

Real Time Vehicle Tracking Using Raspbreey Pi Based on IOT (Internet of Things)

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Abstract- A vehicle following framework is an electronic gadget introduced in a vehicle to empower the proprietor or an outsider to follow the vehicle's area. This paper proposed to structure a vehicle following framework that works utilizing GPS and GSM innovation, which would be the least expensive wellspring of vehicle following and it would fill in as hostile to robbery framework. It is an implanted framework which is utilized for following and situating of any vehicle by utilizing Global Positioning System (GPS) and Global framework for portable correspondence (GSM). This structure will consistently screen a moving Vehicle and report the status of the Vehicle on interest. For doing as such an AT89C51 raspberry pi is interfaced sequentially to a GSM Modem and GPS Receiver. A GSM modem is utilized to send the position (Latitude and Longitude) of the vehicle from a remote spot. The GPS modem will constantly give the information for example the scope and longitude showing the situation of the vehicle. Similar information is sent to the portable at the opposite end from where the situation of the vehicle is requested. At the point when the solicitation by client is sent to the number at the GSM modem, the framework naturally sends an arrival answer to that portable showing the situation of the vehicle regarding scope and longitude continuously.

Index terms- GPS, GSM, Vehicle tracking, Raspberry Pi

1. INTRODUCTION

The security of private and open vehicles is a noteworthy concern these days so having GPS vehicle following framework guarantee their wellbeing while at the same time voyaging. This vehicle following framework can be found in shoppers vehicles as a robbery avoidance and recovery gadget. Police can pursue the flag radiated by the following framework to find a stolen vehicle. For the most part this framework is intended to be

introduced for the four wheelers however for nation like India where larger part of the general population utilizing bikes, here is the least expensive wellspring of an enemy of burglary following framework. Vehicle following frameworks are regularly utilized by armada administrators for armada the executives capacities, for example, steering, dispatch, on-board data and security. Different applications incorporate checking driving conduct, for example, a business of a representative, or a parent with a high schooler driver. Vehicle following frameworks are likewise prevalent in shopper vehicles as a burglary avoidance and recovery gadget. Police can essentially pursue the flag produced by the following framework and find the stolen vehicle.

The remainder of the paper is as pursue. We audit related innovation in area II. In area III we proposed the plan of following framework and usage. We finish up our work, points of interest of gadget and future degree in section IV.

2. RELATED TECHNOLOGY

A. GPS Technology:

The Global Positioning System (GPS) is the main completely practical Global Navigation System (GNSS). The GPS utilizes a star grouping of somewhere in the range of 24 and 32 Medium Earth Orbit satellites that transmit exact microwave flags that empower GPS recipients to decide their area, speed, heading, and time. A GPS collector gets the signs from somewhere around three satellites to figure separation and utilizations a triangulation strategy to process its two measurement (scope and longitude) position or if nothing else four satellites to register its three measurement (scope, longitude and height) position.

Consequently GPS is a key innovation for giving gadget its position. GPS was created by the United States Department of Defense. Its official name is NAVSTAR-GPS. It is initially utilized in military administrations however later permitted the framework accessible free for non-military personnel use as a typical decent. From that point forward, GPS has turned into a broadly utilized guide to route around the world, and a helpful device for guide making, land looking over, business, and logical uses In This gadget we utilize a GPS collector of HOLUX GR-67 arrangement. GPS parameters and determinations are given underneath.

Table-1 GPS parameters and specifications

GPS Module	Chipset	SiRF StarIII Chipset
	Receiver type	20 Channels 'All in view'
	Sensitivity	200,000+effective correlators for fast TTFF and high sensitivity acquisitions
	Protocol format	NMEA-0183
	Start-up times	Hot start: 1 S, Warm start: 38S, cold start: 42 S
	Accuracy of Position	10 meters, 2D RMS
	Power requirement	3.3~5.5VDC, 50mA
	Working Temperature	-10 °C to +60 °C
	Command Statements	GPGGA,GPGSA, GPRMC,GPRSV



Figur1: GPS

B. GSM

1. A GSM modem is a particular sort of modem which acknowledges a SIM card, and works over a membership to a versatile administrator, much the same as a portable phone. GSM (Global

framework for portable) utilizes a procedure called circuit exchanging. This strategy for correspondence enables a way to be built up between two gadgets. When the two gadgets are associated, a consistent stream of computerized information is relayed. GSM systems comprise of thee significant frameworks the Switching System (SS), The Base Station(BSS) and the Mobile station(MS).

2. The Switching framework is employable framework in which numerous pivotal tasks are led, SS frameworks holds five databases with in it which performs distinctive capacities. On the off chance that we talk about real undertakings of SS framework it performs call handling and endorser related capacities. These databases from SS frameworks are HLR, MSC, VLR, AUC and EIR. The MSC in collaboration with Home Location register (HLR) and Visitor area register (VLR), deal with versatile calls and steering of telephone calls. Validation focus (AUC) is little unit which handles the security end of Real Time Vehicle Tracking System by GSM and GPS Technology utilizing raspberry pi

The structure and Equipment identity register (EIR) is another basic database which holds huge information as for convenient kinds of gear. The Base Station System (BSS):

The base station framework have critical job in portable correspondence. BSS are fundamentally outside units which comprise of iron poles and are for the most part of high length. BSS are in charge of interfacing supporters (MS) to portable systems. All the correspondence is made in Radio transmission. The Base station System is additionally separated in two frameworks. These two frameworks, they are BTS and BSC. BTS (Base Transceiver station) handles correspondence utilizing radio transmission with versatile station and BSC (Base station controller) makes physical connection between endorser (MS) and BTS, at that point oversee and controls elements of it. III. Versatile Station (Subscriber):

MS comprise of a portable unit and a keen card which is additionally alluded as a supporter Identity Module (SIM) card. This card fitted with the GSM Modem and gives the client increasingly close to home portability. The gear itself is recognized by a

one of a kind number known as the International Mobile Equipment Identity (IMEI).

The GSM modem utilized in this gadget is SUNROM SIM 900D. The parameters and determination of our GSM modem is given beneath.

Table-2 GSM Modem parameter and specification

GSM Modem	Frequency band	Quad band 850/900/1800/1900
	Transmission power	2 W @850/ 900 MHz 1 W @800/1900MHz
	Baud rate	9600
	Power supply	12V, 1A
	Operating temperature	-40 °C to 85 °C



Figure-GSM

C. Raspberry pi

The raspberry pi is the core of this gadget. It is the interface between the GSM module and the GPS collector. A raspberry pi is a little PC on a solitary coordinated circuit containing a processor center, information memory, A/D converter and programmable info/yield peripherals. In this gadget the raspberry pi is modified so that it invigorates the GSM modem in message sending when a solicitation is send by the client. Raspberry pi are a lot littler and disentangled with the goal that they can incorporate every one of the capacities required on a solitary chip. Having the raspberry pi is of incredible use, as it has low plan cost and add knowledge to the framework.



Figure-Raspberry pi

3. DESIGN OF TRACKING SYSTEM

In this Paper it is proposed to structure an installed framework which is utilized for following and situating of any vehicle by utilizing Global Positioning System (GPS) and Global framework for portable correspondence (GSM). In this Device AT89C51 raspberry pi is utilized for interfacing to different equipment peripherals. The present structure is an inserted application, which will ceaselessly screen a moving Vehicle and report the status of the Vehicle on interest. For doing as such an AT89C51 raspberry pi is interfaced sequentially to a GSM Modem and GPS Receiver. A GSM modem is utilized to send the position (Latitude and Longitude) of the vehicle from a remote spot. The GPS modem will constantly give the information for example the scope and longitude demonstrating the situation of the vehicle. The GPS modem gives numerous parameters as the yield, however just the NMEA information turning out and sent to the versatile at the opposite end from where the situation of the vehicle is requested. At the point when the solicitation by client is sent to the number at the modem, the framework naturally sends an arrival answer to that versatile demonstrating the situation of the vehicle as far as scope and longitude. The square chart of following framework utilizing GPS and GSM innovation is introduced in figure 3. The venture is vehicle situating and route framework we can find the vehicle around the world with miniaturized scale controller, GPS recipient, GSM modem. Raspberry pi utilized is AT89C51. The code is written in the inward memory of Raspberry pi for example ROM. With assistance of guidance set it forms the guidelines and it goes about as interface among GSM and GPS with assistance of sequential correspondence of AT89C51. GPS dependably transmits the information and GSM transmits and get the information.

GPS stick TX is associated with raspberry pi and GSM pins TX and RX are associated with raspberry pi sequential ports. Raspberry pi speaks with the assistance of sequential correspondence. First it takes the information from the GPS recipient and after that sends the data to the proprietor as SMS with assistance of GSM modem. GPS collector takes a

shot at 9600 baud rate is utilized to get the information from space Segment (from Satellites), the GPS estimations of various Satellites are sent to raspberry pi AT89C51, where these are handled and sent to GSM. At the season of handling GPS gets just \$GPRMC values as it were. From these qualities raspberry pi takes just scope and longitude esteems barring time, elevation, name of the satellite, validation and so on. For example LAT: 1728:2470 Real Time Vehicle Tracking System by GSM and GPS Technology utilizing raspberry pi LOG: 7843.3089 GSM modem with a baud rate 57600.GSM is a Global framework for portable correspondence in this gadget it goes about as a SMS Receiver and SMS sender. The power is provided to segments like GSM, GPS and Micro control hardware utilizing a 12V/3.2A battery .GSM requires 12v,GPS and raspberry pi requires 5v .with the assistance of controllers we direct the power between three parts.

4. CONCLUSION

In this paper we have proposed an enemy of robbery framework which can be utilized to follow a vehicle fitted with the proposed gadget in it. It can likewise be utilized in natural life following, resource following and in stolen vehicle recuperation. Later on we may coordinate other related gadgets in a vehicle, for example, sensors. We can make a server to see the vehicle course and other data on our PC and we can spare its direction. The sensors introduced in our vehicle can report the vehicle data to our server and it can frame a wise following framework. There are different reasons why vehicle proprietors and open vehicle administrators want to have a GPS. You can decide your area, regardless of whether you are voyaging locally or in a remote land, having a GPS is genuinely leeway. In the event that you think you are lost, you can utilize your GPS recipient to know your careful area. Vehicle following frameworks are regularly utilized by armada administrators for armada the board capacities, for example, directing, dispatch, on-board data and security. Different applications incorporate observing driving conduct, for example, a business of a representative, or a parent with an adolescent driver

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