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A Project Report on

“Vehicle Tracking System Using GPS & GSM Modem”

PROJECT REPORT

On

VEHICLE TRACKING SYSTEM USING GPS AND GSM MODEM

Submitted in partial fulfillment towards the degree of

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in

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BONAFIDE CERTIFICATE

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ABSTRACT

- This project presents a vehicle tracking system using GPS-GSM technology that can be remotely monitored by a GSM phone. It is designed to track the position of a vehicle at any period of time. It comprises of a GPS receiver, a microcontroller and a GSM module. The combination of these technologies produces a tracking system. The GPS continuously takes input data from the satellite and stores the latitude and longitude values in a ATmega328P microcontroller's buffer. This basically means that if a person has to track a vehicle, a message has to be sent to a GSM device, by which it gets activated. The location of the vehicle is identified using global positioning system (GPS) and global system for mobile communication (GSM). These systems constantly watch a moving vehicle and report the status on demand. When theft is identified, the owner sends an SMS to the microcontroller and the microcontroller sends back a message containing the location of the vehicle in terms of latitude, longitude and time.

ACKNOWLEDGEMENT

This is a project report on **"VEHICLE TRACKNG SYSTEM USING GPS AND GSM"** We are very thankful to our project guide Prof. MAHAVIRSINH M. CHAVDA, Department of Mechanical engineering, DHARMSINH DESAI UNIVERSITY, NADIAD for his invaluable guidance and assistance. We also thank him for giving this opportunity to explore about the Arduino and interrelation with sensors like GPS and GSM.

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ABBREVIATIONS

VTS Vehicle Tracking System

GSM Global System for Mobile Communication

GPS Global Positioning System

Tx Transmitter

Rx Receiver

LCD Liquid Crystal Display

RAM Random Access Memory

ROM Read Only Memory

RST Reset

CHAPTER 1

INTRODUCTION TO VTS

1.1 Introduction

Vehicle Tracking System (VTS) is the technology used to determine the location of a vehicle using different methods like GPS. Vehicle information like location details, speed, distance travelled etc. can be viewed on a digital mapping with the help of a software via Internet.

Even data can be stored and downloaded to a computer from the GPS unit at a base station and that can later be used for analysis. This system is an important tool for tracking each vehicle at a given period of time and now it is becoming increasingly popular for people having expensive cars and hence as a theft prevention.

The system consists of modern hardware and software components enabling one to track their vehicle online or offline.

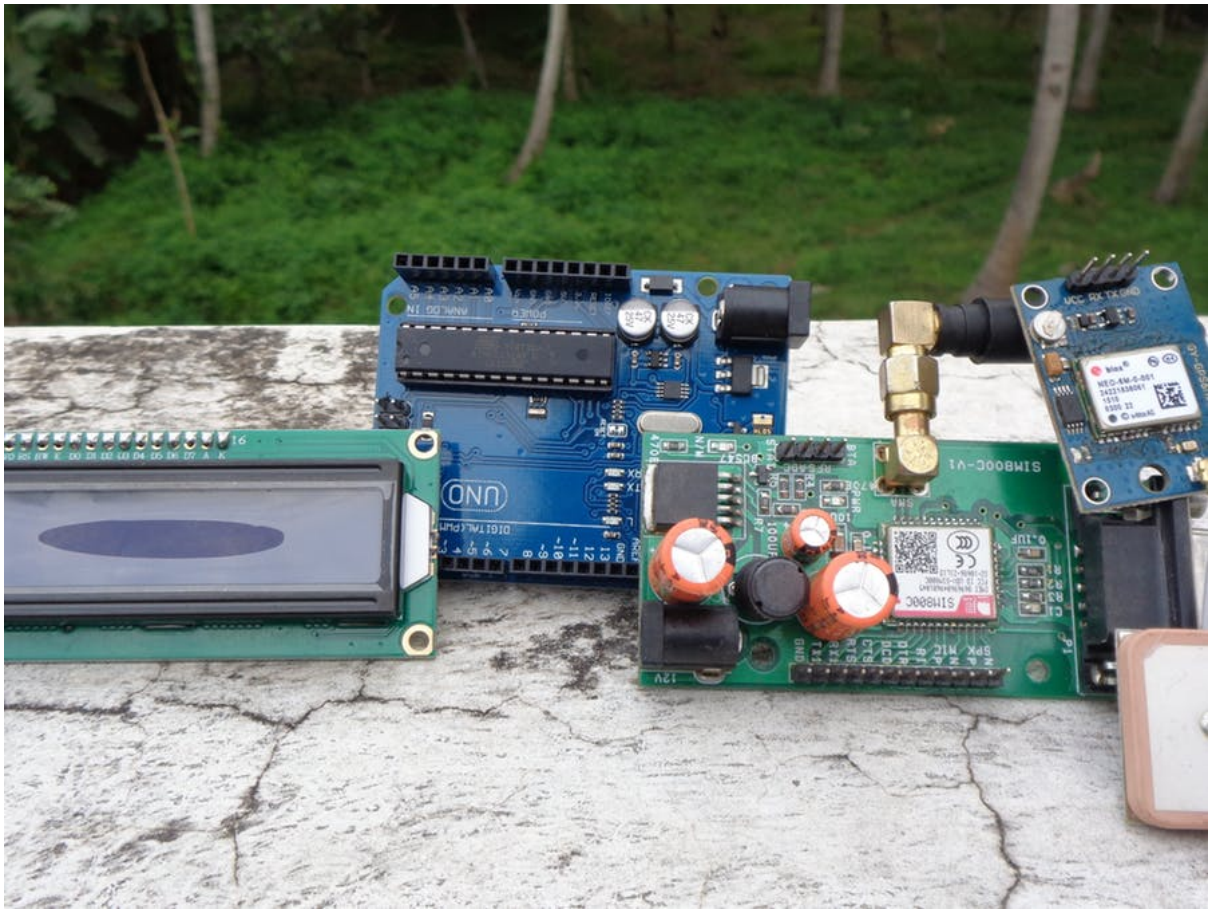


Fig: 1.1

1.2 Vehicle Security using VTS

Vehicle Security is a primary concern for all vehicle owners. Owners as well as researchers are always on the lookout for new and improved security systems for their vehicles. One has to be thankful for the upcoming technologies, like GPS systems, which enables the owner to closely monitor and track his vehicle in real-time and also check the history of vehicles movements.

This new technology, popularly called Vehicle Tracking Systems has done wonders in maintaining the security of the 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.

Due to real-time tracking facility, vehicle tracking systems are becoming increasingly popular among owners of expensive vehicles.

The vehicle tracking hardware is fitted on to the vehicle. It is fitted in such a manner that it is not visible to anyone who is outside the vehicle. Thus it operates as a covert unit which continuously sends the location data to the monitoring unit.

As we have seen the vehicle tracking system is an exciting piece of technology for vehicle security. It enables the owner to virtually keep an eye on his vehicle any time and from anywhere in the world.

1.3 Typical Architecture

Major constituents of the GPS based tracking are

1. GPS tracking device
- The device fits into the vehicle and captures the GPS location information apart from other vehicle information at regular intervals to a central server.
2. GPS tracking server
    - The tracking server has three responsibilities: receiving data from the GPS tracking unit, securely storing it, and serving this information on demand to the user.
3. User interface
    - The UI determines how one will be able to access information, view vehicle data, and elicit important details from it.

1.4New development in technology

- New system costs less with increased efficiency.
- Presently it is small tracking unit in the vehicle with web-based interface, connected through a mobile phone. This device avoids unnecessary investment in infrastructure with the facility of monitoring from anywhere for the fleet managers.
- This provides more efficient route plan to fleet operators of all sizes and compositions saving money and time.
- Vehicle tracking system heralded a new era of convenience and affordability in fleet management.
- Thus due to its easy availability it is going to stay for long.

1.5Vehicle Tracking System Features

- Vehicle Tracking System is a software & hardware system enabling the vehicle owner to track the position of their vehicle.
- A vehicle tracking system uses either GPS or radio technology to automatically track and record a fleet's field activities.
- Activity is recorded by modules attached to each vehicle. And then the data is transmitted to a central, internet-connected computer where it is stored.
- Once the data is transmitted to the computer, it can be analysed and reports can be downloaded in real-time to your computer using either web browser based tools or customized software.

1.6Vehicle Tracking Benefits

- Vehicle tracking system can be active, passive or both depending upon the application. Here are steps involved in the vehicle tracking:

1. Data capture: Data capturing is the first step in tacking your vehicle. Data in a vehicle tracking system is captured through a unit called automated vehicle unit. The automated vehicle unit uses the Global Positioning System (GPS) to determine the location of the vehicle. This unit is installed in the vehicle and contains interfaces to various data sources

2. Data storage: Captured data is stored in the memory of the automated vehicle unit.

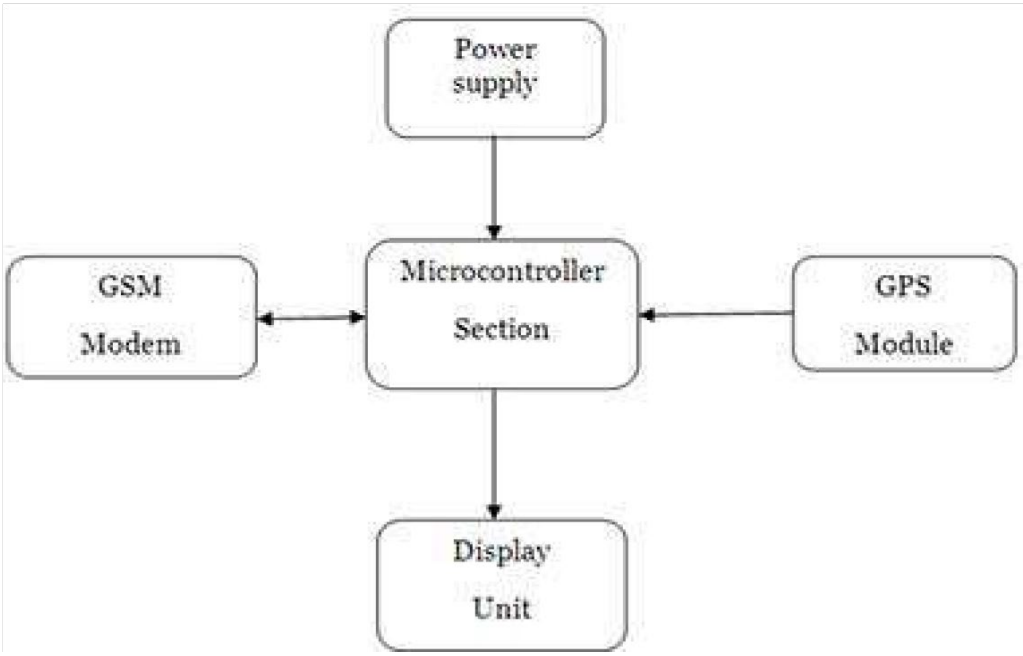
3. Data transfer: Stored data are transferred to the computer server using the mobile network or by connecting the vehicle mount unit to the computer.

4. Data analysis: Data analysis is done through software application. A GIS mapping component is also an integral part of the vehicle tracking system and it is used to display the correct location of the vehicle on the map.

CHAPTER 2

Block Diagram Of VTS

2.1 Block Diagram of Vehicle Tracing Using GSM and GPS Modem



2.2 Hardware Components:

- ARDUINO UNO
- GSM sim900A module
- NEO GPS 6M
- 16 x 2 LCD
- jumper wires

- In this project microcontroller is used for interfacing to various hardware peripherals.
- The current design is an embedded application, which will continuously monitor a moving Vehicle and report the status of the Vehicle on reset.
- For doing so an microcontroller is interfaced serially to a GSM Modem and GPS Receiver.
- A GSM modem is used to send the position (Latitude and Longitude) of the vehicle from a remote place.
- The GPS modem will continuously give the data i.e. the latitude and longitude indicating the position of the vehicle.
- The GPS modem gives many parameters as the output, but only the needed data coming out is read and displayed on to the LCD.
- The same data is sent to the mobile at the other end from where the position of the vehicle is demanded.

- The hardware interfaces to microcontroller are LCD display, GSM modem and GPS Receiver.
- When the request by user is sent to the number at the modem, the system automatically sends a return reply to that mobile indicating the position of the vehicle in terms of latitude and longitude.

As the Micro Controller, GPS and GSM take a sight of in depth knowledge, they are explained in the next chapters.

2.3GPS

The **Global Positioning System** (**GPS**), originally **NAVSTAR GPS**, is a satellite-based radionavigation system owned by the United States government and operated by the United States Space Force.

It is one of the global navigation satellite systems (GNSS) that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Obstacles such as mountains and buildings block the relatively weak GPS signals.

Working of GPS

GPS receiver works on 9600 baud rate is used to receive the data from space Segment (from Satellites), the GPS values of different Satellites are sent to microcontroller AT89S52, where these are processed and forwarded to GSM. At the time of processing GPS receives only $GPRMC values only. From these values microcontroller takes only latitude and longitude values excluding time, altitude, name of the satellite, authentication etc. E.g. LAT: 1728:2470 LOG: 7843.3089 GSM modem with a baud rate 57600.

2.4GSM

GSM (or Global System for Mobile Communications) was developed in 1990.

The first GSM operator has subscribers in 1991, the beginning of 1994 the network based on the standard, already had 1.3 million subscribers, and the end of 1995 their number had increased to 10 million! There were first generation mobile phones in the 70's, there are 2nd generation mobile phones in the 80's and 90's, and now there are 3rd gen phones which are about to enter the Indian market.

GSM is called a 2nd generation, or 2G communications technology. In this project it acts as a SMS Receiver and SMS sender. The GSM technical specifications define the different entities that form the GSM network by defining their functions and interface requirements.

2.5LCD

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 (LCs). LCs does not emit light directly.

LCDs are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. LCDs have replaced cathode ray tube (CRT) displays in most applications.

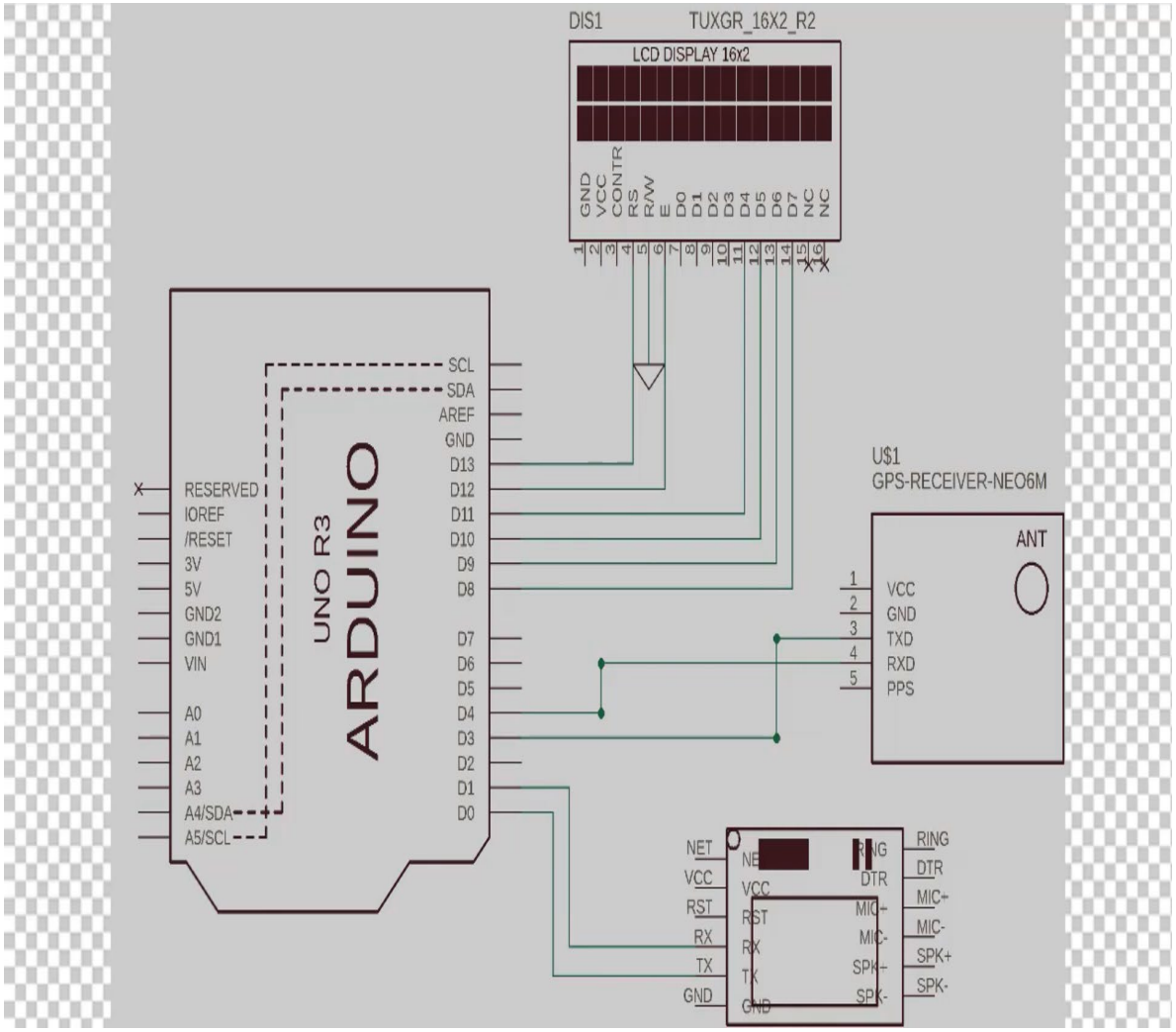
They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they cannot suffer image burn-in. LCDs are, however, susceptible to image persistence.

In particular, portable devices with less information content to be displayed, where lowest power consumption (no backlight), low cost and/or readability in direct sunlight are needed, use this type of display.

CHAPTER 3

WORKING OF VTS

3.1Schematic Diagram of VTS



3.2Circuit Description

- The hardware interfaces to microcontroller are LCD display, GSM modem and GPS receiver.
- GSM modem with a SIM card used here uses for the communication technique.
- When the reset is sent by the number at the modem, the system automatically sends a return reply to that mobile indicating the position of the vehicle in terms of latitude and longitude.

3.3Circuit Operation

- The project is vehicle positioning and navigation system we can locate the vehicle around the globe with ARDUINO UNO microcontroller, GPS receiver, GSM modem, Power supply.
- Microcontroller used is ARDUINO UNO.
- The code is written in the internal memory of Microcontroller i.e. ROM. With help of instruction set it processes the instructions and it acts as interface between GSM and GPS with help of serial communication of ARDUINO.
- GPS always transmits the data and GSM transmits and receive the data. GPS pin TX is connected to microcontroller via serial ports.
- GSM pins TX and RX are connected to microcontroller**.**

3.3.1 Power

- The power is supplied to components like GSM, GPS and Micro control circuitry using a 12V/3.2A battery .GSM requires 12v, GPS and microcontroller requires 5v. With the help of regulators we regulate the power between three components.

3.3.2 Serial ports

- Microcontroller communicates with the help of serial communication. First it takes the data from the GPS receiver and then sends the information to the owner in the form of SMS with help of GSM modem.

CHAPTER 4

ARDUINO UNO

4.1 About Arduino Uno

What is Arduino Uno?

The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (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 a AC-to-DC adapter or battery to get started.

4.2 Features of Arduino Uno board

- Arduino Uno comes with USB interface i.e. USB port is added on the board to develop serial communication with the computer.
- Atmega328 microcontroller is placed on the board that comes with a number of features like timers, counters, interrupts, PWM, CPU, I/O pins and based on a 16MHz clock that helps in producing more frequency and number of instructions per cycle.
- This board comes with a built-in regulation feature which keeps the voltage under control when the device is connected to the external device.
- Reset pin is added in the board that reset the whole board and takes the running program in the initial stage. This pin is useful when board hangs up in the middle of the running program; pushing this pin will clear everything up in the program and starts the program right from the beginning.
- There are 14 I/O digital and 6 analog pins incorporated in the board that allows the external connection with any circuit with the board. These pins provide the flexibility and ease of use to the external devices that can be connected through these pins.
- The 6 analog pins are marked as A0 to A5 and come with a resolution of 10bits. These pins measure from 0 to 5V, however, they can be configured to the high range using analogReference() function and AREF pin.
- Only 5 V is required to turn the board on, which can be achieved directly using USB port or external adopter, however, it can support external power source up to 12 V which can be regulated and limit to 5 V or 3.3 V based on the requirement of the project.

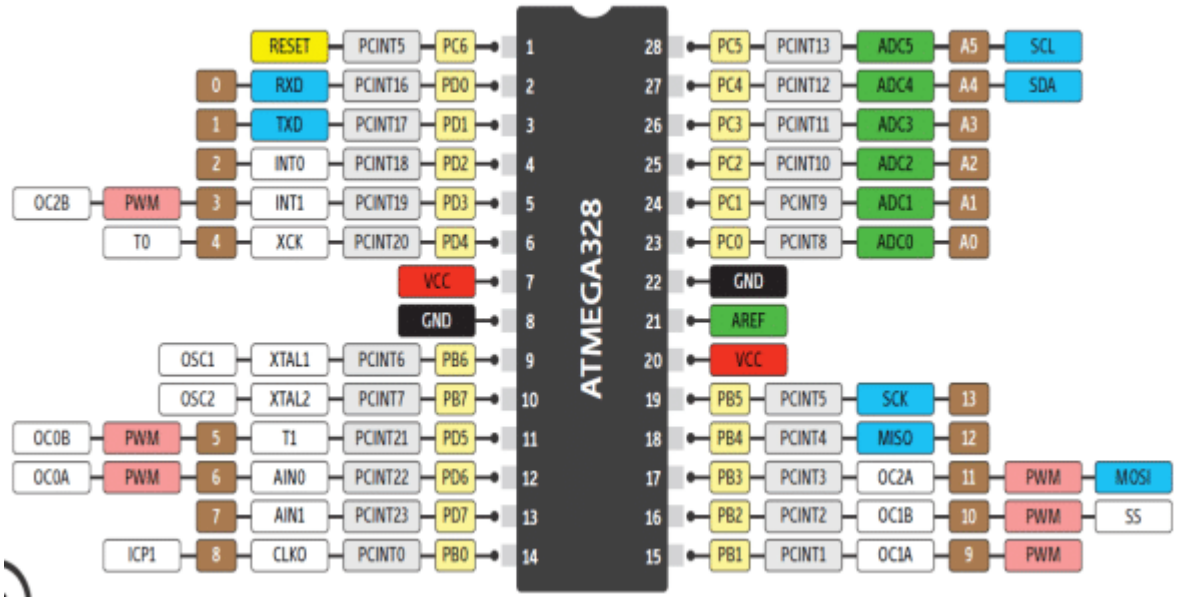


Fig 4.1 **ATMEGA328 MICROCONTROLLER**

4.3 Pin Description

Table 4.1 Arduino Uno pin description

Pin Category	Pin Name	Details
Power	Vin, 3.3V, 5V, GND	Vin: Input voltage to Arduino when using an external power source. 5V: Regulated power supply used to power microcontroller and other components on the board. 3.3V: 3.3V supply generated by on-board voltage regulator. Maximum current draw is 50mA. GND: ground pins.
Reset	Reset	Resets the microcontroller.
Analog Pins	A0 – A5	Used to provide analog input in the range of 0-5V
Input/Output Pins	Digital Pins 0 - 13	Can be used as input or output pins.

Serial	0(Rx), 1(Tx)	Used to receive and transmit TTL serial data.
External Interrupts	2, 3	To trigger an interrupt.
PWM	3, 5, 6, 9, 11	Provides 8-bit PWM output.
SPI	10 (SS), 11 (MOSI), 12 (MISO) and 13 (SCK)	Used for SPI communication.
Inbuilt LED	13	To turn on the inbuilt LED.
TWI	A4 (SDA), A5 (SCA)	Used for TWI communication.
AREF	AREF	To provide reference voltage for input voltage.

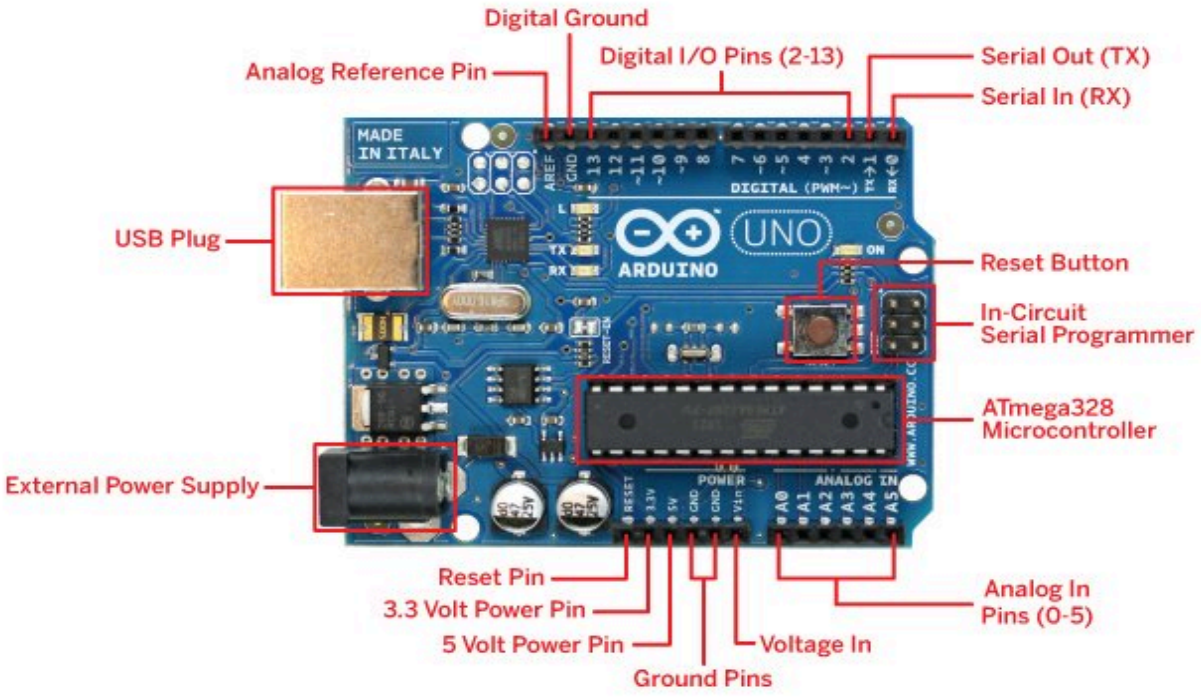


Fig 4.2 ARDUINO UNO PIN DESCRIPTION

CHAPTER 5

GSM

5.1 About GSM Module

A **GSM Module** is basically a GSM Modem (like SIM 900) connected to a PCB with different types of output taken from the board – say TTL Output (for Arduino, 8051 and other microcontrollers) and RS232 Output to interface directly with a PC (personal computer). The board will also have pins or provisions to attach mic and speaker, to take out +5V or other values of power and ground connections.

5.2 Working/Interface of GSM Module with Arduino Uno

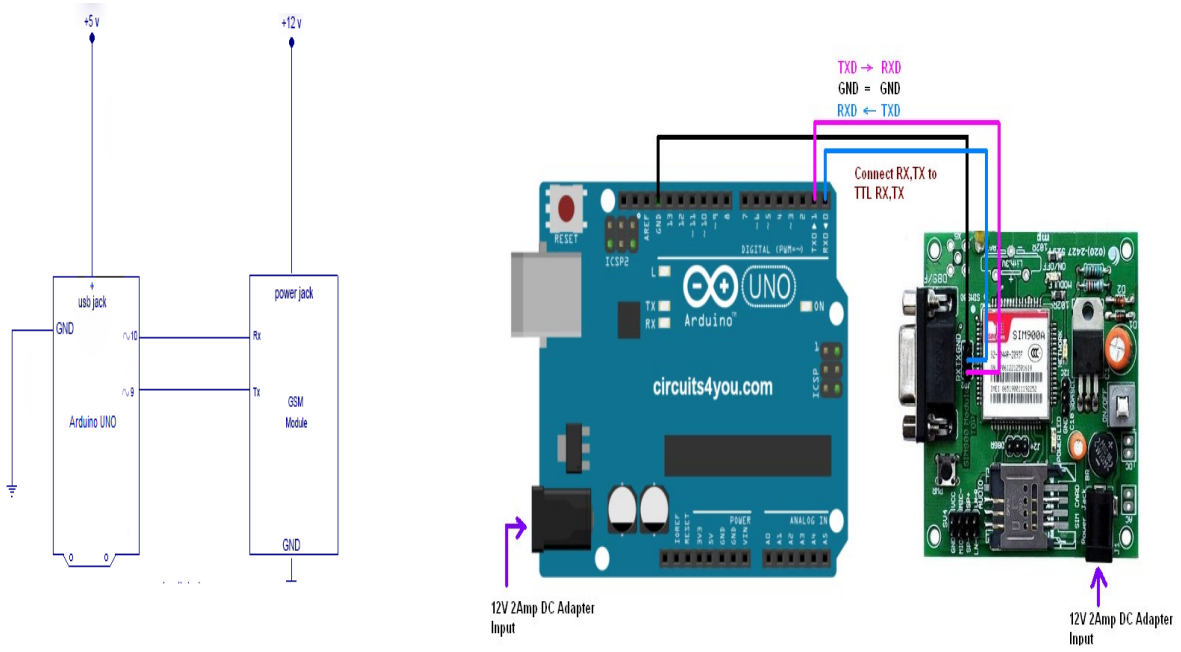


Fig 5.1 CONNECTION OF GSM MODULE WITH ARDUINO UNO

- Connect **TX pin of GSM Module to RX pin** of Arduino Uno.
- Connect **RX pin of GSM Module to TX pin** of Arduino Uno.

How GSM Work?

- For the usage of GSM module you need to know how the GSM will work. To Communicate with GSM you need to know the "AT Commands". By sending this Commands to GSM module it will work according.

- Based on the GSM working Bandwidth you need to configure some settings in MCU(Microcontroller). With out this configuration both devices can't talk to each other.

- After Configuring the settings in MCU you need to send the AT commands to GSM. Commands like AT+91********** with this command the Module will call to that particular number. Like that there are many commands. Refer in internet you will get clear idea on AT Commands.

- IN GSM module you need to Concentrate only on 3 pins. 1. power supply, 2.Tx, 3.Rx

  1.Power Supply: For Supply to module you can use adapter. Based the module architecture, Some modules have this adapter and some not have, any way this is not a big issue, You can supply it easily.

  2. Tx: This pin is GSM Transmitter pin. It should connect to the MCU Rx pin. From this it will send the response for your AT Commands. if the command executed in Module As a result it will send "OK" as reply. If you receive this signal to MCU and transfer the data to Display you can observe the reply from GSM.

  3. Rx: This pin will receive the commands from MCU.

- The total transmission of data in GSM in serial communication. In some MCU's They have built in parallel to serial converters and vice versa. You can use them to communicate with GSM.

5.3 Application of GSM Module

These are mainly employed for computer based SMS and MMS services. The GSM module demonstrates the use of AT commands. It can feature all the functionalities of a mobile phone through computer like making and receiving calls, SMS, MMS etc.

CHAPTER 6

GPS RECEIVER

6.1 GPS History

The Global Positioning System (GPS) is a Global Navigation Satellite System (GNSS) developed by the United States Department of Defense. It is the only fully functional GNSS in the world. It uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals, which enable GPS receivers to determine their current location, the time, and their velocity. Its official name is NAVSTAR GPS. Although NAVSTAR is not an acronym, a few acronyms have been created for it. The GPS satellite constellation is managed by the United States Air Force 50th Space Wing. GPS is often used by civilians as a navigation system.

The design of GPS is based partly on similar ground-based radio navigation systems, such as LORAN and the Decca Navigator developed in the early 1940s, and used during World War II. Additional inspiration for the GPS came when the Soviet Union launched the first Sputnik in 1957. A team of U.S. scientists led by Dr. Richard B. Kershner were monitoring Sputnik's radio transmissions. They discovered that, because of the Doppler Effect, the frequency of the signal being transmitted by Sputnik was higher as the satellite approached, and lower as it continued away from them.

6.2 GPS Module

- NEO-6M GPS Chip
- The heart of the module is a NEO-6M GPS chip from u-blox.
- It can track up to 22 satellites on 50 channels and achieves the industry's highest level of sensitivity i.e. -161 dB tracking, while consuming only 45mA supply current.
- The u-blox 6 positioning engine also boasts a Time-To-First-Fix (TTFF) of under 1 second. One of the best features the chip provides is Power Save Mode(PSM). It allows a reduction in system power consumption by selectively switching parts of the receiver ON and OFF.

NEO-6M GPS module

Figure : 6.1

- The necessary data pins of NEO-6M GPS chip are broken out to a "0.1″ pitch headers. This includes pins required for communication with a microcontroller over UART.
- Note:- The module supports baud rate from 4800bps to 230400bps with default baud of 9600.

6.2 .1 Pin out diagrams of GPS module

- GND is the Ground Pin and needs to be connected to GND pin on the Arduino.
- TxD (Transmitter) pin is used for serial communication.
- RxD (Receiver) pin is used for serial communication.
- VCC supplies power for the module. You can directly connect it to the 5V pin on the Arduino.

Figure : 6.2

6.2.2 Feature of GPS Module

24 Satellites at different orbits Revolve around Earth twice a day

For a 2D location, 3 GPS Satellites are used

For a 3D location, more than 3 Satellites are used

6.3Working and Operation

When people talk about "a GPS," they usually mean a GPS receiver. The Global Positioning System (GPS) is actually a constellation of 27 Earth-orbiting satellites (24 in operation and three extras in case one fails). The U.S. military developed and implemented this satellite network as a military navigation system, but soon opened it up to everybody else.

Each of these 3,000- to 4,000-pound solar-powered satellites circles the globe at about 12,000 miles (19,300 km), making two complete rotations every day. The orbits are arranged so that at anytime, anywhere on Earth, there are at least four satellites "visible" in the sky.

A GPS receiver's job is to locate four or more of these satellites, figure out the distance to each, and use this information to deduce its own location. This operation is based on a simple mathematical principle called trilateration. GPS receiver calculates its position on earth based on the information it receives from four located satellites. This system works pretty well, but inaccuracies do pop up. For one thing, this method assumes the radio signals will make their way through the atmosphere at a consistent speed (the speed of light). In fact, the Earth's atmosphere slows the electromagnetic energy down somewhat, particularly as it goes through the ionosphere and troposphere. The delay varies depending on where you are on Earth, which means it's difficult to accurately factor this into the distance calculations. Problems can also occur when radio signals bounce off large objects, such as skyscrapers, giving a receiver the impression that a satellite is farther away than it actually is. On top of all that, satellites sometimes just send out bad almanac data, misreporting their own position.

Differential GPS (DGPS) helps correct these errors. The basic idea is to gauge GPS inaccuracy at a stationary receiver station with a known location. Since the DGPS hardware at the station already knows its own position, it can easily calculate its receiver's inaccuracy. The station then broadcasts a radio signal to all DGPS-equipped receivers in the area, providing signal correction information for that area. In general, access to

this correction information makes DGPS receivers much more accurate than ordinary receivers.

A GPS Signal contains three different bits of information

(1).Pseudo random code

(2).Ephemeris data

(3).Almanac data

(1).Pseudo random code:

A pseudo-noise code or pseudo-random-noise code (PRN code) is **one that has a spectrum similar to a random sequence of bits but is deterministically generated**. The most commonly used sequences in direct-sequence spread spectrum systems are maximal length sequences, Gold codes, Kasami codes, and Barker codes.

(2).Ephemeris data:

Scientific ephemerides often contain further useful data about the moon, planet, asteroid, or comet beyond the pure coordinates in the sky, such as **elongation to the sun, brightness, distance, velocity, apparent diameter in the sky, phase angle, times of rise, transit, and set**, etc.

(3).Almanac data

Almanac data is used when a **GPS receiver is turned on after being inactive or off for 30 minutes or more**. It is utilized to establish the position of a GPS receiver at a given time depending on its data in the almanac.

6.4GPS Data Decoding

G.P.S receiver continuously sends data and the microcontroller receives the data whenever it requires. The data sent by the G.P.S is a string of characters which should be decoded to the standard format. This is done by the program which we implement in the controller.

Chapter 7

LCD (Liquid Crystal Display)

7.1 16x2 LCD

- 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 (LCs).
- LCs does not emit light directly.
- LCDs are used in a wide range of applications, including computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc.
- They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones.
- LCDs have replaced cathode ray tube (CRT) displays in most applications.
- They are available in a wider range of screen sizes than CRT and plasma displays, and since they do not use phosphors, they cannot suffer image burn-in.

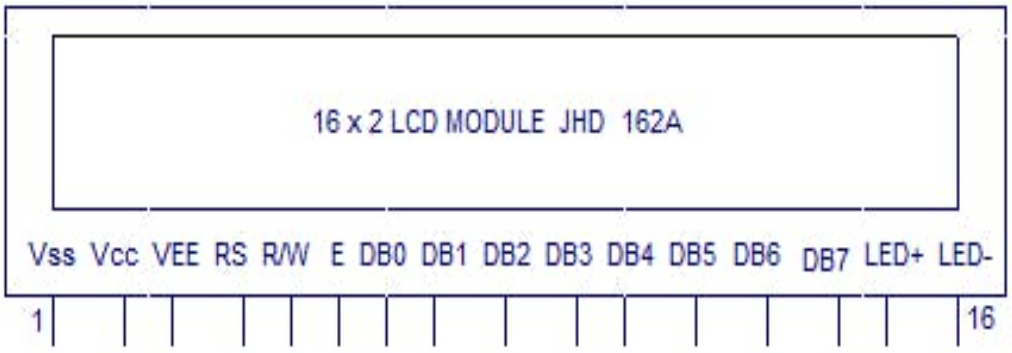


Figure : 7.1

7.2 Interfacing LCD with Ardino UNO

In this project Arduino UNO microcontroller is used for interfacing to various hardware peripherals. The current design is an embedded application, which will continuously monitor a moving Vehicle and report the status of the Vehicle on reset. For doing so an Arduino UNO microcontroller is interfaced serially to a GSM Modem and GPS Receiver. A GSM modem is used to send the position (Latitude and Longitude) of the vehicle from a remote place. The GPS modem will continuously give the data i.e. the latitude and longitude indicating the position of the vehicle. The GPS modem gives many parameters as the output, but only the needed data coming out is read and displayed on to the LCD. The same data is sent to the mobile at the other end from where the position of the vehicle is demanded.

The hardware interfaces to microcontroller are LCD display, GSM modem and GPS Receiver.When the request by user is sent to the number at the modem, the system automatically sends a return reply to that mobile indicating the position of the vehicle in terms of latitude and longitude.

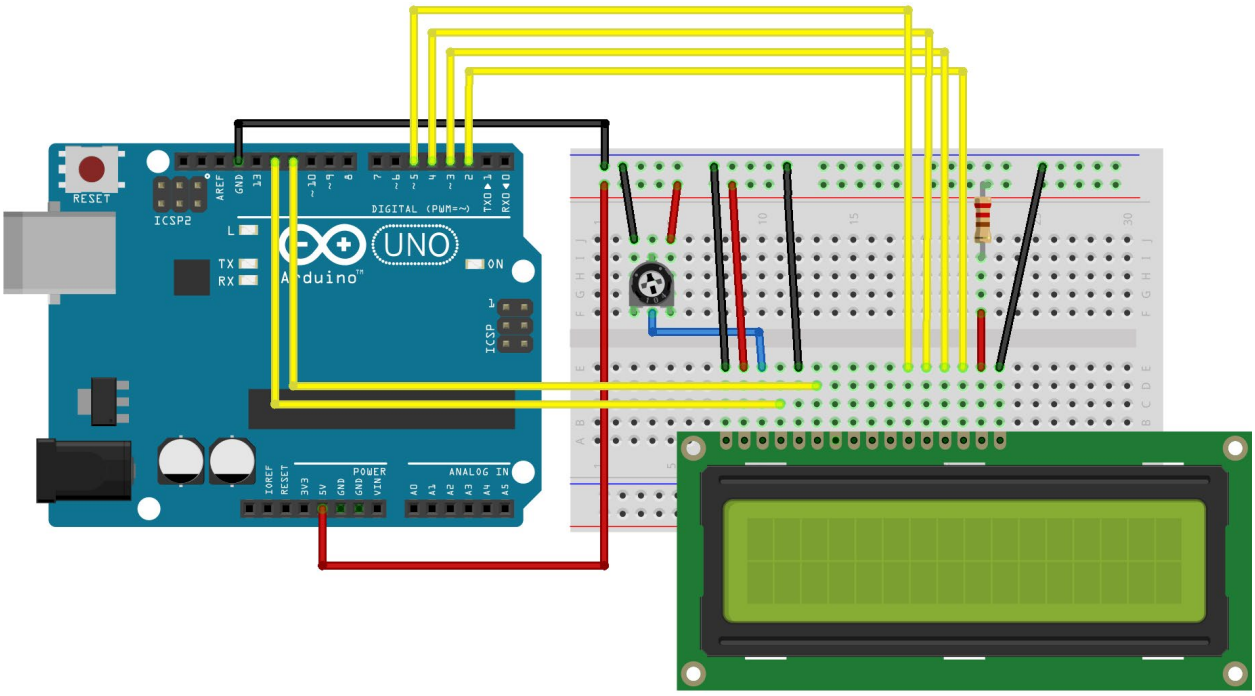


Figure : 7.2

CHAPTER 8

APPLICATIONS

8.1 Applications

- 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.
- These systems are also used in consumer vehicles as devices for preventing theft and retrieving stolen/lost vehicles. The signal sent out by the installed device help the police to track the vehicle. These tracking systems can be used as an alternative for traditional car alarms or in combination with it. Installing tracking systems can thus bring down the insurance costs for your vehicle by reducing the risk factor.
- Vehicle Tracking systems often have several alternatives, like sending automatic alerts to a phone or email if the vehicle is moved without due authorization. They can also work as one layer of several combined security measures.
- Apart from security concerns, the tracking systems can also help users such as taxi services to improve their customer service. The systems enable the operators to identify the empty taxis and direct the nearest one to pick up the customer.
- Vehicle tracking systems can also be applied for monitoring driving behaviour for both commercial and individual situations. Parents for instance can use tracking devices to keep an eye on their teenage son's driving.

The applications for this project are in military, navigation, automobiles, aircrafts, fleet management, remote monitoring, remote control, security systems, teleservices, etc.

CHAPTER 9

ARDUINO SOFTWARE

9.1 Introduction

The **Arduino Integrated Development Environment (IDE)** is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring.

The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures.

User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub *main()* into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution.

9.2 Getting started with Arduino UNO

- Use the Arduino Uno on the Arduino Desktop IDE
- Install the board drivers
- Open your first sketch
- Select your board type and port
- Upload the program

9.3 Arduino software programming procedure

Following steps are to be followed in order to develop code and test the equipment with software.

9.3.1 Procedure steps:

Step-1: Download the Arduino IDE Version 1.8.12. Before you begin building, do a little research to figure out which version will be the most appropriate for your project.

Step-2: Connect your Arduino to the USB port of your computer. This may require a specific USB cable.

Step-3: Set the board type and the serial port in the Arduino Programmer.

Step-4: Test the microcontroller by using one of the preloaded programs, called sketches, in the Arduino Programmer.

Step-5: To upload new code to the Arduino, either you'll need to have access to code you can paste into the programmer, or write it yourself, using the Arduino programming language to create your own sketch.

Step-6: Once you've uploaded the new sketch to your Arduino, disconnect it from your computer and integrate it into your project as directed.

9.4About This Project

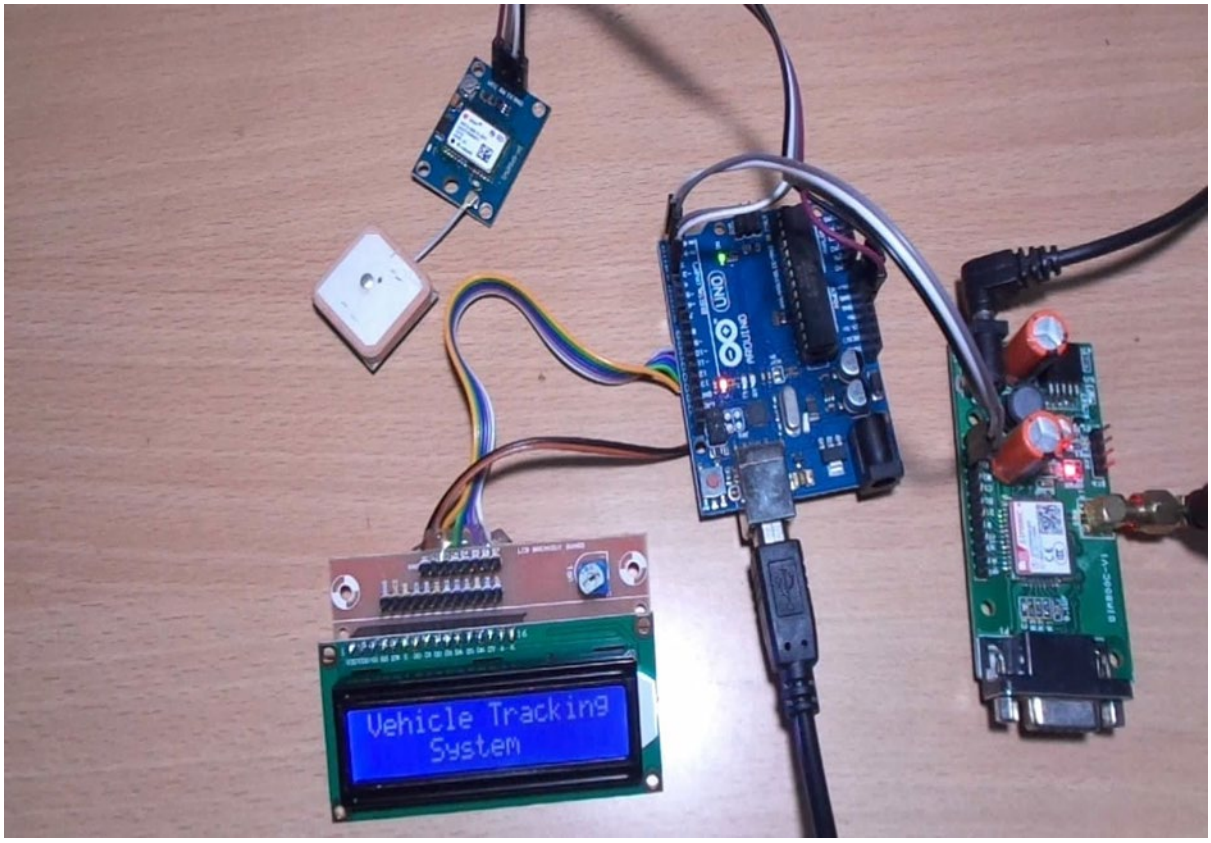
- Step 1: Connect the TX and RX Pin of the GPS to D3 and D4
- Step 2: Connect the LCD to the D8 to D13 of the Arduino Board
- Step 3: Add Tiny GPS Library
- Step 4: Write the code Step 5: Type "TRACK VEHICLE" to the Sim on the Sim Module
- Step 6: You Can Receive the Response SMS From GSM Module
- Step 7: Click the Weblink to Track the Vehicle

  Finally you can track the vehicle in the google map.

CHAPTER 10
RESULT ANALYSIS

- We a team of 3 members have successfully completed our Project on Tracking Down Vehicle and Locking it remotely using GPS and GSM technologies.
- We first tried to understand the working of our project through the schematic and then we proceeded to build the circuit as per the schematic.
- We started by interfacing each component with Arduino Uno and later on we went for developing the overall circuit.
- Initially we faced few problems with the GPS modem, as it won't work efficiently inside buildings. So we tried to keep it in open space for some time to get the accurate results.
- And also the GSM modem suffered problems with the coverage area of the Mobile Service Provider. So, we used Airtel as it has maximum coverage area. In order to solve this problem we can use dedicated servers and purchasing satellite space so that we can track down the vehicle anytime and anywhere.

The overall developed circuit looks as in the following figure:



Thus With the knowledge in Electronics and Communications we have successfully completed our project with perfect results.

CHAPTER 11

CONCLUSION

The project titled “tracing down the vehicle using GSM and satellite communication” is a model for vehicle tracking unit with the help of gps receivers and GSM modem. Vehicle Tracking System resulted in improving overall productivity with better fleet management that in turn offers better return on your investments. 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. We have completed the project as per the requirements of our project. Finally the aim of the project i.e. to trace the vehicle is successfully achieved.

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