AUTOMATIC ALCOHOL DETECTION IN VEHICLE

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ABSTRACT

The main purpose of this research is to design a system for implementing an effectual alcohol detection system which will be helpful in preventing accidents. Most often accidents occur due to an over-drunk person. Though there are laws to punish drunk drivers they cannot be fully implemented because the traffic police cannot be present on every road to examine whether the driver is drunk or not. So, in order to tackle this problem, the requirement for an effective system to check drunken drivers is a must. Hence, to avoid such accidents we have implemented a template project. This system tracks the blood alcohol level from the driver's breath. The amount of alcohol will be detected from the sensors positioned at different locations near the driver. This system is equipped with MQ3 sensors, a microcontroller and an LCD. An MQ3 gas sensor regularly analyzes the content of alcohol present in the driver's blood.

Keyword: - *Vehicle Safety System, MQ3 sensor, microcontroller, LCD.*

1. INTRODUCTION

Getting behind the wheel of a car, truck or any other motor vehicle – after consuming alcohol is considered a major crime. Drinking and driving is usually termed driving under the influence (DUI) or driving while intoxicated (DWI), and comprises operating a vehicle with minimum blood alcohol content (BAC) level of 0.08 %. The largest group of individuals prone to drinking and driving are those who binge drink or are struggling with an alcohol use disorder (AUD). This implies that they consume an excessive amount of alcohol during a short period of time, making them prone to harmful side effects. Alcohol gets absorbed in the human bloodstream roughly in around 30 to 120 minutes. At that moment, your breathing might hamper and your cognitive skills can also be delayed. Alcoholism is a situation which can be cured with the help of specialized treatment and medication. If someone is struggling with this, it is high time they seek help and get their life back on track. A Blood Alcohol Content of 0.09-0.25 percent can cause sedation balance problems, lethargy and blurred vision. Muscle and vision coordination becomes imbalanced due to such conditions resulting in accidents.

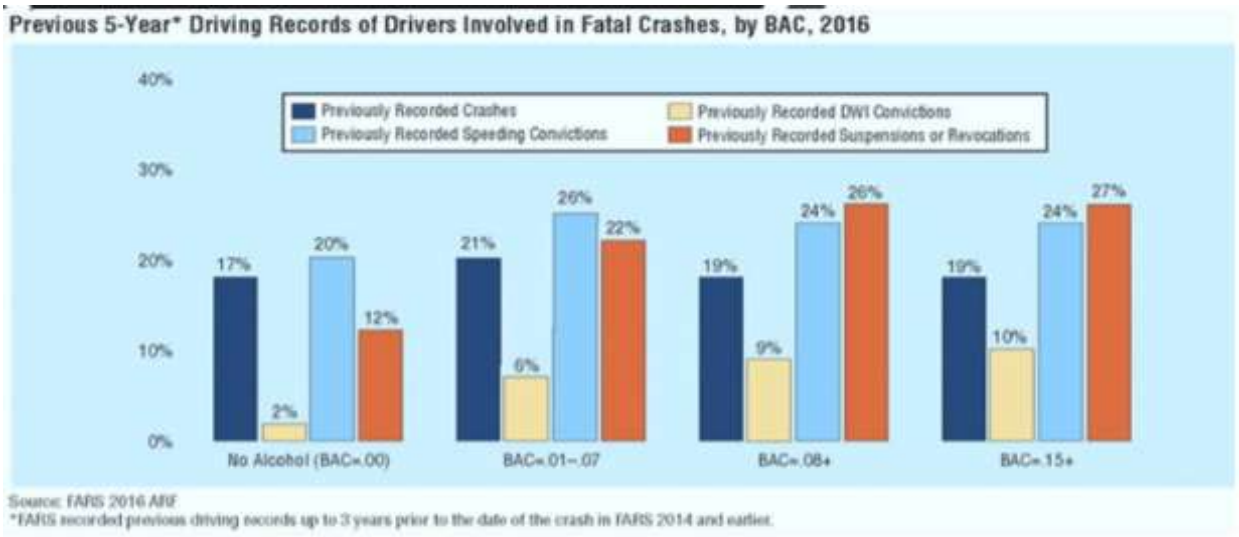


CHART-1: Previous Driving record graph

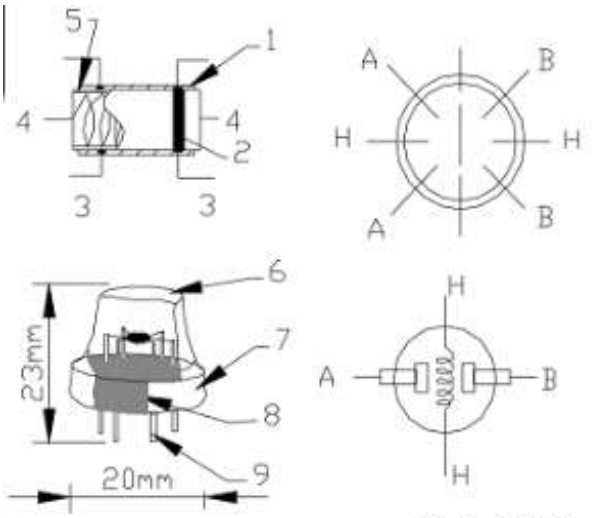
1.1. What is Automatic Alcohol Detection?

Automatic Alcohol Detection may be a system designed to tackle the growing issue of drunk driving. This technique is equipped with an associate in nursing MQ3 gas sensing element that is embedded on the wheel. MQ3 gas sensing element may be a specialized sensing element for alcohol detection. This sensing element is consistently watching the content of alcohol within the driver's body and if the content of alcohol is found to be on top of a particular limit the system mechanically stops the automobile.

1.2. MQ3 Sensor

The Gas Sensor (MQ3) module is useful for gas discharge detection (in home and industry). it's appropriate for detecting Alcohol, Benzene, CH4, Hexane, LPG, CO. Owing to its high sensitivity and quick response time, measurements are typically taken as presently as potential. The sensor can operate at temperatures ranging from -10 to 50°C and consumes less than 150 mA at 5 V. can detect Alcohol gas concentrations anywhere from 200 to 10000 ppm. The sensitivity of the sensing element is usually adjusted by victimization of the potentiometer.

Fig -1: MQ3 Sensor



	Parts	Materials
1	Gas sensing layer	SnO_2
2	Electrode	Au
3	Electrode line	Pt
4	Heater coil	Ni-Cr alloy
5	Tubular ceramic	Al_2O_3
6	Anti-explosion network	Stainless steel gauze (SUS316 100-mesh)
7	Clamp ring	Copper plating Ni
8	Resin base	Bakelite
9	Tube Pin	Copper plating Ni

Fig -2: MQ3 Structure and Configuration

1.3. ATMEGA 16

ATMEGA16 microcontroller is one in all the favored controllers within the AVR series. With its options and buy cost, it became one of all the favorite controllers for hobbyists and engineers. ATMEGA16 programming is analogous to the opposite AVR controller. It is notably a clone to ATMEGA32 except for the memory. though it has solely 1/2 the memory of ATMEGA32, it is still quite enough to satisfy most EMBEDDED SYSTEMS.

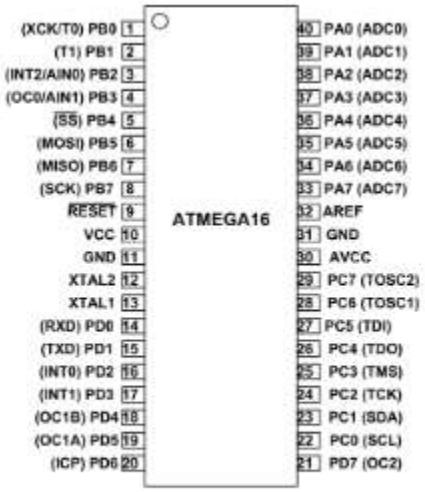


Fig -3: ATMEGA 16

Fig -4: ATMEGA 16 Block Diagram

1.4. 16X2 LCD

It is a sixteen character and two-line display. During this project LCD is functioning in 4-bit mode i.e., the information transferred to the LCD should be in a 4-bit data form. The opening of ATMEGA16 is connected to data pins of LCD and is outlined as LCD_DATA. PortB is outlined as control pins (RS, R/W, and EN). LCD contains three control lines (RS, R/W & EN) and eight data lines(D0-D7), contrast control (Vee), supply voltage (Vcc) and ground(Vss).

Fig -5: 16X2 LCD

2. BLOCK DIAGRAM AND WORKING

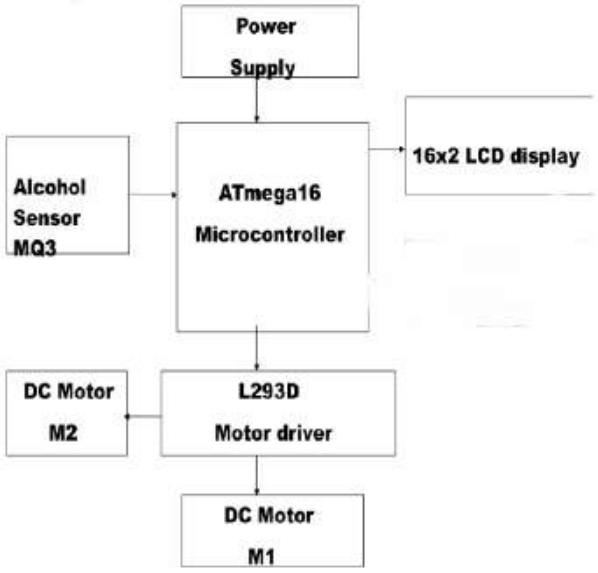


Fig -6: Block Diagram

As shortly because the power supply is given to the VCC pin of the Microcontroller Avr-ATmega16, the alcohol detector MQ3 can discover the alcohol concentration associate degreed provides an analog resistive output supported alcohol concentration which is given to the integral ADC of the microcontroller. It can convert this analog resistive output into the digital output which will be in the form of an LCD message display - "ALCOHOL DETECTED". Then the microcontroller provides the signal to the L293D driver which in turn will generate a signal to the converter of the circuit i.e. increasing firing angle. Also, the DC motor is controlled by the L293D motor drive. Thus, if alcohol is detected, then automobile speed will reduce step by step and the vehicle stops. The system does not directly stop the engine; it sends a message signal to the L293D motor driver, which stops the fuel supply and the engine turns off gradually.
This system is very effective and useful in avoiding road accidents and thus saving lives.

3. CONCLUSIONS

This model effectively checks the number of accidents that occur due to drunken driving. By using this technique in automobiles, a safe journey is feasible which might reduce the accidents and injuries. The planned system will resourcefully sense alcohol from the driver's breath and stop the automobile by interrupting the fuel supply. It provides efficient development in the automobile industry regarding the reduction of accidents caused due to alcohol consumption.

4. REFERENCES

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