



Real Time Vehicle Tracking System

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Abstract: Keeping track of company owned vehicles is challenging to any organisation that owns multiple vehicles. Solution is provided for this inconvenience, by 'Real Time Vehicle Tracking System' (RTVTS), which is a GPS, and GPRS enabled tracking device that works on the principles of IoT (Internet of Things). RTVTS acquires the current geological location of the vehicle, which is translated into a location "pin" on a map depicting the actual location of the vehicle which is dynamically updated on map, in correlation it's changing position. This mechanism enables the Owner to keep track/monitor the movement of the vehicle in real-time.

Keywords: Tracking Device, Real time, Geological Location, Principles of IoT

I. INTRODUCTION

The vehicle tracking systems which are in use as of date, provide service which is not up to the mark, as they have signal transmission problems when the vehicle which is being tracked drives into building or when the GPRS/GSM receivers lose the carrier network's signal. This results in inaccurate location readings which defeats the main purpose of real time vehicle tracking. However, the main cause of concern in the existing system is that the vehicle tracking system under question can be manually switched off and can result in the theft of the vehicle being tracked or damage to the vehicle. The problems which are going to be addressed and overcome by the 'real time vehicle tracking system' are the system being accessible by the driver of the car, which can be operated and switched off, and the system being rendered useless when the carrier GPRS signal is lost.

II. ABOUT LINKIT ONE

The LinkIt ONE development board is an open source, high performance board for prototyping Wearables and IoT devices. It's based on the world's leading SoC for Wearables, MediaTek Aster (MT2502) combined with high performance Wi-Fi (MT5931) and GPS (MT3332) chipsets to provide you with access to all the features of MediaTek LinkIt. It also provides similar pin-out features to Arduino boards, making it easy for you to connect to various sensors, peripherals, and Arduino shields.

LinkIt ONE is a co-design product by Seeed Studio and MediaTek. It brings together the parties' knowledge in open hardware and industry leading reference designs for Wearables and IoT devices to create this powerful development board.

III. ABOUT REAL TIME VEHICLE TRACKING SYSTEM

The Real Time Vehicle Tracking System utilizes the LinkIt ONE Development board's GNSS features to acquire the position and the speed of the vehicle. The data is then uploaded to the MediaTek Cloud Sandbox (MCS) over a GPRS connection. MCS then provides a visualization of the data on a map. For more advanced metrics an accelerometer is also attached to the board, to collect data on the g-forces generated by the vehicle. The fully functioning IoT prototype (Real Time Vehicle Tracking System), gathers GPS and accelerometer data, transmits the data through a GPRS connection to enable control and visualization using a cloud service through a web interface or Android app.

A. Proposed System

A work around to the Existing System is proposed by the 'Real Time Vehicle Tracking System' which is an independent unit, that will be placed in an inaccessible location in the vehicle and can only be operated remotely by the organisation, and not by the driver of the car.

Accurate location readings due to GPRS/ GSM signal loss will be actively avoided with the provision of a Wi-Fi antenna which enables the system to connect to the vehicle Wi-Fi network or any other open Wi-Fi network it finds, to transmit the location data.

B. Construction

The ‘real time vehicle tracking system will be constructed using the latest state of the art IoT equipment, which is developed as a fully functioning prototype which will be built to achieve increased efficiency, and reliability as compared to the existing systems currently in use. The ‘real time vehicle tracking system’ utilizes LinkItONE development board’s GNSS features to acquire the position and speed of vehicle. Data is then uploaded to MediaTek cloud Sandbox(MCS)over a GPRS connection. MCS then provides visualization of data on a map.

C. Components

Components used to construct the RTVTS prototype:

1) LinkIT ONE Development Board:

The Mediatek LinkIT ONE Development board is an IoT board which is used as a parent board to which the GNSS, WIFI, GPRS and Accelerometer sensors are connected. The parent board has a microcontroller built in, and is used to send the GNSS coordinates, and accelerometer data to the satellite, via the GPRS/WIFI antennae.

2) GNSS Antenna:

A GNSS (Global Navigation Satellite System) antenna connected to the parent board which is used to obtain the exact positional geographic location of the system it is connected to, from the GNSS satellite.

3) WIFI Antenna:

A WIFI antenna is connected to the parent board which is used to connect to a secure WIFI network to transfer the GNSS coordinates to the cloud.

4) GPRS Antenna:

A GPRS antenna is connected to the parent board which is used to transfer the GNSS coordinates to the cloud, via the GPRS connection provided by the carrier network of the inserted SIM Card.

5) ADXL Accelerometer:

An ADXL Accelerometer is connected to the parent board which records the G-Forces experienced by the system when in use.

6) Battery:

A 1000mah battery is used to power the system. Estimated power backup is 8 hours.

D. System Architecture



FIGURE 1: SYSTEM ARCHITECTURE

E. Figure Captions

The various pins of the LinkIT ONE Development board are shown in Figure 1. The system built here only utilizes the GSM Antenna Port, WIFI+BT Antenna Port, GPS Antenna port, GROVE sensor port, Li Battery port, and the Micro USB port.

F. Conclusion

Thus, a fast and efficient Real Time Vehicle Tracking System can be constructed by making use of the Mediatek LinkIT ONE Development board, and all of the sensors mentioned above.

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