MINI PROJECT – I

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IOT Based Pollution Monitoring System

SYNOPSIS

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About The Project:

The project is iot based pollution monitoring system. The level of pollution is increasing rapidly due to factors like industries, urbanization, increasing in population, vehicle use which can affect human health. IOT Based Air Pollution Monitoring System is used to monitor the Air Quality over a web server using Internet. It will trigger an alarm when the air quality goes down beyond a certain level, means when there is sufficient amount of harmful gases present in the air like CO2, smoke, alcohol, benzene, NH3 and NOx. It will show the air quality in PPM on the LCD and as well as on webpage so that air pollution can be monitored very easily. The system uses MQ135 and MQ6 sensor for monitoring Air Quality as it detects most harmful gases and can measure their amount accurately.

Motivation:

1.To aware the peoples about pollution.

2.To reduce pollution.

3.It increased pollution in indian cities like Delhi and Kanpur.

Description:

The drawbacks of the conventional monitoring instruments are their large size, heavy weight and extraordinary expensiveness. In order to be effective, the locations of the monitoring stations need careful placement because the air pollution situation in urban areas is highly related to human activities (e.g. construction activities) and location-dependent (e.g., the traffic choke-points have much worse air quality than average). IOT Based Air Pollution Monitoring System monitors the Air Quality over a webserver using internet and will trigger an alarm when the air quality goes down beyond a certain level, means when there are amount of harmful gases present in the air like CO2, smoke, alcohol, benzene, NH3, NOx and LPG. The system will show the air quality in PPM on the LCD and as well as on webpage so that it can be monitored very easily. Temperature and Humidity is detected and monitored in the system. LPG gas is detected using MQ6 sensor and MQ135 sensor is used for monitoring Air Quality as it detects most harmful gases and can measure their amount accurately. In this IOT project, it can monitor the pollution level from anywhere using your computer or mobile.

Requirements and Specifications:

1. Hardware Requirement: -

a. Arduino Uno

b. LCD

c. MQ135 Gas sensor

d. MQ 6 LPG gas sensor

e. Humidity sensor SY-H5220

f. Temperature sensor LM35

g. Buzzer

h. Router

a) Arduino UNO: -

Arduino Uno is a microcontroller board based on the ATmega328P It has 14 digital input/output pins 6 analog inputs, a 16 MHz quartz crystal, a USB Connection, power jack, an ICSP header and a reset button.

b) LCD (Liquid Crystal Display): -

This is a basic (16x2) 16 character by 2-line display. Black text on Green background. It is used to indicate the Air and Humidity in PPM.

c) MQ135 sensor: -

The MQ135 sensor can sense NH3, NOx, alcohol, Benzene, smoke, CO2 and some other gases. It gives the output in form of voltage levels.

d) MQ6 LPG Sensor: -

MQ-6 sensor is a simple-to-use liquefied petroleum gas (LPG) sensor, suitable for sensing LPG (composed of mostly propane and butane) concentrations in the air.

The MQ-6 can detect gas concentrations anywhere from 200 to 10000ppm.

e) Humidity Sensor: -

The humidity sensor is of capacitive type, comprising on chip signal conditioner.

However, it is mounted on the PCB, which also consists of other stages employed to make sensor rather smarter.

The PCB consists of CMOS timers to pulse the sensor to provide output voltage.

f) Temperature Sensor: -

The LM35 is precision integrated-circuit temperature sensor, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature.

It can be used with single power supplies, or with plus and minus supplies.

g) Buzzer: -

A Buzzer or beeper is an audio signaling device.

Whenever the air pollution goes above the threshold level the Buzzer starts beeping indicating Danger.

h) Router: -

A wireless router connects directly to a modem by a cable. This allows it to receive information from and transmit information to the internet. The router then creates and communicates with your home Wi-Fi network using built-in antennas. As a result, all of the devices on your home network have internet access.

Software Requirement: -

1. Arduino UNO Software: -

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

2. Embedded C Language: -

Embedded C is a set of **language** extensions for the **C programming language** by the **C** Standards Committee to address commonality issues that exist between **C** extensions for different embedded system.

Applications: -

1) Industrial perimeter monitoring

2) Indoor air quality monitoring.

3) Site selection for reference monitoring stations.

4) Making data available to users.

Advantages: -

1) Easy to Install.

2) Updates On mobile phone directly.

3) Accurate Pollution monitoring.

4) Remote location monitoring.

Conclusion: -

The system to monitor the air of environment using Arduino microcontroller, 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, using the MQ135 and MQ6 gas sensor gives the sense of different type of dangerous gas and Arduino is the heart of this project.

THANK YOU