VEHICLE TRACKING SYSTEM USING GPS AND GSM TECHNOLOGY

Submitted in partial fulfillment of the requirement
Of the degree of

Bachelor of engineering

by

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2017

Project Report Approval for B. E.

This project report entitled **"vehicle tracking system"** by

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is approved for the degree of B.E in **Electronics & Telecom from university of Mumbai**

Examiners:

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Date:

Place:

Declaration

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature of Student

Date:

Abstract

Vehicle tracking system uses GPS and GSM to track and provide complete location information to user over mobile phone. This project gives minute by minute update about vehicle location by sending SMS through GSM modem. This SMS contain longitude and latitude of the Location of vehicle. Microcontroller is the central processing unit CPU of our project. Arduino gets the coordinates from GPS modem and then it send this information to the user in Text SMS. GSM modem is used to send this information via SMS will be sent to the owner of the vehicle.

List OF Figure

CHAPTER 1

INTRODUCTION

1.1 Introduction:

Introduction In the last few decades, India has progressed at such an enormous rate that many companies have strongly established themselves here. These companies bring a huge amount of workforce with them. Arranging transportation to such a huge mass is a cumber. Some task involving many intricacies. Generally, this transport is arranged through the local transport vendors on a yearly contract basis, recently happen mishaps such as burglary, rape cases etc.

The development of satellite communication technology is easy to identify the vehicle locations. Vehicle tracking systems have brought this technology to the day-to-day life of the common person. Today GPS used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status The GPS/GSM Based System is one of the most important systems, which integrate both GSM and GPS technologies. It is necessary due to the many of applications of both GSM and GPS systems and the wide usage of them by millions of people throughout the world.

This system designed for users in land construction and transport business, provides real-time information such as location, speed and expected arrival time of the user is moving vehicles in a concise and easy - to- read format. This system may also useful for communication process

among the two points. Currently GPS vehicle tracking ensures their safety as travelling. This vehicle tracking system found in clients vehicles as a theft prevention and rescue device. This system installed for the four wheelers, Vehicle tracking usually used in navy operators for navy management functions, routing, send off, on board information a security. The applications include monitoring driving performance of a parent with a teen driver. Vehicle tracking systems accepted in consumer vehicles as a theft prevention and retrieval device. If the theft identified, the system sends the SMS to the vehicle owner.

Vehicle Tracking Features:

It is mainly benefit for the companies which are based on transport system. Since it can show the position of all vehicles in owner mobile phone, so that they can create the expected data accordingly. These tracking system can store the whole data where the vehicle had gone, where did it stop, how much time it take at every stop and can create whole data analysis. It is also used in buses and trains, to estimate how far are they, how much time it takes for them to come to a particular stop. These systems are used to data capture, data storage, data analysis and finally data transfer.

CHAPTER 2

LITERATURE-SURVEY

2.1 Review of Literature

In this project Arduino Uno is used because earlier vehicle tracking system was based on very complicated and high cost microcontroller like 8051 with programming kit ,ARM, etc.

The main advantage of Arduino is low cost and easy to program it also compatible with all the three operating system(windows,mac,linux) that's why Adruino is better and further information is given below, Arduino is an open source, computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world.

GSM is referred by mobile communication magazine and the international journal of recent scientific research vol 6,issue,6, pp.4805-4808,,june 2015[4806],but for our project this information is not sufficient so another reference is IEEE paper[IEEE Sponsored 9th International Conference on Intelligent Systems and Control (ISCO)2015].

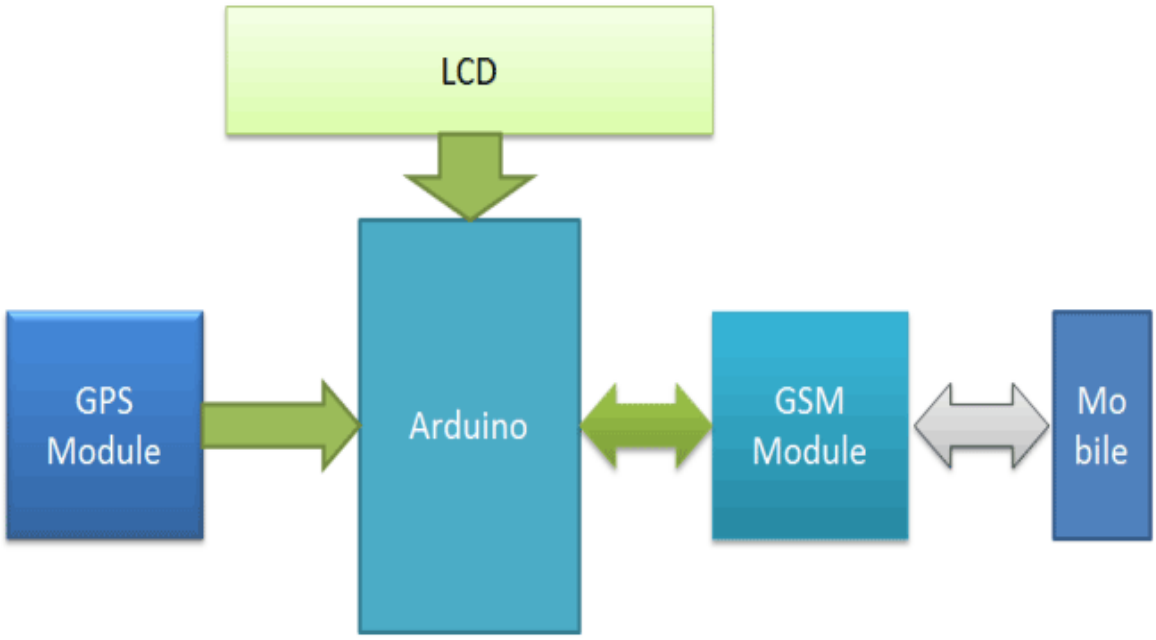
The general information of GPS is been referred by satellite communication magazine [1 set IEEE International Workshop on Machine to Machine Communications Interfaces and Platforms 2013] and also referred IEEE i.e. [IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, VOL. 51, NO. 2, APRIL 2004].

LCD is used in our project to get the feedback from the system and the system is working properly or not. it also used to display longitude and latitude of the vehicle all the basic information of the lcd is been taken from the mazidee and interfacing of Arduino with lcd is taken from Arduino website i.e (www.arduino.com)

CHAPTER 3

METHODOLOGY

3.1Block diagram:



(Fig 3.1)

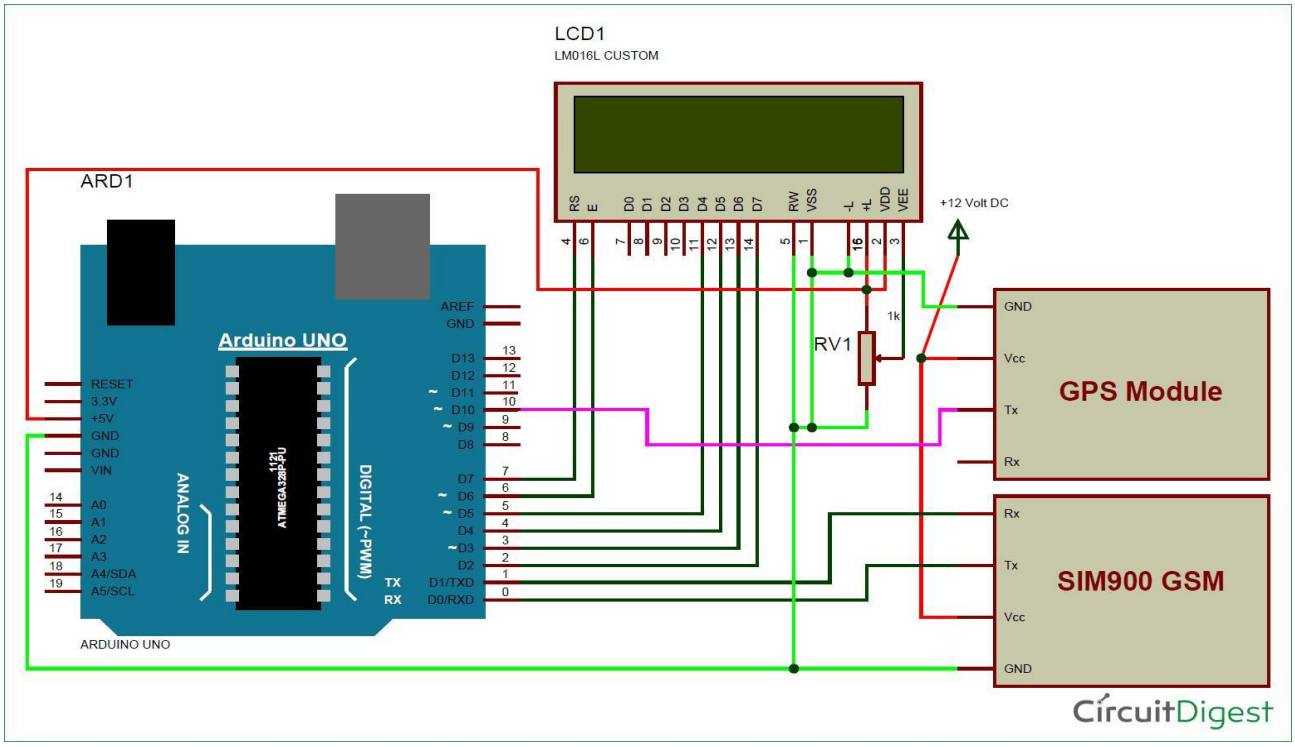
3.1.1 Explanation:

In this project, Arduino is used for controlling whole the process with a **GPS Receiver and GSM module**. GPS Receiver is used for detecting coordinates of the vehicle, GSM module is used for sending the coordinates to user by SMS. And an optional 16x2 LCD is also used for displaying status messages or coordinates. We have used GPS Module SKG13BL and GSM Module SIM900A.

When we ready with our hardware after programming, we can install it in our vehicle and power it up. Then we just need to send a SMS, “Track Vehicle”, to the system that is placed in our vehicle. We can also use some prefix (#) or suffix (*) like #Track Vehicle*, to properly identify the starting and ending of the string, like we did in these projects: GSM Based Home Automation and Wireless Notice Board.

Sent message is received by GSM module which is connected to the system and sends message data to Arduino. Arduino reads it and extract main message from the whole message. And then compare it with predefined message in Arduino. If any match occurs then Arduino reads coordinates by extracting $GPGGA String from GPS module data (GPS working explained above) and send it to user by using GSM module. This message contains the coordinates of vehicle location.

3.2 Circuit Diagram:



(Fig 3.2)

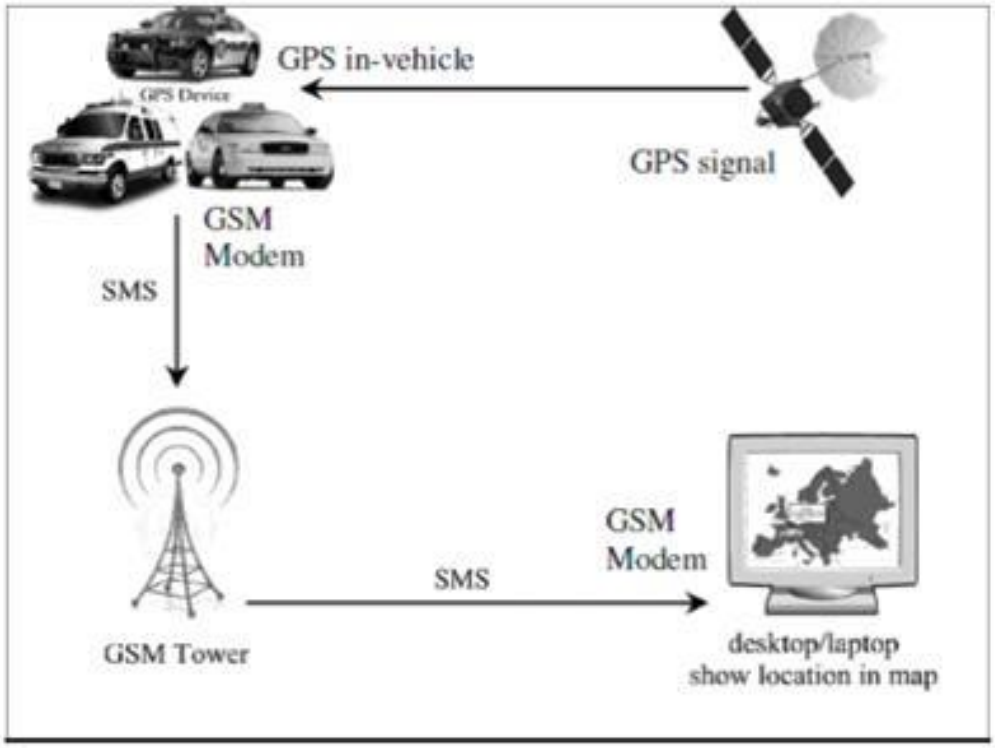
3.2.1 Working:

Circuit Connections of this **Vehicle Tracking System Project** is simple. Here Tx pin of GPS module is directly connected to digital pin number 10 of Arduino. By using Software Serial Library here, we have allowed serial communication on pin 10 and 11, and made them Rx and Tx respectively and left the Rx pin of GPS Module open. By default Pin 0 and 1 of Arduino are used for serial communication but by using Software Serial library, we can allow serial communication on other digital pins of the Arduino. 12 Volt supply is used to power the GPS Module.

GSM module's Tx and Rx pins of are directly connected to pin Rx and Tx of Arduino. GSM module is also powered by 12v supply. An optionalLCD's data pins D4, D5, D6 and D7 are connected to pin number 5, 4, 3, and 2 of Arduino. Command pin RS and EN of LCD are connected with pin number 2 and 3 of Arduino and RW pin is directly connected with ground. A Potentiometer is also used for setting contrast or brightness of LCD.

3.2.2 Concept And Overview:

This vehicle tracking system takes input from GPS and send it through the GSM module to desired mobile/laptop using mobile communication.



(Fig 3.3)

This vehicle tracking system takes input from GPS and send it through the GSM module to desired mobile/laptop using mobile communication. Vehicle Tracking System is one of the biggest technological advancements to track the activities of the vehicle.

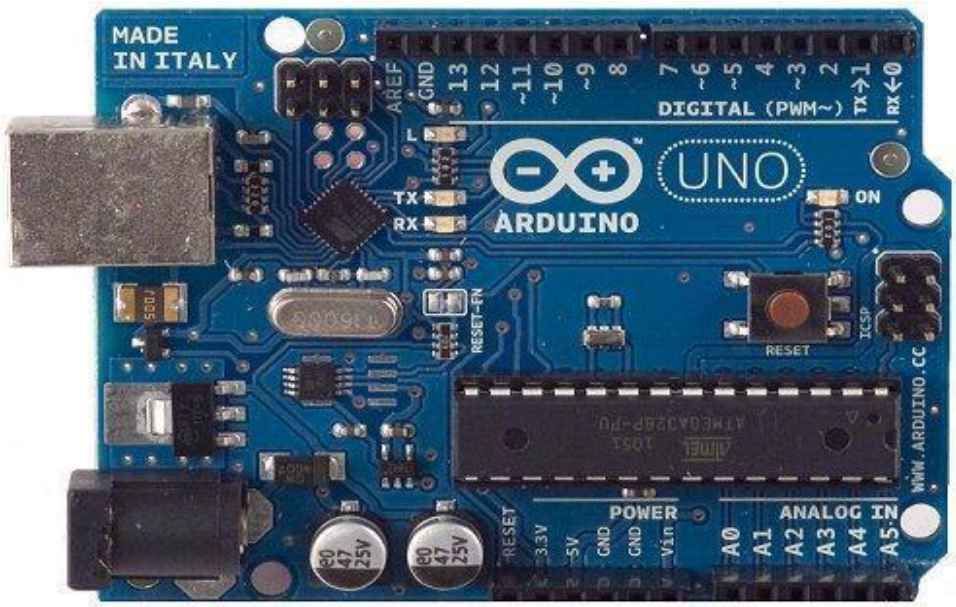
The security system uses Global Positioning System GPS, to find the location of the monitored or tracked vehicle and then uses

satellite or radio systems to send to send the coordinates and the location data to the user mobile. Due to this technology vehicle tracking systems are becoming increasingly popular among owners of expensive vehicles.

CHAPTER 4
PROCESS AND REQUIREMENTS

4.1 Arduino Uno

Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.



(Fig 4.1)

The Arduino boards are able to read inputs - light, proximity or air quality on a sensor, or an SMS or Twitter message - and turn it into an output - activating a motor, turning on a light, publishing content online or trigger external events. You can tell your board what to do by writing code and uploading it to the microcontroller on it using the **Arduino programming language** (based on Wiring), and the Arduino Software (IDE), based on Processing

4.2 Pin Descriptions

VCC: Digital supply voltage.

GND: Ground

Port B (PB7:0): XTAL1/XTAL2/TOSC1/TOSC2

Port B is an 8-bit bi-directional I/O port with internal pull-up resistors. The Port B output buffers have symmetric drive characteristics with both high sink and source capability. As inputs, Port B pins that are externally pulled low will source current if the pull-up resistors are activated. The Port B pins are tri-stated when a reset condition becomes active, even if the clock is not running. Depending on the clock selection fuse settings, PB6 can be used as input to the inverting Oscillator amplifier and input to the internal clock operating circuit. Depending on the clock selection fuse settings, PB7 can be used as output from the inverting Oscillator amplifier. If the Internal Calibrated RC Oscillator issued as chip clock source, PB7...6 is used as TOSC2

Port C (PC5:0):

Port C is a 7-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The PC5...0 output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port C pins that are externally pulled low will source current if the pull-up resistors are activated. The Port C pins are tri-stated when a reset condition becomes active, even if the clock is not running.

PC6/RESET:

If the RSTDISBL Fuse is programmed, PC6 is used as an I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of Port C. If the RSTDISBLF use is un programmed, PC 6 is used as a Reset input. A low level on this pin for longer than the minimum pulse length will generate a Reset, even if the clock is not running. Shorter pulses are not guaranteed to generate a Reset.

Port D (PD7:0):

Port D is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port D output Buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port D pins that are externally pulled low will source current if the pull-up resistors are activated. The Port D pins are tri-stated when a reset condition becomes active, even if the clock is not running.

PC6/RESET:

If the RSTDISBL Fuse is programmed, PC6 is used as an I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of Port C. If the RSTDISBLF use is un programmed, PC 6 is used as a Reset input. A low level on this pin for longer than the minimum pulse length will generate a Reset, even if the clock is not running. Shorter pulses are not guaranteed to generate a Reset

Port D (PD7:0):

Port D is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port D output Buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port D pins that are externally pulled low will source current if the pull-up resistors are activated. The Port D pins are tri-stated when a reset condition becomes active, even if the clock is not running.

4.2.1 Key features:

- Inexpensive and flexible hardware
- Cross-platform
- Open source and extensible hardware
- Open source and extensible software
- Simple programming environment

4.3 GSM Module:

The GSM modem is a specialized type of modem which accepts a SIM card operates on a subscriber's mobile number over a network, just like a cellular phone.

(Fig4.2)

It is a cell phone without display. Modem sim300 is a triband GSM/GPRS engine that works on EGSM900MHz, DCS1800MHz and PCS1900MHz frequencies. GSM Modem is RS232-logic level compatible, i.e., it takes-3v to -15v as logic high and +3v to +15 as logic low.MAX232 is used to convert TTL into RS232 logic level converter used between the microcontroller and the GSM board. The signal at pin 11 of the microcontroller is sent to the GSM modem through pin 11 of max232.this signal is received at pin2 (RX) of the GSM modem. The

GSM modem transmits the signal from pin3 (TX) to the microcontroller through MAX232, which is received at pin 10 of IC1.

4.3.1 Booting the GSM Module:

- Insert the SIM card to GSM module and lock it.
- Connect the adapter to GSM module and turn it ON.
- Now wait for some time (say 1 minute) and see the blinking rate of‘status LED’ or ‘network LED’ (GSM module will take some time to establish connection with mobile network)
- Once the connection is established successfully, the status/network LED will blink continuously every 3 seconds. You may try making a call to the mobile number of the sim card inside GSM module. If you hear a ring back, the gsm module has successfully established network connection.

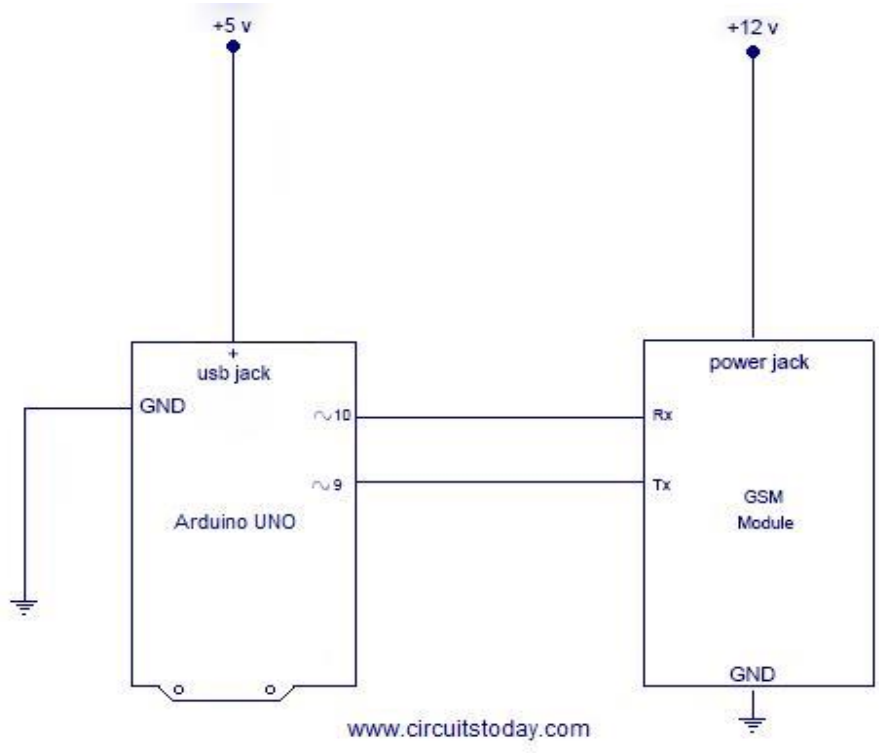
4.3.2 Connecting GSM Module to Arduino:

There are two ways of connecting GSM module to Arduino. In any case, the communication between Arduino and GSM module is serial. So we are supposed to use serial pins of Arduino (Rx and TX). So if you are going with this method, you may connect the TX pin of GSM module to Rx pin of Arduino and Rx pin of GSM module to TX pin of Arduino. You read it right? **GSM TX –> Arduino Rx** and **GSM Rx –> Arduino TX**. Now connect the ground pin of Arduino to ground pin of gsm module! So that's all! You made 3 connections and the wiring is over! Now you can load different programs to communicate with gsm module and make it work.

Note: - The problem with this connection is that, while programming Arduino uses serial ports to load program from the Arduino IDE. If these pins are used in wiring, the program will not be loaded successfully to Arduino. So you have to disconnect wiring in Rx and TX each time you burn the program to Arduino. Once the program is loaded successfully, you can reconnect these pins and have the system working!

To avoid this difficulty, I am using an alternate method in which two digital pins of Arduino are used for serial communication. We need to select two **PWM enabled pins of Arduino** for this method. So I choose pins **9** and **10** (which are PWM enabled pins). This method is made possible with the **Software Serial Library** of Arduino. Software Serial is a library of Arduino which enables serial data communication through other digital pins of Arduino. The library replicates hardware functions and handles the task of serial communication.

I hope you understood so far! Let's get to the circuit diagram! So given below is the circuit diagram to connect gsm module to Arduino – and hence use the circuit to send sms and receive sms using Arduino and gsm modem.



(Fig 4.3)

4.3.3 Features of GSM:

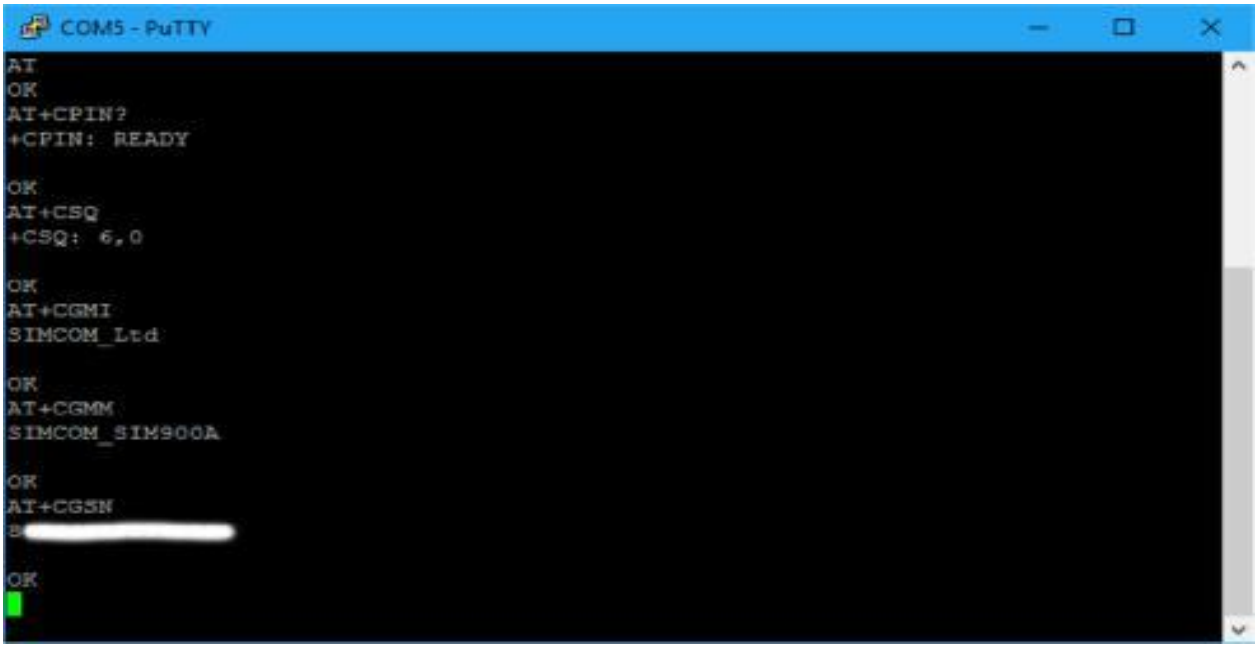
- Dual band GSM/GPRS 900/1800MHz.
- Configurable baud rate.
- SIM card holder.
- Built in network status LED.
- Inbuilt powerful TCP/IP protocol stack for internet data transfer over GPRS

4.3.4 AT Command for GSM Module:

Command	Description
AT+CMGD	DELETE SMS MESSAGE
AT+CMGF	SELECT SMS MESSAGE FORMAT
AT+CMGL	LIST SMS MESSAGES FROM PREFERRED STORE
AT+CMGR	READ SMS MESSAGE
AT+CMGS	SEND SMS MESSAGE
AT+CMGW	WRITE SMS MESSAGE TO MEMORY
AT+CMSS	SEND SMS MESSAGE FROM STORAGE
AT+CMGC	SEND SMS COMMAND
AT+CNMI	NEW SMS MESSAGE INDICATIONS
AT+CPMS	PREFERRED SMS MESSAGE STORAGE
AT+CRES	RESTORE SMS SETTINGS
AT+CSAS	SAVE SMS SETTINGS
AT+CSCA	SMS SERVICE CENTER ADDRESS
AT+CSCB	SELECT CELL BROADCAST SMS MESSAGES
AT+CSDH	SHOW SMS TEXT MODE PARAMETERS
AT+CSMP	SET SMS TEXT MODE PARAMETERS
AT+CSMS	SELECT MESSAGE SERVICE

AT Command Output OnPutty:

Sending output:



(fig 4.4)

Receiving output:

(fig 4.5)

4.4 GPS module:

GPS Technology the Global Positioning System (GPS) is a satellite based navigation system consists of a network of 24 satellites located into orbit.

(fig 4.6)

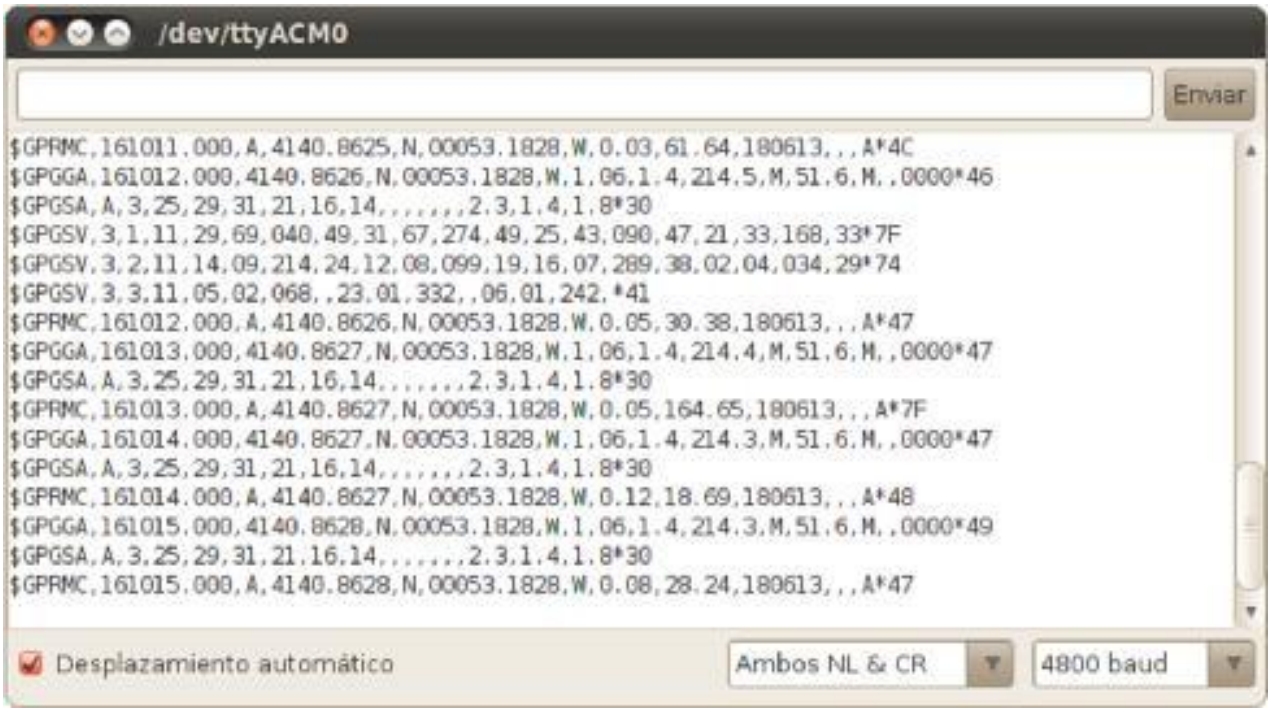
GPS Technology the Global Positioning System (GPS) is a satellite based navigation system consists of a network of 24 satellites located into orbit. The system provides essential information to military, civil and commercial users around the world and which is freely accessible to anyone with a GPS receiver. GPS works in any weather

circumstances at anywhere in the world. Normally no subscription fees or system charges to utilize GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude and longitude) and track movement. With four or more satellites in sight, the receiver can determine the user's 3D position (latitude, longitude and altitude).

Once the vehicle position has been determined, the GPS unit can determine other information like, speed, distance to destination, time and other. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology. **GPS module** sends the data related to tracking position in real time, and it sends so many data in NMEA format (see the screenshot below). NMEA format consist several sentences, in which we only need one sentence. This sentence starts from **$GPGGA** and contains the coordinates, time and other useful information. This **GPGGA** is referred to **Global Positioning System Fix Data**. Know more about Reading GPS data and its strings here.

We can extract coordinate from $GPGGA string by counting the commas in the string. Suppose you find $GPGGA string and stores it in an array, then Latitude can be found after two commas and Longitude can be found after four commas. Now these latitude and longitude can be put in other arrays.

Output Of GPS In NMEA Format:



(fig 4.7)_

4.4.1 Features:

- Standalone GPS receiver
- Dimension:22mmX30mm
- U-blox NEO-6M GPS module
- Height: 13mm
- Under 1 second time-to-first-fix for hot and aided starts
- SuperSense ® Indoor GPS: -162 dBm tracking sensitivity
- Weight: 12g
- Anti-jamming technology
- Support SBAS (WAAS, EGNOS, MSAS, GAGAN)
- u-blox 6 50 channel positioning engine with over 2 million effective correlators
- 5Hz position update rate
- Operating temperature range: -40 TO 85°C
- UART TTL socket
- EEprom to store settings
- Rechargeable battery for Backup
- Build in 18X18mm GPS antenna

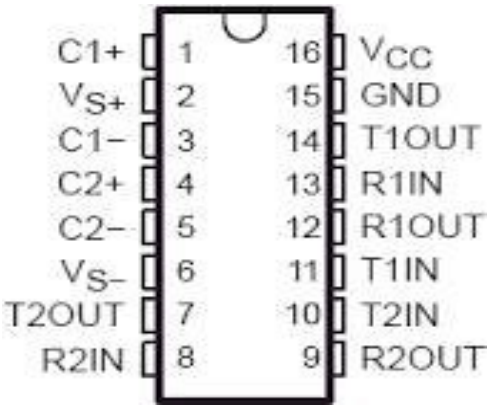
4.4.2 MAX232:

The MAX232 is an IC, first created in 1987 by Maxim Integrated Products, that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals.

The drivers provide RS-232 voltage level outputs (approx. ± 7.5 V) from a single + 5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to + 5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case.

The receivers reduce RS-232 inputs (which may be as high as ± 25 V), to standard 5 V TTL levels. These receivers have a typical threshold of 1.3 V, and a typical hysteresis of 0.5 V.

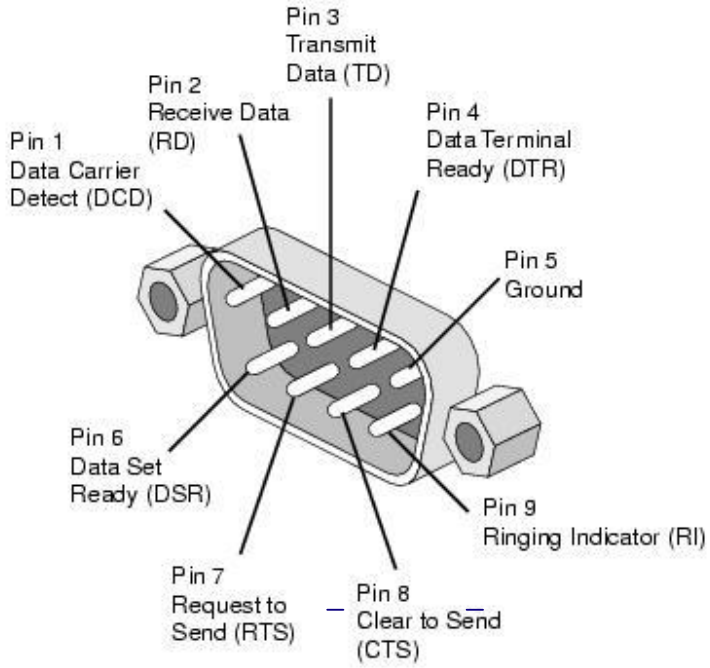
(fig 4.8)



(fig 4.9)

4.4.3 RS232:

In telecommunications systems used today **RS-232** is a standard for serial communication transmission of data. It formally defines the signals connecting between a DTE (data terminal equipment) such as a computer terminal, and a DCE (data circuit-terminating equipment, originally defined as data communication equipment), such as a modem.



(fig 4.10)

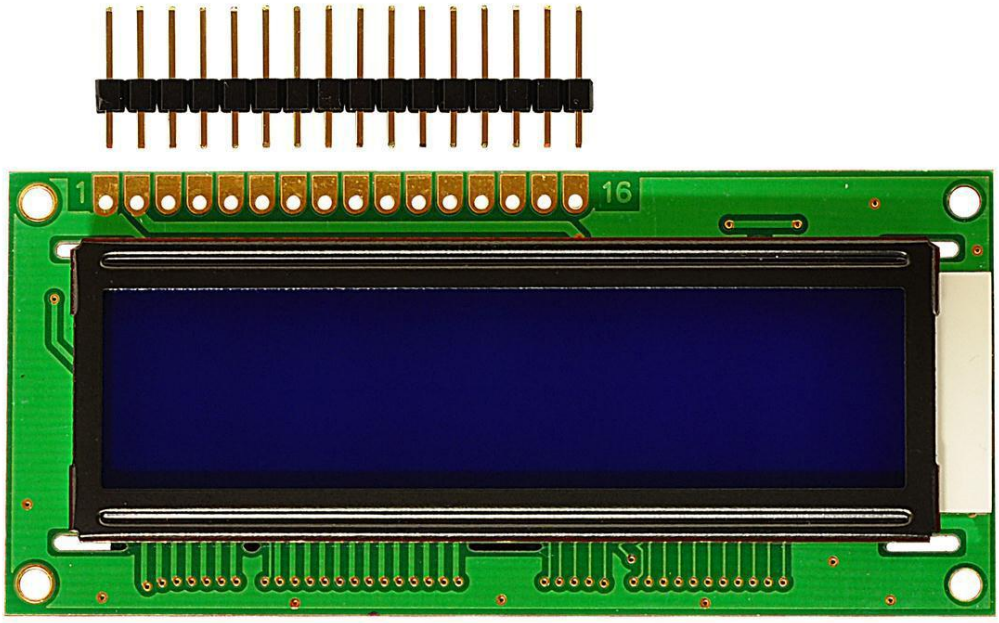
The RS-232 standard is commonly used in computer serial ports. The standard defines the electrical characteristics and timing of signals, the meaning of signals, and the physical size and pinout of connectors. The current version of the standard is TIA-232-F Interface between Data Terminal Equipment and Data Circuit-

Terminating Equipment Employing Serial Binary Data Interchange, issued in 1997.

An RS-232 serial port was once a standard feature of a personal computer, used for connections to modems, printers, mice, data storage, power supplies, and other peripheral devices. However, RS-232 is hampered by low transmission speed, large voltage swing, and large standard connectors.

In modern personal computers, USB has displaced RS-232 from most of its peripheral interface roles. Many computers do not come equipped with RS-232 ports and must use either an external USB-to-RS-232 converter or an internal expansion card with one or more serial ports to connect to RS-232 peripherals. Nevertheless, RS-232 devices are still used, especially in industrial machines, networking equipment and scientific instruments.

4.5 LCD:



(fig 4.11)

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly.

LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

LCDs are used in a wide range of applications including computer monitors, televisions, instrument panels, aircraft cockpit displays, and signage. They are common in consumer devices such as DVD players, gaming devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in most applications.

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4.5.1 Pin Description:

Pin No.	Name	Description
Pin no. 1	**VSS**	Power supply (GND)
Pin no. 2	**VCC**	Power supply (+5V)
Pin no. 3	**VEE**	Contrast adjust
Pin no. 4	**RS**	0 = Instruction input 1 = Data input
Pin no. 5	**R/W**	0 = Write to LCD module 1 = Read from LCD module
Pin no. 6	**EN**	Enable signal
Pin no. 7	**D0**	Data bus line 0 (LSB)
Pin no. 8	**D1**	Data bus line 1
Pin no. 9	**D2**	Data bus line 2
Pin no. 10	**D3**	Data bus line 3
Pin no. 11	**D4**	Data bus line 4
Pin no. 12	**D5**	Data bus line 5
Pin no. 13	**D6**	Data bus line 6
Pin no. 14	**D7**	Data bus line 7 (MSB)

CHAPTER 5

CODING

5.1 Program:

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);
#include <SoftwareSerial.h>
SoftwareSerial gps(10,11); // RX, TX
//String str="";
char str[70];
String gpsString="";
char *test="$GPGGA";
float minut;
String latitude="No Range      ";
String longitude="No Range     ";
int temp=0,i;
boolean gps_status=0;
void setup()
{
  lcd.begin(16,2);
  Serial.begin(9600);
  gps.begin(9600);
  lcd.print("Vehicle
  Tracking");
  lcd.setCursor(0,1);
  lcd.print(" System ");
  delay(2000);
```

```
  gsm_init()
  ;
  lcd.clear();

  Serial.println("AT+CNMI=2,2,0,0,0")
  ; lcd.print("GPS Initializing");
  lcd.setCursor(0,1);

lcd.print(" No GPS Range ");
get_gps()delay(2000);
  lcd.clear();
  lcd.print("GPS Range Found");
  lcd.setCursor(0,1); lcd.print("GPS is
  Ready"); delay(2000);
  lcd.clear(); lcd.print("System
  Ready"); temp=0;
}
void loop()
{
  serialEvent();
  if(temp)
  {
    get_gps();
    tracking();
  }
}
void serialEvent()
{
  while(Serial.available())
  {
```

```
    if(Serial.find("Track Vehicle"))
    {
      temp=1;
      break;
    }
    else temp=0;


}
}
void gpsEvent()
{
  gpsString="";
  while(1)
  {
   while (gps.available()>0)
                                          //che
   cking serial data from GPS
   {
    char inChar = (char)gps.read();
     gpsString+= inChar;
                                            //st
     ore data from GPS into gpsString
     i++;
     if (i < 7)
     {
      if(gpsString[i-1] != test[i-1])
                                             //
      checking for $GPGGA sentence
      {
        i=0;
        gpsString="";
      }
     }
```

```
    if(inChar=='\r')
    {
     if(i>65)
     {
       gps_status=1;
       break;
     }
     else
     {
       i=0;
     }
    }
  }
   if(gps_status) break;
  }
}
void gsm_init()
{
  lcd.clear();
  lcd.print("Finding Module..");  boolean at_flag=1;  while(at_flag)
  {
    Serial.println("AT");
    while(Serial.available()>0)
    {
      if(Serial.find("OK")) at_flag=0;
    }

    delay(1000);
```

```
 }
 lcd.clear();
 lcd.print("Module Connected.."); delay(1000);
 lcd.clear(); lcd.print("Disabling ECHO"); boolean
 echo_flag=1; while(echo_flag)
     {
  Serial.println("ATE0");
  while(Serial.available()>0)
  {
   if(Serial.find("OK")) echo_flag=0;
  }
  delay(1000);
 }
 lcd.clear(); lcd.print("Echo OFF");
 delay(1000); lcd.clear();
 lcd.print("Finding Network.."); boolean
 net_flag=1; while(net_flag)
 {
  Serial.println("AT+CPIN?");
  while(Serial.available()>0)
  {
   if(Serial.find("+CPIN: READY")) net_flag=0;
  }
  delay(1000);
 }
 lcd.clear(); lcd.print("Network Found..");
 delay(1000);
 lcd.clear();
}
  lcd.print("Long:");
  lcd.print(longitude);
```

```
    i=0;x=0;
    str_lenth=0;
    delay(2000);
   }
}
void coordinate2dec()
{

    //j=0;
    String lat_degree="";
    for(i=18;i<20;i++) //extract latitude from string
      lat_degree+=gpsString[i];

    String lat_minut="";
    for(i=20;i<28;i++)
      lat_minut+=gpsString[i];

    String long_degree="";
    for(i=30;i<33;i++) //extract longitude from string
      long_degree+=gpsString[i];

    String long_minut="";
    for(i=33;i<41;i++)
      long_minut+=gpsString[i];

     float minut= lat_minut.toFloat();
     minut=minut/60;
     float degree=lat_degree.toFloat();
```

```
    latitude=degree+minut;

    minut= long_minut.toFloat();
    minut=minut/60;
    degree=long_degree.toFloat();
    longitude=degree+minut;
}
void init_sms()
{
  Serial.println("AT+CMGF=1");
  delay(400);
  Serial.println("AT+CMGS=\"+91**********\""); // use your 10 digit cell no.
here
  delay(400);
}
void send_data(String message)
{
  Serial.println(message);
  delay(200);
}
void send_sms()
{
  Serial.write(26);
}
void lcd_status()
{
  lcd.clear(); lcd.print("Message
  Sent"); delay(2000);
  lcd.clear();
```

```
lcd.print("System Ready"); return;
}
void tracking()
{
   init_sms();
   send_data("Vehicle Tracking Alert:"); send_data("Your Vehicle
   Current Location is:"); Serial.print("Latitude:");
   send_data(latitude); Serial.print("Longitude:");
   send_data(longitude);
   send_data("Please take some action soon..\nThankyou"); send_sms();
   delay(2000); lcd_status();
}
```

CHAPTER 6

ADVANTAGES & FUTURE SCOPE

6.1 ADVANTAGES:

- Commercial fleet operators are by far the largest users of vehicle tracking systems. These systems are used for operational functions such as routing, security, dispatch and collecting on-board information
- It provides high security to vehicles.
- Highly accurate and processing is fast.
- The system is unique as we use fingerprint sensor.
- This project can be used for detection of cab or school transport
- The applications for this project are in military, navigation, automobiles, aircrafts, fleet management, remote monitoring, remote control, security systems, tele services, etc.

6.2 FUTURE SCOPE:

- We can use the EEPROM to store the previous Navigating positions up to 256 locations and we can navigate up to N number of locations byincreasing its memory.
- We can reduce the size of the kit by using GPS+GSM on the same module.
- We can increase the accuracy up to 3m by increasing the cost of the GPS receivers.
- We can use our kit for detection of bomb by connecting to the bomb detector.
- With the help of high sensitivity vibration sensors we can detect the accident. Whenever vehicle unexpectedly had an accident on the road with help of vibration sensor we can detect the accident and we can send the location to the owner, hospital and police.
- We can use our kit to assist the traffic. By keeping the kits in the entire vehicles and by knowing the locations of all the vehicles.
-
- If anybody steals our car we can easily find our car around the globe. By keeping vehicle positioning vehicle on the vehicle.

CHAPTER 6

RESULT & CONCLUSION

6.1 RESULT:

Whenever accident or theft of the vehicle is occurred then the device sends message to given mobile device.

Message for theft:

“Theft alert

Latitude:

1900.07039

Longitude:

07306.264

This system shows the location of vehicle on the LCD connected to it also just to make sure the working condition of the microcontroller.

(Fig 6.1)

7.2 CONCLUSION:

- Vehicle tracking system makes better fleet management and which in turn brings large profits. Better scheduling or route planning can enable you handle larger jobs loads within a particular time. Vehicle tracking both in case of personal as well as business purpose improves safety and security, communication medium, performance monitoring and increases productivity. So in the coming year, it is going to play a major role in our day-to-day living

- Main motto of the project is to incorporate different types of sensors so that they help in decrease the chances of vehicle theft which we can't stop from occurring.

CHAPTER 8

REFERENCES

8.1 REFERENCES:

- IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, VOL. 51, NO. 2, APRIL 2004

- international journal of recent scientific research vole 6,issue,6, pp.4805-4808,,june 2015[4806],

- [IEEE Sponsored 9th International Conference on Intelligent Systems and Control (ISCO)2015]

- [1 st IEEE International Workshop on Machine to Machine Communications Interfaces and Platforms 2013]

- [IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, VOL. 51, NO. 2, APRIL 2004]

- [IEEE SENSORS JOURNAL, VOL. 7, NO. 7, JULY 2007]

- www.arduino.com/about

- www.cooking-hacks.com

Acknowledgement

It is a matter of great privilege for me, to present this project on **"Vehicle Tracking System".** I have tried my best to collect all the information pertaining to it. It was indeed great experience for me.
My deepest thanks to Shahin Athavani the guide of my project, to guide me towards accomplishment, who supported me in correction of our manuscript, make necessary changes with attention and care, without those encouragements I would not be able to accomplish my project.

I express our special thanks to Head of department Prof. Mujib Tamboli for his encouragement and intense motivation. I would also like to express our deep gratitude and special thanks to our Director Dr. Abdul Razzak Honnutagi sir. Last but not least; I would also thanks this prestige institution and its faculty member and especially to the staff member of our department to provide us materials and withstanding all the pain through the journey of our report, without whom it would have been a distant reality.

Date: Student Name