DESIGN AND IMPLEMENTATION OF A VEHICLE THEFT CONTROL UNIT USING ANROID APPLICATION

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ABSTRACT

This project deals with the design & development of a theft control system, which is being used to prevent/control the theft of a vehicle. The developed system makes use of an embedded system based on Global System for Mobile communication (GSM) technology with I^{2}C protocol along with RFID system. The RFID reader will be interfaced with the microcontroller through serial interface to detect the hospitals, hotels, petrol bunks, temples etc. The developed system makes use of an mobile phone that is embedded in the vehicle with an interfacing to Engine Control Module (ECM) , through I^{2}C protocol, communicated with in this, ECM additionally we can get the vehicle present location by using android application.The developed system makes use of an mobile phone that is embedded in the vehicle with an interfacing to Engine Control Module (ECM) , through I^{2}C protocol, communicated with in this, ECM additionally we can get the vehicle present location by using android application.

1.INTRODUCTION

These day's car theft cases are higher than ever, give your car an excellent protection with the only reliable anti-theft device.Car Electronic control unit ensures the best guarantee to protect your car from different kinds of theft cases. It is a car security device that offers excellent protection to your car. A car with Electronic control unit security system helps the user to lock and unlock doors at the press of a button. Mainly two types of Electronic control unit are used in Auto industry - Automatic Electronic control unit and Manual Electronic control unit that ensures smoother and secured operation. We can broadly define an embedded system as a microcontroller-based, software-driven, reliable, real-time control system, designed to perform a specific task. It can be thought of as a computer hardware system having software embedded in it.The designed & developed system is installed in the vehicle. The main concept in this design is introducing the mobile communications into the embedded system.Automotive industry uses Inter-Integrated Circuit (I^{2}C) as the in-vehicle network for the Engine Management, the body electronics like door and roof control, air conditioning and lighting as well as for the entertainment control. Nowadays all most all car manufacturers have also started implementing I^{2}C based vehicle automation. I^{2}C Communication protocol networks used in engine management to connect several ECUs.I^{2}C uses only two bidirectional open-drain lines (SDA) and serial clock line (SCL),pulled up with resistors. Typical voltages used are +5v or +3.3 v, although systems with other voltages are permitted. The I^{2}C reference design has a 7-bit address space, with a rarely-used 10-bit extension. Common I^{2}C bus speed are the 100kbit/s standard mode and 400kbit/s fast mode ,1 Mbit/s fast mode plus or Fm+, and 3.4Mbit/s High speed mode These speed are more widely used on embedded System than on PCs. AnI^{2}C transaction may consist of multiple messages
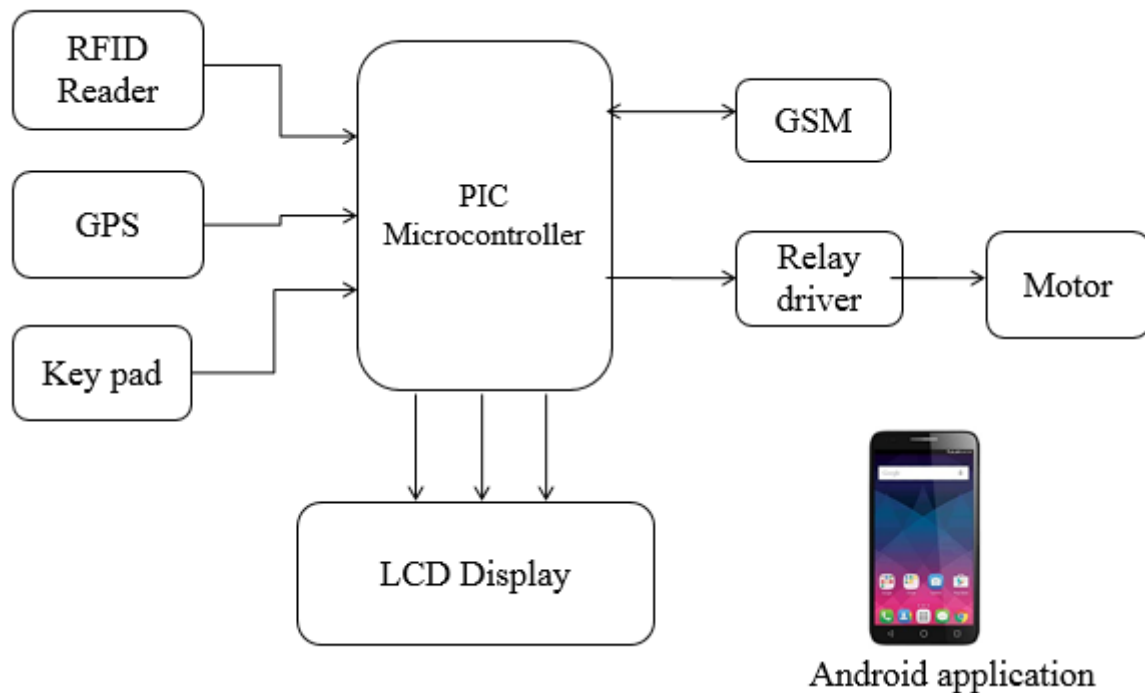
2.BLOCK DIAGRAM

Figure 2. Block Diagram Of Thief Control Unit

DESCRIPTION

RFID reader is used to provide the information of school zone, college zone to the particular vehicle which contains the ID. When the vehicle reaches the place, it provides the corresponding information regarding the places which acts as a prior information, so the speed of the vehicle could be reduced and also to provide the safety to the persons inside the vehicle and also the public in the surrounding places. Android application provides the control of the engine to be in ON or OFF condition. GSM is initialized with the user number so that the engine can be controlled through android app. And also GPS is used to identify the location, in case if the vehicle was theft means, the user can know the exact location of the vehicle by using "GET LOCATION" from the android app to get the latitude and longitude of the location and also the engine can be made OFF by using this android application. LCD displays the current status of the vehicle and the location. Relay driver is used to switch the engine ON or in OFF condition.
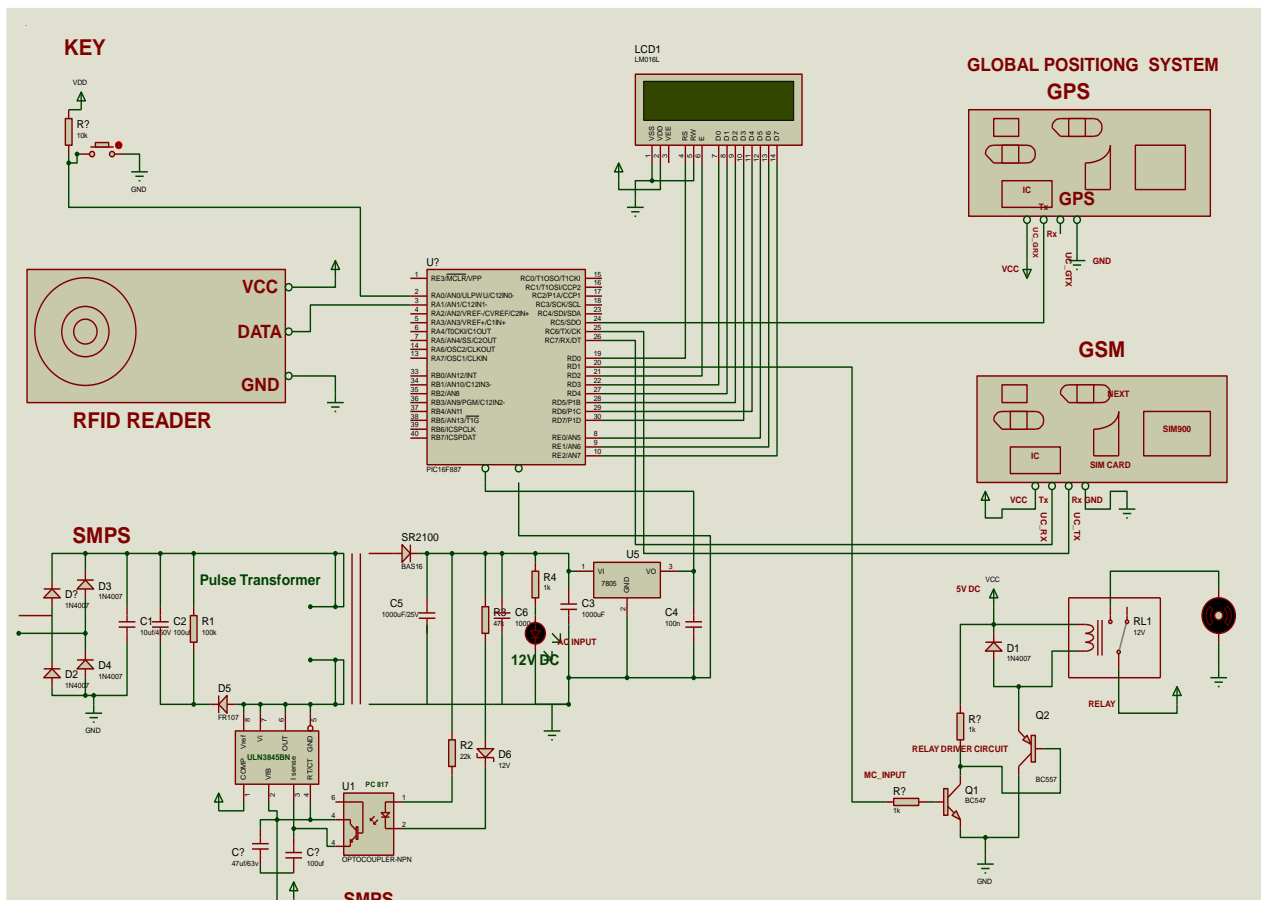
3.Proposed System Circuit Diagram

Figure 3. Circuit Diagram Of Thief Control Unit

Description

SMPS (Switch mode power supply) is used to provide the power supply to the whole unit. Here the 18F45k22 controller is used, the SMPS is used to convert the 230V AC signal to 12 V DC and regulator is used to convert 12V DC to 5V DC, because the controller will operate only on 5V, GPS and GSM will operate by 3.3V. GSM is connected to the android app to control the vehicle engine. GPS is connected to the controller to provide the latitude and longitude of the location. LCD is connected to the controller to display the status which is connected to the output pin of the controller.

4. HARDWARE IMPLEMENTATION

4.1PIC Microcontroller

Peripheral Interface Controller (PIC) was originally designed by General Instruments.In the late 1970s, GI introduced PIC 1650 and 1655 – RISC with 30 instructions.PIC was sold to Microchip Features: low-cost, self-contained, 8-bit, Harvard structure, pipelined, RISC, single accumulator, with fixed reset and interrupt vectors.
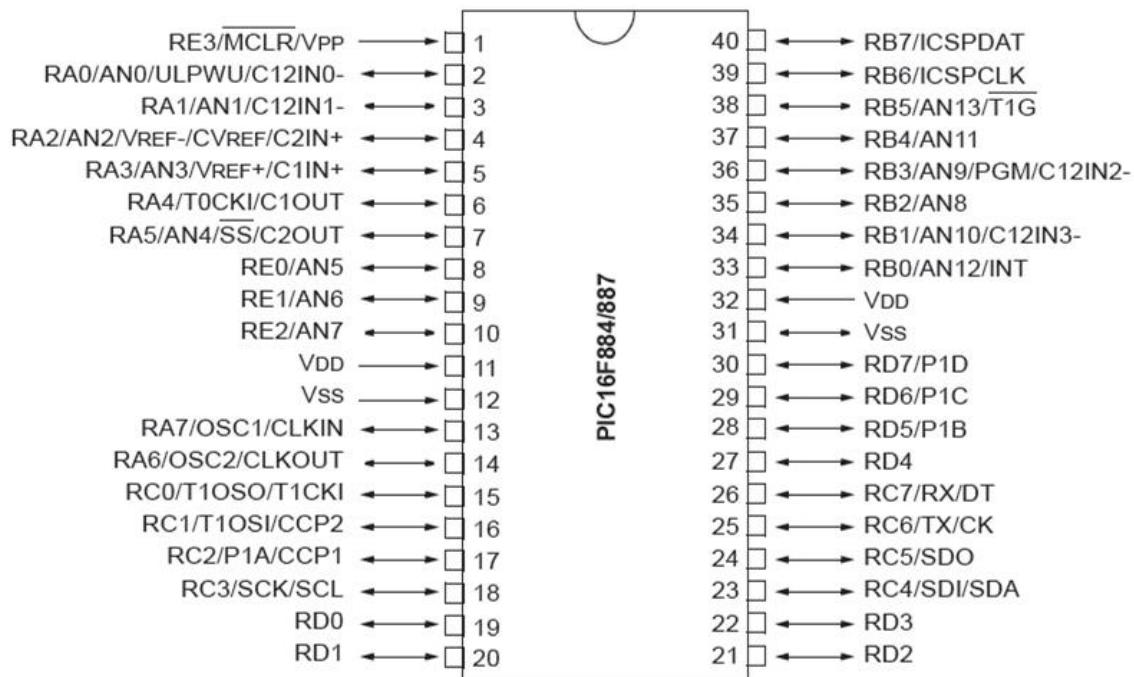
Pin Diagram ofPIC16F887

Figure 4.1 Pin Diagram of PIC16F887

4.2 GSM

GSM is a TDMA based wireless network technology developed in Europe that is used throughout most of the world. GSM phones make use of a SIM card to identify the user's account. The use of the SIM card allows GSM network users to quickly move their phone number from one GSM phone to another by simply moving the SIM card. Currently GSM networks operate on the 850MHz, 900MHz, 1800MHz, and 1900MHz frequency bands. Devices that support all four bands are called quad-band, with those that support 3 or 2 bands called tri-band and dual-band, respectively. In the United States, singular operates on the 850 and 1900MHz bands, while T-Mobile operates only on the 1900MHz band.GSM (Global System for Mobile Communications, originally *Group Spécial Mobile*), is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones.The GSM standard was developed as a replacement for first generation (1G) analog cellular networks, and originally described a digital, circuit switched network optimized for full duplex voice telephony. This was expanded over time to include data communications, first by circuit switched transport, then packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for

GSM Evolution or EGPRS).Further improvements were made when the 3GPP developed third gen.

**Figure 4.2 GSM Development Board**

4.3 RFID READER

RFID is a technology similar in theory to bar-code identification. With RFID, the electromagnetic or electrostatic coupling in the RF portion of the electromagnetic spectrum is used to transmit signals. RFID systems consists of an antenna and a transceiver, which read the radio frequency and transfer the information to a processing device, and a transponder, or tag, which is an integrated circuit containing the RF circuitry and information to be transmitted Radio Frequency Identification (RFID) Card Readers provide a low-cost solution to read passive RFID transponder tags up to 7 cm away. This RFID Card Reader can be used in a wide variety of hobbyist and commercial applications, including access control, automatic identification, robotics navigation, payment systems, and car immobilization. The RFID card reader read the RFID tag in range and outputs unique identification code of the tag at baud rate of 9600. The data from RFID reader can be interfaced to be read by microcontroller or PC.

5. SOFTWARE IMPLEMENTATION
5.1 Proteus

Proteus 7.0 is a Virtual System Modeling (VSM) that combines circuit simulation, animated components and microprocessor models to co-simulate the complete microcontroller-based designs. This is the perfect tool for engineers to test their microcontroller designs before constructing a physical
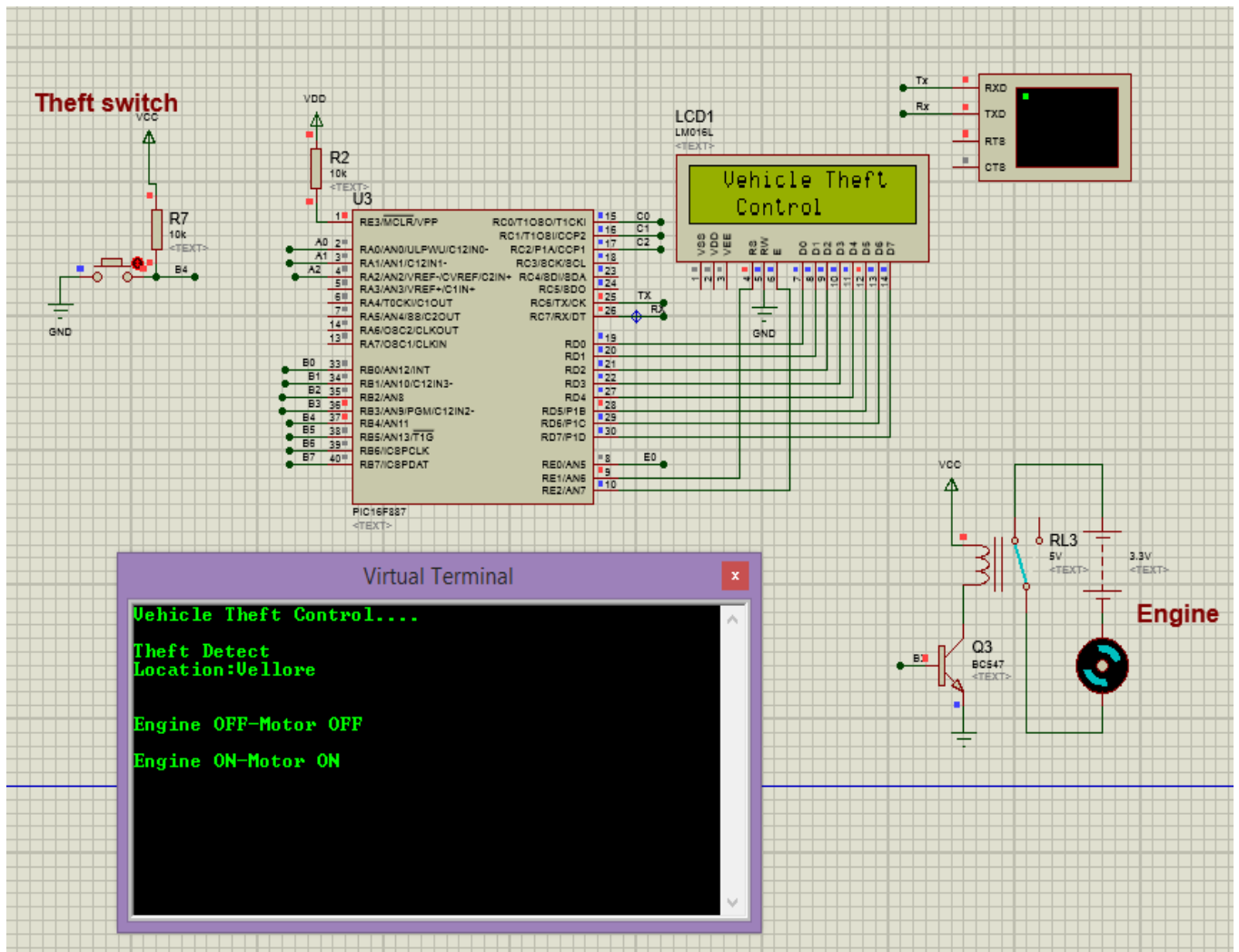
6.Normal Simulation Layout
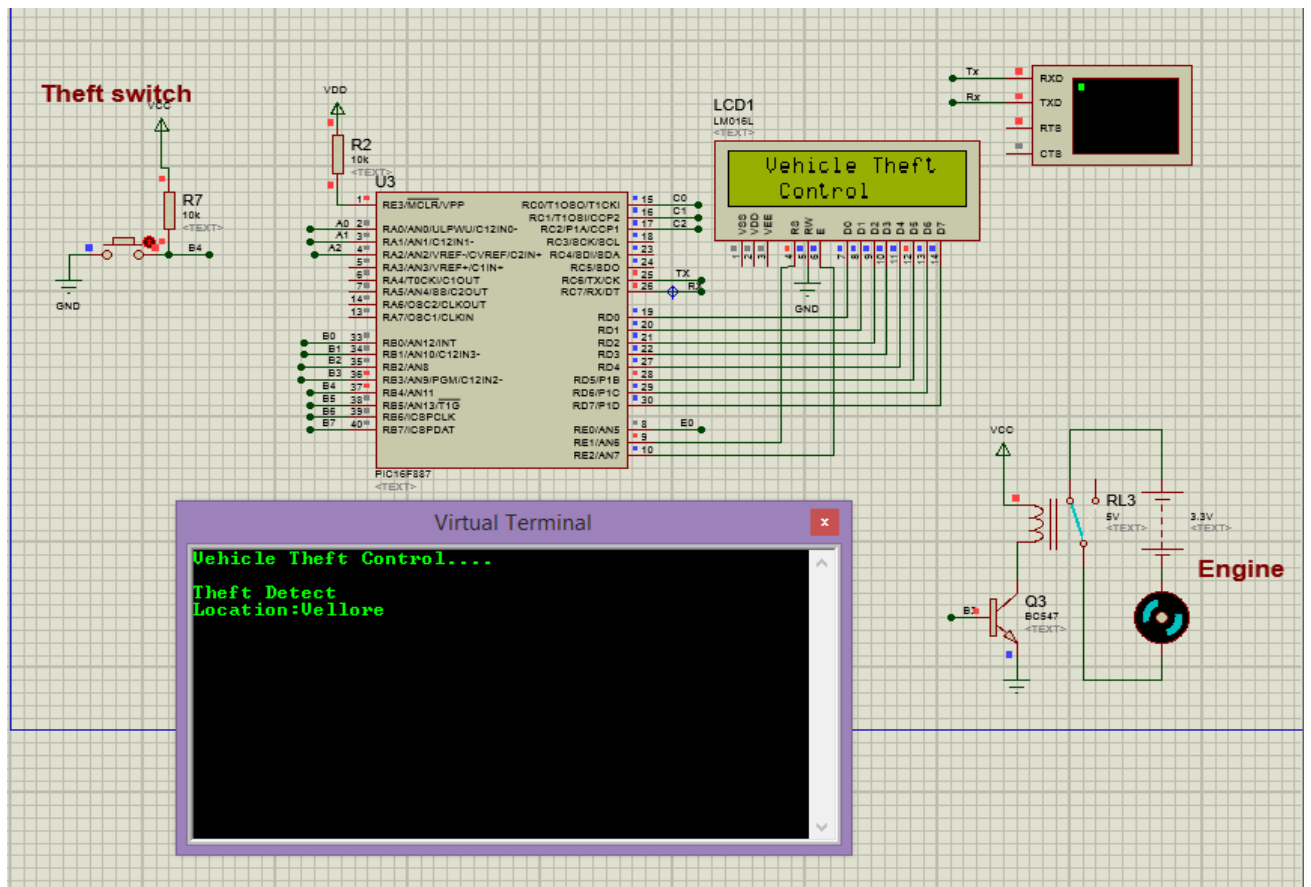
Description

The basic simulation schemata for our project is drawn as seen in the above image with almost all the components, which we use in our project. And to use the thief switch was ON the vehicle theft control system to detect the thief and give as a location on Vellore.
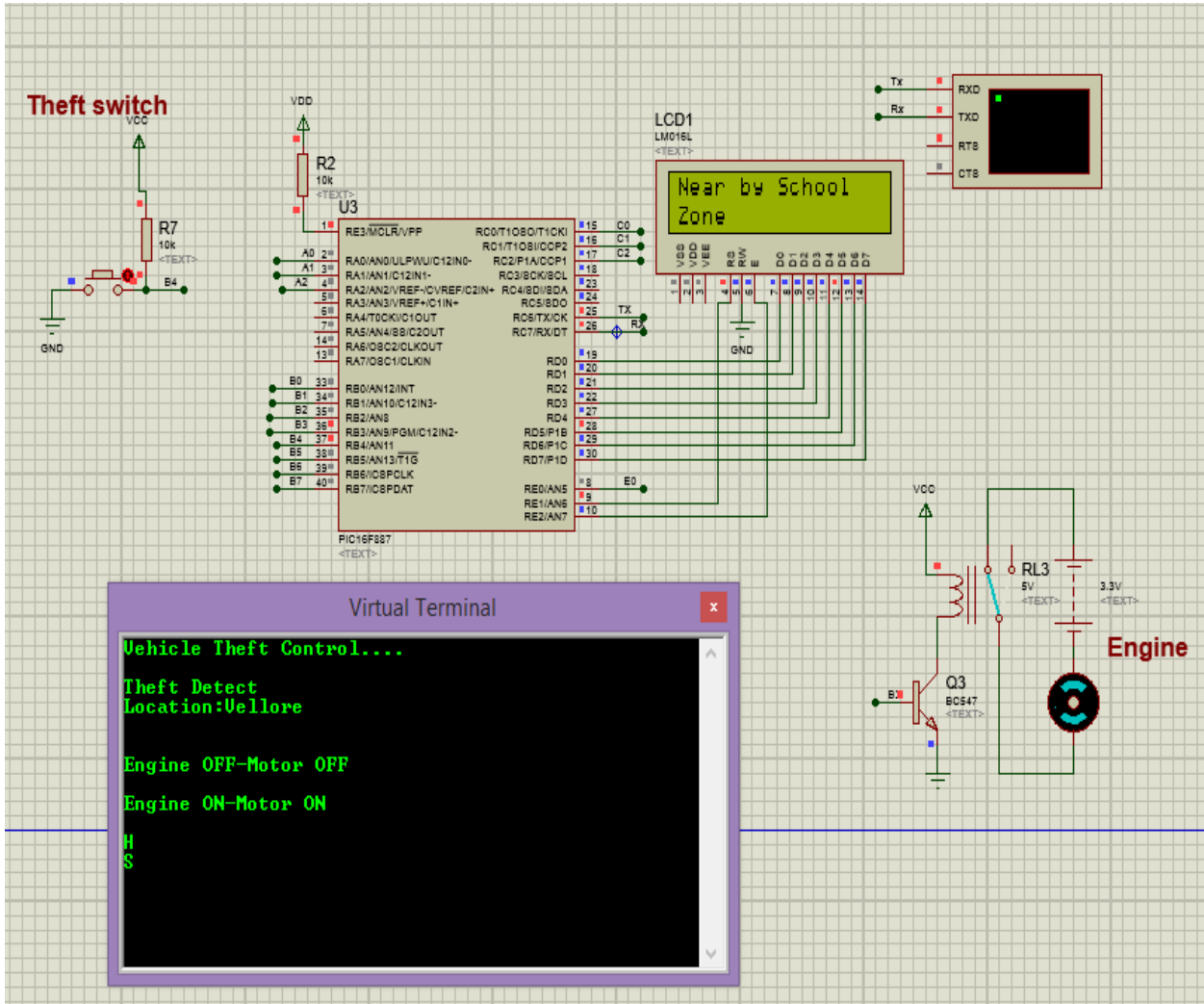
6.To Give Command and to control The Engine:

Description

PreviouslyTo the theft detected then the commend window to give commend "**Engine OFF**"then this commend was given and the "**Engine**" going to **OFF** stage And then to give next commend of "**Engine ON**" then this commend was given and the "**Engine**" again going to **ON** stage.
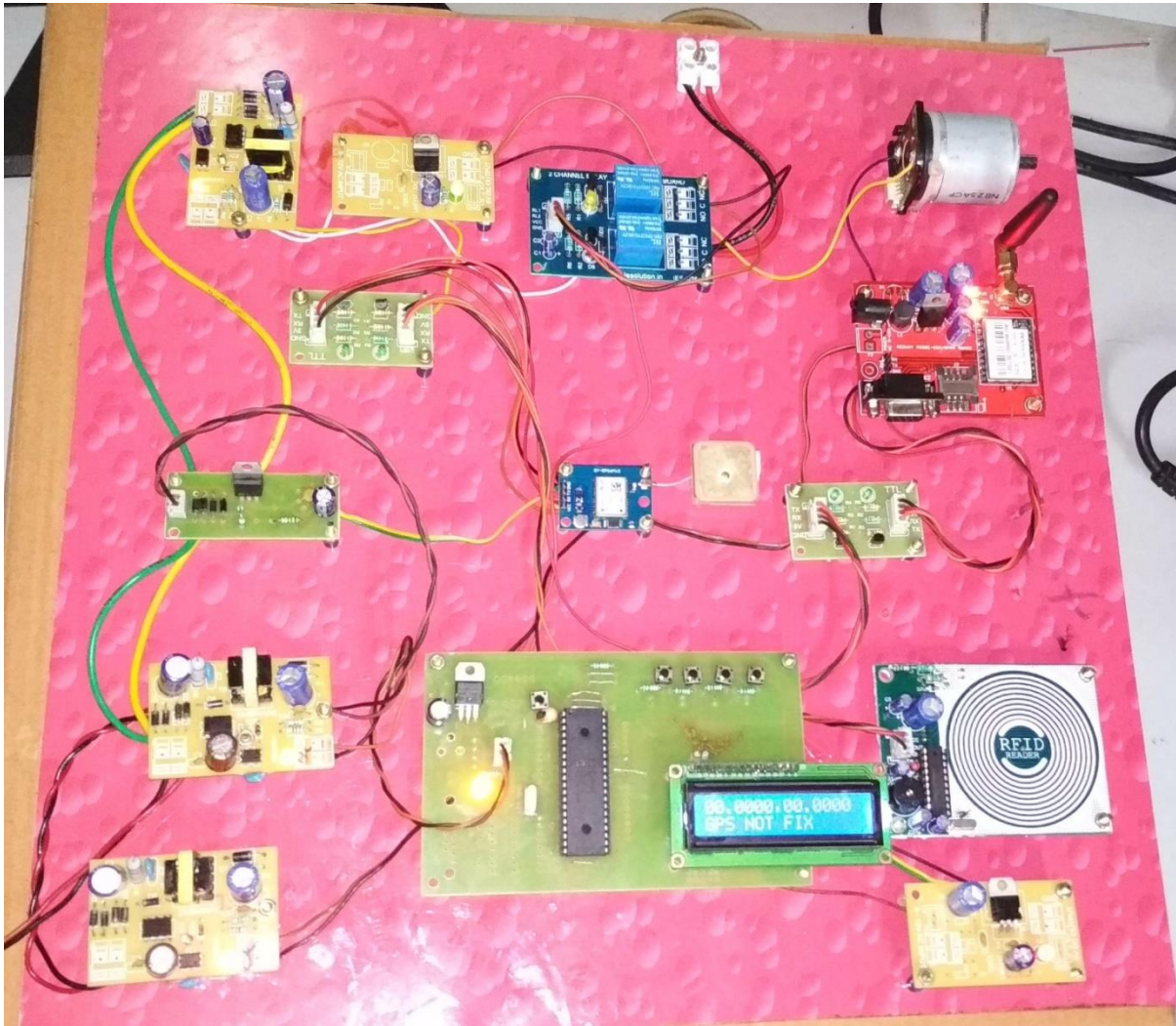
6.To Give Command and Get Location:

Description

Previously After the Engine control to give commend "**H**" then this commend was given and to displayed "**Nearby Hospital Zone**" it's displayed by LCD display. And to give commend "**S**" then this commend was given and to displayed "**Nearby School Zone**" it's displayed by LCD display.

7.HARDWARE OUTPUT

Figure 7. HARDWARE OUTPUT

The basic simulation schemata for our project is drawn as seen in the above image with almost all the components, which we use in our project. And to use the thief switch was ON the vehicle theft control system to detect the thief and give as a location on Vellore.

8. CONCLUSION

In proposed system, the owner of the vehicle can easily control the vehicle by sending a message from his/her mobile to the vehicle engine by interfacing with I^2C protocol along with GSM modem. The user can easily identify the present location of the vehicle by using android application. If the user send request to the vehicle unit he can view the present location of the vehicle in the form of mapping. By using this system, we can control our vehicle remotely by using android application. Here controller is interfaced with an engine. So unauthorized person cannot use the vehicle without the knowledge of owner. By this method, vehicle theft can beavoided and also we can detect the zones

of school, temples, hospitals etc…by using GPS. We can navigate the vehicle position via mapping incase if it is missed.

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