

A System detecting an Air Pollution and tracking using GPS & GSM

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Abstract - Vehicles and Industries are the major origin of Environmental Pollution. Every vehicle will have emission but the problem occurs, which is due to the improper maintenance of vehicles. This emission from vehicles cannot be completely avert but, it definitely can be controlled. As a solution to the above problems we aim to build an automated control system for emission level detection in vehicles and indicate this level with a meter. When the pollution/ emission level shoots beyond the already set threshold level, there will be a buzz in the vehicle to indicate that the limit has been breached and this information has been send to traffic control room which includes vehicle number, owner details and location of the vehicle by using GPS. In future we can add additional features like traffic police have an authority to stop the vehicle remotely by sending a SMS using GSM. This paper, when aggrandize as a real time project, will asset the society and help in reducing the air pollution.

In this project we are implementing pollution monitoring system based on the amount of pollution released from vehicles. We are doing this project using real time operating system, First we will find out the pollution levels that will be done using MQ7 sensor. If the pollution level detected strikes beyond the pre-defined value, then it automatically sends a message containing vehicle number using GSM and its location using GPS.

Key Words: Sensor, GPS, GSM, Microcontroller.

1.INTRODUCTION

In begun 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 MQ7 and Alcohol sensor which detects the concentration of CO gas and

Alcohol. 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.

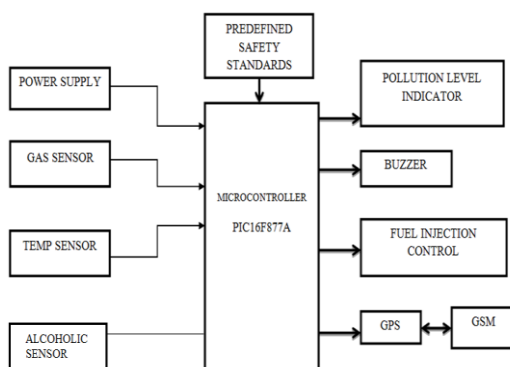
1.1 LITERATURE SURVEY

Over the years, there have been several regulations made by the Government to control the excretion from 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. These were proceed from by making the Catalytic converter mandatory for petrol vehicles and the introduction of unleaded petrol in the market. Car makers were not prepared for this metamorphosis and in a subsequent acuity the execution date for Euro II was not enforced. The standards, based on European regulations were first introduced. Progressively draconian standards have been rolled out since then all new vehicles construct after the implementation of the norms have to be compliant with the regulations, Bharat stage III norms have been ordained across the country. In 13 major cities, Bharat stage IV emission norms are in placed.

The phasing out of two stroke engine for two wheeler, the stoppage of production of various preceding model vehicles advent of electronic controls are as a result of the laws related to transport emissions. The beyond decade, has visible many evaluation sports which can be happening to develop semiconductor gas sensors. This paper concentrates primarily on 3 blocks; smoke detector, microcontroller and fuel. The smoke detector detects the pollutants level. The

microcontroller compares the amount of pollution with the stipulated level allowed by the government. This air pollution may impact severely on the global environment if it is not controlled in right manner and this system is mainly designed for controlling air pollution. When the pollution/ emission level shoots beyond the already set threshold level, there will be a buzz in the vehicle to indicate that the limit has been breached and this information has been send to traffic control room which includes vehicle number, owner details and location of the vehicle by using GPS also. Author described an embedded system for vehicle toxic gasses detection and Alerting. A system is developed using GSM and GPS for detecting toxic gases. Automated control system for air pollution detection is refined for vehicles. A relay circuit is eased off the control of ON and OFF position of the fuel pump. Automated air pollution detection system is refined for vehicles. In this technique various sensors are used for hazardous gas detection. GSM and GPS system are used for sending and receiving data and location nearest work station. An Author chronicle about various vehicle sensors like sensor for safety, distance sensor, Night vision sensors, In last few decade government made a rules and regulation for the vehicles. Central pollution control board set the emission standard under the ministry of Environment and this are first introduced in India.

1.2 Block Diagram



The Block diagram consists of :

- PIC16F877A
- Power Supply
- Sensors
- Buzzer
- GPS
- GSM

Power Supply:

A power supply is an electronic device that contribute electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another and as a result power supplies are sometimes referred to as electric power converters. Some power supplies are separate, stand-alone devices, whereas others are setup into larger devices along with their loads. Examples of the latter include power supplies found in desktop computers and consumer electronics devices. Power supply: 5v is used.

Temperature Sensor:

A temperature sensor is a mechanism that round up data apropos of the temperature from a origin and neophyte it to a form that can be presumed either by an bystander or another device. The LM35 series are exactitude integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an asset over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a giant perpetual voltage from the output to glean contingent Centigrade scaling.

Co Sensor:

A carbon monoxide detector or CO revealer is a resort that reveals the ubiquity of the carbon monoxide (CO) gas in order to forbid carbon monoxide taint. Description: This is a elementary-to-use Carbon Monoxide (CO) sensor, apt for apperceive CO concentrations in the air. The MQ-7 can detect CO-gas concentrations anywhere from 20 to 2000ppm. This sensor has a lofty subtlety and agile feedback. The sensor's output is an analog resistance. The drive circuit is very simple all you need to do is power the heater coil with 5V load resistance, and affix the output to an ADC. This sensor comes in a package akin to our MQ-3 alcohol sensor.

Alcohol Sensor:

This alcohol sensor is apt for reveal alcohol concentration on your breath, just like your prevalent Breathalyzer. It has a lofty subtlety and agile feedback time. Sensor provides an analog resistive output stationed on alcohol concentration. The drive circuit is very simple all it needs is one resistor. A simple interface could be a 0 to 3.3V ADC

GSM:

GSM is a cellular network, which means that cell phones affix to it by seeking for cells in the urgent environs . There are five different cell sizes in a GSM network macro, micro, pico, femto, and umbrella cells. The coverage area of each cell alter bestow to the exertion environment. Macro cells can be gazed as cells where the base station antenna is installed on a “MAST towers” or a building above average rooftop level. Micro cells are cells whose antenna height is under average rooftop level GPS is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth which has an unobstructed view of four or more GPS satellites. A GPS receiver forecast its position by literally timing the signals consigned by the GPS satellites high above the Earth. Each satellite continually transmits messages which include.

Buzzer Alert:

Buzzers are very boundless in habitude and are erect on an preposterous number of divergent devices. Buzzers are habitually occupy to give a user or operator an audio manifestation of the stage of a mechanical device. For precedent , “buzzing someone in” attribute to cranny an electromechanical lock on a door, which belch a buzz, indicating that the lock has been lifted to the open position. A use for buzzers with which most people are likely mundane is on alarm clocks. When the clock horizon a particular state—a time, in this case—the buzzer reverberation to vigilant the user that it’s time to wake up.

LCD Display:

LCD (liquid crystal display) is the mechanization used for displays in notebook and other smaller computers. Like light-emitting diode (LED) and gas-plasma technologies, LCDs acquiesce displays to be much thinner than cathode ray tube (CRT) technology. LCDs deplete much less power than LED and gas-display displays because they endeavor on the proposition of deter light kind off than emitting it.

PIC Microcontroller:

- **Features**
 1. Two PWM 10 bit.
 2. 256byte EEPROM data memory.
 3. Self-programming.
 4. Parallel slave port.
 5. 25mA sink/source per I/O

The 16F877A is capable microcontroller that can do many task because it has a large enough programming memory 8k words and 368 byte of RAM. This is enough to do many projects.

2 Flowchart

Flowchart is shown below the description, After starting the program LCD initializes, we can observe there the temperature , alcohol sensor , carbon dioxide gas on the LCD . When GSM initializes then the SIM gets activated and by using GPS all these values are send to the mobile and the location of that mobile can be detected . when the threshold level is LOW then we can observe it on LCD and if it goes beyond threshold level then it shows HIGH .

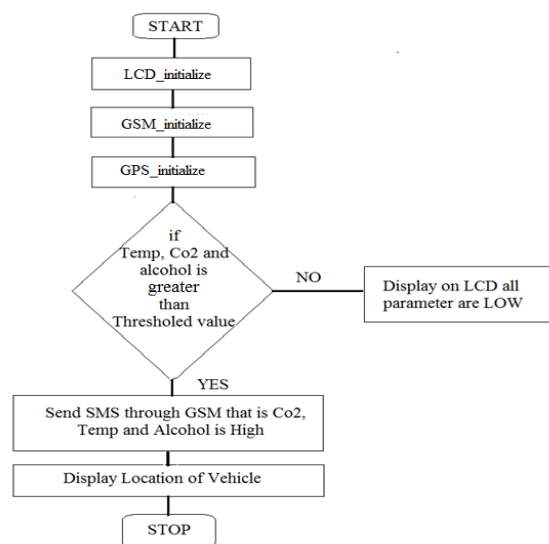


Fig -1: Flowchart

3 CONCLUSION AND FUTURE SCOPE

Hence we have implemented Air pollution Detection in Vehicles that is pollution is high or low because of combustion of fuel in vehicles. We built it up and implemented it using PIC microcontroller and other components. This system is becoming increasingly important in Air Pollution Detection in Vehicles. The additional feature of this circuit is alcohol sensing and tracking system which makes the drive more secure thereby informing the all real time values to base station. This pollution might impact severely on the world setting if it is not controlled in right manner and this method is especially designed for dominant pollution. once the pollution/ emission level shoots on the far side the already set intensity, there will be a buzz within the vehicle to point that the limit has been broken and this data has been send to

control area which incorporates vehicle variety, owner details and placement of the vehicle by exploitation GPS.

REFERENCES

- [1] JoergEberspaecher, GSM Switching, Services, and Protocols
- [2] RogierNoldus, Intelligent Networks for the GSM Network.
- [3] Abid Khan, Ravi Mishra –GPS – GSM Based Tracking System, International Journal of Engineering Trends and Technology ,Volume3,Issue2, Pp: 161-169,2012.
- [4] S.P. Bhumkar, V.V. Deotare, R.V.Babar –Intelligent Car System for Pollution Prevention Using ARM-7, International Journal of Emerging Technology and AdvancedEngineering, Volume 2, Issue 4, Pp: 56-78,2012.
- [5] Siva Shankar Chandrasekaran, SudharshanMuthukumar and SabeshkumarRajendran, “Automated Control System for Air Pollution Detection in Vehicles” 20134th International Conference on Intelligent Systems, modelling and Simulation.