A Real Time Prototype For Vehicle Tracking System

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Abstract- *A REAL TIME PROTOTYPE FOR VEHICLE TRACKING SYSTEM is used to describe the location of a vehicle through GPS technology. The GPS is mainly used to establish the communication path between satellites and ground stations and identify the exact location of a vehicle, with the help of VTS now it is very easy to trace vehicles with accurate location and time on the earth. The VTS also provides the details about vehicle accidents and sends the emergency alert message to our registered mobile Number. The VTS consists transmitting unit at vehicle side and monitoring unit at user side.*

Keywords- VTS, GPS, GSM, Emergency alert

I. INTRODUCTION

Nowadays Embedded Systems are plays a major role in our daily life to fulfill the daily needs of a human being with less effort even to do the complex and specific tasks instead off a human being. The Vehicle Unit consists of a circuit which is designed with GPS and GSM modem hardware parts and is constructed with the primary functions of a modem that keep tracking the vehicle by getting the information through GPS receiver from GPS satellites. The GSM modem sends the vehicle location data to the base station. The microcontroller is play a vital role in VTS device. In this section we are discussing about some existing systems related to VTS.

Prof. (Dr.) Bharati Wukkadada, Allan Fernandes [1] offers an anti-theft system that makes a vehicle more immune by the help of GPS. By using this system they can track a vehicle.

Mrs. K.P.Kamble [2] Vehicle tracking system is used generally for improving overall productivity which offers better return on your investments. For handling larger job loads within a time route planning is important. Both for personal as well as for business purpose, Vehicle tracking improves safety and security, communication medium, performance day-to-day living.

Noppadol Chadil Apirak Russameesawang [3] proposed an open source GPS tracking system, Goo-Tracking system, using commodity hardware and open source software. The Goo-tracking system has shown the feasibility of using it for fleet management. It can also be used for lost vehicle tracking when working with a car alarm system.

Amol Dhuma, Amol Naikoji [4] proposed a system which allows organizations to track their vehicles and to get exact location of vehicle. The system allows those companies to monitor the travelled routes through a web client that uses the Google Maps API and shows colors on the map to indicate if the devices on route. The general evaluation result is that the system proved to be reliable as to view the positioning of the devices.

B. Hari Kumar [5] novel method of vehicle tracking and monitoring systems that will provide better security for the vehicles has been discussed. They also implemented the monitoring of engine's temperature and even the speed control at the specific locations detected by the GPS along with the voice output.

Sathe Pooja [6] Automobile theft and accidents in the transportation systems have caused significant loss of lives, waste of energy, and loss in productivity. To improve the safety, security and efficiency of the transportation systems and enable new mobile services and applications for the traveling public, the project have been developed, which apply rapidly emerging information technologies in vehicles and transportation infrastructures.

II. OVERVIEW OF THE PROPOSED SYSTEM

The main modules present in our proposed system are LPC2148 microcontroller, GSM Modem, GPS, SOS Button, Piezo electric buzzer. MAX232 is used as interfacing between GSM, GPS with the ARM7 Microcontroller. MAX232 is used for the synchronization between GSM and ARM7 and also between GPS and ARM7. ARM7 (LPC2148) microcontroller is used for interfacing to various hardware peripherals. The GPS modem is used to detect the location. It

converts location details into the latitude and longitude indicating the position of the vehicle. The below Fig.1 shows the block diagram of the Proposed System.

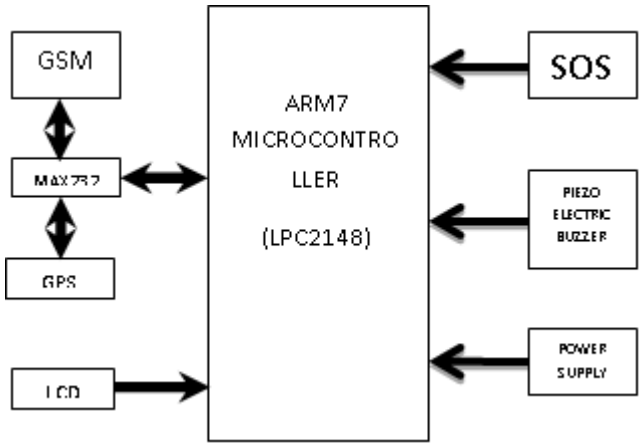

Fig.1 Block diagram of the Proposed System

III. IMPLEMENTATION OF THE PROPOSED SYSTEM

In this section we are discussing about implementation of the proposed system. The below Fig.2 shows that Real time Prototype of the Proposed system. All blocks are connected to the microcontroller.

Fig.2 Real time Prototype of the Proposed system.

IV. RESULTS AND DISCUSSIONS

First microcontroller starts initializing which is displayed by the LCD as shown in Fig.3

Fig.3 Microcontroller initialization displayed by LCD

Case1: User Sending Request

- User sending request to the GSM of VTS in the form of SMS and this SMS must contain a password. The password here we use is "1234" shown in the fig.4

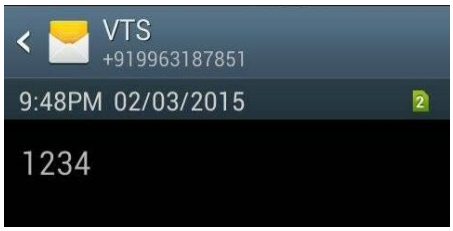

Fig.4. User Sending SMS to VTS.

- Then microcontroller fetches the number from the obtained SMS and verifies this number whether it is valid number or not which is shown in the below Fig.5

Fig.5. Microcontrollers Fetches the Mobile Number.

- Verification of the mobile number includes verification of the message obtained. If the message contains a valid password (1234) then access is granted for further operations shown in the Fig.6

Fig.6. Verifying the Password.

- Then GPS starts working and gets a frame from the satellites. From this frame microcontroller gets only latitude and longitude shown in the Fig.7

Fig.7 GPS Tracking.

- This information are send to GSM and then GSM starts sending message to user shown in the Fig.8

Fig.8 GSM Message Sending.

- Then user gets reply from VTS which contains latitude and longitude message as shown Fig.9

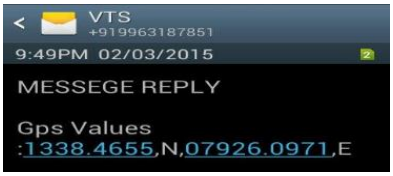

Fig.9 User Gets Reply From VTS.

Case2: In case of accidents

- VTS detects the vibrations and once the vibrations are detected shown in the Fig.10

Fig.10. Piezo Electric Buzzer Detects Vibrations.

- GSM sends latitude and longitude information to the number that is already stored in the microcontroller and also indicates that the vibration is detected shown in the Fig.11

Fig.11 User Gets Reply From VTS

Case3: In case of emergencies

- In case of emergency, driver can press the switch and the same procedure from fig: 6.6 are repeated. A message "SWITCH IS PRESSED" is shown on the LCD Screen. GSM sends latitude and longitude information to the number that is already stored in the microcontroller and also indicates that the switch is pressed shown in the Fig.12

Fig.12 User Gets Reply from VTS.

- As the SMS obtained contains latitude and longitude pair. To know the address corresponding to that GPS pair, an User Interface is created. The home page of this interface is given below Fig.13

Fig.13. Home Page of GUI**.**

- For example if the latitude value is 1338.4599(DDMM.MMMM), in this 13(DD) indicated degrees and 38.4599 indicate minutes (MM.MMMM). Similarly for the longitude values. If the start button is pressed then it will lead to the page shown below. Entering the values of DD MM.MMMM of latitude and longitude. Example values are latitude:13 38.4599 and longitude:79 26.0962

Fig.14. GPS Pair to Address Convertor page.

- Then click on convert. Then these entered latitude and longitude pair is converted into address as shown in the Fig.15

Fig.15 Address is Shown Along with Converted Decimal Degrees.

- If the entered values are correct then the address is displayed. Else a message "invalid address" is displayed. In this GUI, the GPS coordinate pair is converted to decimal degrees. Because the database contains decimal degrees and the address as shown in the TABLE.1

Table.1 Latitude, Longitude Pair and Their Corresponding Address

lat	longi	add
13.653	79.333	Srinivasa Mangapuramu
13.622	79.312	Sree Vidyanikethan Degree College
13.622	79.282	(NULL)
13.634	79.389	Alipiri Road, Tirupati
13.63	79.398	SVU, Tirupati
13.64	79.407	SV Medical College
13.623	79.389	Tumalagunta Bus Stop
13.583	79.316	chandragiri
13.642	79.427	Leelamahal, Tirupati
13.581	79.281	Ithepalli
13.651	79.412	K.T Road, Tirupati
13.656	79.421	Kapil Thertham
13.628	79.408	SV Music College
13.639	79.399	Science Center Road, Tirupati
13.63	79.360	Zoo
13.64	79.434	Akkaram Palle, Tirupati

V. CONCLUSION

A Real Time Prototype for Vehicle Tracking System Is Successfully Implemented With the help of GPS receivers and GSM modem. Vehicle Tracking System resulted in improving overall productivity and reduces the cost with better fleet management that in turn offers better return on your investments.

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