

# Vehicle Monitoring and Tracking System using GPS and GSM Technologies

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**Abstract** - Vehicle security means providing security to the vehicle against any possible thefts. Vehicle security has become a matter of concern these days. The manufacturers of vehicles have been trying to implement different methods in order to provide better security systems. Security for the vehicle can be provided by the use of GPS and GSM technologies. GPS stands for the Global Positioning System, which is a satellite based communication system and provides the details of particular location. GSM, the Global System for Mobile Communication is used for communication between different GSM devices. Vehicle monitoring is also done by the monitoring of different parameters like temperature. In this project the security of a vehicle is provided by tracking its location. The project also has the feature of automatically slowing down of the vehicle speed as soon as the locations detected by GPS are schools, hospitals. There is also a voice output for these particular zones to alert the driver.

**Key Words:** Vehicle Security, GPS, GSM, Temperature, voice output.

## 1. INTRODUCTION

Vehicle theft has become a matter of concern these days. In most of the cases the vehicle which is stolen is not traceable by the owner of the vehicle. So there is a demand for better security systems. This paper presents a novel security system which makes use of GPS and GSM technologies.

The Global Positioning System is a satellite based communication system. The GPS satellites transmit signals at L1 and L2 frequencies containing the ephemeris data,

navigation data, codes etc which are used to determine the location of the vehicle in three-dimensional coordinates i.e., latitude, longitude, and altitude along with the precise time. The signals from GPS satellites are available free of cost which enable the GPS receivers to determine the location, the time, along with the velocity. The tracking sensitivity of GPS receivers is -160dBm and it allows position coverage in all environments continuously.

GSM stands for Global System for mobile communication. GSM provides an alternative to voice calls as Short Message Service (SMS). The GSM modem transmits the GPS parameters of the latitude and longitude values whenever the security mode is ON and whenever there are varying values.

There can also be an arrangement which will have a mechanism to control the speed of the vehicle automatically when locations such as schools and hospitals etc. are approaching. The temperature of the engine present in the vehicle is also continuously monitored which can alert the driver to take necessary action.

## 2. LITERATURE SURVEY

In the recent past, there have been many technological developments in order to provide better security for the vehicles. Few of the technologies provide security in the form of locking system. The manufacturers of the vehicles also are striving for providence of better systems for the vehicle's security and protecting it from theft. Recently, there has been implementation of the central locking system and also theft detection system. But this method had the drawback that it alerts even the local user.

This paper narrates providing the security systems using the GPS and GSM. The vehicle tracking system has been implemented to track the current location of the vehicle. The details of the current position can be sent through the GSM.

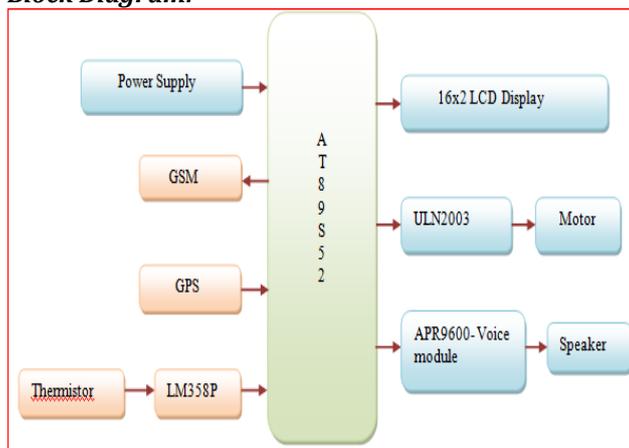
There are certain systems like remote monitoring system which provides the details of the vehicle's position through an SMS.

In the present system, not only the tracking of the vehicle's location is discussed but transfer of the information to the owner's mobile is implemented if the vehicle is subjected to theft. Not only this, in this, monitoring the status of the engine of the vehicle is also discussed by providing a thermistor for continuous monitoring of the temperature.

This method also has a feature of automatically slowing down the speed of the vehicle when few particular zones like schools and hospitals etc., which are detected by GPS are approaching along with the voice message output.

### 3. PROPOSED SYSTEM

#### Block Diagram:



#### Description and Operation:

In the proposed system, we have designed vehicle tracking system along with monitoring of vehicle parameters through GSM technology. The vehicle is tracked by using GPS technology, monitor the parameters using thermistor and sending the status of the vehicle using GSM to the owner thereby providing security to it.

In this project the AT89S52 has been used as the main controller. GSM and GPS are connected to microcontroller through serial interface. Thermistor is also connected to microcontroller through digital I/O lines. GPS parameters like latitude and longitude are transmitted to mobile through GSM modem. LM358P does the conversion from analog input to digital output. The output will be given bit by bit serially.

We also have ULN2003, which is the IC used to drive the DC motor.

#### APR9600 :

APR9600 is the voice module. It has two modes i.e., record mode and play mode. In the record mode, the desired voice is recorded. In the play mode, as soon as a particular condition occurs, the recorded voice output will be produced. The output is connected to the speaker, from where the voice output is heard.

#### Power Supply:

For this project regulated 5V, 500mA power supply is used which is provided by the IC 7805, a three terminal voltage regulator.

#### Micro-controller:

AT89S52 is nothing but the 8051 micro-controller. It is 8-bit micro-controller consisting of 40-pins. That is, it can Read, Write and Process the 8 bit data. This is mostly used microcontroller in the robotics, home appliances like mp3 player, washing machines, electronic iron and industries. This consists of 4 I/O ports to which the different input-output devices will be connected.

In this particular project, we connect the different modules of GPS, GSM, 16x2 LCD, Thermistor, APR 9600, DC motors etc., to the input-output ports of AT89S52 micro-controller.

#### Operation:

The operation of the circuit is that by using GPS we will find the place of the vehicle whenever we keep it in security mode. If the vehicle place is changed, through GSM we have to send the message to the owner's mobile number, which has been registered. If we send the message to stop the vehicle, then the engine should be OFF immediately.

And the location near to the schools and hospitals which are detected by the GPS, the vehicle speed should be automatically controlled for that we are using a motor. It should also give the announcement for decreasing the speed near the schools and hospitals. It is done by the use of APR 9600 voice module.

It also gives an announcement when the temperature of the engine exceeds its normal limits and also sends the message to the registered mobile number of the owner. The warning of High temperature will also be displayed on the LCD screen.

### 4.RESULTS

The implementation of the project is as follows.

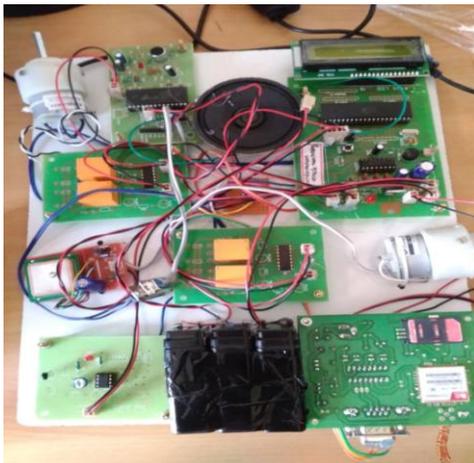


Fig.1 Hardware implementation of the project

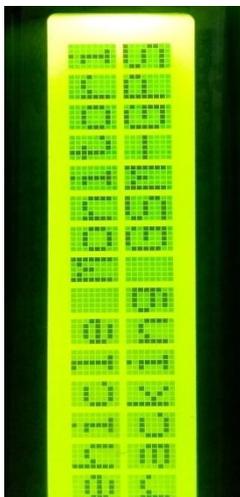


Fig.2 Displaying the project name on the LCD screen after switching on the Kit

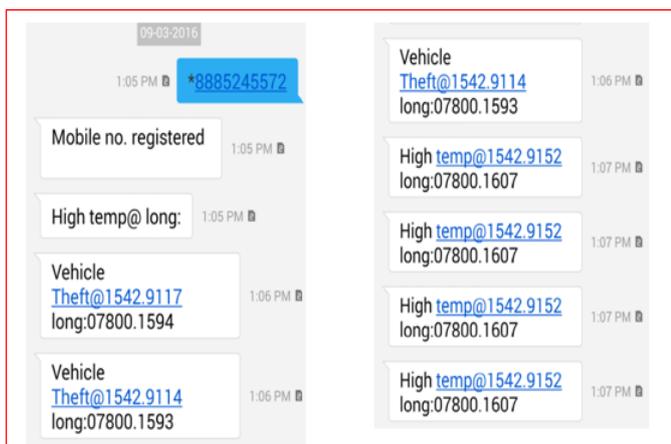


Fig.3 Screenshots of the messages that have been received to the owner's registered mobile number through GSM

### 5. CONCLUSION

In this paper, a novel method of vehicle tracking and monitoring systems that will provide better security for the vehicles has been discussed. We also implement the monitoring of engine's temperature and even the speed control at the specific locations detected by the GPS along with the voice output. Thus, this method can be easily implemented in the vehicle systems in the mere future.

### ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of the task would be incomplete without mentioning the names of the people who made it possible, whose constant guidance and encouragement crowns all efforts with success. We wish to express our warm and sincere thanks to Prof. B. Hari Kumar, Head, Dept. of ECE, Brindavan Institute of Technology and Science for his constant support and our sincere gratitude to our principal Dr. T.S.S. Balaji, for his support and facilities provided.

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