CAR SECURITY SYSTEM VIA SMS

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For you, my mom and dad

For your truly support and undivided love

For making me the person

Who I am today…

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ABTRACT

A car security alarm has become an essential part for all car users as it ensure safety to the properties car. The purpose of this project is to develop a car security system that can be controlled by mobile phone as well as normal remote control. The system will control all the alarm function in a car such as locking the door, unlocking the door, activate and deactivate alarm and also sending an Short Message Service (SMS) to owners according to the event happens. The SMS is used as the control medium to transmit instruction from mobile phone to the security system. There are some issues that lead to this project development. The first issue is the current conventional remote control has short-range functionality. Other issue is the owner did not know the status of the car when parked whether something had happen to the car. An additional function will be added to this system which is auto ignition triggered by remote or SMS. According to those issues, the solution must be made by this system. Basically, the system has three sections which is the owners hand phone or remote control, Global System for Mobile Communication (GSM) modem and also the controller which act as the brain of the system. The owner hand phone communicates in two ways to the GSM modem and the GSM modem also connected in two way communication to the controller. Finally, from the project, a car security system is developed capable to control several function in car alarm system such as locking the door, open the door, activate or deactivate alarm, remotely starting the car's engine and sending an alert to owners.

ABSTRAK

Sistem penggera keselamatan kereta telah menjadi sesuatu yang sangat penting bagi menjamin keselamatan kereta bagi pengguna. Tujuan utama projek ini adalah untuk membangunkan satu system keselamatan kereta yang boleh dikawal oleh telefon bimbit pemilik dan juga system kawalan jauh yang sedia ada. Sistem ini berupaya mengawal semua fungsi penggera dalam kereta seperti mengunci dan membuka pintu dan juga menghantar Sistem Pesanan Ringkas (SMS) mengikut aktiviti yang terjadi. Sistem pesanan ringkas merupakan pengantara untuk menghantar arahan daripada telefon bimbit kepada sistem. Terdapat beberapa isu yang mendorong pembangunan projek ini. Isu yang pertama ialah, sistem kawalan jarak jauh yang sedia ada mempunyai had jarak yang terhad. Isu lain yang berlaku adalah pemilik kenderaan tidak mengetahui status kereta sekiranya perkara buruk terjadi. Fungsi tambahan kepada sistem ini adalah menghidupkan enjin dengan menggunakan kawalan jauh atau SMS. Berdasarkan isu yang dibangkitkan, penyelesaian akan dibuat. Secara umumnya, sistem keselamatan kereta melalui sistem pesanan ringkas mempunyai tiga bahagian iaitu telefon bimbit atau kawalan jauh, modem GSM, dan juga litar pengawal yang mengawal keseluruhan sistem. Telefon bimbit pemilik akan berkomunikasi dengan modem GSM secara dua arah dan modem GSM juga berkomunikasi dua arah dengan litar mengawal. Akhirnya, melalui projek ini, satu system keselamatan kereta yang dikawal oleh sistem pesanan ringkas dapat dibina dan berupaya melakukan beberapa fungsi seperti mengunci dan membuka pintu, mengaktifkan atau mematikan penggera, menghidupkan enjin kereta dan juga mampu menghantar amaran kepada pemilik kereta.

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

SMS	-	Short Message Service
GSM	-	Global System for Mobile Communication
PC	-	Personal Computer
PIC	-	Programmable Interface Controller
PCB	-	Printed Circuit Board
IDE	-	Integrated Development Environment
PC	-	Personal Computer
CPU	-	Central Processing Unit
RISC	-	Reduced Instruction Set Computer
CMOS	-	Complementary metal oxide semiconductor.
USART	-	Universal Synchronous Asynchronous Receiver Transmitter
CAD	-	Computer Aided Design
DC	-	Direct Current
UV	-	Ultraviolet

LIST OF APPENDIXES

CHAPTER I

INTRODUCTION

1.1 Overview

A car security system has become an essential part for all car users as it ensure safety to the properties car. This system is required to make sure the car is far away from danger after the owners spend a lot of money to it. As we all know, some car is very expensive and it is needed in daily life. So, if something happen to the car, the owner's daily schedule may disturb. For example, late for work or an emergency case happen.

This project is to design a car security system that can be controlled by mobile phone as well as normal remote control. This system is capable to control several function in car alarm system such as lock and unlock the door, activate or deactivate alarm, and additional function which is start the car's engine. These system acts as dual-

communication because the owner can access the system and the same time the system provide information to the owners.

The Short Message Service (SMS) is used as the control medium to transmit instruction from mobile phone to the security system. The system also send SMS to alert owner's when the car having disturbance such as collision or attempted break in. At the same time, this system utilizes microcontroller and Global System for Mobile Communication (GSM) modem as mean of communication.

There is none of the project that develops to trigger car alarm system by using SMS but there were projects that develop to car security usage. The previous project that has been developed is only using remote controller and bi-communication between the controller and the car. The first project that has been developed is Two Level Power Car Alarm. Two Level Power Car Alarm is design to trigger a car siren accordingly to the type of intrusion happen such as vibration happen and car door open.

The other project that has been developed is PC Based Remote Control Car. In this system, the car can be remotely controlled by the PC and at the same time monitor the status of the car. According to previous project, A Car Security System via SMS has been develop and has their specialty in control the alarm system in a car. An additional function also has been added which is starting the car using remote medium (remote controller and SMS). This chapter will briefly explain the objectives, problem statements, scope and a simple elaboration in methodology of Car Security System via SMS project.

1.2 Objectives

There are three four objectives for this project.

1. Design and develops a car security system that can be controlled by mobile phone and normal remote control.
2. Design a controller using PIC microcontroller that control alarm circuit and receive signal from sensor mounted in car.
3. Develops a car alarm that interface between PIC, remote control and GSM modem.
4. Develop an auto ignition system for car using the controller.

1.3 Problem Statement

There are different types of car security system that available in the market nowadays. All of this security system was design to fulfill the car owner's needs according to their usage. Not all car owners have the same reason to equip their car with the security system. Differ to other car security systems, Car Security System via SMS was design to improve and new functionality was added to make this system special. There are some issues that lead to the development of Car Security System via SMS.

The main issue happen is conventional remote control has short-range functionality. Therefore, if the owners forget to lock, they have to go back to the car and lock it up. It is a burden to go back if the owner already let say entering the building or walk through the parking lots.

Some of the issue that happen is the owner did not know the status of the car when it parked whether something had happen to the car such as collision or attempted break in. Some security systems available in the market already have their monitoring system itself like display at the remote control screen and so on. But, the monitoring system itself also has a limitation due to the ways trigger the owners and the range of it functionality. By developing Car Security System via SMS, the owner can be trigger at anytime using their own mobile phone as long as the signal from the provider appears at that place.

There are security systems for car available in the market for starting the car engine from a range. It depends on the range and the ways it trigger the starting engine section in the car. The Car Security via SMS was design to improve automatic starting engine with the security after the engine starts.

1.4 Scope of Project

Since the Car Security System via SMS that is going to be develops is for car applications, the target user for this system will be targeted to the people who have their own car. This system will be attached to the car circuitry for the detection process, and each car in the market nowadays has own circuitry differ to another. The development of Car Security System via SMS is according to Produa Kancil Car circuitry. The project development start with the understanding of circuitry in Produa Kancil such as door opened trigger circuit and others.

Car Security System via SMS will be contain of PIC microcontroller as a main brain to control whole system. PIC 16F877 will be used as a controller of the system. Remote controller used are radio frequency based but the way of the signal being transmitted or received by the system will not be covered in this project. The remote

receiver output is only to be considered as the transmitter sends the signal when the button is pressed.

The GSM modem is required to transmit and receive SMS to the system, so TC35iT terminal used in the project development. A research carried out to interface TC35iT with the controller since the actual usage is PC based. The way of the SMS being send or received from mobile phone and TC35iT will not be covered.

Circuit to trigger the PIC will be design and must be able to interface between PIC and Produa Kancil circuitry. The current flow and the voltage for each section will be considered during the circuit design.

The controller need to be program before can be used. In the software development process, Source Boost software will be used as a platform to develop the programming part. The system only will be developing only using C language. The software also needed to develop the hardware. Proteus software will be used for design the schematic, simulation and PCB design.

1.5 Methodology

The project developments consist of two sections, which is hardware development and software development. The hardware development will be performed first before the software development section. The software will be developed according to the circuit that has been design.

Hardware development can also be called as circuit development in Car Security System via SMS project. It involves all the circuitry needed to interface between the PIC pin and car circuitry. The selection of the component is critical since it must be suitable to the load, so the component such as transistor will be compared from each to another by searching the datasheet of each component. The circuit system must be able to

interface with the GSM modem. The hardware development starts by searching the information from books and components datasheet.

After the first phase has been completed, the second section which is software development is started. The software development using the software called SourceBoost IDE. SourceBoost IDE used the C language for programming make it user friendly since the programmer directly can understand the flow of the program.

1.6 Report Structure

This report contains five chapters. The first chapter is the introduction of the project. This chapter covers about the project introduction, overview of this project, objective, problem statement and scope.

The literature review of this project will be covered in the second chapter. Literature reviews includes the study of the component in the project such as PIC 16F877A microcontroller, GSM Modem, and also alarm system circuit. This chapter will also explain the theory of each aspect of the project.

The next chapter is covered the project methodology. The explanation of the step of the project will be clarified. The block diagram will be shown and explain in detail. The process of the project is drawn in the flowchart of the project. All the process is elaborate completely in this chapter.

Result of the project will be covered in chapter four. The result from the circuit simulation is added for proofing the theory and show that the circuit can actually run. The result is fully elaborate helped by figures and table. The system circuit stability and controllability are also being analyzed. The objective of the project compared from the result that has been produced.

The final chapter is conclusion and suggestion. This chapter will conclude the result of this project, and the suggestion for further project is stated to improve the system that has been developed.

CHAPTER II

LITERATURE REVIEW

2.1 Overview

The technologies for security system nowadays are evolving very fast each year. These security systems almost cover for controlling and managing appliances where the safety issue is the top priority. The developments for security system evolve harmony to the advancement of technology. In today's economic context, the design of these control and alert is of a great impact in term of productivity and production costs. Because of these cost, the complexity of a system and the multiple hardware/software combination, the designer has to take the safety of the system into account.

The usage of the component in the design hardware is the critical part. The suitable controllers need to be carried out to manage the performance of the system. In Car Security System via SMS, the controller need to be considered is PIC. This