ISSN (Print): 2957-9325, ISSN (Online): 2957-9333

INTERNATIONAL JOURNAL OF APPLIED ENGINEERING RESEARCH TRANSACTION

(Open Access-Referred-Peer-Reviewed Journal)

Journal homepage:https://ijaer-transaction.com/

Research Article

A PAPER ON PASSWORD BASED LOCK SYSTEM

Tanmay Punse[1], Himanshu Rewatkar[2], Dipali Dhakate[3], Pooja Sharma[4],, Priyanka Gaurkhede[5], Shital Yende[6], Rahul Dekate[7]

[1-7] Dept. of Electrical Engineering, Suryodaya College of Engineering &Technology, Nagpur, India

Article History:	Received: 20.01.2025	Accepted: 24.02.2025	Published: 04.03.2025

Abstract

The password-based door lock system is an electronic access control mechanism that eliminates the need for traditional physical keys. By utilizing a password input interface (keypad), the system ensures secure entry while providing high flexibility and ease of use. This paper presents a design and implementation of a password-based door lock system using the 8051 microcontroller. The system consists of a keypad for user input, an LCD to display feedback, and a motor to control the door lock mechanism. Upon entering a correct password, the door unlocks; incorrect attempts result in an alarm or time delay. This paper details the design, implementation, and testing of the system, demonstrating its effectiveness in securing homes, offices, and other premises.

Keywords: Password-based system, 8051 microcontroller, access control, security, LCD display, motor control.

INTRODUCTION

In today's world, security is a major concern, especially for residential and commercial properties. Traditional lock-and-key mechanisms have limitations, such as the risk of losing keys or unauthorized key duplication. To address these challenges, electronic access control systems have gained popularity. Among these, the password-based door lock system stands out due to its simplicity and effectiveness.

This paper introduces a password-based lock system implemented using the 8051 microcontroller, which allows secure and convenient access control for doors. The system operates through a keypad where the user inputs a password. If the entered password matches the stored one, the door unlocks; otherwise, an error is indicated on the LCD screen, and the system can take additional security measures, such as activating an alarm or delaying subsequent attempts.

SYSTEM DESIGN AND METHODOLOGY

2.1. Components and Specifications

The system utilizes several components to function effectively:

8051 Microcontroller: The microcontroller serves as the brain of the system, processing the input from the keypad, controlling the motor, and driving the LCD display. The 8051 is chosen for its robustness, availability, and ease of integration with external devices.

Keypad: A 4x4 matrix keypad is used for inputting the password. Each key corresponds to a unique numerical or alphanumeric character.

ISSN (Print): 2957-9325, ISSN (Online): 2957-9333

INTERNATIONAL JOURNAL OF APPLIED ENGINEERING RESEARCH TRANSACTION

(Open Access-Referred-Peer-Reviewed Journal)

Journal homepage:https://ijaer-transaction.com/

LCD Display: A 16x2 LCD is employed to provide feedback to the user, such as confirming successful entry or indicating errors.

Electric Motor: A motor (typically controlled by an H-Bridge driver like L293D) is used to actuate the door lock mechanism, either locking or unlocking the door.

Alarm System: An audible alarm is triggered if an incorrect password is entered multiple times or if unauthorized access is attempted.

2.2. System Architecture

The system architecture consists of three primary modules:

Input Module: The user inputs the password via the keypad, which is read by the microcontroller.

Processing Module: The 8051 microcontroller compares the entered password with the stored password in its internal memory. If the passwords match, it sends a signal to the motor to unlock the door. If not, the LCD displays an error message, and an alarm may be triggered.

Output Module: The motor is controlled to lock or unlock the door, and the LCD provides real-time status updates.

A block diagram of the system is shown in the **Figure 2.2.**

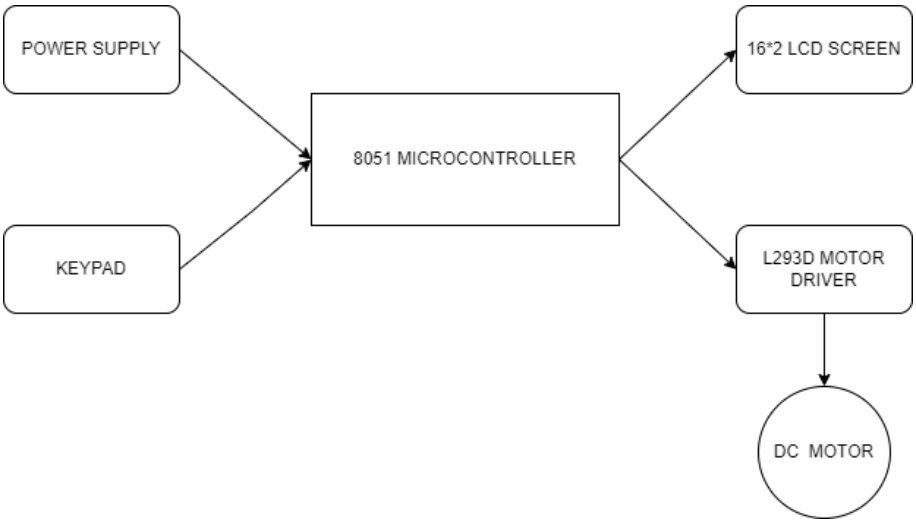


Figure 2.2: Block Diagram

3. Methodology

The basic idea of implementation of the Password Based Door Lock system has been demonstrated in the

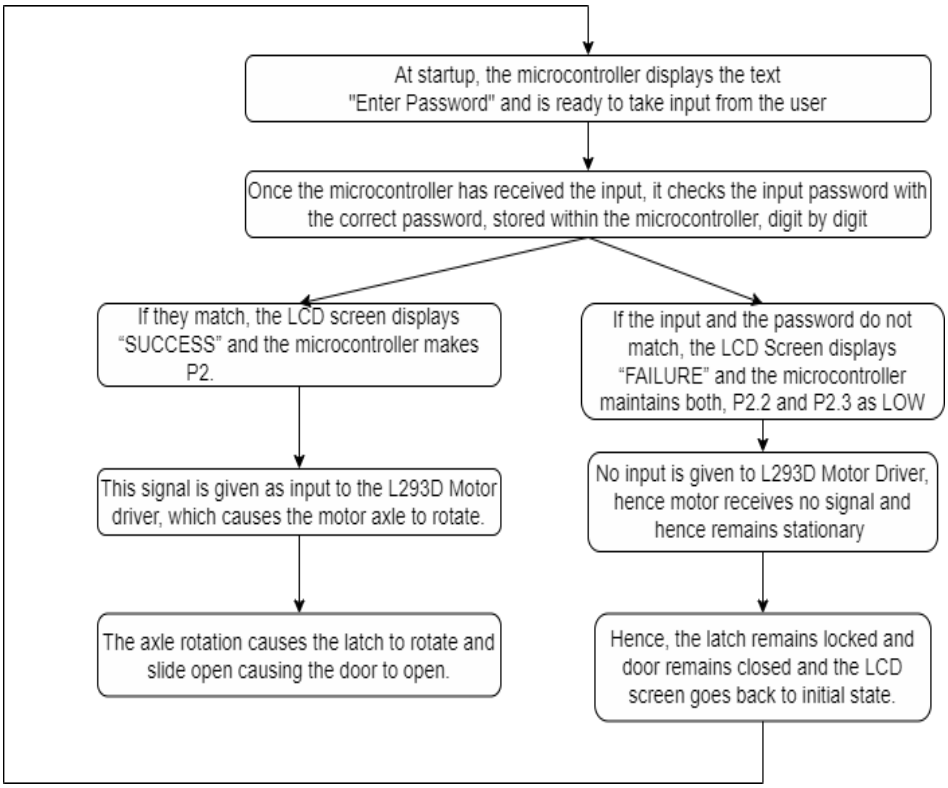
ISSN (Print): 2957-9325, ISSN (Online): 2957-9333

INTERNATIONAL JOURNAL OF APPLIED ENGINEERING RESEARCH TRANSACTION

(Open Access-Referred-Peer-Reviewed Journal)

Journal homepage:https://ijaer-transaction.com/

block diagram (Figure 2.9) as depicted below.



4. CONCLUSION

This chapter concludes the thesis on Precision agriculture system for rice crop and suggests additional functionalities for future implantation.
Our project provides enough security as long as the password isn't shared.
The system comprises a number keypad and that is connected to the 8-bit microcontroller, which continuously monitors the keypad, and opens the door if the entered password is correct, which is stored already and the person is allowed to get in.
As said, the password-based door lock system can be used to providemaximum security in order to satisfy the people's need.

5. FUTURE WORK

Can integrate it with the fingerprint scanner.
Can interface it with sensors to detect the accidents occurring and open the door.
Integrating it with the camera in case of burglary in your house.
Ensured in the places of authorized access like bank vault doors.

6. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body that provides financial or non-financial assistance for the topics or resources covered in this manuscript.

ISSN (Print): 2957-9325, ISSN (Online): 2957-9333

INTERNATIONAL JOURNAL OF APPLIED ENGINEERING RESEARCH TRANSACTION

(Open Access-Referred-Peer-Reviewed Journal)

Journal homepage:https://ijaer-transaction.com/

7. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

8. PLAGIARISM POLICY

All authors declare that any kind of violation of plagiarism, copyright and ethical matters will taken care by all authors. Journal and editors are not liable for aforesaid matters.

9. SOURCES OF FUNDING

The authors received no financial aid to support for the research.

REFERENCES

[1] Zanwar, Sanket, Khan Saif Al Atta Musaab, and Siddique Sohail. "PASSWORD BASED DOOR LOCK SYSTEM USING 8051 MICRO-CONTROLLER."
[2] Roopchandka, Pratik, et al. "Design of Password-Based Door Locking System." Proceedings of the Third International Conference on Microelectronics, Computing and Communication Systems. Springer, Singapore, 2019.
[3] Goswami, Shruti, et al. "Automated password protected door lock system." Advances in Industrial Engineering and Management 6.1 (2017): 48-52.