

# ANDROID DASHBOARD AND SMART VEHICLE MANAGEMENT

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## Abstract—

This system designs to provide a cheap cost means of monitoring vehicle parameters and displaying them on the android mobile smartphone. This article also represents the measurement and displaying readings of different parameters like oil level ,engine temp,speed etc. This will be helpful in the maintenance of the vehicle. An electronic hardware is built to have an interface between the Bluetooth module and phone which is situated in the android mobile device. This system is able to transmit vehicle information to the RTO in case of exceeding traffic speed rules via SMS.

## I. INTRODUCTION

As computer and Information technology is changing rapidly, vehicles are undergoing dramatic changes in their capabilities. Even though some vehicles provisions for deciding to either generate warnings for the human driver or controlling the vehicle automatically, they usually must take these decisions in real time with only incomplete information. So, it is necessary that human drivers still have some control over vehicle.

An intelligence system needs to be developed to overcome these mistakes. So these system is proposed where mistakes done by the driver are eliminated. Most of the intelligent car systems have monitoring system only. Antilock brakes,speed sensors and other automatic systems are present in sports cars and other luxury cars only. But these cars are not affordable to everyone. So a system needs to be developed which can be implemented in every car. The sensor system is placed within a car to inform its driver of any dangers that interface for indicating various parameters of vehicle status like temperature, pressure, oil level etc. along with we used GSM modem. The data acquisition system based on microcontroller uses ADC to bring all data from analogue to digital format.. Since the vehicle information system are spread out all over the body of a practical vehicle. In our project we are measuring vehicle parameters like oil level, engine temp. ,speed of vehicle etc.

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In advance we are introducing a new application as we are using android operating system which includes GPS service . in that ,if the vehicle crosses the particular speed limit the SMS will go to RTO(Regional Traffic Office).In that message all information of the vehicle will be sent to the RTO website.

The project consist ARM microcontroller (LPC2148) via serial communication it will pass the information on the android cellphone.

## 2. SYSTEM OVERVIEW

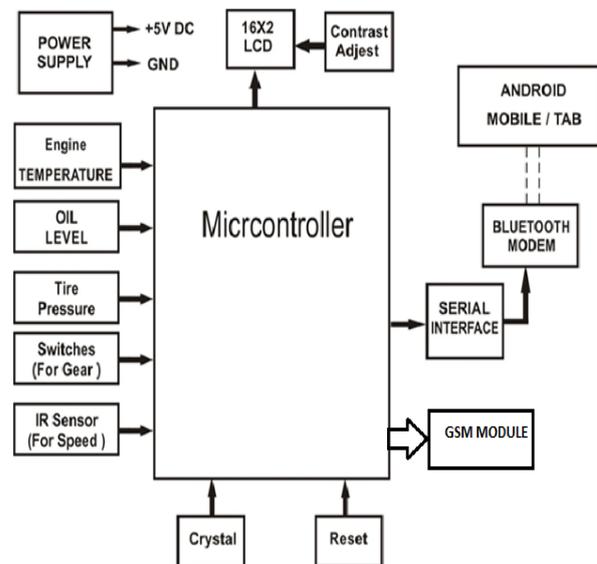


Fig.1 Block Diagram Of system

ARM the word stands for Advanced RISC Machines which is invented in 1990, under the ownership of Acorn and Apple ,VLSI. Acorn which developed a 32-bit RISC processor for its own use (used in Acorn Archimedes)

ARM is a 32-bit RISC-processor core (32-bit having two inbuilt UART (Universal asynchronous receiver transmitter) port. ARM has two in built ADC.

As the system utilizes the information received from the various sensors (Pressure, oil, Temp etc.).These all type of analog information is converted digital form with the help in built ADC.The use of one of UART port in this system is to take analog data from various sections of the vehicle with the help of sensors ; the use of other UART is likewise transmitting that received information to the smartphone with the help of Bluetooth. The Bluetooth model being used in this is HC-06(which has a range of 10meters).

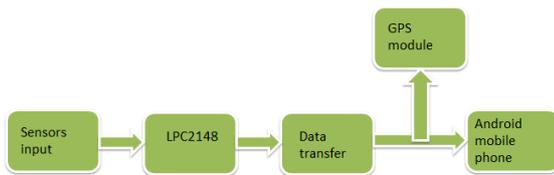


Fig.2 System overview

Bluetooth modems being used for transferring the data. The Bluetooth modem to be used is HC 05/06.

For mobile devices, an application is developed on the Android operating system for a smartphone. It includes a software heap that contains a middleware, operating system, and other key applications.

Android is an operating system that uses JAVA as a programming language and runs on the LINUX Kernel. Other operating systems in the market along with Android are RIM, Windows Mobile, Symbian, iPhone OS (iOS) etc.

When compared with other mobile phone operating systems, Android has four advantages as follows.

- 1) The Android application improvement is easy and quick as the platform provides a great deal of user libraries and tools to the developers.
- 2) Android is an open mobile platform system; according to the need, users can expand and customize their applications.
- 3) All applications are run in effective machine resources.
- 4) The application developers can allocate required data from the WWW (World Wide Web) and store it locally in the Android platform because Android can access the core mobile devices.

#### GPS Method of Operation

A GPS receiver analyzes its position by carefully judging the signals sent by the assemblage of GPS satellites high above the Earth. Continuously, each satellite transmits messages containing the time the message was sent, a particular orbit for the satellite sending the message. These signals collapse at the speed of light through external space, and slightly slower through the sky. The receiver uses the advent time of each message to measure the remoteness to each satellite, thereby establishing that the GPS receiver is almost on the surface of a sphere centered at each satellite. When appropriate, the GPS receiver also uses the awareness that the GPS receiver is on (if vehicle altitude is known) or near the surface of a sphere focused at the Earth center.

This information is then used to approximate the position of the GPS receiver as the connection of sphere surfaces. The resulting organizations are rehabilitated to a more opportune form for the user, such as latitude and longitude, or location on a map, and then displayed. It might seem that three sphere surfaces would be enough to solve for position, since space has three scopes. However, a fourth sphere is needed for two reasons. One has to do with location, and the other is to correct the GPS receiver's clock. It turns out that three sphere surfaces usually intersect in two points. Thus, a fourth sphere surface is needed to determine which intersection is the GPS receiver position.

For near-Earth vehicles, this knowledge that it is near Earth is sufficient to determine the GPS receiver position since for this case there is only one intersection which is near Earth. A fourth

sphere surface is also needed to correct the GPS receiver clock. More precise information is needed for this task. An estimate of the radius of the sphere is required. Therefore, an approximation of the Earth's altitude or radius of the sphere centered at the satellite must be known.

### 3. LITERATURE REVIEW

- Several works are done on ON BOARD DIAGNOSTIC systems and several applications are made using handheld phones.
- "Design of an integrated mobile system to measure blood pressure," in this article, mobile phones are used to measure blood pressure of the human body. In Proc. IEEE 18th Symposium on Communications and Vehicular Technology by Tahat, A. Sacca, Y. Kheetan
- "An expert system for engine fault diagnosis: development and application," Journal of Intelligent and it states various faults in engine like Engine temperature, water level of engine etc. This article was presented by H. Gelgele, Kesheng Wang, Manufacturing, pp
- System use ARM (Advanced RISC processor) which is a 32-bit processor to indicate vehicle status like speed, fuel level, engine temp. This article was presented by Thet. H. Gelgele, Kesheng Wang,
- In our project, we are measuring vehicle parameters like oil level, engine temperature, speed of vehicle etc. In advance, we are introducing a new application as we are using the Android operating system which includes GPS service. In that, if the vehicle crosses the speed limit, the SMS will go to RTO. In that message, all information of the vehicle will be displayed on the RTO website.

### 4. ALGORITHM

We are going to develop an Android Dashboard application:

System Algorithm:

- 1) Initialization of UART and respective ports.
- 2) Encryption of various data will take place.
- 3) ADC calibration for each sensor.
- 4) Transmission of various types of sensor data through Bluetooth of hardware.
- 5) Check for RFID reader to know about area (speed limit).
- 6) Check for speed.
- 7) If particular speed exceeds, SMS to RTO.

Android Algorithm:

- 1) Connection of mobile and hardware Bluetooth will be made.
- 2) Decryption of various data will take place.
- 3) Receiving of various types of data (vehicle parameters) through Bluetooth of mobile.
- 4) That data will be shown in edit text of Android mobile phone.
- 5) Sensored data will be updated in real time.

## 5. CONCLUSION:

We have designed an integrated system which is a combination of hardware unit and a user friendly Android based mobile application software with interesting graphics utilized to create an on-board vehicle diagnostic system. There is iteration between the mobile application software and hardware interface unit wirelessly with the help of Bluetooth and the parameter (eg.oil level, tyre pressure and engine temperature) will be displayed on the dashboard.

In addition we are introducing one more application using GPS facility in the Android. This will be helpful in avoiding traffic rules.

## 6. RESULT:



## 7. REFERENCES:

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