Cost effective Smart Vehicle Security system for Low end cars

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***Abstract*- This Paper aims at design and implementation of low cost anti-theft system to Indian car market. This anti-theft system is entirely different from other available anti-theft system in the market. In this study the main target is to design a anti-theft system and ensure that it is suitable for low end cars in Indian market.**

***Index terms*- GSM module, Security system, anti-theft and Accelerometer.**

I. INTRODUCTION

There are many ways to design an anti-theft system and many different control strategies to achieve different levels of security. One can find burglar alarm, fire alarm, motion detectors, personal safety products, wire and wireless security products and other such products [1].

The current design employs a GSM module which is used to send a message/call to the owner of the car in case of theft. These methods have different goals based on cost and customer acceptance, which will influence market acceptance and future anti-theft system. An anti-theft system is any device used to prevent or deter the unauthorized appropriation of items considered valuable. In cars an anti-theft system is used to prevent unauthorized entry and theft of car or components kept inside the car. Anti-theft systems are designed to raise the difficulty of theft to an infeasible (but not necessarily impossible) level. The kind of system implemented often depends on the acceptable threshold for theft. An engine mobilizer is one such system implemented in cars where the engine gets immobilized if a wrong key/pass code is detected. The aim of this project is to provide a low cost yet fool proof anti-theft system mainly targeted at the low cost Indian cars.

HISTORY –

An anti-theft system is any device or method used to prevent or deter the unauthorized appropriation of items considered valuable. Theft is one of the most common and oldest criminal behaviors. From the invention of the first lock and key to the introduction of RFID tags and biometric identification, anti-theft systems have evolved to match the introduction of new inventions to society and the resulting theft of them by others.

Theft: Motive and Opportunity-Under normal circumstances, theft is prevented simply through the application and social acceptance of property law. Ownership is often indicated by means of visual marking (license plates, name tags). When clear owner identification is not possible and when there is a lack of social observance, people may be inclined to take possession of items to their own benefit at the expense of the original owner. Motive and opportunity are two enabling factors for theft. Given that motives for theft are varied and complex and are generally speaking not within the control of the victim, most methods of theft prevention rely on reducing opportunities for theft.

Nine-out-of-ten cars are hot-wired and driven away. Mechanical devices such as steering wheel bars and pedal locks are only a minor inconvenience for the professional. Although they may work as a deterrent, car alarms can be "hot-wired" around. The professional thief simply cuts or jumps the alarm wires and he is gone. Tracking devices used by police to locate stolen cars do not stop the vehicle from being hot-wired and driven away. They depend on early notification of authorities by the owner. A car that is taken at 2 a.m. can be dismantled miles away before the owner even realizes it is gone. Some models are more popular than others, but any vehicle is a target for car thieves. A dismantled vehicle is worth two to four times its showroom value in parts. Anti-theft devices Car thieves target vehicles that present the least amount of hassle. A vehicle

equipped with an anti-theft device is more of a hassle than one without. This part of Auto Crime and Fraud helps you choose a good anti-theft device and rates the effectiveness of most models available on the market today. It also shows how crime-savvy customers can save money on a policy or a claim.

Anti-theft devices can deter thieves three ways:

- Physically — no thief wants to waste precious time exerting a lot of physical effort.
- Visually — just the sight of an anti-theft device inside a car will put off many thieves.
- Audibly — thieves never want to draw attention to them.

To help protect the vehicle, it's worth investing in the best anti-theft system that can be afforded. But no anti-theft device is foolproof. While not foolproof, anti-theft devices can stop the amateur thief and slow down the professional.

But many anti-theft system which are available in today's Indian market use hard switch and high end sensors which are very costly and which can't be afforded by middle class man. And many of anti-theft systems available can't be implemented to low end cars in Indian market this problem is being an advantage to thief to overcome this problem we have designed a low cost anti-theft system.

II.LITERATURE SURVEY

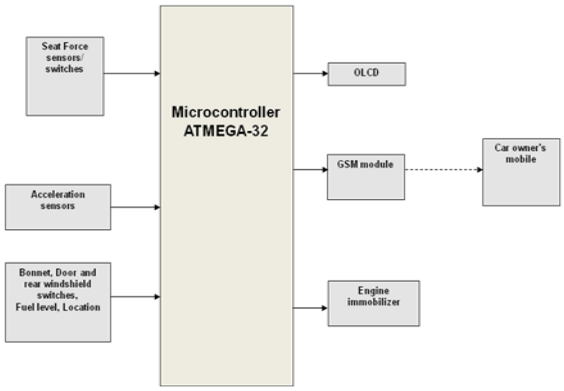
SeokJu Lee, Girma Tewolde, Jaerock Kwon, in their paper titled "Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smartphone Application" have discussed the design of a system which gives location co-ordinates of the vehicle at regular intervals of time and this information is stored in a database, using a smartphone app. The coordinates are then used in the Google maps API to get exact location of vehicle [4].

III. SOFTWARE IMPLEMENTATION

The software platform used for the programming of the microcontroller Atmega-32 is AVR Studio which can support On-chip Debugging. A. Microcontroller Operation the Before programming the ATmega32, the address, data, and control signals should be set up according to the "Flash Programming Modes [2]."

IV. SYSTEM BLOCK DIAGRAM

This project contains the Seat Force Sensor, Acceleration sensors to detect the entry in the vehicle.



V. PROPOSED WORK

This security systemprovides 2 level of security.

1. Lock or unlock using the mobile.
2. Lock or unlock using the Key.

Once the car is lock then read the accelerometer and force sensor value, then maintain this value as a constant standard value to monitor any changes in the values till the unlock the car, if any changes in the value when the car is in lock mode then it will send the SMS to the registered mobile as "CAR UNDER THEFT".

Once the Car is unlock using the key then wait for 30sec if Password is not entered then car will lock and send the SMS to the registered mobile.

In this system will provide the fuel sensors and GPS module, the owner can know the where the vehicle is there and what the fuel level of the car just by send the SMS to the security device. The device will read the value and send to the owner. So No need to go car and check the fuel level. If owner wants to know where the vehicle is, then owner has to send SMS from his mobile to know the vehicle Location, then the device will send the Google map address,, This address can be pasted in google map to get the location of the vehicle. In Figure for working block Daigram.

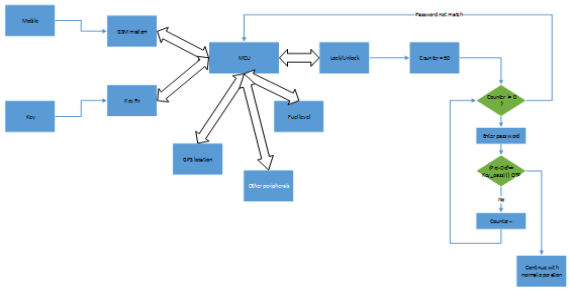


Fig: Working Block Flow diagram

VI. SYSTEM DEVELOPMENT

Several hardware components were used for accomplishing the task of building an efficient and a foolproof in-vehicle security system.

The following modules were used for the system development.

1) AVR (ATMEGA32) –Microcontroller Development board
2) GSM Module- SIMCOM SIM900 V1.0 ITEAD Studio
3) GPS Receiver- GPS-01 Tenet Technetronics Cirocomm
4) The development board consists of Atmega328P microcontroller, which is an 8-bit RISC based AVR made by Atmel and it is optimized for low power applications 756. It has a 32KB flash memory to store Arduino programs and has a default baud rate of 9600bps that can be varied up to 115200 bps.

Arduino Integrated Development Environment (IDE) is a cross platform and is used to write programs and upload them onto the Arduino board. This IDE comes withstandard libraries with predefined functions that help in easy programming. Microcontroller platform [2]

B. GSM Module-SIMCOM SIM900 ITEAD Studio

This is a digital telephony. system which uses the TDMA (Time Division Multiple Access) technology. This module can communicate with controllers via AT commands. In the GSM technology data is compressed and sent down a channel with two other streams of user data, each in its own time slot. It operates at 900MHz or 1800MHz frequency band. UART is the communication protocol being used in this module at a baud rate of 115200 bps. GSM Module- SIM900 transmits data to user's mobile C. GPS Receiver-01 Tenet Technetronics Cirocomm

GPS Technology is a space based navigation system used to precisely locate a receiver in three dimensional spaces anywhere on the earth and even in its orbit. A minimum of 24 satellites is needed in order to acquire the geographic coordinates of the receiver. The coordinates are obtained

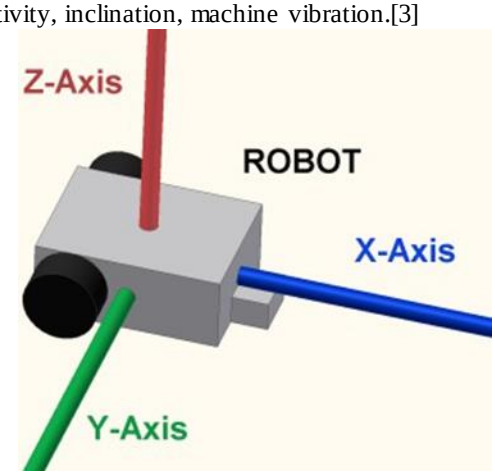
VII. HARDWARE COMPONENTS ARE USED IN THIS PROJECT ARE

GSM MODULE SIM300

- This GSM module is a highly flexible plug and play quad band GSM module reset button and easy integration to RS232.
- Supports features like Voice, Data, SMS,GPRS and integrated TCP/IP stack.
- Control is via AT commands and Current Consumption in normal operation 250mA, can rise up to 1Amp while transmission.
- Works on frequencies EGSM 900 MHz, DCS 1800 MHz .
- It is interfaced via RS MAX -232 through D-TYPE 9 pin connector,
- It has a SIM card holder.
- Power supply through DC socket .
- A mic and speaker is connected to the module to enable voice communication

Accelerometer

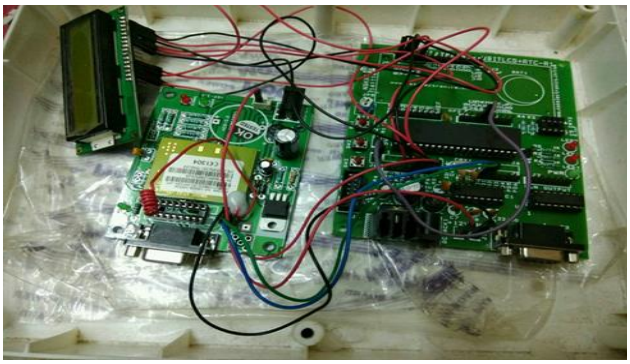
- Its a device that detects acceleration and tilt. Built using MEMS technology, accelerometers detect impact and deploy automobile alerts.[3]
- Accelerometers can be used to measure vibration on cars, machines, buildings, process control systems and safety installations. They can also be used to measure seismic activity, inclination, machine vibration.[3]



- A 16x2 Lcd display is used to display all the system operations.
- Outputs such as "theft", "door locked" etc., are displayed.

VIII. CONCLUSION

- The problems in the current anti-theft system were discussed.
- Solutions to the flaws in the existing anti-theft systems was provided through designing a new conceptual anti-theft system, by using sensors and actuators with its intelligency.
- Advantages of the proposed system were explained convincingly.
- Compelling explanation on the modules used in this system was provided.



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