

Password Protected Electronic Locking System FOR Smart Security Applications

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Abstract- The necessity of a low cost electronic home security system designed in co-ordination with other security measures is always there in our society to reduce the risk of home intrusion. Keeping this problem in mind, we are working on a project on automatic password based door lock system. We want to utilize the electronic technology to build an integrated and fully customized home security system at a reasonable cost. We hope this project will be useful in keeping thieves, dacoits and other sort of dangers at bay. The purpose of this project is to provide security at (house, ATM, office etc.) in this system the user will have to register a unique password. The information will be stored in data base. Whenever the right password will be received, the controller will accordingly give instruction to dc motor. Dc motor will perform the action on door unlocking. We want to utilize the electronic technology to build an integrated and fully customized home security system at a reasonable cost.

I. INTRODUCTION

In day to day life security of any object or place is plays a major role. This project has considered about that and created a secure access for a door which needs a password to open the door. Using keypad it enters a password to the system and if it is entered correctly door is open by motor which is used to rotate the handle of the door lock. Now a day's most of the systems are automated in order to face new challenges and present day

requirements to achieve good results. Automated systems have less manual operations, so that the flexibility, reliabilities are high and accurate. Hence every field prefers automated control systems, especially in the field of electronics. Over the years, various control systems have been designed to prevent access to unauthorized user. The main reason for providing locks for our buildings (home, office, church, school, etc) is for security of our lives and property. It is therefore important to have a stress free and convenient means of achieving this purpose. Automatic doors have become a standard feature on many different types of buildings and they are becoming increasingly popular every day with respect to developing an effective electronic devices geared towards providing adequate security. The project also exhibits low cost home security system which is widely employed in our daily life. This system is designed to prevent the opening of the door by unauthorized persons. The keypad interfaced to the controller is used for inputting the password to open/close the door. As soon as the user enters the correct password, the door lock opens and light, fan will become ON. If the password entered is incorrect, then system does not open the light, fan and door.

II. METHODOLOGY

The goal of the project is to develop a unique system through keypad which can lock/unlock various units of the houses, industries, and also provides a security system. Just by pressing keypad the user can perform ON/OFF operations on the appliances. The project also exhibits low cost home

security system which is widely employed in our daily life.

This system is designed to prevent the accessing of systems by unauthorized persons. The structure of home security system contains a matrix key pad, the door latch opener interfaced to the microcontroller. The keypad interfaced to the controller is used as the password entry system to lock/unlock the system.

III. HARDWARE IMPLEMENTATION

In this system the user will be prompted to set a password at installation. This password inputted at installation will continue to serve the lock until it is changed. User can change the current password with a single key press. The program will check for current password and allows the user to change password only if the current password is input correctly.

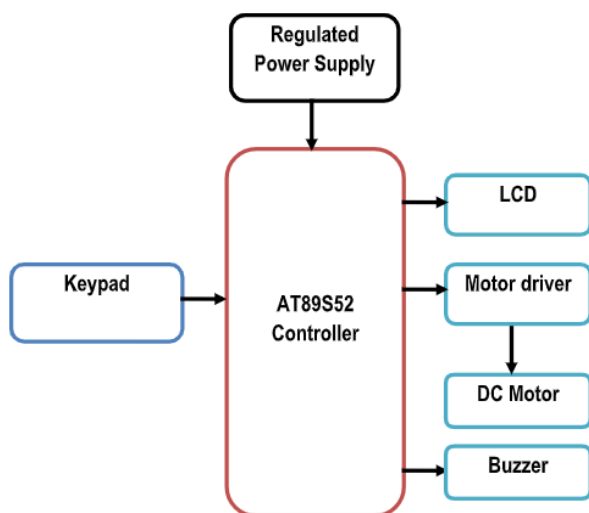


Fig.1 Proposed block diagram

A. Regulated Power Supply:

A variable regulated power supply, also called a variable bench power supply, is one where you can continuously adjust the output voltage to your requirements. Varying the output of the power supply is the recommended way to test a

project after having double checked parts placement against circuit drawings and the parts placement guide.

B. LCD Interfacing

This section describes the operation modes of LCDs, then describes how to program and interface an LCD to art .8051 using Assembly and C.

LCD operation

In recent years the LCD is finding widespread use replacing LEDs (seven-segment LEDs or other multi segment LEDs). This is due to the following reasons:

1. The declining prices of LCDs.
2. The ability of display numbers, characters, and graphics. This is ain contrast to LEDs, which are limited to numbers and a few characters.
3. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU (or in some other way) to keep displaying the data.
4. Ease of programming for characters and graphics.

C. Buzzer:

Buzzer is an electronic device commonly used to produce sound. It is the phenomena of generating electricity when mechanical pressure is applied to certain materials and the vice versa is also true. Such materials are called piezo electric materials. Piezo electric materials are either naturally available or manmade. Piezoceramic is class of manmade material, which poses piezo electric effect and is widely used to make disc, the heart of piezo buzzer.

D. Keypad:

The key board here we are interfacing is a matrix keyboard. This key board is designed with a particular rows and columns. These rows and columns are connected to the microcontroller through its ports of the micro controller 8051. We normally use 8*8 matrix key boards. So only two ports of 8051 can be easily connected to the rows

and columns of the key board. Whenever a key is pressed, a row and a column gets shorted through that pressed key and all the other keys are left open. When a key is pressed only a bit in the port goes high. Which indicates microcontroller that the key is pressed. By this high on the bit key in the corresponding column is identified.

E. Motor Driver:

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).

It works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, Hence H-bridge IC are ideal for driving a DC motor. In a single L293D chip there are two h-Bridge circuit inside the IC which can rotate two dc motor independently. Due its size it is very much used in robotic application for controlling DC motors. Given below is the pin diagram of a L293D motor controller.

F. DC Motor:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical power into mechanical power. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

IV. WORKING PRINCIPLE

In this system the user will be prompted to set a password at installation. This password inputted at installation will continue to serve the lock until it is

changed. User can change the current password with a single key press. The program will check for current password and allows the user to change password only if the current password is input correctly. If password is matched with pre-decided password then microcontroller simply operates the relay to open the lights and fan. Arduino simultaneously operate a dc motor through motor driver for operating the door.

V. RESULTS

Initially the password is predefined. When the device is switched on, it resets the motor angle to lock the door. Now the user is prompted to enter the password. The user enters the password through a keypad which is read by the 8051. Now the entered password is checked with the predefined password. If the password matches, then the servo motor deflects and the door unlocks for 30s else the buzzer beeps indicating the invalidity of the password. The step by step working is given as below. When the 8051 MCU is switched on, the LCD displays the entry screen message by initializing and configuring the LCD pins to 8051.

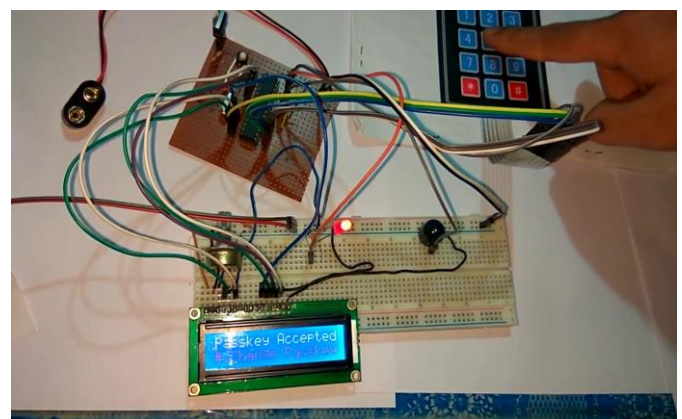


Fig.2 Typical Hardware setup



Fig.3: Entering password through keypad



Fig.4: Using Locker system

VI. CONCLUSION

This system is a good sample of design and implementation of a low cost security system based 8051 microcontroller board. The paramount part of this project is that the user can change the current password and lock the system again with a key press. By using combination of 8051 Microcontroller and password protection one can make possible smart home automation effectively. Password protected locking/unlocking avoids unauthorized unlocking. Flexibility to the user to change or reset the password makes it user friendly. So this system is cheap, reliable and effortlessly installable. This system is a fine example of design and implementation of a low cost smart home security system based Arduino UNO microcontroller board. The best part of this project is that the user can change the current password and lock the system again with a single key press. By using combination of Arduino UNO Microcontroller and password protection one can make possible smart home automation effectively.

Password protected locking/ unlocking prevents unauthorized unlocking. Flexibility to the user to change or reset the password makes it user friendly. So this system is cheap, reliable and easily installable.

VII. FUTURE SCOPE

In future more work can be carried out on this system and more features can be incorporated, like we can interface GSM modem so that an automatic call can be done to the security person when any one enters wrong password.

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