



A Smart anti-theft system –A vehicle Tracking & locking system using GSM & GPS Technology

Prof. Anuprita Linge

Assit.Professor, Dept. of Electronics, SSPACE, Wardha, India.

Prajakta B. Deshmukh

Student, Department of Electronics Engineering, SSPACE, Wardha, India.

Deshmukh.praju21@gmail.com

Monali D. Umate

Student, Department of E&TC Engineering, SSPACE, Wardha, India.

MonaliUmate11@gmail.com

Diksha B.Thool

Student, Department of E&TC Engineering, SSPACE, Wardha, India.

Dikshathool555@gmail.com

Swati V. Turkar

Student, Department of E&TC Engineering, BACE, Wardha, India.

Swatiturkar52@gmail.com

Abstract

Currently widely used of the public having a private vehicle, theft is happening on sometimes driving insecurity places and parking. The safe of our vehicles is highly essential for public private vehicles. An efficient automotive security system is implemented for anti-theft using an embedded system integrated with GPS & GSM. Vehicle tracking & locking system developed in the public or private vehicle, to locking engine motor & track the place. This project proposed work is an attempt to design develop a smart anti-theft system that uses GPS & GSM system to prevent theft & to determine the exact location of vehicle. Which would the cheapest source of vehicle tracking & locking it would work as smart anti-theft system. GPS system track the current location of vehicle, there are two types of tracking use online tracking & offline tracking. The preventive measures like fuel lock engine, electric shock system & paint spray system are installed in the vehicle which is controlled using users or owner GSM mobile. The owner can lock or unlock her/his vehicle with the help of SMS.

1. Introduction:

These days car theft cases are higher than ever, give your car an excellent protection with the only reliable anti-theft device. Car central locking system ensures the best guarantee to protect your car from different kinds of theft cases. In the last few decades, India has progressed at such an enormous rate that many companies have strongly established themselves here. These

companies bring a huge amount of workforce with them. Arranging transportation to such a huge intricacies. Generally, this transport is arranged through the local transport vendors on a yearly contract basis, recently happen mishaps such as burglary, rape cases etc. The development of satellite communication technology is easy to identify the vehicle locations. Vehicle tracking systems have brought this technology to the



day-to-day life of the common person. Today GPS used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status. 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 [1]. This system designed for users in land construction and transport business, provides real-time information such as location, speed expected arrival time of the user is moving vehicles in a concise and easy-to-read format. This system may also useful for communication process among the two points.

Currently GPS vehicle tracking ensures their safety as travelling. This vehicle tracking system found in clients vehicles as a theft prevention and rescue device. Vehicle owner or Police follow the signal emitted by the tracking system to locate a robbed vehicle in parallel the stolen vehicle engine speed going to decreased and pushed to off. After switch of the engine, motor cannot restart without permission of password. This system installed for the four wheelers, Vehicle tracking usually used in navy operators for navy management functions, routing, send off, on board information and security. The applications include monitoring driving performance of a parent with a teen driver. Vehicle tracking systems accepted in consumer vehicles as a theft prevention and retrieval device. If the theft identified, the

system sends the SMS to the vehicle owner. After that vehicle owner sends the SMS to the controller, issue the necessary signals to stop the motor. In this paper, the reviewed related technology, vehicle tracking and locking system block diagram, circuit diagram, flow chart, conclusions, advantages and future scope.

2. Survey of the Related Work:

In [2], the hardware and software of the GPS and GSM network were developed. The proposed security based on embedded system by modifying the existing modules. This method monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle provided alert information as alarm during the dangerous situations. The SMS sends to the authorized person through the GSM. In this method, the IR Sensor used to detect the static obstacle in front of the vehicle and the vehicle stopped if any obstacle detected. This is avoiding accidents due to collision of vehicles with any static obstacles.

In [6], Kai-Tai Song and Chih-Chieh Yang have a designed and built on a real-time visual tracking system for vehicle safety applications. In this paper built a novel feature-based vehicle-tracking algorithm, automatically detect and track several moving objects, like cars and motorcycles, ahead of the tracking vehicle. Joint with the concept of focus of expansion (FOE) and view analysis, the built system can segment features of moving objects from moving background and offer a collision word of warning on real-time. The proposed algorithm using a CMOS



image sensor and NMOS embedded processor architecture. The constructed stand-alone visual tracking system validated in real road tests. The results provided information of collision warning in urban artery with speed about 60 km/hour both at night and day times.

In [7], 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 [8] this paper, the proposed tracking & locking system based on GSM & GPS. If the thief Identified then the pressure sensor sense the signal and SMS sends to the microcontroller and also active the smart anti-theft. This paper having block diagram, circuit diagram, flow chart, hardware description related to technology.

3. Proposed method:

In this proposed work, a novel method of 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 thief occurred in car of on seat then the pressure 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. To open the door or restart the engine, authorized person needs to enter the passwords. In this method, tracking of vehicle place easy and doors locked automatically, thereby thief cannot get away from the car. system. all the vehicles equipped with GPS antenna to locate the place. The Proposed technology significantly avoids the theft of the car.

4. Objective:

The main aim of the project is to design and develop an advanced vehicle locking system in the real time environment. Whenever someone wants to stole vehicle then the system which is feed in vehicle sends a SMS to the owner of the vehicle if owner did not saw the SMS then system will call on owners mobile and when owner receives call, owner will recall the system and after that system will turn off the ignition of the vehicle The user can send a STATUS message from his cell phone and as soon as the GSM module gets the message, it will check for the user's authentication and if found to be valid, it will immediately send the details of the locations like the latitude and the longitude using GPS module. So the user can get to know the exact



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 Google maps. These days' car theft cases are higher than ever, give your car an excellent protection with the only reliable anti-theft device. Car central locking system ensures the best

guarantee to protect your car from different kinds of theft cases. It is a car security device that offers excellent protection to your car. A car with central locking security system helps the user to lock and unlock doors at the press of a button.

5. Block diagram:

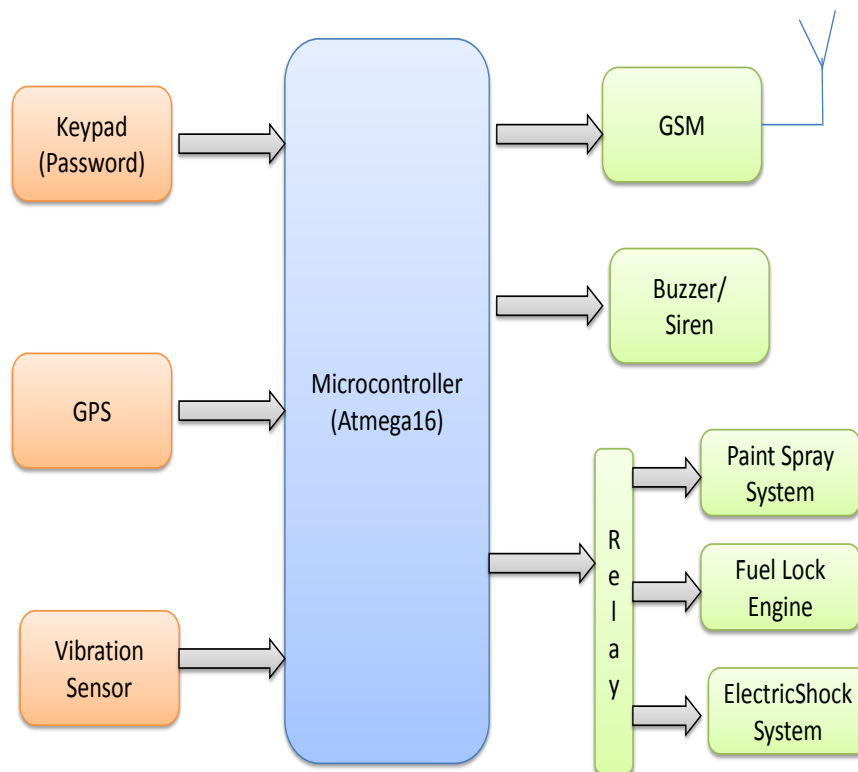
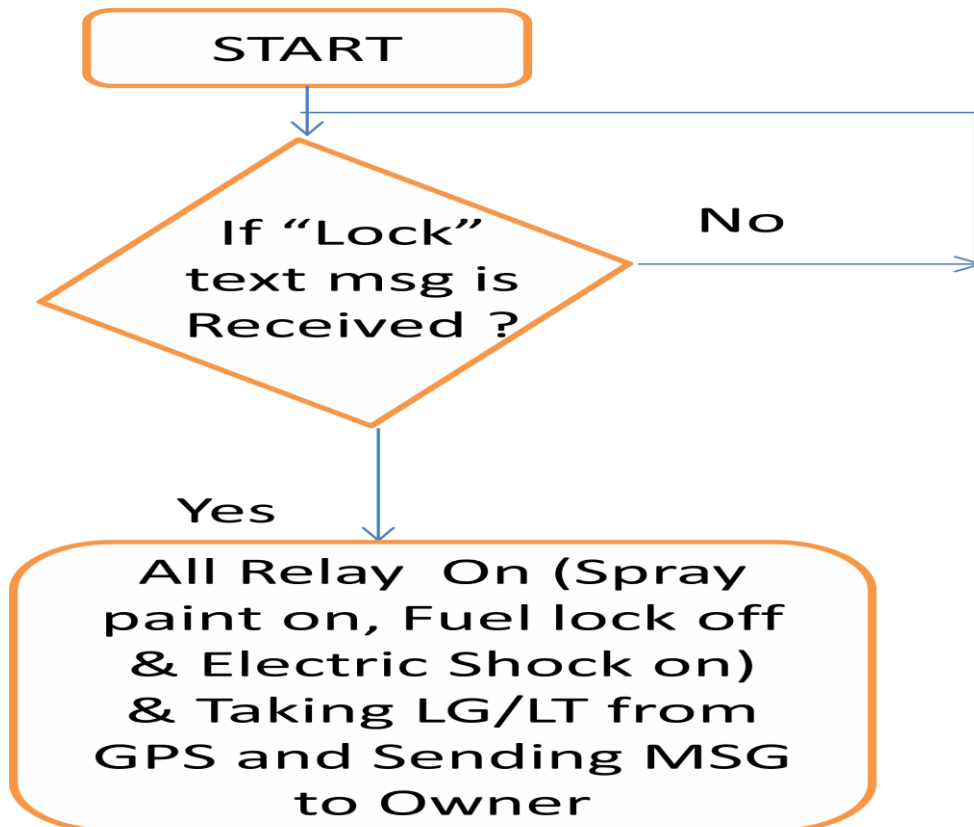
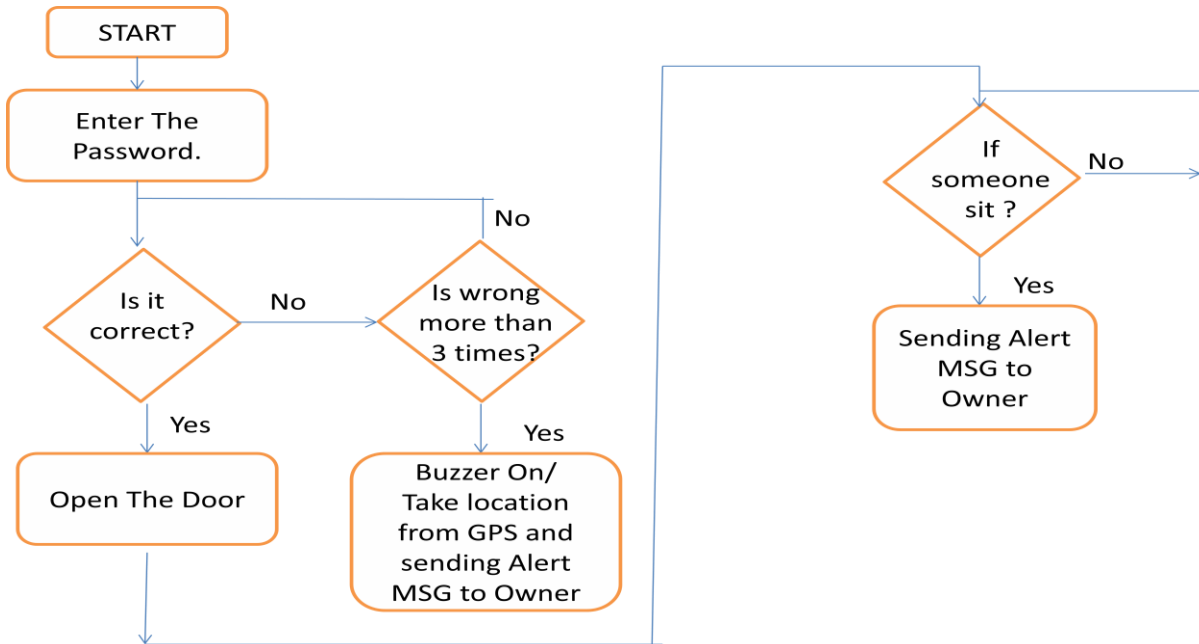


Fig 1: Block diagram of vehicle tracking & locking system based on GSM & GPS.



6. Flow chart:



7. Circuit Diagram:

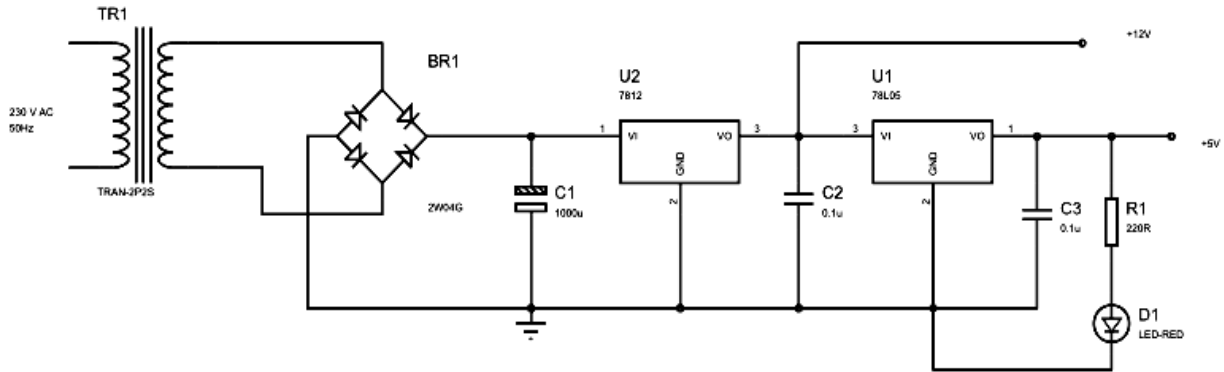


Fig 2: Power supply

Proposed circuit diagram:

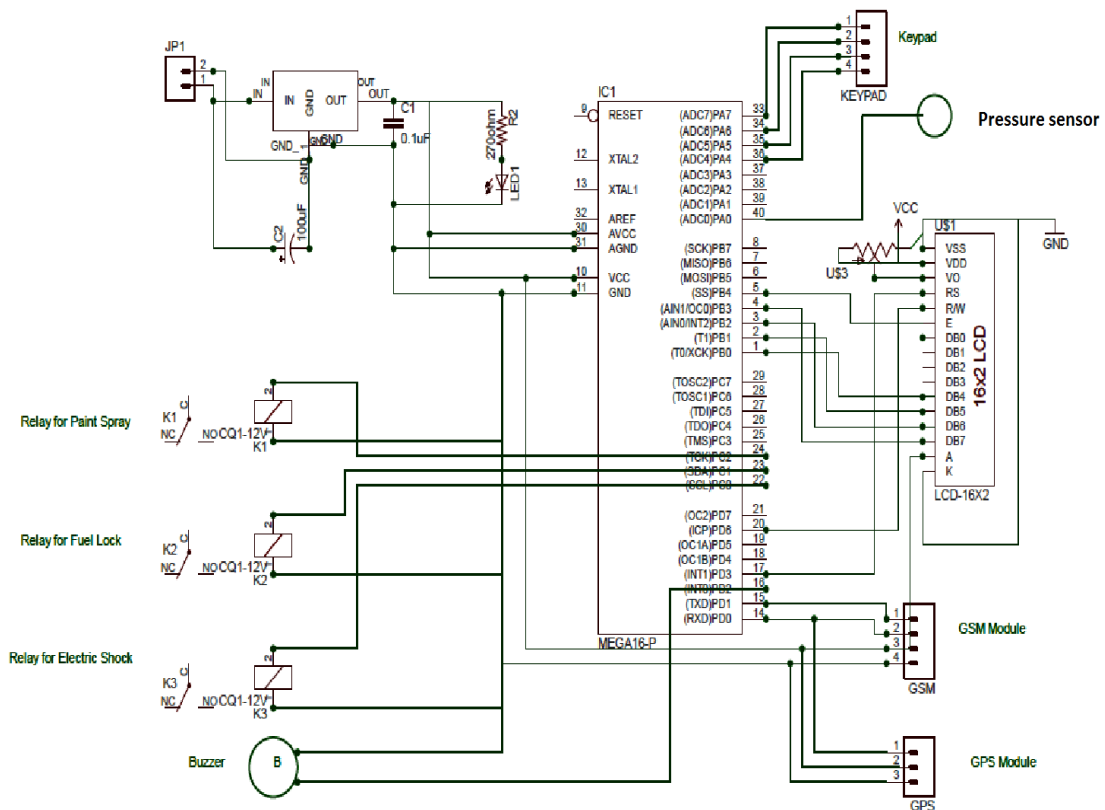


Fig 3: circuit diagram of smart anti-theft system –A vehicle tracking & locking using GSM & GPS.

8. Hardware Description:

➤ GPS Tracking Module

The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. The system provides essential information to military, civil and commercial users around the world and which is freely accessible to anyone with a GPS receiver. GPS works in any weather circumstances at anywhere in the world. Normally no subscription fees or system charges to utilize GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude and longitude) and track movement. With four or more satellites in sight, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the vehicle position has been determined, the GPS unit can determine other information like, speed, distance to destination, time and other. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology



Fig 4: GPS Tracking module

➤ GSM Modem SIM 300

The GSM modem is a specialized type of modem which accepts a SIM card operates on a subscriber's mobile number over a network, just like a cellular phone. It is a cell phone without display. Modem sim300 is a tri-band GSM/GPRS engine that works on EGSM900MHz, DCS1800MHz and PCS1900MHz frequencies. GSM Modem is RS232-logic level compatible, i.e., it takes -3v to -15v as logic high and +3v to +15 as logic low[8][24]. MAX232 is used to convert TTL into RS232 logic level converter used between the microcontroller and the GSM board.

Features of GSM

- Single supply voltage 3.2V-4.5V
- Typical power consumption in SLEEP Mode:2.5Ma.
- SIM300 tri-band.
- MT,MO,CB, text and PDU Mode, SMS storage: SIM card
- Supported SIM card : 1.8 V, 3V.



Fig 5: GSM module.

9. Design of tracking system:

The block diagram of tracking system using GPS and GSM technology is presented in figure 6. The project is vehicle positioning and navigation system we can locate the vehicle around the globe with micro controller, GPS receiver, GSM modem. Microcontroller used is AT89C51. The code is written in the internal memory of Microcontroller i.e. ROM. With help of instruction set it processes the instructions and it acts as interface between GSM and GPS with help of serial communication of AT89C51. GPS always transmits the data and GSM transmits and receive the data

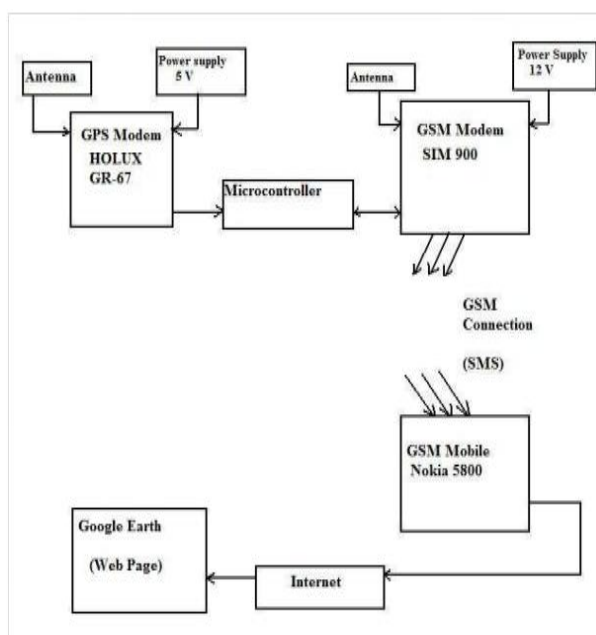


Fig 6: Block diagram illustrating the concept of system

GPS pin TX is connected to microcontroller and GSM pins TX and RX are connected to microcontroller serial ports. Microcontroller

communicates with the help of serial communication. First it takes the data from the GPS receiver and then sends the information to the owner in the form of SMS with help of GSM modem.

10. Benefits:

1. It provides more security than other system.
2. From the remote place we can access the system
3. By this we can position the vehicle in exact place.
4. Increase security

11. Conclusion:

In this paper, we have a proposed method used for vehicle tracking and locking system used to track the theft vehicle by using GPS module and GSM module and also avoid the theft of the car. This system installed into the sleeping mode vehicle handled by the owner or authorized persons; otherwise going to active mode. The mode of operation change by any person or remotely. When the theft or robbery identified, the responsible person send message to the microcontroller, then report the control signal to stop the engine of car. After that all the doors or to restart the engine authorized person needs to enter the password. In this method, easily track the vehicle location

12. Future scope:

This project could be made more convenient & secure with the use of satellite modems instead of cell phone. This design can be made more enhanced in future to support camera,



handset phone / hand free, mobile data LCD display, web based tracking software, also PC based stand alone software. In our project the security system is based on embedded control which provides security system against theft.

13. References

- [1] T. K. Kishor, T. S. Vardhan, N.L. Narayana, Propose “Vehicle Tracking using a reliable embedded data acquisition system with GPS and GSM” Int. journal of computer sci & network security, 2010.
- [2] 2. A. Khan and R. Mishra , Proposed “GPS -GSM based tracking system” .Int. journal of engineering trends & technology, vol.3, 2012
- [3] 3.K. Maurya, M. Sing and N. Jain, “ Real Time Vehicle Tracking System Using GSM and GPS Technology-A anti-theft Tracking system ,” Int. journal of electronics computer science engg,2012
- [4] 4. R.Ramani1, S .Valarmathy, Dr. N.SuthanthiraVanitha1 S.Selvaraju2, M. Thiruppath, propose
- [5] “vehicle tracking & locking system based on GSM & GPS ”.I.J. Intelligent Systems & Applications, 2013, 09,86-93.
- [6] 5. B.Kodavati, V.K. Raju, S. Srinivasa Rao, A.V. Prabu, Proposed, “GSM & GPS based vehicle location & tracking system ”, Int. journal of engg research & applications ,vol.1 .