

# Vehicle Security Using Alcohol Sensor

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## Abstract-

Today's vehicles contain hundreds of circuits and electrical components. To have flexible communication among all these components multiplexing is important. Multiplexing plays an important role in working of a vehicle and makes vehicle more efficient. Similarly developing safety measures to prevent drunk and drowsy driving is also a major challenge for car industry. In last five years near about 61 percent of people lost their lives on highways. Alcohol was the factor in most of these cases. In order to increase the safety on roads it is necessary to provide a system which prevent the drunken person from driving the vehicle. In this project alcohol ignition lock is placed in front of the driver seat. The sensor will lock the ignition after detecting the alcohol beyond the limit. For security of vehicle there is a system in which only car owner can get access to the car by inserting the four digit PIN. This will protect the vehicle from theft.

**Keywords-**Alcohol sensor, PIC controller, GSM modem.

## I. INTRODUCTION

The purpose behind this project is to provide safety and security to the automobiles like cars, trucks etc. Now a day alcohol is a reason of accidents in almost all countries all over the world. Alcohol detector in the car system is designed for safety of the people inside the car. Nowadays internet is widely used in any field for many applications. Every electronic item registered with a code and update in database. Every year the number of cases of vehicle theft and missing are being registered. Internet of things (IoT) is a technology can be used to overcome this issue. This project provides a security by inserting a four digit PIN to start ignition of vehicle.

## II. BLOCK DIAGRAM

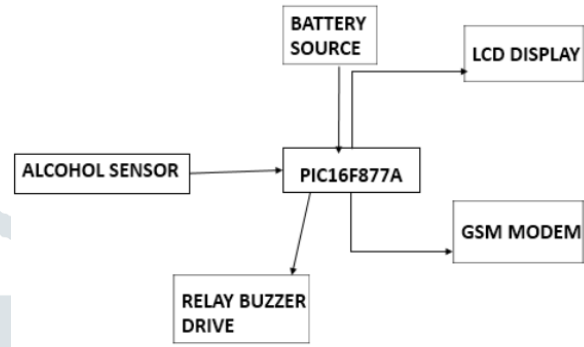


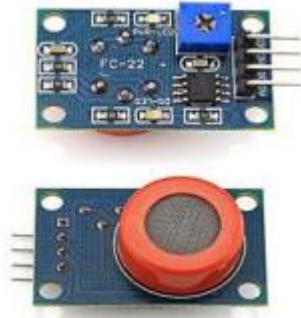
Fig: Block diagram of the system

The main part of the project is an Alcohol sensor. The sensor used in this project is MQ303A. If the alcohol is detected in the breath of the subject then it is detected by the alcohol sensor. MQ303A sensor has fast response to alcohol. Sensor gives this signal to the PIC controller which is the heart of the system. After sensing the alcohol beyond the predetermined level microcontroller send a high pulse to the buzzer. At the same timerelay is turned off. Due to this the ignition system is also turned off. A 16x2 LCD display is interfaced with the controller. The current status of the vehicle and the percentage of alcohol detected by the sensor. GSM modem is also interfaced with IC. The current vehicle update (i.e. alcohol percentage and vehicle status) is send to an authorized person's mobile number.

## III. COMPONENTS

### A. Alcohol sensor :

The MQ3 is an analog gas sensor and suitable for detecting alcohol. SnO<sub>2</sub> is a sensitive material present in MQ3 alcohol sensor, it has lower conductivity in clean air. When it comes in contact with alcohol gas its conductivity increases along with the gas concentration rising. With the help of simple electro circuit, it gives output signal when it comes in contact with alcohol.



**B. GSM modem:**

GSM modem is a device used to send an SMS to the authorized person’s mobile number whose contact number is already saved in controller. It is useful to know the status of vehicle and the driver’s condition. We can track the location of vehicle by using GPS.



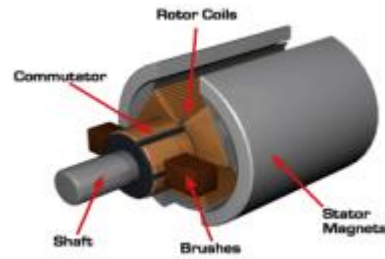
Fig.4 GSM Module

**C. PIC controller:**

The system has PIC microcontroller in which, external crystal required, reset required, it works on 3.5V to 5V it has 4-8 bit ports and 1 3-bit port and it has program memory up to 8Kb program memory and operating frequency up to 40MHz clock frequency.

**D. DC Motor:**

The working principle of DC motor is based on the Fleming’s left hand rule. It states that when we stretch index finger, middle finger and thumb of our left hand such as they are perpendicular to each other. Then if the magnetic field is in the direction of the index finger, the electric current is in the direction of middle finger then the thumb represents the resultant force. In the DC motor when the current carrying conductor is placed in the magnetic field then the shaft of the motor experiences the torque. If the direction of current reversed then the shaft will move in the opposite direction. Figure below shows the construction of DC motor.



**IV. WORKING**

Before starting the vehicle, the driver requires to blow an air into the alcohol sensor which is placed in front of the driver seat. If the breath sample is below the preset alcohol limit, the vehicle can be started. In this project the percentage of alcohol can be shown by blinking LEDs. If the percentage of alcohol is higher than 50 then buzzer circuit is activated and ignition system is deactivated by the controller. The table below shows the percentage of alcohol and the results.

Percentage of alcohol	LED Status	Vehicle status
0 – 10	Green	Vehicle is ON
10 – 15	Yellow	Vehicle is ON
Above 20	Red	Vehicle is OFF

For current updates of driver, it requires to blow an air at random intervals. If alcohol is greater than required level then microcontroller send SMS to the stored number, the stored number can be authorized person or police station or vehicle owner. Other components like regulator, reset circuit, battery are also used. Here the circuit requires 12V and 5V regulated DC supply. The system has 12V rechargeable battery and the out of battery is connected to the circuit via switch through GSM modem and relay. Here is LM7805 regulator to convert 12V into 5V regulated DC. For more security purpose, here keypad is interfaced with the controller. The driver can access to the car only by inserting the four digit PIN. This provides the vehicle from theft. The result of the system can be shown as below

**V. ADVANTAGES**

- 1) The components required for the system are cheap and easily available, so the system can be implemented practically.

- 2) The system is reliable. The driver cannot even tamper it.
- 3) The circuit requires very less power supply (12V)

## VI. CONCLUSION

By this project we can have safe driving for people and can prevent the vehicle from accident. It can be used wherever the drinking is not authentic. The components used in this project are cheap and can be easily available thus we can use this system for almost all vehicles in city and prevent drunken driving.

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