

Electronic Pollution Under Control

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ABSTRACT

Every vehicle has its own emission of gases, but the problem occurs when the emission is beyond the standardized values. The primary reason for this breach of emission level being the incomplete combustion of fuel supplied to the engine which is due to the improper maintenance of vehicles. This emission from vehicles cannot be completely avoided, but it definitely can be controlled. The aim of the project is to monitor the pollutants in the vehicle by using the pollution control circuit. This pollution control circuit consists of various sensors like smoke sensors and all of them are integrated and connected to a Controller. It is a real time work where a demo application has been made in which PIC micro controller is used and a controller board is made where all these devices get integrated and work accordingly. When a vehicle attains certain threshold pollution level then the engine gets automatically switched off and an SMS is generated and sent to the pre-defined number stored in the memory through the GSM module.

Keywords : Sensors, GSM, Controller.

I. INTRODUCTION

The incomplete combustion in the engine of a vehicle leads to emission of different gases contributing to increase in the pollution and adversely affecting the environment. Detection and control of these gases is an important area of work. This emission from vehicles cannot be completely avoided but, it definitely can be controlled. Now a day's accidents are common reason for deaths. These are critical things to control so here we come up with a concept to

reduce pollution. As a solution to the above problems we aim to build an automated control system for emission level control of vehicle and accident place detection. Smoke detector is used to detect the carbon percentage in the smoke released by the vehicle due to combustion of fuel in it. Smoke detector is fixed at the end of the exhaust of vehicle from where smoke is released into the environment. The smoke detector detects carbon and gives it to the Microcontroller to check the maximum percentage of carbon content in the

smoke released by vehicles. So the controller checks the percentage of carbon and if it exceeds the threshold level the system gets triggered and it sends SMS about this to the nearby pollution control office through GSM.

II. METHODS AND MATERIAL

Literature Survey

Over the years, there have been several regulations made by the Government to control the emission from vehicles; most of them being unsuccessful at the same. The standards and the timeline for implementation are set by the Central Pollution Control Board under the Ministry of Environment & Forests. Bharat stage emission standards are emission standards instituted by the Government of India to regulate the output of air Pollutants from internal combustion engine equipment, including motor vehicles. The first emission norms were introduced in India in 1991 for petrol and 1992 for diesel vehicles. These were followed by making the Catalytic converter mandatory for petrol vehicles and the introduction of unleaded petrol in the market. On April 29, 1999 the Supreme Court of India ruled that all vehicles in India have to meet Euro I or India 2000

norms by June 1, 1999 and Euro II will be mandatory in the NCR by April 2000. Car makers were not prepared for this transition and in a subsequent judgment the implementation date for Euro II was not enforced. The standards, based on European regulations were first introduced in 2000. Progressively stringent norms have been rolled out since then. All new vehicles manufactured after the implementation of the norm have to be compliant with the regulations. Since October 2010, Bharat stage III norms have been enforced across the country. In 13 major cities, Bharat stage IV emission norms are in place since April 2010.

In this paper, the semiconductor sensors have been used to detect the pollutant level of the vehicles. This Paper concentrates mainly on three blocks; smoke detector, microcontroller and fuel injector. The smoke detector detects the pollutants (CO, NO_x, etc.) continuously. The microcontroller compares the level of pollutants with the stipulated level allowed by the government. When the pollutant level exceeds the standardized limit, it sends a signal to the fuel injector. On receiving a signal from the controller, the fuel injector stops the fuel supply to the engine after a particular period of time.

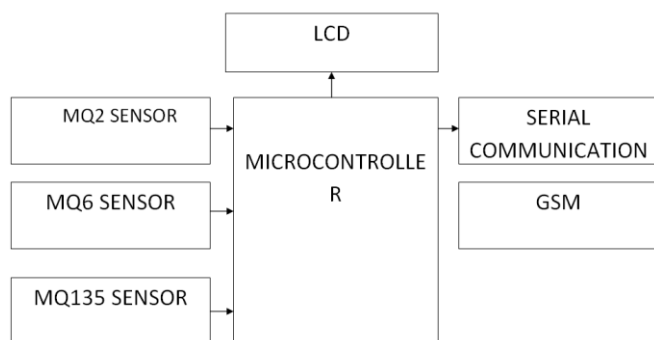


Figure 1: BLOCK DIAGRAM and description

Microcontroller

- ✓ PIC microcontroller 18F4550 is used to detect the sensor values
- ✓ Semiconductor sensor MQ-2 is used to detect the smoke whose range is 300ppm to 10000ppm.
- ✓ MQ6 sensor detects the carbon levels and prevents it from getting over heated.
- ✓ MQ135 sensor is used to monitor polluted air particles
- ✓ Sim 900a is used to send sms
- ✓ 16x2 LCD is used to display sensor values

Advantages

Since the system is automatic it is very efficient and it avoids corruption.

III. RESULTS AND DISCUSSION

The signals acquired from the sensors are compared with the user defined set point crossing the threshold limit the pollution level gets displayed in the LCD and when it exceeds the set point it sends SMS to the RTO.

IV. CONCLUSION

The concept of detecting the level of Pollution and indicating it to the driver is implemented. There is an increase in the level of Pollution over the last couple of decades, leading to several Environmental problems. There will be a huge population, who do not take care of the pollution from their vehicles seriously, which has already resulted in several environmental problems such as Ozone layer depletion and so on. Hence this system will be highly beneficial in curbing this problem.

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