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SMART AIR QUALITY MONITOR

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ABSTRACT:

The level of pollution has increased with times by lot of factors like the increase in population, increased vehicle use, industrialization and urbanization which results in harmful effects on human wellbeing by directly affecting health of population exposed to it. In order to monitor In this project we are going to make an IOT Based Air Pollution Monitoring System in which we will monitor the Air Quality over a web server using internet and will trigger a alarm when the air quality goes down beyond a certain level, means when there are sufficient amount of harmful gases are present in the air like CO2, CO, LPG GAS and also used a temperature and humidity sensor. It will show the air quality in PPM on the LCD display and as well as on webpage so that we can monitor it very easily. In this IOT project, you can monitor the pollution level from anywhere using your compact device.

Keywords – Air quality measurement, Arduino Uno, Internet of Things (IOT).

I.INTRODUCTION

Air pollution has become a common phenomenon everywhere. Especially in the urban areas, air pollution is a real-life problem. A lot of people get sick only due to air pollution. In the urban areas, the increased number of petrol and diesel vehicles and the presence of industrial areas at the outskirts of the major cities are the main causes of air pollution. The problem is seriously intensified in the metropolitan cities. Also, the climate change is now apparent. The governments all around the world are taking every measure in their capacity. The presence of extra unwanted biological molecules, particulates or other harmful things into the earth atmosphere. It is a major cause of infections, allergies, and eventually reasons of death to some peoples and also have ever wondered about the quality of the air you are breathing, Poor air quality can lead to many negative health effects as well as can cause tiredness, headaches, loss of concentration, increased heart rate and so on. It also harms to other existing creatures like that animals as well as food crops, or the ecological or built environment. They are also accountable for various kinds' respiratory infections (like asthma), causes of different types of cancer in individuals, if they are unprotected to these toxins or chemicals for long period of time. For example, carbon monoxide (CO) is extremely poisonous to people as it may happen serious asphyxiation, headaches because of the composition of carboxyl-hemoglobin and thus a reason of death if unprotected for a long time. The similar approximation roughly equaled by the International Energy Agency (IEA) also these chemicals or pollutants are also responsible for various environmental calamities like acid rain and depletion of ozone layer. Because of a number of anthropogenic actions, air pollution is on the growth and its

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controlling is of significant importance to alleviate particular actions to limit it .In the past, the air quality measuring sensors were very big, non-portable and expensive. Presently, most air pollution sensors developed on CO, CO2, TEMP and HUM. In today's world, air pollution and quality monitoring are really vital as it has a great effect on human health. The developed air-quality measurement sensor can identify and observe the incidence of air pollution in the adjacent areas. It can be employed for both indoor and outdoor. With the help of future technological improvements, these sensors will become cheaper and more common, inexpensive, portable air-quality sensors.

II. PROPOSED SYSTEM

In our proposed system is used to measure an air quality monitor. It reduce the health issues for many patients. Issues are like breathing problem, headache, lungs problem and loss of concentration and tiredness. We are identifying 2 pollutant gases and gas leakage by using sensors. primary air pollutant gases like carbon dioxide (CO2-MQ135), carbon monoxide CO(MQ-7) and LPG Gas detector sensor(MQ-6) are measured .As well as sensors like Temperature and humidity (DHT22) are used. Thus all sensors will be controlled by Arduino Uno and the output to be sent to the display section. The brain of this project is an Arduino Uno board which in combination with a 3.5" Touch display provides a decent user interface. We can see the measurements from all the sensors in real time, and if we click on a particular sensor, we will get values for last 24 hours from that sensor. The whole process will be highly accurate and we can obtain the real-time output of the sensors.

III.COMPONENTS USED

HARDWARE REQUIREMENTS:

- Arduino
- Sensors: DHT 22 SENSOR, MQ135Air Quality Sensor, MQ6 Sensor, MQ7 Sensor
- IOT Kit
- Alarm
- LCD
- Power Supply

SOFTWARE & LANGUAGE REQUIREMENTS:

- Arduino IDE
- Embedded c
- Html
- PHP
- MySQL

IV. COMPONENTS SPECIFICATION:

DHT22 – TEMPERATURE AND HUMIDITY SENSOR

The **DHT22** is a commonly used Temperature and humidity sensor. The sensor comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data. The sensor is also factory calibrated and hence easy to interface with other microcontrollers. MQ-135 - GAS SENSOR FOR AIR QUALITY

The air quality sensor is also a MQ-135 sensor for detecting venomous gases that are present in the air in homes and offices. The gas sensor layer of the sensor unit is made up of tin dioxide (SnO2); it has lower conductivity compare to clean hair and due to air pollution the conductivity is increases. The air quality sensor detects ammonia, nitrogen oxide, smoke, CO2 and other harmful gases. The air quality sensor has a small potentiometer that permits the adjustment of the load resistance of the sensor circuit.

MQ-6 GAS SENSOR

They are used in gas leakage detecting equipment's in family and industry, are suitable for detecting of LPG, iso-butane, propane, LNG, avoid the noise of alcohol and cooking fumes and cigarette smoke.

MQ-7 GAS SENSOR

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They are used in gas detecting equipment for carbon monoxide (CO) in family and industry or car.

LIQUID CRYSTAL DISPLAY (LCD)

Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

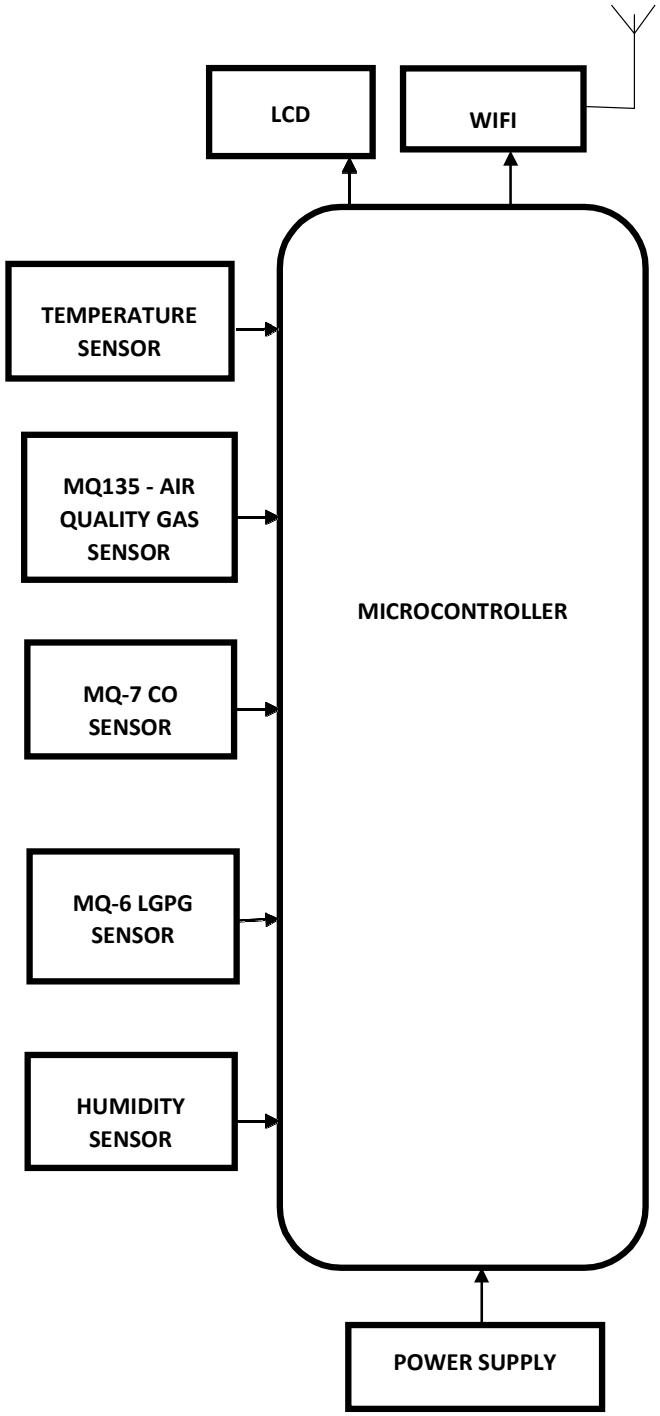
V. WORKING PRINCIPLE

In this project module, the Arduino Uno is programmed for checking by using embedded C language .Four types of sensors namely Co sensor (MQ7), LPG gas sensors (MQ6), CO2 (MQ135), and temperature and humidity sensor (DHT22) are coded and connected with Arduino Uno. Here regulator used for voltage regulation.ESP-01(Wi-Fi module) is used for internet connection and communication services, which is connected to the Arduino Uno. When the ESP-01 is connected to LCD display which is connected to the Arduino Uno. It shows the text 'Finding Module and after the connection. It shows the text 'Wi-Fi Initiation' by coding. The Measuring values are can be seen by PC or Mobile using Internet and the values are represented by graphical mode. In that graph shows last 24hours measuring values of sensors and it can be seen by each Second.

VI. BLOCKDIAGRAM:

ONLINE MONITORING:

BLOCKDIAGRAM:



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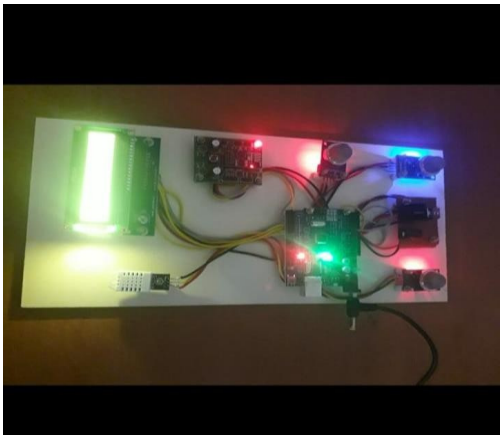
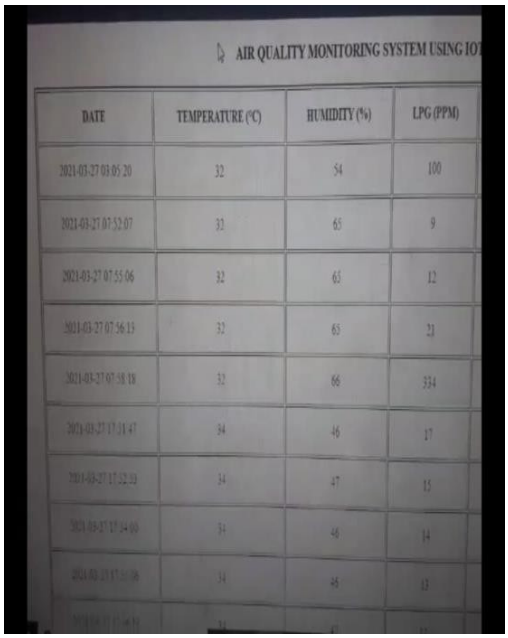
VII. APPLICATION

- Used in Hospitals
- It also used in industrials.
- Used in Houses for detecting Gas leakage

VIII. OUTPUT





IX. CONCLUSION

Air is an important factor for breathing .The air pollution causes stroke,heart disease ,chronic obstructive pulmonary disease lung, cancer and acute respiratory infection to the extreme it causes several million deaths every year.In this project module we have developed a module to detect air pollution and the air quality by measuring pollutant gases in the atmosphere and LPG gas leakage in houses which may be helpful in creating awareness among people.

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