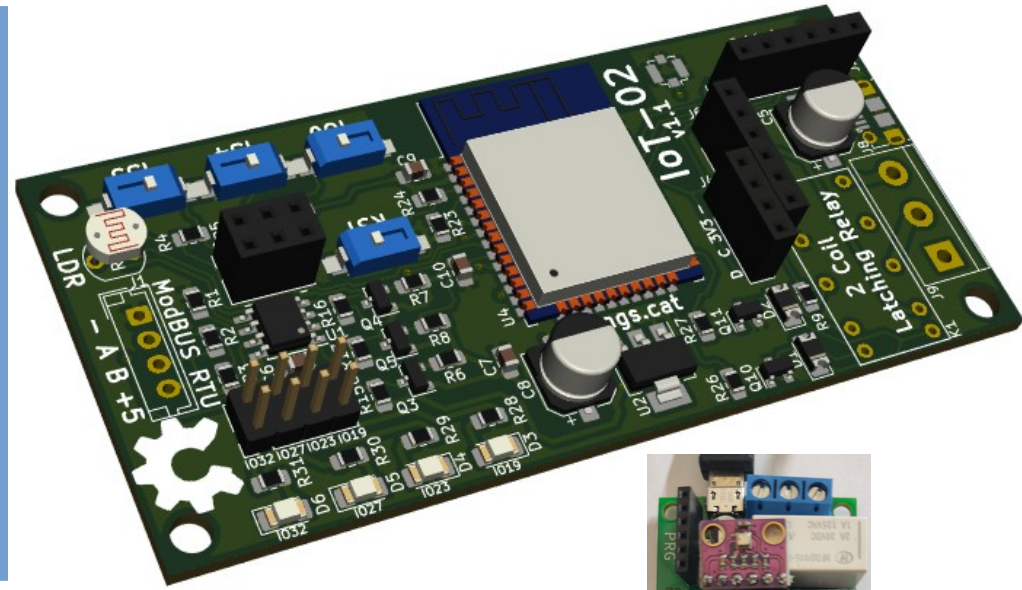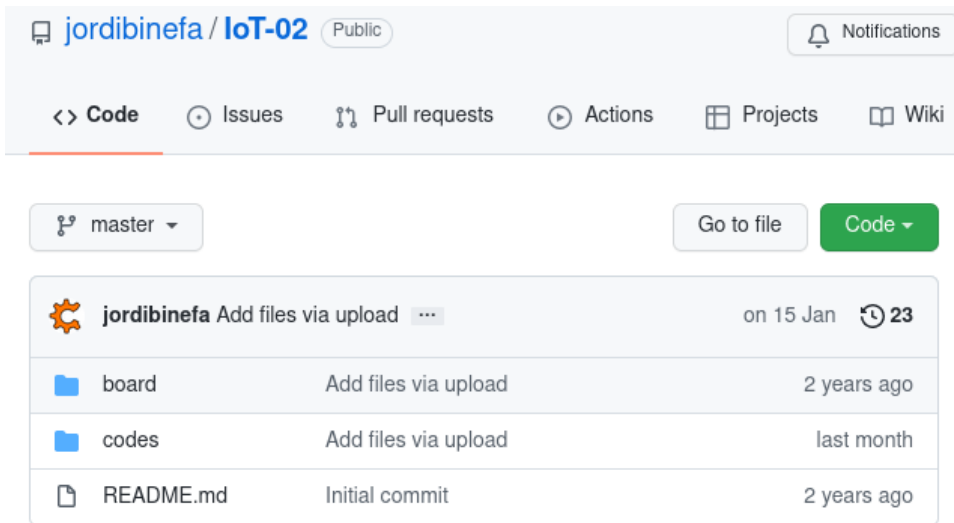# IoT-02 Board

## Introduction

# IoT-02 Board

- Project repository

- Electronic schematic

- Key components

- Arduino IDE settings

- Firmware programming
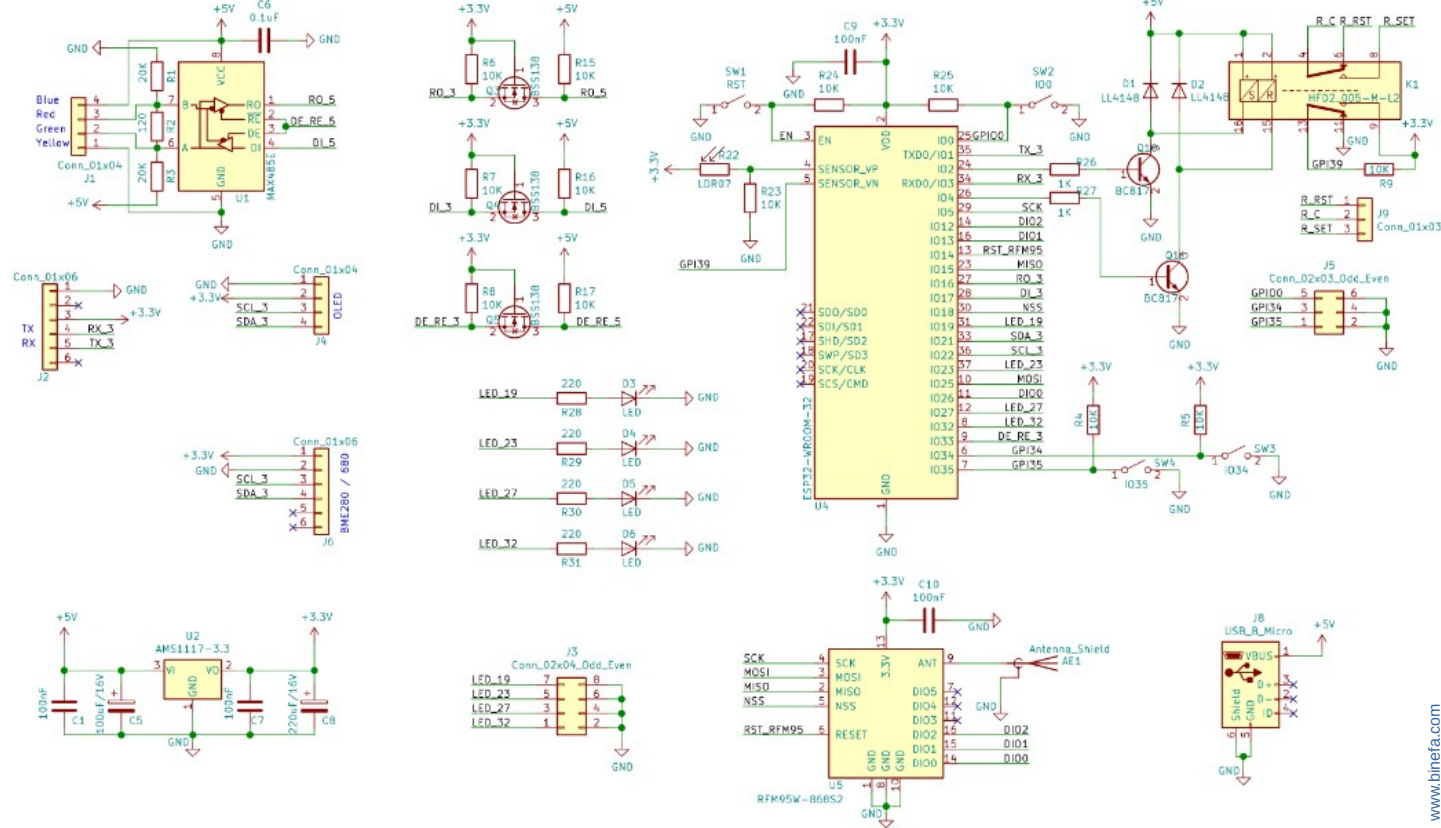
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# IoT-02 Board

- Project repository:
  https://github.com/jordibinefa/IoT-02

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# IoT-02 Board

- Schematic

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# IoT-02 Board

- CPU (ESP32)
- LDR
- Buttons
- Latching Relay

# IoT-02 Board

- CPU (ESP32)

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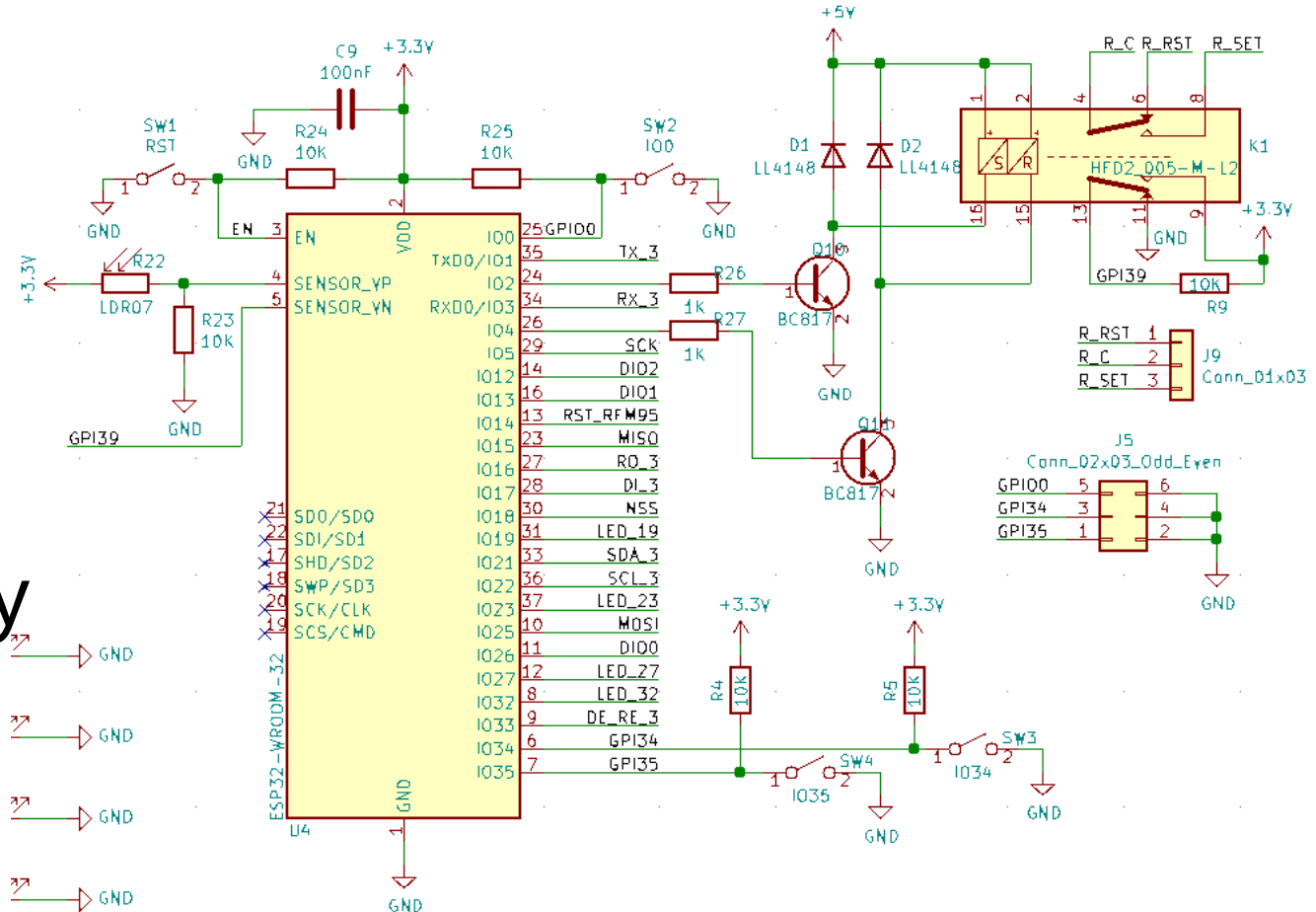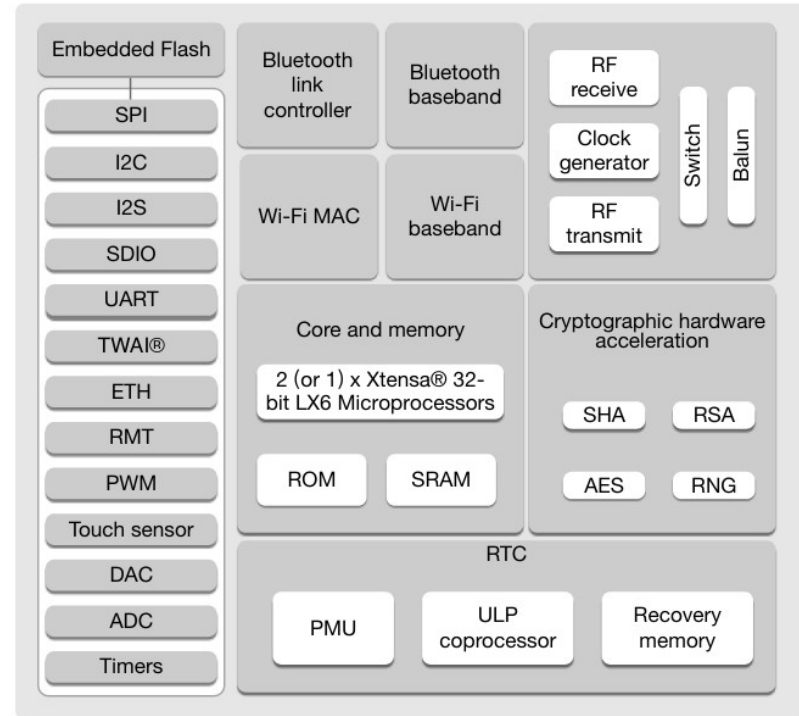
# IoT-02 Board

## Latching Relay



**HFD2**

**SUBMINIATURE DIP RELAY**

File No.:E133481

### Features

- High sensitive: 150mW
- Matching standard16 pin IC socket
- High switching capacity 60W/125VA
- Bifurcated contacts
- Epoxy sealed for automatic wave soldering and cleaning
- Single side stable and latching type available
- Environmental friendly product available (RoHS compliant)
- Outline Dimensions: 20.2 x 10.0 x 10.6 mm

## CONTACT DATA

| | |
|---|---|
| Contact arrangement | 2C |
| Initial contact resistance | 50mΩ |
| Contact material | see ordering info. |
| Contact rating (Res. load) | 2A 30VDC<br>1A 125VAC |
| Max. switching power | 60W / 125VA |
| Max. switching voltage | 220VDC / 250VAC |
| Max. switching current | 2A |
| Min. applicable load | 10mV 10μA |
| Electrical life | $1 \times 10^5$ OPS (at 2A 30VDC)<br>$5 \times 10^5$ OPS (at 1A 30VDC) |
| Mechanical life | $1 \times 10^8$ OPS |

## CHARACTERISTICS

| | | |
|---|---|---|
| Initial insulation resistance | | 1000MΩ (at 500VDC) |
| Dielectric strength | Contacts to coil | 1coil: 1500VAC 1min.<br>2coil: 1000VAC 1min. |
| | Contacts to contact | 1000VAC 1min. |
| Operate time (at nomi. volt.) | | Max. 4ms |
| Release time (at nomi. volt.) | | Max. 3ms |
| Set time (latching) | | 3ms |
| Reset time (latching) | | 3ms |
| Bounce time | | 1.5ms |
| Ambient temperature | | -40 ˚C to +85 ˚C |
| Humidity | | 5 to 85% RH |
| Vibration resistance | | 10 to 55Hz 196m/s² (20g) |
| Shock resistance | Functional | 490m/s² (50g) |
| | Destructive | 980m/s² (100g) |
| Capacitance | Contact to contact | 2.0pF |
| | Contact set to contact | 1.5pF |
| | Contact to coil | 5.0pF |
| Termination | | PCB (DIP) |
| Unit weight | | 4.5g |
| Construction | | Sealed IP67 |

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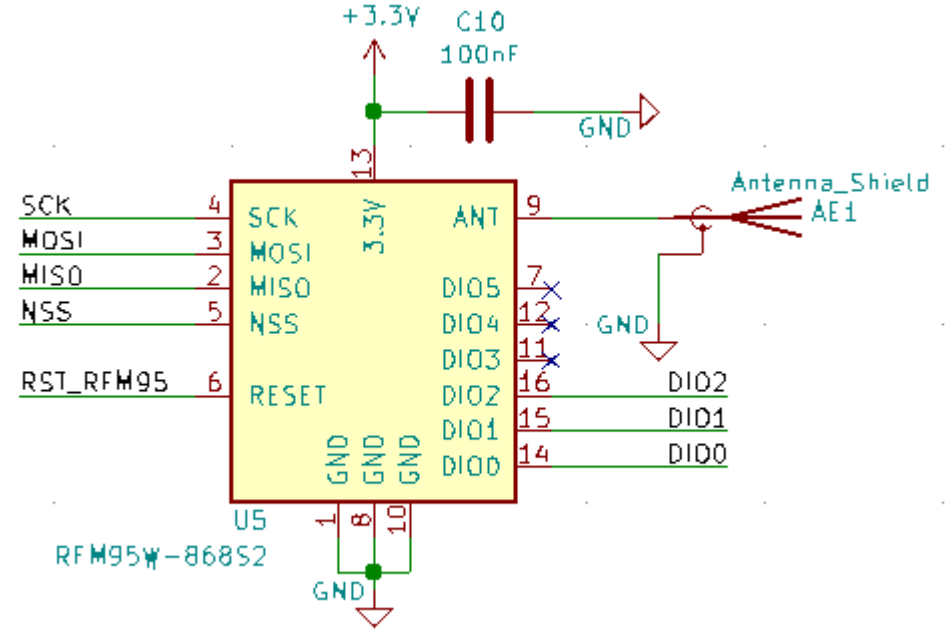
# IoT-02 Board

- ModBus



MAX3485
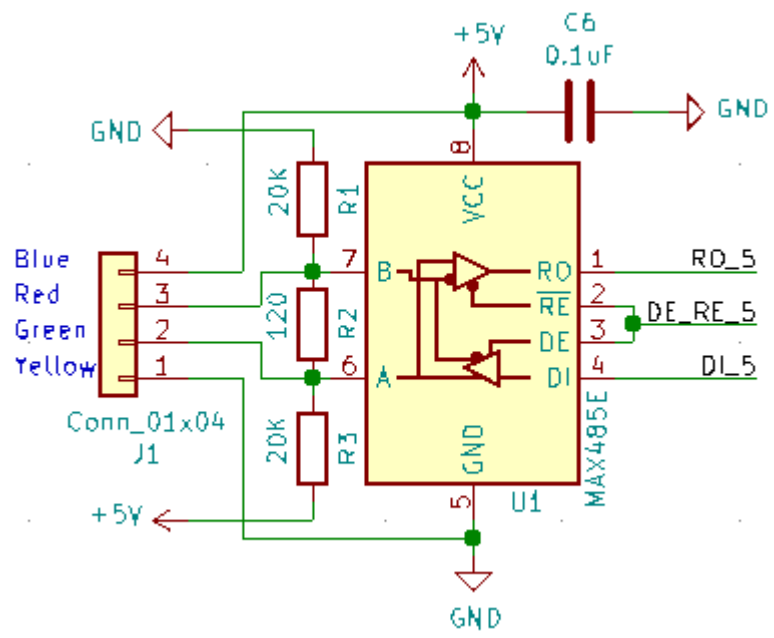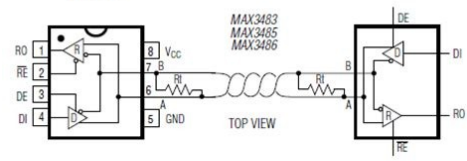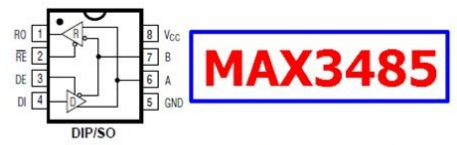


USB to RS485 Converter:
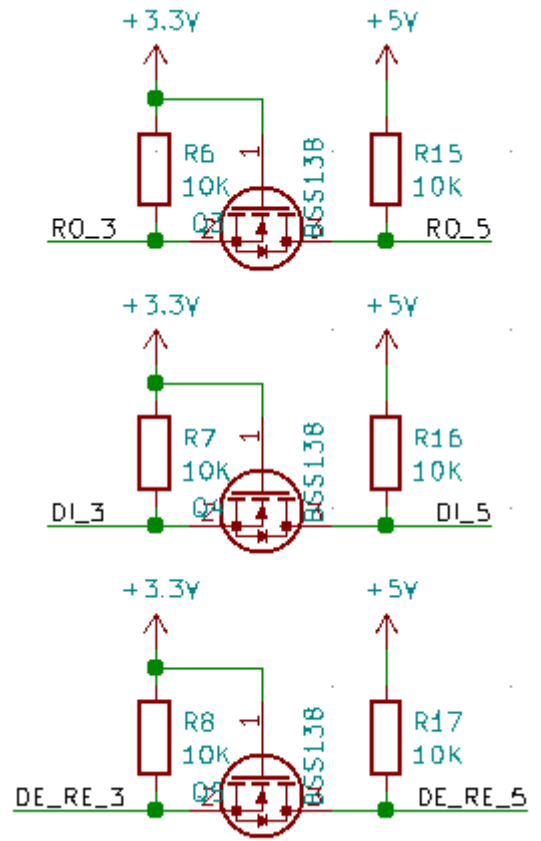


ProSoft Technology video explaining ModBus RTU and ModBus TCP
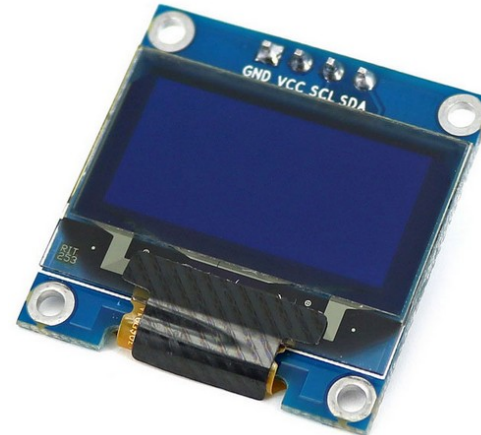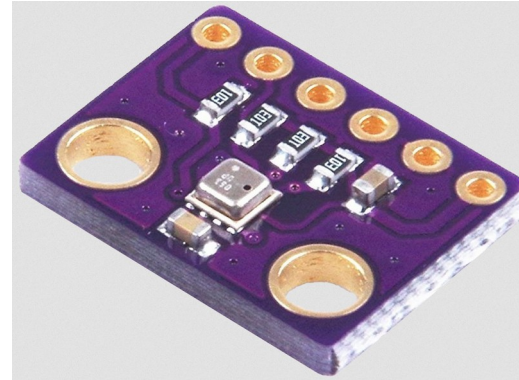
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# IoT-02 Board

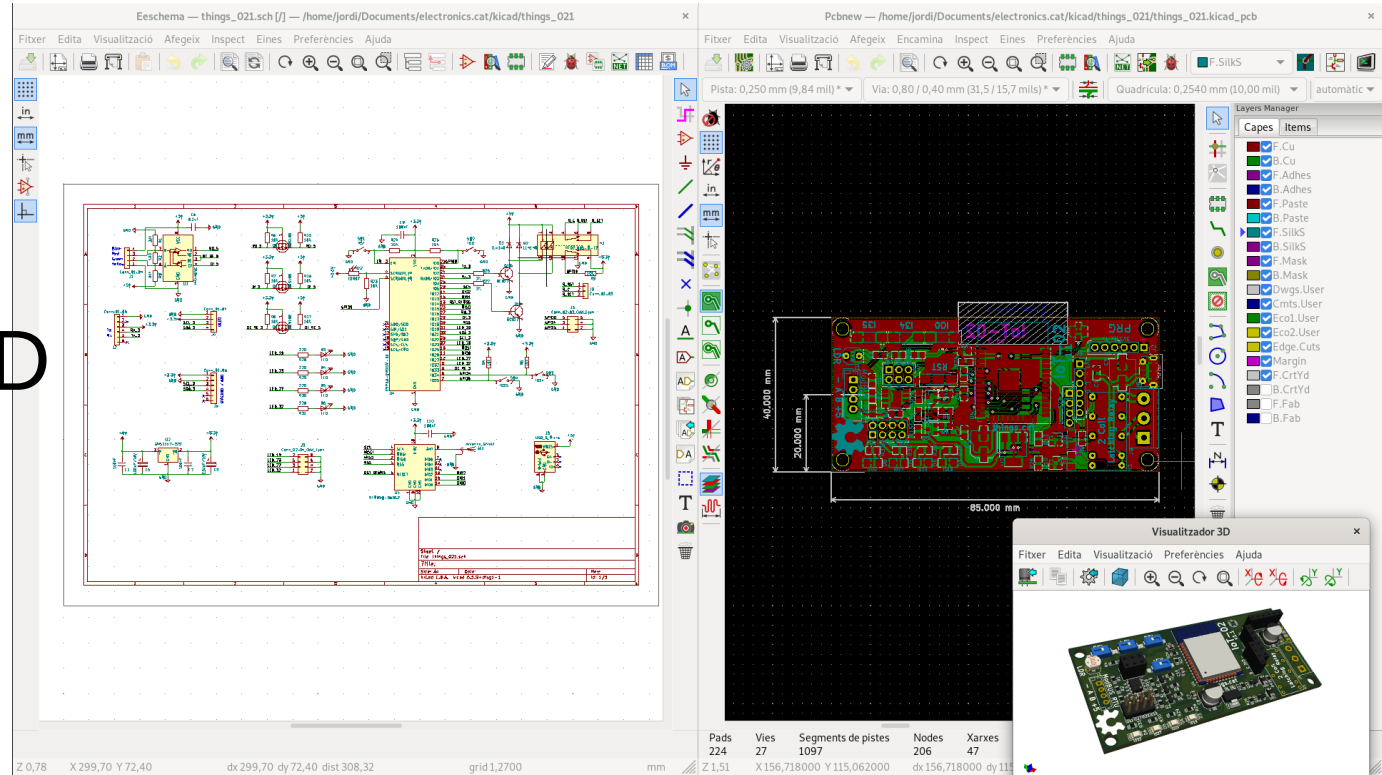- LoRa Module (SPI)



SPI bus explanation

# IoT-02 Board

- I2C (BME280)
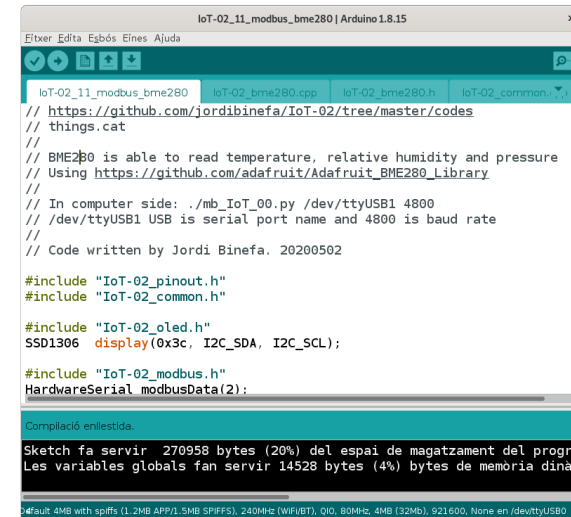
- I2C (OLED 0.96")

I2C bus explanation

# IoT-02 Board

- Made with KiCAD

# IoT-02 Board
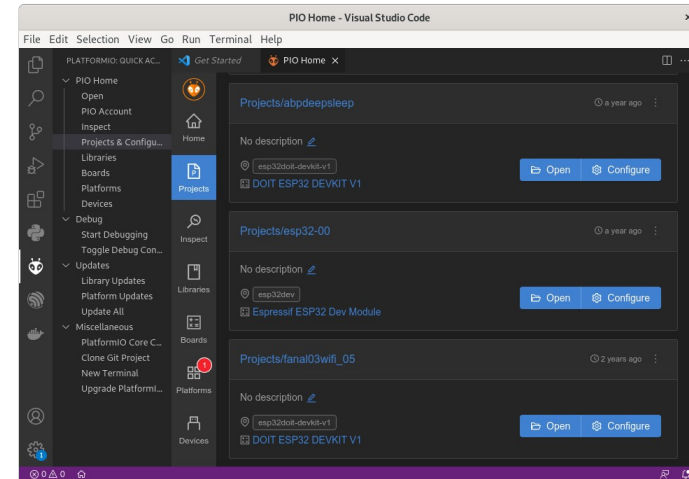
Programmable with

- Arduino IDE

- Platform IO

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# IoT-02 Board

## Installing ESP32 Add-on in Arduino IDE

- In your Arduino IDE, go to *File / Preferences*. Enter the following into the *Additional Board Manager URLs* :

  https://dl.espressif.com/dl/package_esp32_index.json

- Open the Boards Manager. Go to *Tools / Board: "..." / Boards Manager ...* Search for **ESP32** and press install button for the *ESP32 by Espressif Systems* . Approximately 300MB are automatically downloaded.

- Once it is installed, close the board installation popup. Select *Tools / Board: "..." / ESP32 Dev Module*. Select the Port at *Tools / Port / /dev/ttyUSB0* (in Windows the port is *COMx*)

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# IoT-02 Board

Arduino IDE libraries (493MB)

- These libraries are for compiling code examples

Download all GitHub codes and Arduino IDE libraries on your computer. Libraries must be placed in the *libraries* directory inside *Arduino* folder ( */home/user* in GNU / Linux and *My Documents* in Windows)

# IoT-02 Board
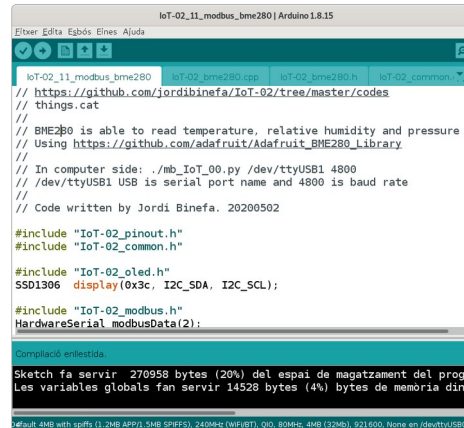
**Sequence to select programming mode on IoT-02 board:**

- Press the red button (**_RST_**)

- Press the **_IO0_** white button

- Stop pressing the red button (**_RST_**)

- Stop pressing the **_IO0_** white button

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# IoT-02 Board

## Uploading example firmware

From Arduino IDE, open
IoT-02_07_SSD1306_BME280.ino file,
previously downloaded with other example
codes.

Set IoT-02 board in programming mode,
connect the red board, and upload the
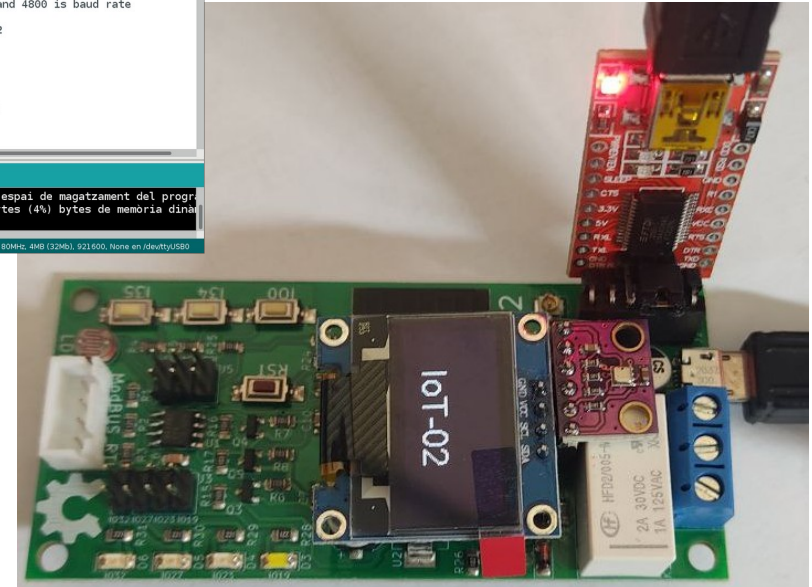firmware by pressing the round button with
right pointing arrow (          )

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# IoT-02 Board

## Physical connection with other devices
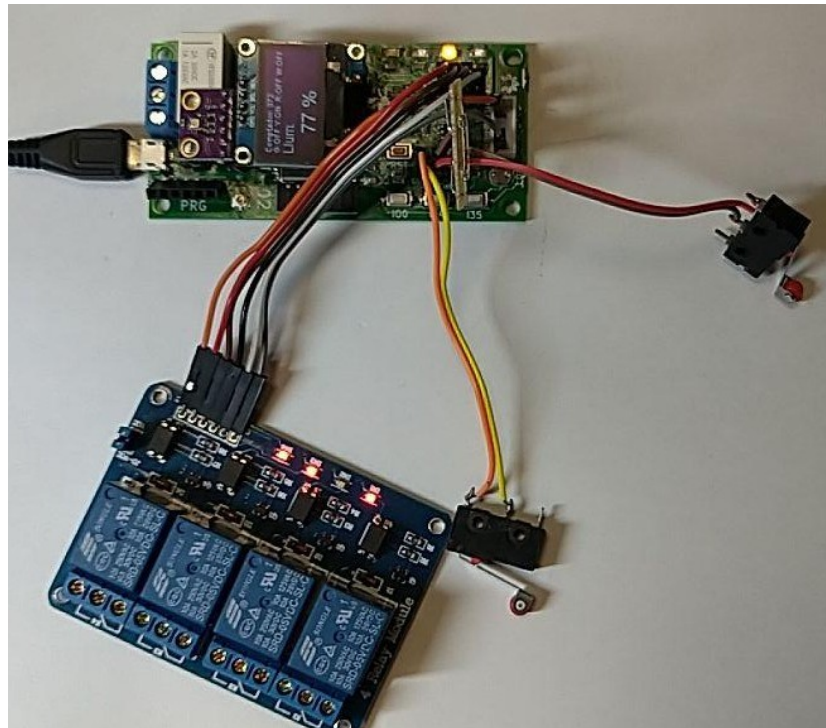
# IoT-02 Board

Practical Demonstration

# IoT-02 Board

Question Time

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