IOT BASED INDUSTRIAL AIR QUALITY POLLUTION MONITORING SYSTEM USING ARDUINO

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ABSTRACT

The majority application of air pollution monitoring systems is in industries. The main objective of our project is to design an efficient & to control the parameters causing air pollution to minimize the effect of parameters & make life easier & control industrial appliances by using Arduino UNO (microcontroller). For controlling harmful gases is increases So we detected by MQ6 sensor we get the alert on "IOT web page", SMS alert & email alert. Harmful industrial accidents can be prevented by implementing of Analog sensor like LM35 (temperature sensor), MQ6 (gas sensor) & MQ9 (Carbon monoxide sensor).

Keywords: Microcontroller (Arduino UNO), LM35, MQ9.GSM SIM 800L, FAN Cooling, SPDT Realy,16*2 LCD Display.

I.   INTRODUCTION

The main objective of IOT pollution monitoring system is that the Air pollution is rising issue these days It is compulsory to monitor air quality and keep it controlling the harmful gases like carbon monoxide. For healthier & happy future we detected the harmful gases by using Arduino so we detected the problem of increasing gases in industries & save control. The growth of population increases day by day and with the increase in the automobiles and Industries the atmospheric conditions are considerably deteriorating day by day. Risky effects of pollution include several allergic reactions causing irritation of the eyes, nose and infections of the throat. It can also lead to inflammation inside lungs paving way to problems like heart diseases, pneumonia, lung & asthma. These pollution related issues can be detected & alert detection. We some percentage of risky effects can be reduces by using the air pollution monitoring system & control.
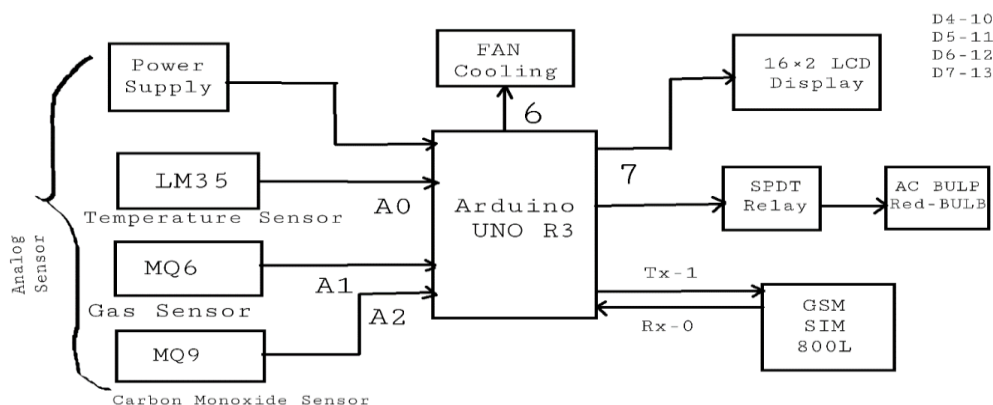
II.   BLOCK DIAGRAM

Figure 1: Block Diagram

The design involves analog sensor for alert & which provide high security features. Various components are required to design & implementation are described following subsections.

2.1 Microcontroller (Arduino UNO)

Arduino UNO is a microcontroller board based it converted analog data to digital data. It works like a microcontroller connected to a computer with a USB cable & power with an analog converter to a digital

converter adapter. Arduino took analog data is converted it into digital that should be display character on the LCD. Arduino is used as security to monitoring air pollution. Its accuracy is easily adjustable.
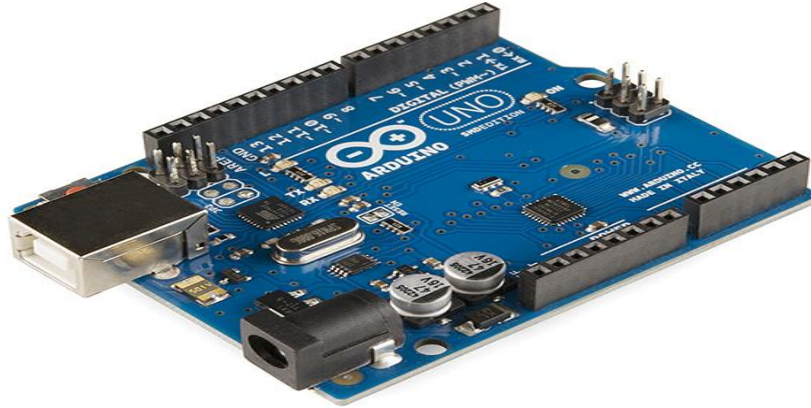

Figure 2: Arduino UNO R3

2.2 Liquid crystal display

An LCD may be a tool used for visual display of the output and whatever process is going on that should be display on LCD display. An LCD is required during this project to display various messages to user and thus making the device hand. In project when GPRS enable this LED is blinking.

Figure 3: Liquid crystal display

2.3 Temperature sensor LM35

Temperature sensor LM35 is integrated circuit temperature sensor it operates over -55 degree to +150 degree. LM35 is a analog sensor which give the analog data to Arduino.
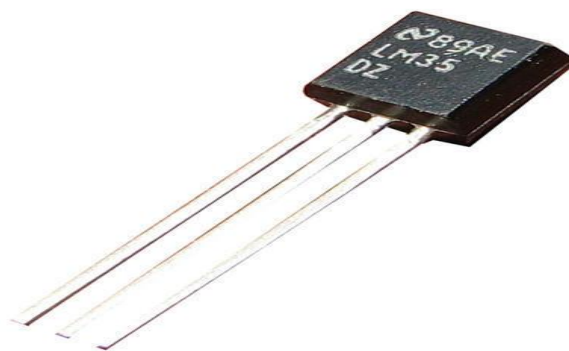

Figure 4: Temperature sensor LM35

2.4 Gas sensor MQ6

Gas sensor MQ6 used in highly industries for gas leakage detection. Gas sensor high sensitivity to LPG.

Figure 5: Gas sensor MQ6

2.5 Carbon monoxide sensor MQ9

Sensor is highly sensitivity to combustible gas It has long life & low cost. we used from the carbon monoxide detection.

Figure 6: Carbon monoxide sensor MQ9

III.   WORKING

To start Air monitoring system giving a power supply to the analog sensor giving the analog input data to the Arduino. The Arduino is taken analog data is converted into digital should be displayed on LCD16*2 Display. Whatever process is going on that should be displayed on the LCD display. Fan connected (cooling fan) to the sixth PWM technique when temperature raises down fan speed control. Carbon monoxide detected SPDT Delay red bulb is ON. Here we are using one GSM SIM 800l & we sending the data over the internet with the SIM card. We are sending the data IOT web page, here we are using IoT web page IOT based air quality pollution monitoring system temperature, MQ6 gas sensor, MQ9 carbon monoxide sensor. All giving the AT command GPRS sending microcontroller board to GPRS enable. Once a GPRS enables this LED is blinking. The temperature is 25 degrees Celsius then fans are rotating slow. When the temperature increases fan is rotating fast speed also increases. when the temperature is maximum speed up to 60 degrees Celsius & above SMS alert & email alert. GPRS sending data to server and webpage display. when we going to increase gas using liters sending data MQ6 to web alert, SMS alert & email alert.MQ9 carbon monoxide is sending data, if carbon monoxide is high bulb will be ON & sending data to a server give the alert by SMS, email, web alert.

IV.   RESULTS AND DISCUSSION

The main aim of this technique is to reduce respiratory health problems related to industrial activities. The focus is on finding solutions to the increasing harmful gases from industrial practices in the country. We can risky effects can be reducing detected the gases. The focus is on the health of the people & environment. To save the life of minerals and water, plants. Lastly, hope that our concept of the project can decrease the risk of harmful gases and bring new technology that can be a great way for air pollution monitoring system.

V.   CONCLUSION

The IoT air pollution monitoring system & control concept can be applied to a wide range of applications. We implemented the use of IoT as industrial pollution monitoring & controlling system. IoT-based air pollution monitoring is proposed to measure the quality of air. The noise sensor is used to measure various parameters. The implementation cost is very economical as the sensors & the microcontroller are easily available. Every industry whether small scale or large scale should be used for that system monitor & control. First one safety is

important in the industries. We done this project is keeping in mind the small-scale industries and hence it is affordable the safety & there is no risk of harmful gases. We fully focus on safety alerts for protection from harmful gases.

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