

Advance Bike Security System

Argade Geetanjali Arjun¹, Moresh Mukhedkar²

¹Electronics & Telecommunication Engineering, S. P. Pune University, Pune, Maharashtra, India

Abstract: *This system deals with the design development of a theft control system for an automobile, which is being used to prevent the theft of a vehicle. The system makes use of an embedded system based on Global System for Mobile communication (GSM) technology. The designed & developed system is mounted in the vehicle. An interfacing cell phone is also connected to the microcontroller, which is connected to the engine. Once, the vehicle is stolen, the information is used by the vehicle owner for further processing. The information is passed on to the central processing insurance system which is in the form of the short message service, the microcontroller unit reads the sms and sends it to the Global Positioning System (GPS) module. By using the triangulation method, GPS module will give the exact location in the form of latitude and longitude to the user's cell phone. Then reading the signals received by the mobile and control the ignition of the engine, say to lock it or the engine immediately stop. The main concept in this design is introducing the mobile or cell phone into an embedded system communication. The designed system is very simple & cost is low. The entire designed system is on a single chip.*

Keywords: GSM, GPS, BIKE, Microcontroller.

1. Introduction

The system "GSM based Control System" at the title suggests is aimed to construct a control system that enables the complete control of the interface it is based on it. General objectives of the project are defined as:-

- To identified co-ordinate vehicle through Short Message Service (SMS).
- To effectively receive and transmit data via SMS
- To eliminate the need of being physically present in any location for security of the bike.

A security system is essential for motorist as the number of motorcycle theft increases every year. Various security systems are available in the market with variety of functions, operating modes and features. Most of the systems are expensive which make security system that offers excellent protection to your vehicle using GPS and GSM is effective one.

The main aim of the system is to design and develop an advanced bike locking system in the real time environment. The user will send a status message from his cell phone and it will check for the user's authentication when the GSM module gets the message, and if found to be valid, it will immediately forward the details of the locations like the latitude and the longitude using GPS device. So the user will 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.

2. Existing System

A security system is essential for motorist now a day as the number of motorcycle theft increases every year. Various security systems are available in the market with variety of functions, operating modes and features. Most of the systems are expensive which make motorcyclists could not afford to have a security system that is efficient. The affordable security system has limitations. It provides basic function and

makes loud noise that will disturb people around it. The basic security system is very simple and not user friendly. Due to this reason numerous researches have been carried out to improve motorcycle security system by incorporating radio frequency identification method [1].

A research that was carried out by Tatt Cheah showed that a microcontroller can be interface input and output devices efficiently [2]. So a microcontroller is widely used in small and large instrument for control. Mobile phone has been used as a medium of communication between user and system. The design of the motorcycle security system based on Global System for Mobile (GSM). The system was equipped with a tracking system and used a mobile phone as the input [3].

The limitation of their system was the GSM was only used for tracking the motorcycle. It did not inform the user and deactivate the engine. In anti-theft alarm system the number of sensors are used and because of that the system became complicated and costly [4].

This paper describe the development of a motorcycle security system that uses a microcontroller to detect theft and inform the owner through GSM module when theft occurs. This system protects motorcycle from theft and provides a reliable security system to motorcyclist with affordable price. The system uses a microcontroller to control all operation including sending the message to user via Normally, digital speedometers are found only luxury car and high end motor bikes when it gets damaged we need to replace the mechanical worm gear and then the cable hence we design a digital speedometer-cum-odometer for motorbike in affordable cost.

3. Proposed System

The aim is to design and develop an advanced vehicle locking and tracking system in the real time environment and developed a simple speedometer, odometer. This system made for tracking vehicle location and also we can lock the vehicle by using GSM.

It consists of a GPS module, a microcontroller circuit and a GSM device. This system can be used in a vehicle (bike), with the battery. When the vehicle is moving, GPS will give the location coordinates, the microcontroller process them and this data is sent as SMS by the GSM module to a known cell number. The time between the SMS can be preprogrammed in advance. We collect the location coordinates in this design.

3.1 Working

An AVR Microcontroller will be interfaced to GSM device, GPS Receiver and also to the vehicle locking system. Micro controller will keep listening to the New SMS arrival. If a sms arrived, it will check for authentication and after authentication is verified it will read the GPS location and will send it to the user's cell phone in the form of sms and send the latitudes and longitudes.

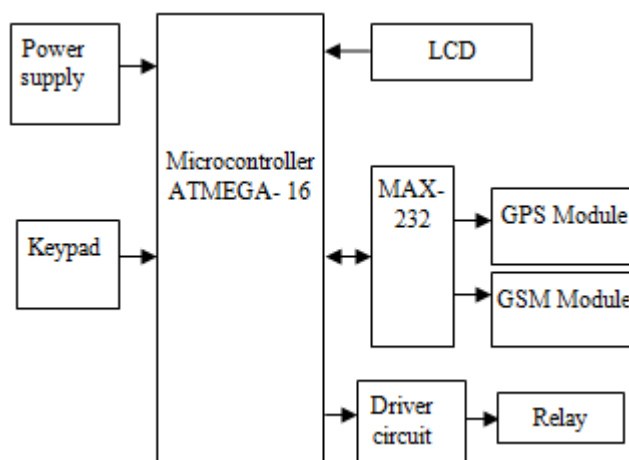


Figure 1 : Block diagram of system

Also, the vehicle can be locked or unlocked by sending a message to the system. The working is done in the process i.e. the drivers RS232 from GPS and GSM device are connected to drivers (RS232) of the microcontroller. Here the RS 232 acts as an interface for the duplex communication from microcontroller to GPS & GSM vice versa. The data which is available at the RS232 of microcontroller is converted into compatible TTL logic through MAX232. When the location is detected then user sends this message as 'lock' to lock the engine of the vehicle. This message can be send to microcontroller through GSM. Then the microcontroller will locks the vehicle engine with the help of relay by applying breaks to it.

3.2 Flowchart:

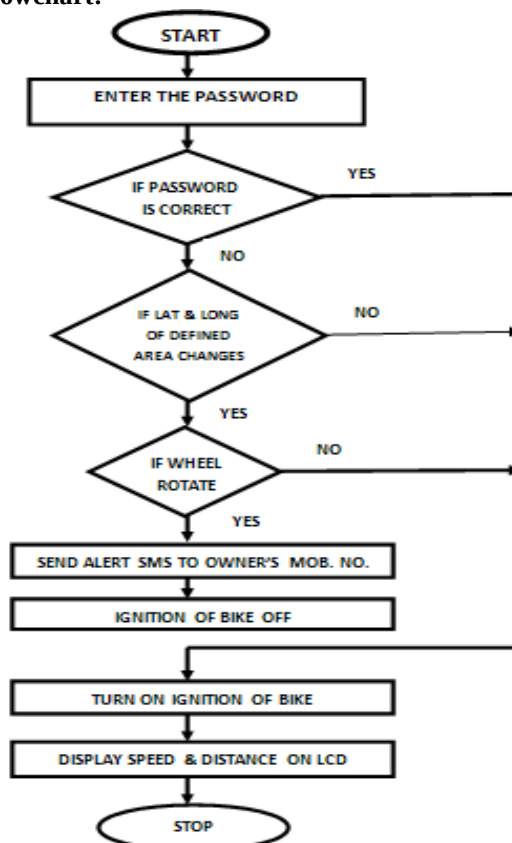


Figure 2: System flow

4. Result

When the unauthorized person tries access the bike by entering the wrong password the system alert to owner by sending SMS.

In fig 3 shows the system alert message send on owner mobile number if location latitude and longitude of the parked bike changes within distance 12m-15m. The system alert message send on owner mobile number if location changed within 12m-15m, then after every 1 minutes system send the respective location of the bike. With the help of simple speed sensor the speed and distance is displayed on LCD.

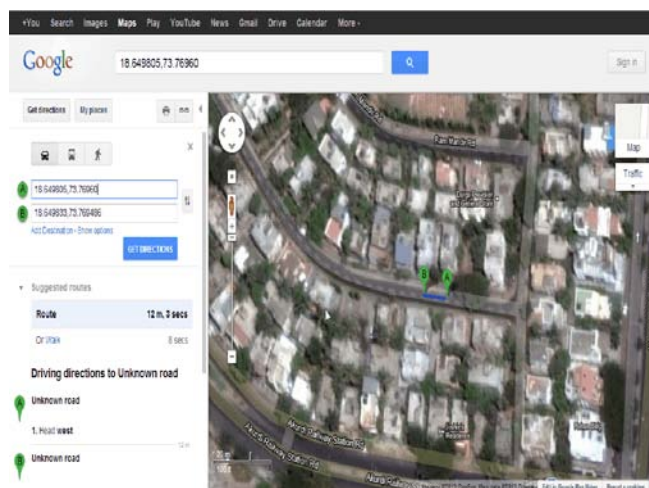


Figure 3: testing location co-ordinate

5. Conclusion and Future Scope

This is a unique method of designing and assembling a low cost, compact theft control system for automobile. This instrument is an ultimate threat to vehicle thieves. By installing this instrument it is very difficult to access by an unknown person since it is based on GSM and GPS technology. In future there is no doubt, that all of the vehicle will be embedded with this unique kit. In addition to above features we can also add extra future like thumb/face recognition to as certain more security of the vehicle.

Ideally this system could be made more convenient and secure with the use of satellite modems instead of cell phone as tracking device as the system may fail when there is no network coverage area. This design can be made more flexible in future to support camera, web based tracking software also PC based stand alone software.

References

- [1] N.Jinaporn, S. Wisadsud, P.Nakonrat and A.Suriya "Security System against Asset Theft by using Radio Frequency Identification technology", Proceeding of ECTI-CON, 2008, pp.761-764.
- [2] L.Tatt Cheah and T. Asai, "Development of a control experiment for small movable object using PIC", SICE-IC ASE International Joint Conference, 2006, pp. 4302-4305.
- [3] B.G.Nagraja, R.Rayappa, M Mahaesh, M.Patil and T.C Manjunath, "Design and development of a GSM Based Vehicle Theft Control System", Proceeding of IEEE on Advanced Computer Control, 2009, pp.148-152.
- [4] L.Wan and T.chen, "Automobile Anti-theft Sytem Design Based on GSM", Proceeding of IEEE on Advanced Computer Control, 2009, pp.551-554.
- [5] Prawada P. Wankhede and Prof. S.O. Dahad, "Real Time Vehicle Locking and Tracking System using GSM and GPS technology", Proceeding of International journal of Technology and Engineering System(IJTES), 2011, pp.272-275. EEE on Advanced Computer Control, 2009, pp.148-152.
- [6] Muhammad Ali Mazidi, Janice Gillispie, Rolin McKinlay, *The 8051 Microcontroller and Embedded systems*, Pearson Publications, 2nd Edition, 2006.
- [7] Steven F. Barrett, Daniel J.Pack, *Atmel AVR Microcontroller Primer: Programming and Interfacing*, Morgan & Claypool Publishers, 2nd Edition, 2008.