

Engine Lock And Tracking System

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Abstract - An efficient vehicle tracking system is designed and implemented for tracking the movement of any equipped vehicle from any location at any time. The proposed system made good use of a popular technology that combines a Smartphone application with a microcontroller. This will be easy to make and inexpensive compared to others. The designed in-vehicle device works using Global Positioning System (GPS) and Global system for mobile communication technology that is one of the most common ways for vehicle tracking. The device is incorporated inside a vehicle whose position is to be determined and tracked in real-time. A microcontroller is used to control the GPS and GSM modules. The vehicle tracking system uses the GPS module to get geographic coordinates at regular time intervals. The GSM/GPRS module is used to transmit and update the vehicle location to a database. A Smartphone application is also developed for continuously monitoring the vehicle location. The Google Maps API is used to display the vehicle on the map in the Smartphone application. Thus, users will be able to continuously monitor a moving vehicle on demand using the Smartphone application and determine the estimated distance and time for the vehicle to arrive at a given destination. In order to show the feasibility and effectiveness of the system, this paper presents experimental results of the vehicle tracking system and some experiences on practical implementations.

IndexTerms: Global positioning system (GPS), Global system for mobile communication (GSM), Microcontroller, Relay, Tracking system, Engine Control Unit (ECU).

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I. Introduction

In today's world vehicle theft is a common issue which everyone faces in insecure parking places. This feature would help the owner for tracking of vehicle in case of theft and saving time and money. This paper introduces an Android based tracking system. GSM and GPS technologies are employed to make vehicle theft almost impossible. GPS is a space based navigation system that provides location and time information in all weather conditions. A GSM modem is a specialized type of modem which accepts a SIM card, and operates just like a mobile phone. The proposed system integrates both GPS and GSM technologies. GPS gives the latitude and longitude positions of the vehicle. Relay unit performs the engine locking mechanism. A Stepper motor is interfaced with relay which is used to immobilize the vehicle. This system is an integration of several modern embedded and communication technologies.

II. Existing Security Issues

A. Literature Survey

1) **Hybrid GPS-GSM Localization of Automobile Tracking System:**

An integrated GPS-GSM system is proposed to track vehicles using Google Earth application. The remote module has a GPS mounted on the moving vehicle to identify its current position, and to be transferred by GSM with other parameters acquired by the automobile's data port as an SMS to a recipient station. The received GPS coordinates are filtered using a Kalman filter to enhance the accuracy of measured position. After data processing, Google Earth application is used to view the current location and status of each vehicle. This goal of this system is to manage fleet, police automobiles distribution and car theft caution.

2) **Smart On-Board Transportation Management System Using GPS/GSM/GPRS Technologies to Reduce Traffic Violation in Developing Countries**

Nowadays, the evolution in transportation technologies makes the necessity for increasing road safety. In this context, we propose the implementation of a smart onboard GPS/GPRS system to be attached to vehicles for monitoring and controlling their speed. In case of traffic c\qspeed violationa GPRS message containing information about the vehicle such as location and maximum speed is sent to a hosting server located in an authorized office so that the violated vehicle is ticketed. Moreover, this system can also track the vehicle's current location on a Google Map, which is mostly beneficial when vehicles should follow a specific road and in case of robbery,Also geo-casting can have a major role in this model. Some sensors, such as shock/vibration sensor usually attached to the air-bags in vehicles, are attached to the system that in case of accident, it will send notifications to the nearest hospital, police station and civil defense. Our proposed model can be utilized for different implementations, both in public and private sectors. While similar existing systems in Palestine have focalized just on the tracking aspect of vehicles' monitoring, it would be the first system supporting both ticketing and tracking.

B. Existing system and its demerits

Present scenario of the vehicle tracking system is useful in many applications like trace the vehicle; find the current location of the vehicle, security of personal vehicle, public transportation system, traffic management and others. Focusing on current traffic scenario in major cities and user requirements, we are trying to implement such system which is useful in real time applications. This paper focuses on some of the techniques to help traffic management. One of the techniques is connecting traffic management with Internet of Things (IoTs). IoT is the system of physical objects or things installed with hardware, software, sensors, and system connectivity, which empowers these objects to gather and trade information .IoT uses different types of protocols to work with different objects. CoAP, MQTT protocols ESP8266 and Zigbee models and customized RFID to help traffic management.

- GPS module is not used for excellent monitoring.
- Unable to find the exact position of the vehicle.

III. Overview Of Proposed System

C. Block Diagram

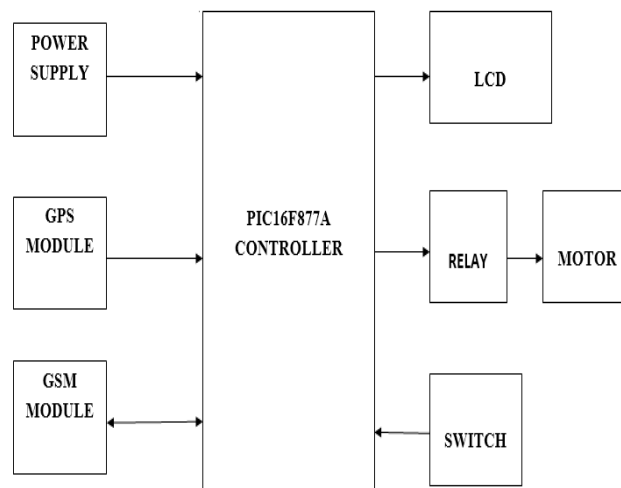


Fig.1. Block Diagram

In this proposed system, Smartphone's become more familiar to people and finding use in the day to day lives, their influence on society continues to grow. The main driving force for this accelerated growth in Smartphone usage is the availability of a large variety of applications to meet the needs of a wide range of users. In our project we developed a Smartphone application along with the in-vehicle tracking device. The two parts work together to offer the most convenience to the users as they become handy to track vehicle locations in real-time. A vehicle tracking is a prerequisite of the most basic function in all fleet management systems. A fleet management is the management of a company's transportation fleet. The fleet management system aims at improving the quality and efficiency of the industry by identifying major obstructions on the road and tracking real-time locations of their fleet on a map. Most of the vehicle tracking systems is designed by using GPS/GSM technology. In vehicle tracking systems, a vehicle location is one of the most important components. The

location and time information anywhere on earth is provided by using GPS technology. It is convenient and accessible way of transferring and receiving data with high reliability. Instead of using SMS, the proposed vehicle tracking system uses the Smartphone application to track and monitor a vehicle location obtained from the in-vehicle tracking device controlled by a microcontroller. The vehicle location is automatically placed on Android application, which make it easier for tracking a vehicle and provides users with more accurate vehicle location information.

IV. Component Description

A. GPS Module



The Global Positioning System (GPS) is a global navigation satellite system that provides location and time information in all weather conditions. GPS satellites transmit signal information to earth. This signal information is received by the GPS antenna in order to measure the user's correct position.

A GPS receiver monitors multiple satellites and determine the precise position of the receiver and its deviation from true time.

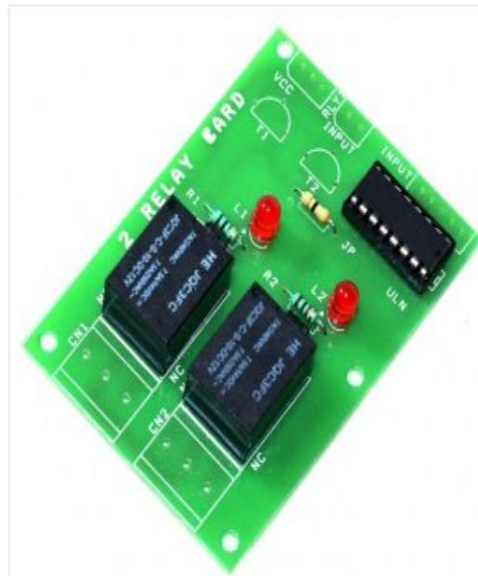
B. GSM Module



This GSM Modem can accept any GSM network act as SIM card and just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications.

The SIM800 delivers GSM/GPRS 900/1800MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption

C . Relay



A relay is an electromechanical switch which is activated by an electric current. A two relay board arrangement contains driver circuit, power supply circuit and isolation circuit. A relay is assembled with that circuit. The driver circuit contains transistors for switching operation .The transistor is use for switching the relay. An isolation circuit prevents reverse voltage from the relay which protects the controller and transistor from damage. The input pulse for switching the transistor is given from the microcontroller unit. It is used for switching of a two device.

D .Dc Motor



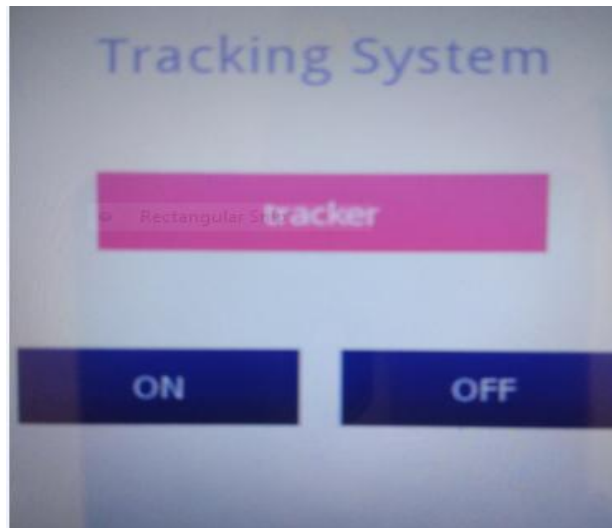
Geared dc motors can be defined as a n extension of dc motors A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM .The gear assembly helps in increasing the torque and reducing the speed.

E.Pic Microcontroller



It is the heart core of the system to which all other components are interfaced .Pic Microcontroller is a RISC Microcontroller made by microchip technology .It is 40-Pin low power ,High performance Microcontroller .

F.Smart Phone Tracking Application



V. Conclusion

This system provides high security to the users. Future scope of this project is to determine the latitude and longitude position of the nearby police station for intimation of theft. Further implementations can be done on the real time tracking mechanism.

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