

Air quality monitoring using IOT

Particulate matter (PM) sensors: PM sensors measure the concentration of fine particulate matter in the air, such as PM2.5 and PM10. PM is a major air pollutant that can have a significant impact on human health.

Gas sensors: Gas sensors measure the concentration of specific gases in the air, such as carbon dioxide (CO₂), carbon monoxide (CO), and ozone (O₃). These gases can also be harmful to human health in high concentrations.

Temperature and humidity sensors: Temperature and humidity sensors are often used in conjunction with other air quality sensors to provide a more complete picture of the air quality environment.

Once you have selected the appropriate sensors, you need to connect them to a microcontroller, such as a Raspberry Pi or Arduino. There are many different ways to do this, depending on the specific sensors you are using. Once the sensors are connected, you can use Python to read the sensor data and perform other tasks, such as logging the data, displaying it on a screen, or sending it to a cloud service.

Here is a simple Python program for reading data from a PM2.5 sensor:

```
Import time
```

```
Import board
```

```
Import busio
```

```
Import adafruit_pm25
```

```
I2c = busio.I2C(board.SCL, board.SDA)
```

```
Pm25 = adafruit_pm25.PM25_I2C(i2c)
```

```
While True:
```

```
    Pm25_concentration = pm25.pm25
```

```
    Print("PM2.5 concentration:", pm25_concentration)
```

```
    Time.sleep(1)
```

```
While True:
```

```
    Pm25_concentration = pm25.pm25
```

```
Print("PM2.5 concentration:", pm25_concentration)
```

```
Time.sleep(1)
```

Use code with caution. [Learn more](#)

This program will continuously read the PM2.5 concentration from the sensor and print it to the console. You can modify the program to log the data to a file, display it on a screen, or send it to a cloud service.

Here is an example of how to log the PM2.5 concentration to a file:

Python

```
Import time
```

```
Import board
```

```
Import busio
```

```
Import adafruit_pm25
```

```
Import csv
```

```
I2c = busio.I2C(board.SCL, board.SDA)
```

```
Pm25 = adafruit_pm25.PM25_I2C(i2c)
```

```
With open("pm25_data.csv", "w") as f:
```

```
    Writer = csv.writer(f)
```

```
    Writer.writerow(["timestamp", "pm25_concentration"])
```

```
While True:
```

```
    Pm25_concentration = pm25.pm25
```

```
    Writer.writerow([time.time(), pm25_concentration])
```

```
    f.flush()
```

```
    time.sleep(1)
```

Use code with caution. [Learn more](#)

This program will create a CSV file called pm25_data.csv and log the PM2.5 concentration to the file every second.

You can use Python to perform many other tasks with air quality sensors, such as:

Displaying the air quality data on a screen

Sending the air quality data to a cloud service, such as Google Cloud or AWS

Triggering alarms if the air quality falls below a certain threshold

Controlling air purifiers or other devices based on the air quality data

Air quality monitoring with sensors and Python is a powerful tool that can be used to improve the air quality in your home, office, or community.