

Vehicle Theft Intimation Using GPS and GSM

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ABSTRACT

Vehicle tracking system is main aim is to provide Security to all vehicles. Accident alert system is main aim is to rescue people injured in accidents. This is improved security system for vehicles. The latest like GPS are highly useful now a days, this system enables the owner to observe and track her vehicle and find out vehicle movement and the recent activities of vehicle. This new technology, popularly called Vehicle Theft Intimation Systems has created astonishing wonders in the field of security of the vehicle. This hardware is fitted on to the vehicle in such a manner that it is not visible to anyone who is inside or outside of the vehicle. Thus it is used as a covert unit which continuously or without any interruption to the system, sends the location data to the monitoring unit.

Keywords Microcontroller(AT89C51), GPS, GSM, Door sensor, Accident sensor, LCD, Voice feedback circuit, Relay circuit.

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I. INTRODUCTION

In the INDIA car theft is the measure problem. Maximum risks occur in situations where in an employee travels for money transactions. Also the Company to which he belongs should be aware if there is some problem and also should have control over the ignition system of the car.[1]

On the other hand safety has also become a major factor that is to be taken care of which numbers of accidents have rapidly increased day by day, many lives are lost due to improper post accident signaling and tracing out the exact location. Our project provides solution for the above stated problems which involves intimating the authorized person in advance about the current status of the vehicle if it is being intruded by a unauthorized person or an accident using GSM and GPS based technology.

It is mainly beneficial for the companies which are based on transport system. Since it can show the position of all vehicles in real time, so that they can create the expected data accordingly. These tracking system can store the

whole data where the vehicle had gone, where did it stop, how much time it took at every stop and can create whole data analysis. It can also be used in buses and trains, to estimate how far are they, how much time it takes for them to come to a particular stop. These systems are used to data capture, data storage, data analysis and finally data transfer.

Tracking in India is mainly used by transport systems, taxi companies, traffic operators. Taxi operators use this to estimate how far the vehicle is from a particular area and send this information to call centers and they can inform general public about the distance of the taxi location and time it takes to come to them. Another use is for traffic police. If this system is fitted in every vehicle the police can estimate the flow of traffic by looking at the map and if any accident is detected then they can route the traffic in to another way. This is how tracking is useful because India is one of high density traffic countries and this system can control and solve many of the traffic problems.

II. LITRATURE REVIEW

Abid Khan [1] et.al states that the system is helpful for public transport vehicles such as buses and taxis, it provides Tele monitoring and management system for the transportation of the taxis and buses within the city. In this paper the system mentioned consists of an —On-board module which is mounted in the vehicle which is to be tracked. This on-board module consists of Global Positioning System, a GSM modem and ARM processor. The navigation message which is broadcasted by the GPS position satellite is received and resolved by the GPS receiver of the vehicle terminal. This satellite computes the longitudes and latitudes of vehicle coordinates, then transform it into the short message form by using GSM communication controller and this message is sent to the monitoring center through the GSM network.

Pankaj Verma [2] et. al states that the system is perfected & collecting the information of the vehicle like location, distance, etc. by using gps and gsm. The information be used with the following features: The information can be transformed about the vehicle like location, etc. is obtained after every specified time interval defined by the user. Then this periodic information of location is transmitted to monitoring or tracking server. This transmitted information is displayed on the display unit by using the google earth to display vehicle location in the electronic google maps.

A.Rajkiran [3] et.al states that the RF transmitter is attached with the vehicle which consists of its own identification. The data which will be continuously transmitting to the RF receiver that is connected to the microcontroller. The GPS will receive the location of the vehicle and will transmit this data to the microcontroller. Suppose in the case the RF transmitter is not receiving the signals from the RF transmitter then the receiving unit triggers a signal to the microcontroller, and from this signal we can identify the theft. If it is identified that the vehicle is theft vehicle then it automatically sends location of the vehicle to its user as the owner of the vehicle receives the information in the form of sms through the gsm modem. This system is much simpler and cost effective than the others. The vehicle is automatically stopped if a password like sms is sent by the user.

III.METHODS

At start when user lock/unlock a door lock from remote control then to show that we have used an lock/unlock switch. When we make the switch ON it means door is unlocked & when we make the switch OFF the it means door is locked. When user press the switch to open the door then microcontroller will detect that switch press and it will come to know that user or owner has opened the door. When after pressing this switch user opens that door then magnet will go away from magnetic sensor hence it will detect and send signal to controller that door is open but now since the owner has opened the door the controller will not take any action. On the other hand when owner locks the vehicle by using lock switch then if anybody else opens the door with an duplicate key etc. then door sensor will give that signal to controller as well as lock switch is ON hence

controller will come to know that person other than owner has opened the car.

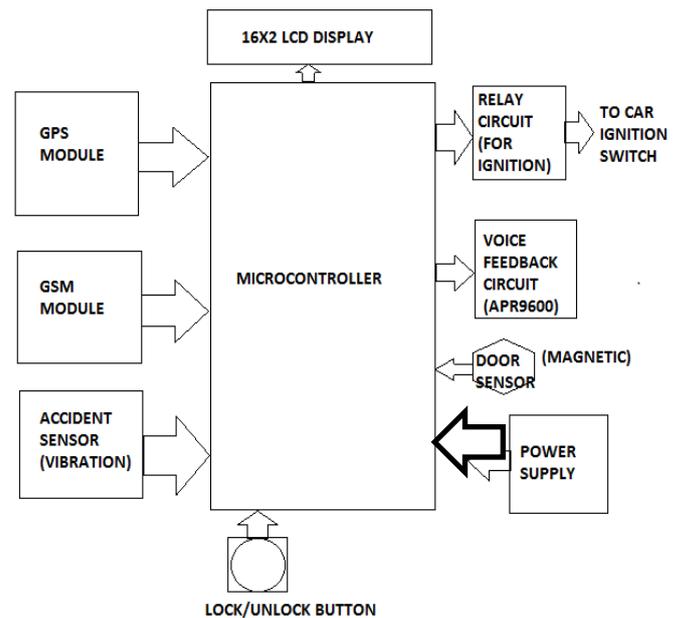


Fig.3.1 Block diagram of vehicle theft intimation

A. Microcontroller:

Here in this system micro controller used is 8051 series. Mainly micro controller consists of cpu, memory and various I/O pins, and the speed of this micro controller is enough to execute the program in real time. This particular micro controller is chosen because the experiment requires minimum of 8-bit micro controller. [2]

A Micro controller consists of a powerful CPU tightly coupled with memory, various I/O interfaces such as serial port, parallel port timer or counter, interrupt controller, data acquisition interfaces-Analog to Digital converter, Digital to Analog converter, integrated on to a single silicon chip. If a system is developed with a microprocessor, the designer has to go for external memory such as RAM, ROM, EPROM and peripherals. But controller is provided all these facilities on a single chip. Development of a Micro controller reduces PCB size and cost of design.

B. GSM SIM300 module:

GSM abbreviates Global System for Mobile communication. This is a second generation (2G) mobile network. This is widely used all over the world for mobile communication. This GSM device consists of sim slot in which a sim can be inserted which has a unique number, this unique number is used for contact. This GSM device consists a unique number called IMEI number and this is different for each and every hardware kit. In our project the device is used for transmitting data. The data from GPS is transmitted to give specific mobile handset through this GSM itself.

A GSM modem is a wireless modem that works with a GSM wireless network. Modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.[3] Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate. The Modem is designed with RS232 Level converter circuitry, which

allows you to directly interface PC Serial port .This GSM/GPRS RS232 Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS as well as DATA transfer application in M2M interface. The modem needed only 3 wires (Tx, Rx, GND) except Power supply to interface with Microcontroller/Host PC.



Fig 3.2:GSM Module

The built in Low Dropout Linear voltage regulator allows you to connect wide range of unregulated power supply .Using this modem, you will be able to send & Read SMS, connect to internet via GPRS through simple commands.

C. GPS L80 module:

GPS abbreviates Global Positioning System and this is used to detect the latitude and longitude of the particular position and it also shows the exact time. It detects these values anywhere on the surface of the earth. In our project it plays main role and it is the main source of the latitude and longitude of the vehicle to know the location of accident occurred location, or even for theft tracking of the vehicle. This gadget gets the coordinates from the satellite for every second. This device is the main component of vehicle tracking project.

The Global Positioning System (GPS) is global navigation satellite system which transmit precise microwave signals, that enable GPS receivers to determine their location, speed, direction, and time. It consists of a single chip GPS IC which includes RF part and Baseband part, a SPDT, a patch antenna, a LNA, a SAW filter, a TCXO, a crystal oscillator, short protection and antenna detection circuit for active antenna.



Fig 3.3.GPS Module

D. Accident sensor:

Using longitudinal vibration and matching with the air by acoustic matching layer, this type realized high sensitivity. Because of short wavelength, this type has sharp directivity and can be used high precise measurement. The shock sensor, PKGS series, is acceleration sensor with 2 terminals and detects acceleration & shock to applied from outside, as electrical signal.By bimorph piezo elements clamped at the two-end with original polarization technology, the shock sensor has high sensitivity and excellent durability. The shock sensor is reflow solderable SMD type. The shock sensor can have inclined primary axis so that appropriate shock sensor can be chosen for shock detection in HDD (Hard Disk Drive) and optical pick-up control in optical drive & optical-magnetic drive.



Fig 3.4.Accident sensor

E. Door sensor (magnetic switch):

The Magnetic Reed Switch is an electrical switch operated by an applied magnetic field. It consists of a pair of contacts on ferrous metal reeds in a hermetically sealed glass envelope. The contacts may be normally open, closing when a magnetic field is present, or normally closed and opening when a magnetic field is applied.

The switch may be actuated by coil making a reed relay or by bringing a magnet near to the switch. Once the magnet is pulled away from the switch, the reed switches go back to its original position. The reed switch contains a pair of magnetic, flexible, metal reeds whose end portions are separated by small gap when the switch is open.

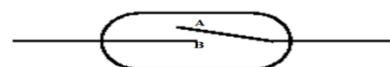


Fig.Magnetic feed switch

Fig 3.5 Magnetic Switch

F. Voice feedback circuit:

APR9600 is a low-cost high performance sound record/replay IC incorporating flash analogues to rage technique. Recorded sound is retained even after power supply is removed from the module. The replayed sound exhibits high quality with a low noise level. Sampling rate for a 60second recording period is 4.2 kHz that gives a sound record/replay bandwidth of 20Hz to 2.1 kHz.

However, by changing an oscillation resistor, a sampling rate as high as 8.0 kHz can be achieved. This shortens the total length of sound recording to 32 seconds. Total sound recording time can be varied from 32seconds to 60 seconds by changing the value of a single resistor. The IC can operate in one of two modes: serial mode and parallel mode.

In serial access mode, sound can be recorded in 256 sections. In parallel access mode, sound can be recorded in 2, 4 or 8 sections. The IC can be controlled simply using push button keys. It is also possible to control the IC using external digital circuitry such as micro-controllers and computers.

The APR9600 has a 28 pin DIP package. Supply voltage is between 4.5V to 6.5V. During recording and replaying, current consumption is 25 mA. In idle mode, the current drops to 1 A. The APR9600 experimental board is an assembled PCB board consisting of an APR9600 IC, an microphone, support components and necessary switches to allow users to explore all functions of the APR9600 chip. The oscillation resistor is chosen so that the total recording period is 60 seconds with a sampling rate of 4.2 kHz. During sound recording, sound is picked up by the microphone.

A microphone pre-amplifier amplifies the voltage signal from the microphone. An AGC circuit is included in the pre-amplifier, the extent of which is controlled by an external capacitor and resistor.

If the voltage level of a sound signal is around 100 mV peak-to-peak, the signal can be fed directly into the IC through ANA IN pin (pin 20). The sound signal passes through a filter and a sampling and hold circuit. The analogue voltage is then written into non-volatile flash analogue RAMs.

It has a 28 pin DIP package. Supply voltage is between 4.5V to 6.5V. During recording and replaying, current consumption is 25 ma. In idle mode, the current drops to 1 ma.

G. LCD(liquid crystal display):

LCD is the display device which is of 16x2 size and it has yellow background light. This LCD is connected to microcontroller.

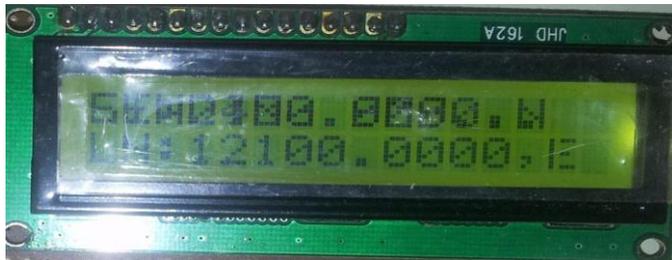


Fig.3.6 LCD display

IV. CONCLUSION

In this paper we present how tracking system is used to track the vehicles. It is completely integrated so that once it is implemented in all vehicles, then it is possible to track anytime from anywhere. This system has many advantages such as large capability, wide areas range, low operation costs, effective, Strong expandability and Easy to use. Also

accident sensor gives information when accident is happened.

V. RESULT AND DISCUSSION

When the door is open owner will receive the message about vehicle then .then owner will control the vehicle and get the location of the vehicle.

- 1.GSM kit send the message to the saved number.
- 2.Owner will stop the vehicle by sending the particular message.
- 3.GPS kit gives the exact location of the vehicles.

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