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Design and Implementation of Vehicle Monitoring System

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Abstract: In today's modern world, travelling has become a major part of any human's life on earth. Either it may be a public transport or private vehicle; both are used equally to satisfy the need of travelling to places. In order to ensure safe and secure mode of transport, this project proposes a solution for monitoring a vehicle's live status and location based on the global positioning system and radio communications to determine the current location of the vehicle, which then sends this information to a remote monitor center/user's cell phone .
Keywords: Vehicle, Black Box, Microcontroller, Computer interface, GPS, GSM.

I. INTRODUCTION

With the increase of number of automobiles especially in some metropolis such as Delhi / Mumbai/Calcutta etc, it is really difficult to solve the problems related to automobile accident.
In these cities accidents have crossed the level above the expectations and caused human loss.
To conflict this predicament, driving safety systems have been customized as per the requirements and encouraged in a lot of developed countries for many years.
Similarly the accidents owed due to the consumption of alcohol is prevented using Alcohol Detection Sensor which senses the alcohol consumption from breath bringing the vehicle to halt and at the same time giving an attentiveness by displaying a message on already mounted LCD monitor.
Even though these days the security measures and standards carried out by the Governments from time-to-time are testing and examining, the accidents have become unavoidable due to local standards of the vehicles .In this modern, fast moving and insecure world, it become elementary need to be aware of one's safety. Maximum risks occur in situations where in an employee travels for money relations.

II. OBJECTIVE

A. A prototype of Black Box For vehicle diagnosis that could be installed into any vehicle.
B. This prototype could be design with minimum number of circuits.
C. And also can contribute to construct safer vehicles, improving the treatment for crash victims, helps the insurance companies with their vehicle crash investigations, enhancing road status in order to decrease the death rate.

III. LITERATURE SURVEY

To evaluate and design the project, several resources' help has been taken. We report on the results of our study from the following viewpoints: 1) the reproducibility of the traffic accident situation; and 2) the interactive car behavior of human subjects embedded in the traffic situation of the practical or virtual environment. video clips in the implemented black box are hashed to provide data integrity before being transmitted to the police server.

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IV. BLOCK DIAGRAM

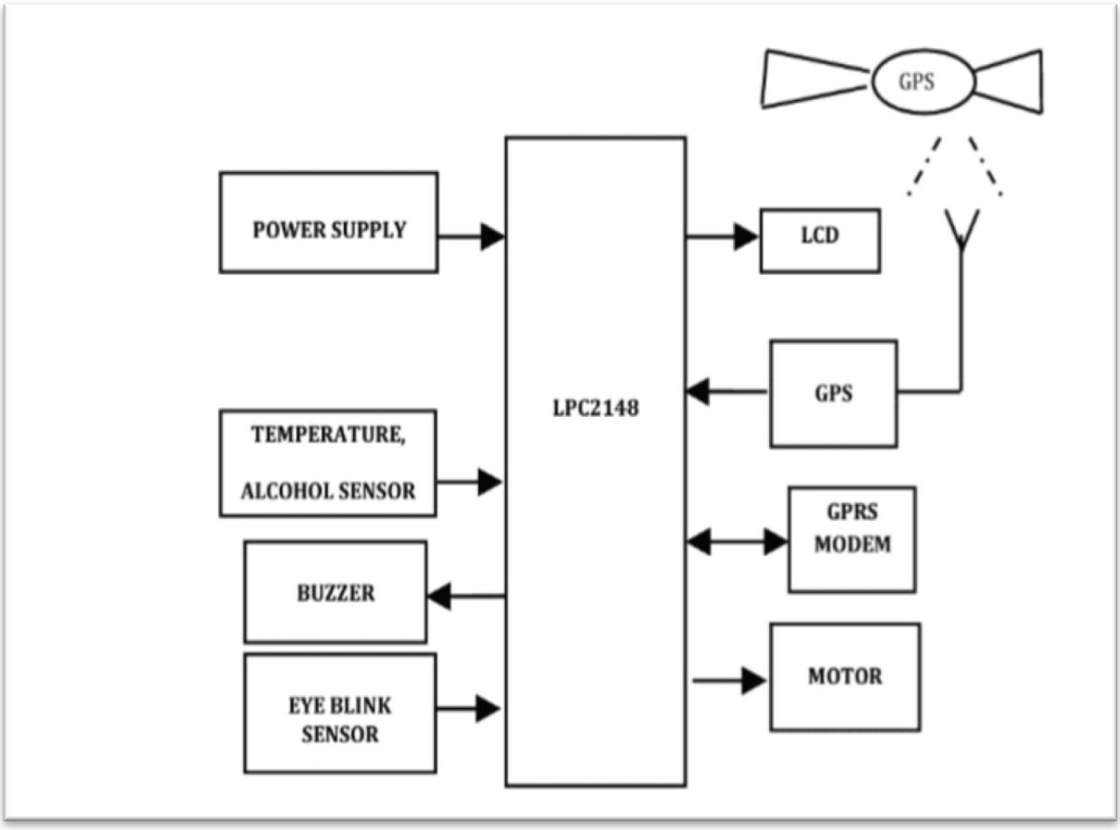

Fig.1.block diagram of Vehicle Tracking system

A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection or a mobile phone that provides GSM modem capabilities. A GSM modem can be a standard GSM mobile phone, the appropriate cable and software driver to connect to a serial port or USB port on our computer. Exact location on earth can be known as GPS latitude, longitude information. Global Positioning System (GPS) is space based on radio navigation System consisting of a constellation of Satellites and network of stations used for monitoring and controlling. The GPS is operated and maintained by the Department of defense (DOD). The GPS is a constellation of satellites in an orbit around the Earth which transmit their positions in space as well as the precise period. It is receiver which collects data from the satellites and after that computes its location anywhere in the world based on information it gets from the satellites .Develop new microprocessor based products and applications. The Temperature- LM35 sensor continuously monitors the temperature of surface at which it is mounted, generally vehicle engine and body. If the Temperature exceeds predefined value, the microcontroller will send alert to the driver by means of buzzer usually fixed near to Dash board. A Hall Effect sensor is a transducer which varies its output voltage in response to a magnetic field. And also this sensors are used for proximity switching and positioning speed detection, current sensing applications. The gas sensors are gas detectors that measure the concentration of a target gas by oxidizing or reducing the target gas at an electrode and measuring the resulting current.

V. COMPONENTS

A. Sim 808 (GPS+GSM)
B. Atmega328 (microcontroller)
C. LM35 (temperature sensor)
D. IR proximity sensor (speed measurement)
E. Vibration sensor (accident monitoring)
F. 12 lead acid battery

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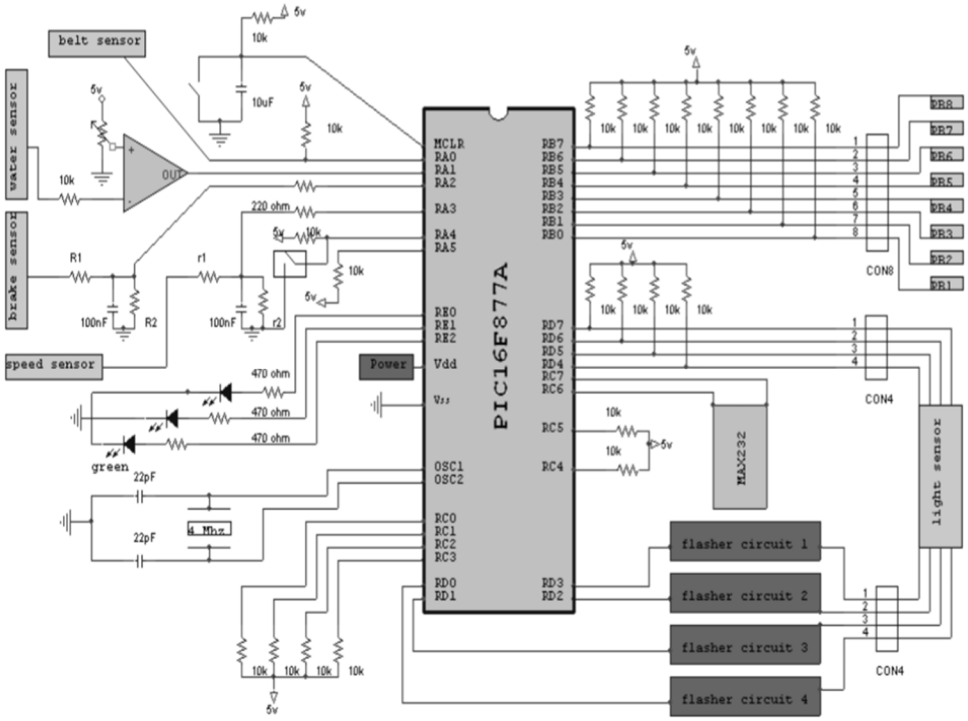
Circuit Diagram



VI. CIRCUIT DIAGRAM DESCRIPTION

A. Microcontroller's Connections

The inputs to the microcontroller, which contain information about the accident, are distributed as follows pins for the 8 accident sensors, 8 for the lights (flashers included), 1 for the speed sensor, 1 for the belt sensor, 1 for the brake switch, 1 for the water sensor, and 1 pin for the serial switch. The outputs of the microcontroller are three pins for the LEDs, and two pins for serial transmission and reception. The three LEDs will show the user whether the black box is recording, waiting, or transmitting.

B. Microcontroller's EEPROM

The EEPROM contained in the PIC has the size of 256 Bytes, and since each address contains 1Byte, the EEPROM has 256 addresses from $00 to $FF. The last 4 addresses will be reserved to save the value of a counter used in controlling the record process on address 252, the accident time on address 253, a variable used to differentiate the process of recording and the process of reading the information on address 254, and the pointer on address 255. Thus, in total 252 addresses will be available for recording the accident data. The accident sensors are grouped into 1 Byte in the EEPROM. Another Byte is needed for the lights.

VII. ADVANTAGE

1) It is used to analyze the cause of vehicular accidents, prevents the loss of life and also property arising from vehicle accidents.
2) The system aim is to achieve accident analysis by objectively tracking what is occurring in vehicles.
3) It is possible to remotely disengage the ignition to make the car immobile.

VIII. CONCLUSION

This document presented a new vision for the vehicle industry, which is the Black Box system used for vehicles. The proposed system plays an important role in monitoring and monitoring the vehicle in real time by updating the vehicle's real-time information to the owner of the mobile device. A complete and detailed description has been made for each part of this system. This document also offered an easy-to-use integrated program for analyzing accident data. The Black Box system can be implemented in any vehicle. As soon as the driver starts the engine, this system will start saving the events of the corresponding vehicle. The latter are always saved in the Black Box EEPROM and, in the event of an incident, an additional 10 seconds of events are saved after this incident. The saved data can only be recovered after the incident due to privacy reasons. Using the serial transmission the EEPROM and show it to the user. In addition, a detailed report will be provided to the user containing the data recorded in the memory.

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IX. FUTURE SCOPE

Use of the GPS module with this system will be useful to find the location of the accident and to carry out the rescue operations quickly. We can improve the current system to control other parameters such as fuel level, tire pressure and headlight operation before starting the vehicle. Many other critical parameters can be read and stored in memory. Another useful add-on to the current system could be the front and back cameras that continue to record live images and store them in memory. This video data would be very useful for accident investigation.

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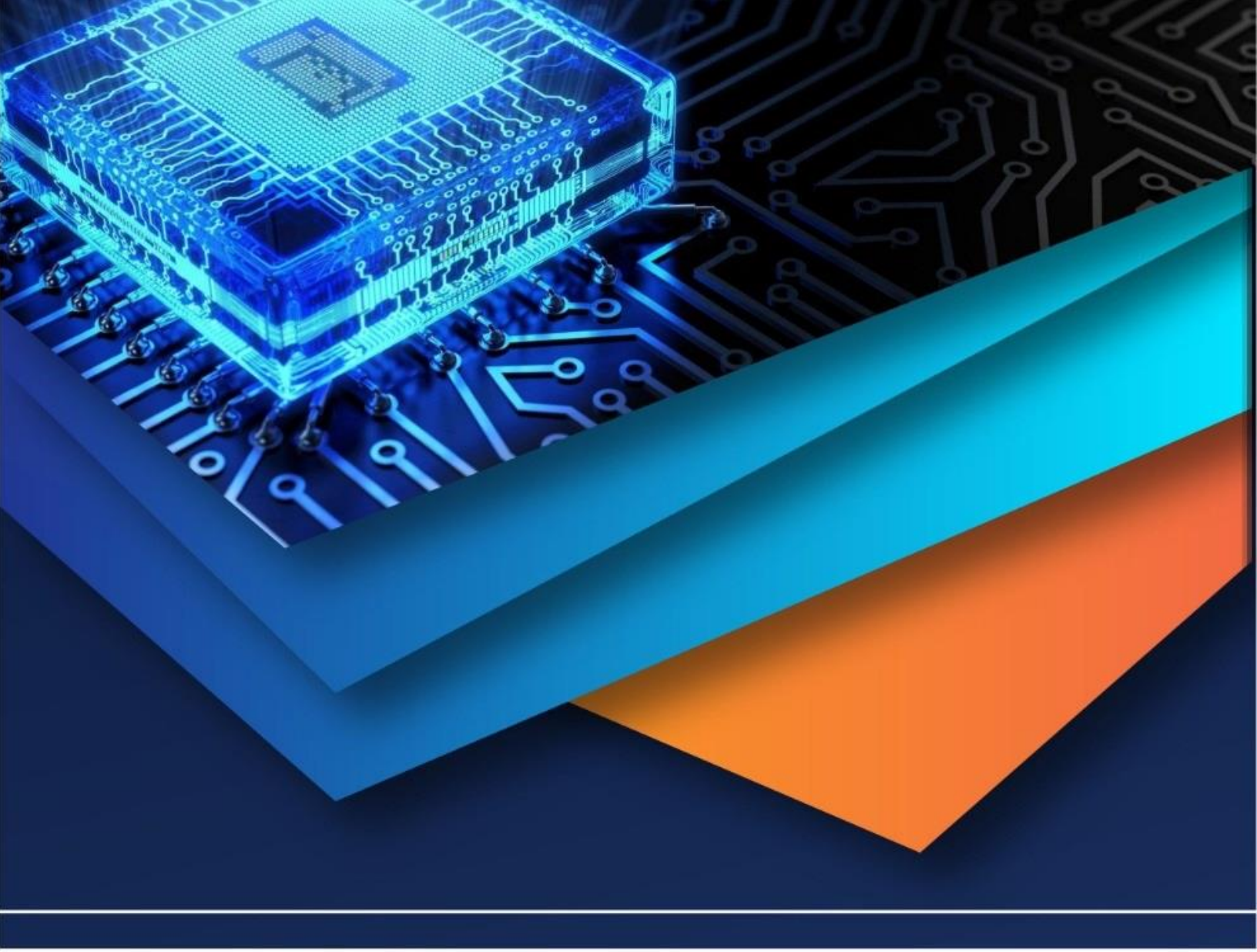

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