AUTOMATED INTELLIGENT DRAWER OR LOCKER SECURITY SYSTEM

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A report submitted in partial fulfillment of the requirements for the degree of Bachelor of Mechatronics Engineering

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2010

"I hereby declare that I have read through this report entitle "Automated Intelligent Drawer or Locker Security System" and found that it has comply the partial fulfillment for awarding the degree of Bachelor of Mechatronics Engineering"

Signature : .....

Supervisor's Name : En. Muhammad Herman Bin Jamaluddin

Date : 22 April 2010

I declare that this report entitle “Automated Intelligent Drawer or Locker Security System” is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : .....

Name : Shafizal Bin Hassan

Date : 22 April 2010

To my beloved mother and father

Hassan Bin Ahamad and Maizon Bt Md Aruf

In appreciation of supported and understanding.

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Alhamdulillah, praise be to Allah, the Cherisher and Sustainer of world, most Gracious, most Merciful Lord.

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ABSTRACT

Nowadays, so many crime cases can occur around us even though we have done all the security measures. For examples, bank robbery can occur in a high security system. If a robber attempt to enter a facility, he will try and break open all the drawers and lockers, so that he can take all the valuables in the property. This is where this automated intelligent plays its part in providing the second backup security system after the existing door or entry security system. The project is called "Automated Intelligent Drawer or Locker Security System" to build a security and safety system which can protect our properties in the drawer or locker. Owner can manually set or reset their personal code. The security system is control by a microcontroller. Keypad reader is used by owner to access to open and lock up their locker (magnetic lock) in active mode then door open automatically. If the drawer had been broken up, the owner will get the information status of their properties which is in danger by using GSM modem.

ABSTRAK

Pada hari ini, pelbagai kes jenayah berlaku di sekeliling kita walaupun kita telah menitikberatkan keselamatan diri. Sebagai contoh, rompakan bank boleh berlaku di kawasan yang mempuyai tahap keselamatan yang tinggi. Sekiranya pencuri cuba untuk memasuki sesebuah premis, dia akan berusaha membuka semua laci dan peti simpanan supaya dapat mengambil semua barang-barang bernilai. Di sinilah kepandaian automatik memainkan peranan dalam menyediakan sistem keselamtan perlidungan kedua. Projek bertajuk ”Sistem Keselamtan Bijak Automatik Laci atau Peti Simpanan” adalah untuk memcipta sistem perlindungan dan keselamatan dimana dapat melindungi harta benda di dalam laci atau peti simpanan. Pemilik boleh menyimpan atau memadam kata laluan persendiriran secara manual. Mikropengawal berperanan mengawal sistem perlindungan. Pembaca kekunci pelapik digunakan oleh pemilik untuk membuka dan mengunci peti simpanan mereka (kekunci magnetik) dalam mod aktif seterusnya pintu terbuka secara automatik. Sekiranya laci tersebut di pecah masuk, pemilik akan mendapat maklumat berkenan harta mereka dalam bahaya menggunakan modem GSM.

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ADC	- Analog-to-Digital converter
ARES	- Advanced Routing and Editing Software
AT	- Attention
CMOS	- Complement Metal Oxide Silicon
COM	- Component Object Mode
CPU	- Central Processing Unit
EEPROM	- Electrically Erasable Programmable Read-Only Memory
GPRS	- General Packet Radio Service
GPS	- Global Positioning System
GSM	- Global System for Mobile
IDE	- Integrated Development Environment
I/O	- Input or Output
LCD	- Liquid Crystal Display
LED	- Light Emitting Diode
PC	- Personal Computer
PCB	- Printed Circuit Board
RAM	- Random Access Memory
SMS	- Simple Message Service
SMT	- Surface Mount Technology
TTL	- Transistor-Transistor Logic
USART	- Universal Synchronous Receiver Transmitter
USB	- Universal Serial Bus

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CHAPTER 1

INTRODUCTION

1.1 Project Background

The highest rate of crime cases reported on the newspaper or news report created a threat environment for public; thus, leave awareness to people around the world. Nothing is more important than the safety and protection especially to our family. So, as we can see nowadays, there are so many security products in the market with the priority to guard home whether they are home or leave home for vacation. The products mostly provide motion sensor, alarm system and are easy to use by subscribers.

This project will be designed to protect valuable property especially in the drawer or locker. The security system will help the user too easily to access their property and can set their desired personal code protection. It also helps on surveillance monitoring property and gives a signal to user if there are any attempts to steal valuables. As mankind dreams to live in a peaceful world, we always take steps in ensuring the safety of our families and property by taking the appropriate measures. Hence, we will prevent situations that can be life threatening to the society we are in.

1.2 Problem statement

We need to take some action to protect our property in preventing crime cases that can occur anytime and anywhere especially in our home. As we know, the security system will give optimum protection to valuable then help the families' members in safe condition. So, the problems to be studied are to build up a system that can protect our property if no one at home. The drawer or locker can be use to keep our valuable property safely. Even though, the system always monitor our property but if someone have broken up the drawer or locker, the trigger alert will be sent to us that our assets are unsafe. This security system is one of the user friendly products whereas easily to access and can set or reset their desired personal code protection.

1.3 Objectives of the project

The objectives of completing the project are based on:

a) Identification of components
   - List out components for the project.
b) Design software and simulate
   - Design the project's software using MicroC compiler.
c) Design hardware and mechanical assembly
   - Design and preparations of components before assembled.
d) Interface software and hardware
   - The combination of software and hardware parts.
e) Analyze output and improve design
   - Analyze the system to fulfill the safety and security condition.

1.4 Scope of the project

The project's scope focuses more on the designing automatic lock system by using microcontroller. The size of drawer is 14 inches x 19 inches x 8 inches with aluminum type. The microcontroller as a brain system that guide the drawer or locker whereas its will control to open the door automatically with a correct code. Otherwise, its will trigger to owner if drawer had been broken up. Here the mobile communication (GSM) will be implementing to enhance the security system precisely. Figure 1.1 shown the project scope of this project.

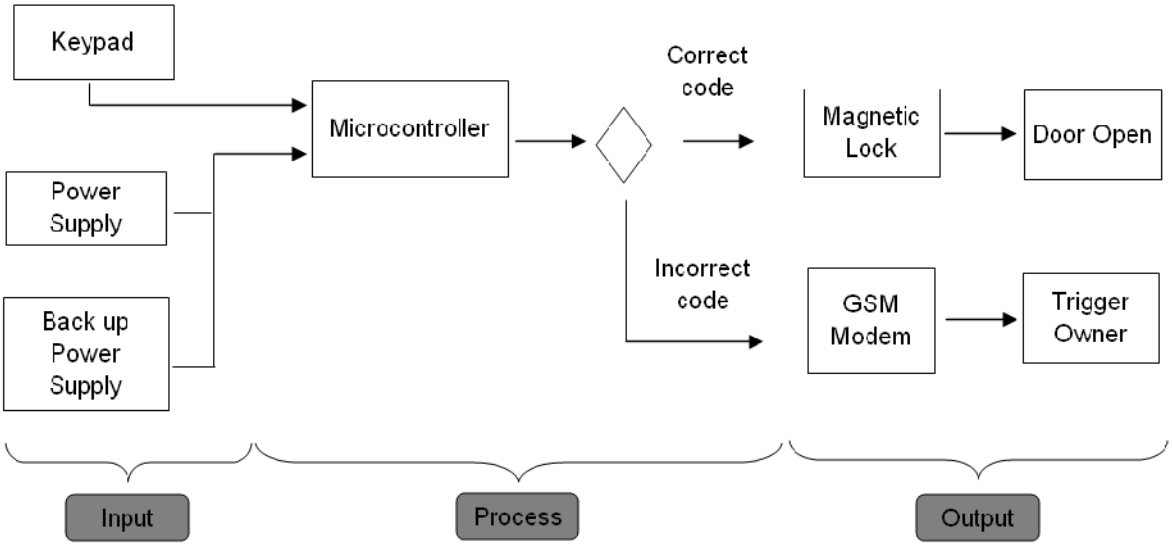

Figure 1.1: Project scope

1.5 Outlines of Progress Report

This thesis is prepared to explain in detail about the final year project which has been done through this semester. This project report consists of six chapters. The first chapter is discussing about the project background, problem statements, objectives and scope of the project. In second chapter, literature review will cover introduction of a security system which is done by a studies on five safety and security product. In addition, there are explanations of theory of Global System for Mobile Communications (GSM) includes software and hardware used in the project. The third chapter will cover the whole methodology that has been followed during implementation of this project. In fourth chapter will show and elaborate the result together with some result analysis. The general discussion of the whole result will be cover in fifth chapter. The last chapter was sixth chapter will highlight the important finding and conclusion for this project together with several recommendations for future work.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Analysis of the previous research of the related products will be discussed in a literature review. The purpose of these literature reviews is to expose the knowledge and general idea had been designed by each manufacturer' company concerned about security system. Hence, the research outcomes idea will be used for improving this project. It's also explained the software and hardware specifications briefly as references and guidelines to smooth the process of completing the project

2.2 Research about safety and security product

Under this project topic a lot of readings have studies to make this project become successful. Thereby, research had been done about a security system focusing only on home surveillance that covered five products as explained in the next section. The analysis's outcome will help to improve the automated-intelligent security system project.

2.2.1 Digimatic Electronic Safety Lockers

Apart from standard sizes, the manufacturer design and manufacture digimatic electronic safety lockers according to customers' specifications & requirements. This safety locker is safe and perfect for storing precious belongings such as cash, jewellery, documents in residences and commercial organizations. Figure 2.1 below show Digimatic Electronic Safety Lockers product.

Figure 2.1: Digimatic Electronic Safety Lockers

Here are some features of this product:

a) Dual password - operations by two persons
b) Password selection through alpha-numeric keys – max 9 characters
c) Change of password facility
d) 4th attempt = Alarm facility for 3 minutes followed by auto-freeze for 5 minutes
e) Low battery indication - external battery provided
f) Non-volatile memory enables password retention even when the battery is removed

2.2.2 Mini Lok-All Keyless Locker

Mini Lok-All allows users to select their own personal code for access. It provides codes resettable system by each user usage. A keyless locker security system is provided with optional shelves. Keyless operation offers self-storage to users and a low maintenance system for operators. Management master keys are provided to easily open and resolve forgotten personal codes. Figure 2.2 below show Mini Lok-All Keyless Locker product.

Figure 2.2: Mini Lok-All Keyless Locker

2.2.3 Aftek SpyGuard

Aftek Spyguard is a small, simple, easy to use video, alarm, notification, all-in-one security system. This product helps people to keep a watch on their home, office or shop while they are away. Figure 2.3 show Aftek SpyGuard product.