



# Automatic Engine Locking System Alcohol Detection for Drunk & Drive with GSM

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## ABSTRACT

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others. In this project, we are developing an Auto Lock System with GSM. The input for the system is from Detection Sensors either from Alcohol Breath or any other mechanism. The controller keeps looking for the output from these sensors. If there are any traces of Alcohol above the set limit, then the system will lock the Engine and send the message to the concerned person of the driver, so that person will take of both the vehicle and driver. As vehicle automobiles are beyond the scope of this project, we are simulating the process by activating the relay and with the help of dc motors.

**Keywords:** Automatic Engine, Global System for mobile (GSM), Microcontroller, Alcohol Sensor (MQ3)

## I. INTRODUCTION

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others. The system uses a compact circuitry built with microcontroller with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C. The main purpose behind this project is "Drunken driving detection". Now-a-days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus drunk driving is a major reason of

accidents in almost all countries all over the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car. This project should be fitted / installed inside the vehicle. By implementing this design a safe car journey is possible and also drunken drivers can be controlled. Government must enforce laws to install such circuit in every car and must regulate all car companies to preinstall such mechanisms while manufacturing the car itself. If this is achieved the deaths due to drunken drivers can be brought to minimum level. In this type of system, future scope can be safely landing of car aside without disturbing other vehicles. India had earned the dubious distinction of having more number of fatalities due to road accidents in the world. Road safety is

emerging as a major social concern around the world especially in India. Drinking and driving is already a serious public health problem, which is likely to emerge as one of the most significant problems in the near future. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle. At the same time an SMS along with the location of the vehicle is send to three pre-selected contacts. Hence the system reduces the quantum of road accidents and fatalities due to drunk driving in future. An effective solution is provided to develop the intelligent system for vehicles which will monitor various parameters of vehicle in-between constant time period and will send this data to the base unit as explained in this paper, by using hardware platform who's Core is microcontroller, Alcohol sensor (MQ3), Global System for Mobile (GSM) module. The designed system would finish the function of communicating with the base station via GSM and control of various parameters. The whole Control system has the advantage of small volume and high reliability. Future scope of this system is to control the accidents and providing useful details about the accidental vehicle, thereby reducing the rate of accidents taking place due to drunken driving. This system brings innovation to the existing technology in the vehicles and also improves the safety features, hence proving to be an effective development in the automobile industry.

## II. RELATED WORK

In [1] , they had use PIC 16876A controller, Alcohol sensor, LCD Display And Alarm system

to notify driver only, ignition system was immediately off when detected alcohol. In [2], GSM and GPS were used to send location and alcohol detected related message to relative of driver. Location was normally in longitude and latitude which was difficult to locate. Ignition system directly turn off when detected alcohol. In [3], IR LED 894 was used. It was produces high intensity IR ray's, which means it absorb alcohol of only high content from air, so this symbolizes that this mechanism will work only when driver is over drunk for lower concentration of alcohol it was detected accurately. In [4], IR sensor was used to detect obstacle which comes in front of this sensor (vehicle), and when obstacle detected vehicle was stop. It was also monitoring the toxic gases such as CO<sub>2</sub>, LPG, Alcohol from inside area of the vehicle .If there is high content of gases then SMS had been send to authorized person to notify only. In [5], it describes real-time online prototype driver-fatigue monitor. It uses remotely located charge-coupled-device cameras which was equipped with active infrared illuminators to acquire video images of the driver. Various visual cues that typically characterize the level of alertness of a person are extracted in real time and systematically combined to infer the fatigue level of the driver. The visual cues employed characterize eyelid movement, gaze movement, head movement, and facial expression. If the eye of driver is being continuously closing it mean eye-blink frequency is beyond the normal state and it is in sleeping condition then ignition system would be off immediately.

### III. SYSTEM ARCHITECTURE

Here AT89S51 is used as Microcontroller Unit (MCU) which acts as the heart for the system. The system is divided into two parts; one part is for detecting, and another for controlling the parts installed in the car. The working of the system is when the driver sits, in position sensor gets activated and send alert abnormal condition to detect alcohol for the driver. Then the detection process starts and displays the amount of alcohol taken on Liquid Crystal Display (LCD). If the amount of alcohol detected is normal, the vehicle can start. If detects more than the alcohol allowed makes the vehicle cannot work if driver ignores the command and tries to start the car immediately breaks will activate and makes the wheels not to rotate. The ignition will begin only when the key touches +ve and -ve terminals with low o/p at the key terminal, the key fails to complete the circuit where it results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car.

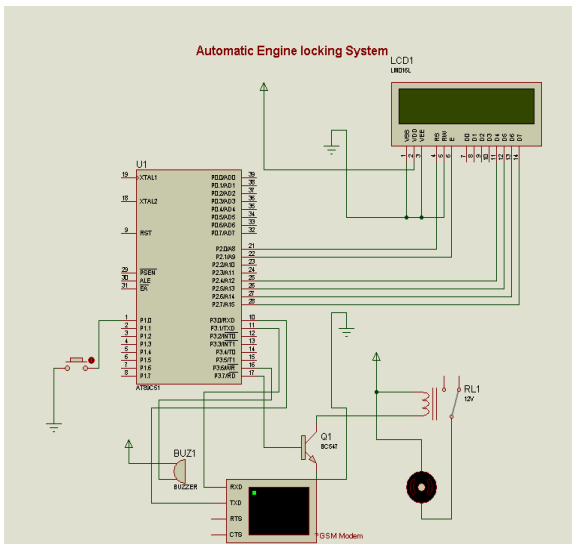


Figure 1. Circuit Diagram of the system

#### 1. Microcontroller (AT89C51):

Now let us talk about this popular 8051 chip. It has on chip ROM in the form of flash memory. This is ideal for fast development since flash memory can be erased in seconds compared to the twenty minutes or more needed for the 8751. For this reason the AT89C51 is used in place of the 8751 to eliminate the waiting time needed to erase the chip and thereby speed up the development time. To use the AT89C51 to develop a microcontroller based system requires a ROM burner that supports flash memory; however, a ROM eraser is not needed. Notice that in flash memory you must erase the entire contents of ROM in order to program it again. This erasing of flash is done by the PROM burner itself.

#### 2. Alcohol Sensor:

The alcohol sensor will detect the alcohol content from human (driver) breath and send its value to microcontroller. Alcohol sensor (MQ3) is suitable for detecting alcohol concentration just like your common breathalyzer. It has a high sensitivity to small value of BAC and fast response time, provides an analog resistive output based on alcohol. It has SnO<sub>2</sub> as gas sensitive material to sense alcohol.

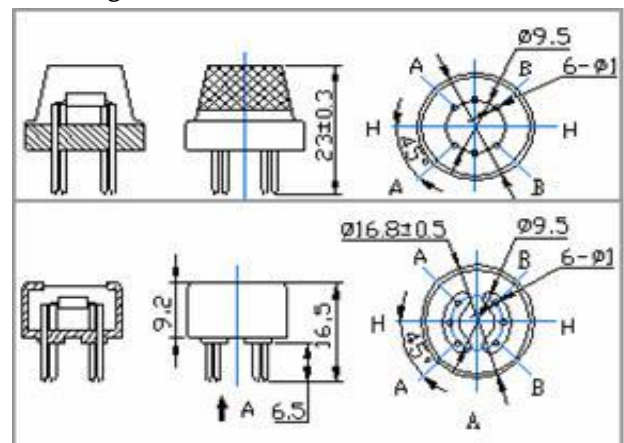


Figure 2. Overview of MQ-3 Alcohol Sensor

### 3. LCD Display:

The LCD display is fitted inside the car and this LCD display is act as indicator to driver and other people who are sitting inside the car. This display gives indication of alcohol level detected by alcohol sensor, this also provide warning message to driver to stop car or vehicle within particular time afterward car will automatically stop, indication of smoke/gas detected in car.

### 4. DC Motors:

When alcohol is detected while driving then instead of stop ignition system directly while driving state, signal is passed to fuel blocker and fuel supply is cut-off. This results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car. To demonstrate the project, we used dc motors instead of engine.

### 5. Relay:

Relay is used to turn off the dc motor by passing low power signal to dc motor .that's mean when alcohol detected power signal is triggered. The advantage of the system is that the driver cannot even tamper with it. Because, the fuel supply valve is open only when all the components are working properly. So if anyone tampers with it or if the alcohol content is above a particular limit, fuel is not supplied and the vehicle cannot be started.

- ✓ Also when the fuel supply is cut-off, the car doesn't stop abruptly. This helps to prevent collision with the vehicles coming behind.
- ✓ This circuit detects the alcohol directly.
- ✓ This circuit is simple in construction.
- ✓ Readily available ICs are used.
- ✓ Responsibility of the circuit is high.
- ✓ High Accuracy

### 6. Global System for Mobile (GSM)

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM (Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 kbit/s, together with the transmission of SMS (Short Message Service). Once the alcohol is detected, SMS will be send to the concerned person of the vehicle or driver.

## IV. RESULT AND DISCUSSION

The following procedure explains the procedure of flow

- ✓ When driver starting car/vehicle then alcohol sensor start sensing at condition vehicle speed equal to zero.
- ✓ If alcoholic driver detected then immediately ignition system will turn off along with message about detection is send to relevant of driver for notification and notification will be displayed on LCD.
- ✓ A flag is set when first condition is passed without detection of alcohol.
- ✓ When speed of vehicle is greater than zero. i.e. vehicle started to driving then again along with alcohol, start to sense collected parameter values are send to microcontroller.
- ✓ If alcohol detected in this case then signal is send to fuel blocker by microcontroller for

blocking fuel supply to ignition system. So driver feel's that vehicle is going to stop and then place car at appropriate location.

Strategies to be used for proposed system:

1. Starting vehicle by driver.
2. Check alcohol sensor of vehicle.
3. If it is zero then start sensing by various sensors & notifies detection .In this case alcohol is mainly checked if it detected then stop dc motor.
4. If speed is greater than 2 kmph then again sensing started. Detection of various parameters will be sense by sensor & will be notified.
5. At a same time if alcohol is detected then fuel supply will blocked.
6. Vehicle will stop & notify detection and displays in LCD.

## V. CONCLUSION

Our system efficiently checks the accidents occurs or not and drunken driving. By implementing this system in vehicle, a safe journey is possible which would decrease the injuries during accidents and also reduce the accident rate due to drunken driving. This system has also accident prevention technology which would reduce the accident of the vehicle in crowd areas. Proposed system will resourcefully detect alcohol through driver breath and stop the vehicle by interrupting the ignition, instead of directly stopping the vehicle. We can implement a mechanism to cut-off fuel supply instead of stop ignition system directly because direct stop of ignition system on detecting an alcohol may be dangerous as driver driving a vehicle at a high speed and it may lead to chance of accident, so after cut-off fuel supply driver will place at a proper position.

## VI. REFERENCES

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