AUTOMATIC ENGINE LOCKING SYSTEM FOR DRUNKEN DRIVERS

(Industrial Training and Viva Voce)

A

report on

submitted in partial fulfillment of the requirements

for the award of the degree of

BACHELOR OF TECHNOLOGY

by

IZHAR QADEER

(1902900310013)

Submitted to

Dr. Sapna Katiyar

ELECTRONICS & COMMUNICATION ENGINEERING

ABESIT GHAZIABAD

Affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow

December, 2020

ABSTRACT

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the harsh driving is the inconvenience for other road users and also question of life and death for drunken drivers and for others.

In this project, we are developing an Auto Lock System. The input for system is from Detection Sensors either from Alcohol Breath or any other mechanism. The controller keeps looking for the output from these sensors. If there are any traces of Alcohol above the set limit, then the system will lock the System.

As vehicle automobiles are beyond the scope of this project, we are simulating the process by activating the relay.

DECLARATION

I hereby declare that that the work reported in the report entitled **"Automatic Engine Locking System for Drunken Drivers"** submitted to the Department of Electronics & Communication Engineering, **ABESIT GHAZIABAD** is an authentic record of my work. I have not submitted this work elsewhere for any other degree. I am fully responsible for the contents of my report.

IZHAR QADEER

Department of Electronics and communication Engineering

ABES Institute of Technology

January 2020

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of the people who made it possible and whose constant guidance are encouragement crown all the efforts success.

I am extremely grateful to **Dr. A.P.J. Abdul Kalam Technical University** for fostering an excellent academic climate in our institution. I also express my sincere gratitude and convey thanks to our respect Head of Department who is also our Project guide **Dr. Sapna Katiyar** for his guidance, encouragement, co-operation and kindness the entire duration of the course and academics.

Last but not least we also think our friends and family members for helping us in completing the project.

CERTIFICATE

UNIVERSITY OF MICHIGAN

COURSE CERTIFICATE

Dec 30, 2020

Izhar Qadeer

has successfully completed

Programming for Everybody (Getting Started with Python)

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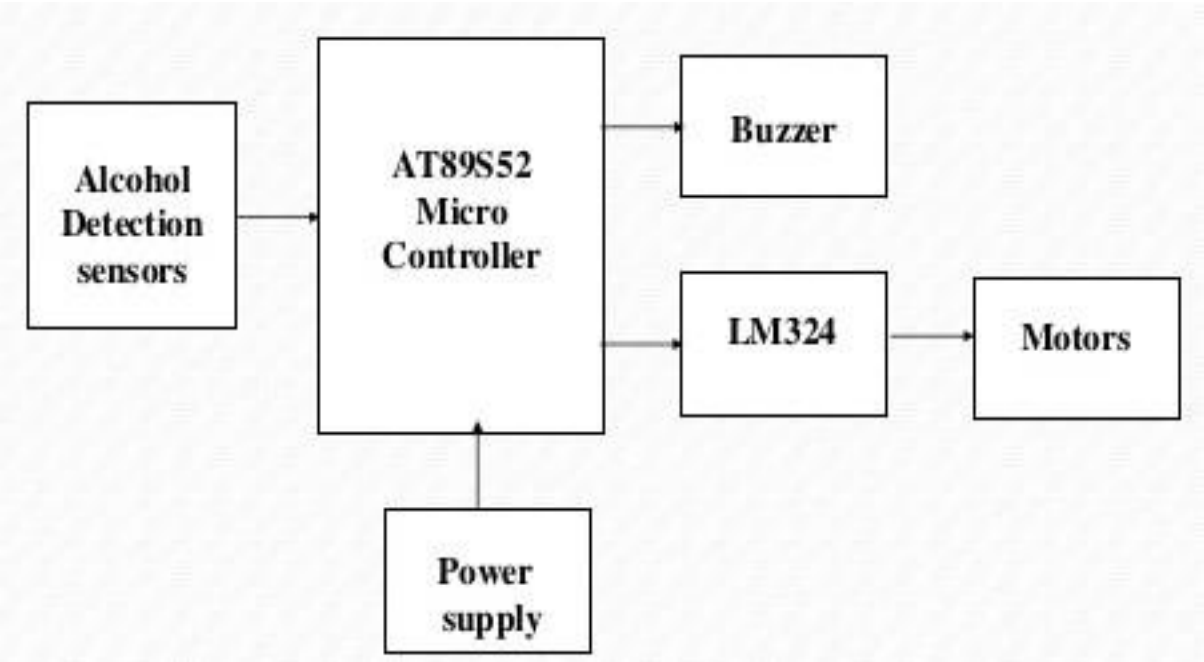
INTRODUCTION

Most of these days, we hear a lot of accidents due to drunken driving. Drunken drives will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others.

The system uses a compact circuitry build around Flash version of AT89S52 microcontroller with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C. ISP is used to dump the code into the microcontroller.

The main purpose behind this project is “Drunken driving detection”. Now-a-days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in Car is designed for the safety of the people seating inside the car. This project should be fitted / installed inside the vehicle.

BLOCK DIAGRAM

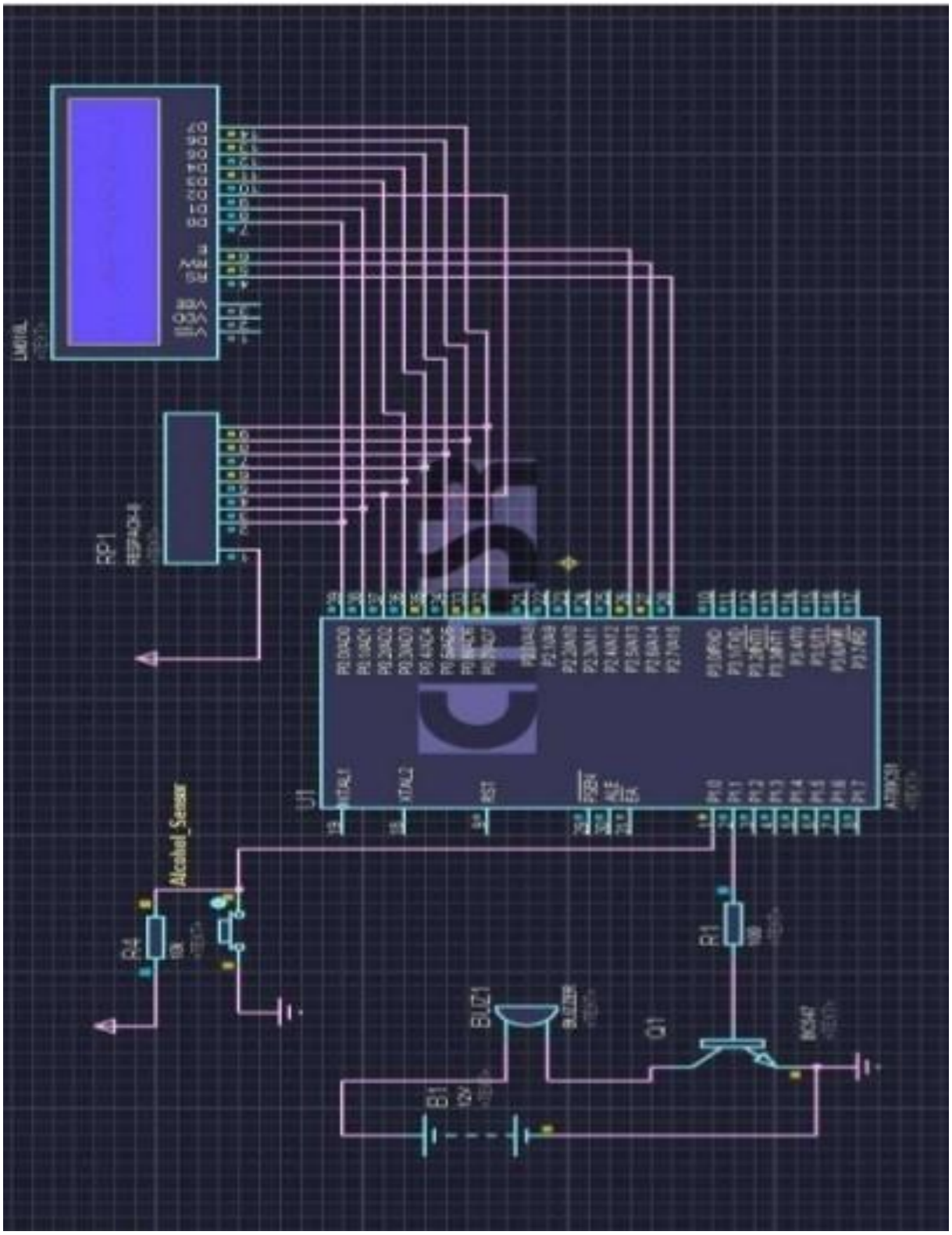


WORKING

The above block diagram illustrates the automatic vehicle engine locking system through an alcohol detection. The Microcontroller (AT89S52), alcohol detector (MQ-3), relay motor driver IC (ULN2003) are the major prerequisites for the system construction. The Alcohol detector sensor will be attached with our Microcontroller.

The input for the Microcontroller is identified by the alcohol detector sensor through the breath of a human. In the next scenario the levels of alcohol measured by the sensor and compared with the set-in limits. If the set limit of consumption of alcohol is less than the alcohol consumed by the person, the system of activating relay is initiated which in turn activates the automatic lock on the vehicle, i.e. it stops the motor rotation if it is in running state or it is unable to start. The system will lock the Engine at the same time will automatically give a buzzer. By this, we can avoid accidents by checking the driving people on the roads. Software Program for the system developed in embedded C. ISP is used to dump the code into the Microcontroller.

SCHEMATIC CIRCUIT DIAGRAM



HARDWARE COMPONENTS DESCRIPTION

1. POWER SUPPLY:

Power supply is a supply of electrical power. A device or system that supplies electrical or other types of energy to an output loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

A power supply may include a power distribution system as well as primary or secondary sources of energy such as:

- Chemical fuel cells and other forms of energy storage systems.
- Solar power and batteries.
- Generators and alternators.

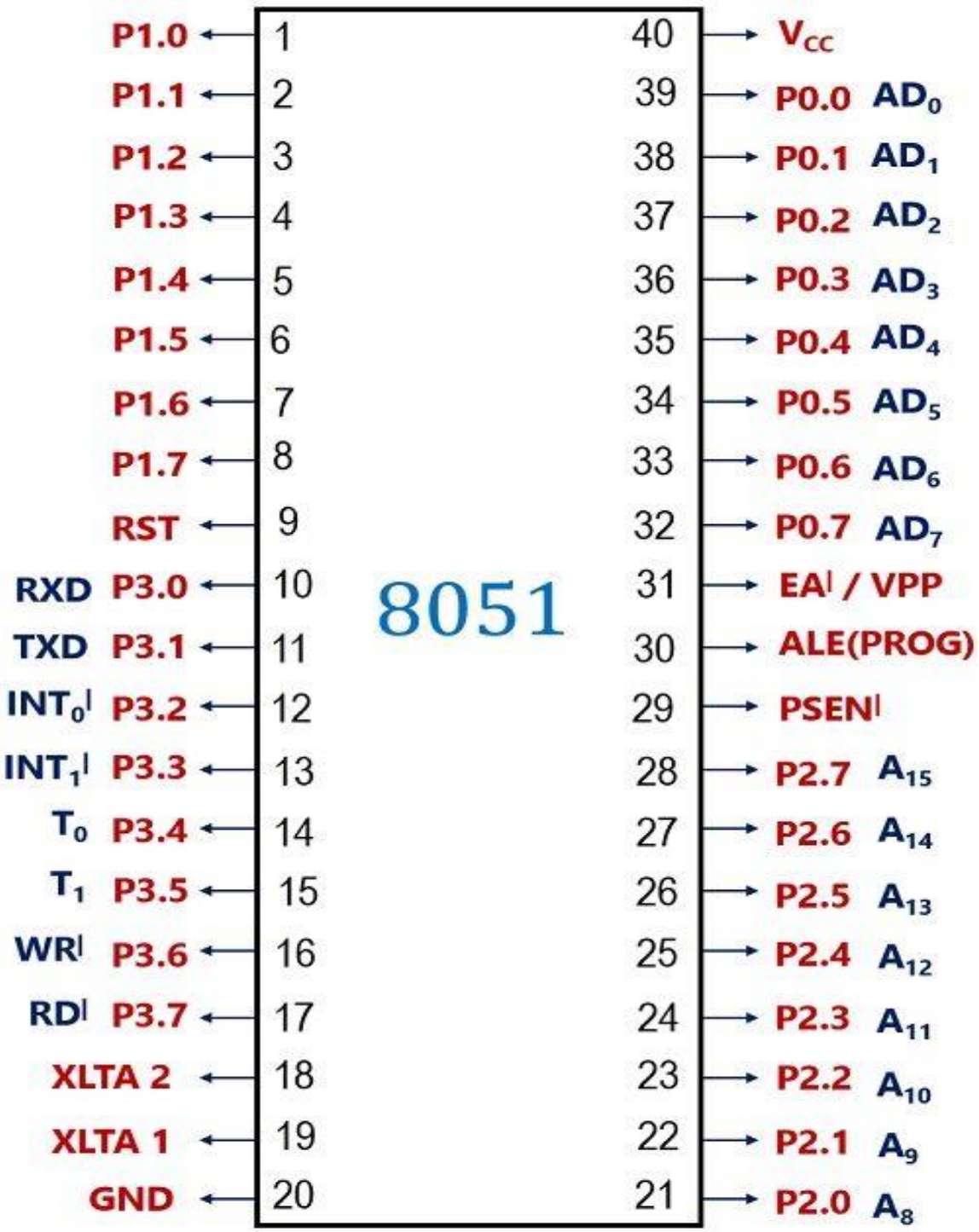
A brief description:

- Transformer -steps down high voltage AC mains to low voltage AC.
- Rectifier converts AC to DC, but DC output is varying.

2. Microcontroller AT89S52:

Microcontroller are “embedded” inside some other device. They can control the features or actions of the product. Another name for the microcontroller is “embedded controller”. Microcontroller are dedicated to one task and run one specific program. The program is stored in ROM (Read Only Memory) and generally does not change. Microcontrollers are often low-power devices. A microcontroller has a dedicated input device and has a LED or LCD display for output. A microcontroller also takes input from the device it is controlling and controls the device by sending signals to different components in the device.

Pin Diagram -



Pin diagram of 8051 Microcontroller

Electronics Desk

3. Alcohol Detection Sensor:

The alcohol detector sensor used in our project is **MQ-3 Sensor.**

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyser. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple, all it needs is one resistor. A simple interface could be a 0-3.3 V ADC.

The main features and applications of the alcohol sensor are as follows:

Features:

- High sensitivity to alcohol and small sensitivity to benzene.
- Fast response and high sensitivity.
- Stable and long life.

Applications:

- They are suitable for alcohol checker, breath analyzer.

4. Buzzer:

Features:

- These are reliability electromagnetic buzzers are applicable to automobile equipment.
- Compact pin terminal type electromagnetic buzzer with 2048Hz output.
- Pin diagram terminal construction enables direct mounting onto printed circuit board.

Applications:

- Clock, travel watches, keyboards, toys, various alarms of automatic equipment.

5. Buzzer driver circuit:

Digital system and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10 milli amps to be operated, the microcontroller's pin provide a maximum of 1-2 milli amps to be operated, the microcontroller's pin provide a maximum of 1-2 milli amps.

Block diagram of buzzer driver circuit:

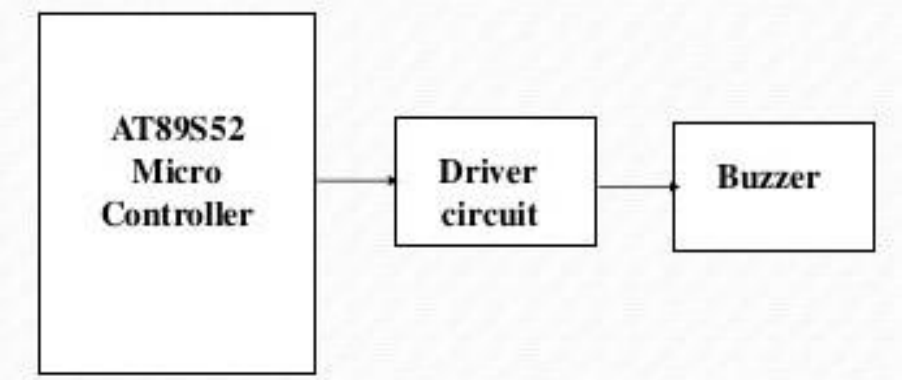


Fig: Buzzer driver circuit

The input to the base of the transistor is applied from the microcontroller port pin P1.0. The transistor will be switched on when the base to emitter voltage is greater than 0.7 V (cut-in voltage). Thus when the voltage applied to the pin P1.0 is high i.e. P1.0=1 (>=0.7 V), the transistor will be switched on and thus the buzzer will be ON.

6. Transformer:

A suitable ready-built mains power supply unit, such as those used to control model trains, will include a transformer. I wouldn't recommend building your own due to the safety.

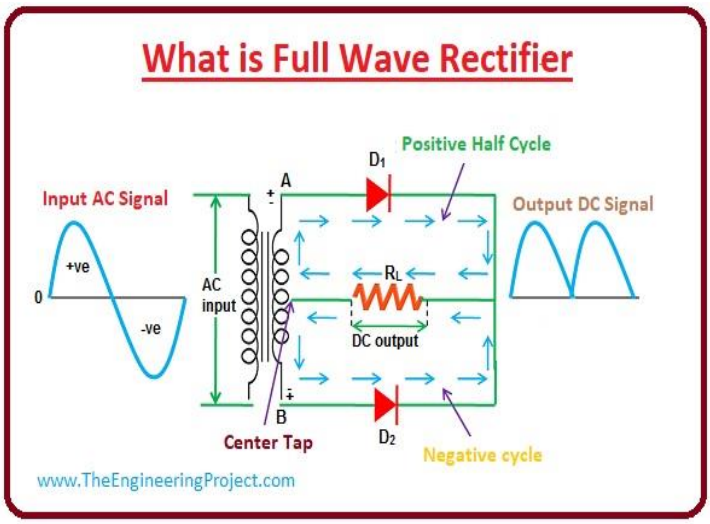
Considerations when dealing with mains voltages if such a unit does not incorporate smoothing, rectification, and regulation, then you will need to build these blocks as described in part 1 of this series. If the unit does not have a fuse or a cut-out on the output of the transformer, you will also need to add a fuse of an appropriate rating. This fuse is in addition to the mains fuse in the unit's plug and is needed to protect the low voltage winding of the transformer and any circuits you connect to it. Although we won't be building the transformer block of our 5V regulated power supply, it is interesting to know how it works.

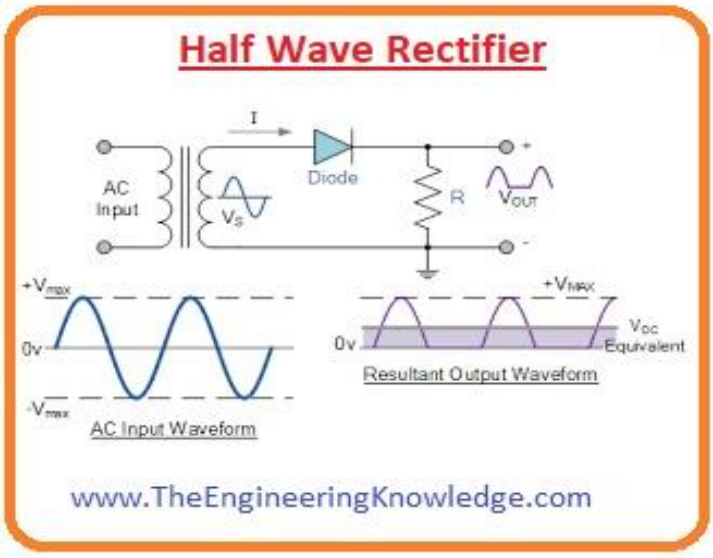
7. Rectifier:

A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), which flows in only one direction. The reverse operation is performed by the inverter. The process is known as rectification, since it "straightens" the direction of current.

Additionally, we use rectifiers to change voltage in DC power systems. Because it is relatively difficult to convert DC voltage directly in some scenarios, the simplest solution may be the following process.

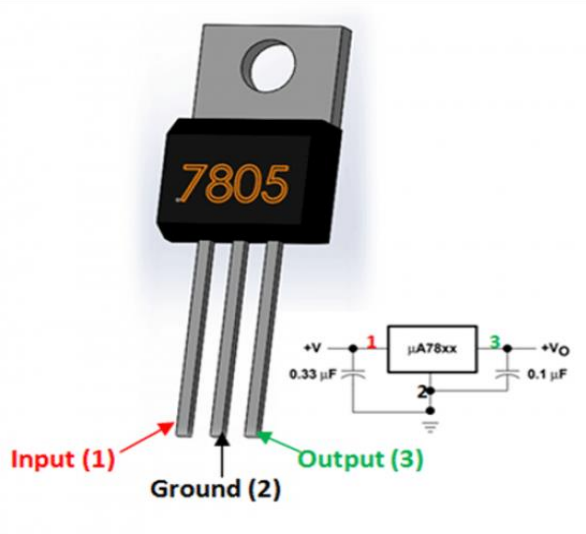
1. Convert DC to AC.
2. Change the voltage using a transformer.
3. Convert AC back to DC using a rectifier



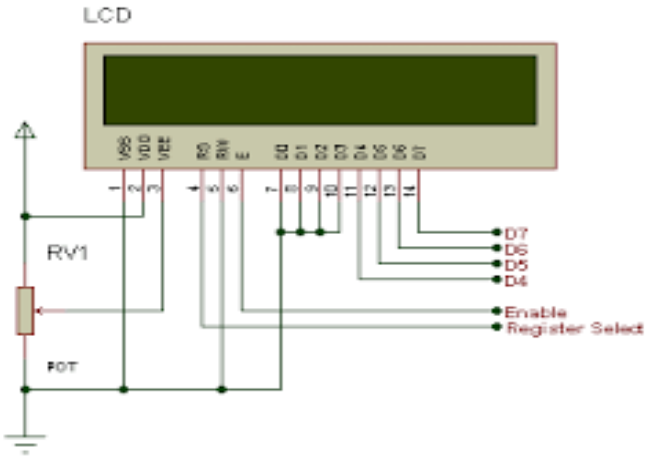


8. Regulator:

A voltage regulator is one of the most widely used electronic circuitry in any device. A regulated voltage (without fluctuations & noise levels) is very important for the smooth functioning of many digital electronic devices. A common case is with micro controllers, where a smooth regulated input voltage must be supplied for the micro controller to function smoothly.



9. LCD:



LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDS are economical, easily programmable, have to limitation of displaying special & even custom characters (unlike in seven segments).

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

10. Motors:

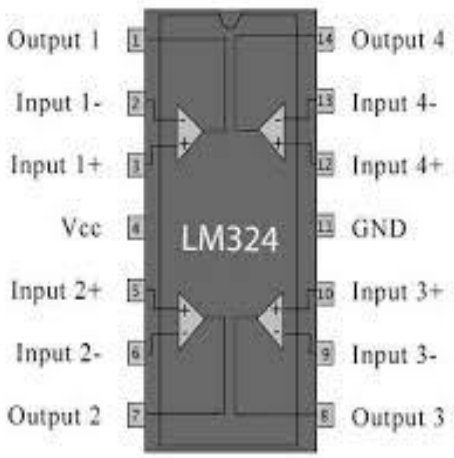
The speed of a DC motor is directly proportional to the supply voltage, so if we reduce the supply voltage from 12 Volts to 6 Volts, the motor will run at half the speed. How can this be achieved when the battery is fixed at 12 Volts. The speed controller works by varying the average voltage sent to the motor. It could do this by simply adjusting the voltage sent to the motor, but this is quite recent to do. A better way to switch the motor's supply on and off very quickly. If the switching is fast enough the motor doesn't notice it, it only notices the average effect.

11. LM324 OP-AMP:

The LM324 series are low-cost, quad op-amps with true differential inputs. They have several distinct advantages over standard operational amplifier types in single supply applications. The quad amplifier can operate a supply voltages as low as 3.0 V or as high as 32 V with quiescent currents about one-fifth of those associated with the MC1741 (on a per amplifier basis). The common mode input range includes the negative supply, thereby eliminating the necessity for external biasing components in many applications. The output voltage range also includes the negative power supply voltage.

Features:

- Short circuited protected outputs.
- Truck differential input stage.
- Single supply operation: 3V to 32(LM224. LM324, LM324A).
- Low input bias currents: 100 nA maximum (LM324A).
- Four amplifiers per package.
- Internally compensated. •
- Common mode range extends to negative supply



12. Resistors:

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines.

The behaviour of an ideal resistor is dictated by the relationship specified by Ohm's law:

$$V = I.R$$

13. Capacitors:

A capacitor is a device that stores electrical energy in an electric field. It is a passive electronic component with two terminals. The effect of a capacitor is known as capacitance. While some capacitance exists between any two electrical conductors in proximity in a circuit, a capacitor is a component designed to add capacitance to a circuit. The capacitor was originally known as a condenser or condensator.

SOFTWARE COMPONENTS DESCRIPTION

KEIL SOFTWARE:

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing, Keil compiler also supports C language code.

Source code

```
#include<reg52.h>
#define lodport P2
sbit rs=P2^0;
sbit en=P2^1;
sbit buzzer= P3^7;
sbit smoke=P1^7;
sbit mp1=P1^0;
sbit mn1=P1^1;
void lcd_cmd(unsigned char);
void delay(unsigned int);
void lcd_msg(unsigned char *);
void lcd_data(unsigned char);
void dis_data(unsigned char);
void dis_cmd(unsigned char);
void lcd_int();
void main()
{
```

```
lcd_int();
smoke=1;
buzzer=1;
mp1=1;
mn1=0;
lcd_int();
dis_cmd(0x80);
lcd_cmd(“ DRUNKEN DRIVE”)
dis_cmd(0xc0);
lcd_msg(“       BASED”);
delay(100);
dis_cmd(0x01);
dis_cmd(0x80);
lcd_msg(“  ENGINE LOCK”);
dis_cmd(0xc2);
lcd_msg(“        SYSTEM”);
delay(100);
dis_cmd(0x01);
while(1)
{
If(smoke==0)
{
buzzer=0;
mp1=mn1=0;
dis_cmd(0x80);
lcd_msg(“ALCOHOL DETECTED”);
dis_cmd(0xc2);
lcd_msg(“    BUZZER ON”);
delay(50);
```

```
dis_cmd(0x01);
}
else
{
smoke=1;
buzzer=1;
mp1=1;
mn1=0;
dis_cmd(0x80);
lcd_msg(" NO ALCOHOL");
dis_cmd(0xc0);
lcd_msg("  BUZZER OFF");
delay(50);
dis_cmd(0x10);
}
}
}
void delay(unsigned int ms)
{
int i,j;
for(i=0;i<ms;i++);
for(j=0;j<1275;j++);
}
void lcd_int()
{
dis_cmd(0x02);
dis_cmd(0x28);
dis_cmd(0x0C);
dis_cmd(0x06);
```

```
dis_cmd(0x80);
}
void dis_cmd(unsigned char cmd_value)
{
unsigned char cmd_value1;
cmd_value1 = (cmd_value & 0xF0);
lcd_cmd(cmd_value1);
cmd_value1 = ((cmd_value<<4) & 0xF0);
lcd_cmd(cmd_value1);
}
void dis_data(unsigned char data_value)
{
unsigned char data_value1;
data_value1=(data_valye&0xF0);
lcd_data(data_value1);
data_value1=((data_value<<4)&0xF0);
lcd_data(data_value1);
}
void lcd_cmd(unsigned char cmdout)
{
lcdport=cmdout;
rs=0;
//rw=0;
en=1;
delay(1);
en=0;
}
void lcd_data(unsigned char dataout)
{
```

```
lcdport=dataout;
rs=1;
//rw=0;
en=1;
delay(1);
en=0;
}
void lcd_msg(unsigned char *ptr2)
{
while(*ptr2)
{
dis_data(*ptr2);
delay(10);
ptr2++;
}
}
```

FEATURES

Advantages:

- Low cost.
- Automated operation.
- Low power consumption.
- It provides an automatic safety system for car and vehicles as well.

Applications:

- “Alcohol Detector Project” can be used in various vehicles for detecting whether the driver has consumed alcohol or not.
- This project can also be used in various companies or organization to detect alcohol consumption of employees.

Future Enhancement:

- We can implement GSM technology to inform the relatives or the police station about the alcohol consumption.
- We can implement GPS technology to find out the location of the vehicle.

CONCLUSION

In this project we have developed a real time model that can automatically lock the engine when a drunken driver tries to drive a car. Now-a-days car accidents are mostly seen. By fitting this alcohol sensor into the car, we can save guard the life of the driver and also the remaining passengers. It is very simple application. The life time of the project is high. It has low or zero maintenance cost and of course low power consumption.

This is a developed design to efficiently check drunken driving. By implementing this design a safe car journey is possible decreasing the accident rate due to drinking. By implementing this design, drunken drivers can be controlled so are the accidents due to drunken driving. Government must enforce laws to install such circuit in every car and must regulate all car companies to preinstall such mechanisms while manufacturing the car itself. If this is achieved the deaths due to drunken drivers can be brought to minimum level. In this type of system, future scope can be safely landing of car aside without disturbing other vehicles.

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