International Journal of Emerging Trends in Science and Technology
7(2) December 2021, 37-40
http://www.publishingindia.com/ijetst

Real Time Air Quality Analyzing System

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Abstract:

The air quality is pre-dominate part of human health and its influence on life expectancy overall is very curial. In our project, we classify the quality of air through a series of sensors which are particular for analyzing the levels of harmless in the air. There is an algorithm which filters that classification as good, moderate and harmful. The occurrence of injurious gas decides the nature of the air and these classifications can be predicted occasionally by calculating the amount of SO2 and N02. These calculation and categorized data goes to the public knowledge where the accessibility of such details are effortless. Through the IOT device to identify the quality of air. The Programmable Interface Controllers is used to representative signals from sensors to LCD and IOT by converting than the monitoring can be useful for betterment of the environment.

Keywords: Quality, IoT, Node, Sensor

I. INTRODUCTION

Pollution is the unwanted constituent part mixed in the atmosphere and affects the environment. Pollution is classified into many ways such as air pollution, water pollution, light pollution etc. This article contains with air pollution, air pollution is effected due to the emission of poisonous gases in the air.

The emission of toxic gaseous leads to smoke, smog and acid rain. The injurious gases effects for human body for that the harmful gases create cardiac related problems, cancer, and breathing troubles.

In manufacturing company's Sulfur dioxide and Nitrogen Dioxide gas range is high. In garbage collection station methane gas range is too high. The Modernity is major cause for contamination. The main cause of air pollution

Carbon Monoxide: A Carbon Monoxide that creates from the burning of fuels, usually in automobiles. It is affects the human body feeling faint and drained and gives them headache. Carbon Monoxide is unscented, poisonous, colorless, and flammable gas and it is present in the air in less amounts.

Toxic air pollutants: The Toxic air pollution can be produced in biochemical plants. The toxic gases are emitting while oils are flamed. It is main reason for human cancer. Other harmful gases create birth problems.

Nitrogen Dioxide: Fuel explosion for example automobile, electronic services, firewood burnings. This is the reason of lungs related problems.

Sulfur Dioxide: It originates from boiling of high sulfur fuel in addition to natural disasters.

Monitoring and recognition of dangerous gases is very important. Since human body has a very limited recognition of gases such as nitrogen, N2. Human being is able to notice limited amount of fusion of gases .It is very difficult to distinguish the various percentages of each gas individually

Objectives

Owing to the increase of automobiles and companies quality of atmosphere has gone very worst and it disturbs to all the living things.

Diseases like Breathing disorders and respiratory problems have enlarged children's less than ten. Chimney from various Manufacturing companies produce lots of injurious gases, though the real time air quality analyzing device is recognized in most parts of the universal.

Rapidly increasing in various manufacturing companies has produced a major atmosphere pollution problem. It is creates a harmful atmosphere around the companies and plunders the of the human. The recent evolution of technology, measure the harmful substance in the atmosphere particles.

The main goal is to develop a system which can be analyzing the amount of injurious particles in atmosphere using the MQ135 sensor. The quality of air can be measured by the IOT dedicated server.

When the harmful elements in the atmosphere like Carbon dioxide, marsh gas, methanol, benzol increases an alarm will be triggered. Air quality in Part per Million is showed on the web server. This system can be applied anyplace and when pollution across the safe area some external devices can be activated, like displaying an alert message over the LCD.

II. Existing System

The existing system can make use of GSM module, the model was designed with basic functionalities, and it allows the finding of pollution and informs the customer via message.

Comparison of real time air quality analyzing system for each tie slot cannot be done. And it can identify the limited Number of toxic gasses in the presence area.

Disadvantages

- It is very expensive.
- Limited gasses only it will be monitor.
- High cost around 10k to 1akh.
- Required more time and space to operate
- Maintenance is difficult
- Limited gases only Monitor

III. Proposed System

Real Time Air Quality Analyzing System is used to manage the web server using Network and will generate the alarm to judge the quality of the air. The amount of harmful gases presents in the air like Carbon dioxide, fire burning, methanol, benzol and ammonia. This system will be observing the atmosphere quality in parts per million and web server.

Applications

- Manufacturing companies perimeter will be monitoring
- Indoor air quality will be analyzed
- Site selection for reference stations.
- Making the data available to the customer

Advantages

- Implement in Cloud network
- Updates On Cell phone
- Perfect Pollution monitoring
- Remote location monitoring

IV. Module Description

4.1 Node MCU Microcontroller

It is open source software. It is fully based on Lua based firmware. It is mainly used for Internet of Things based Applications. This firmware works on ESP8266.This controller based on the ESP-12 module.
It is an electronic chip. A microcontroller contains many Central Processing Units contains with memory and programmable input and output devices.

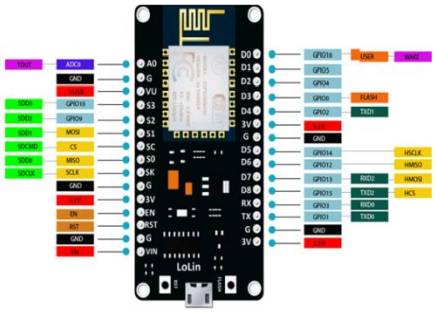

Figure 1: Node MCU

4.2 BMP 280 Sensor

This Sensor is mainly designed for mobile applications. The sensor module is used in an extremely compact package. Digital Pressure Sensor is having small dimension. It is mainly used less power consumption and implementation in less battery usage devices

BMP 280 Sensor is supported on piezo-resistive pressure sensor technology. It does provide the highlighting accuracy and linearity in addition to long term stability and high robustness. There is a number of devices operation options provided highest accuracy related to filter. consumption, resolution.

It is provides fast accurateness over a wide temperature range. It is high response time for fast context alertness. The pressure sensor is having high accuracy and less noise.

The integrated temperature sensor has been enhanced for low sound and uppermost determination. This output is fully based on the temperature compensation. The humidity sensors are used for finding the temperature.

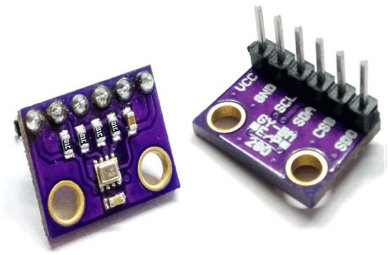

Figure 2 BMP 280 Digital Pressure Sensor

4.3 PMS3003 G3 Particle Sensor

Comparatively PMS1003 and PMS3003 is mechanical size detection sensors. Both sensors are having same electronic equipment's. This sensor is replaced a simple hole over the diode.

This sensor is finding the world particle sensor; it is creating to find the most number of adjourned elements in the atmosphere.

The sensors can be added in a variety of ways of environment based instruments suspended particles matter in the air, to provide timely and accurate concentration data.

Features

- Measuring range of data in 0.3 to 1.0 and 1.0 to 2.5 and 2.5 to 10 *(mm)*
- Data counting efficient 50% to 98%
- Response time 10 sec
- DC supply voltage 5v
- 120 MA of operating current
- Temperature range -20 c to 50 c
- Operating humanity range 0 to 98%
- Size 65*42*23 mm

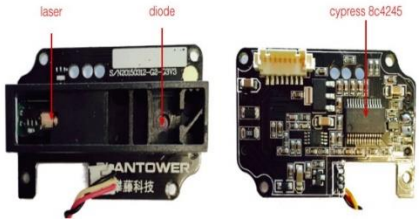

Figure 3 PMS 3003 G3 Sensor

4.4 MQ 135 Gas Sensor

This sensor applies Sulfur dioxide which has a lesser conductivity in the clear atmosphere as a gas observed substance. In an ambiance where there may be polluting gas,

the conductivity of the gas sensor raises along with the absorption of the polluting gas increases.

The MQ-135 sensor. This Sensor performs a good discovery to smoke and other injurious gas, especially finding to ammonia, sulfide and benzene steam. Its ability to find various poisonous gas and lower cost make MQ-135 an ideal excellent of different applications of gas detection.

Features

1. Easily detecting the particles
2. Less Expensive
3. Good Accuracy

Application

It is used for analyzing the air quality in online. With the help of this sensor finding Azane, Nitric oxide, methanol, Benzol, carbon dioxide etc.

4.5 MQ-2 Semiconductor Sensor

MQ-2 gas sensor is used find the less conductivity in atmosphere. Normally conductivity is higher than while gas concentration arising. Kindly use the simple electro circuit for convert resembles output signal of gas prediction

This sensor has high compassion to cooking gas,c3h8, and H2. This is mainly used to CH4.It is very low cost and suitable for various applications.

Character Configuration

1. Easy to find the Flammable gas
2. High ways to analyze LPG, Propane and Hydrogen
3. Less Expensive
4. Simple device circuit

Application

1. Home gas leakage detector
2. Industrial Flammable gas detector
3. Transportable gas detector

4.6 MQ-7 Semiconductor Sensor

This sensor has less conductivity of cleaning the atmosphere. This sensor easily predicts the high and low heat, and detects Carbon dioxide.

This sensor has high accuracy to find the Carbon Monoxide. This is mainly used to detect various gases contains CO, low cost and adapted for various applications.

Character Configuration

1. Easy to find the Flammable gas
2. Very high sensitivity
3. Low cost and long Life
4. Very Simple

Application

1. Gas outflow Predictor
2. CO2 detector
3. Port able gas finder

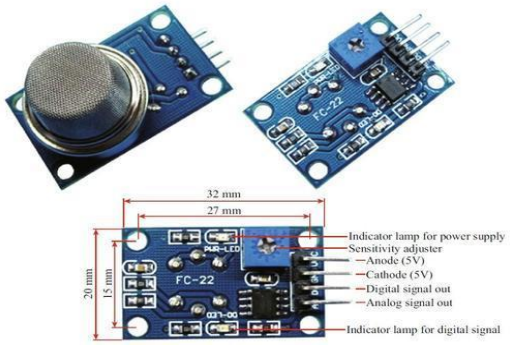

Figure 4 MQ 135 Gas Sensor

4.7 LCD Display

Liquid crystal display has substance which combines the possessions of both crystals and liquid. They have a high range in the molecules are almost as movable as they liquid, but are grouped together in an order form of crystal

Figure 5 LED display

V. CONCLUSION

This article which deals about the happiness of the humanity which should be recipient for all the peoples by keep away from themselves from pollution, Sensors which are associated with this many types like co sensor, CO2 sensor, NO2 sensor, SO2 sensor and CH4 sensor. Considering the major pollution effects which is commonly found to exist in our society the proposed hardware model will be another device to safe guard people in the society and give them awareness about the level of Pollution and ways to protect themselves. Hence our proposed system will be beneficiary to the peoples in our society to prevent themselves from the effects of unsafe gas.

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