



## ARDUINO BASED AIR QUALITY MONITORING SYSTEM USING ESP8266

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### ABSTRACT

India is one of the countries which is facing air pollution and is unable to maintain air quality. Even though many technologies are developed for controlling air pollution, preventing it in an early stage would be easy to maintain the ecosystem. Our project comes under prevention or identification in the early stage. Our project is based on sensors like the MQ135 gas sensor and Modules like the Wi-Fi module ESP8266, with help of the Wi-Fi module we can view the air quality in Parts per Million(PPM) in your browser.

**Keywords-** *MQ135 gas sensor, Wi-Fi module ESP8266, PPM.*

### I.INTRODUCTION

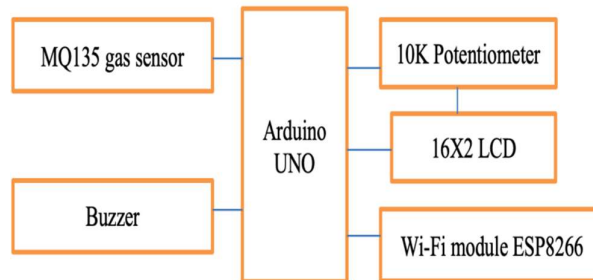
Air defile can be characterized as the proximity of moments that bothers the working of common procedures and further creates unfortunate well-being impacts. Oncontrarilydefile can influence the characteristic aeon and furthermore it can irritate the well-being of a person,modernization and automation are generallywhich is getting furnished everywhere. Air Pollution is the one which is citable to worry over the world and World Health Organization has built up adistinct rules to confine the break-off points of specific gases like Ozone, Nitrogen dioxide, and Sulphur dioxide. They show ideal firm grade and are practically estimated over a wide scope of air toxins. Asfrom our project we can expect that our result would be near the approximated value with the actual value in PPM, with this everyone can maintain air quality without waiting for the news from air quality management and can take necessary precautions to prevent air pollution.

### II. RELATED WORK

In the earlier years, the contamination levels because of various ventures and urbanization have been rising significantly, making it urgent to have a trusted and innovatively propelled method for estimating and observing probably the most vital air components, including CO<sub>2</sub>, clean, and temperature, to have the capacity to monitor how a portion of the present progress acts, for example, woodlands cutting, expanded utilization of vehicles and other mechanical acts imperil our wellbeing as well as the earth. In Wireless Air Pollution Monitoring System, a numerous proposed work are

there which requires software that are not user friendly and are to be maintained by respective profession .Our project is to place over cities and a user friendly model. Other models like cloud based requires space and many can't afford. Ours are simple and economical one with a great lifespan.

### III. Block Diagram of Proposed Work



### IV. Description of Components

#### A. Arduino

Arduino is an open-source electronic platform which requires software to program it. Arduino is designed to make electronics more accessible to anyone who are interested in creating interactive objects or environments. An Arduino board can be purchased pre-assembled or because the hardware design is open source, built by hand. Either way, an user can adapt the boards to their needs, as well as update and distribute their versions.

#### B. MQ135 Gas sensor

The MQ-135 Gas sensor can detect gases like Ammonia (NH<sub>3</sub>), sulphur (S), Benzene (C<sub>6</sub>H<sub>6</sub>), CO<sub>2</sub>, other harmful gases and smoke. Similar to other MQ stream gas sensors, this sensor also have digital and analog output pin. When the level of these gases go beyond a limit in the air the digital pin goes high. This value can be set by using the on-board potentiometer. The analog output pin, produces an analog voltage which can be used to relative the level of these gases in the atmosphere. The MQ135 air quality sensor module are handled at 5V and consumes about 150mA. It requires some warm up before it could actually give accurate results.

#### C. Wi-Fi Module ESP8266

The ESP8266 Wi-Fi Module is a aloof SOC with integrated TCP/IP protocol stack that can offer any microcontroller to be fit for your Wi-Fi network. The ESP8266 is capable of one of two hosting an application or offloading all Wi-Fi networking functions from another application processor. This module contains a single-chip CPU, GPIO pins, analog pins, I2C and SPI pins.

#### D. Buzzer

**A buzzer is an audio producing device, which may be mechanical, electromechanical or piezoelectric. Usually, a buzzer is used in alerting systems which requires a sound or noise to inform a person either direct or indirect.**

### G. 16X2 LCD Display

LCD is an electronic presentation component .it used in a widevariety of applications.16x2 LCD that means demonstrate alphabets in two lines every line16 character

### VI. Result and Conclusion

MQ135 Sensor taking air as input and analyses the gas particles: We have used the MQ 135 sensor for detecting the harmful gasses air and the ESP8266 Wi-Fi module to send the data to webpage. When the power supply is given to Arduino the sensor will turn on and it will send the data to Arduino. The data will be viewed in your webpage with the IP address given by ESP8266 module and you can refresh the page to know the current value. User can discern the air quality in the lcd display.

### VII. Future development

This project can be implemented using Wi-Fi module which displays the air quality index on a web server incessantly. The server is public whichcan be accessed by everyone, anytime and it can keep them informed about the air quality of a desired location. We can also connect multiple products and display the air quality index of multiple areas and compare them to find which area is more polluted and which one is cleaner. We can also use the GSM module to send messages to users when the air quality goes above a particular limit i.e. the citizens can be alerted if the air quality index goes above 300 and the air quality turns bad. Many won't consider the use age of cloud due to its storage price, instead one can get an e-statement of a particular period of time.

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