UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CAR ALARM SYSTEM VIA GSM

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Engineering Technology Electronics (Telecommunication) (Hons.)

by

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I hereby, declared this report entitled “Car Alarm System via GSM” is the results of my own research except as cited in references.

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APPROVAL

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 Engineering Technology Electronics (Telecommunication) (Hons.). The member of the supervisory is as follow:

……

MD ASHADI BIN MD JOHARI

ABSTRAK

Projek sistem keselamatan kereta menggunakan GSM (Car alarm system via GSM) ini berfungsi sebagai satu sistem keselamatan kereta daripada berlakunya kecurian. Sistem ini dicipta untuk setiap pemilik kenderaan bagi menggelakkan daripada berlakunya kes kecurian kereta. Oleh itu, dengan penambahbaikan sistem keselamatan kereta dengan menggunakan GSM dapat mengurangkan kes kecurian kereta. Sistem ini adalah sistem yang diubahsuai dari model penggera asal kepada sistem yang menggunakan gelombang GSM tetapi menggunakan konsep dan fungsi yang sama iaitu menghantar isyarat kepada pemilik kereta. Sistem ini juga dapat membantu pemilik kereta dengan menggunakan GSM tersebut. Sistem ini dapat mengesan kecurian dan menghantarkan isyarat kecemasan atau peringatan kepada pemilik kenderaan dengan menghantar sms kepada pemilik kenderaan. GSM dipilih kerana ianya digunakan di seluruh dunia. Pendail atau pengubahsuaian ke atas litar telefon mudah alih digunakan untuk disambungkan kepada penggera yang asal dan sistem enjin. Sistem ini akan mengenalpasti kecurian apabila pintu kereta dibuka yang mana dalam kenderaan sama sistem penggera masih berfungsi dan enjin kenderaan dihidupkan. Setelah kecurian dikesan, sistem keselamatan ini akan menghantar pesanan ringkas kepada pemilik kereta sebagai tanda isyarat peringatan. Pemilik kereta tersebut boleh menghantar arahan kepada sistem keselamatan kenderaan tersebut dengan menghantar pesanan ringkas.

ABSTRACT

Car security system project using GSM (via GSM Car alarm system) serves as a safety system of the car thefts. This system created for every vehicle owner to prevent the occurrence of cases of car theft. Therefore, by improving car safety systems using GSM can reduce car theft cases. This system was modified from the original model to the alarm system using GSM waves but uses the same concept and function of sending a signal to car owners. This system can also help car owners using the GSM. This system can detect theft and sending a distress signal or warning to motorists by sending short message service to vehicle owners. GSM was chosen because it is used throughout the world. Dialler or modifications to the circuit used mobile phones to connect to the original alarm and engine systems. The system will identify theft when the car door is opened, which in the same vehicle alarm system is still functioning and the vehicle engine is turned on. After the theft is detected, the security system will send short message service to car owners as a sign of warning signals. The car owner can send commands to the vehicle security system by sending short message service.

DEDICATION

This thesis work is dedicated to my parents, Sharif bin Lan and Nor Aizan binti Abd. Wahab who has been a constant source of support and encouragement during the bachelor degree project. I am truly thankful for having both of my parent in my life. This work also dedicated to my supervisor, Md. Ashadi bin Md. Johari whose good examples have taught me to work hard for the things that I aspire to achieve.

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In the name Allah, the most gracious and the most merciful

Alhamdulillah, first of all, I would like to express my thankful to the Almighty for blessing me with strength and courage to complete this project paper. From beginning till the end of this project paper, I have some of people who stand by me, given me guidance for every obstacle that occurs during study and do research about this project. Therefore, I would like to express my deepest thankful to those involved in this project paper.

First and foremost, I would like to express my gratitude and millions thanks to my supervisor, Md. Ashadi bin Md. Johari, who had showered me with ideas and guidance through whole time till the last second in Final Year Project 1. I will never forget all your sacrifices and only Allah could repay what you have done for me.

Last but not least, I would like to express my appreciation to my beloved parents Sharif bin Lan and Nor Aizan bt ABD Wahab for the unconditional love and support me that let me through the toughest days in my life. To all my friends who shared ideas to make my thesis better, I hope we can have a good grade for our effort. For those whom not stated here, I would like to thank for their help, friendship and countless support to me. May Allah S.W.T. bless all of them for their supports.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

GSM	-	Global System of Mobile
LED	-	Light Emitting Diode
LCD	-	Liquid Crystal Display
ADC	-	Analogue to digital converter
PIC	-	Programmable Integrated Circuit
PCB	-	Printed Circuit Board
PIR	-	Passive Infrared
IC	-	Integrated Circuit
UV	-	Ultra Violet
mm	-	Millimetre
V	-	Voltage
DC	-	Direct Current
ROM	-	Read – Only Memory
EEPROM	-	Electrically Erasable Programmable Read – Only Memory
ASCII	-	American Standard Code for Information Interchange
HD	-	High Definition
SMS	-	Short Message Services
HVAC	-	Heating, Ventilating, and Air Conditioning
AT	-	Attention
CNMI	-	Display a new SMS
CPMS	-	Selection of SMS memory
CMGF	-	SMS string format
CMGR	-	Read new message
CMGS	-	Send message
CMGD	-	Delete message
mA	-	Mill Ampere
µ	-	micro

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

In the present growing economy in Malaysia, the uprising of crime rate this country faces. The offense has generated losses in properties, valuables and moneys. In this project, the main concern is about the security of the car, it is the one of the biggest crimes which is hard to prevent it. The car alarm is the common device that has been use nowadays. However, still the car stolen is increases and it hard to prevent it. In this project, the car alarm system will be improve and more affordable to use it. An early version, it was invented by unknown prisoner from Denver in 1913. This type of car alarm system was manually armed, and triggered when someone tried to crank the engine. In 1916, the alarm inspire by an early version of a remote starter. This version had the car owner carry a receiver, which is buzz if the car ignition system was tampered.

Car Alarm System via GSM is devices of a security of the car system designed to prevent thief to breach of the owner vehicle. Car security systems are usually designed for the common vehicle. The function of this version car alarm system is less effective. There is several types of car alarm system consists of Audible Security System, Inaudible Security System and Ignition System Immobilizers.

The latest trend of the car theft involves is alarm capturing signal. This alarm capturing signals is the alarm disabler signal can be traced by thief and duplicate it by the thief to steal the car. There are many alternative to prevent this problem such by using Global Positioning System (GPS) to traced the stolen car and the other alternative is by locking gear and steering, gear lock, tire lock and hidden kill switch engine in the owner car.

The project is conducted for additional features in car alarm system. This device can improved to the present car alarm without changing any modification of the major car alarm system. When the car alarm is triggered, through motion sensor detector or breaching in the car, the car alarm system will cut off the engine starter so that the vehicle cannot start the engine. This system will disable the power of the battery through the engine. This will prevent the car been stolen and the thief will panic and run away.

Car Alarm System via GSM is an advanced features of the existing car alarm system that can improve the security of the car. The present security system is not efficient and affordable due to the following facts:

- Distance – the siren cannot be heard over the long distance.
- False Alarm
- Not 100% safe
- Same sound (siren) for most of the cars.

Vehicle security system alone is not sufficient to prevent auto theft. Even though the vehicle is equipped with one of the most expensive system, there are certain circumstances when such systems are useless, when the vehicle is parked in the basement of the office building where alarm cannot be heard. Sometimes, the alarm siren does not even attract the attention of most of the pubic because of the mentality of people nowadays that intend to ignore such alarms.

By improvement of Car Alarm System the vehicle owner will be guarantee of their security of the car. With this system it can improve the present car alarm system. In most cases, the owner realized when their car has been stolen a few hours after the theft.

1.2 PROBLEM STATEMENT

"Car Alarm System via GSM". Based on the statement, the aim in this project is to serve as good indication of how important it is to curb car theft in the country. This system is specified to a car alarm and will cut off the engine of the car when the alarm triggered.

The present car alarm system is inefficient conventional security car alarm system, the possibility the car stolen is high. The main reason is that the sound of the alarm has limitation distance and sometimes is not loud enough to hear it. With Car Alarm System via GSM it can improve the security of the car because it can cut off the power engine and it does not require much cost.

Although there are more affordable and efficient of the car alarm system but the main reason people does not apply it because the cost and the probability of the car stolen is high.

1.3 OBJECTIVES

The objective of the project is:

- To be familiar with developing and trouble shooting a basic circuit.
- To work independently on a project starting from planning, designing and complete a project.
- To design a security system by using GSM modem.

1.4 WORK SCOPE

The main scope for this project is basically in GSM theory that the signal wave can be spread widely. This is an idea to implement the project to improvise the car alarm system. It can be handling at anywhere and anytime.

The project is to design a system that the function is securing the car from stolen. From that, it can be control the system of car to avoid the car from stolen. GSM system is use as the operation frequency. The output from GSM will send the short messages to the owner of the car. The owner of the car can control the car alarm system by using their hand phone. For example, the owner of the car reply the message to the GSM module to control the car alarm system. The suitable place to placing the system is in the car and the detector switch will place at the door or behind the lock door.

1.5 PROJECT SIGNIFICANCE

By completing this project:

- This Car Alarm system via GSM may help to reduce theft auto.
- It is an effective system that upgrades the system already installed to the car.
- By using this system, it can improve the security of the car.

1.6 SUMMARY

This thesis consists of 5 chapter overall and explain all of the project flow in detail. The chapter 1 is an introduction chapter that shows the brief description for the objectives, scopes of project and project significance.

The chapter 2 is the literature review. In this chapter it explain detailed or information that had got from other resources or journal and the best technique to design and produce the project. The technique has divided into two type, which is hardware and software.

In the chapter 3, it will explain about the methodology of the project. In this chapter included the method and procedure to complete the project. For example, the method and step that had used which is simulation, circuit designing, etching and tests the circuit.

In chapter 4, it will show the result and the analysis of the project. In this chapter included all data from the final test circuit. The expected result are also included in this chapter.

Lastly, the chapter 5 that will explain the conclusion of the project. In this chapter, it conclude overall of the project that had done.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, all the information found by study and research that is critical and have an important value for the whole project. It also gives some basic theoretical or knowledge is used as foundation to achieve the main objectives. Most of the literatures are the related journals, article, and books and previous works of the same field. These literatures are then compiled and use as a guidance to the work of this project.

2.2 DEFINITION OF CAR ALARM SYSTEM

Car alarm system is the electronic device that has one or more sensors connected to some sort of siren. The very simplest alarm would have a switch on the driver's door, and it would be wired so that if someone opened the door the siren would start wailing. By implement this car alarm with a switch, a couple of pieces of wire and a siren. However, most modern car alarm systems are much more sophisticated than this.

The immobilizers are not the car alarm. Although the purpose of both may be to deter car theft, they operate in a dissimilar fashion. An immobilizer generally will

not offer any audible or visual theft deterrence, nor require any additional input from the driver than from the driver of a non-immobilizer car.

There are two categories of car alarm system which is:

- Aftermarket – installed at any time after the car has been built.
- OEM – built in factory

The car alarm have several mix features such as remote car alarm that contain in radio receiver that allows the owner to wirelessly control alarm from a key. It also typically come with the motion sensor detectors.

Keyless remote car alarms are typically based on strong cryptography authentication methods:

- Radio receiver
- Immobilizer
- Motion Detector
- Wireless USB
- A siren, often able to create a variety of sounds so that you can pick a distinct sound for your car
- An auxiliary battery so that the alarm can operate even if the main battery gets disconnected

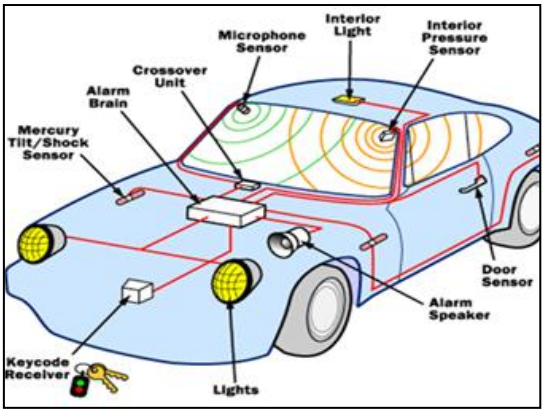

Figure 2.1: Example parts of a Car Alarm