ANTI –THEFT SECURITY WITH NOTIFICATION

(SMS SECURITY NOTIFICATION

MUAHMMAD ZHAFRI B ABD RASHID
B020810277

This Report Is Submitted In Partial Fulfillment Of Requirements For The Bachelor of Electronic Engineering (Wireless Communication) With Honours

Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka

APRIL 2011

UNIVERSTI TEKNIKAL MALAYSIA MELAKA

FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN

PROJEK SARJANA MUDA II

Tajuk Projek ANTI –THEFT SECURITY WITH NOTIFICATION (SMS SECURITY NOTIFICATION)

Sesi 2010/2011

Pengajian

Saya MUHAMMAD ZHAFRI B ABD RASHID mengaku membenarkan Laporan Projek Sarjana Muda ini disimpan di Perpustakaan dengan syarat-syarat kegunaan seperti berikut:

1. Laporan adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan laporan ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. Sila tandakan (√) :

☐	**SULIT***	(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)
☐	**TERHAD***	(Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)
☐	**TIDAK TERHAD**	

Disahkan oleh:

_____ _____

(TANDATANGAN PENULIS) (COP DAN TANDATANGAN PENYELIA)

Alamat Tetap: 766 PMTG ARA,
13500 PMTG PAUH
SBRG PERAI
PENANG

Tarikh: ..... Tarikh: .....

"I hereby declare that this report is the results of my own work except for quotes as cited in the reference."

Signature : ……

Author : MUHAMMAD ZHAFRI B ABD RASHID

Date : …….

"I hereby declare that I have read this report and in my opinion this report is sufficient in terms of the scope and quality for the award of Bachelor of Electronic Engineering (wireless communications) With Honours"

Signature :……..

Supervisor's name :ENGR. ZULKIFLI B SHARIFF

Date : …….

Specially dedicated to

My beloved parents, brother, sister and my lover who have encourage, guided and Inspired me throughout my journey of education

ACKNOWLEDGEMENT

All praise to ALLAH because of HIM, I manage to complete this *PROJECT SARJANA MUDA 2 (*PSM2). I also want to thanks my parents for all their support. I also would like to thanks my supervisor, MR. ZULKIFLI B SHARIFF to all his guidance in completing this first *PROJECT SARJANA MUDA 1* (PSM 1) and PSM 2. Without his guide, this report cannot be completed. Furthermore, I would like to thanks to all my friends with their help in finishing this PSM 1. With all the help form involves parties; I manage to finish this PSM 1 and PSM 2 with all the help, I manage to complete my report and my project which is Anti-Theft Security with Notification also known as SMS Security System. This report will be used as a guidance to undergo PSM 2.

ABSTRACT

Safety is one of the crucial aspects that appear in every person daily life. “Safety First” is a tag line often used in the working area. It doesn’t means that only in the working are this tag line should be used. Every action must be considered with this tagline as a first step. Safety is not for our self only but this term also used for our belongings. In order to secure user belonging from been reviewed or stolen, it is very costly. Based from the problem in securing user’s house, this project is developed. The ATSeN. The Acronym of ATSeN is stand for Anti-Theft Security with Notification. The word “Anti-Theft” are placed in front of this project titled is to strengthen this project main purpose development. In this project, the “Security” word is defined by the safety of the belongings that need to be secure. The word notification shows the capability of this system to notify the owner if there are any breached of the system. By combing the three word described above, it is chosen to become this project title. The combination of these phrases is chosen as project title based on its advantage and capability.

ABSTRAK

Keselamatan adalah aspek penting yang wujud dalam kehidupan seseorang.”Utamakan Keselamatan” adalah frasa yang selalu digunakan dikawasan berkerja. Ini bukan bermaksud hanya ia dugunakan dikawasan berkerja sahaja tetapi disemua kawasan. Segala perlakuan perlu berdasaekan kira frasa ini. Factor keselamatan bukan sahaja perlu diambil kira dari aspek diri sendiri tetapi juga dari aspek harta benda. Kos untuk menjaga keselamatan harta benda adalah tinggi. Projek ini dijalankan berdasarkan permasalahan dalam menjaga harta benda di kediaman pengguna. ATSeN merupakan nama singkatan kepada Anti-Theft Security with Notification. Perkataan “Anti -Theft” diletakkan dihadapan tajuk projek ini adalah untuk menunjukkan tujuan utama pembangunan projek ini. Dalam projek ini, perkataan “Security” membawa maksud langkah keselamatan yang diambil bagi menjaga barangan berharga milik pengguna. Manakala perkataan “Notification ” boleh didifinasikan sebagai keupayaan projeck ini dalam memberitahu pengguna jika terdapat pencerobohan.Dengan menggabungkan tiga perkataan yang telah dijelaskan sebelum ini, ia dipilih sebagai tajuk projek ini. Pengabungan perkataan ini dipilih berdasarkan kelebihan serta kebolehan projek ini.

TABLE OF CONTENT

ABBREVIATION

1D	**-**	**1 D**imensional
2D	**-**	**2 D**imensional
3D	**-**	**3 D**imensional
ATSeN	-	**A**nti-**T**heft with **Se**curity **N**otification
C1	**-**	**C**oil **1**
C2	**-**	**C**oil **2**
CCTV	**-**	**C**ircuit **C**losed **T**elevision
CLK	-	**C**lock
COM	**-**	**C**ommon
CPU	-	**C**entral **P**rocessing **U**nits
FKEKK	**-**	**F**akulti **k**ejuruteraan **E**lektronik & **K**ejuruteraan **K**omputer
GND	-	**G**rou**nd**
GSM	-	**G**lobal **S**ystem for **M**obile Communication (formerly Group Special Mobile)
I/O	-	**I**nput / **O**utput
IC	-	**I**ntegrated **C**ircuit
ICC	-	**I**ntegrated **C**ircuit **C**ard
ID	-	**Id**entification

IR	-	**I**nfra **R**ed
mm	-	**m**ille-**m**eters
NC	-	**N**ormally **C**losed
NO	-	**N**ormally **O**pen
PC	-	**P**ersonal **C**omputer
PIC	-	**P**eripheral **I**nterface **C**ontroller
PIR	-	**P**assive **I**nfra-**R**ed
RAM	-	**R**andom **A**ccess **M**emory
RC	-	**R**adio **C**ontrol
RF	-	**R**adio **F**requency
RFID	-	**R**adio **F**requency **I**dentification
RISC	-	**R**educed **I**nstruction **S**et **C**omputing
ROM	-	**R**ead **O**nly **M**emory
SMS	-	**S**hort **M**essage **S**ystem
UTeM	-	**U**niversiti **Te**knikal **M**alaysia, Melaka
VCC	-	Input Voltage
VCD	-	**V**ideo **C**ompact **D**isc
VSM	-	**V**irtual **S**ystem **M**emory
WDT	-	**W**atch **D**og **T**imer
WORM	-	**W**rite-**O**nce-**R**ead-**M**any

LIST OF TABLE

LIST OF FIGURE

CHAPTER I

Introduction

Nowadays, there are many security system developed by the company or personnel. As we know, the security system produced is in high cost and not everybody can afford to use the system. More advanced the security system, the higher the cost will be. In this proposal, the low cost security systems with advance features are design and develop.

1.1 Project Background

This project called Anti-Theft Security with Notification (ATSeN) and also known as SMS Security Notification. The purpose of this project is to detect any person (via movement) after the security been activated and notified the owner or direct to the police station (based on the setting). The notifications are sending via mobile attached to the microcontroller. This is why this project is in low cost because there are no GSM modules used (the GSM used only the build in the cell phone). The main purpose of this project is to produce a low cost security system with twice the safety.

1.2 Problems Statement

Usually every door will be equipped with the locking mechanism. There are many type of lock mechanism such as Wafer-tumbler, Tubular Locks, Cylinder Locks and other more. This type of lock mechanism has its own disadvantages. This is because there are many way to open this type of lock. The example of method used to picking the door lock:

1.2.1 Conventional Techniques

The normal way to pick a lock involves the use of a lock-pick set to turn and open a pin tumbler lock. The pin tumbler is the very common type of lock found on front doors, padlocks and a lot of cars internationally. The pins in a pin tumbler lock the keyway from turning unless the correct combination in the form of the key leads to the actuation of the keyway and the opening of the door.

1.2.2 The Simplest Bypass

The common way of opening doors as seen on real life crime tv and movies is to wedge the door open using a crowbar. In this way the door is physically separated from the door frame so that the bolt is no longer lodged in the door frame allowing the door to open.

1.2.3 The Simplest Bypass Redone

The wooden lock and a steel strip with an inverted 'V' slot on one side can be used with the crowbar. If the door frame has a wooden ledge this has to be removed using a crowbar. Then the crowbar is used to slightly wedge the door above and below the bolt each time placing a slim wooden wedge there to keep the space open. Then the slotted knife is inserted above the bolt, pressed down and pulled to actuate the spring bolt.

1.2.4 Straight Shims

A straight shim is a small thin, flat strip of spring steel that is curved by width and straight by length. It can only be used on locks where the separation of the keyway tumbler and the lock is accessible. The shim can be inserted into this spacing while quickly moving each internal pin with a simple pick so that the strip of metal will completely separate the two parts of the pins that are responsible for the turning of the lock.

1.2.5 Padlock Shims

A padlock shim can bypass all this difficult work; it is placed in the spacing between the lock body and the inner side of the arm of the padlock which is usually always accessible. Once the shim is there it can be turned using its handle so as to extract the bolt from the notch in the arm opening the lock

.

1.2.6 Lockpick Gun

A very well known tool, it is in wide use today for quick door entry. The lock pick gun works on mathematical principles of chance. A striker moves to hit all the pins in in a tumbler lock and with that there is a very good chance that the pins will by chance be in the correct place at the correct time and lead to the opening of the lock.

1.2.7 Drilling the Lock

There are two ways to use a drill.

1. Use a tiny drill bit to drill a hole in the shoulder of the lock just above the keyway.
2. The brute force technique is to drill out the whole keyway using a larger drill bit and then forcing the inner side of the bolt in the now open keyway open.

Besides the disadvantages of the normal door lock, the other problem occur when the room been intrude that is no way that the owner can be informed. This can lead to the stolen of the properties that been kept inside the room.

1.3 Project Objectives

Based on the problem statement above, it is clear that the main objective of this project development is to prevent a room from been intrude by other person and protect the owner belongings. Besides the main objective, there is also other objective that related to this project development.

First is about cost. In this project, the GSM units are not required and replaced with the Nokia 1110 cell phone. There are advantages when using the GSM in the cell phone. Firstly is the size is small. When the size are small it also will reduced the size of the product. Secondly is the cost per unit for Nokia 1110 is RM 100 compared to the cost of GSM module which is will cost RM 550.

The second objective of this project is to prevent any method that can be used to open the normal door lock. Based from the method of picking the door lock stated in the problem statement part, it showed that there are many to pick a lock. The projects are using a magnetic door lock rather than a normal door lock. This magnetic door lock only allowed a person that have a RFID card to enter the room equipped with this system.

Last but not the least, the objective of this project development is to notified the owner when there are breach of the secured room, the system will notified the owner via short message system.

1.4 Scopes of Project

The system will be on standby mode if trigger by the switch that on by the owner before leaving the room. All the system is in standby mode including the IR sensor, cell phone, and the RFID card reader. When the switch been on, the metal placed on top of the main entrance door will become magnetize and lock the door. The LCD display will display the "*PLACED THE ID CARD HERE*" text. This means

that all the system is in good condition and function. If there are intruder enter the room, he will accidently cut the infra red signal and will trigger the alarm and the same time the signal from the IR sensor will be processed in microcontroller and it will send the data in pulse condition to trigger the cell phone and sending an *SMS* notification to the owner. In the other hand, if the owner wants to enter the room, he only need to touch the RFID card to the RFID card reader and the LCD display will show the "*VALID ENTRANCE*". Once the RFID card detect the valid card, it will send a signal to the micro controller and send the signal to cut off the current flow toward the metal placed on top of the door. When there are no current flows at the metal, it will stop become a magnet and the door can be open without triggering the alarm.

1.5 Report Structure

This report consists of chapter that will explains the details about this project. This project is divided into five (5) chapters. Each chapter will give a brief explanation about the overall process of the project.

The first chapter will explain about the basic theory of SMS security notification with introduction of overall process for this project.

The second chapter will explain the literature review that been done in order to develop this project.

The third chapter will explain the methodology of this project. This chapter consist of method used to develop this project.

The fourth chapter will discuss about the result and discussion. All the data gain from this PSM 1 is included such as the type of software and hardware chosen to be used in PSM 2.

The fifth chapter consist of conclusions of this PSM 1 and future works that need to be done in PSM 2.

CHAPTER II

Literature Review

2.1 Introduction

This chapter will explain about the source that collected regarding this project that gain from the research made. All data gathered based on the research done via journal paper and internet source such as blog, website and others.

2.2 Journal Review

2.2.1 PIC16f877A

2.2.1.1 Design and Implementation of Line Follower Robot

This paper discuss about the implementation of line follower using PIC16f877A. Based from this article, the robots are divided into several parts:

1. Sensors
2. ADC (Analog to Digital Converter) and sensor circuit
3. Processor
4. Driver
5. Actuators (Motors and wheels)
6. Chassis and body structure
7. Power Supply (5V / 12V DC)

The electrical circuit of some line follower robots can compare the analog signal received form sensors and then transmit the result to the processor in digit '0' or '1' and some of them send the analog signal to the processor directly. Anyway, the analog signal must be converted to the digital form and then the processor can process it according to that digit.

Based from this paper, the outputs for the follower robot are motors. For sms security notification, the outputs are changed from motor to cell phone interface circuit.

2.2.2 Motion detector

2.2.2.1 Robust motion detector for video surveillance applications

This paper presents a robust motion detector video sensor. It is intended to operate in surveillance applications for long periods of time with time-varying noise level. It makes use of the fact that whenever there is no motion a similarity measure between frames tends to have similar values.

Based from this paper, a variable in that need to be adjusted to have a good detection of the sensor is the height. These concepts are implemented in this SMS security notification project.

2.2.3 RFID System

2.2.3.1 Design and implementation of RFID system

This paper deals with the Radio Frequency Identification (RFID) and shows a full design for an RFID system. This system was designed as a security system for corporate and an office where a list of employees is provided in a database in the main computer and each employee is given a Tag that holds a specific identification number. The system will identify the employees as they pass nearby the Reader. A software application works as an interface application to the RFID system. The RFID system was designed using the concept of FSK modulation as a technique to transmit and receive the signal. The FSK modulator works on two discrete frequencies 14