

# Over Speed and Alcohol Detection SMS Alert System

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## Article Info

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## Abstract:

With rising technologies and developed automobiles with high end motor vehicles, increased horse power and accessible speed, it is easier than ever to come in contact with accidents. People are able to drive recklessly, affecting the safety of common people. Although speed limits and other prevention laws were implemented, road accidents continue to happen every day. Some of the main contributing factors leading to motor vehicle accidents are over speeding, rash driving and drunk driving. The proposed work is to develop a device which controls accidents due to over speed, drunk driving, rash driving on motor vehicles. This device will be able to detect over speed and programmed to alert with a SMS. The device also includes an application which disables the starting of the vehicle engine when alcohol consumption is detected. The device model is designed using Arduino MEGA, GPS (Global Positioning System), GSM (Global System for Mobile Communication).

**Keywords:** Alcohol consumption detection, over speed detection, SMS alert.

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## I. INTRODUCTION

Road accidents are being major problem these days across the world. About 1.25 million people die each year due to road accidents. These road accidents are quite common in low-income and middle-income group countries i.e. in these countries about 90% of the deaths are due to road accidents because these have about 54% of the total vehicles in the world. These accidents are mainly observed among the age group of 18-30 years' people. There are many factors that cause road fatalities like rash driving, improper maintenance of roads, lack of traffic knowledge, alcohol consumption etc.

This work helps in reducing the road fatalities occurring across the world due to over speed and alcohol consumption. It supervises the alcohol content and the speed of the driver. Traffic accidents caused by drunken drivers and due to rash driving not only represent a significant portion of all automobile accidents but they frequently involve fatalities. However, an effective device that prevents such fatalities is not yet developed. The objective of the apparatus is to initially check the alcohol content of the driver and not to start the ignition if it is more and to supervise the speed of the vehicle and if stays for three seconds in the excess speed it sends an alert to the respective authorities. Sweat sensors, straw like sensors are used to check the drunken condition of the drivers which may mislead because of wrong

reading etc. Now in order to reduce these wrong reading Scientists have developed a CNT (carbon nanotube) based alcohol sensor which gives an accurate value of the alcohol level consumed by the drivers.

## II. Device Designing

### A. Stage One-Alcohol Detection and Ignition Control

Ethanol is also called alcohol, ethyl alcohol and drinking alcohol is chemical compound simple alcohol with chemical formula  $C_2H_5OH$ . Its formulae can be written also as  $C_2H_5-OH$ , and is often abbreviated as EtOH. Ethanol is a volatile, flammable, colorless liquid with a slight characteristic odor.

An alcoholic drink (or alcoholic beverage) is a drink that contains ethanol which is produced by fermentation of grains, fruits etc. The consumption of alcoholic drink plays an important social role in many cultures. Most countries have laws regulating the production, sale, and consumption of alcoholic beverages. The alcohol sensor named MQ-3, which detects ethanol in the air. It is one of the straight forward gas sensors and it works almost the same way like other gas sensors. It is also used as breath analyzers or breath testers for the detection of ethanol in the human breath. Now the alcohol sensor senses the value and this value is converted to analog value and this value is transmitted to the controller through analog pin.



Figure. No. 01. Alcohol sensor MQ-3

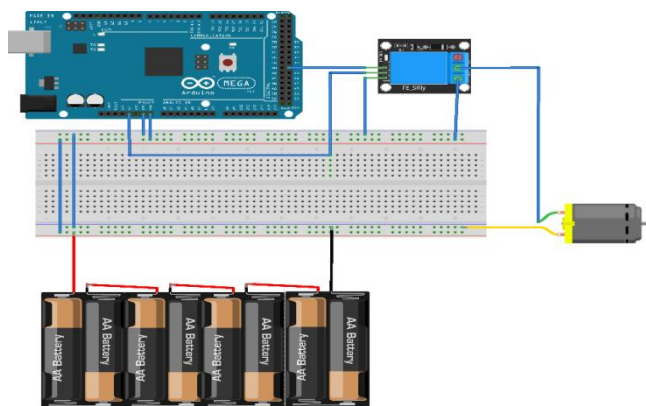


Figure. No. 02. Relay interfacing with Arduino

Now through the program the threshold value is compared and if it exceeds the value then the ignition of the bike does not start. This ignition control is done through relay.

### B. Stage Two-Speed and Location Tracking of the Vehicle

GPS works on the principle of trilateration method for locating. GPS receivers work by the method of figuring out the number of satellites around them. They are pre-programmed to know where the GPS satellites are at any given time. The function of the GPS module is to calculate the speed and location of the vehicle. The satellites transmit the information of their location in the form of radio signals to the earth. Now the earth station receiver receives the information about the location this is how we figure out the distance from number of satellites and determine the location of receiver. A minimum of 6 satellites are required to have the exact location. In this the data will be received by the controller in NMEA format so to understand these commands by the controller we use tinygps++ library.

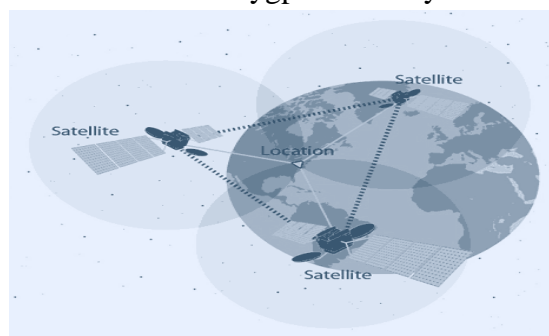


Figure. No. 03. Trilateration method diagrammatic representation

The speed is calculated using the formula

$$S=D/T$$

where S= speed of the vehicle

T= time taken to travel the distance

D= distance travelled

The GPS module continuously sends the location and speed of the vehicle to controller and the controller compares with the threshold value continuously. Once the threshold value is crossed and the vehicle stays in the same speed for three seconds then an SMS alert is sent to the default numbers.

### C. Sending an SMS alert if crosses the desired speed

Global System for Mobile Communication(GSM) is used in this project to send the message to the respective numbers saved in the controller. This was developed as a digital system which works on the principal of TDMA (Time Division Multiple Access) for communication purpose. A GSM digitizes the data i.e. it converts the analog format to the digital format and reduces the data. Now it sends it through a channel with two different streams of client data. These streams have a particular time slot for each. The GSM module has an ability to carry 64 kbps to 120 Mbps of data rates.

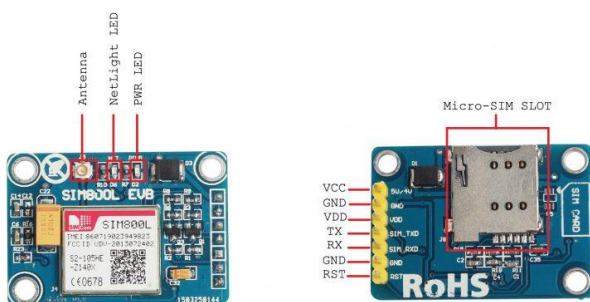


Figure. No. 04. Pinout description of SIM800L

In this work we have used sim800l. From the previous stage the location and the speed will be sent through SMS by GSM module. When we click on the link it pushes the link to google maps and the

speed information can also be known through the SMS.

### III. Methodology

The device works on the methodology shown below:

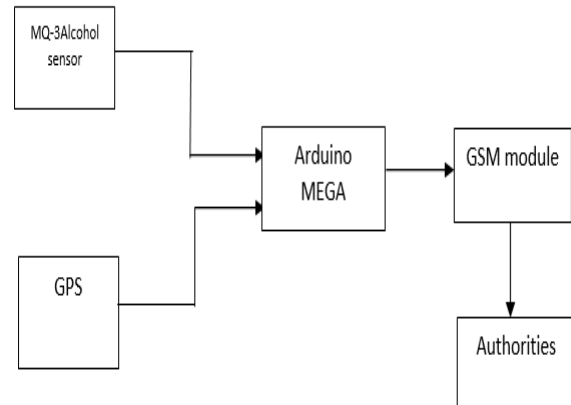


Figure. No. 05. Block diagram of the system

Firstly, the alcohol level consumed by the driver is tested i.e. The person has to blow at the sensor and this value is converted to analog value by the transducer present in the sensor and this analog value is given to the controller and this controller compares with value stored in it and if it crosses the value the ignition of the vehicle doesn't start else the bike starts. Now while travelling the location and speed of the vehicle is continuously tracked and the information of the speed and location is continuously sent to the controller where it compares with the threshold speed level and if the vehicle crosses the value the information of the speed and location is sent through SMS to the respective authorities given to the controller. For sending an SMS we have used GSM module. This methodology is illustrated through the flowchart shown below:

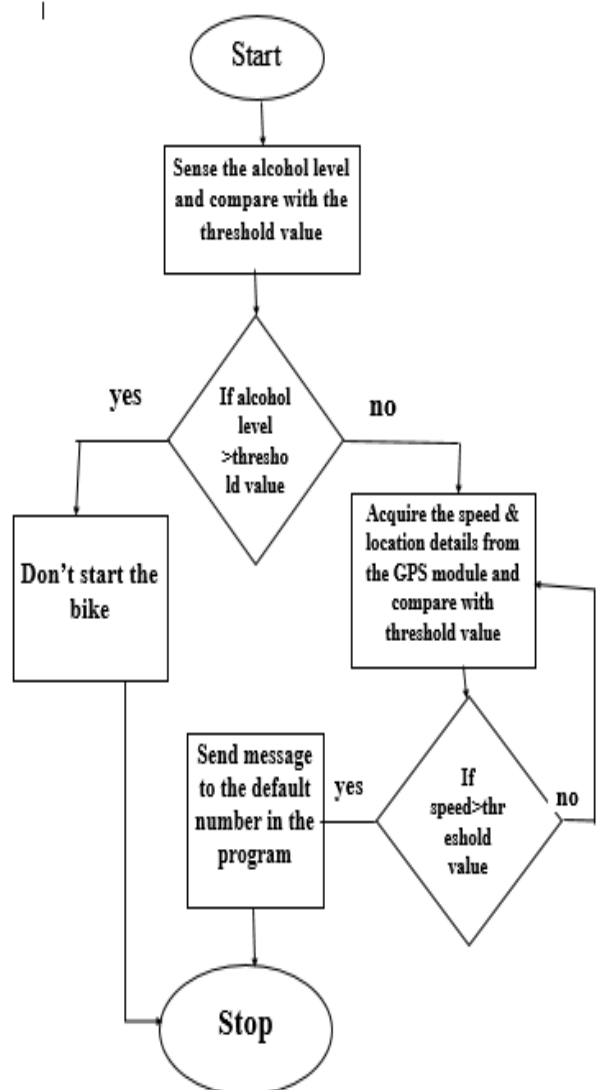


Figure. No.06. Flowchart of the system



Figure. No. 08. when alcohol level is sensed and more than the threshold value

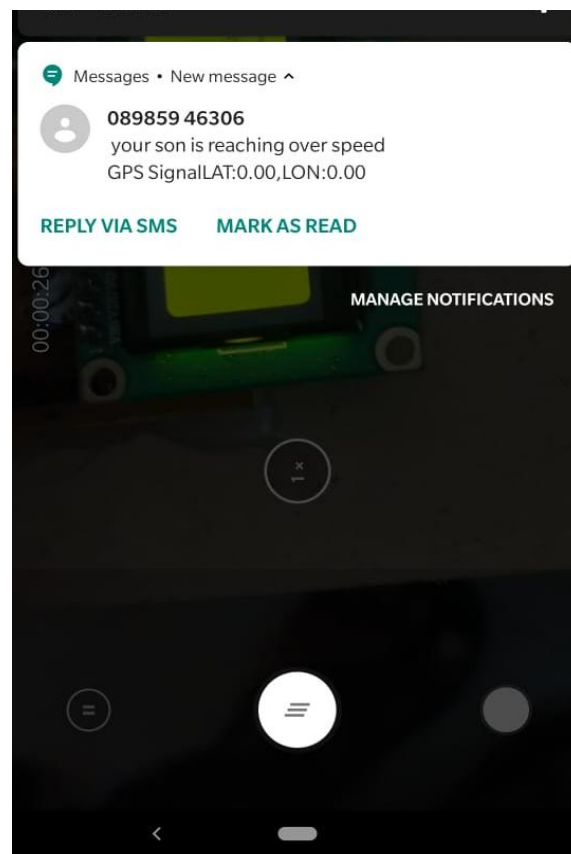


Figure. No. 09. SMS alert when crossed the speed limit

#### IV. Results



Figure. No. 07. While checking the alcohol level of the driver





Figure. No. 8. SMS when opened

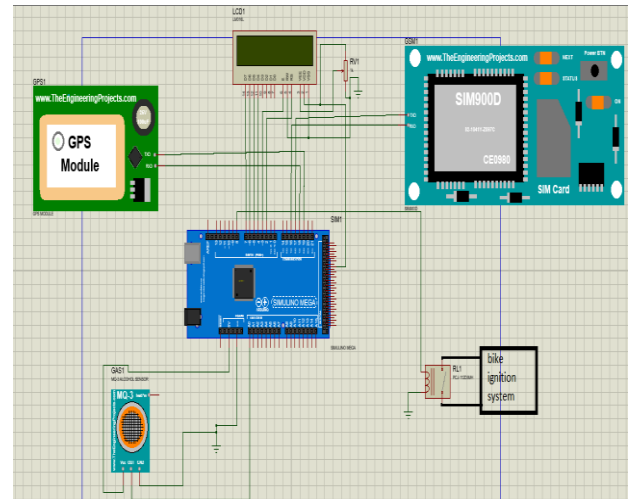


Figure.No.10. Circuit Diagram



Figure. No. 10. SMS when pushed to google maps

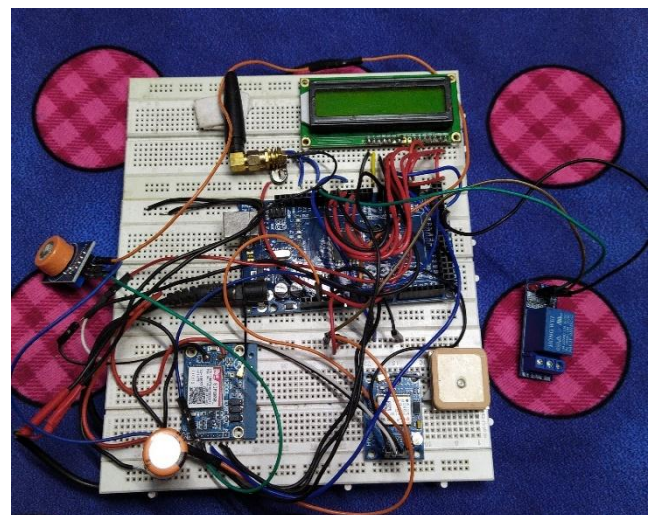


Figure.No.11. Final device

## V. Conclusion

The work helps in reducing the road fatalities due to alcohol consumption and rash driving. By installing such device, the ignition of the vehicle is also controlled i.e. the vehicle doesn't start if the driver consumes alcohol and the speed of the driver is continuously supervised and by sending alerts to authorities while crossing the limit promotes the road safety not only to the people driving but also the pedestrians. Thus the work reduces the road fatalities caused by two major reasons which are alcohol consumption and rash driving.

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A Pratyusha student of Anil Neerukonda Institute of Technology and Sciences pursuing her bachelor ‘s degree in Electronics and Communications Engineering(ECE) department. Being an

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