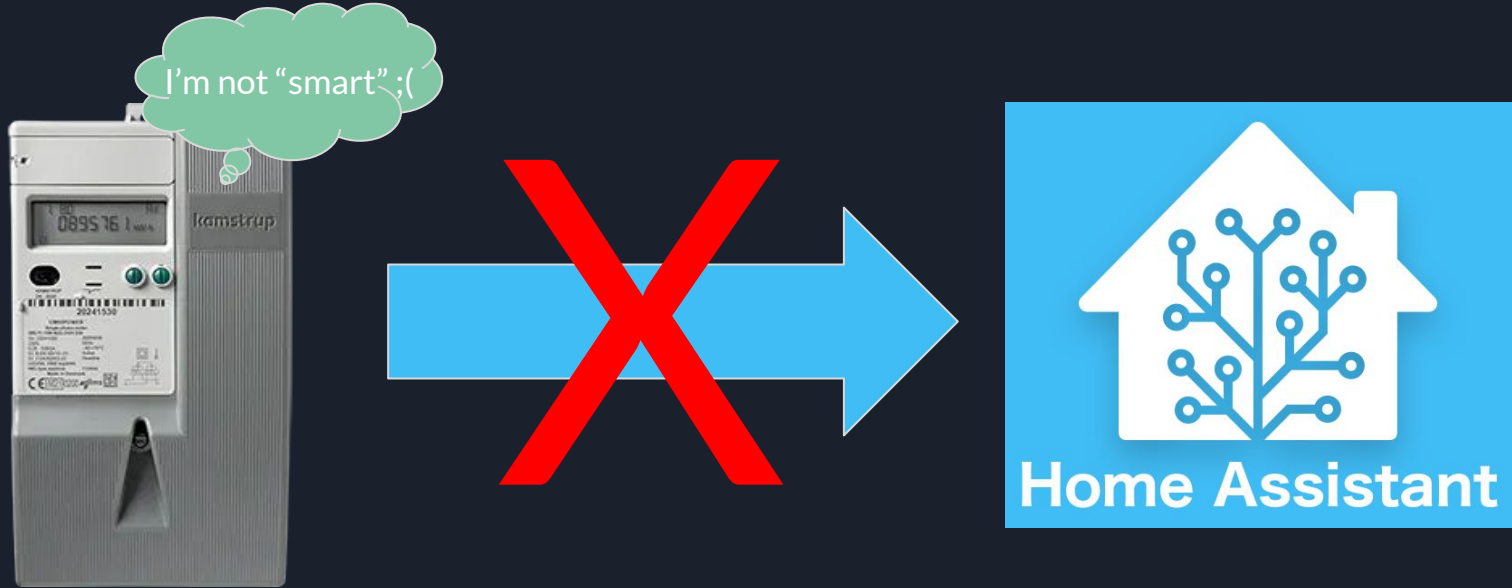# Electricity Smart Meter

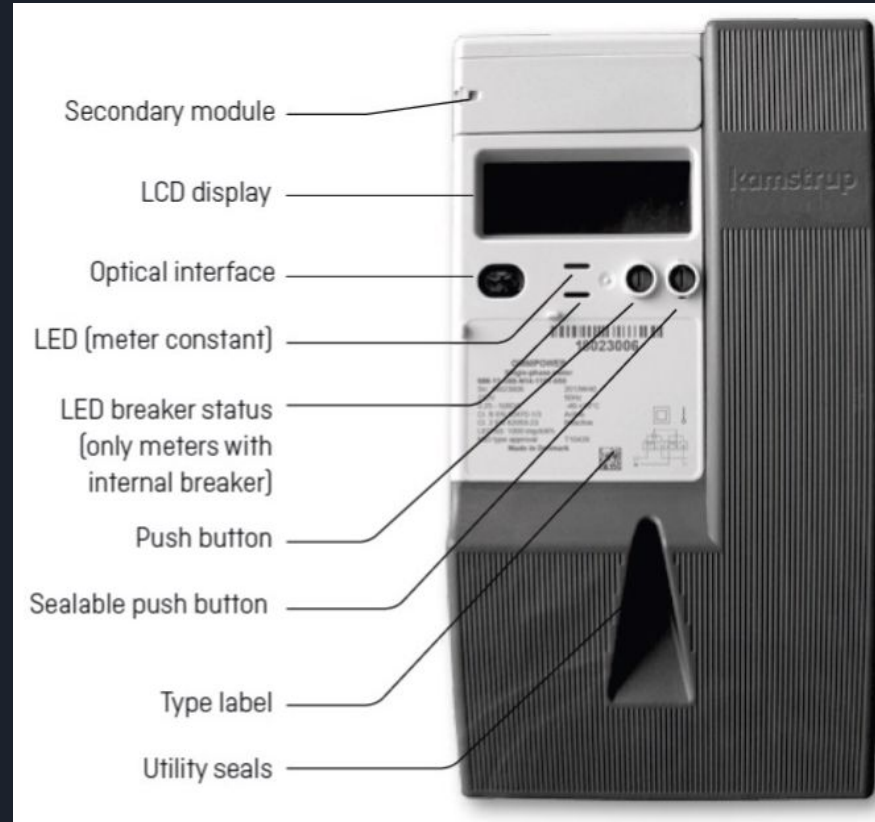Vadym Melnychenko

# Understanding Problem

I'm not "smart" ;(

The problem is that many people have electricity meters from which it is impossible to get data online for their own use. That is, you cannot process the data directly, you need to get the results visually every time, and the only way is to go outside, open the door of the electronic cabinet and read the data.

# Possible solutions

Depend on your electricity meter you may have a few options:

- Additional communication module
- Optical interface
- LED meter Constant
- Read directly from your home circuit
- Change your electricity meter to new one



Secondary module

LCD display

Optical interface

LED (meter constant)

LED breaker status (only meters with internal breaker)

Push button

Sealable push button

Type label

Utility seals

# Select solution

In my case i choose **LED constant** as a possible solution.

Why?

- Almost **every single** electricity meter has LED constant - a special lamp that blinks every n *Wh

Wh(Watt Hour) = Used power during  1 hour

Power = V * I

I - strength(Ampers), V - current(Volts)

# Possible Challenges

- when LED blinks - how often every n Wh or kWh ?
- how LED blinks - how long one blink is ?
- what type of radiation(light) does LED have? *infrared, visible, UV light
- how to detect a LED blinks ?
- how convert LED blinks to human read data ?
- how to send data to the *server ?
- how to receive data on the server ?
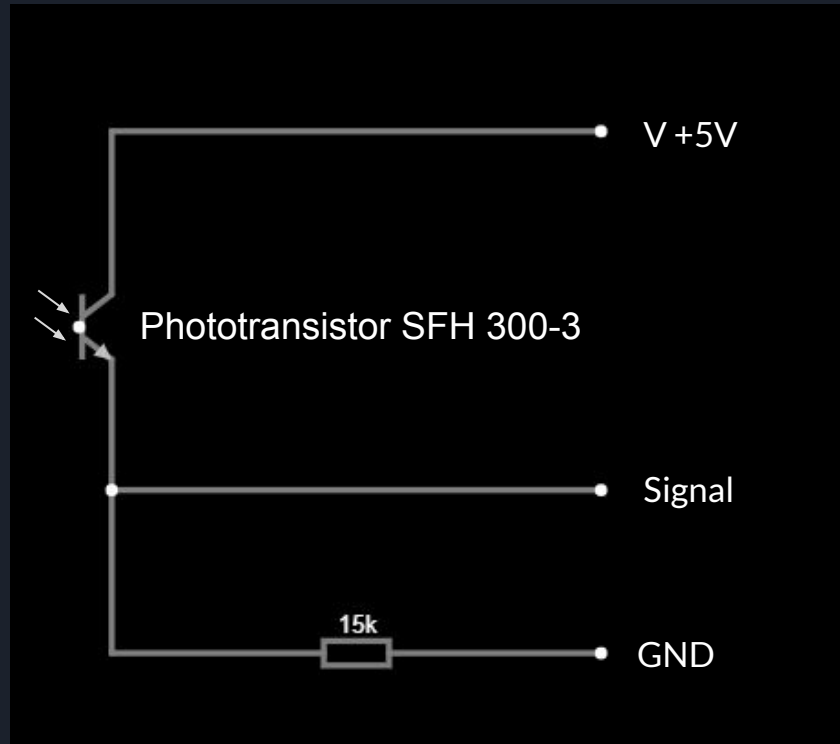- how to read data on the server ?
- how to use data ?
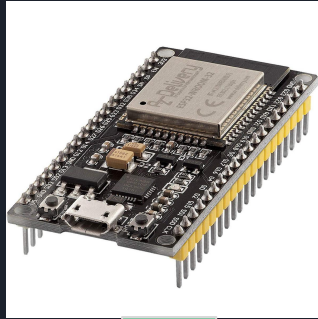- and more…

# Hardware Implementation
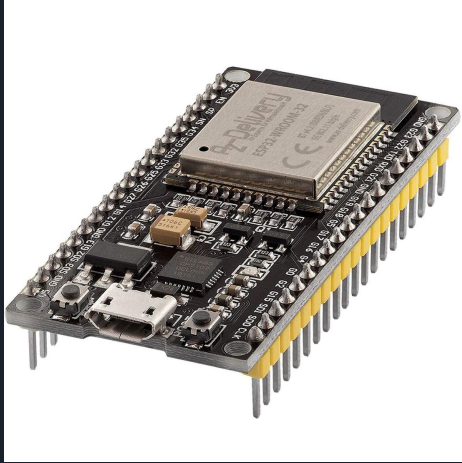


ESP32
Resistors
Phototransistor
Wire
*usb connectors
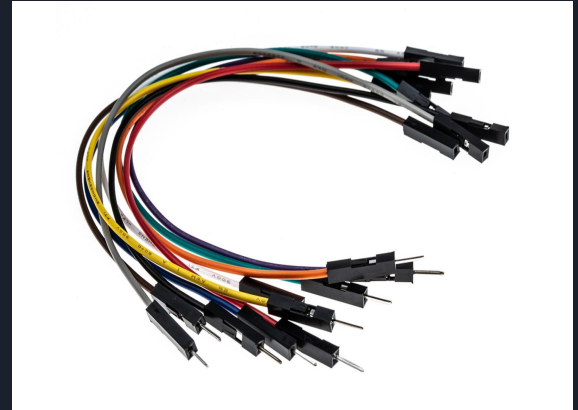
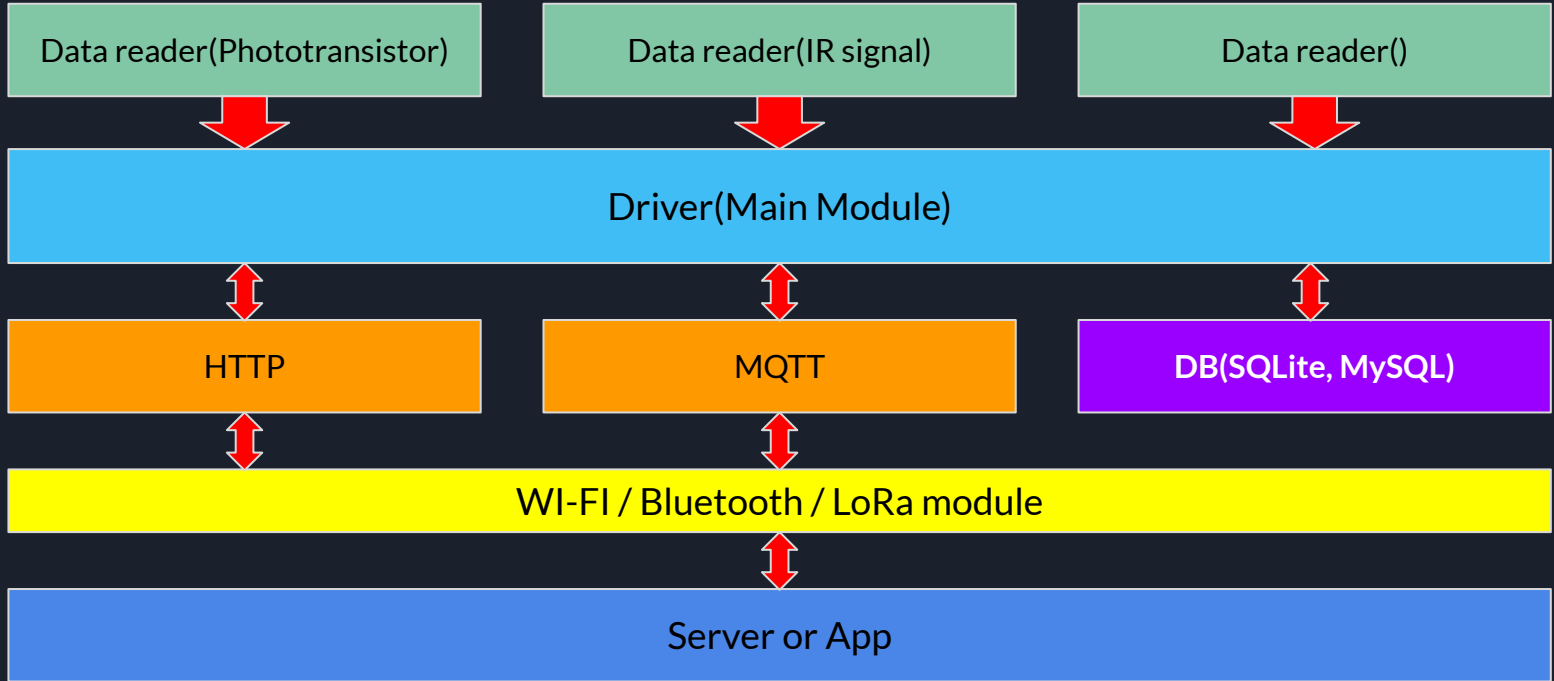# Hardware Connection

# How it works ?

# Software

The project splitted for a few independent modules:

- Read data source module(Phototransistor, Photoresistor, IR receiver, etc)
- Connectors module (Wi-Fi, Bluetooth, Zigbee, etc)
- Transmit module(MQTT, HTTP, etc)

# Modules communication

| Data reader(Phototransistor) | Data reader(IR signal) | Data reader() |
|---|---|---|

**Driver(Main Module)**

| HTTP | MQTT | DB(SQLite, MySQL) |
|---|---|---|

**WI-FI / Bluetooth / LoRa module**

**Server or App**

# THANK YOU