

Vehicle Pollution Reporting And Control Using IOT

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Abstract

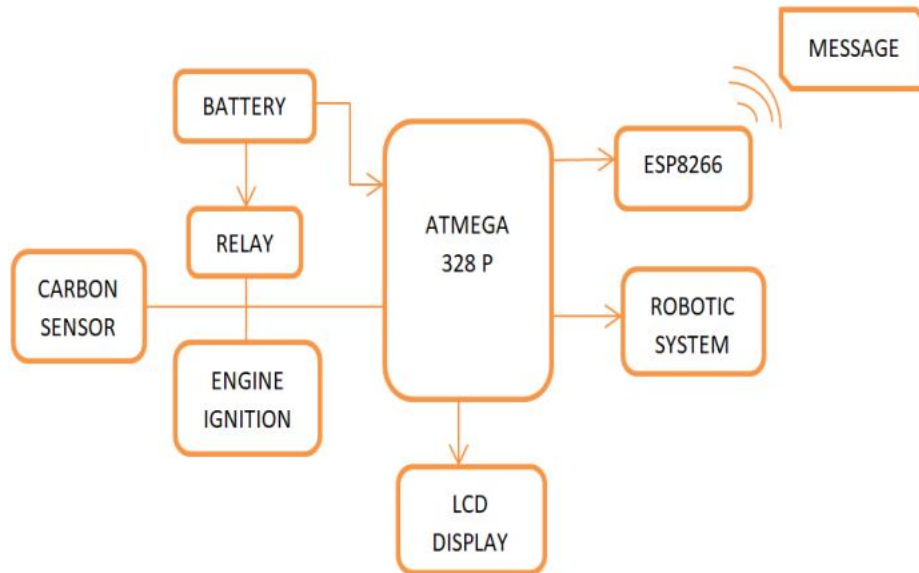
This system is specifically designed to report and control the pollution level in vehicles using IoT and other devices like Carbon Sensor, Arduino (NANO and UNO), Relay, LCD, Motor and motor driver. The sensor is placed near the pollution emitter (Silencer), from where the sensor detects the pollution. When the sensor senses the pollution above the permissible limit, the engine is stopped after giving a warning to the user and information is also sent to the RTO using IoT so that we can control the pollution that is emitted by the vehicle.

Keywords: IOT, Carbon Sensor, RTO

1. Introduction

Pollution is one of the major issues in India. The effect of pollution is visible already in the form of various natural calamities like No Rain or Less Rain in Chennai, Drought, Cyclones in Orissa and Andhra Pradesh, Flood in Bihar and Assam. Our system is made up of pollution reporting system, which will be installed in vehicles by the manufacturers themselves. The system will constantly display the percentage of carbon emissions by the vehicle and will update it to the pollution department websites via IoT. The recorded information helps them to take further actions.

2. Block Diagram



3. Working

The Vehicle is turned on and the silencer produces pollution as in all the vehicles. The vehicle works normally when the pollution rate is normal. Once when the vehicle starts to produce pollution more than the permissible limit, it is then sensed by a carbon sensor (MQ-5) which is a viscous sensor. Then the vehicle uses its IoT (Internet Of Things) device ESP8266 and uploads a message that is set as per our program, like “Vehicle No. PY 01 SM 1009’s Pollution Level has crossed the Threshold level! Take Immediate Action!” and then uploads it to the RTO/ Pollution Control Department. In turn, they can turn off their engine after giving a warning note. When the engine is made off, the LCD display that is fit in the vehicle near the speedometer displays a message to the user like, “Vehicle is Not in proper Condition, kindly Service it! The engine will off in 2mins” and then turns the vehicle off. Even when the vehicle is made to start then this process is repeated and the engine is made off again. This switching off of engines will make the owners of the vehicles service their mean of transport regularly. This, in turn, reduces the pollution amount in the air.

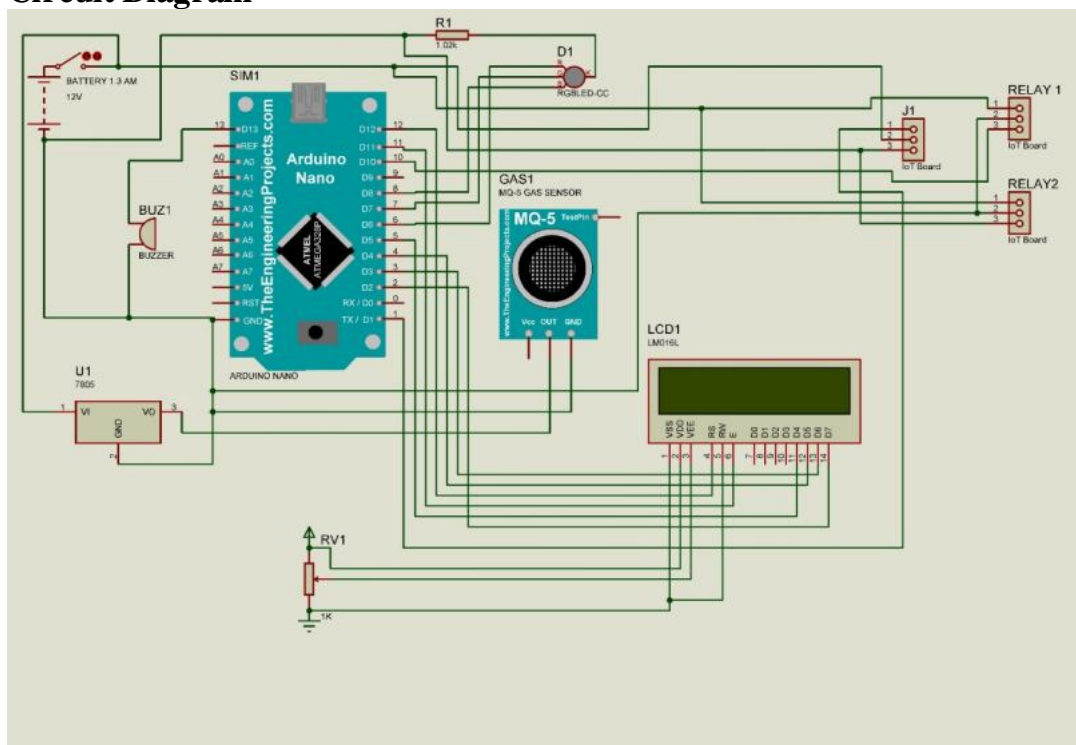
4. Components

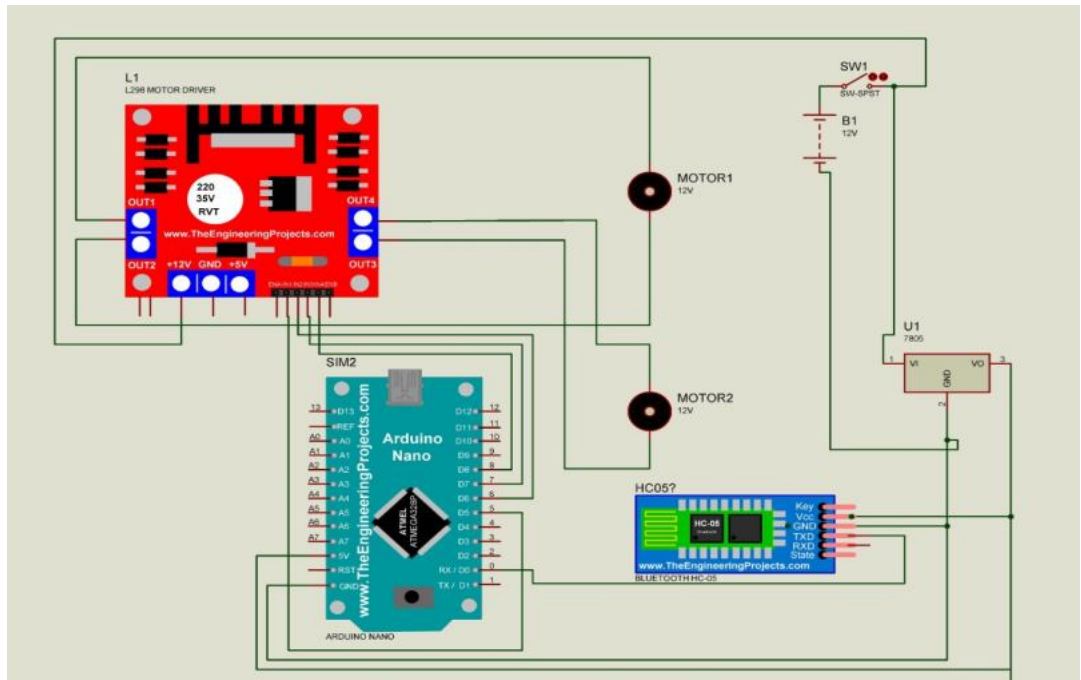
- **ATMEGA 328P**
It is a high performance and low power controller. It is an 8-bit microcontroller that is fitted to Arduino Nano here.
- **ESP8266**

It is a preprocessor. ESP8266 is a low-cost microchip that helps us to send information to the RT0 using IoT.

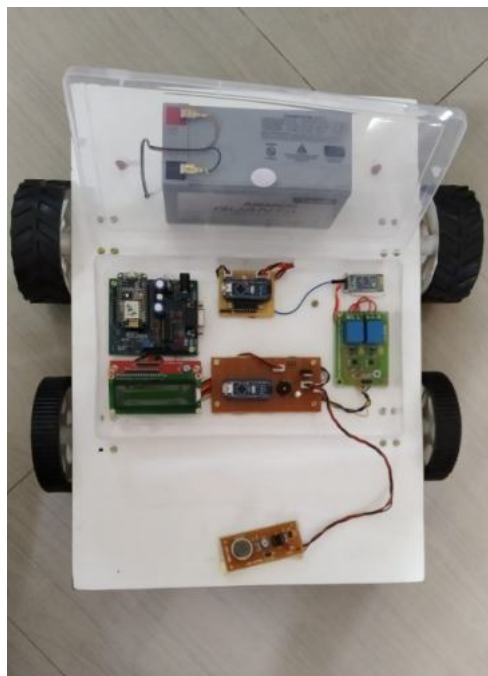
- **MQ-5**
MQ-5 is the carbon sensor. It is a viscous sensor that helps to sense the amount of pollution that is emitted by the vehicle. It can also detect methane, butane and petroleum.
- **LCD Display**
A 16x2 display that is fitted near the speedometer of the vehicle. It displays a warning message to the user.
- **Engine Ignitor**
It is an ignition system component which is responsible for providing the signal for ignition coils to fire.
- **Relay**
It is an electrically operated switch to control a high current circuit with a low current signal. A dual-channel relay is used in this system.
- **Voltage Regulator**
It maintains a constant voltage level. A 7805 voltage regulator is used in this system to avoid “Load Balancing.” It is the intermediate connector between the 12V power supply and the carbon sensor.
- **Robotic System**
It is the system in which the entire setup is fixed.

5. Circuit Diagram





6. Working Model



7. Conclusion

Thus we developed this system for reporting and controlling pollution levels. The sensor and system designed during the process are possible to be implemented in real-time. The main part of the system is the Atmega328P Microcontroller which is designed by easy embedded C programming. The sensing unit is the carbon dioxide, methane, butane, and petroleum sensing unit whereas the communication unit is the IOT web server. This makes the system reachable throughout the world. Future enhancement can be helpful in reducing the pollution automatically thus making the environment pollution-free.

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