UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SECURITY LETTER AND PARCEL BOX USING GSM

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronic Engineering Technology (Industrial Electronic Industry) with Honours.

by

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This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Industrial Electronic Industry) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Sistem persuratan ialah sistem yang masih digunakan dan penting kepada kita. Surat akan di hantar ke rumah kita dan meletakkan di dalam peti surat oleh posmen. Peti surat ialah kotak di mana surat akan dihantar dan di tempatkan di hadapan bangunan atau pintu masuk. Peti surat amat penting untuk dilindugi dari rosak dan hilang. Tujuan projek ini untuk membangunkan peti surat pemberitahuan melalui SMS menggunakan teknologi GSM dan untuk menggantikan trend lama peti surat dengan menambah teknologi elektronik dengan menggunakan modul GSM. Modul GSM memerlukan kad SIM dan beroperasi melebihi langganan untuk telefon bimbit. Projek ini dicadangkan kerana masalah yang dihadapi oleh pengguna apabila mereka tidak sedar bahawa surat baru diterima. Komponen utama yang digunakan dalam projek ini ialah Modul GSM, Arduino MEGA (2560 mikropengawal) dan penderia infamerah (IR). SMS akan diterima oleh pengguna dengan memberi pengetahuan kepada pengguna apabila surat diterima. Sistem ini akan menginteraksi dengan mikropengawal Arduino MEGA manakalaModul GSM akan menginteraksi dengan arahan AT. Sistem ini akan mula beroperasi apabila penderia inframerah (IR) mengesan surat dan mikropengawal akan menghantar arahan kepada Modul GSM. Untuk bungkusan, posmen memerlukan kata laluan untuk membuka kotak bungkusan itu dengan memasukkan kata laluan ke dalam keypad yang disediakan. Pengguna akan memberi kata laluan kepada posmen melalui telefon bimbit. Hasilnya, pengguna akan menerima pemberitahuan melalui SMS melalui telefon bimbit mereka. Manfaat daripada projek ini ialah untuk pemberitahuan kepada pengguna dan keselamatan apabila surat atau bungkusan baru diterima. Juga, ianya boleh menggelakkan daripada kehilangan surat dan bungkusan.

ABSTRACT

The system of mailing is the most significant mechanism for us. The letter is sent to our building and placed by the postman in the mailbox. Mailbox is a package delivered and placed before the building or entrance. Mailbox is essential to protected and defend your mail from missing. The purpose of this project is to develop mailbox notification via SMS using GSM technologies and replace the old trend of mailbox with adding electronic technology by using GSM module. The GSM module needs the SIM card and works via a mobile phone subscription. This project is proposed because of problem faced by the user when they did not realize when receive a new mail. The main component will use in this project is GSM module, Arduino MEGA (2560 microcontroller) and IR sensor. SMS will receive by user and give the notification when receive a mail. This system will integrate with Arduino MEGA microcontroller and then GSM module will integrate using AT command. This system will start operate when the IR sensor detect the mail and send the signal to microcontroller and the GSM module get the instruction to operate. For the item or parcel, it need a password to open the box by key in the password in keypad. When the password key in, it will active the DC motor to open the parcel box. The user will give the password to the postman to open it through mobile phone. As a result, user will receive the notification via SMS through their mobile phone. The benefit of this project is giving alert and security to user when have new mail and item. Also can avoid the loss of important letter and item.

DEDICATION

Alhamdulillah, I am grateful to Allah for the grace and divine help to give me the time and energy to prepare the thesis final report of the project tasks successfully and in timely manner. I would like to dedicate this study to my family that gives a lot of support and encouragement to me. Besides, they also helped me a lot for financial support to produce this thesis. I would also like to dedicate this whole project for my supervisor Mr. Zulhairi bin Othman for this final year project organized by University Teknikal Malaysia Melaka. Lastly, I also dedicate to the university and the entire lecturer that involve in this final year project.

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Alhamdulillah, I am grateful to Allah for the grace and divine help to give me the time and energy to prepare the thesis final report of the project tasks successfully and in timely manner.

Firstly, I would like to use this statement to express how thankful I am to be supervised under Mr. Zulhairi bin Othman for this final year project organized by University Teknikal Malaysia Melaka. This final year project gives me the chance to explore more about what I wanted to achieve in engineering course.

In addition, thanks again to my supervisor because a lot of help, assist and provide some knowledge to me while doing this project. To all friends that always support and helped me to face with difficult task and encourage me to start up writing thesis proposal. Without support and advice from them I will not be able to complete this thesis.

Last but not least, I want to take this opportunity to thank to my family that gives a lot of support and encouragement to me. Besides, they also helped me a lot for financial support to produce this thesis.

Lastly, I want to thank for the university and the entire lecturer that involve in this final year project. This program is a good practice to provide opportunities for the students to apply what they have learnt and create the bond between students and supervisors. The most important things, students are exposed to real life about the research environment. To the entire organization of University Malaysia Perlis, you really made everything possible, Thank You Very Much.

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LIST OF ABBREVIATIONS

LCD	Liquid Crystal Display
IR Sensor	Infrared Sensor
GSM	Global System for Mobile Communications
DC motor	Direct Current motor
RFID sensor	Radio-Frequency identification
PLC	Programmable Logic Controller

CHAPTER 1

INTRODUCTION

1.1 Project Background

Mailing system is very essential to us as it will send to our house and put in the mailbox by the postman. Mailbox is important to protect the mail from damaged and avoid missing. This project is proposed because of problem faced by the user when they did not realize when receive item. The mailbox is very essential for some individuals. It is dependent on the clie nt's mail. For instance, lawyers, bankers, internet businesses and writers need their client's feedback letter as their foundation for progress and company suc cess. In addition, some countries have mail robbery issues, either stolen their mail or smashed their post box.

The project is aim to developing Parcel Box Notice using Global Mob ile Communications System (GSM) via the Short Message Service (SMS) technologies and to replace the old trend of mailbox with adding of electronic technology by using GSM module. The GSM module needs the SIM card and works via a mobile phone subscription. This project is proposed because of the problem faced by the user when they did not realize when receive a new mail and items. The main component used in this project is GSM module, Arduino Uno (ATmega328 microcontroller) and IR sensor. SMS will receive by the user with give them notification when receive a mail and items. This system will integrate with Arduino Uno. This system will start operate when

the IR sensor detect the mail and items then send the signal to microcontroller and then GSM module get the instruction to operate. As a result, user will receive the notification via SMS through their mobile phone.

1.2 Problem Statement

Nowadays, most parcel and letter boxes are now in the regular and manual forms. Therefore, it will be less secure if someone leave the letter and items too long in the box. There are some difficulties in daily life, mostly faced in condo, office and apartment buildings that have little time to regularly check mail and items because of central location of boxes. Therefore, this will waste the user time to check their parcel and letter boxes daily.

Besides that, Problems happen when an individual does not know or be informed of latest mails or item in his packages. The possibility of an important letter requiring immediate action or missed out on a fixed date may result in a penalty. Then, people should check their boxes content periodically everyday whether they receive the mail and items or not.

1.3 Objective of the Project

i. To design a secure electronic parcel and letter box which can fit a size of the box is 30 cm x 20 cm.

ii. To develop a detection circuit for mail and parcel and short notification in mailing system via SMS.

iii. To apply the GSM module as a medium to send the notification to the user when receive the mail.

1.4 Scope of Project

The scopes of this project are to design an efficient Parcel and letter box security by using Arduino Uno with maximum dimension of 30 cm x 20 cm Perspex glass box. This project focused on residents building such as condominium, offices buildings and apartment. This project also focused on how to build and evaluate the electronic letter and parcel box by using GSM module that allow the message to send to the user. For this project, It will send the user the notification if courier or any other person inserts the letter, but if courier inserts the package it will take a password from the user to open the packaging box.

The work scope for this project is design using hardware and software. For the hardware part, were consist sensor circuit, Arduino, LCD and GSM module. Arduino act as controlled circuit and to make a transmitter and receiver through Arduino it connected to circuit sensor. For the software part, it consists of programming language software to guide the parcel box for the certain operations.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

The information for this project is described by a literary review. The background information on the project is important for achieving all goals. There is a difference between the past project and this project so that no problems exist.

2.1 Previous Project

2.1.1 Intelligent Letter Box Using Gsm and Arduino with Automatic Notification

The previous research by Norasyikeen Binti Sahat (2016) for the intelligent letter box uses a PIR detector in the letter box to recognize the latest letter [4]. The aim of the project is to create a letter box automation technique, which notifies you when the packages are shipped. This application is placed outside the building like home, office institutions and so on. The controller that is used is Arduino. Then, the GSM module sends customer smartphone information about the letter. The LCD was appearing at the letter box that indicates the status of the letter box. Once the new incoming letter put inside the box, the GSM will get the command from the Arduino that information is the motion was detected. Then, the GSM will send the notification to the number telephone of user.

Hardware component consists of an Arduino, GSM or LCD detector module. In order to obtain and communicate the signal the Arduino was linked to the Arduino circuit detector. Then Arduino will send notification to the user via the mobile phone to the LCD display and send it wirelessly via the GSM module.

2.1.2 Letter box with counting letter

The previous project by Shubham Bhor, Deepak Kulawade, Avinash Kale, Rajesh Chakve (2016) which this project takes over the task of display counting the letter in letter-box.

The counter is increase by one when a letter enters the room. At the entrance of the letter box, IR detectors are put and used to identify the existence of a letter. A fluid glass screen displays letter digits. The DC motor is used as a conductor for boosting the current. It is not necessary to turn motors using a present amplifier from the present microcontroller [3].

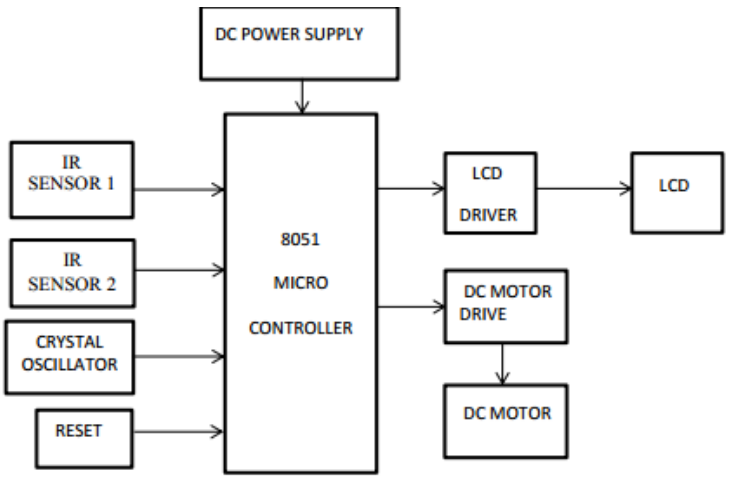

Figure 2.1: Block diagram [3]