International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

Control and Measure System from Air Pollution by Co2 Exhaust in Vehicles and ECU

*E. Roja **A. Bharath Kumar

*M.TECH student, Dept of ECE, VAAGDEVI ENGINEERING COLLEGE

**Assistant Professor, Dept of ECE, VAAGDEVI ENGINEERING COLLEGE

ABSTRACT

Now a days , usage of vehicles has been rapidly increased day by day .This development has both advantages and disadvantages .The main disadvantage is more pollutants are being released from the vehicles beyond the standardized values that may causes air pollution which harm all natural living things by destroying the ozone layer.

To overcome this problem, I have implemented "Control And Measure System From Air Pollution By Co2 Exhaust In Vehicles And ECU". This emission from vehicles cannot be completely avoided but, it definitely can be controlled. With the usage of semi-conductor sensors for detecting the various gases, this aims at using those semi-conductor sensors at the emission outlets of vehicles which detects the level of pollutants.

1. INTRODUCTION

The beginning of the 21st century was the time when importance for Environmental awareness was instigated. One of the major concerns regarding the environment is air pollution. Air pollution contributes to the green houses gases, which causes the green house effect, whose side effects are now well known to all of us after the findings about the hole in the ozone layer.

Air pollution is not only harmful to the environment but, also to all other living beings on earth. Air pollutants that are inhaled have serious impact on human

(ISSN: 2456-5083)

health affecting the lungs and the respiratory system; they are also taken up by the blood and pumped all round the body. These pollutants are also deposited on soil, plants, and in the water, further contributing to human exposure and also affecting the sea life. Vehicles are one of the major contributors to air pollution apart from industries.

The main pollutants from vehicles are the oxides of carbon and nitrogen, which can be easily detected these days with the help of semi conductor gas sensors. Therefore, in this paper an idea is suggested, which would be very helpful in reducing the amount of pollution from vehicles.

2. 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

(ISSN: 2456-5083)

the norms 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.

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, NOx, 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.

3. Existing Method

In the existing system the vehicle smoke controlling can be done by the manual the smoke levels are measured by the mobile pollutions check points with their certification the vehicle are going to give permission to the road way but these manual checking cannot be taking by the all vehicles so even the vehicle exhausting the pollution larger amount of co2 and harmful gasses into the environment .the vehicle are also tested check for every some duration period but the driver / owner vehicle air pollution can't be measured continuously. So they not able check the air pollution level of the vehicle.

4. Proposed Method

The detector consists of three sub-blocks namely smoke sensor, transducer and ADC. The smoke sensor is the main component of the detector block which is embedded onto the exhaust of the vehicle.

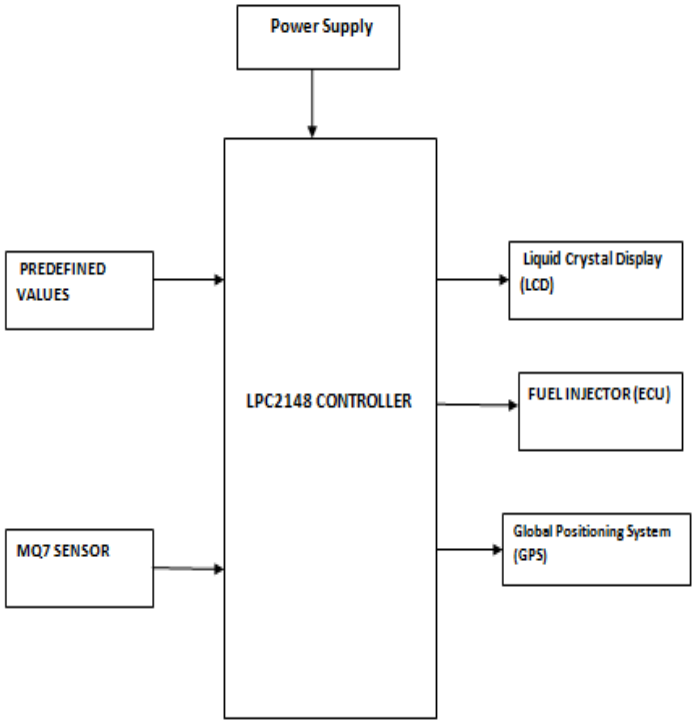
The sensor senses the amount of emission from the vehicle and feeds the data to the microcontroller through the transducer and the analog to digital converter at regular intervals of time. The transducer is used to convert the output of the sensor into an electrical signal.

(ISSN: 2456-5083)

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

The analog electrical signal is then converted into a digital signal using an ADC, so that, it can be compared with the predefined values, in the microcontroller. In this paper, carbon monoxide sensor (MQ-7) which can measure CO concentrations ranging from 10 to 10,000 ppm is considered. This sensor, basically finds usage in sensing carbon monoxide concentrations (ppm), in the exhaust of cars as shown in figure.3.3 and gives an analog output. The MQ-7 gas sensor is mainly made up of SnO2, whose conductivity varies with the cleanliness of air i.e. it has a lower conductivity in clean air and viceversa. A simple circuit as shown in figure.3.2, is used to map the changes in conductivity to the corresponding output signal of the gas concentration. The main advantage of the MQ-7 gas sensor is that it has high sensitivity to Carbon Monoxide. Additionally, it has a very long life time and is available at a low cost. Also it can be used for a wide range of applications.

Block Diagram



5. 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,

(ISSN: 2456-5083)

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. LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADCs, 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems

References

[1] http://wikipedia.org/wiki/Bharat_Stage_emission_standards

[2] George F. Fine, Leon M. Cavanagh , Ayo Afonja and Russell Binions " Metal Oxide Semi-Conductor Gas Sensors in Environmental Monitoring", Sensors 2010, 10, 5469-5502; doi:10.3390/s100605469

[3] K. Galatsis, W. Wlodarsla, K. Kalantar-Zadeh and A. T rinchi, " Investigation of gas sensors for vehicle cabin air quality monitoring," vol. 42, pp. 167-175, 2002.

[4] "Trade of Motor Mechanic"; Module 5; Unit 2 Electronic Fuel injection; Phase 2 by FÁS Learning Innovation Unit with Martin McMahon & CDX Global; Curriculum Revision 2.2 16-01-07.

[5] LIU Zhen-ya, WANG Zhen-dong, CHEN Rong, "Intelligent Residential Security Alarm and Remote Control System

(ISSN: 2456-5083)

Based On Single Chip Computer," vol. 42, pp. 143-166, 2008.

AUTHOR 1 :-

* E. Roja completed her B tech in Balaji Institute of Technology & Sciences in 2014 and pursuing M-Tech in Vaagdevi Engineering College

AUTHOR 2:-

**Mr.A.Bharath Kumar is working as Assistant Professor in Dept of ECE, Vaagdevi Engineering College