POLITEKNIK MELAKA

Secure Tag Door Access Control System with IOT Platform

NAME: MUHAMMAD AIDIL BIN MOHAMAD RAZIF

REGISTRATION NO 11DJK22F1015

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2024

POLITEKNIK MELAKA

Secure Tag Door Access Control System with IOT Platform

NAME: Muhammad Aidil Bin Mohamad Razif

REGISTRATION NO: 11DJK22F1015

This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electronic Engineering (Control)

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2024

CONFIRMATION OF THE PROJECT

The project report titled " Secure Tag Door Access Control System With IOT Platform " has been submitted, reviewed, and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by: 15/11/2024

Supervisor's name: DR. AZLAN BIN MUHARAM
Timbalan Pengarah (Sokongan Akademik)
Politeknik Melaka

Supervisor's signature:

Date:

Verified by:

Project Coordinator name:

Signature of Coordinator:

Date: 15/11/24

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature : 

Name : **Muhammad Aidil Bin Mohamad Razif**

Registration Number : **11DJK22F1015**

Date : 15/11/2024

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : Secure Tag Door Access Control System With IOT Platform

SESSION: JUNE 2020

1. I, 1. Muhammad Aidil Bin Mohamad Razif 11DJK22F1015

   is a final year student of **Diploma in Electronic Engineering (Control), Department of Electrical, Politeknik Melaka**, which is located at **No 2 Jalan PPM 10, Plaza Pandan Malim , 75250, Melaka**. (Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electronic Engineering (Control)** to me.

Made and in truth that is recognized by;
a) Muhammad Aidil Bin Mohamad Razif
(Identification card No: - 041113020683)

) .....
) Muhammad Aidil Bin Mohamad Razif

In front of me, Dr. Azlan Bin Muharam
(840529045113)
As a project supervisor, on the date:

) .....
) Dr. Azlan Bin Muharam

ACKNOWLEDGEMENTS

I have make efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them. I am highly indebted to Dr. Azlan Bin Muharam for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

I would like to express my gratitude towards my parents & members of Politeknik Melaka for their kind cooperation and encouragement which helped me in completion of this project. I would like to express my special gratitude and thanks to industry people for giving me such attention and time.

My thanks and appreciation also go to my colleagues in developing the project and people who have willingly helped me out with their abilities.

ABSTRACT

Many different methods are used to control access, but automatic lock systems are designed to prevent unauthorized people from accessing physical controls. For starters, lecturers need to control physical access through mechanical means, such as locks, or through technology known as automatic lock systems. This access right is limited to lecturers who want to teach in the Tecc Room, and it is very helpful to protect important assets from being stolen or lost. The Lock System must be made as secure as possible, easy to control, and work smoothly. The lock automation system is developed independently. The purpose of this final task is to control and monitor the automatic door lock system. This process can be checked in Microsoft Excel as a record of the use of the Tecc Room as a security system. For this project, Arduino UNO is used as a microcontroller to control all other parts. The input of this project uses the RFID Card Reader Detector RC522 as a function to detect the id card to access the entrance. Then the output of this project uses Solenoid Lock to open or close the lock on the automatic door.

ABSTRAK

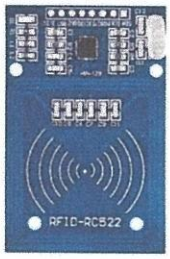
Banyak kaedah berbeza digunakan untuk mengawal akses, tetapi sistem kunci automatik direka untuk menghalang orang yang tidak dibenarkan daripada mengakses kawalan fizikal. Sebagai permulaan, pensyarah perlu mengawal capaian fizikal melalui cara mekanikal, seperti kunci, atau melalui teknologi yang dikenali sebagai sistem kunci automatik. Akses ini terhad kepada pensyarah yang ingin mengajar di Bilik Tecc, dan ia sangat membantu untuk melindungi aset penting daripada dicuri atau hilang. Sistem Kunci mesti dibuat seaman mungkin, mudah dikawal dan berfungsi dengan lancar. Tujuan tugas akhir ini adalah untuk mengawal dan memantau sistem kunci pintu automatik. Proses ini boleh menyimpan data dalam Microsoft Excel sebagai rekod penggunaan Bilik Tecc sebagai sistem keselamatan.Untuk projek ini, Arduino UNO digunakan sebagai mikropengawal untuk mengawal semua bahagian lain. Input projek ini menggunakan pengesan Pembaca Kad RFID RC522 sebagai fungsi untuk mengesan kad id untuk mengakses pintu masuk. Kemudian keluaran projek ini menggunakan Kunci Solenoid untuk membuka atau menutup kunci pada pintu automatik.

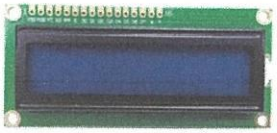
TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF COMPONENT

NO	SYMBOL	NAME OF COMPONENT
1		Arduino UNO
2		RFID Reader Card RC522
3		Solenoid Lock
4		Power Supply
5		Relay
6		Buzzer

7		Keypad 4x4
8		Lcd 16x2

LIST OF ABBREVIATIONS

RFID = Radio Frequency Identification
USB = Universal Serial Bus
TECC = Technology Enable Collaborative Classroom

CHAPTER 1

INTRODUCTION

1.1 Introduction

Automatic room door security systems are becoming an important issue nowadays. The problem of security system is something important to protect valuable assets and the problem of slow return of Tecc Room keys is also one of the causes of time wastage. Unwanted things like loss, theft and learning delay can happen due to weak Tecc Room security system. When an emergency occurs, you can still use a normal key. To meet the above requirements, an easily accessible and secure system needs to be developed. Radio Frequency Identification (RFID) has been widely used as a way to use identity cards to gain entry as a replacement for manual door locks. Automatic door locks always maintain security and protect assets.

Previous research has shown that (RFID) uses radio frequency signals to automatically identify a person's identity. RFID is commonly used for: electronic toll collection (ETC), train identification and tracking, intermodal container identification and tracking, asset identification and tracking, item management for retail, healthcare application logistics, access control, animal identification, material dispensing loyalty programs fire, and car immobilization.

This system is very helpful in using the Tecc Room and can record lecturer usage data on Microsoft Excel. In addition, this system provides many facilities to access the Tecc Room. This project also uses Arduino UNO as the main driver in moving all the hardware components used.

1.2 Background Research

Many lecturers who are using Tecc Rooms are disturbed by the late key return mechanism as some lecturers take a long time to return the keys. This device can also improve the security of the Tecc Room. In the 21st century, which is considered the era of technology, the room door security system can be improved and slow key return can be avoided. "RFID Door Lock System" improves Tecc Room security and slow key return problem. As a result, in this day and age can use ideas based on modern technology.

1.3 Problem Statement

The issue of the delay in returning the Tecc Room key needs to be taken into account, as it causes lecturers who want to teach to lose valuable time when trying to use the Tecc Room. This particular approach is designed to save time when trying to get a key.

Furthermore, this technology is also able to improve and solve the safety issue of the Tecc Room. This will be able to strengthen the security system of losing items in the Tecc Room.

1.4 Research Objectives

The main objectives of this project is to solve the Tecc Room key return problem and improve security

More specifically the principle objective of this research are:

1. To design a special system so that the lecturers can access the Tecc Room
2. To develop a door locking system in the Tecc Room that is controlled using RFID sensors by using cards.
3. To verify that there are no faults in the system being utilised, test the product by attempting to access the registration card and recording the use of the Tecc Room.

1.5 Scope of Research

1. This project focuses especially on lecturers who want to use the Tecc Room to teach student.
2. The emphasis is that this project was created especially for Tecc Room as a replacement for existing manual locks.
3. The main controller is using Arduino UNO to move all the components and Microsoft Excel to keep records of the use of the Tecc Room.

1.6 Project Significance

One of the benefits of this project is that it will reduce the time it takes to get a key and wait for other lecturers to return the key in the main lecturer's room, thus increasing the security of Tecc Room containing the valuables assets.

1.7 Chapter Summary

In this chapter, there are some information about the statement of project problems and the purpose of this project is held. In addition, the objective to carry out the project is clear to help the security system in general , especially security systems to be more effective, and very reliable.