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VEHICLE CONTROLLING AND ENGINE LOCKING SYSTEM WITH ALCOHOL DETECTION USING AROUINO

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Abstract: - The aim of my seminar report is to represent human driving safer and to overcome accidents. This seminar is developed by integrating alcohol sensor with Arduino board. Arduino processor ATmega328 is able to handle more functions than conventional microcontrollers. The alcohol sensor used is MQ3 which to detect the alcohol content in human breath. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. This is fitted inside the vehicle. It is designed for the safety of people sitting inside the vehicle.

Keywords- Arduino ATmega328,Alcohol detector,MQ3, LCD,Buzzer

I BLOCK DIAGRAM

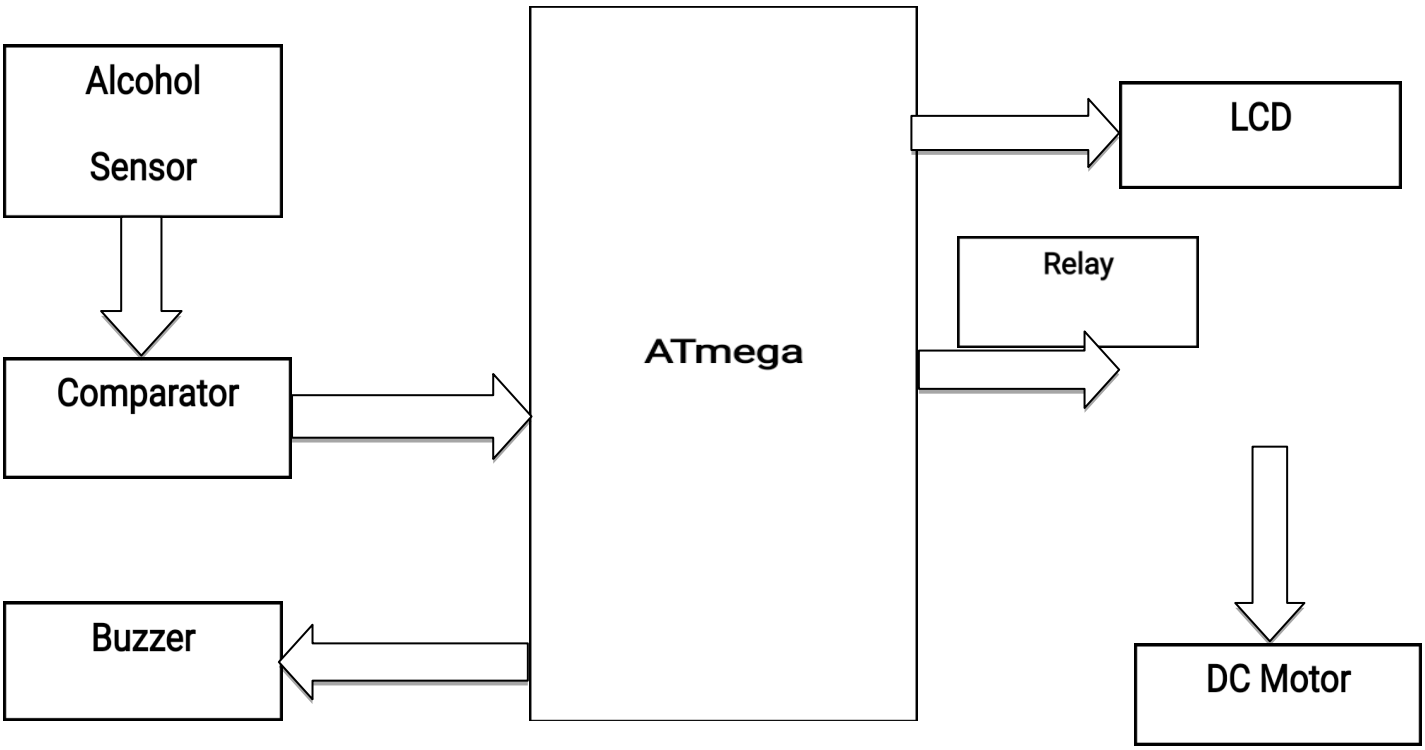


Figure 1: BLOCK DIAGRAM

The entire system adopted the Arduinouno microcontroller board (Based on ATMEGA 328), the principle of the hardware chart as shown in fig1. The core functions modules are Arduinouno alcohol sensor module (MQ3), LCD display, buzzer, relay

II INTRODUCTION

Drinking and driving is already a serious public health problem ,which is likely to emerge as one of the most significant problems in near future .The system implemented aims at reducing the road accident in the near future due to drunken and drive . This report present the progress in using the alcohol detector ,a device that senses a change in the alcoholic gas content of the surrounding air these device is more commonly referred to as a breath analysis, as it analysis the alcohol content from person's breath. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle.

IV.ARDUINO BOARD

The arduino board is the central unit of the system. The arduinouno is the microcontroller board based on the ATmega 328. It is a programmable microcontroller for prototyping electromechanical devices.It has 14 digital inputs/output pins (of which 6 can be used as PWM output),6analog inputs , a 16 MHz ceramic resonators the arduino differs from all preceding board is that it does not use the FTDI USB to serial driver chip.

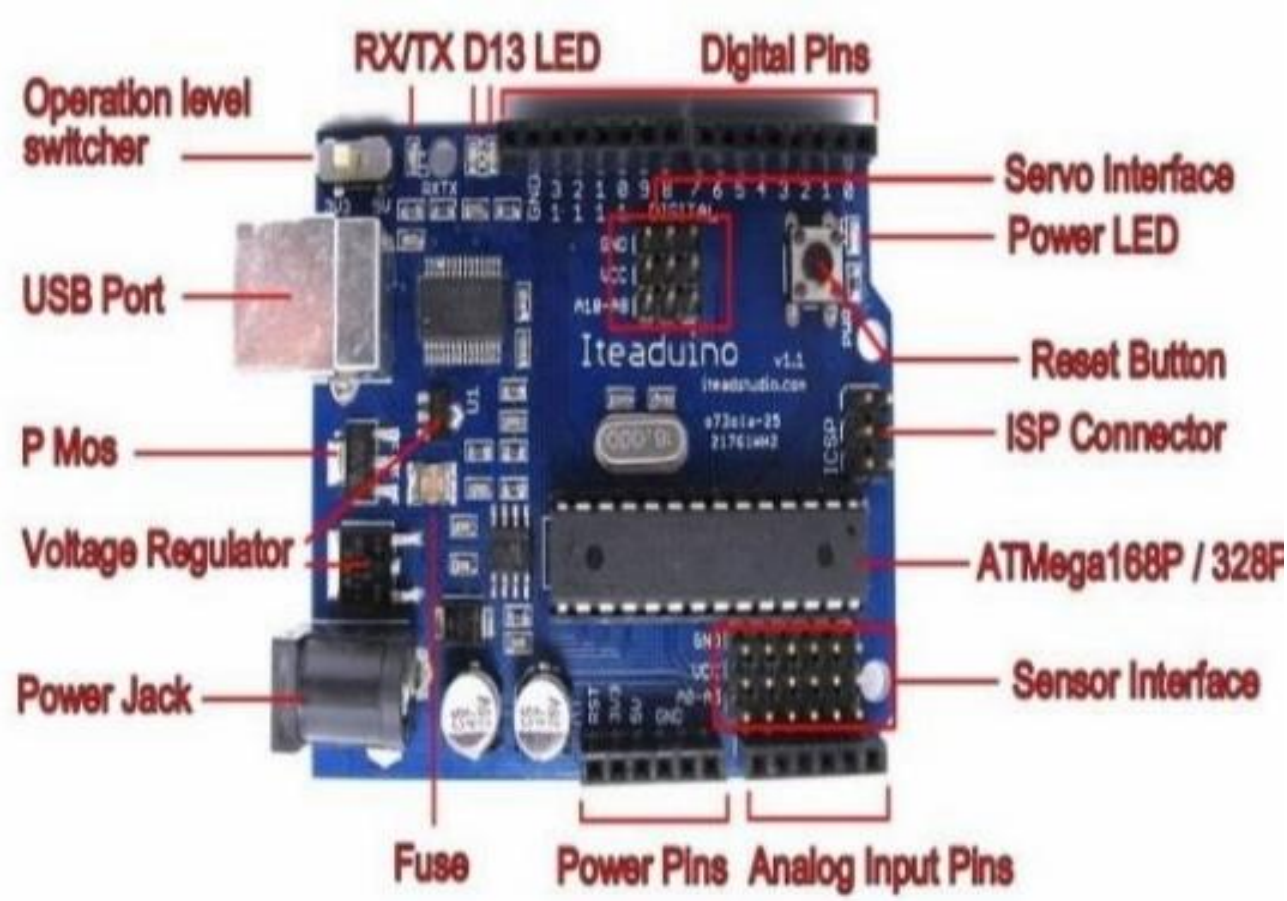


Figure 2.Arduino Board Discription

III. ALCOHOL SENSOR (MQ3)

The alcohol gas sensor- MQ3 is suitable for alcohol detecting, this sensor can be used in a breath analyzer. It has a high sensitivity to alcohol and small sensitivity to benzene. The sensitivity can be adjusted by the potentiometer sensitive material of MQ3 gas sensor is SnO2, which with lower conductivity in clean air. When the target alcohol gas exist, the sensors conductivity is higher along with the gas concentration rising, use of simple electro circuit, convert change of conductivity to correspond output signal of gas concentration.

Figure 3. Alcohol Sensor

MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapour. It has fine sensitivity range around 2 meters. The sensor could be used to detect alcohol with different concentration; it is with low cost and suitable for different application.

Sensitivity Adjustment:

Resistance value of MQ-3 is difference to various kinds and various concentration gases. So, when using these components, sensitivity adjustment is very necessary. It is recommended to calibrate the detector for 0.4mg/L (approximately 200ppm) of Alcohol concentration in air and use value of Load resistance that (RL) about 200 KΩ (100KΩ to 470 KΩ). When accurately measuring, proper alarm point for the gas detector has to be determined after considering the temperature and humidity influence.

Character configuration:

1. Good sensitivity to alcohol gas.
2. Circuit is simply driven.
3. Low cost and long life.
4. Small towards benzene and High sensitivity to alcohol .
5. Fast response and high sensitivity and stability and long life.

Specification:

1. Power supply requires 5 volts.
2. Interference type: analog only.
3. Pin specification: 1-output, 2-GND, 3-VCC
4. High sensitivity and fast response.
5. Stable and long life
6. Small towards benzene and High sensitivity to alcohol Simple drive circuit with size:40*20mm.

V. LIQUID CRYSTAL DISPLAY

Figure 4. LCD Display

Liquid crystal display screen is the electronic display module and find a wide ranges of applications. A 16*2 LCD display is very basic module and it is very commonly use in various devices and circuit. These modules are preferred to seven segments and other multi segments LEDs. The reason being: LCDs are economical; easily programmable; have no limitation of displaying special and even custom characters (unlike in 7 segments), animations and so on. A 16*2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5*7 pixel matrix. This LCD has 2 registers , namely command and data.

The command registers stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. the data registers stores the data to be display on the LCD . The data is the ASCII value of the character to be displayed on the LCD.

VI. BUZZER

Features:

1. The PS series are high performance buzzers that employ uni-morph piezoelectric elements and are designed for easy incorporation into various circuits.

2.They feature extremely low power consumption in comparison to electromagnetic units.

3. Because these buzzers are designed for external excitation, the same part can serve as both a musical tone oscillator and a buzzer.

4.They can be use with automated inserters, moisture-resistant models are also available.

VII.DC MOTOR

This DC or direct current motor works on the principal, when a current carrying conductor is placed in a magnetic field, it experiences a torque and has a tendency to move. This is known as motoring action. If the direction of current in the wire is reversed, the direction of rotation also reverses. When magnetic field and electric field interact they produce a mechanical force, and based on that the working principle of dc motor established. The direction of rotation of a this motor is given by Fleming's left hand rule, which states that if the index finger, middle finger and thumb of your left hand are extended mutually perpendicular to each other and if the index finger represents the direction of magnetic field, middle finger

indicates the direction of current, then the thumb represents the direction in which force is experienced by the shaft of the dc motor.

Dc motor principle and construction Structurally and construction wise a direct current motor is exactly similar to a DC generator, but electrically it is just the opposite. Here unlike a generator supply electrical energy to the input port and derive mechanical energy from the output port. I can represent it by the block diagram shown below. Dc motor Here in a DC motor, the supply voltage E and current I is given to the electrical port or the input port and derive the mechanical output i.e. torque T and speed ω from the mechanical port or output port. The input and output port variables of the direct current motor are related by the parameter K. So from the picture above can well understand that motor is just the opposite phenomena of a DC generator, and can derive both motoring and generating operation from the same machine by simply reversing the ports.

Specification:

Input Voltage : 12 volt DC

Maximum output power: 338.09w

Maximum efficiency: 78%

Electrical connection: Terminal

VIII.RELAY DRIVER :

A relay is an electrically operated switch. Many relay use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifier: They repeated the signal coming in form one circuit and re-transmitted it on another circuit. Relays were extensively in telephone exchanges and early computers to perform logical operations.

A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating charactaristics and sometime multiple prating coils are used to protect electrical circuits from overload or faults.

Specification :

1.Contains 7 high-voltage and high current Darlington pairs.

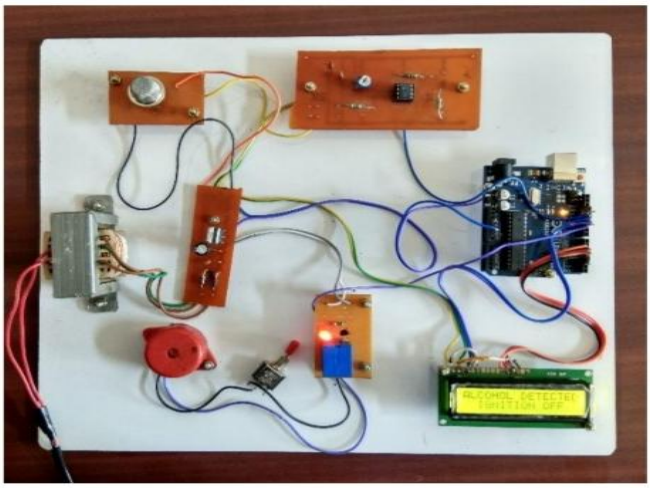
2. Each pair is rated for 50V and 500mA.

3. Input pins can be triggered by +5V.

4. All seven Output pins can be connected to gather to drive loads up to (7×500mA) ~3.5A.

5. Can be directly controlled by logic devices like Digital Gates, Arduino, PIC etc.

HARDWARE SETUP :



IX RESULT :

Figure 5. Output on LCD

When the drunken driver enters in the vehicle alcohol sensor senses the alcohol, therefore buzzer rings and LCD displays that alcohol is detected as shown in fig.6 and ignition of vehicle automatically turns off by relay. So, by this the purpose of that is succeeds.

ADVANTAGES

1. To prevent accident due to drunk and driving.

2. Easy and efficient to test the alcohol content in the body.

3. Quick and accurate results.

4. Helpful for police and provides and automatic safety systems for cars and other vehicles as well.

5. Alcohol detection system in cars provides an automatic safety systems for cars and other vehicle as well.

DISADVANTAGES

1. Damage of sensor cannot be detected

2. One time investment cost.

3. Usage of relays leads to consume more power.

APPLICATIONS

1. "Alcohol detector project" can be used in the various vehicles for detecting whether the driver as consumed alcohol or not.

2. This can also be used in various companies or organizations to detect alcohol consumptions of employees**.**

FUTURE SCOPE:

1. We can implement GSM technology to inform the relatives or owners of the vehicle about the alcohol consumption.2. We can implement GPS technology to find out location of the vehicle.

3. The setup is very easy which makes it open to future requirements without the need of rebuilding everything from scratch, which also makes it more efficient.

4. This can be modified for communication with the help of GSM modem to the vehicle owner.

IX CONCLUSION :

We have provided a very effective solution to develop an intelligent system for vehicles for alcohol detection whose core is Arduino. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. The whole system has also an advantage of small volume and more reliability. As the growing public perception is that vehicle safety is more important, advances in public safety is gaining acceptance than in the past. Future scope of this system is to control the accidents causes due to alcohol consumption. This system improves the safety of human being. And hence providing the effective development in the automobile industry regarding to reduce the accidents cause due to alcohol.

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