A vehicle with various safety features using Embedded System

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Abstract- Now a days technology is being used everywhere in our day to day life. E.g. in hospitals, garden, schools, vehicle Noes, etc. As the technology has improved a lot the user in the car market does not only check the average or cost of the car but he also checks the various safety features implemented in the car.

In this project we have developed a system 'car with various safety features' which is equipped with GSM module, RFID card reading system. System also facilitates different sensors like alcohol sensor, pressure sensor, PIR sensor, etc. This system will help to decrease the percentage of accidents in the society and will provide a safe drive to the people of society.
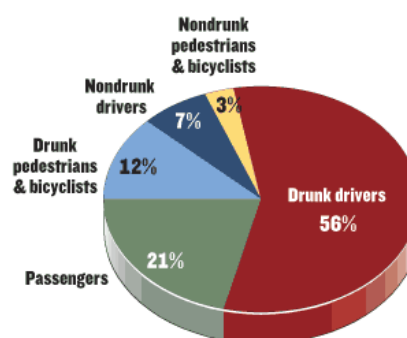
Keywords— GSM module ,RFID module, PIR sensor, MUX

Fig.:- 1.1 percentage accidents due to drunk drivers

I.   INTRODUCTION

Some of the reasons of accidents are sudden decrease in the tire pressure. Sometimes the driver starts the car without checking that the passenger has entered the car or not. Sometimes the driver is drunk. One of the major reasons of the accidents is drunk driver. Let's see the data available on the internet-

II.   OBJECTIVE

Now a day the concept of smart car is trending a lot. Smartness and safety are the two important aspects of smart car hence we have made a car which has a smart as well as safety features. The objective of this project is to provide a safe drive to the user. The objectives of our project are as follow:-

- To provide the information that the passenger has entered or departed from the car with the help of RFID module.
- Alcohol detection by using alcohol sensor.
- To help the driver to recognize the presence of the passenger with the help of PIR sensor.
- Helps the driver to detect the pressure in tire using pressure sensor.
- To send the message that the ride is on or off to the owner of the car by using GSM.

III.   PROJECT SCOPE

This project has great future scope. A vehicle with various safety features can be used in different fields like smart city, smart society. In future we can add the exact location of the passenger, the exact amount of petrol in the car. In future by

using another method we can give the same functionality or features.

IV. PROPOSED SYSTEM

The number of cars in our country is being increased since last few years. With this increase, the user wants advancement in the features of the car. One of the advancement the user wants in his car is related to the safety. The user in the market now a days wants a car which is smart as well as safe for him. Hence all with these objectives in our mind we have proposed a system which is a smart car with various safety features.

A. Alcohol Sensor:-

The sensor we are for alcohol detection is **MQ3 gas sensor.** The **MQ3 gas sensor** is **alcohol sensor** which is used to detect the alcohol concentration on your breath. This sensor provides an analog resistive output based on alcohol concentration. When the alcohol gas exist, the sensor's conductivity gets higher along with the gas concentration rising
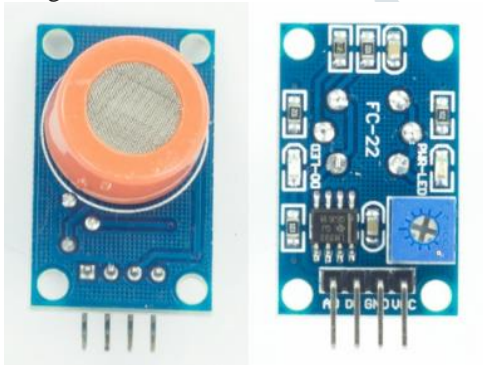

Fig.4.1 Alcohol Sensor

B. Pressure sensor

Pressure sensor is a device for pressure measurement of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force punit area. A pressure sensor usually acts as a transducer; it generates a signal as a function of the pressure imposed.

C. PIR Sensor:-

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. They have a digital output of approximately 3V.

Fig.4.2 PIR Sensor

D. AT89S52 Microcontroller: -

TheAT89S52 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.
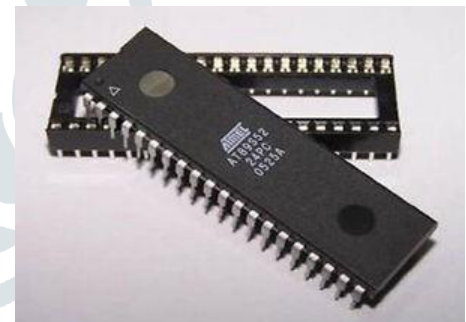

Fig.4r

E. L CD Display:-

We have used a 16*2 LCD display for our project. It has 5 x 8 dots includes cursor built for controller. It is operated at +5V power supply and 1/16 duty cycle.

*Fig.4.4 LCD Display (16*2)*

F.   RFID **Reader: -**

Radio-frequency identification (**RFID**) is a technology to record the presence of an object using radio signals. It is used for inventory control or timing sporting events. RFID is not a replacement for bar-coding, but a complement for distant reading of codes. The technology is used for automatically identifying a person, a package or an item. To do this, it relies on *RFID tags*. These are small transponders (combined radio receiver and transmitter) that will transmit identity information over a short distance, when asked. The other piece to make use of RFID tags is an RFID tag reader.

Fig.4.5RFID Module

G. GSM:-

GSM (**Global System for Mobile communications**) is a standard developed by the European

Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets. As of 2014, it has become the global standard for mobile communications. "GSM" is a trademark owned by the GSM Association.

H.   Multiplexer: -

In electronics, a multiplexer (or mux) is a device that combines several analog or digital input signals and forwards them into a single output line. A multiplexer of 2^n inputs has n select lines, which are used to select which input line to send to the output. Multiplexers are mainly used to increase the amount of data that can be sent over the network within a certain amount of time

IMPLEMENTED SYS

The system implemented is consists of many features that makes any car more safe and secure for users. All features that we have implemented are described below with deeper implementation details along with working.

and bandwidth. A multiplexer is also called a data selector. Multiplexers can also be used to implement Boolean functions of multiple variables.
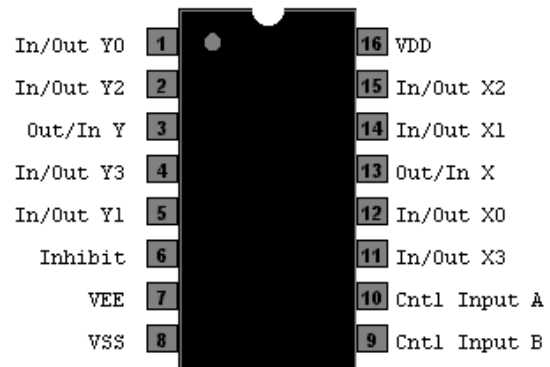

Fig.4.6 CD4052 Mux IC

V.   SOFTWARE **1**INTERFACE

1. Express PCB (circuit dia.) and Layout :- ExpressPCB is designed to enable very fast rapid development of Electronic Schematics and Printed Circuit Board Layouts. It includes ExpressSCH Classic for drawing schematics and **ExpressPCB** Plus for**circuit board** layout. Both programs are completely free, fully functional and easily installed with a single InstallShield setup program. Learning to use our **software** is fast because of its standardized Windows user interface.

2. Keil Compiler:- The Keil 8051 Development Tools are designed to solve the complex problems facing embedded software developers. When **starting** a new project, simply select the microcontroller you use from the Device Database and the µVision IDE **sets** all compiler, assembler, linker, and memory options for you

1. We have used GSM module for sending security related message. Message will get triggered in following cases:
   A)   while checking alcohol consumed by Driver.
   B)   when tire pressure is below certain limit.
   C)   if car is accessed by unauthorized person.

2. We have also placed LCD display in system to show all important alerts upfront. The LCD will show messages following scenarios:
   A) Greetings message
   B) All the car information will be displayed initially
   C) RFID scanning alert will also get displayed on screen

3. We have used multiple sensors that will help us to enable all features provided by system
   A) Alcohol sensor: - alcohol detector
   B) Pressure sensor: -pressure detector
   C) PIR sensor :- presence of passenger

VII.   EXPECTED RESULT

- pressure in the tire of car &alert the driver if pressure is too low or too high.
- Check the presence of passenger in the car if passenger is present, indicate as 'P' if absent indicate as 'A'.
- Detect the percentage of alcohol taken by the driver if it is too high then do not start theengine.
- Check the driver has picked up the correct passenger.

VIII.   EXPERIMENTL RESULT

We are expecting to have good amount of pressure in tire to start the car. Please find below reading from pressure sensor.

	Minimum value	Result
Case 1	30 tsi	RIDE ON

If driver has consumed alcohol then car will not start as it is dangerous to ride car after drinking.

	Minimum value	Result
Case 1	0.08%	RIDE ON

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APPLICATIONS

- Transportation
- Safety services
- Public transport system
- Smart city
- Accidents prevention
- Economic development
- Public safety

IX.   CONCLUSION

The system developed by us will provide alcohol detection, pressure measurement, presence or absence of passenger, will allow only the correct passenger to enter in the car. Will give message to the owner of the car that the ride is on or off. Thus it will ensure a safe and happy will provide happy journey to the user. A car with various features is the best example of enhanced technology.

X.   REFERENCES

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6. .[https://en.wikipedia.org/wiki/Pressure_sensor