Air Monitoring HAT for Raspberry Pi
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Air Monitoring HAT

Introduction

Air Monitoring HAT is a powerful and hi-tech PMSA003 sensor that provides the information of suspended particulate matter (PM1.0, PM2.5, and PM10) in the air per unit volume via digital output with an operating voltage of 3.3 V. It communicates via UART (serial) with the standby current \( \leq 200 \) Microampere (\( \mu A \)) of the sensor.

Pin Out
Features

- Digital sensor
- Operating Voltage 5V DC
- PMSA003 Sensor
- Standard 40 Pin GPIO
- OLED Display 0.91”
- Measuring range 0.3 to 10 Micron
- UART (Serial) Interface
Specification

- Model - Air Monitoring HAT
- Sensor Model number - PMSA003
- Data Output - Digital Sensor (unit quality + number of units)
- Type - Biosensor
- Communication Interface - UART (Serial)
- Display Type - OLED Display 0.91”
- Board Dimension - 65 x 56 mm
- Measuring range - 0.3 to 1.0, 1.0 to 2.5, 2.5 to 10 Micron (μm)
- Counting efficiency - 50% @ 0.3 μm 98% @> = 0.5 um
- Response time - ≤10 s
- DC supply voltage - 5.0 V
- Maximum Operating Current - 100 Milliamp (mA)
- Standby current - ≤200 Microamp (μA)
- Data interface level - L <0.8 @3.3, H >2.7 @3.3 Volt(V)
- Operating Temperature range - -10 to +60 Celsius (°C)
- Operating Humidity range - 0 - 99%
- Mean time between failures - ≥3 Year(Y)
Hardware
**Installation Process**

**Enable I2C and Serial Interface**

- GUI Method to enable i2c and Serial
**Through Terminal:**

Open a terminal and run the following commands to enable I2C and Serial:

- `sudo raspi-config`

Choose Interfacing Options -> I2C -> yes

Terminal method to enable i2c and serial can be followed as:
● sudo raspi-config

Choose Interfacing Options -> Serial -> No -> Yes

Testing

● Stack Air Monitoring HAT on top of Raspberry Pi GPIO Header pins.

Source Code Link: https://github.com/sbcshop/Air-Monitoring-HAT

Clone Repository

git clone https://github.com/sbcshop/Air-Monitoring-HAT.git

cd Air-Monitoring-HAT

● Run GUI by running the below command:

python3 Air_monitoring_GUI.py
GUI and Examples

Select **COM port** from above GUI ("/dev/ttyS0" in case of default connection), and click on the start button to start Real-Time data from the sensor on Graph and OLED Display.

You can also use these two examples and modify them easily:

1.) **display_on_oled_example.py** :- To print the sensor data on OLED Display.

2.) **read_example.py**: To print the sensor data on Python shell or Terminal.

For detailed information please visit the wiki of this repository.
https://github.com/sbcshop/Air-Monitoring-HAT/wiki/Wiki