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VEHICLE POLLUTION MONITOR USING IOT

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ABSTRACT:

Pollution has a significant part in the degradation of our planet. Quick industrialization, rapid urbanisation, rapid population expansion, a dramatic increase in automobiles on the road, and other human activities have disrupted the natural environment's balance. It alters the climate's quality, and season change is caused by build-up of the greenhouse gases in the aerosphere. Global warming, which is produced by the release of greenhouse gases, is one of the most serious environmental issues confronting the globe today. CO2, which is a main component of the circumstances, is causing the globe's surface to warm. Observing and regulating these seasonal changes is a major problem in saving our ecosystem. The transportation sector is a main source of air pollution in urban cities, particularly in growing countries such as India. This project uses multiple sensors, including a gas sensor located at the vehicle's exhaust, to measure pollution limits in real time. The information collected checks the standard limits and is sent to the vehicle operator via the Global System for Mobile Communication module (GSM) and the cloud using Internet of Things (IoT).

I.INTRODUCTION OF PROJECT

In India pollution is the one of the dangerous thing in society. The government is trying to control it but day by day itis going out of control. The Delhi government brought odd even number plate scheme but it does not work well. So we aimed our project to monitor vehicle pollution, by using IoT. IoT is one ofthe most dominating technology of 21st century. IoT means the devices connect with each other using wireless network or internet. In today's era internet has reached everywhere and it has become part of human life. According to a research 20 billion devices have connected with each other using IoT. In our system internet is doing major role along with raspberry pi 3. Raspberry pi 3 is a system on chip device which has developed for IoT application It is a credit card size device. It has 1.2GHz ARM cortex processor. It has 64 bit processor. It has inbuilt 1GB RAM and expandable SD card to install Linux operating system. The system and Raspberry is connected to the internet using Wi-Fi modules and it helps to system to mailtheGPS location to RTO. If pollution has been detected then RTO will warn to user /owner to maintain the vehicle. If user do not maintain the vehicle, then RTO can block his vehicle using IoT.

II.LITERATURE SURVEY

Vehicle pollution monitoring and controlling using IoT, December -2015 BRS.PRASANNA KUMAR1, MADDIRALA SRI RAMA SEKHAR2, MYLA LOVA KIRAN VERMA3

This paper gives us , a novel solution is presented to monitor and control the pollution at the traffic signaling lights. A simple wireless embedded chip is inserted in the personal vehicles to control the ignition on and off remotely. Depends upon the pollution level measured from sensors at the traffic signaling,the operator will send command to the wireless traffic pollution control system. Also a simple radio frequency based embedded chip is

inserted in the personal vehicles to control the ignition on the of remotely via control system at the traffic lights is the best way to reduce the air pollution.

Vehicle Pollution Monitoring Using IoT, 13th-14th march 2017 USHA.S1, NAZIYA SULTAN.A2, PRIYANKA.M3, Dr.SUMATHI.S4 In this paper ,according to recenttechnology developmentin this miniaturization of electronics and wireless communication technology have led to the emergence of environmental pollution sensor network wireless air pollution monitoring system provides real-time information about the level of air pollution. In this regions , as well as provides alerts in case of drastic change in quality of air. This information can then be used by the authorities to take prompt actions such as evacuating people or sending emergency response team. It uses an Air Quality Index to categorize the various levels of air pollution. The system also uses the AQI to evaluate the level of health concern for a specific area.

Development of IoT based vehicular pollution monitoring system, September 2015 RAMAGIRI RUSHIKESH ,CHANDRA MOHAN REDDY SIVAPPAGARI This paper gives us, Wireless sensors are used in most ofthe in real time applications for collecting physical information. The impossible measurements in typical ways have currently become attainable using the wireless technology. In this technology, the measurement of air quality is one of the difficult areas for the researchers. The main source of atmosphere pollution happens due to vehicles. The high inflow of vehicles in urban areas causing more air pollution and decreasing air quality that leads to severe health diseases. The measured data is also shared to vehicle owner, traffic department and agencies of national environment. This system is a low cost and provides good results in controlling the air pollution especially in the urban areas.

III.DESIGN OF HARDWARE

This chapter briefly explains about the Hardware. It discuss the circuit diagram of each module in detail.

ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode. Arduino board has the following new features:

- 1.0 pin out: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. The second one is a not connected pin, that is reserved for future purposes.

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- Stronger RESET circuit.
- Atmega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

Fig: ARDUINO UNO

POWER SUPPLY:

The power supplies are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which performs a particular function. A d.c power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as “Regulated D.C Power Supply”.

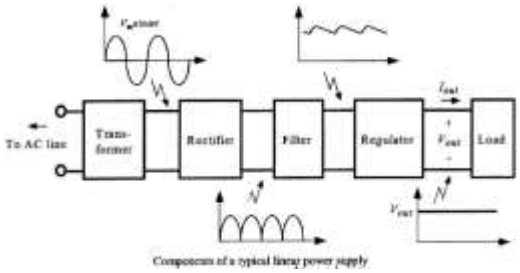

Fig: Block Diagram of Power Supply

LCD DISPLAY

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.

Fig: LCD

BUZZER

Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10milli amps to be operated, the microcontroller’s pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.

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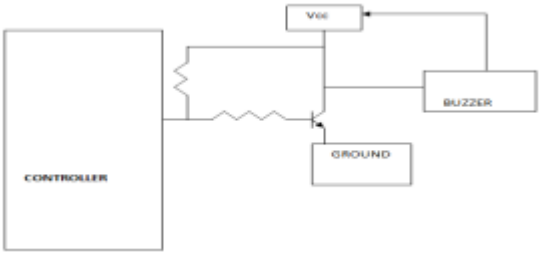


WIFI MODULE:

The **ESP8266** is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems.[1]

The chip first came to the attention of western makers in August 2014 with the **ESP-01** module, made by a third-party manufacturer, Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at the time there was almost no English-language documentation on the chip and the commands it accepted.[2] The very low price and the fact that there were very few external components on the module which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.[3]

The **ESP8285** is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.[4]

The successor to these microcontroller chips is the ESP32.

LED:

A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p–n junction diode that emits light when activated.[5] When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons.

This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. LEDs are typically small (less than 1 mm^2) and integrated optical components may be used to shape the radiation pattern.

Early LEDs were often used as indicator lamps for electronic devices, replacing small incandescent bulbs. They were soon packaged into numeric readouts in the form of seven-segment displays and were commonly seen in digital clocks. Recent developments have produced LEDs suitable for environmental and

task lighting. LEDs have led to new displays and sensors, while their high switching rates are useful in advanced communications technology.

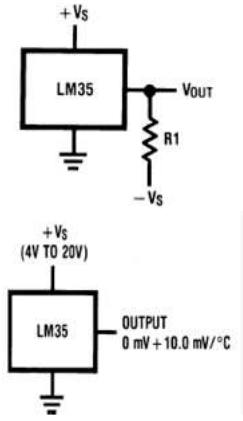
LEDs have many advantages over incandescent light sources, including lower energy consumption, longer lifetime, improved physical robustness, smaller size, and faster switching. Light-emitting diodes are used in applications as diverse as aviation lighting, automotive headlamps, advertising, general lighting, traffic signals, camera flashes, and lighted wallpaper. They are also significantly more energy efficient and, arguably, have fewer environmental concerns linked to their disposal.

TEMPERATURE SENSOR (LM35):

In order to monitor the temperature continuously and compare this with the set temperature preprogrammed in the microcontroller, initially this temperature value has to be read and fed to the microcontroller. This temperature value has to be sensed. Thus a sensor has to be used and the sensor used in this project is LM35. It converts temperature value into electrical signals.

LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 requires no external calibration since it is internally calibrated. . The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4°C over a full −55 to +150°C temperature range.

The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 μA from its supply, it has very low self-heating, less than 0.1°C in still air.



The characteristic of this LM35 sensor is:

For each degree of centigrade temperature it outputs 10milli volts.

ROLE OF LM35:

In this project, the temperature is to be monitored continuously and if the temperature exceeds the set value preprogrammed in the microcontroller, a buzzer indication is provided in the circuit to alert the people in the industry to stop the process immediately. Thus the temperature sensor LM35 has to read the temperature continuously and the microcontroller has to compare this temperature value with the set temperature preprogrammed in it. When this temperature exceeds the set value, the microcontroller sends an indication to the buzzer which gives a loud noise.

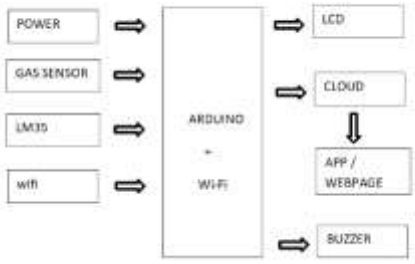
MQ2- SENSOR

MQ2 flammable gas and smoke sensor detects the concentrations of combustible gas in

the air and outputs its reading as an analog voltage. The sensor can measure concentrations of flammable gas of 300 to 10,000 ppm. The sensor can operate at temperatures from -20 to 50°C and consumes less than 150 mA at 5 V.

Connecting five volts across the heating (H) pins keeps the sensor hot enough to function correctly. Connecting five volts at either the A or B pins causes the sensor to emit an analog voltage on the other pins. A resistive load between the output pins and ground sets the sensitivity of the detector. Please note that the picture in the datasheet for the top configuration is wrong. Both configurations have the same pin out consistent with the bottom configuration. The resistive load should be calibrated for your particular application using the equations in the datasheet, but a good starting value for the resistor is 20 kΩ.

IV.BLOCK DIAGRAM:



V.CONCLUSION

The proposed system of monitoring the pollution will reduce the air pollution. This paper gives the technique for vehicular pollution monitoring using IoT.This paper helps to study the existing systems and development for IoT.

FUTURE SCOPE

In this project can add more sensors for accident detection also inbuilt this system to upcoming vehicle

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[4] IoT Based air and sound pollution monitoring system ARUSHI SINGH ,DIVYA PATHAK , PRACHI PANDIT , SHRUTI PATIL ,PRO. PRITI.C. GALAR2