



VEHICLE THEFT DETECTION BY GSM

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Abstract

Nowadays, automobile thefts and the production of vehicle are increasing in yearly world. So, vehicle theft is a universal problem. To solve this problem, most of the vehicle owners have started using the theft protection systems. The main purpose of this paper is to prevent the vehicle theft and the functionality is achieved by detecting vehicle status in theft mode and by sending an SMS is generated automatically. This SMS is then sent to the owner of the vehicle. The owner can then send back the SMS in order to disable the ignition of the vehicle. Thus in this way crimes can be reduced to a great extent as vehicles today are being stolen in large number. Hence, the vehicles today require high security which can be achieved with the help of this application that how the system works is when a person tries to steal the vehicle, the microcontroller in it is interrupted and the command is sent to the GSM modem to send SMS. On the receipt of the message, the owner sends back the SMS to the GSM modem. This is done in order to stop the engine. This GSM modem is interfaced to the micro controller. This microcontroller on the receipt of the message uses a mechanism that helps to stop engine. Motor is being used to indicate vehicle ON/OFF state.

Keywords: GSM modem, voltage regulation, micro controller.

1. INTRODUCTION

As everyone in this competitive world prefers to make the things easy and simple to handle, this project sets an example to some extent. In this paper we deal with the security of the vehicle. Whenever the GSM modem receives

the message from the particular mobile then the car engine gets stopped. The mobile number from which the message is being sent should be the authorized mobile number. Nearly 99 per cent of the processors manufactured end up in embedded systems. The embedded system market is one of the highest growth areas as these systems are used in very market segment-consumer electronics, office automation, industrial automation, biomedical engineering, wireless communication, data communication, telecommunications, transportation, military and so on. An embedded system can be defined as a computing device that does a specific focused job. Appliances such as the air-conditioner, VCD player, DVD player, printer, fax machine, mobile phone etc. are examples of embedded systems. Each of these appliances will have a processor and special hardware to meet the specific requirement of the application along with the embedded software that is executed by the processor for meeting that specific requirement. The embedded software is also called “firm ware”. The desktop/laptop computer is a general purpose computer.

2. Proposed Method

Peoples are using the manufacturer security alarm only. The thief had an experience regarding this security alarm, which means their work is getting easier to steal the car because they had well known about the alarm circuit. They know when the time to cut off the alarm and had well known about the system. So, it is important to double protect the security of the vehicle. Antitheft security system utilizes an embedded system design with Dual Tone Multi Frequency (DTMF) and a GSM to monitor and safeguard a vehicle. It secures the vehicle

against theft. Upon activation, it automatically demobilizes the vehicle by disconnecting the ignition key supply from the car battery. This now makes it impossible for anybody to start the vehicle, let alone moving with it. In an attempt of theft through the vehicle doors or boot, the system sends text message to the vehicle owner and at the same time starts up an alarm. This design popped out due to the increasing rate at which packed vehicles are stolen especially in our country, but with this design this packed vehicle is being monitored irrespective of where it is packed, provided there is GSM network coverage. From the research conducted, it was found out that majority of the existing vehicle security system uses only

alarm, and doesn't send text message to the vehicle owner let alone demobilizing the vehicle. But with the use of GSM network, the owner is guaranteed that the vehicle will send text message to his phone, and at the same time, have people around alerted of what is happening.

Nowadays, automobile thefts are increasing and also the production of vehicle also increasing in yearly world. So, vehicle theft is a universal problem. To solve this problem, most of the vehicle owners have started using the theft protection systems nowadays. A wireless vehicle security system which implements the mobile communication protocol is used. The most known existing car security system is car alarm and has a lot of drawbacks.

The block diagram for vehicle theft detection system by using GSM is as shown in the Fig.1

Block diagram:

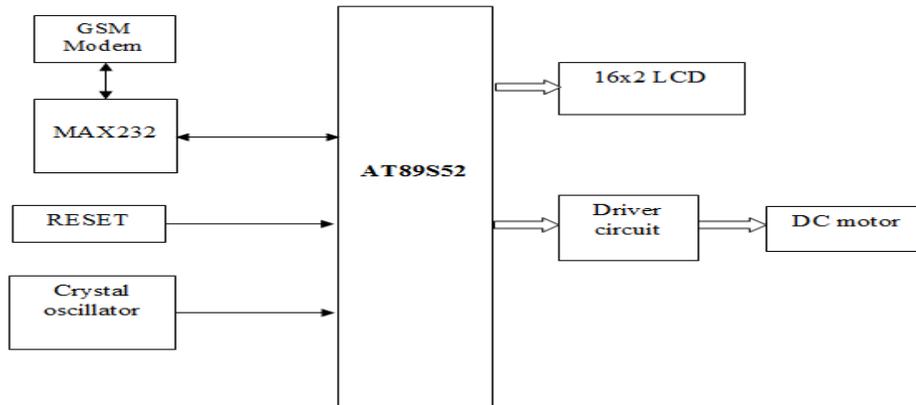


Figure-1
Block Diagram for Vehicle Theft Control System

Global System for Mobile (GSM) is a second generation cellular standard developed to cater voice services and data delivery using digital modulation. Cellular is the one of the fastest growing and it is the most demanding telecommunications applications. Cellular systems using a digital technology will become the universal method of tele-communications. Short message service is a mechanism of delivery of short messages over the mobile networks. It is a store and forward way of transmitting messages to and from mobiles. The message (text only) from the sending mobile is stored in a central short message center (SMS) which then forwards it to the destination mobile. This means that in the

case that the recipient is not available, the short message is stored and can be sent later.

Each short message can be no longer than 160 characters. These characters can be text (alphanumeric) or binary Non-Text Short messages. An interesting feature of SMS is return receipts. This means that the sender, if wishes, can get a small message notifying if the short message was delivered to the intended recipient.

Since SMS used signaling channel as opposed to dedicated channels, these messages can be sent/received simultaneously with the voice/data/fax service over a GSM network. SMS supports national and international roaming. This means that you can send short

messages to any other GSM mobile user around the world. With the PCS networks based on all the three technologies, GSM, CDMA and TDMA supporting SMS, SMS is more or less a universal mobile data service.

The SMC (Short Message Center) is the entity which does the job of store and forward of messages to and from the mobile station. The SME (Short Message Entity) which can be located in the fixed network or a mobile station, receives and sends short messages.

The SMS GMSC (SMS gateway MSC) is a gateway MSC that can also receive short messages. The gateway MSC is a mobile network's point of contact with other networks. On receiving the short message from the short message center, GMSC uses the SS7 network to interrogate the current position of the mobile station from the HLR, the home location register.

HLR is the main database in a mobile network. It holds information of the subscription profile of the mobile and also about the routing information for the subscriber, i.e. the area (covered by a MSC) where the mobile is currently situated. The GMSC is thus able to pass on the message to the correct MSC.

MSC (Mobile Switching Center) is the entity in a GSM network which does the job of switching connections between mobile stations or between mobile stations and the fixed network.

A VLR (Visitor Location Register) corresponds to each MSC and contains temporary information about the mobile, information like mobile identification and the cell (or a group of cells) where the mobile is currently situated. Using information from the VLR the MSC is able to switch the information (short message) to the corresponding BSS (Base Station System, BSC + BTSs), which transmits the short message to the mobile.

The BSS consists of transceivers, which send and receive information over the air interface, to and from the mobile station. This information is passed over the signaling channels so the mobile can receive messages even if a voice or data call is going on.

2.1 WORKING OF VEHICLE THEFT DETECTION BY GSM

This paper includes the various important blocks of system are:

- 1) Vibration Sensor: It is a kind of Piezoelectric sensor. It detects the amount of vibration, compares it with threshold level set by user and gives high pulse at its output. We have used Digital output vibration sensor.
- 2) Ignition Lock: This is used to identify that owner has left the vehicle. Any action after key removal will be considered as invalid access to the vehicle.
- 3) Microcontroller: We have used 8051 series Microcontroller, AT89S52. 8051 communicates with sensor, ignition key, LCD display, GPS modem and GSM modem.
- 4) LCD display: This is non-mandatory component of the circuit. However it is important part while developing the project.
- 6) GSM Modem: Microcontroller sends AT commands to the GSM modem. Then GSM modem sends SMS.
- 7) Buzzer: This will be turned on when Vibrations are detected.

The embedded system installed in the engine of the vehicle along with the GSM modem. By entering a correct password the instrument allows to activate the 12v relay and then ignition of the engine will start. Hence starts the vehicle. If anyone tries to access the vehicles password or theft the vehicle, then the MCU will block the entry of further password. Then the buzzer will turned on to create a noise to panic the culprit, followed by sending a message "Alert: Car Is Under Threat" through GSM modem to the owner's mobile for further action for prevention of his vehicle. According to the prototype model after entering correct password the Fan will move and at the same time, according to the instruction it will run forward for 10 sec and backward for 10 sec like an automobile. Password can be changed by the following proper procedure. First enter #, then enter the old password, then new password. Now test, whether the new password is working or not. As per algorithm given below the new password will retain even after power failure. So it will work as usual. The source code is written in the embedded C language. To develop the source code the flow chart of the project is shown in the figure below 3.

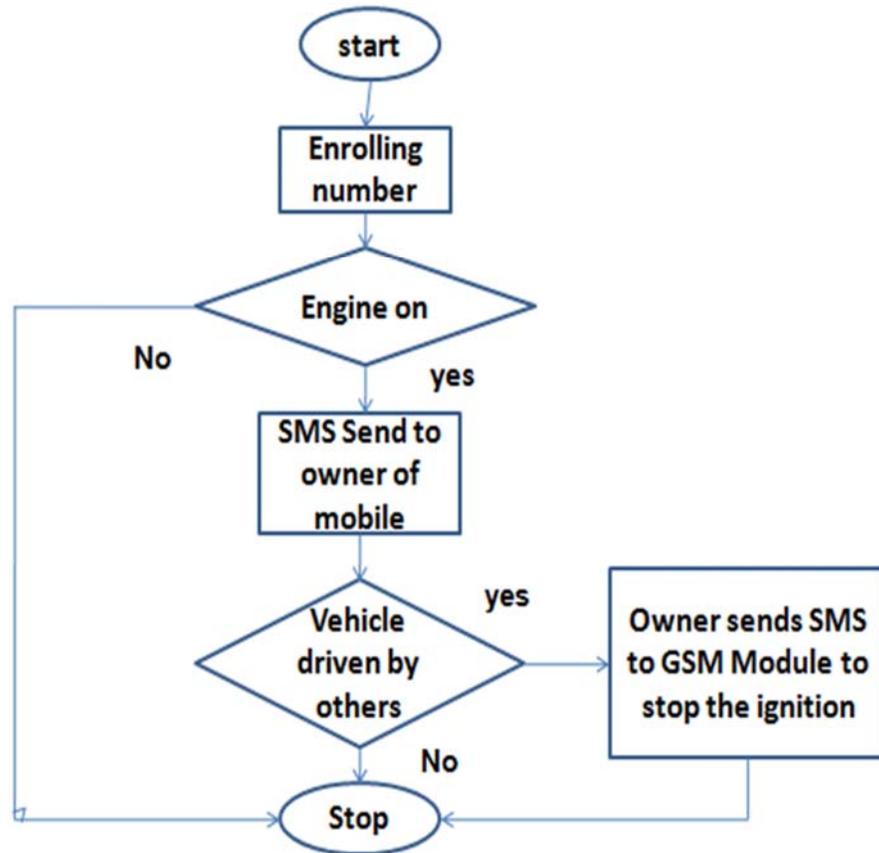


Figure-3: Flow chart for vehicle theft control system by using GSM

3. RESULTS AND DISCUSSIONS

This GSM based vehicle theft control system retrieves vehicle status is whether it is in theft mode. This data is fed to the microcontroller, which is interfaced to a GSM modem. The microcontroller generates the vibrations and sends an SMS to the concerned authority over GSM modem on periodical intervals which is set by the user. An LCD display is connected to the microcontroller for crossing the data received before being sent over GSM. This project will be very useful to people to keep track of their vehicles. Further, this project can be developed by making an arrangement

to stop the ignition of the vehicle by the owner remotely by sending an SMS in theft situations.

The kit consists of an ARM Controller, Relay circuit, GSM Module and LCD Display are interfaced on a single board and embedded on single board which is embedded to a vehicle as a control unit. The relay is connected to the Vehicle Engine Unit of the Automobile. When “OFF” message sent by the owner of the vehicle to the mobile embedded in the control unit, the controller displays the message in the LCD as shown in the Fig.4. and invokes the relay that is connected to the vehicle engine which will stop fuel flow thus locking the vehicle engine.



Fig.4: Engine OFF Message

Similarly when "ON" message sent by the owner of the vehicle to the mobile embedded in the control unit, the controller displays the message in the LCD as shown in the Fig.5 and

invokes the relay that is connected to the vehicle engine which will in turn allows the fuel flow by unlocking the vehicle engine.



Fig.5 Engine ON Message

4. CONCLUSION

In this paper we have studied and implemented a complete working model using a Microcontroller. Using this project, one can control his vehicle's car engine by means of an SMS. The main purpose of this paper is to prevent vehicle theft. This functionality is achieved by detecting vehicle status in theft mode and by sending an sms which is generated automatically. This sms is then sent to the owner of the vehicle. The owner can then sent back the sms in order to disable the ignition of the vehicle. Thus in this way crimes can be reduced to a great extent as vehicles today are being stolen in large number. Hence, vehicles today require high security which can be achieved with the help of this application.

5 FUTURE SCOPE

Further enhancement can be done to this paper by using a GPS system that helps to find out the exact position of the vehicle with the help of its latitude and longitude which then can be sent to the owner of the vehicle via SMS. This data can be then entered by the owner on Google map to find out the exact location of the vehicle. There are many Applications of GPS based Vehicle theft detection system using GSM technology, few of them are listed below: GPS Car theft detection can be used in transportation vehicles of Companies, schools, colleges and industries. This work can be used in our cars and even in bikes.

BIBLIOGRAPHY

- [1] B.G. Nagaraja, Ravi Rayappa, M. Mahesh, Chandrasekhar M. Patil, Dr. T.C. Manjunath, "*Design & Development of a GSM Based Vehicle Theft Control System* " 978-0-76953516-6/08©2008 IEEE, DOI 10.1109/ICACC.2009.154, pp.148-152.
- [2] M. A. Mazidi, "*The 8051 Microcontroller & Embedded Systems*", Pearson Education Asia, India, 2nd edition, 2008.
- [3] Kenneth J. Ayala, "*The 8051 microcontroller Architecture, programming & applications*", Penram International, India, 1996.
- [4] Raj Kamal, "Embedded System-Architecture, Programming and Design", Tata McGraw Hill Publisher, 2nd edition, 2008.
- [5] Myke PREDCO, "PROGRAMMING and customizing 8051 microcontroller", Tata McGraw Hill Publisher.
- [6] Toshiba's 1993 "NAND Flash Applications Design Guide".
- [7] Mill man & Garble, "*Combinatorial Digital Circuits*" and "*Sequential Digital Circuits*" of, Microelectronics, 2nd edition.
- [8] National motor vehicle theft reduction conference 2000, Conference Papers (Australia).
- [9] Stolen and Wrecked Vehicles Monitoring Program, CCMTA June 1994 (Canada).
- [10] CCMTA Best Practice Models for Combating Auto Theft, Version 6.1, Oct. 2006, Anti Auto Theft Project Group.