

IOT BASED AIR QUALITY MONITORING

- Air pollution is one of the biggest threats to the present-day environment.
- Everyone is being affected by air pollution day by day including humans, animals, crops, cities, forests and aquatic ecosystems.
- Besides that, it should be controlled at a certain level to prevent the increasing rate of global warming.
- This project aims to design an IOT-based air pollution monitoring system using the internet from anywhere using a computer or mobile to monitor the air quality of the surroundings and environment.
- There are various methods and instruments available for the measurement and monitoring quality of air.
- The IoT-based air pollution monitoring system would not only help us to monitor the air quality but also be able to send alert signals whenever the air quality deteriorates and goes down beyond a certain level.

Components Used

Hardware Components

1. NodeMCU V3
2. DHT11 Sensor Module
3. MQ-135 Gas Sensor Module
4. Veroboard(KS100)
5. Breadboard
6. Connecting Wires

7. AC-DC Adapters

8. LEDs emitting green, yellow and red colours

9. Resistors

SOFTWARE COMPONENTS

1. ThinkSpeak Cloud

2. Arduino IDE

NodeMCU V3

- ❖ NodeMCU V3 is an open-source ESP8266 development kit, armed with the CH340G USBTTL Serial chip. It has firmware that runs on ESP8266 Wi-Fi SoC from Espressif Systems.
- ❖ Whilst cheaper, CH340 is super reliable even in industrial applications. It is tested to be stable on all supported platforms as well. It can be simply coded in Arduino IDE. It has a very low current consumption between 15 μ A to 400 mA

DHT11 Sensor Module

- ❖ The DHT11 is a temperature and humidity sensor that gives digital output in terms of voltage. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air.
- ❖ we need to supply a voltage of 5V (DC) to the Vcc pin and ground it to the GND pin. The sensor output can be easily read from the Data pin in terms of voltage (in digital mode).

Humidity Measurement:

- ❖ The humidity sensing capacitor has two electrodes with a moisture-holding substrate as a dielectric between them .
- ❖ Change in the capacitance value occurs with the change in humidity levels.

- ❖ The IC measure, process these changed resistance values and then converts them into digital form.

Temperature Measurement:

- ❖ For measuring the temperature, the DHT11 sensor uses a negative temperature coefficient thermistor, which causes a decrease in its resistance value with an increase in temperature.
- ❖ To get a wide range of resistance values, the sensor is made up of semiconductor ceramics or polymers.

CONNECTIVITY:

- ❖ ThingSpeak is open-source software written in Ruby which allows users to communicate with internet-enabled devices.
- ❖ It facilitates data access, retrieval and logging of data by providing an API to both the devices and social network websites.
- ❖ ThingSpeak was originally launched by ioBridge in 2010 as a service in support of IoT applications.
- ❖ ThingSpeak has integrated support from the numerical computing software MATLAB from MathWorks, allowing ThingSpeak users to analyse and visualize uploaded data using MATLAB without requiring the purchase of a MATLAB license from MathWorks.
- ❖

