

Alcohol Sensing Engine Locking System With GPS

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Abstract - In this project we have used an alcohol detecting sensor in vehicle for safe driving system of vehicle for drunk and driving cases, which senses and detects alcohol particles and send messages if alcohol. In this process GSM and GPS modules are connected to microcontroller for controlling purpose. GPS module get the position of vehicle with longitude and latitude and it send message to authorized person. We have also provided the security system for vehicle that ensuring the driver is engaged the helmet

Key Words: Alcohol, Driver, Hazardous, GSM, GPS, Alcohol Sensor

1. INTRODUCTION

This system senses the content of alcohol in breath. This system uses LCD display, MQ3 sensor, force sensor and GPS and GSM techniques. The output of the sensor is directly proportional to the content of alcohol consumed. This type of sensors in cars is a great safety factor which can be embedded in steering of the cars. When the driver starts the ignition, sensor detect the presence of the alcohol in his breath and if the alcohol detected then automatically it will stop the ignition of the car. Thus we can reduce accident rate due to drunk and drive. The system also check whether the driver is engaged the seat belt or not. By using GSM send a SMS to the authorized person. And by using GPS we can send the location of the vehicle at that instant. Hence the system reduces the road accidents and fatalities due to drunk driving in future. Microcontroller is the heart of our project. Microcontroller gets the coordinates from GPS modem and then it sends this information to user in text SMS through GSM.

1.1 Alcohol Detection

Alcohol consumption of the driver will be detected by using a MQ3 sensor. If driver consumed alcohol, then alcohol level inside the vehicle will be higher than a threshold value. When alcohol consumption detected, then the vehicle immediately stops to avoid risk of accident.

1.2 Seat Belt Detection

Using the force sensor we will be detecting whether the seat belt is engaged or not. If the seat belt is not engaged the vehicle will fail to start.

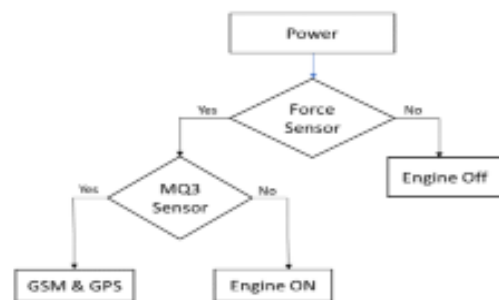
1.3 Sending Location via SMS

When the alcohol presence is detected by the system an SMS will be sent to the authorized person. The said SMS will be containing the current location of the driver

2. SYSTEM DESIGN

System consists of force sensor, Alcohol detection part, GPS and GSM. Force is used to check whether the driver is engaged the seat belt or not. Alcohol detection will be done using MQ3 sensor. If the alcohol presence is detected the message containing current location will be sent to the family or friends

2.1 BLOCK DIAGRAM



A. Arduino ATMEGA328

ATmega328 Arduino Uno microcontroller board is used in the designed system. 14 pins are present in the unit, which allows outflow and inflow of feeding, a Universal Serial Bus port, 6 continuous signals with time changing quantity, an on-board voltage regulator, 16 Mega Hertz electronic oscillator, a power connector, ICSP header, and a reset button. The Atmega328 microcontroller has 32 Kilo Bytes flash memory, 1 Kilo Bytes EEPROM and 2 Kilo Bytes SRAM.

B. Alcohol MQ-3 Sensor

Tin Dioxide (SnO₂) sensitive layer is used to made sensor. It is having less sensitivity to Benzene and more sensitivity to alcohol. It has a circuit with improved stability, good lifetime and quick response. Analog interface type design is used in the sensor. Sensor pins represents 1-output, 2- ground and 3-power supply. The

technical specification of the sensor is depicted. As specified in the datasheet, we use 200k ohm Resistor along with sensor.

C. Power Supply

5V adapter is used to provide the power to the controller and other part of the system.

D. LCD Display

Liquid crystal display screen is the electronic screen and consists of various applications. The generally used 16x2 LCD screen is fundamental module operated in various circuits and devices. These modules are elected to seven segments and various multi segment LEDs. The reason being: LCDs are simply programmable; economical; have no constraints of computing exceptional and balanced ordinance characters (unlike in 7 segments), dynamism and so on. 16 characters per line are displayed in 16x2 LCD and there are 2 such segments. Each character is betrayed in 5x7 pixel grid in this LCD. This LCD consists of 2 registers, namely data and command. The command instructions are stored in the command registers which are given to the LCD. To do a predefined task the command instructions are given to LCD for striping its screen, operating it, guiding display, locating the cursor position etc. The data to be display on the LCD is stored in the data registers. The data is in the form of ASCII value of the character which is to be displayed on the LCD.

E. DC Motor

The DC motor is an electric DC motor operated to validate the abstract of engine padlocking. Here in this task, the motor will be associated to pin 9 on the microcontroller, the DC motor stops when the alcohol is sensed and when there is no alcohol sensed the DC motor continuous running.

F. Force sensor

A Force Sensor is defined as a transducer that converts an input mechanical load, weight, tension, compression or pressure into an electrical output signal. Force Sensors are also commonly known as Force Transducer.

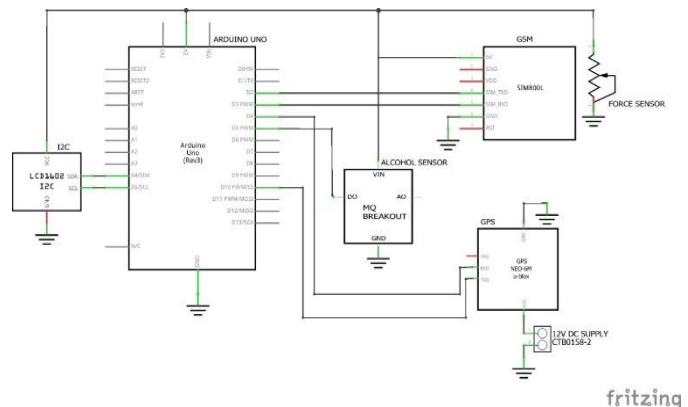
G. GPS Module

The Global Positioning System (GPS) is a spacebased satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver

H. GSM Module

The GSM net used by cell phones provides a low cost, long range, wireless communication channel for applications that need connectivity rather than high data rates. Machinery such as industrial refrigerators and freezers, HVAC, vending machines, vehicle service etc. could benefit from being connected to a GSM system.

2.2 CIRCUIT DIAGRAM



2.3 System Operation

The microcontroller reads the voltage values which are noticed as digital in nature, the Uno board of Arduino generally consists of 8 channels, the device is of 10 bits, that used to give output as digital digits by processing Analog voltage on a pin. The device relates the load of input voltages ranges from 0-5V with the outcome values ranges from 0- 1023volts to bring about 5volts of voltage in a cycle for every 1024 units. First of all the system will ensure that the driver is engaged the seat belt and if the seat belt is not engaged the system will not check the other conditions such as alcohol detection and if alcohol is not detected it will go to the next stage .Check whether the driver is consumed alcohol .If the alcohol presence is detected .The sensor information is given to the Arduino through which the Arduino controls the engine of the vehicle. And message along with the current location of the vehicle will be send to the family or friend.

3 . RESULT

After the person who consumed alcohol enters into the vehicle then the alcohol sensor starts it's work and detects the level of alcohol which is followed by the buzzer ring and the LCD displays the content of alcohol after that the relay comes into action and will turn off the ignition, by which the vehicle won't move which is the main aim of our project. An intelligent system in which Arduino is the main base has been created by us as Innovative system. Also we have used sensors which has range of 2 meters such that they can suit for any vehicle and also can be hidden form some people. The main advantage of the proposed work is

that it is small in size and also has higher reliability and efficiency. Now-a-days people idea on transport safety is changing, public safety is given more importance by which our project can be made successful and useful to public. Future vision of the project is that it can be made inbuilt in the vehicles manufacturing it will be a new innovation to the technology in automobiles by adding safety feature, there by bringing a new development in the automobile industry.

4 . CONCLUSION

We had proposed a system that detects the alcohol from the breath of the vehicle driver there by stopping the vehicle to move and reduce the danger of people's lives. The system came alive by using effective Arduino ATmega328 microcontroller and sensors.

REFERENCES

- [1] Vijay J, Saritha B, Priyadharshini B, Deepeka S, Laxmi R. Drunken Driven Protection System. International Journal of Scientific and Engineering Research. 2011; 2(12):1-4.
- [2] Kousikan M, Sundaraj M. Automatic Drunken Drive Prevention System, International Journal of Students Research in Technology and Management. 2014; 2(2): 75-77.
- [3] Prashanth KP, Padiyar K, Naveen KPH, Kumar KS. Road Accident Avoiding System using Drunken Sensing Technique. International Journal of Engineering Research and Technology. 2014; 3(10): 818- 823.
- [4] Bindu JH, Reddy GA, Anoosha P, Vinolini KAV. Programmed Engine Locking System by Automatically Detecting Drunken Drivers. International Journal of Innovative Research in Science, Engineering and Technology. 2015; 4(11):11344-11348.
- [5] Altaf SV, Abhinay S, Ansari E, Kaunain Md, AnwerR. Alcohol Detection and Motor Locking System. International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering. 2017; 6(2): 989-993.
- [6] Ambikapathy A., Kumar A., Verma J., Singh G., Sharma R. (2021) Arduino Based Accident Prevention Technique Using Eye Blink Sensor. In: Priyadarshi N., Padmanaban S., Ghadai R.K., Panda A.R., Patel R. (eds) Advances in Power Systems and Energy Management. ETAEERE 2020. Lecture Notes in Electrical Engineering, vol 690. Springer, Singapore. <https://doi.org/10.1007>