IOT Based Air Quality Monitoring System

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Abstract- *The air quality is monitored by using MQ135 sensor and its senses gases like NH3, CO2, ALCOHOL, BENZENE and SMOKE. The output is shown in graphical mode and also sound alarm is given to the user if the air quality goes below certain predetermined levels.*

I. INTRODUCTION

In every nation the air pollution is the biggest problem, whether it is developed or developing country. In developing countries health problem increases fastest rate because of industrialization and vehicles. The air pollution causes the diseases like irritation of the throat, eyes and nose and some serious problems like bronchitis, heart diseases, pneumonia, lung cancer and aggravated asthma. According to a survey, 50,000 to 100,000 premature deaths per year occurs in United States alone and also in European region, it reaches to 30,000 and over 3,000,000 worldwide due to air pollution.

II. LITREATURE SURVEY

In the exist paper, they sense the gases like ammonia (NH3), nitrogen oxides (NOx) benzene, smoke, CO2 by MQ135 sensor and display the air quality in PPM (parts per million).But doesn't give the details of the level of each gases. In our proposal model, we display the level of each gases in the LCD Display as well as stored in a database for future analysis to take corrective measures to mitigate the air pollution problem. We also display as graphs in the web page also.

III. HARDWARE REQUIREMENTS

- MQ135 Gas sensor
- Arduino Uno
- Wi-Fi module ESP8266
- 16X2 LCD
- Breadboard
- Regulator
- Buzzer

IV. COMPONENTS DESCRIPTION

MQ 135 SENSOR:

MQ135 sensor is agreeable for sensing ammonia (NH3), itrogen oxides (NOx) benzene, smoke. This sensor can be sized, measure a variety of harmful gases and is a low-cost sensor for a variety of applications. It is also having the following features. 1. fast response and high sensitivity,2. stable and long Life. 3.Wide detecting scope.

Fig 1:MQ 135 sensor

16X2 LCD Panel:

LCD is a flat-panel display, it doesn't discharge a light directly, alternatively using a blacklight or reflector to create an image in colour or monochrome. It's operating voltage range between 4.7V to 5.3V. LCD can work on both 8-bit and 4-bit mode. LCD is obtainable in Green and Blue backlight.

Fig 2:16*2 LCD

Arduino Uno:

The Arduino Uno is a microcontroller board having root of ATmega328. It holds everything to support the microcontroller, simply bind it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get begin.

Fig 3:Arduino

WI-FI module ESP8266:

ESP8266 is a Wi-Fi enabled system on chip module developed by Espress if system. It is mostly used for development of

Internet of Things embedded applications.

Fig 4: WI-FI module ESP8266

BUZZER:

A buzzer is an audio signalling gadget. Whenever the air quality goes to a substandard level, the buzzer starts horning and specifies danger.

Fig 5: BUZZER:

WORKING EXPLANATION:

The MQ135 gas sensor specified the data of air. The MQ135 sensor can sense NH3, NOx, alcohol, Benzene, smoke, CO2. So it is a dynamic gas sensor for our Air quality Monitoring system. When it will be connected to Arduino then it will sense all gases, and it will give the Pollution level in PPM. The sensor gives as values between 0 to 30 which means air condition is great, values between 31 to 50 which means air condition is good, values between 51 to 100 which means air condition is moderate, values above 100 which means air condition is substandard level. If the value is in between 101 and 150, the buzzer starts beeping. The values of ppm and the condition of air is displayed in LCD as well as in webpage.
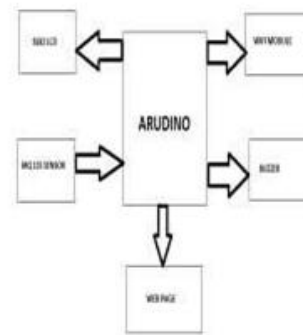

Fig 6:Block diagram

V. RESULT

The output is displayed in webpage and LCD as shown in fig:7
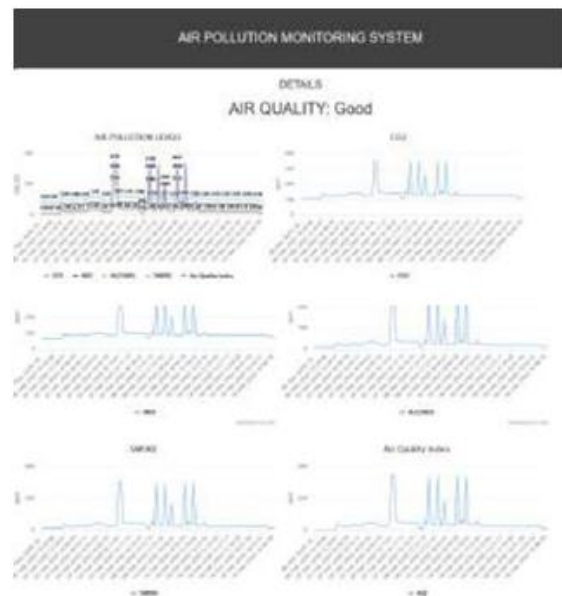

Fig 7:Output

VI. CONCLUSION

This system shows the air quality for small variations also. The user can easily understand the different levels of poisonous gases and this system assists the user to take correct measures to reduce the air pollution.

REFERENCES

[1] Harsh N. Shah, Harsh N. Shah, Harsh N. Shah, IOT Based Air Pollution Monitoring System, International Journal of Scientific & Engineering Research Volume 9, Issue 2, February-2018 ISSN 2229-5518.

[2] Bathiya, B., Srivastava, S., & Mishra, B. (2016). Air pollution monitoring using wireless sensor network. 2016 IEEE International WIE Conference on Electrical and Computer Engineering (WIECON-ECE).19-21 December 2016, AISSMS, Pune, India.

[3] Gagan Parmar, Sagar Lakhani, Manju K. Chattopadhyay, An IoT Based Low Cost Air Pollution Monitoring System, Proceeding International conference on Recent Innovations is Signal Processing and Embedded Systems (RISE -2017) 27-29 October,2017.

[4] Anil.H.Sonune, 2S.M.Hambarde, Monitoring and Controlling of Air Pollution Using Intelligent Control System, International Journal of Scientific Engineering and Technology ISSN:2277-1581Volume No.4 Issue No5, pp: 310-31301 May. 2015.