AIR QUALITY MONITORING SYSTEM USING ARDUINO

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Abstract - Now a days the pollution level has increased because of increase in population, increase in vehicles, industrialization, urbanization etc. and which result in health of human being. So in this project we are going to develop an air quality monitoring system by using Arduino which can help you to monitor the quality of air that is fresh air or poor air available in Area.

Key Words: **Internet of things, sensors, air quality system, Arduino etc.**

1. INTRODUCTION

Main objective of IOT Air Monitoring System is that the Air pollution is a growing issue these days. It is necessary to monitor air quality and keep it under control for a better future and healthy living for all. Due to flexibility and low cost Internet of things (IOT) is getting popular day by day. With the urbanization and with the increase in the vehicles on road the atmospheric conditions have considerably affected. Harmful effect of pollution is directly done on human. Monitoring gives measurements of air pollutant in the ppm format and which can then be analyzed interpreted and presented. Analysis of monitoring data allows us to assess how bad air pollution is from day to day.

1.1 Arduino

Arduino is an open source electronics platform based on easy to use hardware and software. Arduino is the heart of this project which controls the entire process. Arduino boards are able to read inputs and turns it into output. It has 14 digital input output pins. All Arduino boards are completely open-source, empowering users to build them independently and eventually adapt them to their particular needs .The software, too, is open-source, and it is growing through the contributions of users world wide.

1.2 sensors and Wi-Fi Module

MQ 135 Gas sensor- MQ 135 gas sensor can monitor the different types of toxic gases sulphide, ammonia, and co2.

MQ7 Gas sensor- MQ 7 gas sensor used to detect the carbon monoxide.

MQ3 Gas sensor -MQ 3 gas sensor used to detect the specially alcohol.

ESP8266 WI-FI module-

The ESP8266 Wi-Fi Module is a self contained SOC with integrated IP protocol stack that can give any microcontroller access to your Wi-Fi network. Wi-Fi module is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Every ESP8266 module comes pre-programmed with an AT command set firmware, meaning, we can simply connect to the Arduino device. The ESP8266 module is an extremely cost effective board..
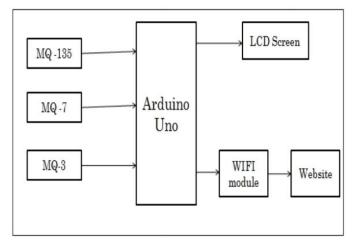
2. Modules

2.1 Air quality:

To check the quality of air, MQ135 and MQ7 sensors are used. The MQ135 sensor can sense NH3, NOx, alcohol, Benzene, smoke, CO2 and some other gases, so it is perfect gas sensor for this Project.

2.2 Air pollution monitoring system:

The main aim of this project to develop a device which can monitor PPM in air in real time. Tell the quality of air and log data to a remote server (Arduino IDE).The air monitoring device developed in this project is based on the Arduino Uno. The Arduino board connect switch Arduino IDE platform using ESP8266 Wi-Fi module. The sensor used form monitoring the air pollution is MQ-135gas sensor. The sensor data is also displayed on a character LCD.

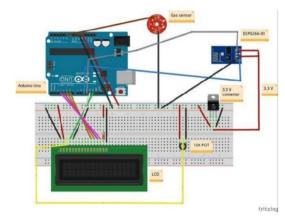**2.3 Block diagram:**

3. IMPLEMENTATION

We start with connecting the ESP8266 with the Arduino. Connect the TX pin of the ESP8266 to the pin 10 of the Arduino and the RX pin of the esp8266 to the pin 9 of Arduino through the resistors. ESP8266 Wi-Fi module gives your projects access to Wi-Fi or internet. It can communicate with microcontroller and it is the most leading devices in the IOT platform. Then we will connect the MQ135 sensor with the Arduino. Connect a buzzer to the pin 8o of the Arduino which will start to beep when the condition becomes true. The MQ135 sensor can sense NH_3, NO_x, alcohol, Benzene, smoke, CO_2 and some other gases, so it is perfect gas sensor for our Air Quality Monitoring Project. When we will connect it to Arduino then it will sense the gasses and we will get the Pollution level in PPM (parts per million).

MQ135 gas sensor gives the output in form of voltage levels and we need to convert it into PPM. So for converting the output in PPM, here we have used a

Library for MQ135 sensor. Sensor was giving us value of 90 when there was no gas near it and the safe level of air quality is 350 PPM and it should not exceed

1000 PPM. Whenever the value will increase 1000 PPM, then the buzzer will start beeping and the LCD and webpage will display "Poor Air, Open Windows". If it will increase 2000 then the buzzer will keep beeping and the LCD and webpage will

Display "Danger! Move to fresh Air".

4. CONCLUSIONS

The authors can acknowledge any person/authorities in this section. This is not mandatory.

The system to monitor the air of environment using Arduino micro-controller, IOT Technology is proposed to

Improve quality of air. With the use of IOT technology enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. Here the using of MQ135 gas sensor gives the sense of different type of dangerous gas and arduino is the heart of this

Project which controls the entire process. Wi-Fi module connects the whole process to internet and LCD is used for the visual Output. The Automatic Air Sound management system is a step forward to contribute a solution to the biggest threat. The air sound monitoring system overcomes the problem of the highly-polluted areas which is a major issue. It supports the new technology and effectively supports the healthy life concept. This system has features for the people to monitor the amount of pollution on their mobile phones using the application.

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