VEHICLE SECURITY ALERT SYSTEM

MOHD ASHRAF BIN MOHD RÁZALI

This report is submitted in partial fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Industrial Electronics) With Honours

Faculty of Electronic and Computer Engineering

Universiti Teknikal Malaysia Melaka

MAY 2011

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : **Vehicle Security Alert System**

Sesi Pengajian : **2010/2011**

Saya **MOHD ASHRAF BIN MOHD RAZALI** 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)

Alamat Tetap: 229 LORONG 3,
JALAN SELAMAT,
KG. SG. TAPAH TAMB.
30020 IPOH,
PERAK DARUL RIDZUAN.

Tarikh: 13/5/2011

(COP DAN TANDATANGAN PENYELIA)

ABD. SHUKUR BIN JAAFAR
Ketua Jabatan Kejuruteraan Telekomunikasi
Fakulti Kejuruteraan Elektronik Dan Kejuruteraan Komputer
Universiti Teknikal Malaysia Melaka (UTeM)
Hang Tuah Jaya, 76100 Durian Tunggal,
Melaka.

Tarikh: 13/5/2011

"I hereby declared this report is result of my own work except for quotes as cited clearly in the references."

Signature : .....

Name : MOHD ASHRAF BIN MOHD RAZALI

Date : 13/5/2011

"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 (Industrial Electronics) with Honours."

Signature : .....

Supervisor's Name : MR. ABD. SHUKUR BIN JA'AFAR

Date : 13/5/2011

Dedicated to my beloved family especially my father and mother

ACKNOWLEDGEMENT

First and foremost, I would like to praise ALLAH SWT for His blessing. He gave me physical and mental strength to carry on my final year project up to completion.

I also would like to express gratitude and thanks to my supervisor, Mr. Abd. Shukur bin Ja'afar for his support, encouragement, guidance, advice and unfailing patience throughout the duration of the project. His encouragement and guidance are truly appreciated. Otherwise, this project has not been possible. I have learnt a lot under his guidance, be it practicaly or theoritically.

Other than that, I am also grateful my co-supervisor Mr. Mazran Bin Esro for really help me out and giving me opinions along implementation of this project.

I would like to thank my beloved mum, dad and all family members for their encouragement and never ending support. Their support and lovely companionship is another important source of strength for me. Without their devoted love and sacrifices, none of this would have been possible.

Finally, I would like to offer thanks and deepest gratitude from the bottom of my heart for all the supports, encouragement and inspirations I obtained throughout the duration of this project. The help rendered to me priceless, be it from the smallest of its kind to the largest.

ABSTRACT

In the modern era and high-tech now, although there are people who use the technology for the benefit and convenience, but there are also some of the daily use of technology toward evil and unlawful. We often hear the phone and the laptop is placed in a car stolen by unscrupulous persons. But how did they know that mobile phones and laptops are in cars, with the sophisticated technology they can find out by using the frequency detector can detect the type and frequency to know the goods that are in the car. As a car's owner, a security system is needed to protect our car from dangers. There is no way to totally eliminate the car theft, but there are still ways to prevent cars from being stolen and being broke. Hence, A Vehicle Security Alert System is created as an approach to protect our car. This system is a security system that is designed to protect and alert the user on certain happening that need prompt attention to the car. This system involves the real connection with the conventional alarm system connected to the PIC and GSM Modem. When these situations occur, the car security alarm will sound and when any car door is opened a signal will send to the PIC, then PIC will process the data and will transmit the signal to the GSM modem and GSM modem will send SMS to phone the owner of the vehicle immediately. Users can make prompt attention to overcome the problem. The Micro C Compiler programming can be used to monitor and transmit controlling signals to the modem by connecting a serial communication port RS232 between GSM modem and the hardware. AT command is used to control the function of the modem.

ABSTRAK

Dalam zaman yang serba moden dan berteknologi tinggi kini, walaupun ada manusia yang mengunakan teknologi untuk kebaikan serta kemudahan harian tetapi ada juga sebahagiannya yang menggunakan teknologi kearah kejahatan serta menyalahi undang- undang. Kita sering kali mendengar telefon bimbit serta komputer riba yang diletakkan didalam kereta dicuri oleh orang yang tidak bertanggungjawab. Tetapi bagaimana mereka mengetahui telefon bimbit itu serta komputer riba berada didalam kereta, dengan teknologi yang serba canggih mereka dapat mengetahui dengan menggunakan alat pengesan frekuensi yang boleh mengesan jenis- jenis frekuensi dan dapat mengetahu barang - barang yang berada didalam kenderaan tersebut. Sebagai pemilik kereta, kita perlukan satu sistem sekuriti untuk melindungi kereta daripada sebarang ancaman. Kita tidak boleh menyelesaikan permasalahan ini secara menyeluruh, tetapi masih ada pelbagai cara untuk melindungi kereta. *Vehicle Security Alert System* merupakan sistem yang dicipta sebagai langkah untuk melindungi kereta dari sebarang ancaman. Sistem ini adalah sistem sekuriti yang melindungi dan memberitahu pemilik kereta tentang sebarang kejadian pada kereta yang perlu diberi perhatian sewajarnya. Apabila ada penceroboh yang ingin menceroboh kereta, sistem penggera kereta akan berbunyi, apabila salah satu pintu kereta dibuka, sistem ini akan memberitahu pemilik kereta bahawa kereta diceroboh melalu sistem pesanan ringkas. Projek ini direka menggunakan pemancar yang memancarkan isyarat kepada penerima, yang berhubung dengan sistem kawalan yang dikenali sebagai mikropengawal. Apabila system penggera keselamatan kereta berbunyi serta pintu kereta dibuka ia akan mengesan voltan untuk dihantar kepada mikropengawal. Perkakasan dihubungkan kepada *GSM modem* melalui perisian *Micro C Compiler* aturcara bergrafik dengan menggunakan kabel *serial communication RS232* di mana ia dapat digunakan untuk memapar dan meghantar isyarat kawalan kepada *modem*. *AT Commands* merupakan satu kod isyarat kawalan yang membolehkan modem tersebut berfungsi.

TABLE OF CONTENTS

II LITERATURE REVIEW

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

GSM	-	Global System for Mobile
SMS	-	Short Message Service
PWM	-	Pulse Width Modulation
I/O	-	Input/ Output
USB	-	Universal Serial Bus
UART	-	Universal Asynchronous Receiver and Transmitter
SIM		Subscriber Identity Module
IEEE		Institute of Electrical and Electronics Engineers
LAN		Local Area Network
WAN		Wireless Area Network
RAM		Random-access memory
ROM		Read-only memory
LED		Light emitting Diode

LIST OF APPENDIX

CHAPTER I

INTRODUCTION

This chapter will explain about the basic of this project generated. The chapter contains introduction, objective of the project, problem statement, scopes of work, brief methodology, and report structure.

1.1 Introduction

Vehicle security alert system is a security system that is designed to protect and alert the user on certain happenings that need prompt attention to the car. Vehicle security alert system is a vehicle safety system is required at present. This is due to crimes involving vehicle theft increased from year to year. This system involves the real connection with the conventional alarm system connected to the PIC and GSM Modem. When these situations occur, the car security alarm will sounded and when the car door opened a signal will send to the PIC, then PIC will process the data and will transmit the signal to the GSM modem and GSM modem will send SMS to phone immediately. Users can make prompt attention to overcome the problem.

This module is applied for transferring of GSM SMS message to the user's mobile phone. The module is used for car protection in combination with the

conventional car alarm system. When car alarm system was triggered and any car door open this system will send SMS immediately to the user mobile phone.

In general, the project is fully hardware configuration and categorized into two parts electronic and telecommunication area involved, where each carries 40% and 60% of the overall project respectively. The first part equipment is a transmitter, which transmit signals to the receiver that link with control system which defined as PIC microcontroller. The alarm will arm and it will sample its voltage then transmits it to PIC microcontroller. The Micro C Compiler programming can be used to monitor and transmit controlling signals to the modem by connecting a serial communication port RS232 between GSM modem and the hardware. AT command is used to control the function of the modem.

This project is design because it is usefull to cars owner to keep an eye on their car from any harm. Stolen car cases are increasing rapidly here in Malaysia. Besides that, nowdays we always heard the news about stolen laptop from the car. The project will be done is related to Short Message Service (SMS). The project aim is design a Vehicle Security Alert System.

1.2 Project Objective

The main objectives of this project are :

I. To design sms alarm alert system that is capable to help user handles and manages the safety of their car.

II. To develop a Vehicle Security Alert System by using PIC microcontroller that is connected to the GSM module with RS232 connector.

1.3 Problem Statement

Several important aspects of alert system problem should be acknowledged and need an in-depth research in order to understand the problems:

I. The rapid rise cases of the car being burgled by the unauthorized users. These situations are excessively happen when the users park their car at some dangerous place or unauthorized parking
II. When the car's user is far from their car, they would not know if their car is alarming. Hence, this project was propose where it will help to prompt the user by using short messaging service (SMS).

1.4 Scope of Project

As we are concern with scopes of work while doing the project, so it must be create properly. There must be a guideline, in which the student should attain, but yet never go beyond is as to fulfill the requirement of the project. A Scope of work as listed below:

I. Study on the PIC microcontroller & the control system of the circuit
II. Study on the application of the GSM modem
III. To construct & develop the model of the circuit design (hardware)

1.5 Project Methodology

Meeting And Discuss With Project Supervisor

Meeting and discuss with supervisor project every Thursday about the general ideas and concepts of the project. Understand the concept and objective of the project.

Literature Review

The background of this project is studied and research is done by referring various sources like references book, IEEE journal, and any information from internet.

Searching Information

The project outline has been established, each subsections of the system is studied and analyzed.

Study from current project.

Books and journal will be found to support my research and recommendation. The background study of the project along with the literature review is performed and documented about the theoretical concept applied in completing the project.

Development for C programming

The C programming is studied to program the microcontroller with the GSM modem and real car alarm system.

Development for hardware

To development hardware would be studied, and then the hardware interfacing for this project is built and assembled.

Overall System Testing.

After built the hardware interfacing, overall system will be test. If the result is not fulfill the desired output, then check again all the programming and interfacing.

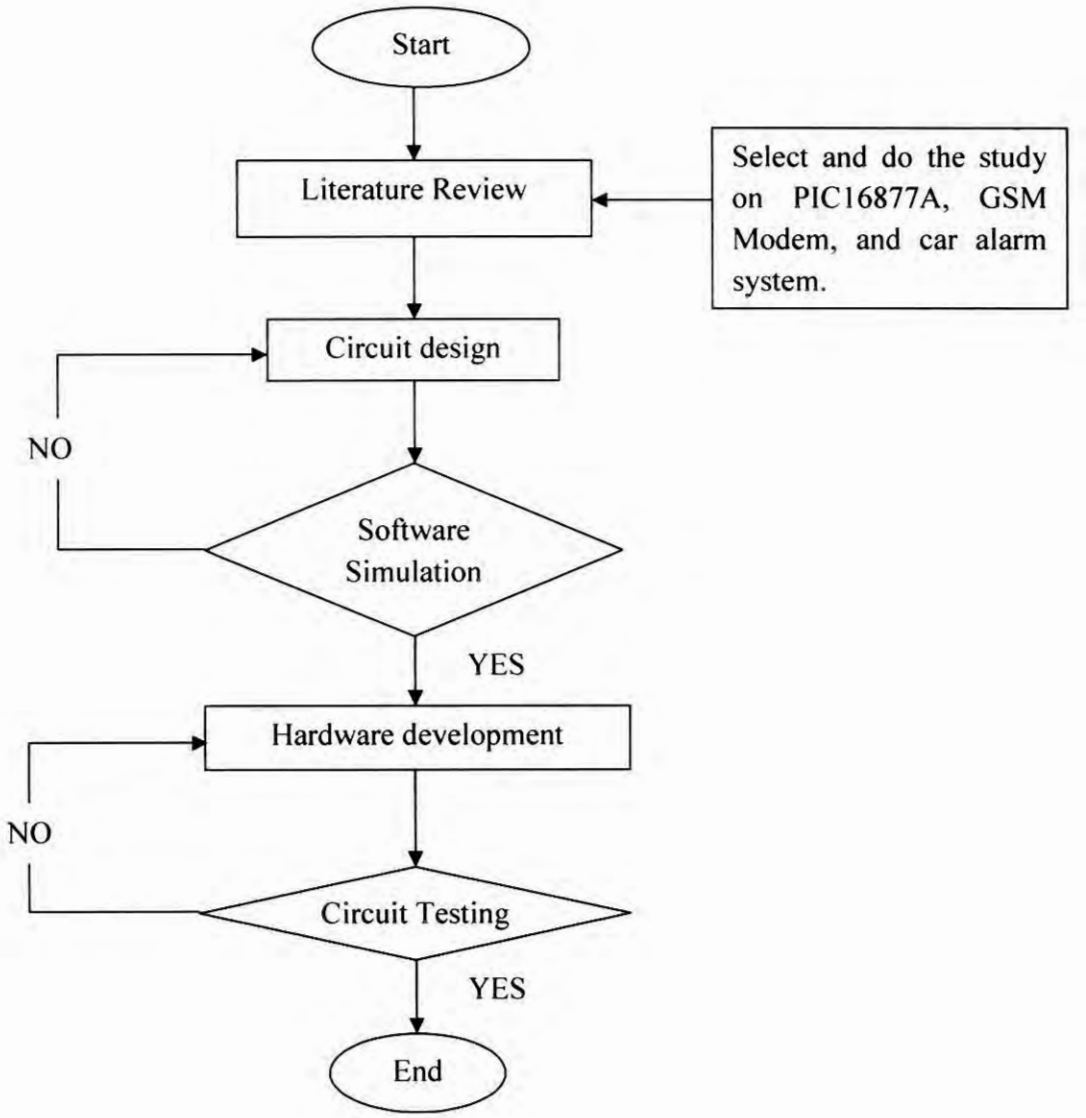

Figure 1.1: General Flowchart of the Project

1.6 Report Structure

The first chapter gives a basic introduction to how the idea of this project generated. The chapter contains introduction, objectives of the project, problem statement, scopes of work, brief methodology, and report structure.

Chapter 2 is a literature review in theoretical concepts applied in this project. In this part, there are some details about the background knowledge of mikroC Compiler, the best PIC microcontroller for this project, what is GSM Modem and applications of others component. Literature review will produce overall structure of this Vehicle Security Alert System.

Chapter 3 introduces the methodology of the project. Project methodology give details about the method used to solve problem to complete the project. The chapter contains the flow chart which explains the overall method taken along the project carry out. Besides that, this chapter also introduces the construction of the project, which involves hardware development and software development. Basically, the hardware development for the project concludes the study of AT commands for GSM modem, block diagram design, and prototype for car alert alarm system. Besides, the software development of this project will discuss on the programming, how to use Micro C Compiler and how to implement it on this project.

Chapter 4 will be cover all the results form designing process. It will also include a discussion about the project. The chapter concludes with discussion on the hardware and software development of this project.

Chapter 5 will be conclusion of the PSM project. The chapter concludes with some recommendation that can be implemented in the future.

CHAPTER II

LITERATURE REVIEW

This chapter is a about the theoretical concepts applied in this project. The chapter concludes the background study of Vehicle Security Alert System. Besides that, this chapter also explains how Vehicle Security Alert System works, what is mikroC Compiler, the best PIC microcontroller for this project, what is GSM Modem and applications of others component. Information from the literature review are very important as the background of my project, Vehicle Security Alert System.

2.1 Introduction

Throughout the world, there have been many researches about the concept and implementation of this Vehicle Security Alert System. Literature reviews are based in information obtained from valid sources such as books, articles of relevance, published paper or any other source deemed appropriate. One of the more famous sources for literature reviews from IEEE, denoting the Institute of Electrical and Electronics Engineers which is based in New York, USA. The forms literature include standars of practice, proceeding paper or conference paper such as those from Power Engineering Conference.