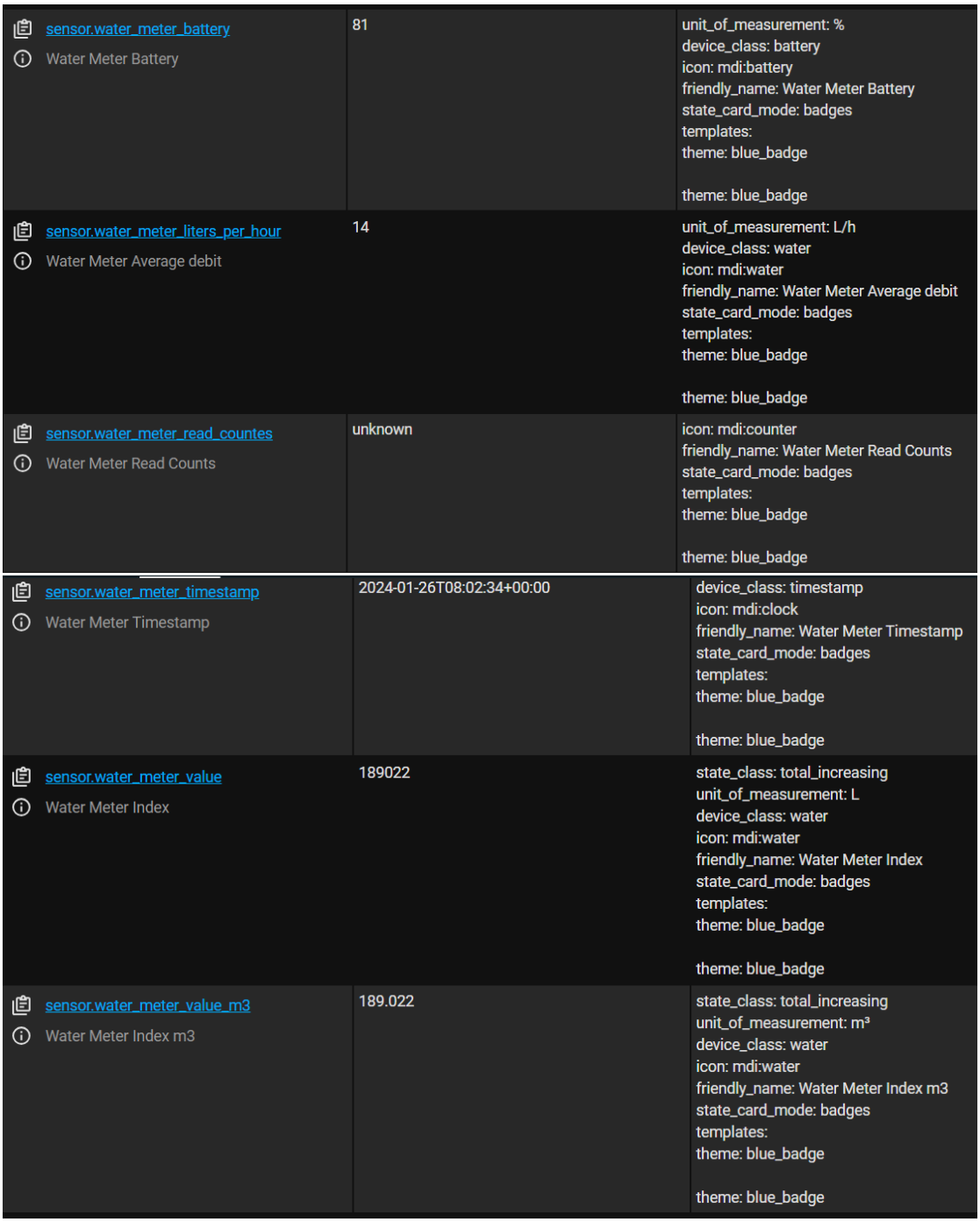


sensor.water_meter
Water meter

0

state_class: total_increasing
source: sensor.water_meter_value
status: collecting
last_period: 0
last_valid_state: 189022
meter_period: daily
cron pattern: 0 0 * * *
last_reset: 2024-01-27T22:00:00.085026+00:00
unit_of_measurement: L
icon: mdi:counter
friendly_name: Water meter
state_card_mode: badges
templates:
theme: blue_badge

theme: blue_badge



Troubleshooting:

1	Device is not accessible through http://watermeter nor http://watermeter.local	1. When device is in AccessPoint mode and you are connected to CybleReaderAP Wifi network: If this doesn't' work, check device IP address. Usually, should be something like 192.168.4.x. The device IP address in this case will be 192.168.4.1. Open a web browser and access this address **http://192.168.4.1**. In case 192.168.4.1 is not reachable, check what is the IP address of the phone/laptop connected to CybleReaderAp and try to access that gateway (is usually your address and just replace last part of the IP with "1") 2. When device is connected to your own Wifi network: check your router to find the watermeter device IP address and open that IP in a browser
