

GPS and GPS Based VTS Using Web Based Mapping Application

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Abstract- Now a days GPS is used in large number of applications. One of the applications is tracking vehicles and getting exact locations of your vehicles. This tracking system is used to get you the location and route travelled by the vehicle, and that information can be observed from any other remote location. It also includes the use of web application, generally a mapping application that provides you exact location of target by entering the latitude and longitude. This system enables us to track target in any weather conditions. The system uses GPS and GSM technologies. The paper includes the hardware part which comprises of GPS, GSM, Atmega 168 microcontroller, 16x2 LCD and software part is used for interfacing all the required modules and a web application is also developed at the client side. The design uses RS232 protocol for serial communication between the modems and the microcontroller. The main objective is to provide a system that can easily track vehicles at low costs.

Keywords- GPS, GSM, Tracking System, VTS

I. INTRODUCTION

Now a day's transportation is very important need. A lot of problems occur on the road every day. Therefore the need of security and monitoring is developed. The solution to such problems is developed by using GPS and GSM technologies and web based mapping application. Various problems that we face:

- a) Vehicle theft
- b) Real time tracking of vehicles
- c) Finding different available routes

This system uses a Global Positioning System (GPS) which receives the coordinates from the satellites among other critical information. The system is based on a microcontroller along with a global positioning system (GPS) and global system for mobile communication (GSM) modules. This project uses only one GPS module for acquiring locations and GSM module to send the received locations to a remote device. GSM module, provided with a SIM card uses the same communication process as we are using in regular phones.

Tracking system is very important for this modern world. This system can also be used in Courier tracking, soldiers monitoring, tracking of the theft vehicle and various other applications. This system is user friendly, easily installable, easily accessible and can be used for various other purposes. After installation system will locate target by the use of a Web application (HTML based application) in Google map. The system allows to track the target anytime and anywhere in any weather conditions.

II. SYSTEM ARCHITECTURE

It consists of two units one is transmitting side (vehicle unit) and other one is monitoring side. The system consists of a GPS module for getting locations, a GSM module for sending locations and a Micro controller for all controlling applications.

A. The transmitting unit:

a) GPS Module

The **Global Positioning System (GPS)** is a space-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil, and commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver.

b) GSM Module

GSM modem is used for transmitting and receiving the data. In this system it acts as a SMS sender. The GSM technical specifications define the different entities that form the GSM network by defining their functions and interface requirements.

c) Microcontroller

In this project ATMEGA 168 microcontroller is used for interfacing to various hardware peripherals. The

ATMEGA 168 microcontroller is interfaced serially to a GSM Modem and GPS Receiver. The hardware interfaces to microcontroller are LCD display, GSM modem and GPS Receiver. The design uses RS232 protocol for serial communication between the modems and the microcontroller.

d) RS 232 Interface

In telecommunications, RS232 is the traditional name for a series of standards for serial binary single-ended data and control signals connecting between a DTE (Data Terminal Equipment) and a DCE (Data Circuit terminating Equipment). It is commonly used in computer serial ports.

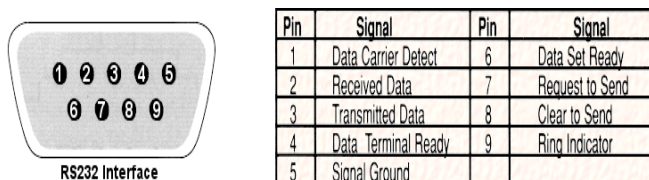


Fig – RS232 Interface

e) Display

A **liquid-crystal display (LCD)** is a flat-panel display or other electronic visual display that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly. The most flexible ones use an array of small pixels. The earliest discovery leading to the development of LCD technology, the discovery of liquid crystals, dates from 1888. By 2008, worldwide sales of televisions with LCD screens had surpassed the sale of CRT units. We are using a 16x2 LCD in our system.

f) Monitoring Unit

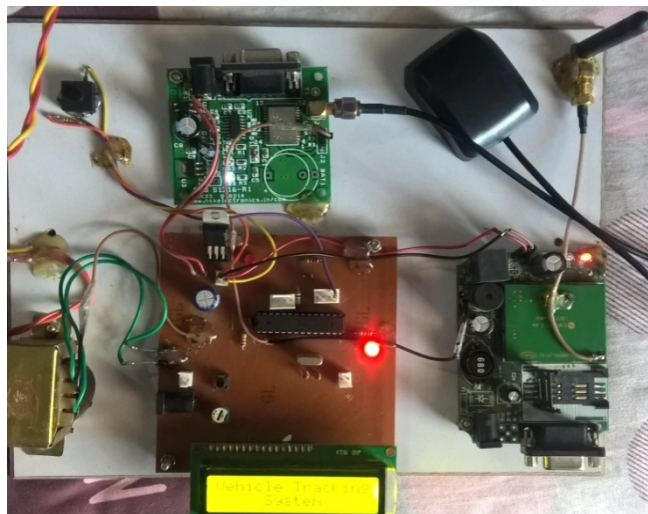
The monitoring unit consists of a GSM mobile and a Web Application. The GSM mobile will acquire the position of the vehicle (longitude and longitude) and then by typing those co-ordinates in web application owner of vehicle can get the exact location of the vehicle.

III. HARDWARE

The system is a positioning and navigation device, we can locate the vehicle around the globe with ATMEGA 168 micro controller, GPS receiver, GSM modem, Rx TX Module, Power supply. Microcontroller used is ATMEGA 168. The code is written in the internal memory of Microcontroller i.e.

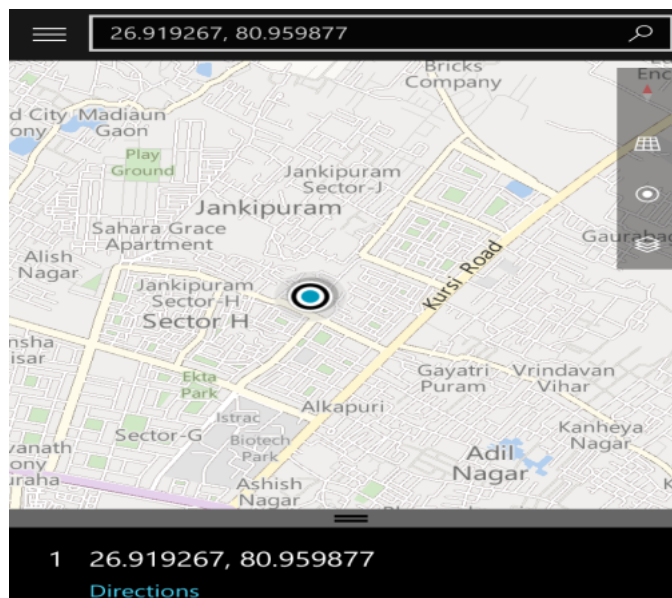
ROM. With help of instruction set it processes the instructions and it acts as interface between GSM and GPS with help of

serial communication of ATMEGA 168 . GPS always transmits the data and GSM transmits and receive the data. GPS pin TX is connected to Rx pin of microcontroller. GSM pins TX and RX are connected to microcontroller.



IV. TRACKING

It would be time consuming to track location on Printed maps. But now a day’s various websites and apps are available on internet which shows online map. Google maps are one of the main and useful website. You can use any one of these websites to track or find the location of vehicle. You can track the location using Longitude and Latitude received in SMS. Using these maps you can track vehicle and get the exact location as well as directions to go to those places from your current/desired location. All you need to do is copy the contents of Text sms received from SMS based Vehicle tracking system using GPS into the Google map.



V. CONCLUSION AND FUTURE SCOPE

The system is all about controlling thefts of vehicles. The system is about making vehicle more secure by the use of GPS, GSM technology and a web application.

It can also be beneficial for:

- a) Parents to look after their children
- b) To track animals in jungles
- c) Delivery services
- d) Cops department and fire services

This project can be further enhanced by the use of camera and by developing a mobile based application to get the real time view of the vehicle instead to check it on PC, which would be more convenient for the user to track the target.

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