Alcohol detection and vehicle control system

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Abstract: This system provide the method to mitigate the problem related to alcoholic people. We have installed a sensor on the steering of the car that detect the concentration of alcohol into the breath of the drunk driver. The sensor generate current which is sent to the microcontroller and are compared to the preset value. Microcontroller generate the signal proportional to the compared current and on increasing the threshold value then it stop ignition and start buzzing the buzzer and force the GSM module to inform their relative by sending message .

In this way it is going to be used in vast applications. This type of system is a great safety factor which can be implanted in the steering of the car. When driver start the ignition system, sensor measures the concentration of alcohol in to its breath and switch off the ignition system of car and notify their relative by sending SMS. So we can minimize the such types of alcohol related accidents. This system can also be implanted in schools and hospitals.

Keywords: **GSM,TDMA, LCD ,MQ-3.**

1.INTRODUCTION: This system uses the alcohol detection sensor which detect the concentration of alcohol into the breath of the drunk driver and stops the ignition system of the car. This system uses the ATMEGA 328,MQ-3,Buzzer,GSM module, LCD display and relay. The output generated is proportional to the value compared with preset value in microcontroller. If the concentration exceeds threshold value it led the ignition system to shut and notify their relative by sending message using GSM module
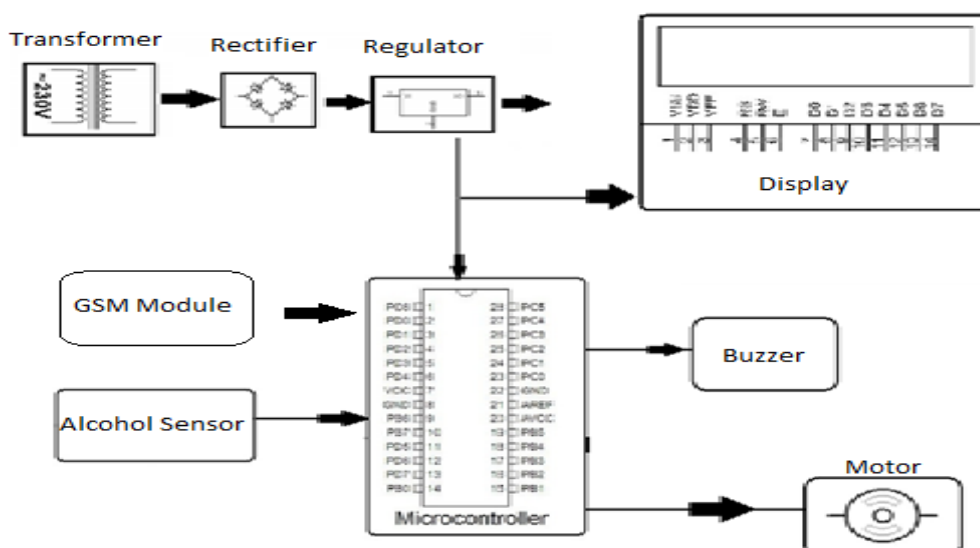
2. BLOCK DIAGRAM

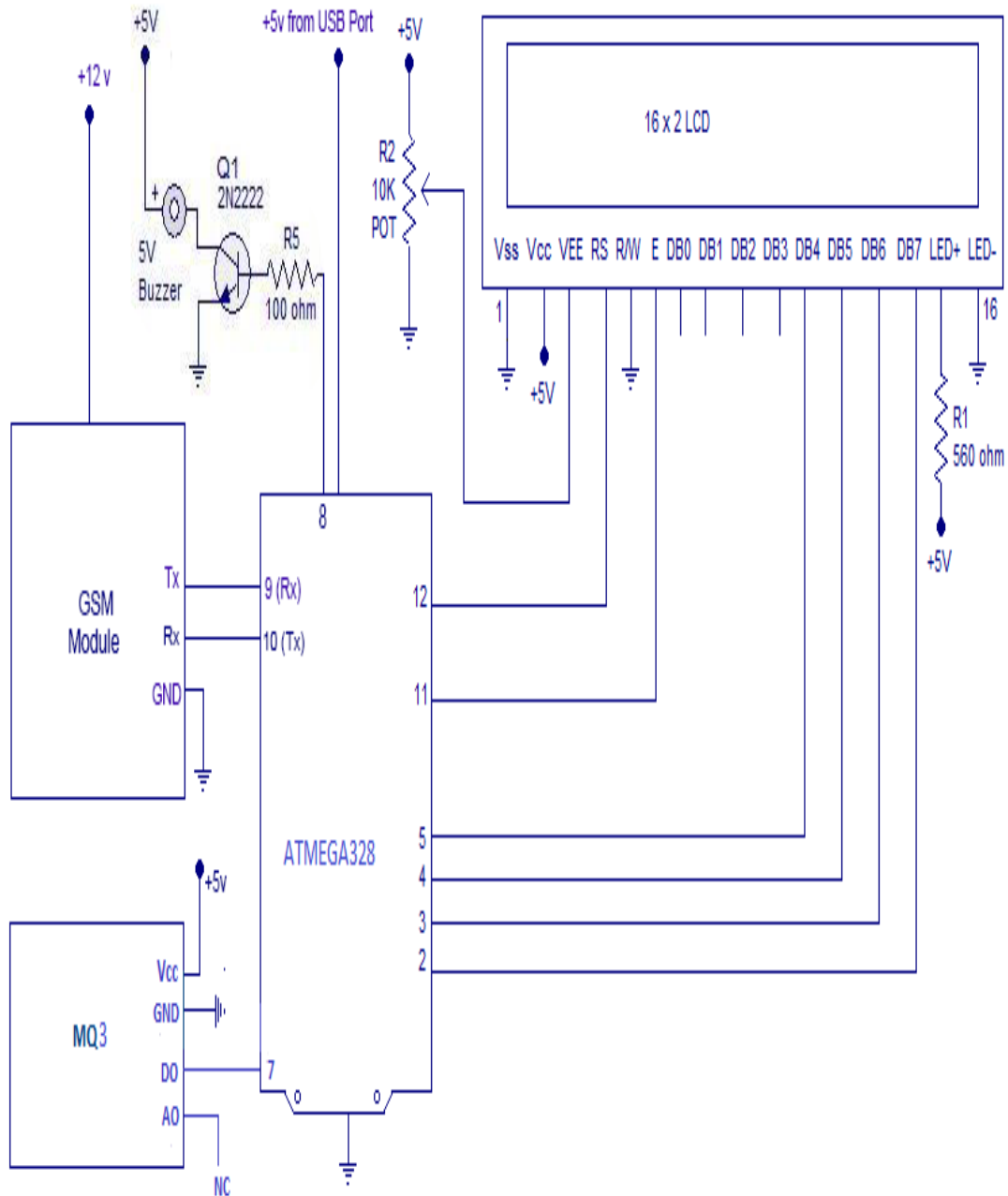Fig. 1 Block diagram of the proposed alcohol detection system

4.SCHEMATIC DIAGRAM

Fig. 2 Schematic diagram of the proposed alcohol detection

5.SCHEMATIC DISCRIPTION

1. MQ-3.

We can see that it has 4 pins 1)+5V,2) D out, 3) A out, 4) GND. Inside the sensor there is placed heating tube. It is made up of aluminium dioxide and tin dioxide. This tube gets up heated by the conduction of heat through the coil placed inside the tube. Coil terminals are connected to the supply voltage.

SnO_2 acts as semi conductor when it heated up so, more electrons are available to flow, which means more current. When the coil gets contact with the alcohol molecules then alcohol decomposes into acetic acid and more current will flow. As the amount of alcohol increased or decreased, current will also increase and decrease. In this way we will get the different value from the MQ-3 sensor.

Fig.3 MQ-3 Gas Sensor

2.LCD Display

This LCD are used to display the data. It is not a graphical LCD ,it is simply a dot-matrix type. CMOS technology make it used in many portable applications.
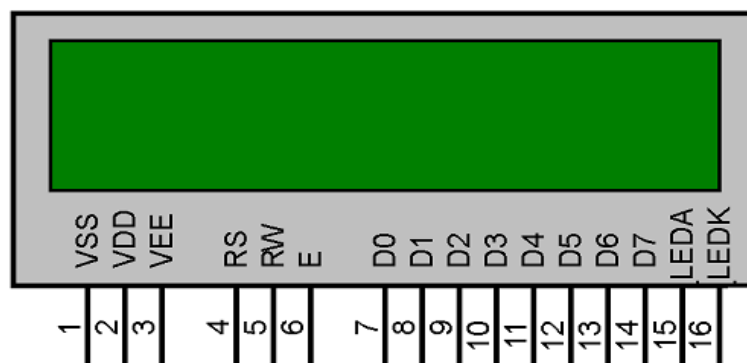

Fig.4 Liquid Crystal Display

[5]The data bus lines are DB7-DB0.When the enable signal is at the low level, this data bus terminals will remain in a high impedance state. When the data bus is open it produces a high output voltage. When the busy flag is at a high level, it indicates that the controller is in the internal operation mode and the next instruction will not be accepted. The next instruction must be written after the busy flag goes low. The delay should be suitable for most machines. If the LCD panel is not initializing properly, you can try increasing the delays.

The LCD module is automatically initialized or reset when the power is turned on using the internal reset circuit. The busy flag holds 1 and does not accept instructions until initialization ends. The busy state lasts for 15 minutes after Vdd rises to 4.5 volts. When power supply restrictions are not met, the internal reset circuit will not operate normally and the initialization will not be performed. In this case, the controller should be initialized by the MPU according to "initializing by instruction"

3. Microcontroller

Microcontroller is used to operate and control the whole circuit. Here, we used ATMEGA328 from Atmel corporation. It is a 8-bit AVR RISC based microcontroller. It has 32kb ISP flash memory, 2kb SRAM, 1kb EEPROM,23 general purpose general purpose working register. All the external module are connected to this microcontroller through the ports provided. It has total 32 pin count and operates between 1.8V and 5.5V.
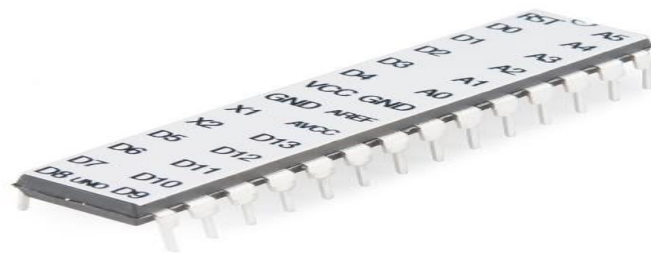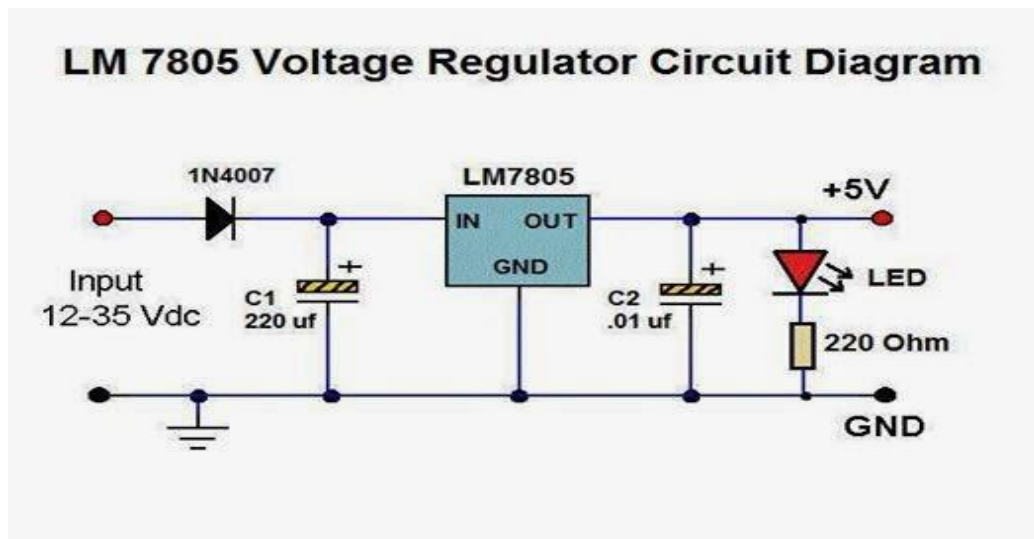

Fig.5 ATMEGA328

4. Voltage Regulator

Fig.6 Voltage regulator

[5]It is used to regulate the voltage fluctuation from the dc source. The fluctuation is due to the variation in to the load or due to the fluctuation in input voltage. This fluctuation is not suitable for the circuit operation. So, we used LM 7805 voltage regulator to curb this problem. It consists of several transistor inside it. It use the resistance of these transistor to maintain the output voltage. Then, the output regulated voltage generated is given to the operational circuit.

5.GSM Module

Fig.7 GSM Module

It is a device that uses digital data to operate. It is based on TDMA technology to communicate over the channel. It digitize and reduce the data and then send it to the different channel. TDMA technique assign different time slot to users on the same frequency. A GSM module requires SIM card to operate over the range of network provided by the network operator.

6. Results and Discussions

The circuit has an alcohol sensor that senses the alcohol content into the breath of the driver sitting in front of the steering of the car. Sensor generate voltage signal which is proportional to the concentration of ethanol into the breath of the driver. Based on these signals microcontroller controls the operation of the buzzer as well as the ignition system.

GSM module which is a device equipped with a slim slot for their operations. It's work is to send the status of ethanol content to the relative of drunk driver. In this way this system shut the ignition system and help in reducing the road accident .

7.Conclusion

Because of its compactness it is very relevance in mounting into the car and reduce road accidents. Thus we can reduce road accident and notify the reason of accident by notifying the content of alcohol to the respective relatives of the driver.

8. Future Enhancement

This system for reducing road accident can come with quite improved concept in to the market with GPS module. GPS module provide exact location of the vehicle after shutting it down to the family member or police station. So that the vehicle can be traced and can be collected by the family member of the driver before meeting accident.

9. Reference

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