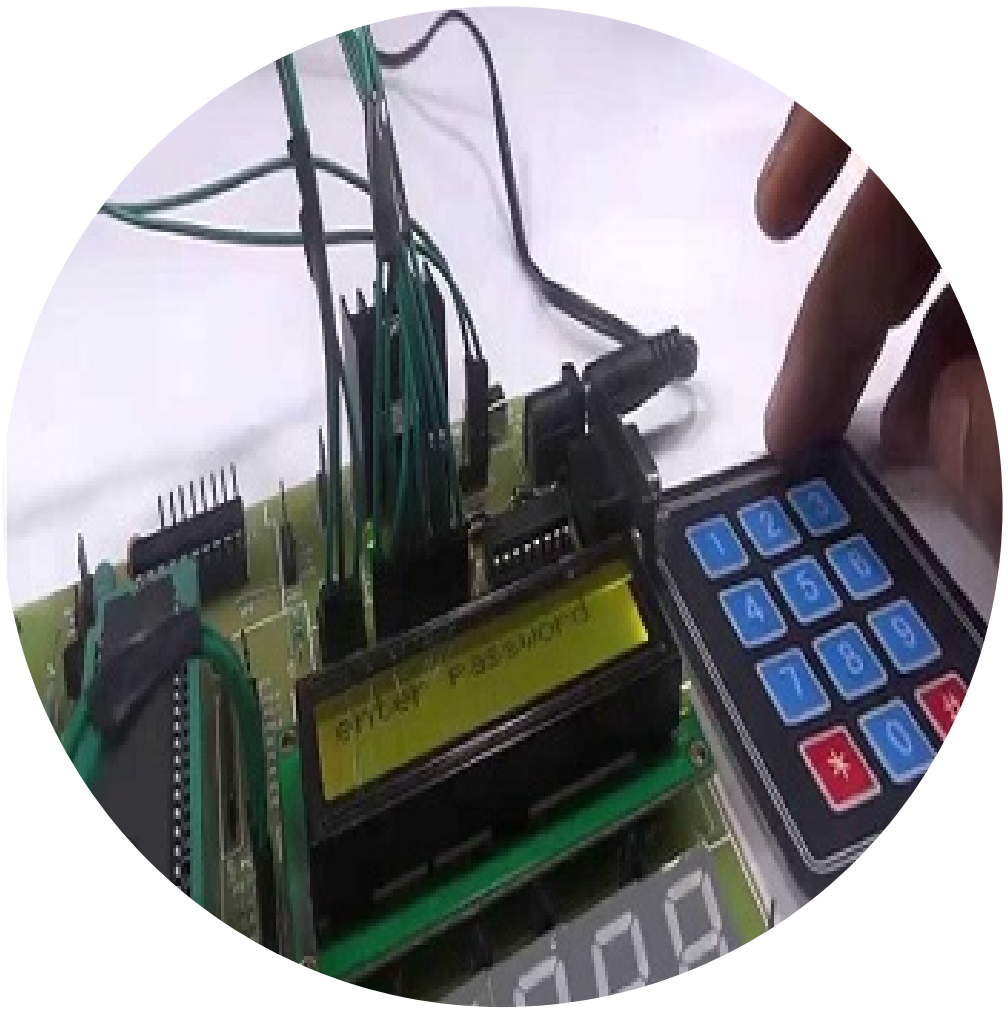


Password Based Door Lock System (Using PIC16F877A)

23.07.2019

Projects

Project Objective

The main objective of the project was to build a printed circuit board that drives a stepper motor when the entered password is correct. It can not be considered as a very complex project. Since it was a course project the main idea was to getting familiar with PIC 16F877A microcontroller and printed circuit boards(PCBs). User input is taken by a keypad and an LCD screen is used for informing the user.

Basic Functions:

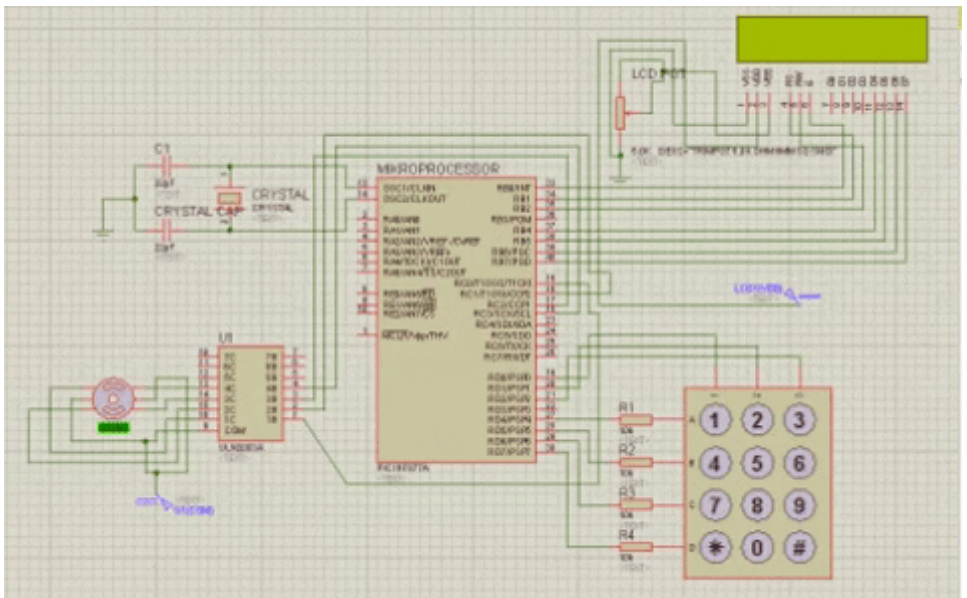
- Door unlock and lock if the entered password is correct.
- If the password is entered wrong three times, the user is asked by a puk code.
- If the puk code is entered wrong three times, the system is blocked
- Password can be changed.

Components:

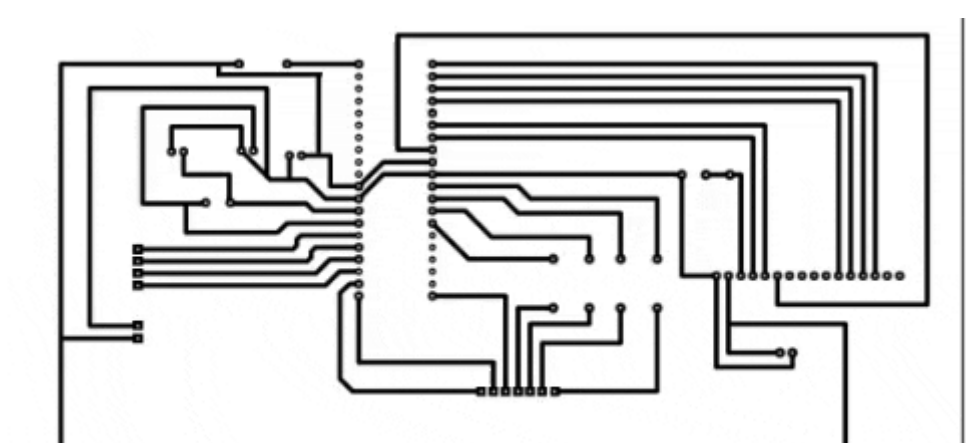
- Pic 16F877A
- 4Mhz Crystal
- 22pF Capacitor x2
- 100nF Cap
- ULN2003A Motor Driver IC
- 28BYJ-48 Step Motor (5V DC)
- 4x3 Keypad
- LM016L LCD
- Potentiometer
- 10KOhm Resistor x4
- Also some other resistors can be used for keypad 330 ohm x3 and 10Kohm Resistor x3 for keypad pulldowns.
- 5V power supply
- Raw Copper Plate (For PCB)

- Lazer printer and glossy paper (For PCB)
- Iron (For PCB)
- Perhydrol (For solving copper)
- Nail Polish Remover
- 0.8 mm drill
- Soldering Iron and Solder
- Connectors
- Jumpers

Proteus Isis - Schematic



Proteus Ares - PCB Schematic

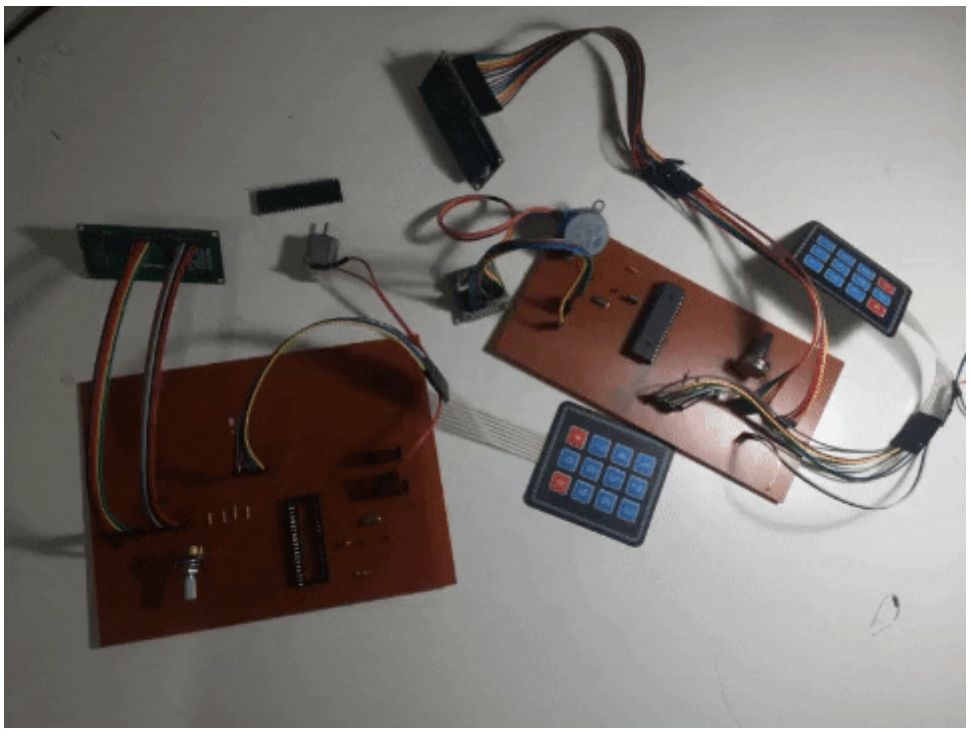


PCBs:

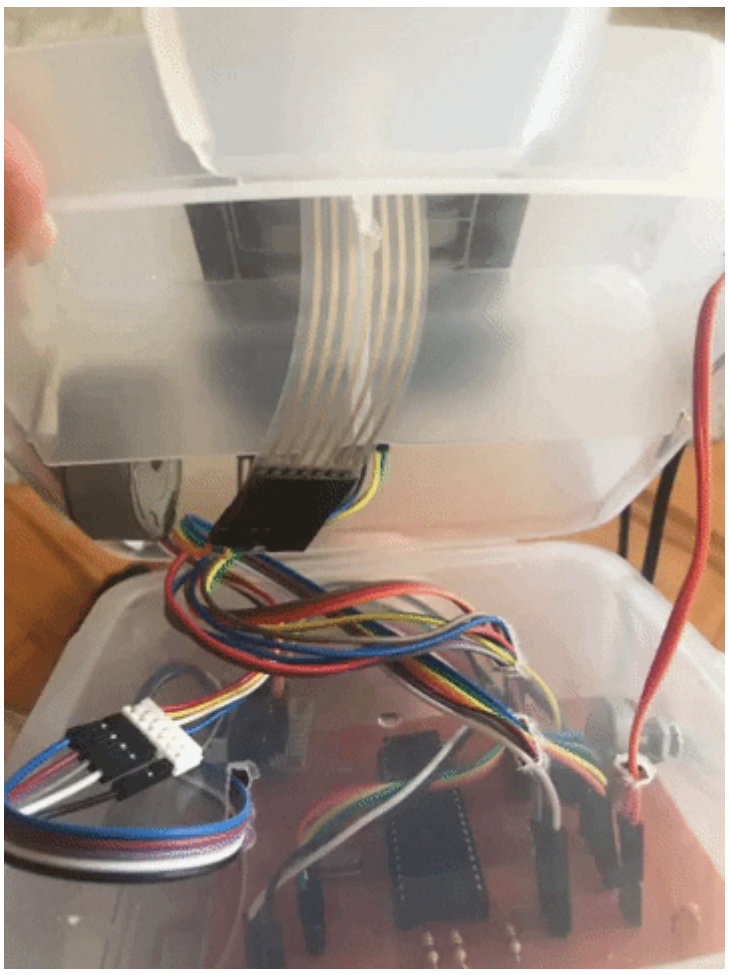
I've done 2 different PCBs one for a stepper motor and another for a dc motor. Here is a picture of both.

The only difference between them is the motor type. One is using a stepper motor with a driver ic (ULN2003A) and another is using a DC motor with 4 transistors. The purpose of transistors is changing the direction of DC motor rotation by switching operations.

I've done ISIS simulations, ARES drawings, CCS C codings and actual printed circuit board for both of these 2 projects.



For stepper motor PCB, I've used a box and put all the circuit elements inside the box.



Application:

Entering correct password (1234):

Password change(1234 to 2580):

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