

AIR POLLUTION MONITORING AND NOTIFICATION IOTBASED DEVICE

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ABSTRACT:

In most of the developed and developing countries, the air pollution and airborne particulate matter (PM) such as PM10, PM2.5 and PM1 has increased rapidly in the last few decades. PM Concentration and increase in air pollutants has not only degraded the air quality but also has brought many health hazards problems by inhaling these small particulates. Therefore, it is necessary to have a portable and costeffective solution for monitoring the air pollutants, air quality index along with its PM Concentration. So, we have proposed an IoT Based System using ESP32 Wi-Fi Module & PMS5007 Particulate Matter PM2.5 & PM10 Sensor. The device when powered on starts measuring the Particulate Matter Concentration in Air & displays the real-time value on a 0.96" OLED Display. The ESP32 also connects to the Wi-Fi Network and uploads the data to the Web Server. Using the Local IP address of ESP32, you can get the PM1.0, PM2.5 & PM10 value on any Web Browser. The Air Quality Index (AQI) value anything above 50 is unhealthy for breathing. So, when the pollution level exceeds in air, the fan turns on automatically to blow fresh air. Instead of Fan, you can use any other air freshening device like aconnected to the relay.

KEYWORDS: Automatic, Neural network, Traffic signs, Recognition.

1. INTRODUCTION

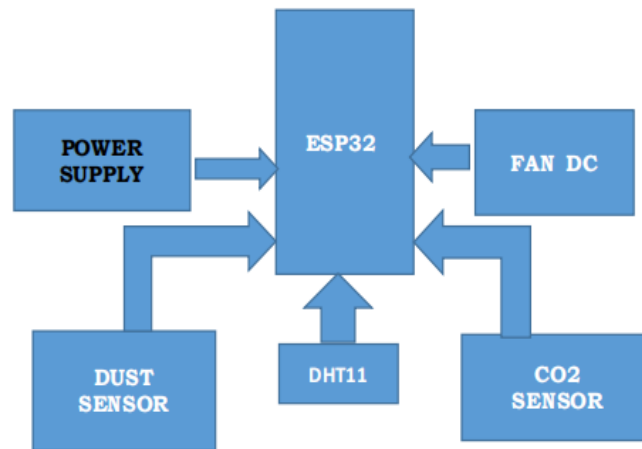
In this IoT based Particulate matter monitoring with air freshener system, we will design an ESP32 & PMS5007 Based PM2.5 & PM10 Monitoring System along with an Automatic Air Freshener System. The device can monitor and measure the PM2.5 & PM10 concentration in the air. It can also activate the air freshener when the PM Level exceeds the danger value. The device can be used in the house, industry, schools, office, and around crowded places.

2. EXISTING METHOD

The most common way of measuring PM10 and PM2.5 automatically is to use an analyser called a TEOM (Tapered Element Oscillating Microbalance). Air is sucked in through a sampling head, which is designed to stop large particles entering the device (for instance a PM10 sampling head will only allow particles with a diameter less than or equal to 10 microns). Some of the air then passes through the device and onto a filter that's its on a vibrating quartz rod (this is the oscillating microbalance part). As the number of particles deposited the most common way of measuring PM10 and PM2.5 automatically is to use an analyser called a TEOM (Tapered Element Oscillating Microbalance). Air is sucked in through a sampling head, which is designed to stop large particles entering the device (for instance a PM10 sampling head will only allow particles with a diameter less

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3.BLOCK DIAGRAM

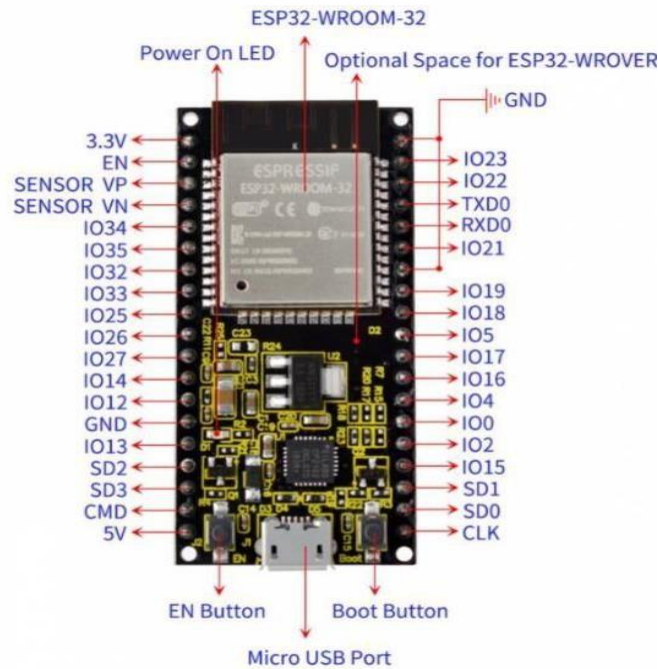


The project work corresponding to our system is done in a structured and meticulous manner. We formulated an algorithm of all the steps we need to follow in order to complete the project and meet our objective First of all, we had designed the circuit and had written the program for ESP32 with the help of our project guide and then we had purchased the hardware components required. The tasks of dumping the code into 6 ESP32 and webserver is shared among us and we completed the tasks. Testing is done in the presence of our project guide. The Block Diagram of the IOT Based Particulate matter monitoring with air freshener system consists of ESP32, PMS5007 Sensor.

4.ESP32 BOARD

ESP32 board is a low-power microcontroller (MCU) with integrated WiFi and dual-mode Bluetooth—it is a successor of ESP8266 MCU. ESP32 is shown in Fig. 4.1 Arduino IDE is used to upload the sketch to ESP32.

ESP32 Development board is based on the ESP WROOM32 WIFI + BLE Module. It's a low-footprint, minimal system development board powered by the latest ESPWROOM-32 module and can be easily inserted into a solderless breadboard. It contains the entire basic support circuitry for the ESP-WROOM-32, including the USB-UART bridge, reset- and bootmode buttons, LDOregulator and a micro-USB



5.RESULTS

IoT based Particulate matter monitoring with Air freshener system is designed using ESP32 board, PMS5007 sensor, OLED display and DC Fan. The circuit diagram is represented in the figure 5.1.

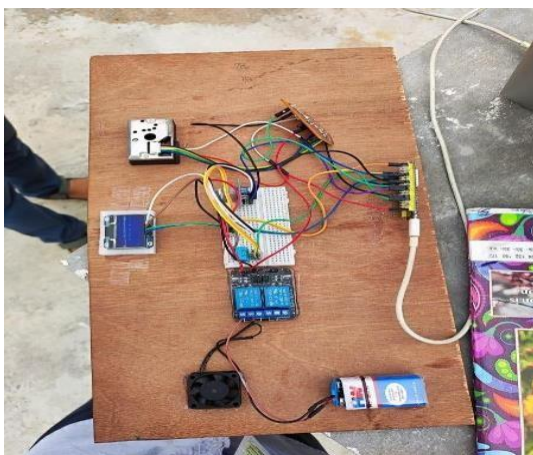


Fig.5.1

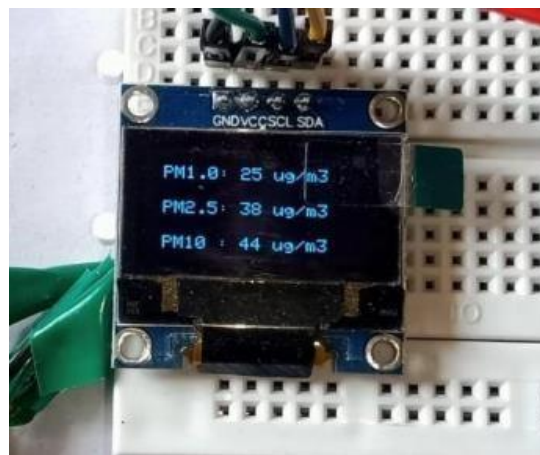


Fig.5.2

After showing IP address the PMS5007 sensor starts reading the particulate matter values like

PM1.0, PM2.5 and PM10 and then OLED display shows particulate matter values on its screen.

6. CONCLUSION

Technology is proposed to improve quality of air. With the use of IOT technology enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. Here, using the ESP32 Wi-Fi Module & PMS5007 Particulate Matter PM2.5 & PM10 Sensor. Sensor gives the sense of different type of dangerous PM2.5 & PM10 and Arduino is the heart of this project which controls the entire process. Wi-Fi module connects the whole process to internet and OLED is used for the visual output. The system to monitor the air of environment using Arduino micro controller. IoT technology proposed to improve quality of air. PMS5007 sensor gives the sense of different type of PM2.5 & PM10. It supports new technology and healthy life concept.

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