Central Locking System Using Android Application

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Abstract- *In this paper, will focus on developing an advanced security system in car. Traditional car security system depends on mechanical key if under any circumstances the key is loss then there is possibility of theft of vehicle. Nowadays smart thieves know how to deactivate the central locking system wiring connected to the various car units and steal car fuel. To solve such a above car automation side effects we have come up with an android mobile based application and control unit, interacting using Bluetooth and GSM. Java coding done using eclipse along with android 5.0.2 Lollipop version is utilized to create particular application for android cell phone. In this system we use ARM LPC2138 is control unit of our entire project embedded within microcontroller is program that helps the microcontroller to take the action on input provided by the output of the sensors. Once the fuel level changes and the car is in locked state in this cases may be driver is away from the car the message is send to driver of the car. In most of the time we have observed that locking system are nuisance in public places, where the sensors are so sensitive that even a small pebble falls on the car, continuous beeps are generated. In these cases if the driver is away from the car he can't off it. This drawback is also overcome in this system he can off it even if he is at long distance from his car by using his android based cell phone application. The one another feature is the driver can lock his is even he is away from the car.*

Keywords- Embedded System, GSM, Bluetooth, and Android based cell phone.

I. INTRODUCTION

These days' car theft cases are increasing day by day. Thus car central locking system using Android based application cell phone gives the best guarantee to protect your car from different kinds of theft cases [4, 6]. In today's lifestyle technology has become very vast in many ways thereby security is very essential day by day life. In last two to three decades, India has progressed at such a wide rate that many industrial, home automation, security systems and building controls are some of the areas where in various research in the use of technology is widely taking place as we speak are strongly established themselves here. A vehicle with central locking system using android application provides high security to vehicle and helps the user to lock and unlock ignition from the mobile application [6]. Mainly two types of central locking systems are used in auto industry; those are automatic central locking system and manual central locking system. This system design for to ensures smoother and secured operation, provide real time Information such as fuel level, touch detection when car is in off state. This system may also useful for communication process among the two points; the main concept in this system design is introducing the mobile communication in to the embedded system.

II. METHODOLOGY

Many embedded systems have substantially different designs according to their functions and utilities. In this project , structured modular design concept is adopted and the system is mainly consist of a single microcontroller, relay, touch screen, buzzer, vehicle switch (push button switch), fuel sensor, Bluetooth module and Android application based cell phone.

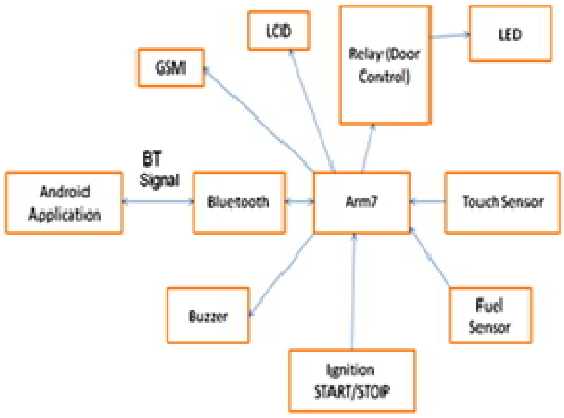

Fig no.1: Block Diagram

A. ARM 7

The microcontroller located at the centre forms the control unit of the entire project. Embedded within the microcontroller is a program that helps the microcontroller to take action based on the inputs given by the output of the sensors. With ARM7 the new vehicle security system integrated various hardware modules such as wireless transmission [2]. This system implements the functions of GSM system. It is designed based on low power 32 bit ARM7 [2]. It is high performance and low cost solution for the applications.

B. TOUCH SENSOR

Whenever anyone touches the touch screen an output voltage is generated which is fed to the microcontroller input pins. The microcontroller then triggers the buzzer to beep while a message is also transmitted to the driver of the particular vehicle. Using the application developed for the Android cell phone the driver can switch off the buzzer without locking or unlocking the car door.

C. ANDROID APPLICATION

The microcontroller take action on the incoming voltages from the sensor depending on the program embedded within it. The output of the microcontroller is passed to Android cell phone via Bluetooth [5]. With the Android application developed for the particular cell phone, incoming data is converted to voice output. Java coding done using Eclipse, along with Android 4.0 SDK is utilized to create the particular application for the Android cell phone. The android application is used as a key for opening and closing locks of vehicles, and also to switch off the buzzer [1].

D. IGNITION START/STOP

Vehicle switch is provided to demonstrate the start and stop of the car.

E. FUEL SENSOR

When the vehicle switch is turned off the level of the petrol is indicated by the fuel sensor. If in the off state the petrol level begins to drop from its last noted level, the fuel sensor output voltage is noted by the microcontroller, which sends the data to the driver of the car via Bluetooth.

F. BUZZER

A buzzer take input and gives response by sound. Buzzer takes energy and converts in to acoustic energy. Microcontroller triggers the buzzer in response to the output of sensors.

G. GSM

A GSM modem is a specialized type of a modem which accepts a SIM card and operates over a subscription to a mobile operator, just like mobile phone [4,3]. In this project we also use GSM when driver is at long distance. Driver of the car inform via GSM through message. It is a wireless modem that behaves like a dial-up modem [2]. The main difference between them is that a dial-up modem sends and receives data through telephone line while a wireless modem sends and receives a data through radio waves [2].

H. RELAY

To demonstrate the control of unlocking and locking the vehicle door via Android cell phone the triggering of relay action is implemented. A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch.

I. LCD

In the above block diagram LCD is utilized to demonstrate the working of the entire unit. The LCD screen is more energy efficient and can be given more safely than CRT can. It consumes low electrical power.

J. BLUETOOTH

Bluetooth was selected as way of communicating mobile with central system that is ARM7 [5]. Bluetooth module receives the data serially in RS232 format from controller and sends it to wireless network. For interfacing with system we need to build a circuit because Bluetooth module understands data in RS232 standard.

III. HARDWARE IMPLEMENTATION

We developed the hardware module which is shown in below fig no:2 .

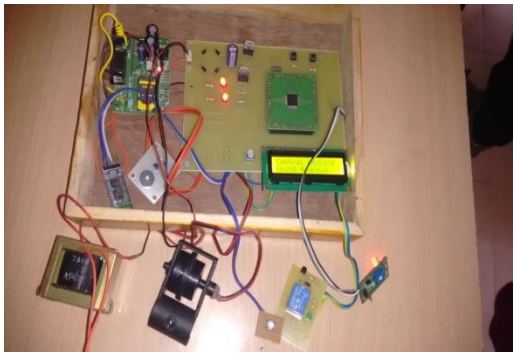

Fig no.2: Hardware Implementation

PCB Design Software

For PCB design Dip trace software is used.

Dip Trace provides the following features:

Easy to learn for user and to design a schematic, simply select and keep components onto your document and connect them together using probes and bus tools. Multisheet

design is supported, after this we select many switch to board for converting schematic in to the PCB. Layout can be updated from Schematic in a few clicks at anytime. In design objects if we create then they are underlined to improve your work. Step-by-step tutorial available from web-site guides the design process and allows to get started with ease.

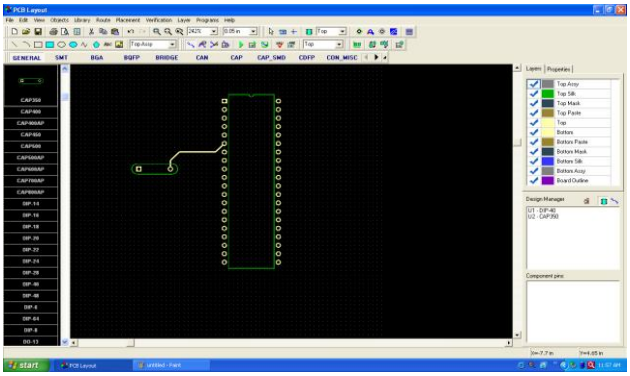

Fig No.3: Window of Dip trace

IV. SOFTWARE DEVELOPMENT

Development of Android Application

Java coding done using Eclipse along with Android 5.0.2 Lollipop version is utilized to create particular application for Android cell phone. Eclipse is an integrated development environment (IDE). Eclipse is mostly written in JAVA and its primary use for developing JAVA application, but it may also use to develop applications in other programming languages through the use of plug-in. The eclipse software development kit (sdk), which includes the java development tools, is meant for java developers. Users can extend its abilities by installing plug-ins written for the eclipse platform, such as development toolkits for other programming languages, and can write and contribute their own plug-in modules.

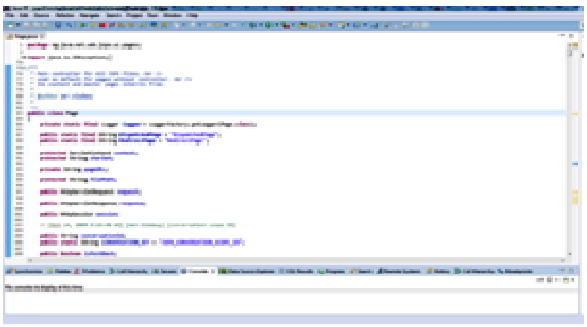

Fig No.4: Eclipse

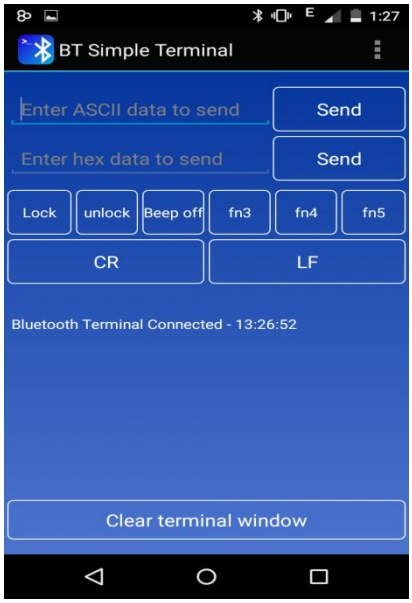

Fig No.5 Android Application

V. RESULTS

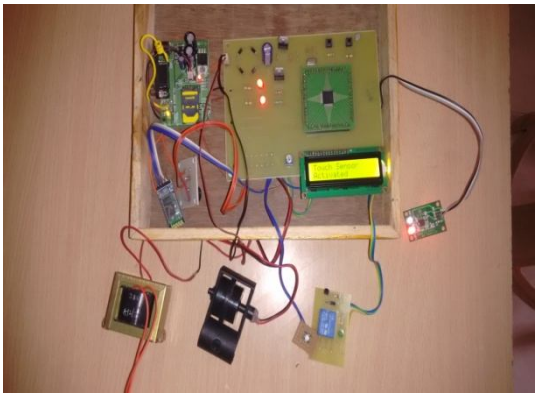

Fig No.6: Touch Sensor Activated

If anyone touches the car touch sensor gets activated and triggers the buzzer.

Fig No.7: Fuel Sensor Activated

When car is in OFF state the level of fuel is indicated by the fuel sensor.

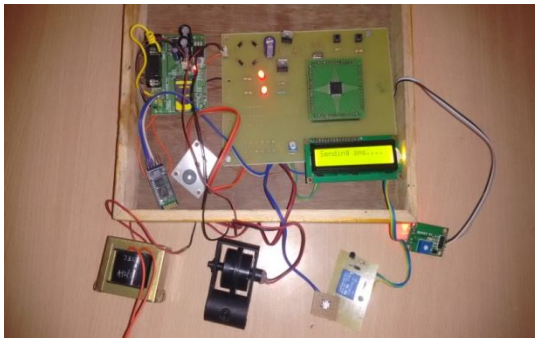

Fig No.8: Sending SMS through GSM

When fuel level drops the driver of the car inform through GSM.

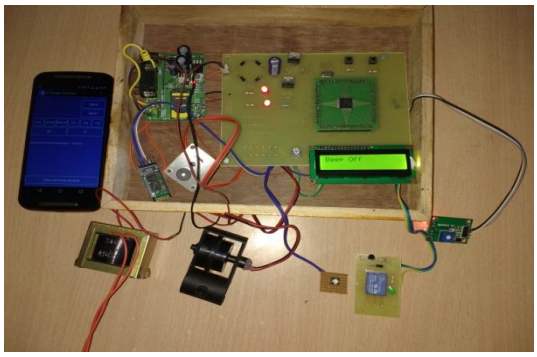

Fig No.9: Beep OFF

We can OFF the buzzer by beep OFF button which is in Android App. We can also send the SMS beep OFF using GSM.

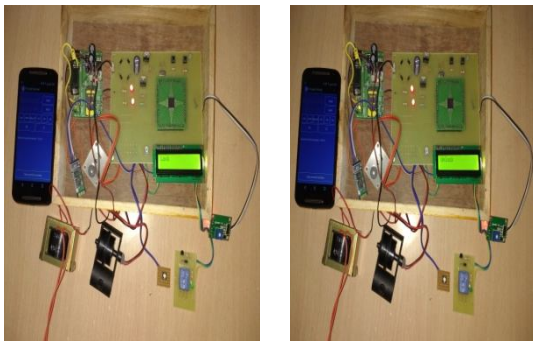

Fig No.10: Lock & Unlock

We can lock and unlock the car by using the buttons lock and unlock present in the Android App triggering the relay action. Same can be done by sending SMS using GSM.

IV. CONCLUSION

In this paper, we have reviewed the background work of central locking system and compared with our system. This paper proposed the central locking system for four wheeler vehicles; we developed the android application which used to automate the system.

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