Laser Lock

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Abstract— The system designed is a laser lock which is a high security lock used to unlock doors. With the advent of smart phone technology, people have become fascinated with the pattern lock system in android operating system. Our system is based on a similar concept. The people wishing to unlock the door is supposed to a draw a particular pattern on the lock with the help of a laser and then connect his mobile phone to the DTMF decoder and enter the password. If the password as well as the pattern matches, then, the door opens. The password becomes a necessity for higher security as anyone can observe the unlocking pattern. The proposed system thus aims at helping people keep their valuables safely without any fear.

Index Terms— DTMF Decoder, LDR, Lock, microcontroller, pattern, safety, servomotor

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1 INTRODUCTION

TECHNOLOGY has always been like a maelstrom in its growth. People have acclimated themselves to the changes that take place every now and then in the world. A number of these upcoming advances have fascinated a major part of the population. One of these is the recently invented locking systems used in smart phones like Android based phones. Our system is just another application of the same. People have a lot many valuables which they fear being stolen. Our system, termed as LASER LOCK, is a high security based solution to their problem. Due to the reliability of our system, people will be able to safely keep their most important possessions in laser lock operated lockers as the high security features would now make them tension free.

2 WORKING

The designed system is basically a laser lock. We do not need to carry a key for doors operating on laser lock in order to open it. We just need to remember the unlocking pattern and mobile password. The hardware part consists of a resistor connected to an LDR which is a light dependent resistor. This is then connected to one of the channels of an Analog to Digital converter (ADC) which is an inbuilt with ATMega8 microcontroller. The voltage across the LDR changes with the change in intensity of light.
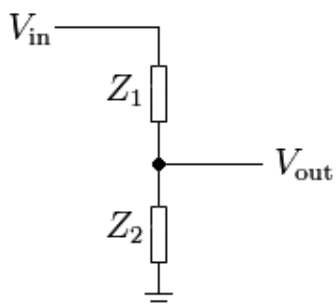
$$V_{\text{out}} = \frac{Z_2}{Z_1 + Z_2} \cdot V_{\text{in}}$$

Fig.1. Voltage Divider Rule [2]

This voltage is then received at that particular channel of the ADC. Thus, we get a different value of voltage at all the channels of the ADC. We thus have to arrange all the LDR's in a particular sequence and then draw the unlocking pattern across them with the help of a laser. Once the pattern is drawn, the microcontroller will check all the channels of the ADC to find out whether the pattern drawn is correct or not. Whenever light falls on the LDR, it gets shorted and hence the particular channel of the ADC connected to that LDR also gets shorted to ground otherwise it is pulled up. Thus, the different channels get shorted one by one as per the unlocking pattern. The microcontroller thus checks if the channels are getting shorted to ground in the right order. After the checking is done, if the pattern drawn is correct, the bicoloured LED turns green, i.e., if the pattern is wrong, the LED turns red. The system has a MT8870 DTMF Decoder. The mobile phone is connected to this decoder via a 3.5mm jack. This stage acts as a second level of security as anyone can see the pattern we draw on the lock. Thus, we have an additional password to be entered via the mobile phone once the pattern is drawn on the lock. After entering the password, the servomotor is rotated and finally the locked door opens up. Thus, in short, the user draw a pattern on the laser lock, and then plug the mobile phone with the DTMF Decoder via a 3.5mm jack, type the password in the mobile phone which finally opens the locked door.
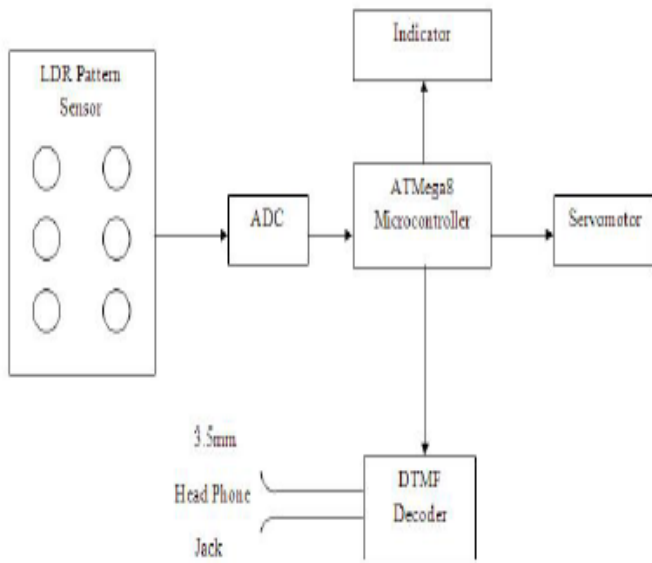
3 FIGURES

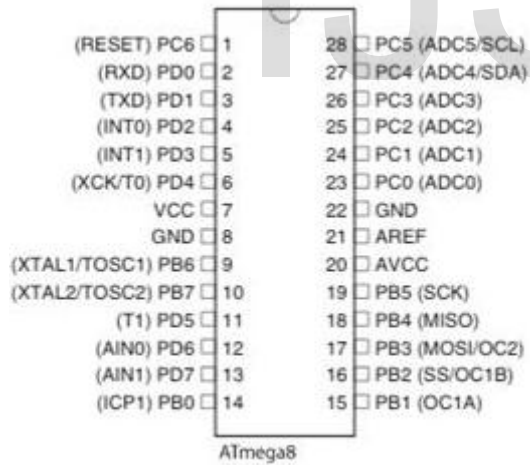Fig.2. Block diagram of Laser Lock System

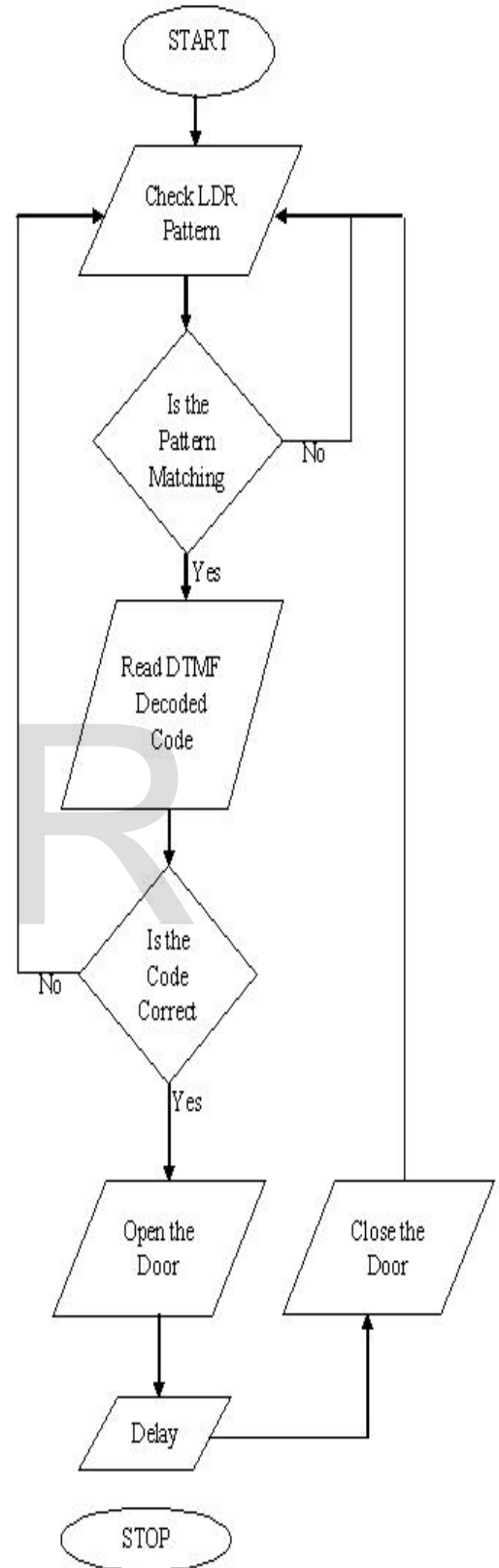Fig. 3. Pin diagram of atmega8 microcontroller [4]

Fig.4. Flowchart of Laser Lock System

4   CONCLUSION

The designed system most importantly aims at keeping people tension free as far as their valuables are concerned. Money, some important papers, jewelery or any other precious or important things which people wish to keep safely can be done easily using the laser lock system. This is because LASER LOCK system has high security as well as reliability.

ACKNOWLEDGMENT

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