

Sensors Node Project

status active

#### Sensors Node Project



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## About

This repo contains circuit, firmware and backend for Sensors Node Project with drivers for

- BMP388
- BME680
- BMX055
- BMX160
- NEO-6M

## Getting Started

These instructions will get you a copy of the project up and running on your Raspberry Pi and ESP32.

#### **Prerequisites**

What things you need to install the software and how to install them.

- Raspberry Pi Model 3B, 3B+, 4B or CM4
- ESP32

### Installation and Configuration

A step by step series that covers how to get the Firmware running.

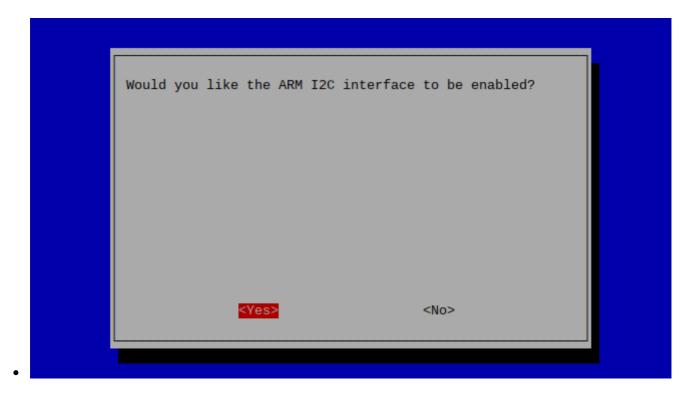
#### Raspberry Pi Firmware Pre-Regs

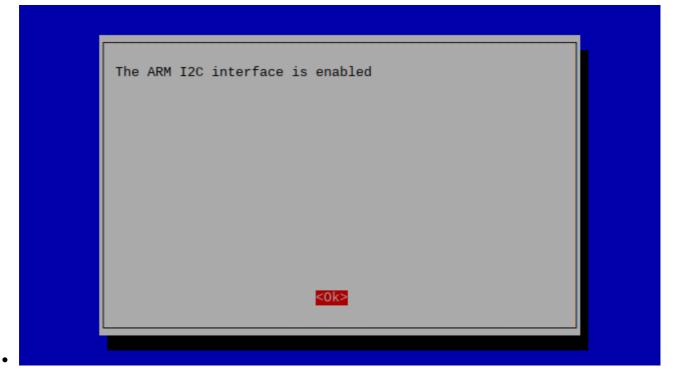
- 1. Download and install the latest Raspberry Pi OS Desktop image to your SD card
- 2. Open the terminal and execute the following command sudo raspi-config
- 3. Then follow the following pictures to enable I2C bus on you raspberry pi

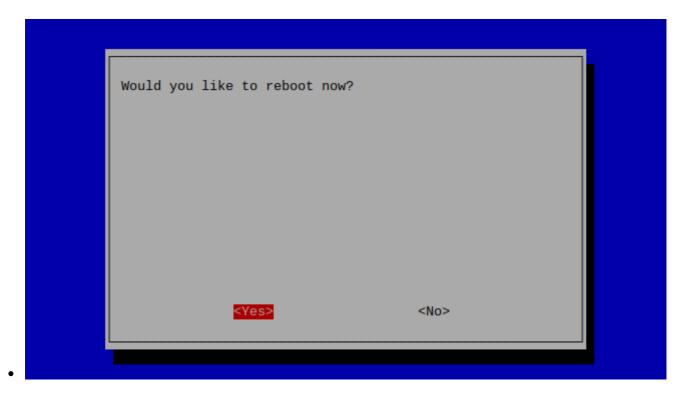
```
Raspberry Pi 3 Model B Rev 1.2
       Raspberry Pi Software Configuration Tool (raspi-config)
1 Change User Password
                                  Change password for the current u
2 Network Options
                                  Configure network settings
                                  Configure options for start-up
3 Boot Options
4 Localisation Options
                                  Set up language and regional sett
5 Interfacing Options
                                  Configure connections to peripher
                                  Configure overclocking for your P
6 Overclock
7 Advanced Options
                                  Configure advanced settings
8 Update
                                  Update this tool to the latest ve
9 About raspi-config
                                  Information about this configurat
                  <Select>
                                               <Finish>
```

Raspberry Pi Software Configuration Tool (raspi-config) P1 Camera Enable/Disable connection to the P2 SSH Enable/Disable remote command lin P3 VNC Enable/Disable graphical remote a P4 SPI Enable/Disable automatic loading Enable/Disable automatic loading P5 I20 P6 Serial Enable/Disable shell and kernel m Enable/Disable one-wire interface P7 1-Wire P8 Remote GPIO Enable/Disable remote access to G <Select> <Back>

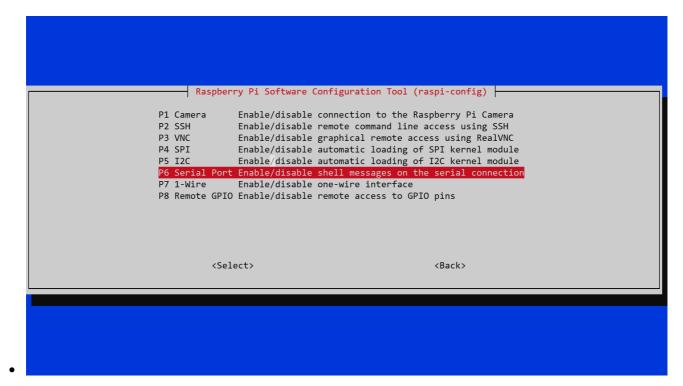
2/7

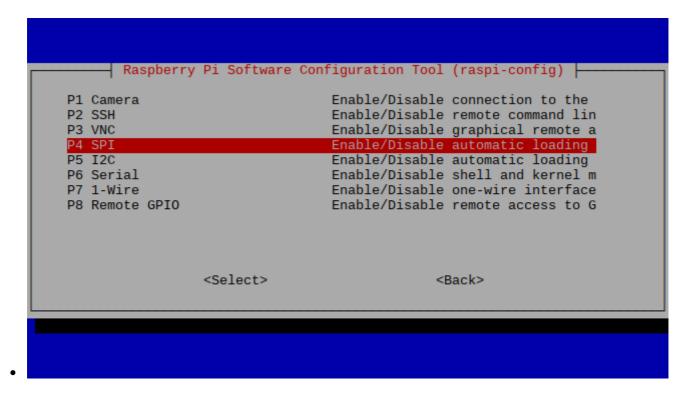






• Then do the same for Serial(UART) and SPI





#### Configuring Raspberry Pi

#### **DS3231 Configurations**

- 1. Copy Firmware folder to the desktop of your Raspberry Pi, open the terminal of your Raspberry Pi and execute the following commands
- sudo apt-get update
- sudo apt-get upgrade
- cd ~/Desktop/Firmware/
- sudo chmod a+rx starter.sh
- sudo apt install python3-pip
- sudo pip3 install --upgrade setuptools
- pip3 install paho-mqtt
- pip3 install smbus-cffi==0.5.1
- cd ~
- sudo pip3 install --upgrade adafruit-python-shell
- wget https://raw.githubusercontent.com/adafruit/Raspberry-Pi-Installer-Scripts/master/raspi-blinka.py
- sudo python3 raspi-blinka.py
- sudo pip3 install adafruit-circuitpython-bmp3xx
- sudo pip3 install adafruit-circuitpython-bme680
- pip install pynmea2
- sudo cp /boot/cmdline.txt /boot/cmdline\_backup.txt
- sudo nano /boot/cmdline.txt
- Delete the file content and put the below content in it:
- dwc\_otg.lpm\_enable=0 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline fsck.repair=yes rootwait quiet splash plymouth.ignore-serial-consoles
- Press CTRL+O and then CTRL+X to save and exit.

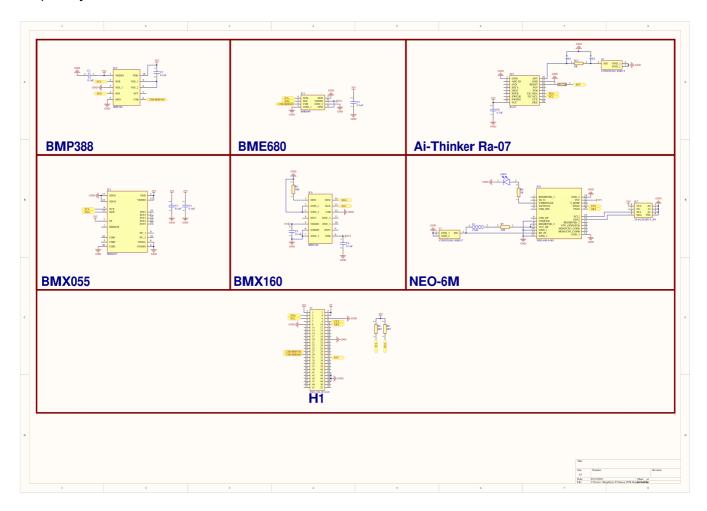
- Again on terminal execute the following commands
- sudo reboot
- sudosystemctl stop serial-getty@ttyAMA0.service
- sudosystemctl disable serial-getty@ttyAMA0.service
- sudosystemctl stop serial-getty@ttyS0.service
- sudosystemctl disable serial-getty@ttyS0.service

## Testing

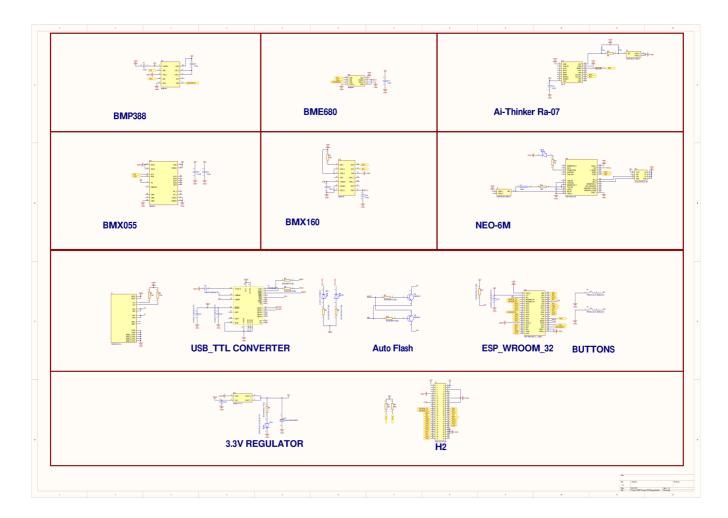
- 1. The Firmware can be tested on Raspberry Pi
- 2. Connect the sensors as shown in the Schematics section below.
- 3. In the terminal execute the following commands to run the code
  - 1. cd ~/Desktop/Firmware/
  - 2. ./starter.sh

## 🗞 Circuit Diagram

### Raspberry Pi Schematics



ESP32 Pi Schematics



# Components Used

- 1. Raspberry Pi
- 2. ESP32
- 3. Sensors

# **尽** Built Using

• Python3 - Raspberry Pi FW