TAIZ UNIVERSITY

FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

(Computer Network and Distributed Systems Engineering)

TERM PROJECT REPORT

ON

"Embedded System"

TOPIC

"Locking Security Keypad System"

Report Submitted using AVR Atmega16

(Proteus8 Professional And AtmelStudio Programs)

SUBNITTED BY

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1. Abstract:

The security is very important things about as , everyone wants to be as much secure as possible . access control for doors forms a secure point butter than traditional way. The microcontroller based Door locker is an access control system that allows only authorized persons to access a restricted area. The system is fully controlled by the 8 bit microcontroller AVR atmga16 which has a kbytes of ROM for the program memory. The password is stored in the EPROM so that we can change it at any time. The system has a keypad by which the password can be enter through it.

When they entered password equals with the password stored in the memory then the relay gets on and so that the door is opened through the rotation of motor that installed on the key of door.

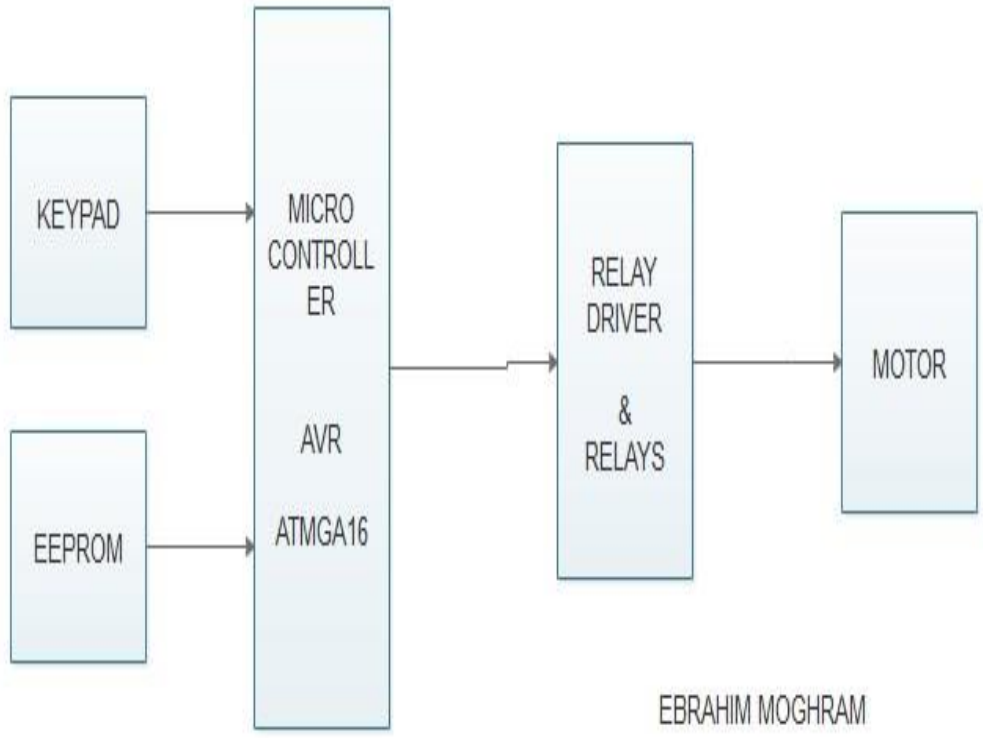
If we entered a wrong password for more than three times then the Alarm is switched on .

2. INTRODUCTION :

Password Based Door Security System using Microcontroller is used in the places where we need more security . It can also used to secure lockers and other protective doors. The system comprises a number keypad and the kay pads are connected to the 8 bit microcontrollers . It has only 40 pins and there are 15 input/output lines. The microcontroller has a program memory of 2 kilobytes. The microcontroller continuously monitor the keypad and if somebody enters the password it will check the entered password with the password which was stored in the memory and if it they are same then the microcontroller will switch on the corresponding device.

The system will allow the person who knows the password and it will not allow who don't know the password and the system will also show the persons who try break the protection barrier. I used a Buzzer , it using when the person enter more than three wrong try this step increased the guess attempt password if no one is at home for a period of time.

3. PROJECT DESCRIPTION:

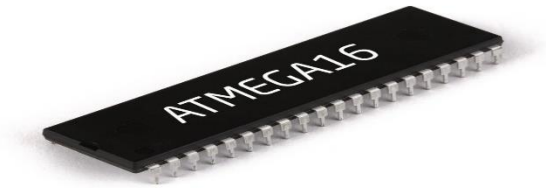


4. COMPONENTS:

COMMON	NAME OF COMPONENTS	QUA	FUNCTION
AVR	Atmega16	2	The controller is programmed to operate the panel and execute the program.
LCD	LCD 16*2	1	TO display the the requirement
KAYPAD	Small calc	1	Input the char
EEPROM	M24C16	1	Stored the password that entered.
BUZZER	BUZZ	1	Alram when entered 3 wrong tries.
EQULATOR	Pull up	1	Doesn't increase the current.
MOTOR	motor	1	Rotation the key of door
RESISTER	RES40	3	LCD are prevented from damage due to excessive current.
POWER	12V , 5V	2	Provide motor and lcd and atmega16 .

a. Microcontroller ATM16 :

The ATMega16 is a popular 8-bit microcontroller from the Atmel AVR family. It is widely used in various embedded systems and applications due to its versatility and ease of use.



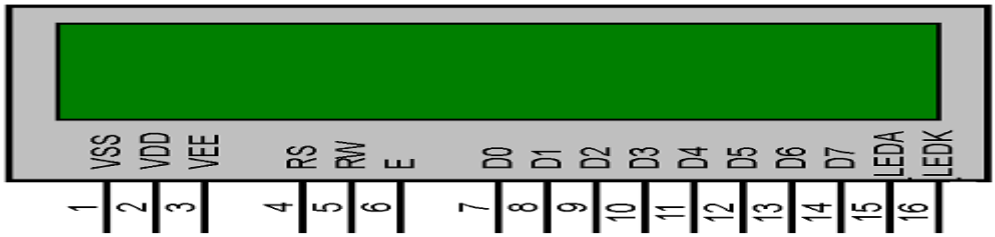
b. LCD16 :

-LCD is a dot matrix liquid display crystal that displays alphanumeric, characters and symbols.

-Internal refresh is provided.

-All the functions required for dot matrix LCD drive are internally provided.

-Built-in oscillator circuit.



c. Power supply unit:

To turn on the devices like keypad , motor ,LCD

We use two DC power support 12V to our circuit and 5V to BUZZER.

d. MOTOR:

A DC motor consists of a small DC motor, feedback potentiometer, gearbox, motor drive electronic circuit and electronic feedback that control open an close the door by rotate the key of door. It is more or less similar to the normal DC motor. The stator of the motor consists to the commutator.

e. EEPROM:

Eeprom is the memory that is stored the password inter in it The size it's 16 kbit.

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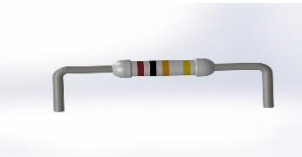
f. PULL UP :

This piece does not allow high voltages to cross.

g. RES :

Resister is a component that flow of alternating electric circuit .Resisters can limit or divide the current . reduce the voltage, protect an electric circuit ,or provide large amounts of heat or light .An electric current is the movement of charged particles called electrons from one region to another .Resistors are usually placed in electric circuits. physicists explain the flow of current through a material, such as resistor , by comparing it to water flowing through a material , such as resistor , by comparing it to water flowing through a pipe. Resistors are designed to have a specific value of resistance . Resistors used in electric circuits are cylindrical .They are often coded by three colour bands that indicate the specific value of resistance. Resistors obey ohm's law , which states that the current density is directly proportional to the electric field when the temperature is constant.



h. BUZZER:

-Operates using piezoelectric effect.

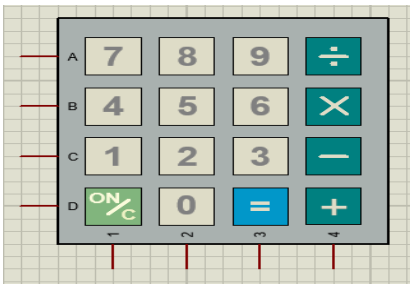
-Sound emitter may be extremely low or ear piercing.

-Driven by low voltages and currents.

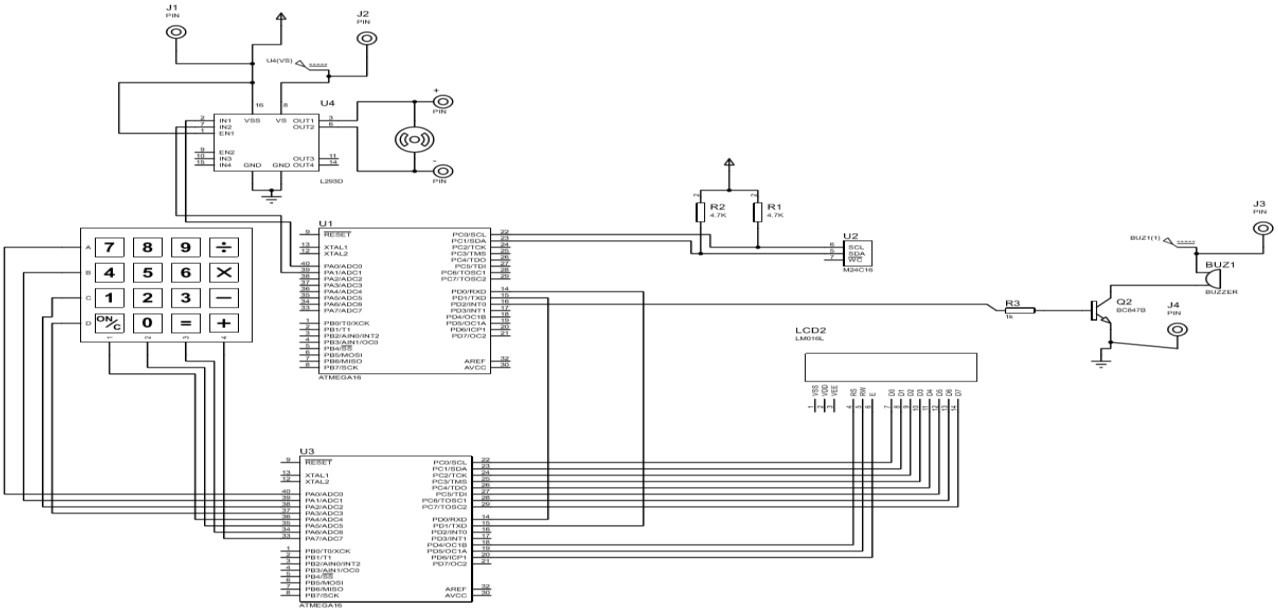
Elements are made from crystals, such as quartz or Rochelle salts.

i. KAYPAD:

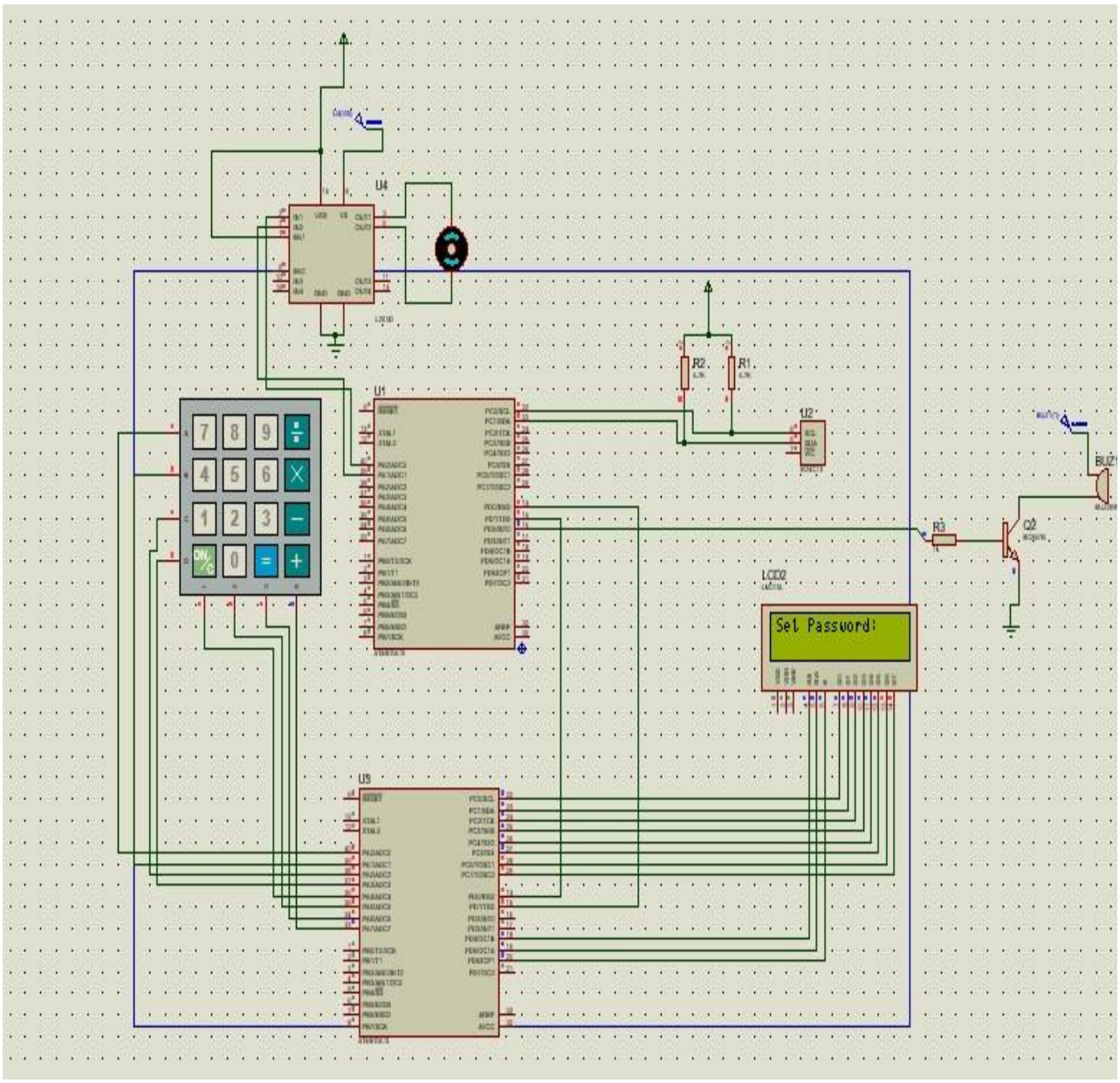
This is the a 4*4(having 4 rows and 4 columns) keypad which is interfaced with microcontroller with its each key assigned a specific no, or symbol defined in the program.



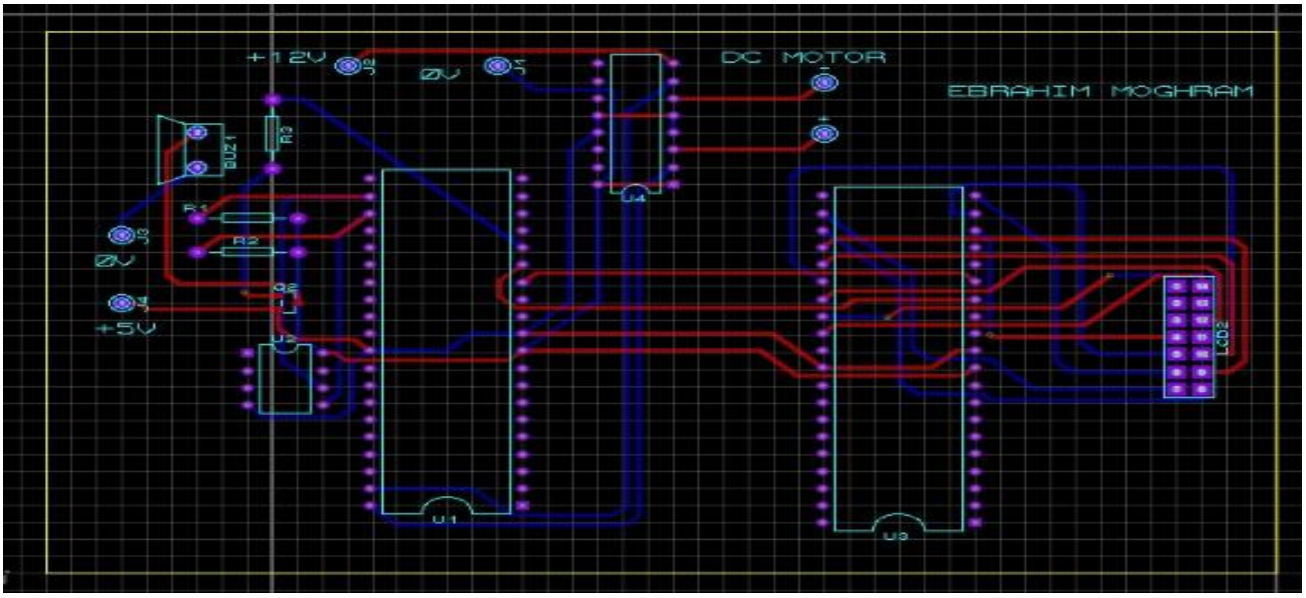
5. SIMULATION DIAGRAM:



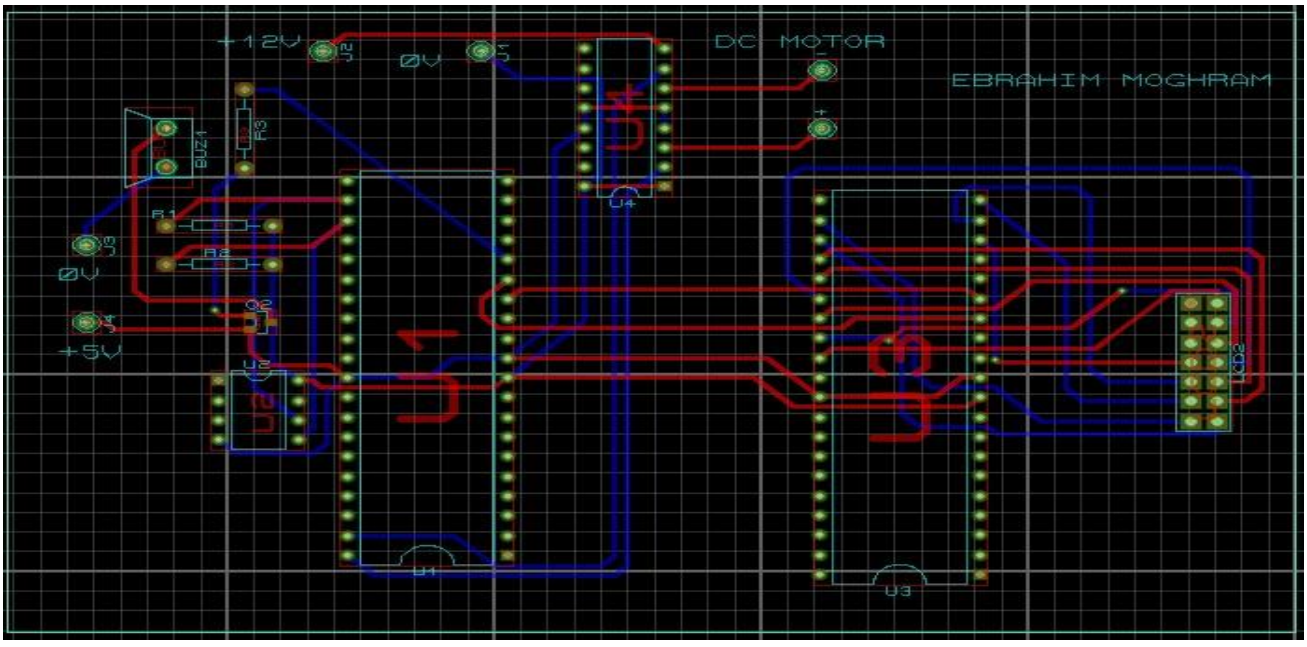
6. SIMULATION DESIGN :



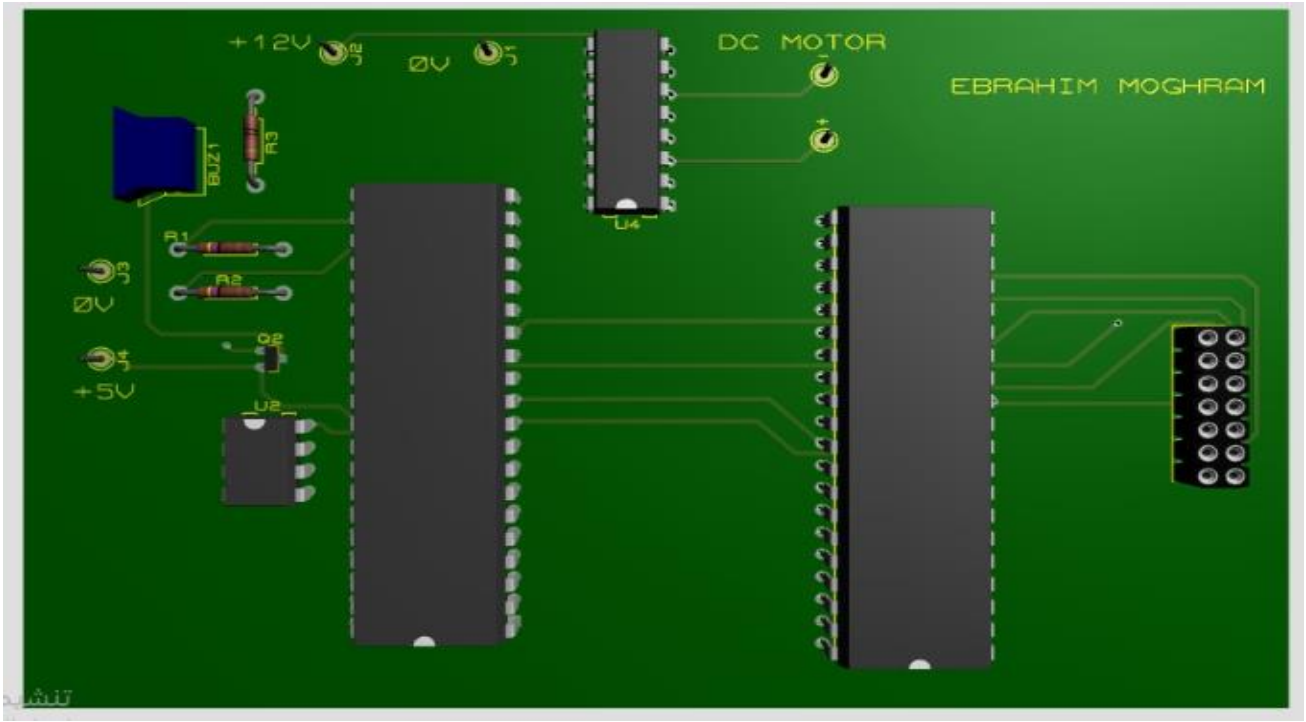
7. PCB DESIGN:



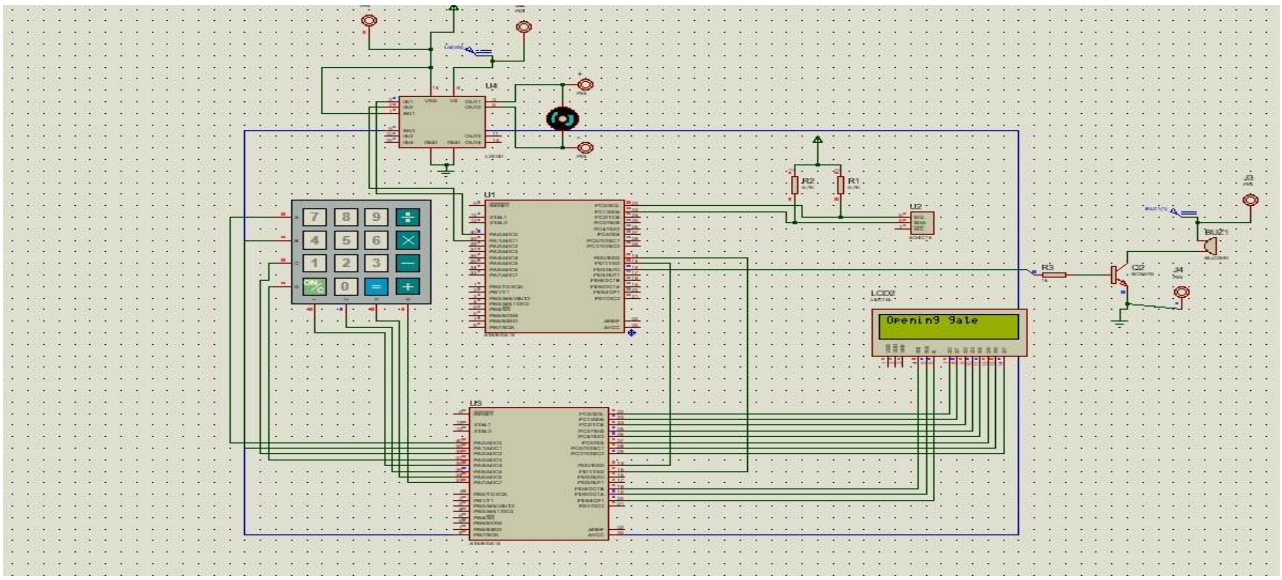
8. GERBER:



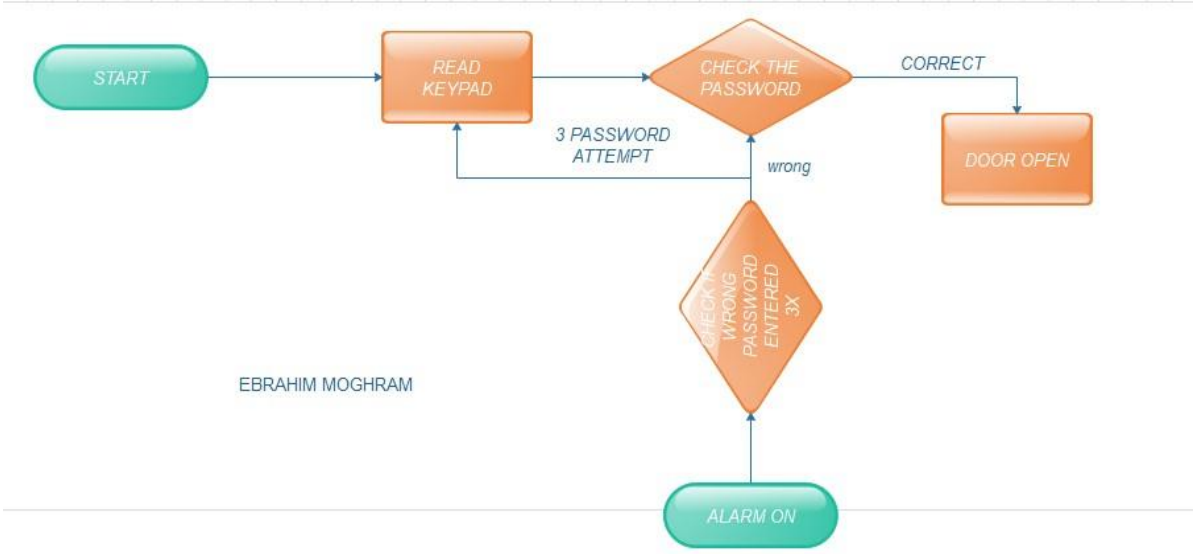
9. 3D DESIGN:


+12V
J2
ØV
J5
DC MOTOR
EBRAHIM MOGHRAM
BUZ1
R3
U4
R1
R2
ØV
J5
Q2
+5V
U2

10.OUTEPUT OF DISEGN



11.FLOWCHART:



12. ALGORITHM:

1.START
2.initialise led , keypad

3.clear lcd

4.print "Enter lock code" on led

5.get 7 char long password using matrix keypad

6.if input ="1234567" then

6.1 print "Enter master code"

6.2 get 10 char long password using matrix keypad

6.3 if input = masterlock then

6.3.1change user password

6.3.2 go to step 4

6.4 else

6.4.1 print "wrong code" on lcd

6.4.2 go to step 4

7.else

7.1 if input = userlock or input = default lock then

7.1.1 unlock the lock

7.1.2 retry count =3

7.1.3 print " '#' to lock " on lcd

7.1.4 accept input using matrix keypad

7.1.5 if input ="#" then lock

7.1.6 go to step 4

7.2 else

7.2.1 decrement retry count

7.2.2 print "wrong code" on lcd

7.2.3 if retry count = 0 then sound alarm on

8.2.4 go to step 4

8.STOP

13. ADVANTAGES:

-No keys to be lost, stolen or occupied.

-Can be locked by keypad.

-Automatic door opening.

Gavies an indication for unauthorized entry.

-Totally cost efficient.

14. DISADVANTAGES:

-Currently if the personal identification number is somehow forgotten the system could not be accessed.

-Powered by electricity may not function properly in the case of a power failure.

15.FUTURE ENHANCEMENTS:

-we can developing it by add a GSM piece that will be send a message from email or sms for anyone need when someone enter a wrong password three tries.

-Electrical devices such a lights. computer ect can be controlled by using separate passwords.

-THE system can be easily connected to the personal computer for further control.

-Other than the speaker sounds , all the lights are made to turned on if password entered is wrong for three times and also a hidden camera is used to record the faces who trespassed.

-We can use this system as an attendance register for the students to enter a calss room with their respective password.

16. CONCLUSION:

This project is mean for security systems whose access is only for respected authorities. Using a microcontroller the password entered is checked with the stored password and then does the corresponding operations. Here we use a 7 digits password for better security.

The size it's 16 kbit

17.REFERENCES:

http://google.schoolar.com

http://IEEE.xploer.com

http://geeksforgeeks.com

http://alldatasheet.com

http://atmel.com