

## VEHICLE TRACKING AND LOCKING SYSTEM BASED ON GSM AND GPS

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**Abstract:** It is amazing to know how simple ideas can give a whole new dimension to the tracking and navigation industry and smart vehicle tracking system is used for tracking the vehicles. You can optimize driver routes, save petrol or gas and time, reduce theft and control the vehicle functions. Many a times it is not required to track your vehicle or target globally. In majority of cases tracking is more restricted to local purposes only, such as tracking movement of vehicle within city tracking the raw materials within industrial estate or to know the present position of your daughter or son within city. But unfortunately in the pursuit of making things complex this simple idea is forgotten. This simple yet powerful idea forms the basis of this revolutionary project. All this coupled with a very low cost, a robust design and tremendous market potential makes this model even more attractive.

### I. INTRODUCTION

The project “Vehicle tracking and locking system based on GSM and GPS” is based on the microcontroller which will provide an access for controlling engine and monitoring position of the vehicle. Vehicle Security is a primary concern for all vehicle owners. Owners as well as researchers are always on the lookout for new and improved security systems for their vehicles. One has to be thankful to the technologies, like GPS systems, which enables the owner to closely monitor and track his vehicle in

real-time and also check the history of vehicles movements. This new technology, popularly called Vehicle Tracking Systems has done wonders in maintaining the security of the vehicle tracking system is one of the biggest technological advancements to track the activities of the vehicle. The security system uses Global Positioning System GPS, to find the location of the monitored or tracked vehicle and then uses Global system for Mobile communication (GSM) to send to send the coordinates and the location data to the mobile. After receiving coordinates it has to be manually searched in Google maps. In this way the Vehicle owners are able to track their vehicle on a real-time basis. Due to real-time tracking facility, vehicle tracking systems are becoming increasingly popular among owners of expensive vehicles.

The vehicle tracking hardware is fitted on to the vehicle. It is fitted in such a manner that it is not visible to anyone who is outside the vehicle. Thus it operates as a covert unit which sends the location data to the monitoring unit on demand.

When the vehicle is stolen, the location data sent by tracking unit can be used to find the location and coordinates which can be sent to police for further action. Further, the system has an in build controlling mechanism which allows the owner to start and stop the engine from a remote place. Some Vehicle tracking System can even detect unauthorized movements of the vehicle and then alert

the owner. This gives an edge over other pieces of technology for the same purpose

## II. HARDWARE SYSTEM

**Micro controller:** This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

**ARM7TDMI:** ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

**Liquid-crystal display (LCD)** is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

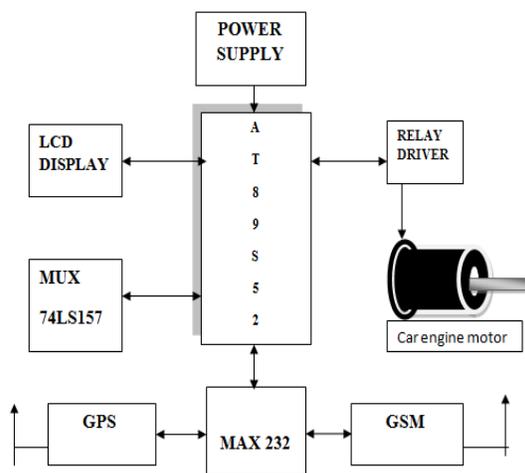


Fig: Monitoring section



Fig: Control section

The two sections Control section and Monitoring section includes, a SIM card enabled Mobile phone, Microcontroller (8052), MAX232, LCD, GPS module, GSM module. Software requirement of our project is Keil Compiler and Embedded C. In our Project we planned to obtain the position of the vehicle on demand and to control the engine of the vehicle from a remote place. The Microcontroller we are using is AT89S52. The Vehicle is controlled by sending a simple text command from the controlling section. The Microcontroller controls the engine of vehicle by delivering signals to it. The location of the vehicle can be obtained on the mobile phone. The coding for Microcontroller is done through Assembly Language or Embedded C Program.

## III. System hardware requirements

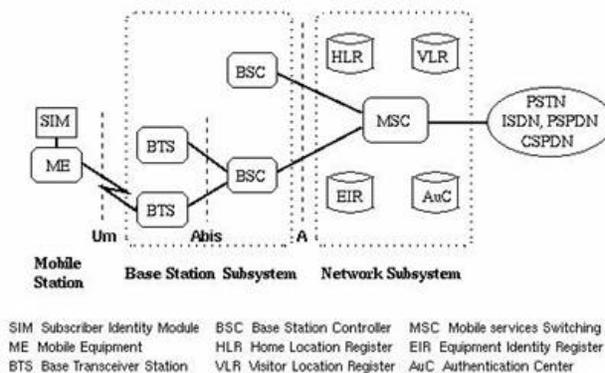
### GSM:

Global System for Mobile Communication (GSM) is a set of ETSI standards specifying the infrastructure for a digital cellular service.

The network is structured into a number of discrete sections:

- Base Station Subsystem – the base stations and their controllers explained
- Network and Switching Subsystem – the part of the network most similar to a fixed network, sometimes just called the "core network"
- GPRS Core Network – the optional part which allows packet-based Internet connections
- Operations support system (OSS) – network maintenance

SM was intended to be a secure wireless system. It has considered the user authentication using a pre-shared key and challenge-response, and over-the-air encryption. However, GSM is vulnerable to different class of attacks, each of them aiming a different part of the network.



GSM architecture

**GPS:**

Global Positioning System (GPS) technology is changing the way we work and play. You can use GPS technology when you are driving, flying, fishing, sailing, hiking, running, biking, working, or exploring. With a GPS receiver, you have an amazing

amount of information at your fingertips. Here are just a few examples of how you can use GPS technology.

GPS technology requires the following three segments.

- Space segment.
- Control segment.
- User segment

**Space Segment**

At least 24 GPS satellites orbit the earth twice a day in a specific pattern. They travel at approximately 7,000 miles per hour about 12,000 miles above the earth’s surface. These satellites are spaced so that a GPS receiver anywhere in the world can receive signals from at least four of them.

**Control Segment**

The control segment is responsible for constantly monitoring satellite health, signal integrity, and orbital configuration from the ground control segment includes the following sections: Master control station, Monitor stations, and Ground antennas.

**User Segment**

The GPS user segment consists of your GPS receiver. Your receiver collects and processes signals from the GPS satellites that are in view and then uses that information to determine and display your location, speed, time, and so forth. Your GPS receiver does not transmit any information back to the satellites.

The following points provide a summary of the technology at work:

- The control segment constantly monitors the

GPS constellation and uploads information to satellites to provide maximum user accuracy

- Your GPS receiver collects information from the GPS satellites that are in view.
- Your GPS receiver accounts for errors. For more information, refer to the Sources of Errors.
- Your GPS receiver determines your current location, velocity, and time.
- Your GPS receiver can calculate other information, such as bearing, track, trip distance, and distance to destination, sunrise and sunset time so forth.
- Your GPS receiver displays the applicable information on the screen.

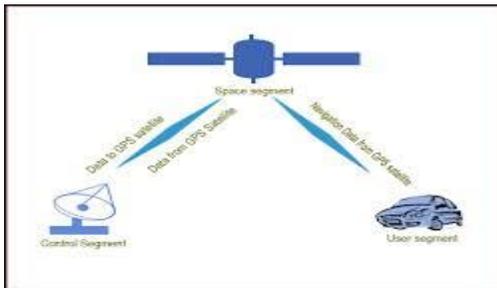


Fig: GPS Working

**DC Motor:**

A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the center of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°.



Fig: DC Motor

**Motor driver:**

DC motors are typically controlled by using a transistor configuration called an "H-bridge". This consists of a minimum of four mechanical or solid-state switches, such as two NPN and two PNP transistors. One NPN and one PNP transistor are activated at a time. Both NPN and PNP transistors can be activated to cause a short across the motor terminals, which can be useful for slowing down the motor from the back EMF it creates. H-bridge. Sometimes called a "full bridge" the H-bridge is so named because it has four switching elements at the "corners" of the H and the motor forms the cross bar. The switches are turned on in pairs, either high left and lower right, or lower left and high right, but never both switches on the same "side" of the bridge. If both switches on one side of a bridge are turned on it creates a short circuit between the battery plus and battery minus terminals. If the bridge is sufficiently powerful it will absorb that load and your batteries will simply drain quickly. Usually however the switches in question melt.

High Side Left	High Side Right	Low Side Left	Low Side Right	Quadrant Description
On	Off	Off	On	Forward

				Running
Off	On	On	Off	Backward Running
On	On	Off	Off	Braking
Off	Off	On	On	Braking

Table: operation of H-Bridge

#### Max 232:

MAX232 converts from RS232 voltage levels to TTL voltage levels, and vice versa. One advantage of the MAX232 chip is that it uses a +5V power source which, is the same as the source voltage for the 8051. In the other words, with a single +5V power supply we can power both the 8051 and MAX232, with no need for the power supplies. The MAX232 has two sets of line drivers for transferring and receiving data. The line drivers used for TXD are called T1 and T2, while the line drivers for RXD are designated as R1 and R2. In many applications only one of each is used.

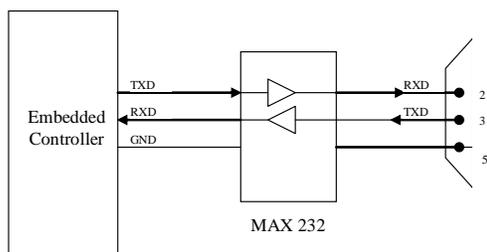


Fig: Communication via Max 232

#### IV. CONCLUSION

The project titled “Vehicle tracking and locking system based on GSM and GPS” is a model for

vehicle tracking unit with the help of GPS receivers and GSM modem. Vehicle Tracking System resulted in improving overall productivity with better fleet management that in turn offers better return on your investments. Better scheduling or route planning can enable you handle larger jobs loads within a particular time. Vehicle tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. So in the coming year, it is going to play a major role in our day-to-day living. We have completed the project as per the requirements of our project. Finally the aim of the project i.e. to determine the position of the vehicle and to start and stop the vehicle in need is successfully achieved.

#### V. REFERENCES

- [1]. Chen, H., Chiang, Y. Chang, F., H. Wang, H. (2010). Toward Real-Time Precise Point Positioning: Differential GPS Based on IGS Ultra Rapid Product, SICE Annual Conference, The Grand Hotel, Taipei, Taiwan August 18-21.
- [2]. Asaad M. J. Al-Hindawi, Ibraheem Talib, “Experimentally Evaluation of GPS/GSM Based System Design”, Journal of Electronic Systems Volume 2 Number 2 June 2012
- [3]. Chen Peijiang, Jiang Xuehua, “Design and Implementation of Remote monitoring system based on GSM,” vol.42, pp.167-175. 2008.
- [4]. V.Ramya, B. Palaniappan, K. Karthick, “Embedded Controller for Vehicle In-Front Obstacle Detection and Cabin Safety Alert System”, International Journal of Computer Science &



Information Technology (IJCSIT) Vol 4, No 2, April  
2012.

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