

Android Based Smart Vehicle Tracking System

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ABSTRACT

Android smartphones have brought world on hands bringing all available data on a flick. GPS one such technology is very emissive that have laid its application in every fields providing us the leisure of knowing our current position and our surroundings. Our one such aim is to provide the leisure to track a vehicles position using GPS and integrating it with android smartphone via android application. Our work provide details about the vehicles current location which can be accessed through android smartphone. Through this android application user can have access to more than one vehicle integrated to it-once a vehicle registered through the app its GPSs location is continuously monitored and user can also set notification to notify when the vehicle reaches the users proximity. This feature can be used to notify the location of one daily commuter.

Keywords : MSP430, GPS, WIFI, Vehicle tracking, IoT.

I. INTRODUCTION

GPS tracking device receives signals from the GPS satellites whereby each satellite knows the exact distance from the other satellites in its proximity. Depending on the time it takes for a signal to reach the device from each satellite, the GPS receiver can calculate its exact location on the ground. The GPS tracking device can then route that information back to an online tracking system for mapping. The main aim of this Android application is to track the buses. Which would give the exact location of buses with the help of Google map and help the users to plan their way to reach their college on time. Android mobiles has become common and spread everywhere. In addition, this will also enhance the security since the movement of the buses is always available. A vehicle tracking system is one of the most common applications used for tracking vehicles which is also used to prevent vehicle from theft.

Today Android Applications are very good source for tracking the vehicles. It provides real time data on the movement of vehicles. Android phones are widely used for this purpose because they have GPS device attached with it. It acts as both transmitter as well as receiver. A

vehicle tracking system combines the use of automatic vehicle location in individual vehicles with software that collects these fleet data for a comprehensive picture of vehicle locations. Modern vehicle tracking systems commonly use GPS for locating the vehicle, but other types of automatic vehicle location technology can also be used. Vehicle information can be viewed on electronic maps via the Internet. Urban public transit authorities are an increasingly common user of vehicle tracking systems, particularly in large cities.

Objective

To provide people with a best-integrated and user-friendly android application which is integrated to the vehicle using our vehicle tracking system and by synchronizing vehicle location we can provide exact location of our vehicle .also providing a feature to alert when vehicle reaches users proximity.

II. METHODS AND MATERIAL

A. Findings of the Study (Literature Survey)

A vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third

party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and Cloud technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS). This design will continuously integrate watch a moving Vehicle and report the status of the Vehicle when needed.

This project is extremely feasible. Since gadgets used are already into human livelihood. Android application are easy to develop hence can be made available for free of cost When put into mass implementation expenses are reduces to the most

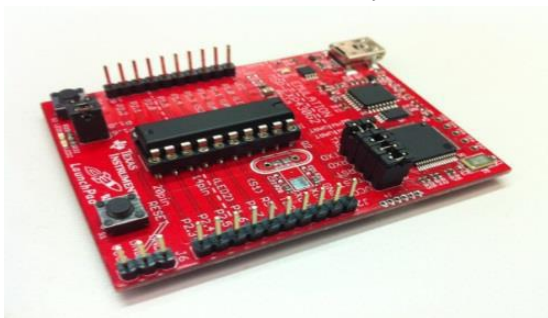
B. Block Diagram

Figure1. Block diagram of the proposed system (Android based smart vehicle tracking system) After setting up a tracking module, the above mentioned GPS and Wi-Fi in the block diagram are used to transmit location data of the vehicle system and can be located using android phone via android app.

C. Hardware Materials

1. MSP430 Micro Controller

The definition of a micro controller is somewhat difficult due to the constantly changing nature of the silicon industry. What we today consider a micro controller with medium capabilities is several orders of magnitude more powerful, than the computer used on the first space missions. Nevertheless, some generalizations can be made as to what characterizes a microcontroller. Typically, microcontrollers are selected for embedded system projects, i.e., control systems with the limited number of inputs and outputs where controller is embedded into system.



2. SKG13BL GPS Module

The SKG13BL is a complete GPS engine module that features super sensitivity, ultra-low power and small form factor. The GPS signal is applied to the antenna input of module, and a complete serial data message with position, velocity and time information is resented at the serial interface with NMEA protocol or custom protocol.



D. Liquid Crystal Display (LCD)

Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

An LCD consists of two glass panels, with the liquid crystal material sand witched in between them. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbols or patterns to be displayed polymeric layers are present in between the electrodes and the liquid crystal, which makes the liquid crystal molecules to maintain a defined orientation angle.

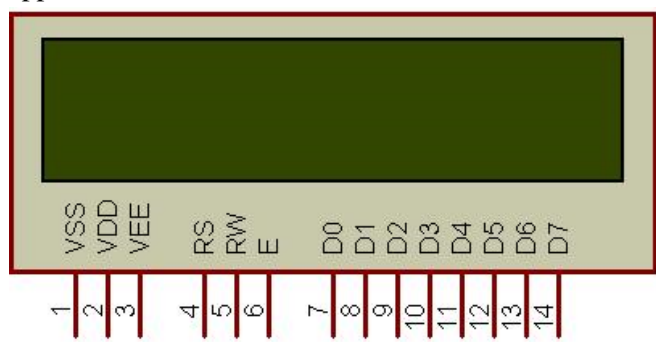
One each polarizes are pasted outside the two glass panels. These polarizes would rotate the light rays passing through them to a definite angle, in a particular direction. When the LCD is in the off state, light rays are rotated by the two polarizes and the liquid crystal, such that the light rays come out of the LCD without any orientation, and hence the LCD appears transparent.

When sufficient voltage is applied to the electrodes, the liquid crystal molecules would be aligned in a specific direction. The light rays passing through the LCD would be rotated by the polarizes, which would result in activating / highlighting the desired characters. The

LCD's are lightweight with only a few millimeters thickness. Since the LCD's consume less power, they are compatible with low power electronic circuits, and can be powered for long durations.

The LCD does not generate light and so light is needed to read the display. By using backlighting, reading is possible in the dark. The LCD's have long life and a wide operating temperature range. Changing the display size or the layout size is relatively simple which makes the LCD's more customers friendly.

The LCDs used exclusively in watches, calculators and measuring instruments are the simple seven-segment displays, having a limited amount of numeric data. The recent advances in technology have resulted in better legibility, more information displaying capability and a wider temperature range. These have resulted in the LCDs being extensively used in telecommunications and entertainment electronics. The LCDs have even started replacing the cathode ray tubes (CRTs) used for the display of text and graphics, and also in small TV applications.



4. Wifi Module

ESP8266 offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor.

When ESP8266 hosts the application, and when it is the only application processor in the device, it is able to boot up directly from an external flash. It has integrated cache to improve the performance of the system in such applications, and to minimize the memory requirements.

Alternately, serving as a Wi-Fi adapter, wireless internet access can be added to any microcontroller-

based design with simple connectivity through UART interface or the CPU AHB bridge interface.

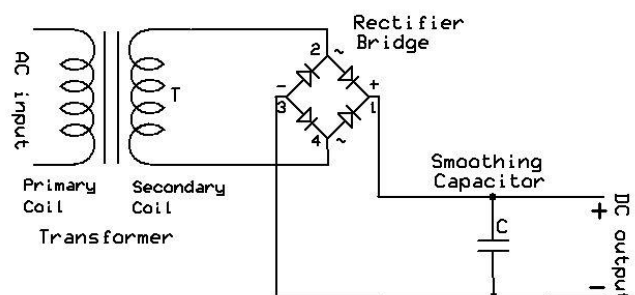
ESP8266 on-board processing and storage capabilities allow it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. With its high degree of on-chip integration, which includes the antenna switch balun, power management converters, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area.

Sophisticated system-level features include fast sleep/wake context switching for energy-efficient VoIP, adaptive radio biasing for low-power operation, advance signal processing, and spur cancellation and radio co-existence features for common cellular, Bluetooth, DDR, LVDS, LCD interference mitigation.



5. Power Supply

Regulated power for the SKG13BL is required. The input voltage V_{cc} should be 3.0V to 4.2V range, current is no less than 100mA. Suitable decoupling must be provided by external decoupling circuitry (10uF and 1uF). It can reduce the Noise from power supply and increase power stability. Main power supply V_{cc} current varies according to the processor load and satellite acquisition. Maximum V_{cc} peak current is about 30 mA during acquisition.



III. RESULTS AND DISCUSSION

GPS starts sending coordinates to MCU database. MCU sends data to server channel via wifi module. Server contained with channels referring tabulations are updated. Location received via android app from data base. Received location Displayed via google map.

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