VEHICLE EMISSION MONITORING, DETECTING AND TRACKING USING GPS & GSM

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Introduction

In belgam distinct period of history air pollution is consequential problem in society which anguish to the human health & environment. This is the great problem faced in the urban area. The main pollution to form the vehicle is carbon-dioxide, which can be easily sense by the semiconductor gas sensors. These pollutants are having sensors which impact on the human health affecting lungs & respiratory system. These pollutants are also settle on soil plants & water etc. This paper consists of various sensors like MQ135 detects the concentration of CO gas and CO2. If this concentration is beyond the threshold value then this sensor gives the input to the micro-controller. This Micro-controller displays the result on the LCD and sends the trigger pulse to motor to stop the ignition of fuel. Emitted gases are sense by the various sensors. Therefore this paper is an idea recommend which help to diminish the pollution form vehicle. The use of tetraethyl lead as a gasoline additive in 1923 introduced yet another toxic substance to automobile emissions that threatened human health. To prognosticate weather in now-cast and short range scales over distinct sections of the Metropolitan cities including severe weather warnings. To provide detailed customized meteorological products on-demand basis. In future we can add additional features like traffic police have an authority to stop the vehicle remotely by sending a SMS using GSM.

A system designed to detect emissions from vehicles and track their movements typically combines various technologies like GPS (Global

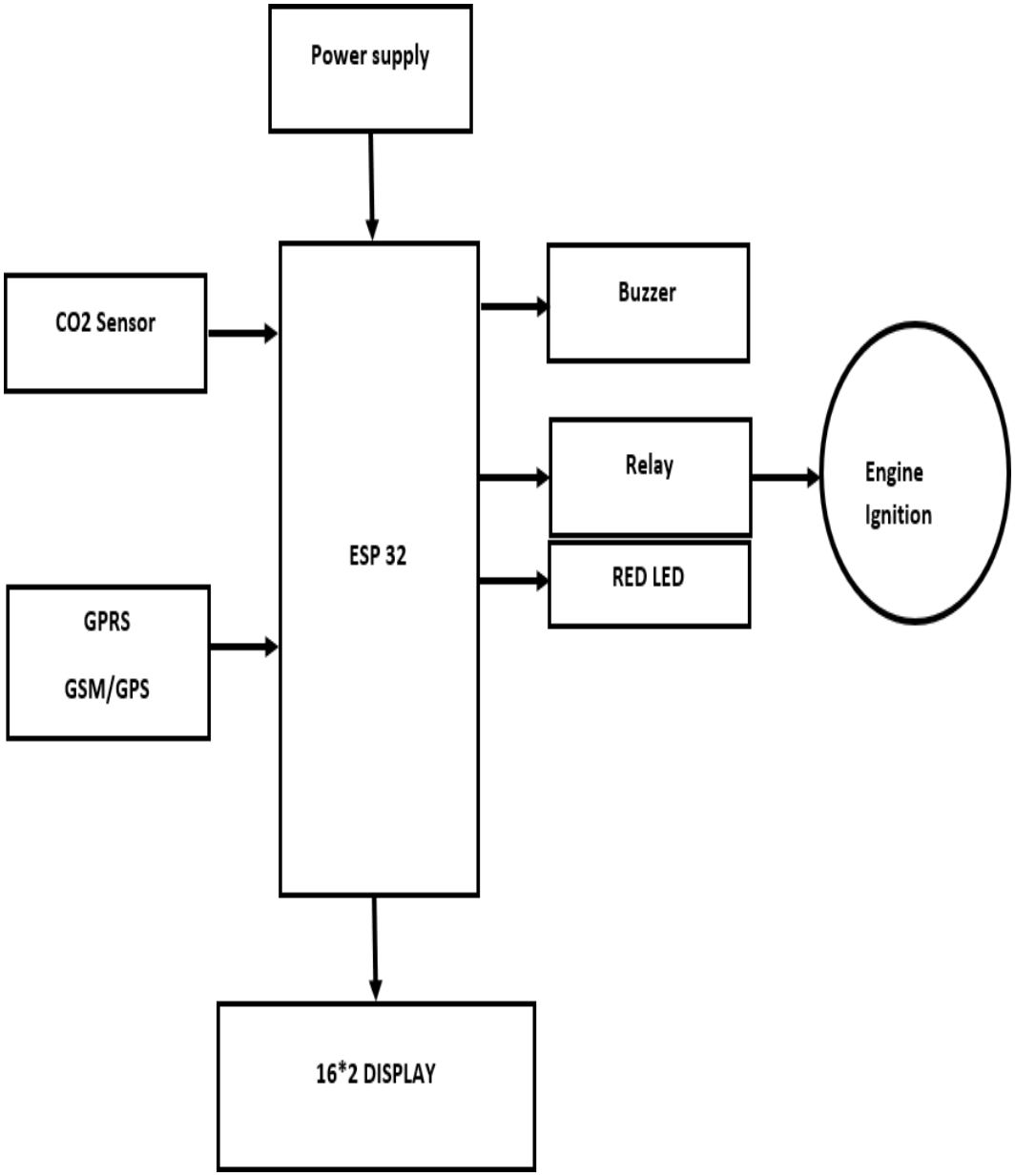
Positioning System) and GSM (Global System for Mobile Communications). The system involves sensors to detect emissions, GPS for location tracking, and GSM for data transmission. It helps monitor vehicle emissions, track their routes, and potentially enforce regulations or analyze data for environmental or logistical purposes. This setup aids in gathering real-time information about vehicle emissions and their geographical movements for better management and analysis. Emission detection systems are designed to monitor and measure the exhaust gases and pollutants emitted by vehicles. Sensors integrated into the vehicle's exhaust system or external devices analyze these emissions, measuring pollutants like carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter. By detecting and analyzing these emissions, the system can assess a vehicle's environmental impact and compliance with emission standards, contributing to environmental monitoring and regulatory enforcement efforts. When these technologies are combined, they form a comprehensive system that not only tracks vehicle movements but also monitors emissions, providing valuable data for environmental analysis, regulatory compliance, and efficient vehicle management.

Objectives

1. Record the concentration levels of vehicle pollutants to define air quality levels and establish action plans ifhigh levels of contamination are detected.
2. To verify the amount of carbon monoxide, Carbon oxide, Hydrocarbons emitted in the vehicles.
3. The system should allow users to access air quality data remotely through web-based dashboards, mobile device etc.
4. The system should incorporate an early warning mechanism to alert with relevant information of percentage of pollution and shut down the ignition of the engine.
5. The air quality monitoring system has access to calculate the harmful gases present in atmosphere.

6. If the vehicle owner ignore the alert, then vehicle can be tracked through SMS sent by the GPRS.

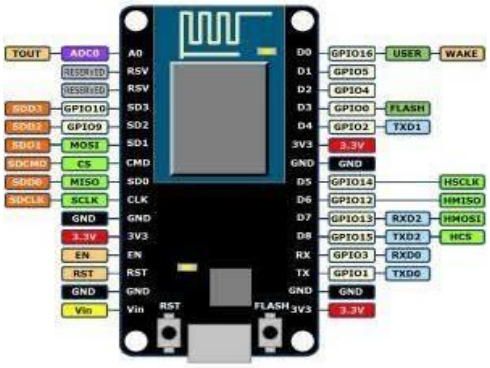
METHODOLOGY



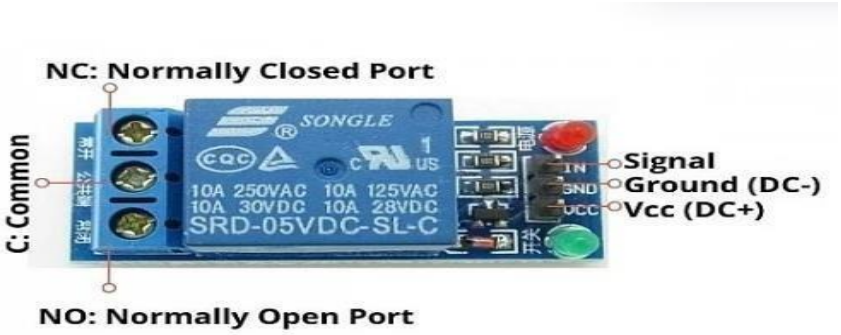
Block diagram

The block diagram consist of the Power supply which supply the 12v DC , CO2 sensor which is used the sense the gases such as CO2 & CO , ESP 32 is microcontroller which is receive the signal from the gas sensor according that the controller will react , GPRS is the device which the tracks the location of the bike owner and sends the alert message the to the bike owner, Relay which is connected to the bikes ignition according the notification of the controller the single channel relay will shunt down the bike, Buzzer warns the bikes owner by alarm and last the LCD display will shows to bike owner about the CO2 & CO emission from the vehicle exhaust

1. ESP 32



The ESP32 is a powerful and versatile microcontroller developed by Espressif Systems. It is widely acclaimed for its dual-core processing capabilities, built-in Wi-Fi and Bluetooth connectivity, and rich set of peripheral interfaces



2. RELAY

- Relays are electrically operated switches that open and close the circuits by receiving electrical signalsfrom outside sources.

1. GPRS Module

GSM has achieved global adoption, with networks operating in nearly every country around the world. This widespread deployment ensures ubiquitous coverage and connectivity for users, whether they are in urban centers, rural areas, or remote locations, making GSM the most widely used cellular technology globally

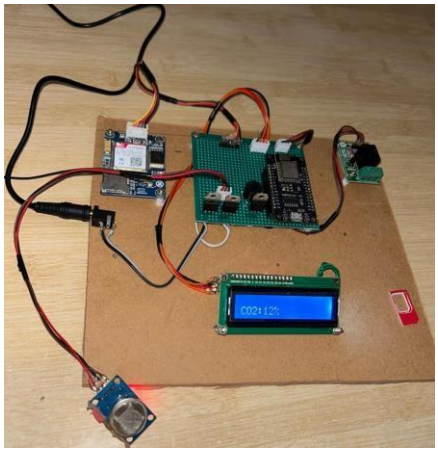
2. MQ-7 Gas Sensor

MQ2 is one of the commonly used gas sensors in MQ sensor series. It is a Metal Oxide Semiconductor (MOS) type Gas Sensor also known as **Chemiresistors** as the detection is based upon change of resistance of the sensing material when the Gas comes in contact with the material. Using a simple voltage divider network, concentrations of gas can be detected.

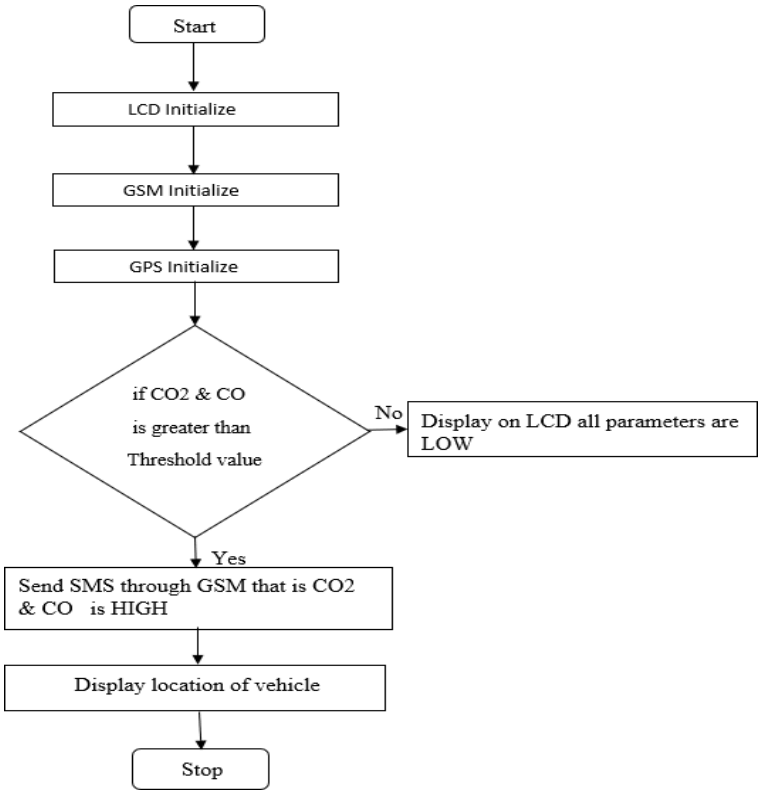
MQ2 Gas sensor works on 5V DC and draws around 800mW. It can detect **Carban dioxide** and **Carbon Monoxide** concentrations anywhere from 200 to 10000ppm.

WORK PLAN

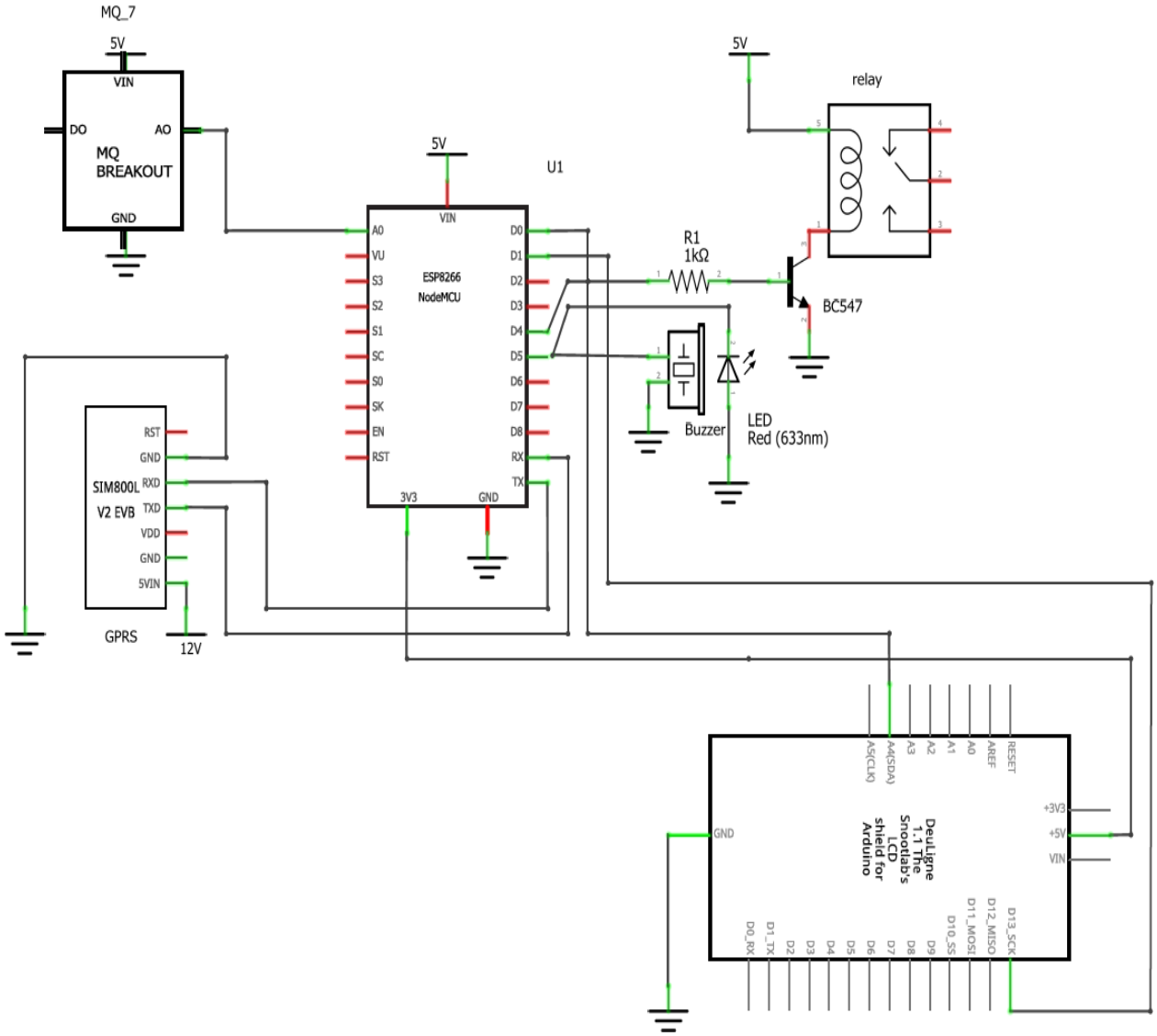
SET UP OF SYSTEM MODEL



SYSTEM ALGORITHM



System Design



Result

Air quality level:	Status:
40%	Display value 
40-60%	Alert 
>60%	message with current location 

This proposed model consist of MQ7 gas sensor which senses the CO and CO2 gases which is emitted from the vehicle emission. It work as when the gases are emitted on it the filament which consist of different level of resistance with voltage of 0-5V. As the sensor is connected to Node MCU which takes the input from sensor and according to program the value is converted from voltage to percentage and further the as per the program the different values are set based on which the values is displayed on LCD display. Through GSM and GPS model the value is sent to the user according to program based on level of percentage and GPS help the model for positioning the user. As the level which are implemented in program the Node MCU will send the signal in the form of voltage to the single channel relay. Further the voltage will amplified to 12V relay. hence the relay ip

the supply to ignition will be cut-off. Till the user doesn't reset the model the model won't allow him to accesses the ignition of vehicle. Table 3. shows the emission level of the vehicle.

Scope

- The vehicle emission monitoring, detecting and tracking model can be installed in all type of carbon monoxide and carbon dioxide emitting vehicles. Where the model send the alert SMS and location to the owner.
- This proposed model can be used in chemical industries. If the sensor detects any burning of gases happens in industry, the alert SMS with current location will be sent to registered company.
- This model can be installed in forest. To avoid the burning of tree by knowing the alert and locationwhich sent by the model.
- This model also can install in all the shops. From this we will get the alert and current location.

Conclusion

The proposed project is the proto type model of the emission testing of the vehicle. It will detect the level of harmful gases present in the emission of the vehicle. It also alert the user to pollution level by giving alert message. The proposed project designed to detect emissions from vehicles while simultaneously tracking their location through GPS and transmitting this data via GSM (Global System for Mobile Communications). This system combines environmental monitoring (emission detection) with vehicle tracking capabilities, utilizing GPS for location data and GSM for communication. It aims to provide real-time information about vehicle emissions and their geographical movement for analysis or regulatory purposes