

VEHICLE THEFT ALERT & ENGINE LOCK SYSTEM USING ARM7

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ABSTRACT

At the present time, the rate of crime is increasing rapidly because it is a kind of evident from the actual fact that thefts became a matter of routine. Particularly these vehicles may incur huge losses on the amount invested on these vehicles. To overcome this problem, there are numerous technologies are available in the market such as GPS,GSM and GPRS systems. In the present days, most of the vehicles are designed with GSM based vehicle theft control systems, which provides the protection from thefts even if they are parked in the parking area.

Keyword: ARM7, GSM, GPS,LCD;

Introduction



Vehicle Theft Detection/Notification with Remote Engine Locking mainly aims to reduce vehicle theft to a great extent. Today vehicles are being stolen on a large number and this is the reason why this system is being introduced. To prevent the theft from stealing vehicle, this system uses two mode and theft mode. If the vehicle is in theft mode, this system send SMS to the user if any one try to stole the car. After which the user is supposed to send back the message. This message gives command to the vehicle to lock the engine. Whenever a person tries to steal a vehicle, The ARM7 is being interrupted.After which the GSM modem is responsible to send SMS to the user indicating That his vehicle is being stolen.The ARM uses a mechanism to stop the engine. In order to indicate vehicle ON/OFF state the system makes use of motors. This project can be further enhanced by using a GPS which will also help to find the exact location of the vehicle.This information can then be sent to the user via SMS.

LITERATURE SURVEY

In , the hardware and software of the GPS and GSM network were developed. The proposed GPS/GSM based System has the two parts, first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data

transmission and reception of data among the mobile unit and control stations are working successfully. These results are compatible with GPS technologies.

In , a vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand.

In , the remote monitoring system based on SMS and GSM was implemented. Based on the total design of the system, the hardware and software designed. In this paper, the GSM network is a medium for transmitting the remote signal. This includes two parts that are the monitoring center and the remote monitoring station. The monitoring centers consist of a computer and communication module of GSM. The software-monitoring center and the remote monitoring station implemented by using VB. The result of this demonstration shows that the system can watch and control the remote communication between the monitoring center and the remote monitoring station.

In this paper, the proposed tracking system based on cloud computing infrastructure. The sensors are used to monitor the fuel level, driver conditions, and speed of the vehicle. All the data transferred to cloud server-using GSM enabled device. All the vehicles equipped with GPS antenna to locate the place. If we avoid the drunk and drive, the alcohol sensor installed to monitor the driver status. The proposed technology significantly avoids the accident in highways

Proposed Method

In this proposed work, a vehicle tracking and locking system used to track the theft vehicle by using GPS and GSM technology. This system puts into sleeping mode while the vehicle handled by the owner or authorized person otherwise goes to active mode, the mode of operation changed by in person or remotely. If any interruption occurred in any side of the door, then the IR sensor senses the signals and SMS sends to the microcontroller. The controller issues the message about the place of the vehicle to the car owner or authorized person. When send SMS to the controller, issues the control signals to the engine motor. Engine motor speeds are gradually decreases and come to the off place. After that all the doors locked. In this method, tracking of vehicle place easy and doors locked automatically, thereby thief cannot get away from the car.

BLOCKDIAGRAM

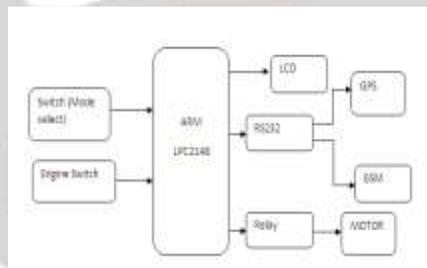


Figure 1 Block Diagram

The Block diagram of Vehicle tracking and locking system based on GSM and GPS technology is shown in the figure1. It consists the power supply section, keyboard, GSM, GPS, ARM LPC2148, MAX232driver, relay driver, IR Transmitter, IR receiver, LCD . The GSM board has a valid SIM card with a sufficient recharge amount to make outgoing calls or msg. The circuits powered by +5v Dc.

- **ARM-7 module-** In our system we are using LPC2148. It acts as the major controller unit of the system. Input from various units like IR sensor, Engine switch is given to this unit on which it process according to the programming and gives output to the relay driver circuit, and to GSM module It needs 3.3V to drive the ARM7 module.
- **Power supply**7805 is a voltage regulator integrated circuit. It is a member of 7805 series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output. The voltage regulator IC maintains the output voltage at a constant value. 7805 provides +5V regulated power supply. Capacitors of suitable values can be connected at input and output pins depending upon the respective voltage levels.

- **LCD interfacing:** It is the display unit of the system that displays appropriate messages based on the scenario. The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. LCD consists of LCD driver/controller that is used to interface LCD and microcontroller.
- **GPS Receiver:** The GPS is used to obtain the current location of the vehicle. The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. Information from the GPS system is accessible with GPS receiver. GPS receiver is used to detect the vehicle location and provide information to responsible person through GSM technology. GPS unit can determine other information like, speed, distance to destination, time etc once the vehicle position has been determined.
- **GSM modem:** The GSM modem is used to send and receive messages to and from the owner. It is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.
- **MAX 232:** It is an integrated circuit. Max232 is a voltage converter which converts from RS232 voltage levels to TTL voltage levels and vice-versa. MAX232 uses +5v power source which is same as that of source voltage. Single +5v power supply is used to power both microcontroller and MAX232. It consists of two sets of line drivers for transferring and receiving data.
- **Motor:** It is the DC motor that represents the engine. DC motor is interfaced with microcontroller. Speed, direction of rotation of motor etc can be controlled by interfacing with the with microcontroller.

DESIGN AND IMPLEMENTATION

This project uses two important platform.

1. Software Platform and
2. Hardware Platform.

These platforms are discussed below Software platform

- Keil
- Programmers (Flash magic)
- Language: Embedded C

HardwarePlatform

This part consists of ARM core processor as a main unit, system, GSM module and GPS module. This modules with arising with and implementation technique is given below.

ARM processor is used for dominant the final system. Here we've got an inclination to square measure using the LPC2148 series that has two UART. In UART0 we have a tendency to all interface the GPS receiver to induce the orbital information and in UART1 we area unit able to interface with GSM. Then the ignition driver circuit is connected to the GPIO pin of ARM. Interrupt routine code is used to check whether or not or not we have an inclination also track location if incase it got stolen with to possess gotten any serial interrupt (i.e.,) from owner any command is coming or not. During this project the engine unit area unit controlled by a driver circuit. The driving force circuit consists of a relay, resistor and a transistor. If the automotive is started, the engine area unit turned ON that suggests ARM processor can give the bias voltage to the transistor to change on the relay that in turn placed on the automotive engine. So that, the engine area unit turned off. Two UART are used for GSM and GPS. GSM can helps to know the vehicle state and the help of GPS.

Wireless Platform:

a)GSM communication:



Fig 2 GSM module

A GSM equipment might be a wireless equipment that works with a GSM wireless network. A wireless equipment behaves type of a dial-up equipment. the foremost distinction between them that a dial-up equipment sends and receives data through a tough and quick phone line whereas a wireless equipment sends and receives data through radio waves.

A GSM equipment square measure usually academic degree external device or a portable computer Card / PCMCIA Card. Typically, academic degree external GSM equipment is connected to a computer through a serial cable or a USB cable. A GSM equipment inside the type of a portable computer Card / PCMCIA Card is meant to be used with a laptop computer. It need to be inserted into one in all the portable computer Card / PCMCIA Card slots of a laptop computer. Type of Type of a GSM movable, a GSM equipment desires a SIM card from a wireless carrier therefore on management.

As mentioned in earlier sections of this SMS tutorial, computers use AT commands to manage modems. Every GSM modems and dial-up modems support a typical set of traditional AT commands. You will be ready to use a GSM equipment rather sort of a dial-up equipment.

In addition to the standard AT commands, GSM modems support academic degree extended set of AT commands. These extended AT commands unit printed inside the GSM standards. With the extended AT commands, you can do things like:

- Reading, writing and deleting SMS messages.
- Sending SMS messages.
- Monitoring the signal strength.
- Monitoring the charging status and charge level of the battery.
- Reading, writing and searching phone book entries.

Sending the message

To send the SMS message, type the following command:



Fig.4 : MMS test window

Global Positioning System:



Fig. 3: GPS module

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.

Advances in technology and new demands on the existing system have now led to efforts to modernize the GPS system and implement the next generation of GPS III satellites and Next Generation.

A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites high above the Earth. Each satellite continually transmits messages that include

- The time the message was transmitted
- Satellite position at time of message transmission

The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite using the speed of light. Each of these distances and satellites' locations define a sphere. The receiver is on the surface of each of these spheres when the distances and the satellites' locations are correct. These distances and satellites' locations are used to compute the location of the receiver using the navigation equations. This location is then displayed, perhaps with a moving map display or latitude and longitude; elevation or altitude information may be included. Many GPS units show derived information such as direction and speed, calculated from position changes.

In typical GPS operation, four or more satellites must be visible to obtain an accurate result. **Hardware Assembling and Testing:**

First step, we need to make single side PCB layout for the given circuit diagram. After made the PCB the following process is required to complete the project.

1. Assemble all the components on the PCB based on circuit diagram. TX and RX pins of the GSM modem to pins 13 and 14 of MAX 232 and insert a valid SIM in the GSM modem.
2. Connect the GPS module according to circuit diagram.
3. This projects implemented and tested successfully by us.
4. This system is very useful and secure for car owners.

EXPERIMENTAL RESULTS



Figure5 Hardware Platform

Fig.5 shows the hardware part of the project. This 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 Fig.7 and invokes the relay that is connected to the vehicle engine which will stop fuel flow thus locking the vehicle engine.



Fig.6. LCD displaying “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 Fig.8 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.7Location details received

The Fig. 9 shows the typical message displaying the location in terms of latitude, longitude and geo-graphical address of the location

CONCLUSIONS

In this paper, we have proposed a novel method of vehicle tracking and locking systems used to track the theft vehicle by using GPS and GSM technology. This system puts into the sleeping mode vehicle handled by the owner or authorized persons; otherwise goes to active mode. The mode of operations changed by persons or remotely. When the theft identified, the responsible people send SMS to the micro controller, then issue the control signals to stop the engine motor. After that all the doors locked. To open the doors or to restart the engine authorized person needs to enter the passwords. In this method, easily track the vehicle place and doors locked

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