

Measuring of Air Pollution Using Cansat

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Abstract: The change in atmospheric conditions in nature around us is noticeable reality, it is moderately yet unquestionably having unfavourable outcomes on our lives and the things around us. With the ongoing addition in industrialization, release of toxic substances has enlarged in complex. The levels of poisonous gases are observable all around is disturbing and these are causing an irreversible change. As specified by studies and report around the world it is been concluded that out of 8 deaths around the worldwide is linked to air pollution. Under this conditions it is very much important for everybody to have the ability to keep check in the circumstances of air pollution and air quality around us.

In this project we control the problem by using the concept of embedded system where we can monitor the air quality through sensors. Here we are using Arduino Atmega 328P and gas sensor such as MQ9 and MQ135 for sensing the carbon-monoxide, methane and carbon-dioxide levels in the atmosphere. These data are sent to the android through a Blynk app by using Wi-Fi module. The project model is enclosed in a cansat and send to the atmosphere through drone. The work is actualized using android microcontroller board of Arduino.

Keywords: Arduino Uno, Air pollution, Blynk App, Cansat, Measuring.

1. Introduction

Air pollution is the major issue of every nation, whether it is developed or developing. Especially in urban areas of developing countries health problems have been growing at faster rate where industrialization and growing number of vehicles leads to release of lot of gaseous pollutants. Lethal effects of pollution include serious allergic reactions such as irritation of the eyes, nose and throat as well as some mild problems like heart diseases, pneumonia, bronchitis, lung and aggravated asthma.

In this project, we present IoT Based Air Pollution Measuring System that measures the Air quality over smartphone using Internet and will display the amount of harmful gases present in the air like smoke, benzene, CO₂, alcohol, LPG, NH₃ and NO_x. The air quality will be shown in PPM on the smartphone through Blynk app. The system is placed inside cansat and sent to atmosphere through to measure air quality.

2. Background

Basically the process is collecting the data of air quality around us using gas sensors. The sensors like MQ135 and MQ9 is selected such that it senses the quality of gas present in the atmosphere. The sensors are interfaced with Arduino. After the process of sensing gas element, these data are sent to the android through Wi-Fi via Blynk app. The whole system is placed inside cansat and it is send to atmosphere through drone.

This project helps to know what is the present air quality in and order us. MQ9 measures the value of carbon monoxide, CH₄, LPG and MQ135 measures the value quality of air and it will also check does it as any content on poisonous gas which may harm human beings. Blynk app measures these values and display them in the form of numbers and MQ9 is measured in the form ppm. Before connecting we must pre heat the MQ9 sensor for best value of checking air pollution.

Cansat is a simulation of a real satellite, integrated within the volume and shape of a soft drink can. It performs a mission and collects data. Typical Cansat missions can be atmospheric measurements, video capture, imaging, communications or navigation. Missions can be simple or complex. The challenge is to fit all the major subsystems such as sensors power supply and a communication system, into this minimal volume. A Cansat is classified as a picosatellite, which means its weight is limited to 1kg, but normally the Cansats weigh about 350g, and its structure is based on a can of soda, a 6.1 cm diameter cylinder, 11.65 cm tall. Wireless Data Transfer technology makes it easy to fetch the data from the Cansat Kit. The data thus obtained can be viewed on android phone.

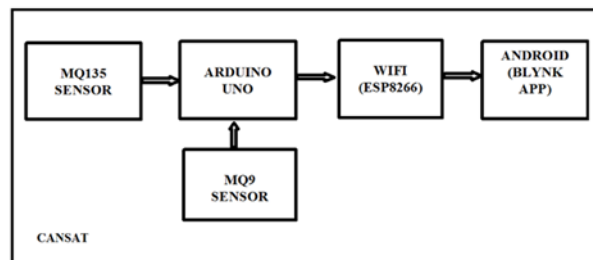


Fig. 1. Block diagram

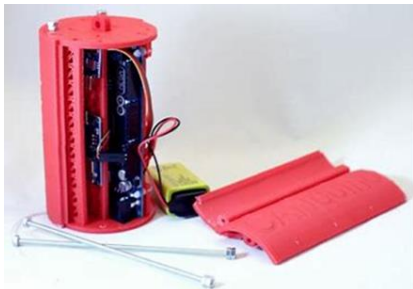


Fig. 2. Cansat structure

Blynk is a hardware-agnostic IoT platform with white-label mobile apps, private clouds, device management, data analytics, and machine learning. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Blynk makes complex IoT technology simple. It designs, develops, and test the building blocks of a complete IoT solution.

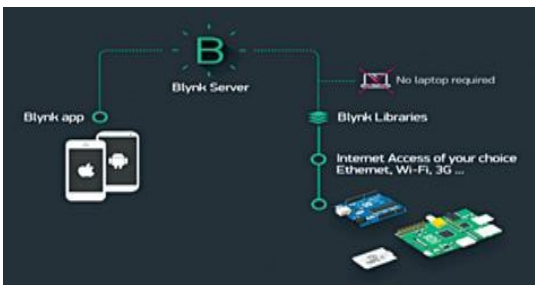


Fig. 3. Blynk App Setup

3. Result

The value is measured from the sensor and it is then displayed in the blynk app through Wi-Fi module and Arduino UNO.

MQ9 will measure in the form of PPM, the detecting range is 20 ppm - 2000 ppm (carbon monoxide), 500ppm-10000 ppm (CH4, LPG). MQ135 will measure value in this way like if its normal air the range is 100-150, if there is the content of alcohol the range is approximately 700, if air contains gas return then range is 750.

4. Conclusion

In India lots of places are effected by some kind of gases which is harmful to human beings as well as environment. Around half of nation is filled with lots of factory which will affect the nature causing lot of pollution. The project focuses on measuring air pollution value based on the concept of IoT and Android application which can be used even by common man. Here a man can check the value of air pollution in his surroundings which is displayed in the mobile application and he can keep a track on the area which is polluted more.

References

- [1] Arunava Mukkhopahay, "Design of Air Quality Meter and Pollution Detector."
- [2] E Suganya, S. Vijayashaarathi, "Smart Vehicle Monitoring System for Air Pollution Detection using WSN."
- [3] Siva Shankar Chandrasekaran, Sudharshan Muthukumar, Sabeshkumar Rajendran, "Automated Control System for Air Pollution Detection in Vehicles."
- [4] B. Spyropoulos, "A method for the monitoring of the air pollution in the operating room caused by anaesthesia agents."