

# Embedded Vehicle Tracking & Theft Controlling System using Wireless Technology

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**Abstract**— The proposed system for vehicle tracking and anti-theft detection locking system using Gsm & Gps deals with the design & development of a theft control system for safety and security in automobiles, which is being used to prevent the theft of a vehicle. This system makes use of an embedded system contributes major roles which based on Global System for Mobile communication (GSM) technology. The proposed system is placed in the vehicle and Mobile interfaced with engine protocols. When the vehicle is being stolen, the information about vehicle is received by vehicle owner with GSM technology for corrective action. The information is forwarded to central processing system which is in the form of the text message. The controller fetch the sms and sends it to the Global Positioning System (GPS) module and GPS module reads location in the form of latitude and longitude and sends information to the user's mobile. After getting location information about vehicle the mobile, car owner can control the ignition of the vehicle's engine. Controlling action generated by Car owner or system, it will stop or lock the engine immediately. The designed unit is very simple & low cost.

**Key words:** Tracking System, Controlling Action, Global Positioning System (GPS), Global System for Mobile Communication (GSM), Controller

## I. INTRODUCTION

Now days, vehicle stolen cases are increasing at a great extent in every country. Each vehicle owner are struggling and fighting against vehicle thefts. So to escape from these thieves most of the vehicle owners have started using the theft control systems. The commercially available anti-theft vehicular systems are very expensive. To solve this Car manufacturing companies are trying to provide an excellent car protection with the reliable anti-theft device for a customer which is essential for car security. Central car locking system ensures the guarantee to protect your car from different kinds of theft cases where anti-theft locking system using GSM & GPS offers excellent protection to your car.

Earlier defined system for security and safety was unable to provide complete security and accessibility of the vehicle in case of theft. So as to provide more security here advance technology is used in more developed system makes use of an embedded system based on GSM technology. The designed & developed system is installed in the vehicle. The main concept in this design is introducing the mobile communications into the embedded system. The GPS/GSM Based System is one of the most important systems, which integrate both GSM and GPS technologies. It is necessary due to the many of applications of both GSM

and GPS systems and the wide usage of them by millions of people throughout the world.

Various anti-theft control systems have designed in past recent years. An integrated Info-Security Circuit Board that communicates with ECUs and sensors inside a vehicle through CAN bus, LIN bus, Flex Ray and MOST Bus communicates with other vehicles, road-side infrastructure and mobile phones with wireless interfaces. The main drawback with the system is the data timeliness and network delays to realize reliable secure car communications. There are many remote controlled security systems that disable an automobile and its key auto systems through remote control when it is stolen. This requires secure vehicle-vehicle communications.

## II. OBJECTIVE

The main objective of this proposed system is to design and develop advanced vehicle tracking and anti-theft locking system in the real time measurement, so as to get exact current status of your vehicle.

## III. WORKING PRINCIPLE

The system mainly based on GPS and GSM which is correlated with controller. System reads Information about Vehicle by satellite systems and sends to GSM systems. Vehicle and car owner are connected initially by using GSM network. User sends the message to Moving vehicle for connectivity, hardware mounted on vehicle reacts to the message and send conformation message to user and then if the message is valid and if authenticate then GPS modem is initiated and requested for location. It can be achieve with GSM and GPS systems which is interfaced with embedded system. The user can send a STATUS message from his cell phone, which is received by GSM module when it found authentication is valid, immediately sends the details of the locations in the form of latitude and the longitude using GPS module. So the vehicle owners have exact current location of the vehicle. At the same time message will be sent to a personal computer where user can get the exact location of vehicle pointed out on the goggle maps. The system provides benefits to car owner in safety and security scenario

#### IV. METHODOLOGY

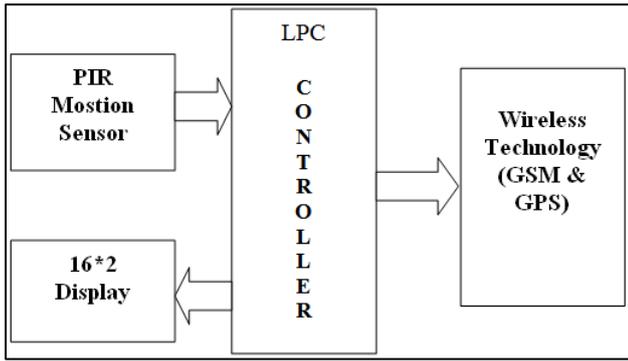


Fig. 1: Block Diagram of Proposed System

The LPC2141/42/44/46/48 micro-controllers are based on a 16-bit/32 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine the microcontroller with embedded high-speed flash memory ranging from 32 kB to 512 kB.

These systems constantly watch a motion of moving Vehicle with the help of motion sensor and send real time status of vehicle to turn activate processing unit. When the theft identified, the responsible person send SMS to the microcontroller, then microcontroller issue the control signals to stop the engine motor. Authorized person need to send the password to controller to restart the vehicle and open the door. It offers more security & reliability at low cost.

The latitude and longitude values are compared with the values stored in the memory and corresponding location name is given to the Controller which in turn uses GSM/GPRS to send the location name by means of Short Message Service back to USER. Once vehicle is traced, if user wants to lock the vehicle he will simply send the SMS LOCK to the microcontroller kit using previously registered GSM mobile number. Microcontroller will sense the SMS and then it will first lock doors of vehicle using solenoid valve. Then microcontroller makes fuel system off followed by ignition off and then breaks will be applied to the engine. After locking the vehicle microcontroller sends the acknowledgement signal to the user.

##### A. PIR Sensor Operation:

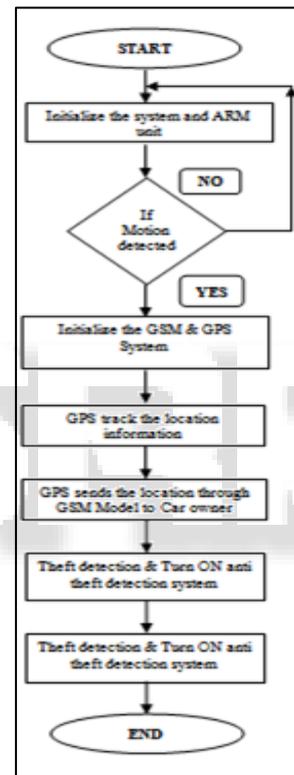
PIR sensor detects small changes in the amount of infrared radiation impinging upon it, it varies depending on the temperature and surface characteristics of the objects in front of the sensor.[2] When an object, such as a human, passes in front of the background, such as a wall, the temperature at that point in the sensor's field of view will rise from room temperature to body temperature, and then back again. The sensor converts the resulting change in the incoming infrared radiation into a change in the output voltage, and this triggers the detection. Moving objects of similar temperature to the background but different surface characteristics may also have a different infrared emission pattern, and thus sometimes trigger the detector.

PIRs come in many configurations for a wide variety of applications. The most common models have numerous Fresnel lenses or mirror segments, an effective range of about ten metres (thirty feet), and a field of view less than 180 degrees. Models with wider fields of view,

including 360 degrees, are available—typically designed to mount on a ceiling. Some larger PIRs are made with single segment mirrors and can sense changes in infrared energy over one hundred feet away from the PIR. There are also PIRs designed with reversible orientation mirrors which allow either broad coverage (110° wide) or very narrow "curtain" coverage or with individually selectable segments to "shape" the coverage

#### V. SOFTWARE DESIGN OF SYSTEM

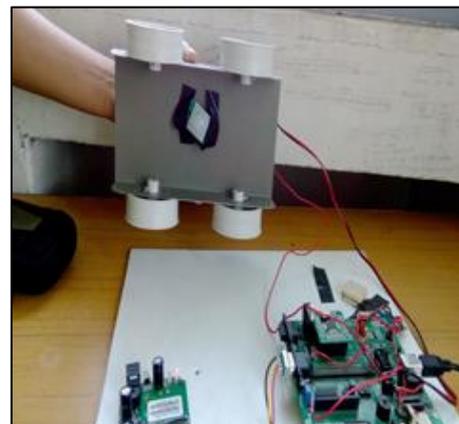
- Keil and ARM company makes c compilers, macro assemblers, real-time kernels, debuggers, emulator, simulator, integrated environments, evaluation board and emulators for ARM7 \ARM9\CORTEXM3, XC16x\C16x\ST10,251, 8051 MCU families.



##### A. Hardware Initial Stage

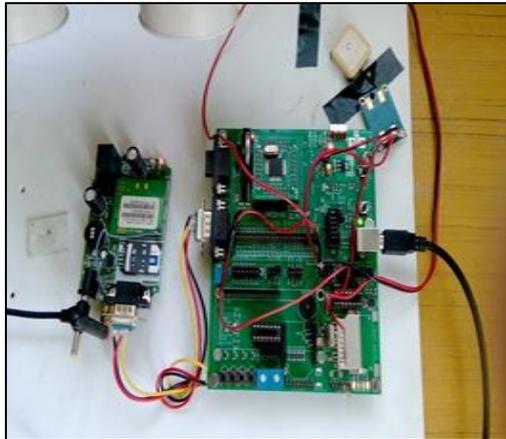
###### 1) First stage and Second stage:

In this stage we have the initial status of the car and motion to vehicle to test for demo.



## 2) Third Stage:

In this stage motion is detected and vehicle is locked which is indicated by using LED.



## B. Overall System:

In this stage vehicle is locked and owner of car get current location of vehicle via message.



## VI. RESULT

Proposed system Vehicle Tracking and Antitheft Locking System Using GPS & GSM is fully based on wireless digital communication, operates on short message services (SMS). In case someone stolen your car and you found that your car is not in parked place then PIR SENSOR sense the motion and lock the engine. And for demo level it is shown by LED, it will track the vehicle continuously track the vehicle with the help of GPS unless and until we make kit off. So that ignition of the car will off and car will stop vehicle, thus provides the security. At that place ARM Controller receives the rate of tracking from GPS directly & send it to the user via GSM model. Owner uses this information to find out location of vehicle using Google map. Thus using this GPS system we track the vehicle.

## VII. CONCLUSION

- 1) Vehicle owner can lock/unlock his vehicle with the help of a simple SMS (Short Message Service).
- 2) Also the vehicle can be tracked with the exact location using GPS at every instant it provides the present status of the vehicle. Whenever the motion of the vehicle

sensed, at an instant message send on mobile of the owner of the car. Requirement of installation cost, hardware and software implementation cost is very less. Hardware is very simple because of digital system mobile handset can be easily available with low cost.

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