AIR QUALITY MONITORING SYSTEM USING ARDUINO

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ABSTRACT

Air pollution is one of the most adverse issues in the environment. It causes major effects like cancer, heart diseases and lung diseases etc. Air pollution which is caused by solid, liquid particles and some gases that are present in the air. These particles and gases are evolved by industry, transport, factories.

To detect the quality of air, the Arduino based air quality monitoring system is used to monitor the air quality. The buzzer starts beeping whenever the air quality goes below a threshold level, that means a lot of harmful gases are present in the environment such as carbon dioxide, smoke, alcohol, benzene, NH3 and NOx. The quality of air is shown by PPM on the LCD screen. By this the air quality can be monitored easily.

In this system, Arduino Uno, MQ135 gas sensor and some other components are used. Arduino has high speed and compatibility compared to the others.MQ135 gas sensor is used to detect the harmful gases which present in the air and can be measured accurately and it shows the concentration in PPM.

KEYWORDS : MQ135 gas sensor, Arduino Uno.

INTRODUCTION

Air pollution is the biggest problem of every nation, whether it is developing or developing. Health problems have been growing at a faster rate mostly in the urban areas of developing countries where industries and numbers of vehicles lead to the release of a lot of gas pollutants. It has an adverse impact on the living organisms like humans, animals, food crops etc. It may result in allergies, harmful diseases such as cardiovascular diseases, lung diseases and can also cause death. Every year nearly 1.2 million Indians die due to air borne pollutants. According to the survey, due to air pollution 50,000 to 100,000 premature deaths over a year occur in the U.S whereas in the EU the number reaches to 300,000 and over 3,000,000 worldwide.

Air pollution monitoring system monitors the air quality using Arduino and the buzzer will beep if the air quality is less than the threshold level, meaning the harmful gases where present in the air such as CO2, NH3, LPG, benzene, alcohol, smoke and NOx. It will show air quality in PPM on the LCD screen.
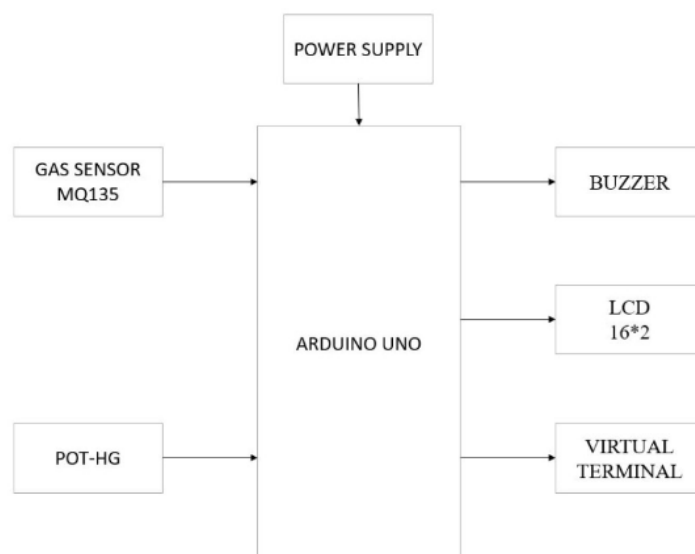
LITERATURE SURVEY

The drawback of WIFI- enabled indoor air quality monitoring and control system the current work focuses on the control of the particulate matter PM 2.5 concentration, and can be extended to humidity control as well as network control over wireless sensor and actuator networks which makes the design complex.

A low-power real-time air quality monitoring system using LPWAN based on LoRa is a technology that has a drawback of complexity and space occupancy; it needs more equipment. This technology is more expensive.

An embedded system model for Air Quality Monitoring is drawback of present National air quality monitoring network is limited in scope as the recorded values are indicative and there is immense time lag in reporting the data. So real time action is not possible.

BLOCK DIAGRAM

The data of air is recognized by the MQ135 gas sensor. The MQ135 sensor can sense NH3, NOx, alcohol, Benzene, smoke, CO2. So, it is a dynamic gas sensor for our Air pollution Monitoring system. When it is connected to Arduino then it will sense all gases, and it will give the Pollution level in terms of PPM (parts per million).

The MQ135 gas sensor will give the output in the form of voltage levels and we have to convert it into PPM. So, for converting the output in PPM, we have used a library for the MQ135 gas sensor. The MQ135 gas sensor and POT-HG are connected to the input of the Arduino Uno.

The output of Arduino Uno is connected to the buzzer, LCD, virtual terminal and led. After executing the code, if the ppm is less than the threshold, then the air quality will be Good and it displays on the LCD screen that "AQ Level Good". The buzzer will be turned off.
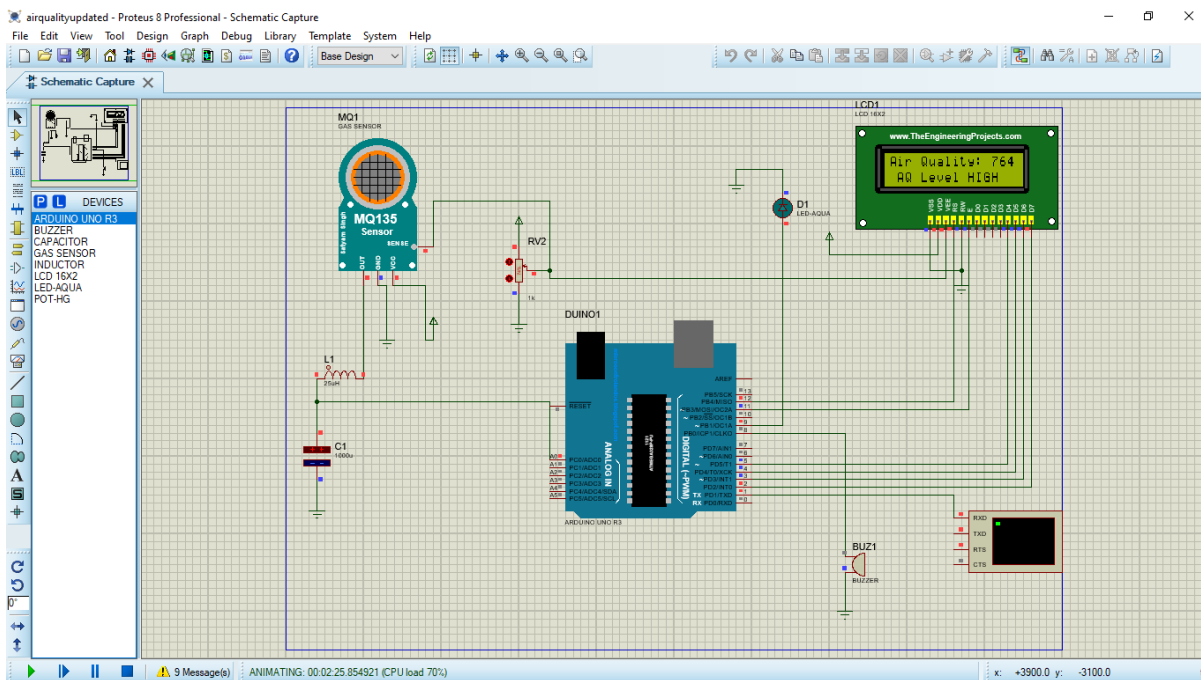
If the ppm is greater than the threshold, the air quality will be high and it displays on the LCD screen that "AQ Level High". the buzzer will be turned on. The virtual terminal will display the output. Led will glow when threshold level goes high and led will start to glow when threshold level goes high.
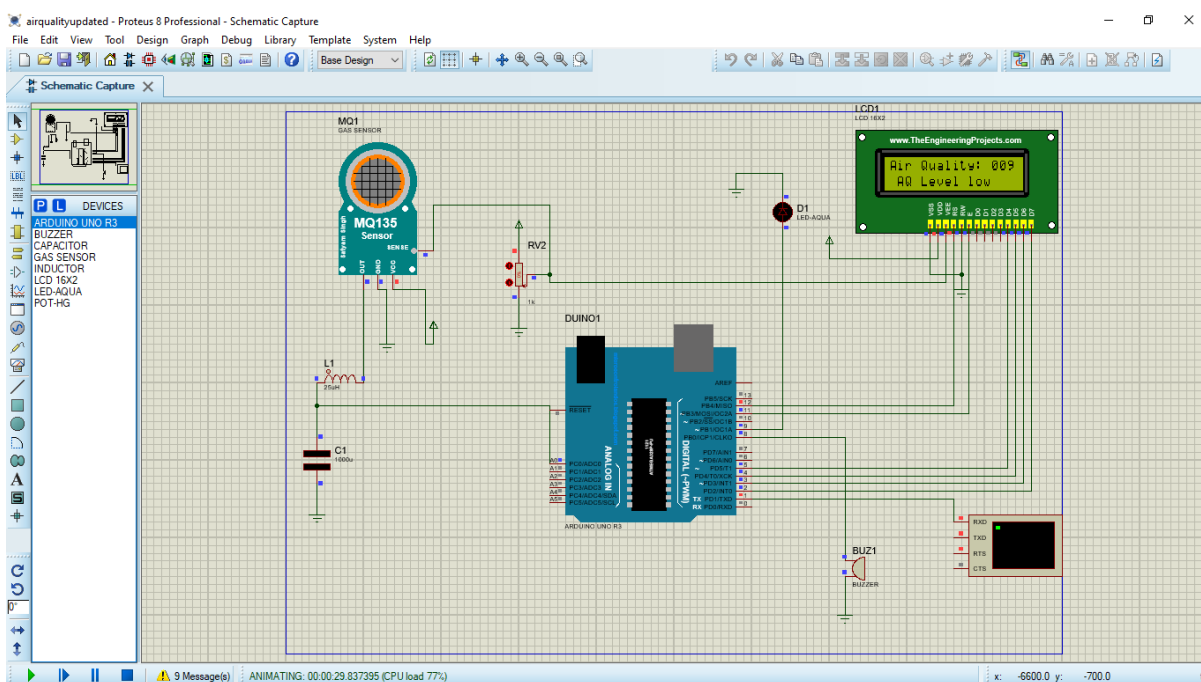
METHOD AND METHODOLOGY

To implement the method there are many different types of technologies and ways.But we have opted for the motive of the Air quality management system using Arduino as it is very efficient and easy process to get the concentration of the particulate matter (PM) in the form of PPM (parts per million). This method we have considered is very less expensive and in addition to this it is an easy go technique where we can get our desired applications to happen.

RESULTS

Here the Air Quality is measured in terms of ppm (parts per million). If the ppm is greater than the threshold value that we have fixed, Then the LED blinks, and Buzzer turns on and prints "AQ LEVEL HIGH" If its high particulate matter is high and the air is impure and needs to be purified.

If the ppm is less than the threshold value, Then we turn off LED, and Buzzer turns on and prints "AQ LEVEL LOW" If its high particulate matter is high and the air is impure and no need to be purified.

CONCLUSION

As the air pollution is increasing day by day due to human activities, it is desirable to take measurements to resolve the problem on the basis of the particulate matter present in the atmosphere. In our project, various techniques for measuring the particulate matter concentration are analysed. Compared to the others. The circuit for the air quality management system has been designed using Arduino Uno, MQ135 messenger and other components through and Arduino software is such a way that it shows that particular concentration in PPM. Stimulation results suggest that the proposed design of air quality management system using Arduino

has less circuit complexity and high performance compared to other techniques that can be incorporated in higher applications. The proposed method is used in both indoor and outdoor air quality monitoring.

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