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ALCOHOL DETECTION WITH AUTO FINE GENERATION USING INTERNET OF THINGS

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ABSTRACT

Vehicular Accidents are a major cause of concern in today's world. Safety of the driver and the co passengers can be threatened because of various reasons that lead up to an accident and moreover there is a huge lag between the time of accident and time when emergency services reach ground zero. Many lives can be saved if proper emergency services reach the accident location at the right time. With the help of the proposed system not only accidents are detected but also notifications are sent to the nearest hospital, police station and emergency contacts. Accidents are detected using two sensors i.e, vibration sensor, and IR sensor. These sensors form the part of the embedded system which has an arduino. The smartphone detects whether an accident has occurred or not using the Accident detection algorithm. On detection of an accident, a message along with the gps coordinates (users current location), blood group and vehicle plate number (collected at the time of user registration) is sent to the nearest hospital, police station and emergency contacts. This process can significantly reduce the number of casualties because of delay in receiving proper medical care. Also in order to minimize false positives, an alarm system has been included which goes off as soon as accident has been detected. If the driver is safe, he/she can shut the alarm and cancel the sending of the message. The alarm rings for about 30 seconds after which it automatically forwards the message to emergency services and contacts. This application will help the service providers to reach on time and save valuable human life.

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CHAPTER-1

INTRODUCTION

The development in the field of automobiles is highly increasing and which leads to the accidents and so many hazards due to traffic. People's life are under high risk. This situation prevails, just because there is a lack of emergency facilities in our country. In our country, many people loose their life with accidents. Because of causalities or improper communication to rescue team. We are in the process of solving this issue by proposing an efficient solution and to reduce the loss of lives as much as possible. In our theory, the design of the system help us to detect accidents in significantly less time and transfer the fundamental informations to the first aid centre within a few seconds covering the geographical coordinates, the time and the angle where the vehicle had met with an accident. This alert message is sent to the rescue team(ambulance) and the family within the short period. This real time application saves many valuable lives .The message is sent through the GSM module and the location of the basic idea is to localize the vehicle system by receiving the real time position of the vehicle through GPS and send the information through GSM module via SMS service with an added feature of GPRS transmission to the monitoring center through usage of internet.

The most obvious reason for a person's death during accidents is unavailability of the first aid provision, which is due to the delay in the information of the accident being reached to the ambulance or to the hospital. Thus, in the case of incidents involving vehicular accidents, response time is crucial for the timely delivery of emergency medical services to accident victims and is expected to have an impact on fatalities. Moreover, each minute is passed while an injured crash victims do not receive emergency medical care can make a large difference in their survival rate, for example, analysis shows that decreasing accident response time by 1 minute correlates to a six percent difference in the number of lives saved [2]. Thus, the reduction in response time would occur with widespread implementation of enhanced traffic technologies that are used to reduce the response time and thus reducing traffic fatalities. The early experiences with these technologies are concerned with development Advance traffic management system (ATMS) and development automatic car accident detection and notification system built-in vehicles in United States (U.S). The ATMS is based on traffic sensors that are used to monitor the traffic and detect the accidents. These traffic sensors are installed in main highway; some of them are installed under the surface of

the road such as loop detectors [3]. However, in this system, finding the traffic sensors in every roads process is impossible, since the traffic sensors are installed in main highways only, besides, the installation cost of these sensors are high. Apart from that, these traffic sensors are affected by the environment. For example some of traffic sensors are not perform well in the snow environment. Other systems, the automatic accident detection and notification systems are equipped with the most recent manufactures vehicles, such as BMW and General Motor (GM), which depend on the vehicle on-board sensors to detect the accident and utilize the built-in radio cellular to notify the emergency responders [4]. However, the fast evolution of the technology requires the upgrading the software or even some hardware features of the vehicles in order to install the automatic accident detection and notification system, while the installation cost of these system inside the vehicles are expensive. Also, these systems are not considered as a standard option for all vehicles in U.S and other countries, these systems are just equipped with specific type of the vehicles in U.S such as BMW and GM. These facts are the ones that motivated the researchers to proof the advantages of using the smartphone in development car accident detection and notification systems.

The benefits of the smartphone that can be exploited to develop these systems are:

- Clearly known that the user renews the smartphone much more frequently compared with the vehicle and the smartphones are more frequently updated in software and even in hardware.

- Likewise, institution of smartphones gave birth to a lot of innovative technology and exchanging information globally has become more prominent. Smartphones gave a new dimension to the usage of mobile phones for the users.

- Regardless, the use of a smartphone gives the possibility of having additional sensors, advance power processor and communication interfaces, which permits to develop traffic accident detection and notification system that predicts when an accident has occurred based on sensor inputs to the smartphone without need to interaction with a car or changing anything in the car.

- On the other hand, the low cost of the smartphones compared to the existing traffic technologies.

- Moreover, smartphones travel with their owners, providing accident detection regardless of whether or not the vehicle is equipped with an accident detection and notification system, and whether there is a traffic sensor installed on the road or not.

In recent years, road accidents have emerged as a significant global concern due to their devastating impact on human lives, property, and overall societal well-being. Advanced technological solutions are crucial in mitigating the severity of these accidents and enhancing emergency response capabilities. The integration of GSM (Global System for Mobile Communications) technology into vehicle accident detection and tracking systems has revolutionized the way accidents are managed and responded to.

The GSM-based Vehicle Accident Detection and Vehicle Tracking System represents a pivotal step forward in ensuring road safety and timely emergency assistance. This innovative system combines real-time accident detection, location tracking, and communication capabilities to minimize response times and maximize the chances of saving lives.

Key Features of the System:

Accident Detection: The system employs a combination of sensors and algorithms to detect vehicle accidents accurately. These sensors, including accelerometers and gyroscopes, are capable of identifying sudden decelerations, impacts, and rollovers indicative of accidents.

Location Tracking: GPS (Global Positioning System) technology is integrated into the system to pinpoint the exact location of the vehicle involved in the accident. This location information is vital for emergency responders to reach the scene swiftly, particularly in remote or less-frequented areas.

Instant Communication: The GSM technology allows the system to establish a connection with emergency services and authorized contacts as soon as an accident is detected. This communication channel enables timely sharing of critical information, such as the accident location and severity, helping responders make informed decisions.

Emergency Alerts: In the event of an accident, the system automatically sends out alerts to predefined contacts, such as family members, emergency services, and even the vehicle owner. These alerts can be transmitted via SMS, phone calls, or dedicated mobile applications.

Vehicle Tracking and Recovery: Beyond accident scenarios, the system also facilitates vehicle tracking and recovery in case of theft. Owners can monitor their vehicles in real-time through dedicated applications, enhancing overall security and peace of mind.

Benefits:

Rapid Emergency Response: The immediate transmission of accident data to emergency services expedites their response times, leading to quicker medical assistance and reducing the severity of injuries.

Improved Road Safety: By identifying accident-prone areas and analyzing accident data, authorities can implement measures to enhance road safety, potentially preventing future accidents.

Enhanced Accountability: The system can also provide valuable evidence for insurance claims and legal proceedings by capturing accident data and location information.

Remote Monitoring: Vehicle owners can remotely monitor their vehicles' status, location, and activities through mobile applications, promoting a sense of security and control.

The GSM-based Vehicle Accident Detection and Vehicle Tracking System represents a leap forward in road safety, emergency response, and vehicle security. By combining advanced sensing technology with real-time communication capabilities, this system contributes significantly to reducing accident-related fatalities, improving emergency response efficiency, and creating a safer driving environment for all road users. Its potential to save lives and mitigate the consequences of accidents makes it a crucial tool in modernizing the way accidents are managed and addressed.

CHAPTER-2

LITERATURE SURVEY

Patole Gitanjali and team [1] created a case study “IOT based Vehicle Tracking & Vehicular Emergency System” which focuses on the Architectural functioning of different units of the System which include the Vehicle and Ambulance Unit, Traffic and Server Unit. “Smart on-board transportation management system Geo-Casting featured”, by Saed Tarapiah and team [2] aims to

send the notification regarding the Geographical Location of the Vehicle to the Subset. Aishwarya and others [5] implemented a system "An IoT Based Accident Prevention & Tracking System for Night Drivers" in which the primary role of the device proposed is to provide an Eye Blinking Monitoring System (EBMS) that alerts the night drivers during drowsiness. Parveen Sultana and the team imported their work by creating the recording equipment which gets connected to the cloud to produce continuous updates which helps to tell the closest hospital of a crash instantly [6].

The work carried by M.Kavya and Shakeel Ahmed in "IOT BASED REAL-TIME AUTONOMOUS VEHICLE TRACKING SYSTEM" [8] is a study which would inform about an accident that just happened to the rescue team and to the relatives of the person who met with the accident. It uses MEMS sensor which may find the abrupt vibration once an accident is occurred and additionally used ultrasonic sensors for distance calculation. The project "Arduino premised Vehicle Accident Detection System" by Pooja Shindalkar and the team uses an accelerometer device that may sight the unevenness of vehicle associated vibrations once an accident occurs. This sends a symbol to the microcontroller.

Vehicle accident detection system victimization GSM and GPS modems are completed. Messages notifications are unit sent to the mobile number which is prescribed. [12] "Accident Alert and Vehicle Tracking System" by Priyanka and the team proposed a work in which the system is represented as the foremost application of early accident detection. It will automatically sight traffic accidents by applying vibration sensors and immediately inform a central emergency dispatch server that an accident had occurred by making use of GPS coordinates. In conjunction with that information it will send an ambulance that is closest to the accident location. The technique uses devices named Raspberry Pi, Vibration Sensors, GPS and GSM modules to discover traffic accidents. [16]

Detecting Driver Drowsiness Based on Sensors Researchers have attempted to determine driver drowsiness using the following measures: (1) vehicle-based measures; (2) behavioural measures and (3) physiological measures [3]. A detailed review on these measures will provide insight on the present systems, issues associated with them and the enhancements that need to be done to make a robust system [3]. This paper reviews the three measures as to the sensors used and discuss the advantages and limitations of each. The various ways through which drowsiness has

been experimentally manipulated is also discussed [3]. It is concluded that by designing a hybrid drowsiness detection system that combines non-intrusive physiological measures with other measures one would accurately determine the drowsiness level of a driver. A number of road accidents might then be avoided if an alert is sent to a driver that is deemed drowsy [3]. D. Eye Tracking Based Driver Drowsiness Monitoring And Warning System This project represents a way of developing an interface to detect driver drowsiness based on continuously monitoring eyes and DIP algorithms [4].

Micro sleeps are the short period of sleeps lasting 2 to 3 seconds, are good indicator of fatigue state. Thus by monitoring continuously the eyes of the driver by using camera one can detect the sleepy state of driver and timely warning is issued. Aim of the project is to develop the hardware which is very advanced product related to driver safety on the roads using controller and image processing [4]. This product detects driver drowsiness and gives warning in form of alarm and it also decreases the speed of vehicle. Along with the drowsiness detection process there is continuous monitoring of the distance done by the Ultrasonic sensor [4]. The ultrasonic sensor detects the obstacle and accordingly warns the driver as well as decreases speed of vehicle [4]. E. Driver Drowsiness Detection System: One of the major cause of traffic accident is Driver‘s drowsiness. It is a serious highway safety problem. If drivers could be warned before they became too drowsy to drive safely, some of these crashes could be prevented.

In order to reliably detect the drowsiness, it depends on the presentation of timely warnings of drowsiness [5]. To date, the effectiveness of drowsiness detection methods has been limited by their failure to consider individual differences. Based on the type of data used, drowsiness detection can be conveniently separated into the two categories of intrusive and non-intrusive methods [5]. During the survey, non-intrusive methods detect drowsiness by measuring driving behaviour and sometimes eye features, through which camera based detection system is the best method and so are useful for real world driving situations [5]. This paper presents the review of existed drowsiness detection techniques that will be used in this system like Circular Hough Transform, FCM, Lab Color Space etc [5].

A literature survey on GSM-Based Vehicle Accident Detection and Vehicle Tracking Systems reveals a comprehensive body of research and development efforts in this domain. Below are some key research papers, articles, and studies that highlight the advancements and insights in this field:

"A GSM and GPS based Vehicle Tracking and Employee Security System" Authors: A. Ananthi, M. Nithya, P. Prasath This paper discusses the integration of GSM and GPS technologies for tracking vehicles and ensuring employee security. It presents a system that can track vehicle movements, provide real-time location updates, and enhance overall security. Published in: International Journal of Computer Applications, Volume 17, No.1, February 2011.

"Vehicle Accident Automatic Detection and Remote Alarm Device Design Based on GSM" Authors: Shengyong Zhao, Lixia Shi, Hongxun Yao This research proposes a vehicle accident detection system that utilizes GSM technology to send an alarm message to a remote server in the event of an accident. The system is designed to improve emergency response times and enhance accident management. Published in: 2010 3rd International Conference on Computer Science and Information Technology.

"Development of Vehicle Accident Detection System" Authors: M. Muralidharan, S. Padmavathi This study focuses on the development of an accident detection system using accelerometer sensors and GSM technology. It presents an algorithm to differentiate between normal driving and accident scenarios based on accelerometer data analysis. Published in: International Journal of Computer Applications, Volume 84, No.9, November 2013.

"An Intelligent Vehicle Monitoring and Tracking System Using GSM and GPS for Accident Prevention" Authors: K. S. Rajasekaran, R. Sugumaran, M. Rajkumar This paper proposes a system that uses GSM and GPS technologies to monitor and track vehicles, providing accident prevention and enhanced vehicle security. It discusses various aspects, including hardware design and communication protocols. Published in: International Journal of Computer Applications, Volume 57, No.4, November 2012.

"A Survey on Vehicle Tracking System with Remote Control" Authors: S. Bhagwan Das, D. Avinash, T. RamaRao This survey article provides an overview of various vehicle tracking systems, including those based on GSM and GPS technologies. It highlights the importance of remote control and monitoring in vehicle tracking systems. Published in: International Journal of Computer Applications, Volume 129, No.12, November 2015.

"Design and Implementation of Vehicle Accident Detection System using MEMS and GPS" Authors: G. Sreenivasulu, S. Srinivasa Rao This paper discusses the design and implementation of a vehicle accident detection system that utilizes MEMS (Micro-Electro-Mechanical Systems) sensors and GPS technology. It emphasizes the need for accurate accident detection and timely response. Published in: International Journal of Computer Applications, Volume 82, No.3, November 2013.

These research papers collectively demonstrate the ongoing efforts to leverage GSM and GPS technologies for vehicle accident detection and tracking systems. They highlight the significance of accurate accident detection, real-time communication, and remote monitoring in enhancing road safety and emergency response. As technology continues to advance, these systems are likely to play an increasingly important role in modernizing accident management and vehicle security.

CHAPTER-3

EXISTING SYSTEM

The motorcycle accident is a major public problem in many countries. Despite awareness campaign, this problem is still increasing due to rider's poor behaviors such as speed driving, drunk driving, riding with no helmet protection, riding without sufficient sleep, etc. The numbers of death and disability are very high because of late assistance to people who got the accident. These cause huge social and economic burdens to people involved. Therefore, several research group and major motorcycle manufacturers including have developed safety devices to protect riders from accidental injuries. However, good safety device for motorcycle is difficult to implement and very expensive

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CHAPTER-4

PROPOSED SYSTEM

Previously, the world has gone through fast advancement in innovation just as the transportation system. Vehicles are modernized and efficient as well as shockingly cause the number of causalities in street accidents. Unidentified crashes and late rescue causes more tense circumstances, especially in remote areas. To diminish this unintentional death rate, a minimal expense programmed accident discovery system is suggested that consequently distinguishes the accident and sends notification through Short Message Services (SMS) of the accident spot to concerned relative with precise GPS location. The proposed system comprises equipment and programming modules. The equipment module depends on the Controller board with Sensors and GPS which is installed in the vehicle while the software part is an Android application that is installed on user's phone. The experimental results indicate that the presented system works well as expected.

SYSTEM SPECIFICATIONS

Microcontroller	:	RASPBERRY PI PICO
Crystal	:	16 MHz
LCD	:	16X2 LCD
GSM	:	SIM800C
GPS	:	NEO-6M
Alcohol Sensor	:	MQ3
Accident Sensor	:	Limit Sensor
Relay	:	12V DC Electromagnetic
Motor	:	DC motor 5V
Power Source	:	12v 2 amp Adaptor

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SOFTWARE:

Arduino IDE

Proteus based circuit diagram

CHAPTER-5

BLOCK DIAGRAM

5.1 BLOCK DIAGRAM OVERVIEW:

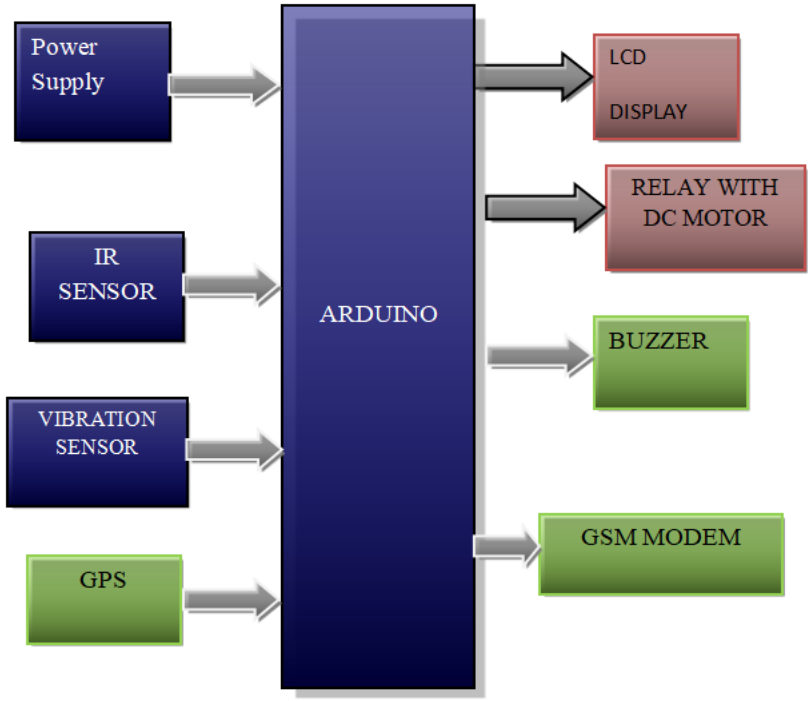

Fig.2.1.block diagram

2.2 POWER SUPPLY:

All digital circuits require regulated power supply. In this article we are going to learn how to get a regulated positive supply from the mains supply.

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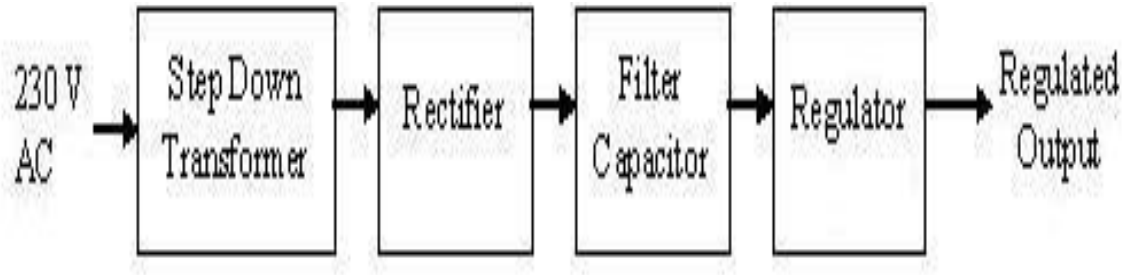
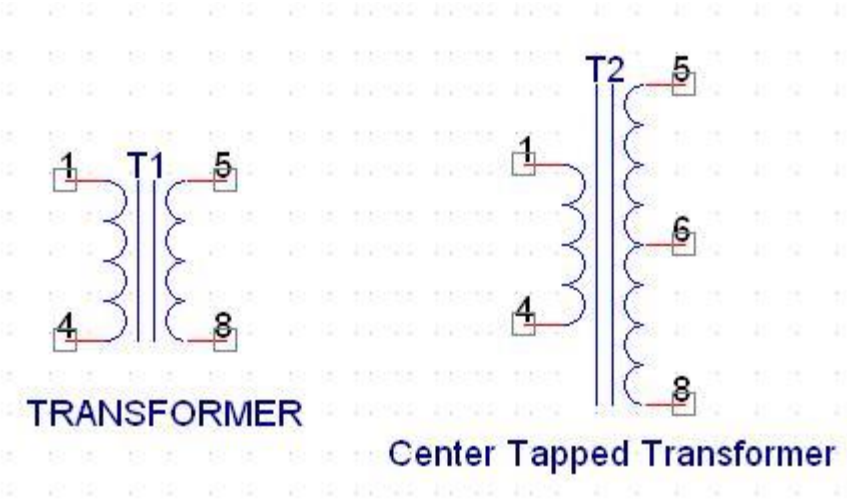


Fig:2.2 shows the basic block diagram of a fixed regulated power supply. Let us go through each block.

TRANSFORMER



A transformer consists of two coils also called as "WINDINGS" namely PRIMARY & SECONDARY.

They are linked together through inductively coupled electrical conductors also called as CORE. A changing current in the primary causes a change in the Magnetic Field in the core & this in turn induces an alternating voltage in the secondary coil. If load is applied to the secondary then an alternating current will flow through the load. If we consider an ideal condition then all the energy from the primary circuit will be transferred to the secondary circuit through the magnetic field.

$$P_{primary} = P_{secondary}$$

So

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$$I_p V_p = I_s V_s$$

The secondary voltage of the transformer depends on the number of turns in the Primary as well as in the secondary.

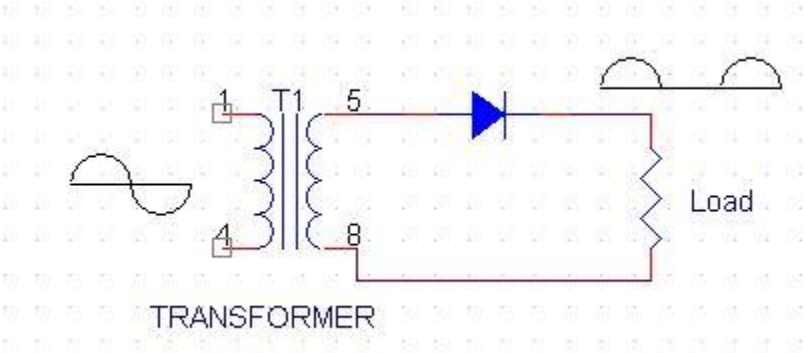
$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

Rectifier

A rectifier is a device that converts an AC signal into DC signal. For rectification purpose we use a diode, a diode is a device that allows current to pass only in one direction i.e. when the anode of the diode is positive with respect to the cathode also called as forward biased condition & blocks current in the reversed biased condition.

Rectifier can be classified as follows:

1) Half Wave rectifier.



This is the simplest type of rectifier as you can see in the diagram a half wave rectifier consists of only one diode. When an AC signal is applied to it during the positive half cycle the diode is forward biased & current flows through it. But during the negative half cycle diode is reverse biased & no current flows through it. Since only one half of the input reaches the output, it is very inefficient to be used in power supplies.

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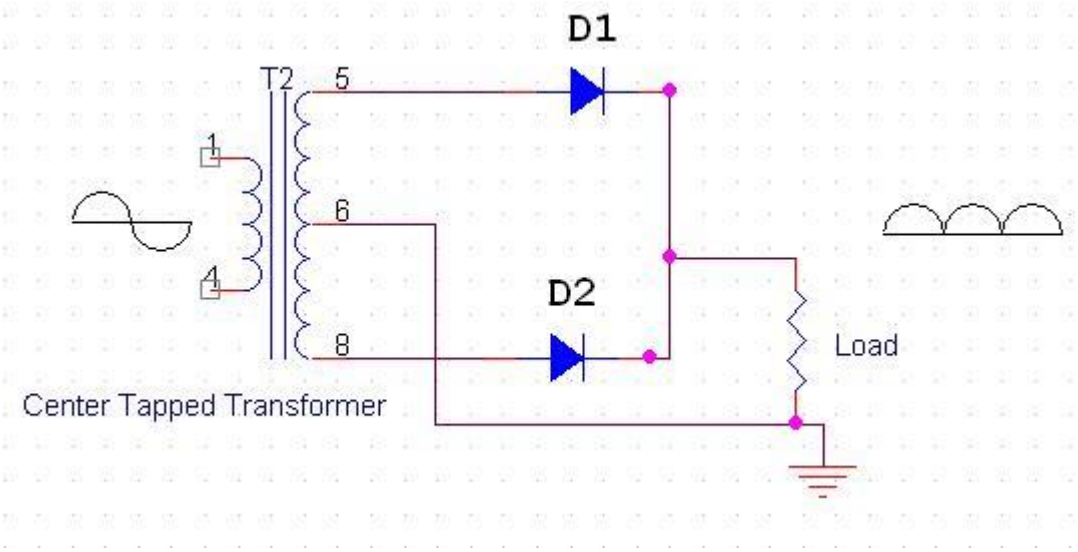
2) Full wave rectifier.



Half wave rectifier is quite simple but it is very inefficient, for greater efficiency we would like to use both the half cycles of the AC signal. This can be achieved by using a center tapped transformer i.e. we would have to double the size of secondary winding & provide connection to the center. So during the positive half cycle diode D1 conducts & D2 is in reverse biased condition. During the negative half cycle diode D2 conducts & D1 is reverse biased. Thus we get both the half cycles across the load.

One of the disadvantages of Full Wave Rectifier design is the necessity of using a center tapped transformer, thus increasing the size & cost of the circuit. This can be avoided by using the Full Wave Bridge Rectifier.

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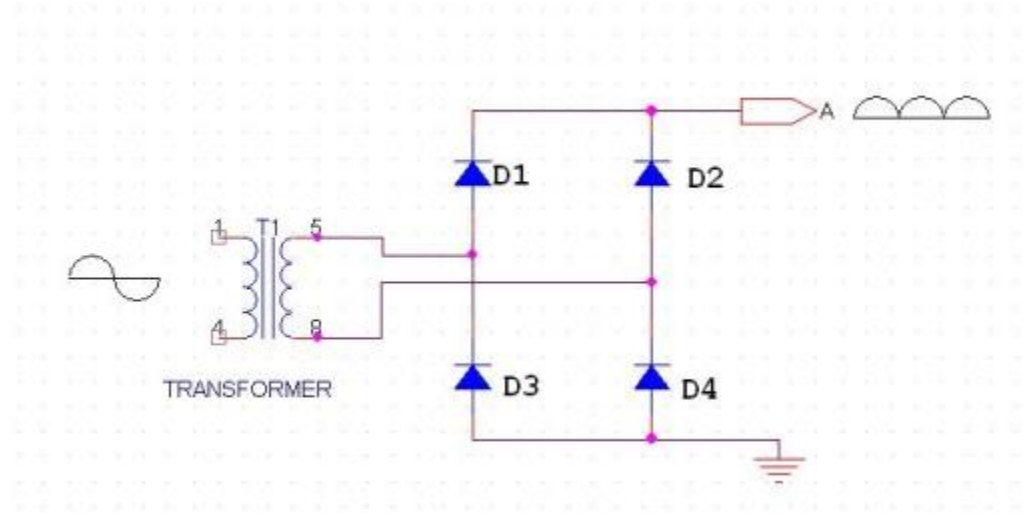
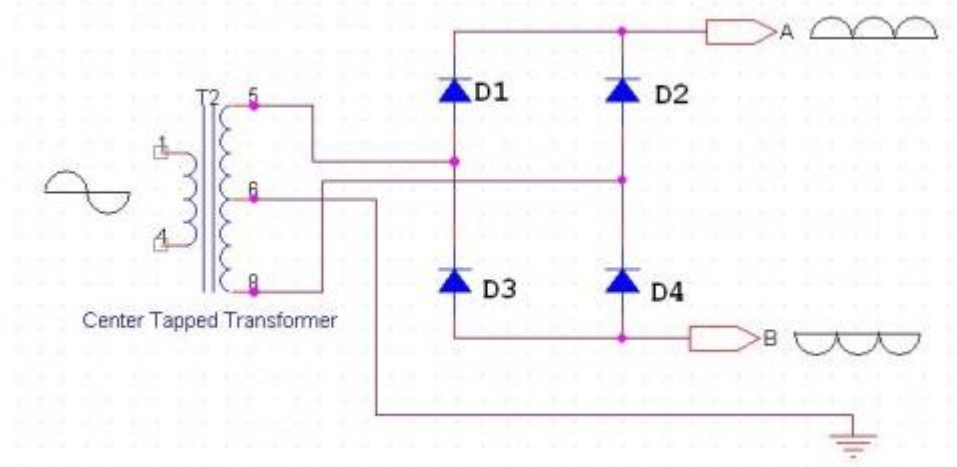
3) BridgeRectifier.



As the name suggests it converts the full wave i.e. both the positive & the negative half cycle into DC thus it is much more efficient than Half Wave Rectifier & that too without using a center tapped transformer thus much more cost effective than Full Wave Rectifier.

Full Bridge Wave Rectifier consists of four diodes namely D1, D2, D3 and D4. During the positive half cycle diodes D1 & D4 conduct whereas in the negative half cycle diodes D2 & D3 conduct thus the diodes keep switching the transformer connections so we get positive half cycles in the output.



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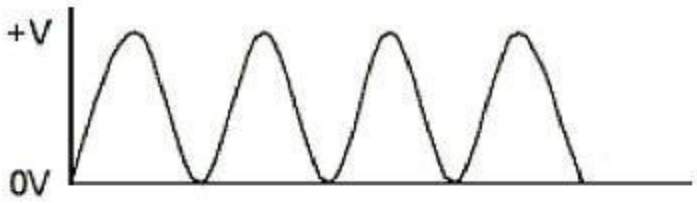
If we use a center tapped transformer for a bridge rectifier we can get both positive & negative half cycles which can thus be used for generating fixed positive & fixed negative voltages.

FILTER CAPACITOR

Even though half wave & full wave rectifier give DC output, none of them provides a constant output voltage. For this we require to smoothen the waveform received from the rectifier. This can be done by using a capacitor at the output of the rectifier this capacitor is also called as “FILTER CAPACITOR” or “SMOOTHING CAPACITOR” or “RESERVOIR CAPACITOR”. Even after using this capacitor a small amount of ripple will remain.

We place the Filter Capacitor at the output of the rectifier the capacitor will charge to the peak voltage during each half cycle then will discharge its stored energy slowly through the load while the rectified voltage drops to zero, thus trying to keep the voltage as constant as possible.



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If we go on increasing the value of the filter capacitor then the Ripple will decrease. But then the costing will increase. The value of the Filter capacitor depends on the current consumed by the circuit, the frequency of the waveform & the accepted ripple.

$$C = \frac{V_r F}{I}$$

Where,

Vr= accepted ripple voltage.(should not be more than 10% of the voltage)

I= current consumed by the circuit in Amperes.

F= frequency of the waveform. A half wave rectifier has only one peak in one cycle so F=25hz Whereas a full wave rectifier has Two peaks in one cycle so F=100hz.

VOLTAGE REGULATOR

A Voltage regulator is a device which converts varying input voltage into a constant regulated output voltage. Voltage regulator can be of two types

1) Linear Voltage Regulator

Also called as Resistive Voltage regulator because they dissipate the excessive voltage resistively as heat.

2) Switching Regulators.

They regulate the output voltage by switching the Current ON/OFF very rapidly. Since their output is either ON or OFF it dissipates very low power thus achieving higher efficiency as compared to linear voltage regulators. But they are more complex & generate high noise due to their switching action. For low level of output power switching regulators tend to be costly but for higher output wattage they are much cheaper than linear regulators.

The most commonly available Linear Positive Voltage Regulators are the 78XX series where the XX indicates the output voltage. And 79XX series is for Negative Voltage Regulators.

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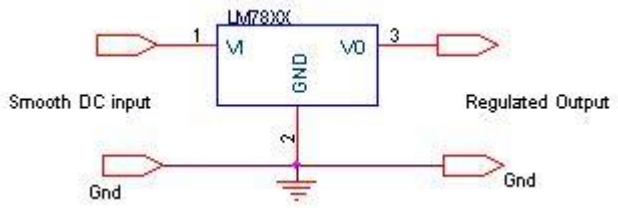

After filtering the rectifier output the signal is given to a voltage regulator. The maximum input voltage that can be applied at the input is 35V.Normally there is a 2-3 Volts drop across the regulator so the input voltage should be at least 2-3 Volts higher than the output voltage. If the input voltage gets below the Vmin of the regulator due to the ripple voltage or due to any other reason the voltage regulator will not be able to produce the correct regulated voltage.

3 Circuit diagram:

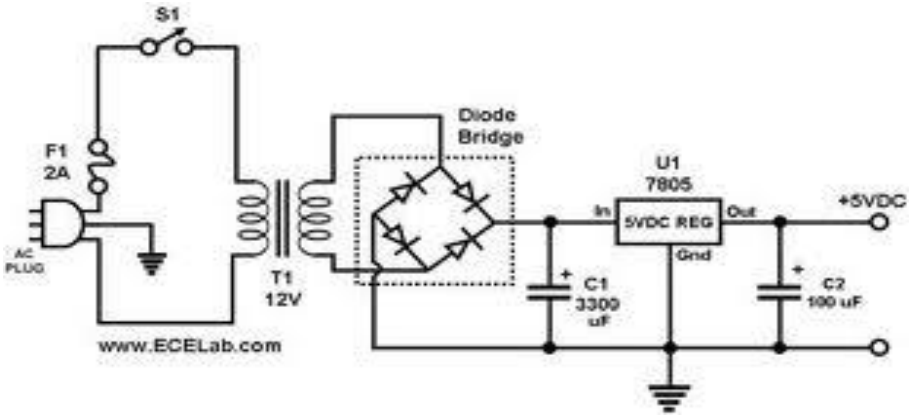

Fig 2.3. Circuit Diagram of power supply

IC 7805:

7805 is an integrated three-terminal positive fixed linear voltage regulator. It supports an input voltage of 10 volts to 35 volts and output voltage of 5 volts. It has a current rating of 1 amp although lower current models are available. Its output voltage is fixed at 5.0V. The 7805 also has a built-in current limiter as a safety feature. 7805 is manufactured by many companies, including National Semiconductors and Fairchild Semiconductors.

The 7805 will automatically reduce output current if it gets too hot.The last two digits represent the voltage; for instance, the 7812 is a 12-volt regulator. The 78xx series of regulators is designed to work in complement with the 79xx series of negative voltage regulators in systems that provide both positive and negative regulated voltages, since the 78xx series can't regulate negative voltages in such a system.

The 7805 & 78 is one of the most common and well-known of the 78xx series regulators, as it's small component count and medium-power regulated 5V make it useful for powering TTL devices.

Table 2.1. Specifications of IC7805

SPECIFICATIONS	IC 7805
V_{out}	5V
V_{ein} - V_{out} Difference	5V - 20V
Operation Ambient Temp	0 - 125°C
Output I_{max}	1A

5.4. IR transmitter and receiver

Basics of IR transmitter and receiver transmitter and receiver are commonly used in engineering projects for remote control of objects. In particularly, in Robotic system uses transmitter and receiver. Here i would like to describe the basics if IR transmitter and receiver

Basics of IR transmitter:

An electroluminescent IR LED is a product which requires care in use. IR LED's are fabricated from narrow band hetero structures with energy gap from 0.25 to 0.4 eV. Infra red transmitter emits IR rays in planar wave front manner. Even though infra red rays spread in all directions, it propagates along straight line in forward direction. IR rays have the characteristics of producing secondary wavelets when it collides with any obstacles in its path. This property of IR is used here.

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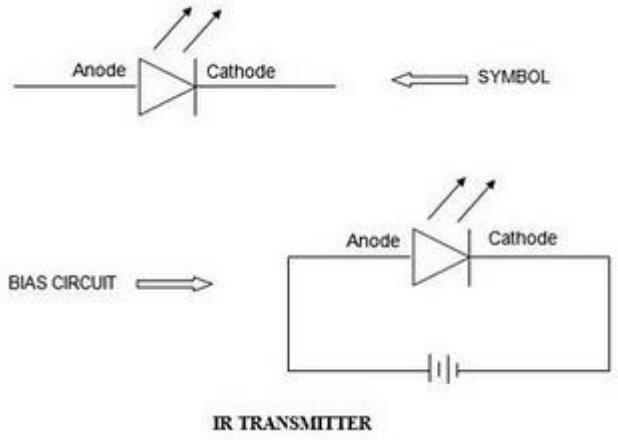

IR TRANSMITTER

When IR rays gets emitted from LED, it moves in the direction it is angled. When any obstacle interferes in the path, the IR rays get cut and it produces secondary wavelets which propagates mostly in return direction or in a direction opposite to that of the primary waves, which produces the net result like reflection of IR rays.

Basics of IR receiver:

Infrared photo receiver is a two terminal PN junction device, which operates in a reverse bias. It has a small transparent window, which allows light to strike the PN junction. A photodiode is a type of photo detector capable of converting light into either current or voltage, depending upon the mode of operation. Most photodiodes will look similar to a light emitting diode. They will have two leads, or wires, coming from the bottom. The shorter end of the two is the cathode, while the longer end is the anode.

A photodiode consists of PN junction or PIN structure. When a photon of sufficient energy strikes the diode, it excites an electron thereby creating a mobile electron and a positively charged electron hole. If the absorption occurs in the junction's depletion region, or one diffusion length away from it, these carriers are swept from the junction by the built-in field of the depletion region. Thus holes move toward the anode, and electrons toward the cathode, and a photocurrent is produced.

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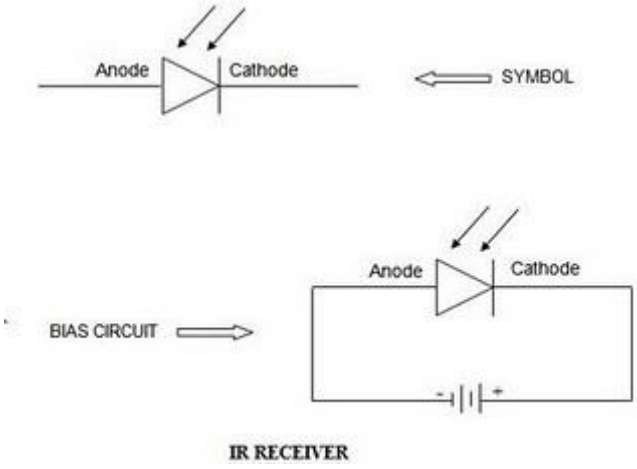

IR RECEIVER

Working of infrared communication:

Various types of infrared based applications are available in the market. The circuit for infrared based applications is designed along with the transmitter and receiver sections i.e. we can't use it for other application. But the infrared communication project which we have done here can be used in any application just by replacing the application at the place of infrared LED in the circuit diagram of infrared communication. By using this project we can design infrared based applications easily. The entire circuit consists of two sections named as

1. Transmitter section and
2. Receiver section

1. Transmitter section:

The transmitter section consists of a 555 timer IC functioning in astable mode. It is wired as shown in figure. The output from astable mode is fed to an IR LED via resistor which limits its operating current. Infrared LED in the transmitter section emits IR radiation which is focused by a plastic lens (optics) in to a narrow beam.

2. Receiver section:

The receiver section consists of a silicon phototransistor to convert the infrared radiation to an electric current. It responds only to the rapidly pulsing signal created by the transmitter, and filters out slowly changing infrared radiation from ambient light. The receiver section comprises an infrared receiver module, and a led indicator. When the signals are interrupted, the IR Led goes off after a few seconds depending upon the value of RC combination.

We can increase the distance between the IR transmitter and receiver just by placing the lens between them. After connecting the IR transmitter and receiver circuit, we can get the output by applying 6V Power supply to the circuit. We can use this circuit with any application very simply. For example a buzzer circuit is placed at the output of IR circuit, when the signals are interrupted, the buzzer produces sound. Both the transmitter and receiver parts can be mounted on a single bread board or PCB. The infrared receiver must be placed behind the IR Led to avoid false indication due to infrared leakage. An object moving nearby actually reflects the IR rays emitted by the IR Led.

Photo Diodes:

A photodiode is a semiconductor diode that functions as a photo detector. Photodiodes are packaged with either a window or optical fiber connection, to let in the light to the sensitive part of the device. They may also be used without a window to detect vacuum UV or X-rays.

A phototransistor is in essence nothing more than a bipolar transistor that is encased in a transparent case so that light can reach the base-collector junction. The phototransistor works like a photodiode, but with a much higher responsivity for light, because the electrons that are generated by photons in the base-collector junction are injected into the base, and this current is then amplified by the transistor operation.

Fig (3.13) Photodiode schematic symbol

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Principle of operation:

A photodiode is a p-n junction or p-i-n structure. When a photon of sufficient energy strikes the diode, it excites an electron thereby creating a mobile electron and a positively charged electron hole. If the absorption occurs in the junction's depletion region, or one diffusion length away from it, these carriers are swept from the junction by the built-in field of the depletion region, producing a photocurrent.

Photodiodes can be used under either zero bias (photovoltaic mode) or reverse bias (photoconductive mode). In zero bias, light falling on the diode causes a current across the device, leading to forward bias which in turn induces "dark current" in the opposite direction to the photocurrent. This is called the photovoltaic effect, and is the basis for solar cells in fact; a solar cell is just a large number of big photodiodes. Reverse bias induces only little current (known as saturation or back current) along its direction.

But a more important effect of reverse bias is widening of the depletion layer (therefore expanding the reaction volume) and strengthening the photocurrent. Circuits based on this effect are more sensitive to light than ones based on the photovoltaic effect and also tend to have lower capacitance, which improves the speed of their time response. On the other hand, the photovoltaic mode tends to exhibit less electronic noise.

Avalanche photodiodes have a similar structure, but they are operated with much higher reverse bias. This allows each photo-generated carrier to be multiplied by avalanche breakdown, resulting in internal gain within the photodiode, which increases the effective responsivity of the device.

Features:

Critical performance parameters of a photodiode include:

1. Responsivity:

The responsivity may also be expressed as quantum efficiency, or the ratio of the number of photo generated carriers to incident photons and thus a unit less quantity.

2. Dark current:

The dark current includes photocurrent generated by background radiation and the saturation current of the semiconductor junction. Dark current must be accounted for by calibration if a photodiode is used to make an accurate optical power measurement, and it is also a source of noise when a photodiode is used in an optical communication system.

3. Noise-equivalent power:

(NEP) The minimum input optical power to generate photocurrent, equal to the RMS noise current in a 1 hertz bandwidth. The related characteristic directivity (D) is the inverse of NEP, 1/NEPThe NEP is roughly the minimum detectable input power of a photodiode.

Applications:

1. P-N photodiodes are used in similar applications to other photo detectors, such as photoconductors, charge-coupled devices, and photomultiplier tubes.
2. Photodiodes are used in consumer electronics devices such as compact disc players, smoke detectors, and the receivers for remote controls in VCRs and televisions.
3. PIN diodes are much faster and more sensitive than ordinary p-n junction diodes, and hence are often used for optical communications and in lighting regulation.

P-N vs. P-I-N Photodiodes:

1. Due to the intrinsic layer, a PIN photodiode must be reverse biased (Vr). The Vr increases the depletion region allowing a larger volume for electron-hole pair production, and reduces the capacitance thereby increasing the bandwidth.
2. The Vr also introduces noise current, which reduces the S/N ratio. Therefore, a reverse bias is recommended for higher bandwidth applications and/or applications where a wide dynamic range is required.

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3. A PN photodiode is more suitable for lower light applications because it allows for unbiased operation.

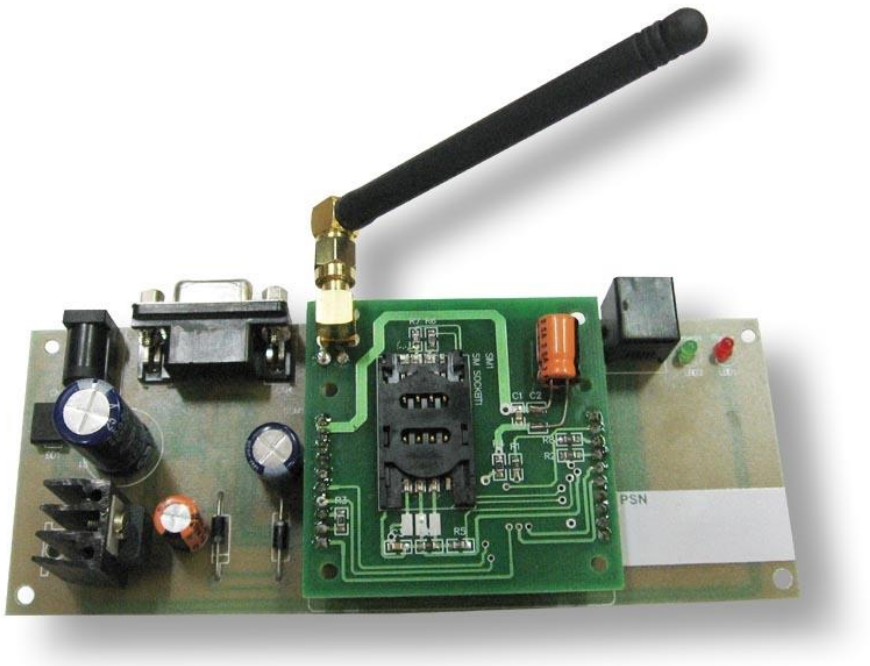
GSM MODULE:

Global System for Mobile Communication (GSM)

Definition:

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.



MODEM SPECIFICATIONS:

The SIM300 is a complete Tri-band GSM solution in a compact plug-in module.

Featuring an industry-standard interface, the SIM300 delivers GSM/GPRS900/1800/1900Mhz performance for voice, SMS, data and Fax in a small form factor and with low power consumption.

The leading features of SIM300 make it deal fir virtually unlimited application, such as WLL applications (Fixed Cellular Terminal), M2M application, handheld devices and much more.

1. Tri-band GSM/GPRS module with a size of 40x33x2.85
2. Customized MMI and keypad/LCD support
3. An embedded powerful TCP/IP protocol stack
4. Based upon mature and field proven platform, backed up by our support service, from definition to design and production.

General Features:

- Tri-band GSM/GPRS900/1800/1900Mhz
- GPRS multi-slot class 10
- GPRS mobile station class –B
- Complaint to GSM phase 2/2+
    i. -class 4(2W @900MHz)
    ii. -class 1(1W @/18001900MHz)
- Dimensions: 40x33x2.85 mm
- Weight: 8gm
- 7. Control via AT commands
- (GSM 07.07, 07.05 and SIMCOM enhanced AT commands)
- SIM application tool kit
- supply voltage range 3.5…….4.5 v
- Low power consumption
- Normal operation temperature: -20 ’C to +55 ‘C

- Restricted operation temperature : -20 ’C to -25 ‘C and +55 ’C to +70 ‘C
- storage temperature: -40 ‘C to +80 ‘C

Specifications for Fax:

Group 3 and class 1

Specifications for Data:

- GPRS class 10: max 85.6 kbps (downlink)
- PBCCH support
- coding schemes Cs 1,2,3,4
- CSD upto 14.4 kbps
- USSD
- Non transperant mode
- PPP-stack
-

Specifications for SMS via GSM/GPRS:

- Point to point MO and MT
- SMS cell broadcast
- Text and PDU mode

Compatibility:

At cellular command interface

Specifications for voice:

1. Tricodec

-Half rate (HR)

-Full rate (FR)

-Enhanced full rate (EFR)

2. Hands free operation

(Echo cancellation)

Drivers:

Microsoft windows mobile RIL driver

MUX driver

Interfaces:

- Interface to external SIM 3v 1.8v
- 60 pins board-to-board connector
- Two analog audio interfaces
- Keypad interfaces
- LCD interface
- RTC backup
- AT commands via serial interface
- Dual-Serial interfaces
- Antenna connector and antenna pad

Approvals:

- FTA
- Local type approval
- CE

Need of GSM:

The GSM study group aimed to provide the followings through the GSM:

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- Improved spectrum efficiency.
- International roaming.
- Low-cost mobile sets and base stations (BS)
- High-quality speech
- Compatibility with Integrated Services Digital Network (ISDN) and other telephone company services.
- Support for new services.

GSM – Architecture:

A GSM network consists of several functional entities whose functions and interfaces are defined. The GSM network can be divided into following broad parts.

- The Mobile Station (MS)
- The Base Station Subsystem (BSS)
- The Network Switching Subsystem (NSS)
- The Operation Support Subsystem (OSS)

Following fig shows the simple architecture diagram of GSM Network.

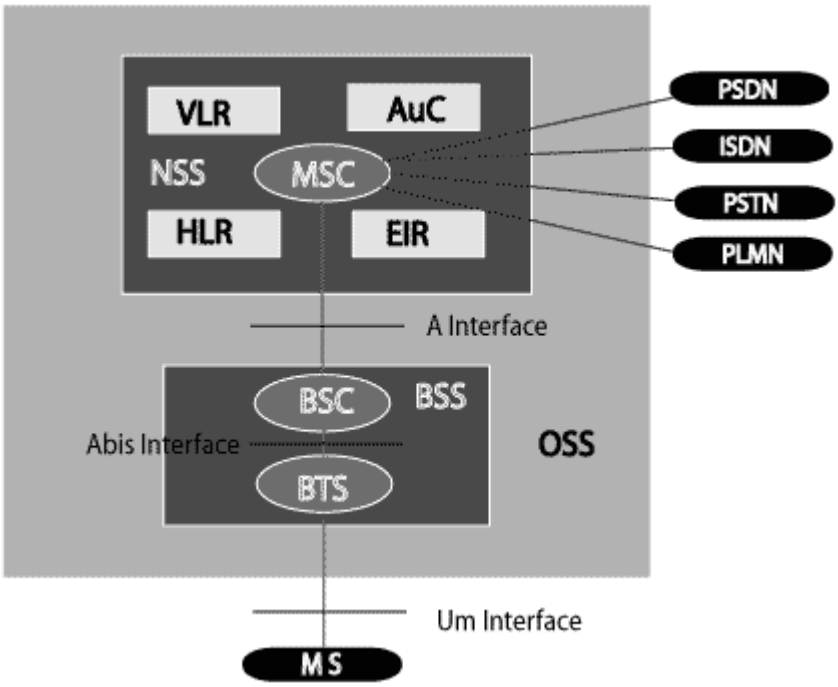

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Fig: GSM Network.

The added components of the GSM architecture include the functions of the databases and messaging systems:

- Home Location Register (HLR)
- Visitor Location Register (VLR)
- Equipment Identity Register (EIR)
- Authentication Center (AuC)
- SMS Serving Center (SMS SC)
- Gateway MSC (GMSC)
- Chargeback Center (CBC)
- Transcoder and Adaptation Unit (TRAU)

Following fig shows the diagram of GSM Network along with added elements.

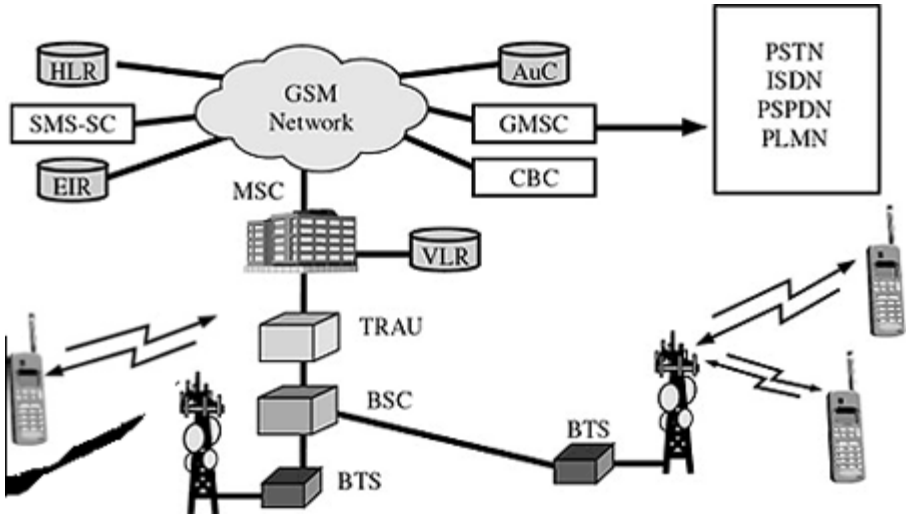

Fig: GSM Network along with added elements.

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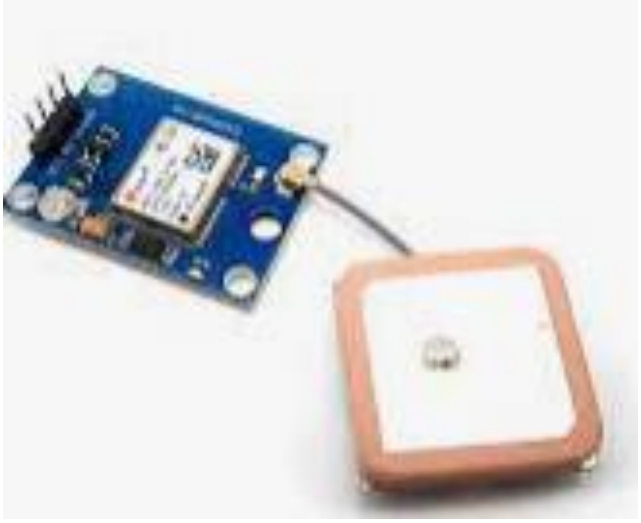
GPS MODULE:

GPS is known as Global Positioning System used to trace the location of vehicle. A GPS framework computes its position by accurately timing the signal sent by GPS satellites high over the Earth.GPS Receiver gets the location information from satellites. It consists of internal RTC back up and can be directly connected to USART of the microcontroller. The current date, time, longitude, altitude, speed, and travel direction/ heading among other data are provide by the module and can be used in many applications including navigation, fleet management, tracking system, mapping.



Buzzer

Basically, the sound source of a piezoelectric sound component is a piezoelectric diaphragm. A piezoelectric diaphragm consists of a piezoelectric ceramic plate which has electrodes on both sides and a metal plate (brass or stainless steel, etc.). A piezoelectric ceramic plate is attached to a metal plate with adhesives. Applying D.C. voltage between electrodes of a piezoelectric diaphragm causes mechanical distortion due to the piezoelectric effect. For a misshaped piezoelectric element, the distortion of the piezoelectric element expands in a radial direction. And the piezoelectric diaphragm bends toward the direction. The metal plate bonded to the piezoelectric element does not expand. Conversely, when the piezoelectric element shrinks, the piezoelectric diaphragm bends in the direction Thus, when AC voltage is applied across electrodes, the bending is repeated, producing sound waves in the air.

To interface a buzzer the standard transistor interfacing circuit is used. Note that if a different power supply is used for the buzzer, the 0V rails of each power supply must be connected to provide a common reference.

If a battery is used as the power supply, it is worth remembering that piezo sounders draw much less current than buzzers. Buzzers also just have one ‘tone’, whereas a piezo sounder is able to create sounds of many different tones.

To switch on buzzer -high 1

To switch off buzzer -low 1

Notice (Handling) In Using Self Drive Method

1) When the piezoelectric buzzer is set to produce intermittent sounds, sound may be heard continuously even when the self drive circuit is turned ON / OFF at the "X" point shown in Fig. 9. This is because of the failure of turning off the feedback voltage.

2) Build a circuit of the piezoelectric sounder exactly as per the recommended circuit shown in the catalog. Hfe of the transistor and circuit constants are designed to ensure stable oscillation of the piezoelectric sounder.

3) Design switching which ensures direct power switching.

4) The self drive circuit is already contained in the piezoelectric buzzer. So there is no need to prepare another circuit to drive the piezoelectric buzzer.

5) Rated voltage (3.0 to 20Vdc) must be maintained. Products which can operate with voltage higher than 20Vdc are also available.

6) Do not place resistors in series with the power source, as this may cause abnormal oscillation. If a resistor is essential to adjust sound pressure, place a capacitor (about 1μF) in parallel with the piezo buzzer.

7) Do not close the sound emitting hole on the front side of casing.

8) Carefully install the piezo buzzer so that no obstacle is placed within 15mm from the sound release hole on the front side of the casing.

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Fig: Picture of buzzer.

RELAY:

The Arduino relay module has total of six pins: three on one side and three on other side.On the bottom side, there are three pins which are signal, 5V and ground. We will connect these pins with the Arduino. While on the other side, there are NC (Normally close), C (Common) and the NO (normally open) which are the output pins of the 5V relay. There, we will connect the output device.

Normally open state (NO) VS Normally closed state (NC)

The Arduino relay module can be used in two states which are

1. Normally open state (NO)
2. Normally closed state (NC)

Normally open (NO)

In the normally open state, the initial output of the relay will be low when it will be powered. In this state, the common and the normally open pins are used.

Normally closed state (NC)

In the normally closed state, the initial output of the relay will be high when it will be powered. In this state, the common and the normally close pins are used.

Controlling DC Devices using Arduino Relay Module

In the first part, we will control a led using the relay and in the second part we will control a high voltage device using the relay. Controlling a DC device is easy as compared to the AC device. For controlling the DC device, you do not require an external supply until you are controlling a small voltage device like LED which runs on up to 5V.

Required Components

1. Arduino Uno
2. Relay Module
3. LED

Circuit Diagram and Explanation

The connections for connecting the relay module with Arduino are very simple. In this example, we will connect the relay module with Arduino in the normally open state. So, connect the 5V and the ground of the Arduino with the 5V and the ground of the relay module. Then connect the signal pin of the relay module with the pin 12 of the Arduino.

On the other side of the relay module, we will use the common pin and the normally open pin because we are going to connect the relay in the normally open state. So, connect the pin 13 of Arduino to the common of relay module and the normally open (NO) of the relay module to the positive pin of the LED. Connect the other pin of LED to the ground of Arduino.

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CHAPTER-3

Raspberry Pi Pico:

Pico provides minimal (yet flexible) external circuitry to support the RP2040 chip: flash (Winbond W25Q16JV), crystal, power supplies and decoupling, and USB connector. The majority of the RP2040 microcontroller pins are brought to the user IO pins on the left and right edge of the board. Four RP2040 IO are used for internal functions - driving an LED, onboard Switched Mode Power Supply (SMPS) power control and sensing the system voltages. Pico has been designed to use either soldered 0.1" pin-headers (it is one 0.1" pitch wider than a standard 40-pin DIP package) or can be used as a surface mountable 'module', as the user IO pins are also castellated. There are SMT pads underneath the USB connector and BOOTSEL button, which allow these signals to be accessed if used as a reflowsoldered SMT module

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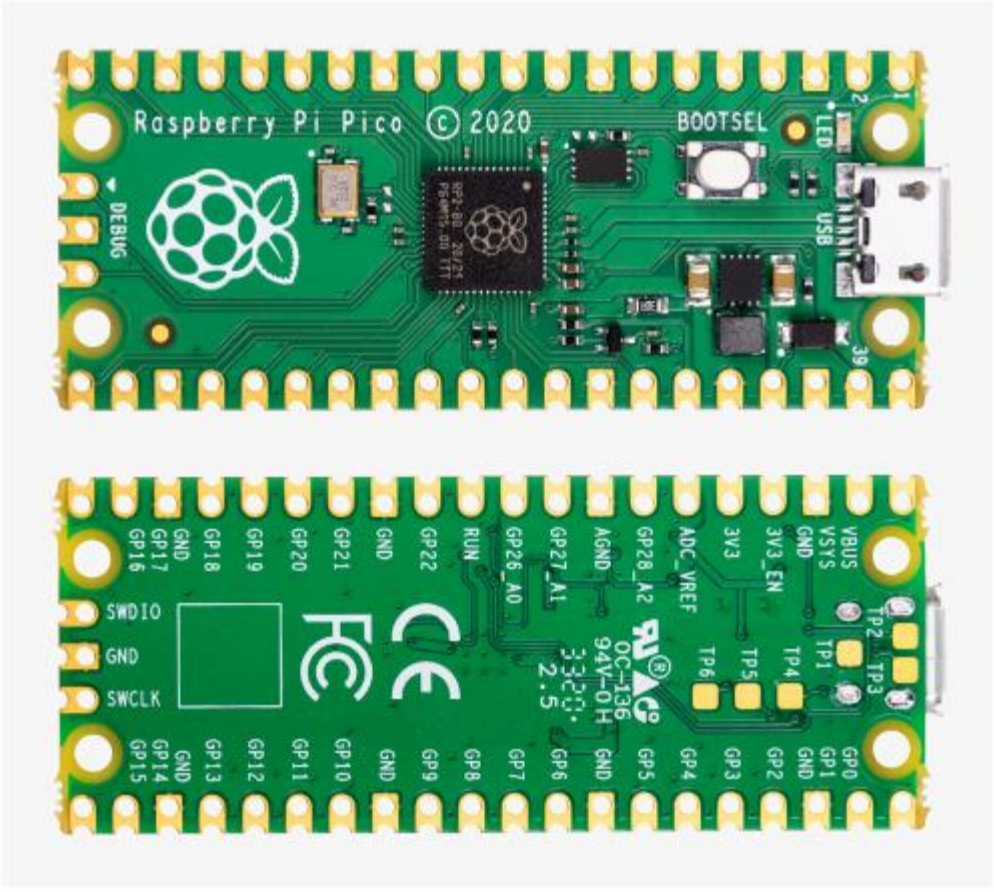
Figure 2.3 RASPBERRY PI PICO Development Board



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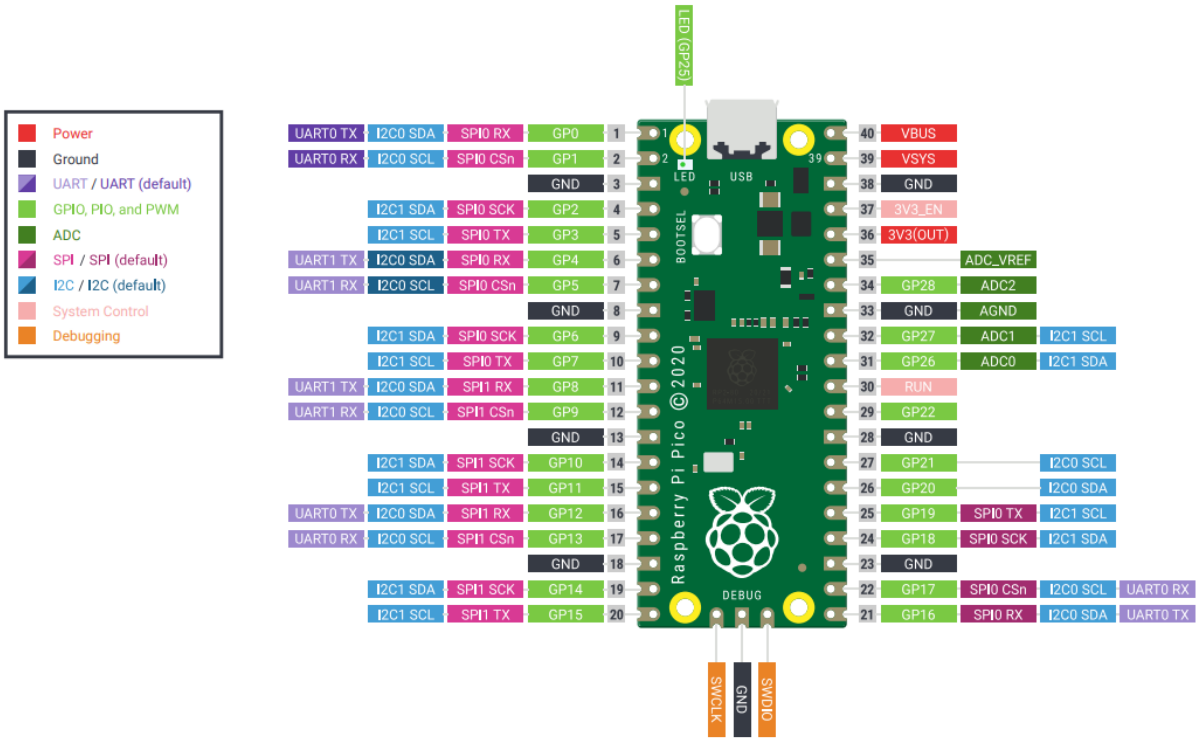
Pico uses an on-board buck-boost SMPS which is able to generate the required 3.3 volts (to power RP2040 and external circuitry) from a wide range of input voltages (~1.8 to 5.5V). This allows significant flexibility in powering the unit from various sources such as a single Lithium-Ion cell, or 3 AA cells in series. Battery chargers can also be very easily integrated with the Pico powerchain. Reprogramming the Pico Flash can be done using USB (simply drag and drop a file onto the Pico which appears as a mass storage device), or the standard Serial Wire Debug (SWD) port can reset the system and load and run code without any button presses. The SWD port can also be used to interactively debug code running on the RP2040.

2.2 Pin Diagram:

The Pico pinout has been designed to directly bring out as much of the RP2040 GPIO and internal circuitry function as possible, while also providing a suitable number of ground pins to reduce EMI (Electro Magnetic Interference) and signal crosstalk. This is important in general but especially for RP2040 which is built on a modern 40nm silicon process and hence the digital IO edge rates are very fast.



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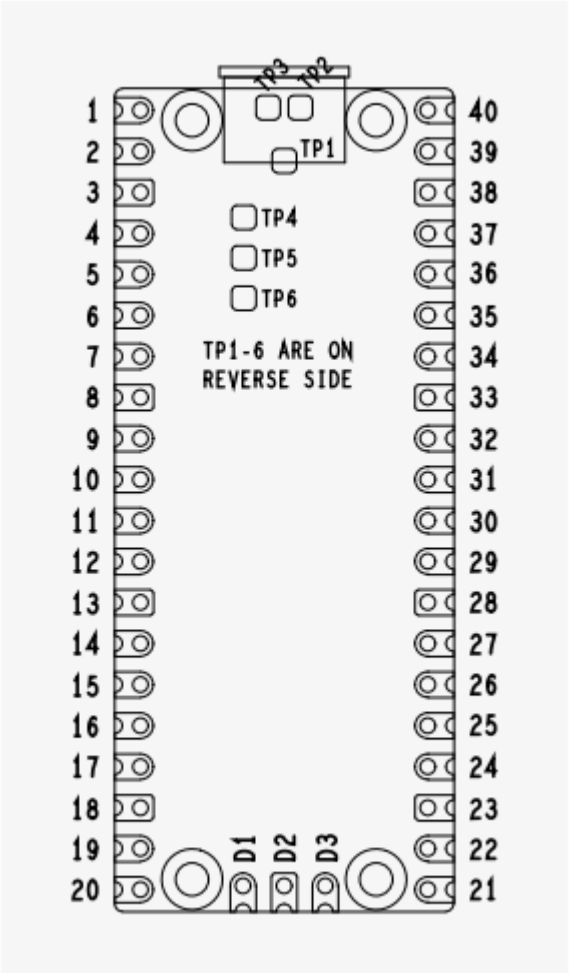

PICO Technical Specification

Raspberry Pi Pico is a low-cost, high-performance microcontroller board with flexible digital interfaces. Key features include:

- RP2040 microcontroller chip designed by Raspberry Pi in the United Kingdom
- Dual-core Arm Cortex M0+ processor, flexible clock running up to 133 MHz
- 264KB of SRAM, and 2MB of on-board Flash memory
- Castellated module allows soldering direct to carrier boards
- USB 1.1 with device and host support
- Low-power sleep and dormant modes

- Drag-and-drop programming using mass storage over USB
- 26 × multi-function GPIO pins
- 2 × SPI, 2 × I2C, 2 × UART, 3 × 12-bit ADC, 16 × controllable PWM channels
- Accurate clock and timer on-chip
- Temperature sensor
- Accelerated floating-point libraries on-chip
- 8 × Programmable I/O (PIO) state machines for custom peripheral support

GPIO PIN CONFIGURATION

GPIO29 IP Used in ADC mode (ADC3) to measure VSYS/3

GPIO25 OP Connected to user LED

GPIO24 IP VBUS sense - high if VBUS is present, else low

GPIO23 OP Controls the on-board SMPS Power Save pin (Section 4.4) Apart from GPIO and ground pins, there are 7 other pins on the main 40-pin interface: PIN40 VBUS

PIN39 VSYS

PIN37 3V3_EN

PIN36 3V3

PIN35 ADC_VREF

PIN33 AGND

PIN30 RUN VBUS is the micro-USB input voltage, connected to micro-USB port pin 1. This is nominally 5V (or 0V if the USB is not connected or not powered). VSYS is the main system input voltage, which can vary in the allowed range 1.8V to 5.5V, and is used by the on-board

SMPS to generate the 3.3V for the RP2040 and its GPIO. 3V3_EN connects to the on-board SMPS enable pin, and is pulled high (to VSYS) via a 100K resistor. To disable the 3.3V (which also de-powers the RP2040), short this pin low. 3V3 is the main 3.3V supply to RP2040 and its I/O, generated by the on-board SMPS. This pin can be used to power external circuitry (maximum output current will depend on RP2040 load and VSYS voltage, it is

recommended to keep the load on this pin less than 300mA). ADC_VREF is the ADC power supply (and reference) voltage, and is generated on Pico by filtering the 3.3V supply. This pin can be used with an external reference if better ADC performance is required. AGND is the ground reference for GPIO26-29, there is a separate analog ground plane running under these signals and terminating at this pin. If the ADC is not used or ADC performance is not critical, this pin can be connected to digital ground. RUN is the RP2040 enable pin, and has an internal (on-chip) pull-up resistor to 3.3V of about ~50K Ohms. To reset RP2040, short this pin low. Finally, there are also 6 Test Points (TP1-TP6) which can be accessed if required, for example if using as a surface mount module. These are: TP1 Ground (close coupled ground for differential USB signals) TP2 USB DM TP3 USB DP TP4 GPIO23/SMPS PS pin (do not use) TP5 GPIO25/LED (not recommended to be used) TP6 BOOTSEL TP1, TP2 and TP3 can be used to access the USB signals instead of using the micro-USB port. TP6 can be used to drive the system into mass-storage USB programming mode (by shorting it low at power-up). Note that TP4 is not intended to be used externally, and TP5 is not really recommended to be used as it will only swing from 0V to the LED forward voltage (and hence can only really be used as an output with special care).

CHAPTER-5

SOFTWARE EXPLANATION

4.0 : Introduction

This project is implemented using following software's:

- Express PCB – for designing circuit
- Arduino IDE compiler - for compilation part
- Proteus 7 (Embedded C) – for simulation part

4.1 : The Interface

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When a project is first started you will be greeted with a yellow outline. This yellow outline is the dimension of the PCB. Typically after positioning of parts and traces, move them to their final position and then crop the PCB to the correct size. However, in designing a board with a certain size constraint, crop the PCB to the correct size before starting.

Fig: 4.1 show the toolbar in which the each button has the following functions:

Fig: 4.1 Tool bar necessary for the interface

The select tool: It is fairly obvious what this does. It allows you to move and manipulate parts. When this tool is selected the top toolbar will show buttons to move traces to the top / bottom copper layer, and rotate buttons.

The zoom to selection tool: does just that.

The place pad: button allows you to place small soldier pads which are useful for board connections or if a part is not in the part library but the part dimensions are available. When this tool is selected the top toolbar will give you a large selection of round holes, square holes and surface mount pads.

The place component: tool allows you to select a component from the top toolbar and then by clicking in the workspace places that component in the orientation chosen using the buttons next to the component list. The components can always be rotated afterwards with the select tool if the orientation is wrong.

The place trace: tool allows you to place a solid trace on the board of varying thicknesses. The top toolbar allows you to select the top or bottom layer to place the trace on.

The Insert Corner in trace: button does exactly what it says. When this tool is selected, clicking on a trace will insert a corner which can be moved to route around components and other traces.

The remove a trace button is not very important since the delete key will achieve the same result.

4.2 : Design Considerations

Before starting a project there are several ways to design a PCB and one must be chosen to suit the project's needs. Single sided, or double sided?

When making a PCB you have the option of making a single sided board, or a double sided board. Single sided boards are cheaper to produce and easier to etch, but much harder to design for large projects. If a lot of parts are being used in a small space it may be difficult to make a single sided board without jumpering over traces with a cable. While there's technically nothing wrong with this, it should be avoided if the signal travelling over the traces is sensitive (e.g. audio signals).

A double sided board is more expensive to produce professionally, more difficult to etch on a DIY board, but makes the layout of components a lot smaller and easier. It should be noted that if a trace is running on the top layer, check with the components to make sure you can get to its pins with a soldering iron. Large capacitors, relays, and similar parts which don't have axial leads can NOT have traces on top unless boards are plated professionally.

6.0 AURDINO COMPILING

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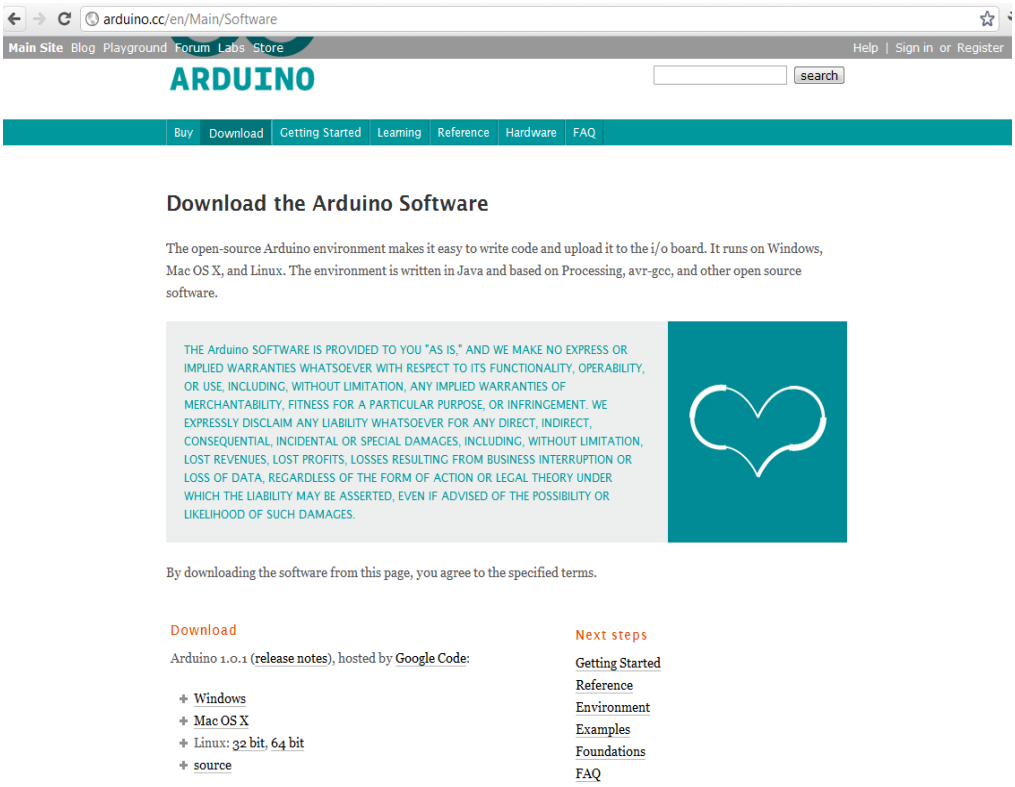
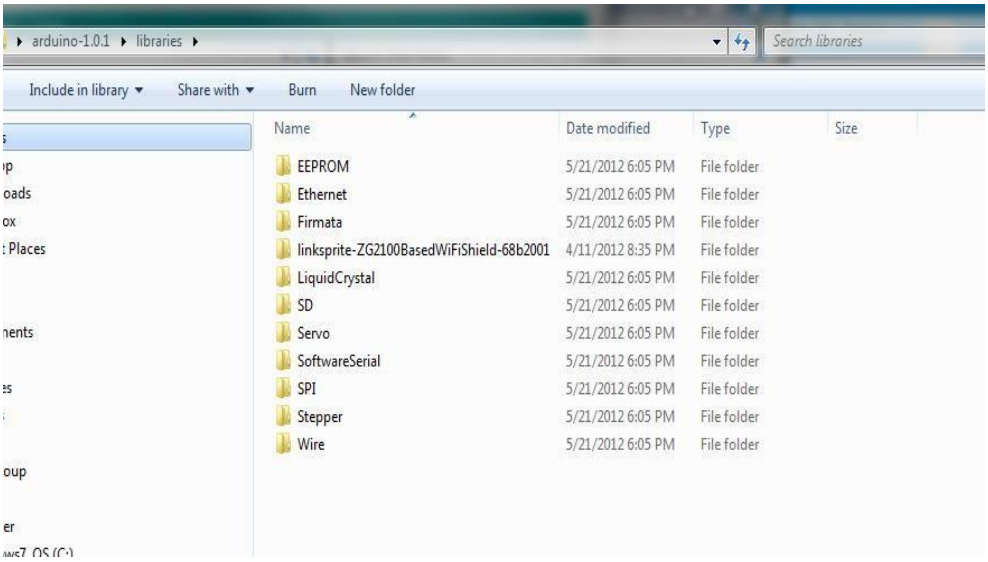


In next step download library



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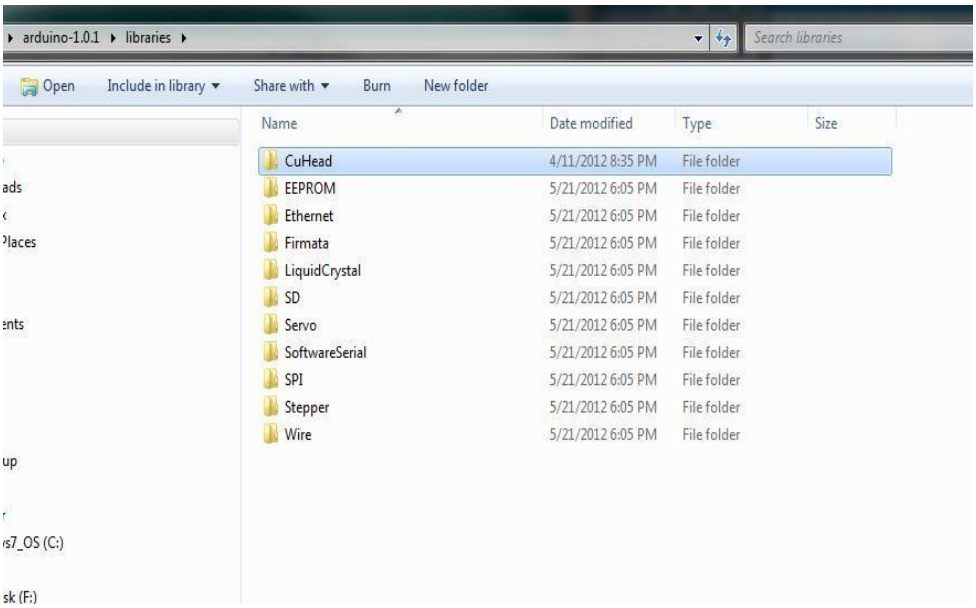
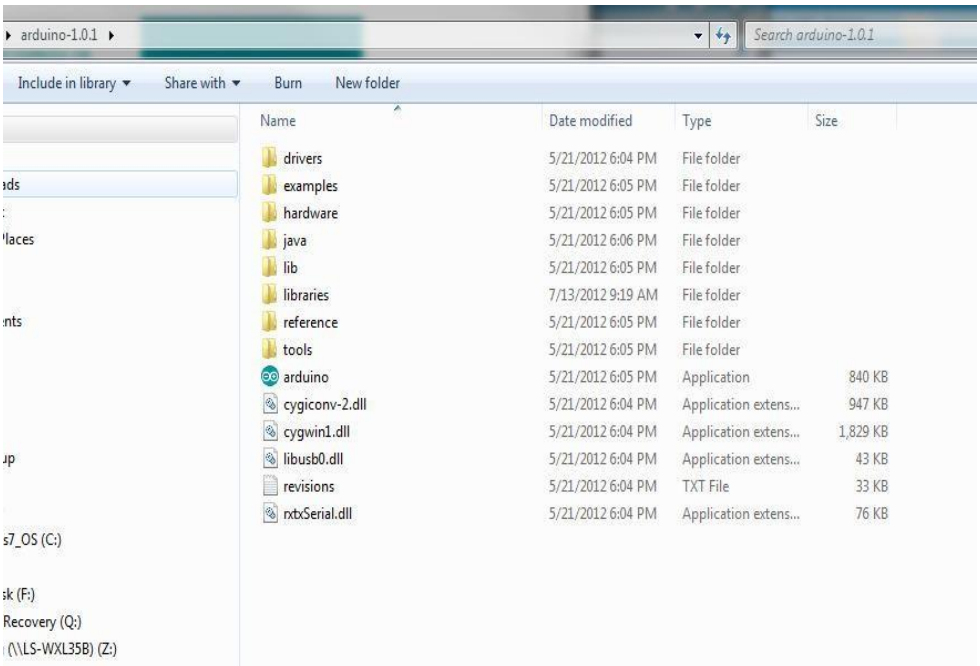
As Arduino doesn't recognize the directory name, please rename it



Launch Arduino by double click "Arduino" below



One example

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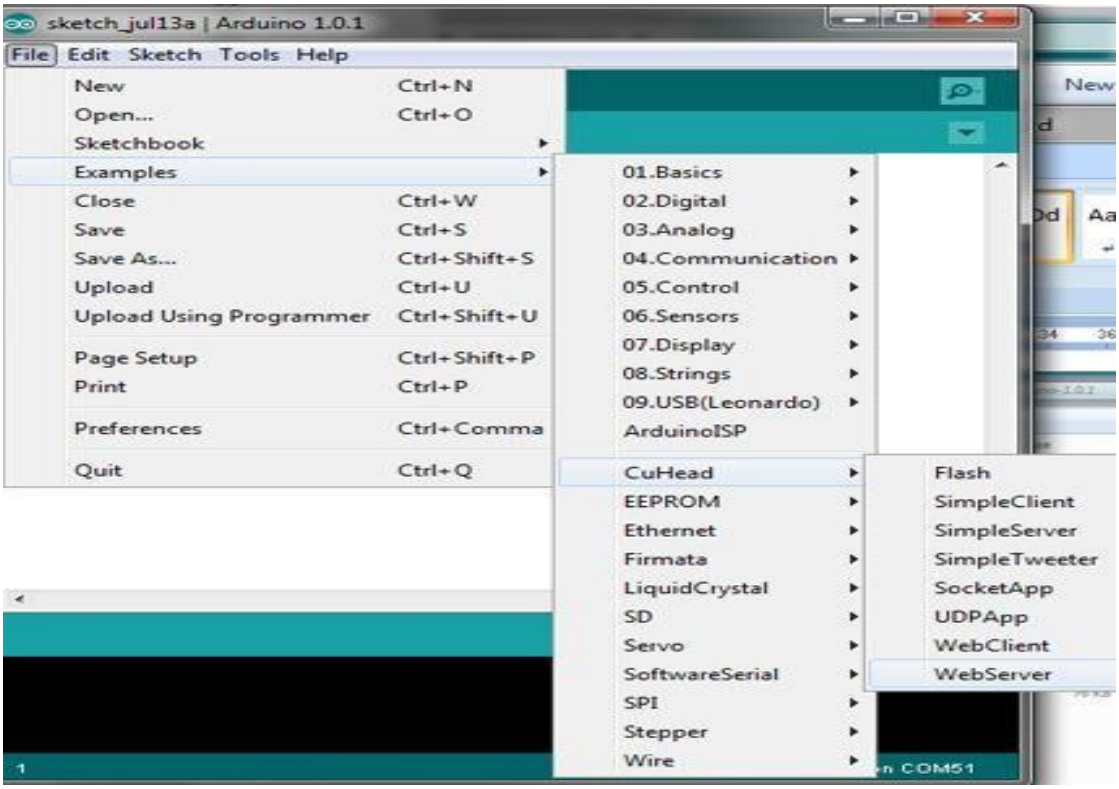

Select the target board as “Arduino Uno”:

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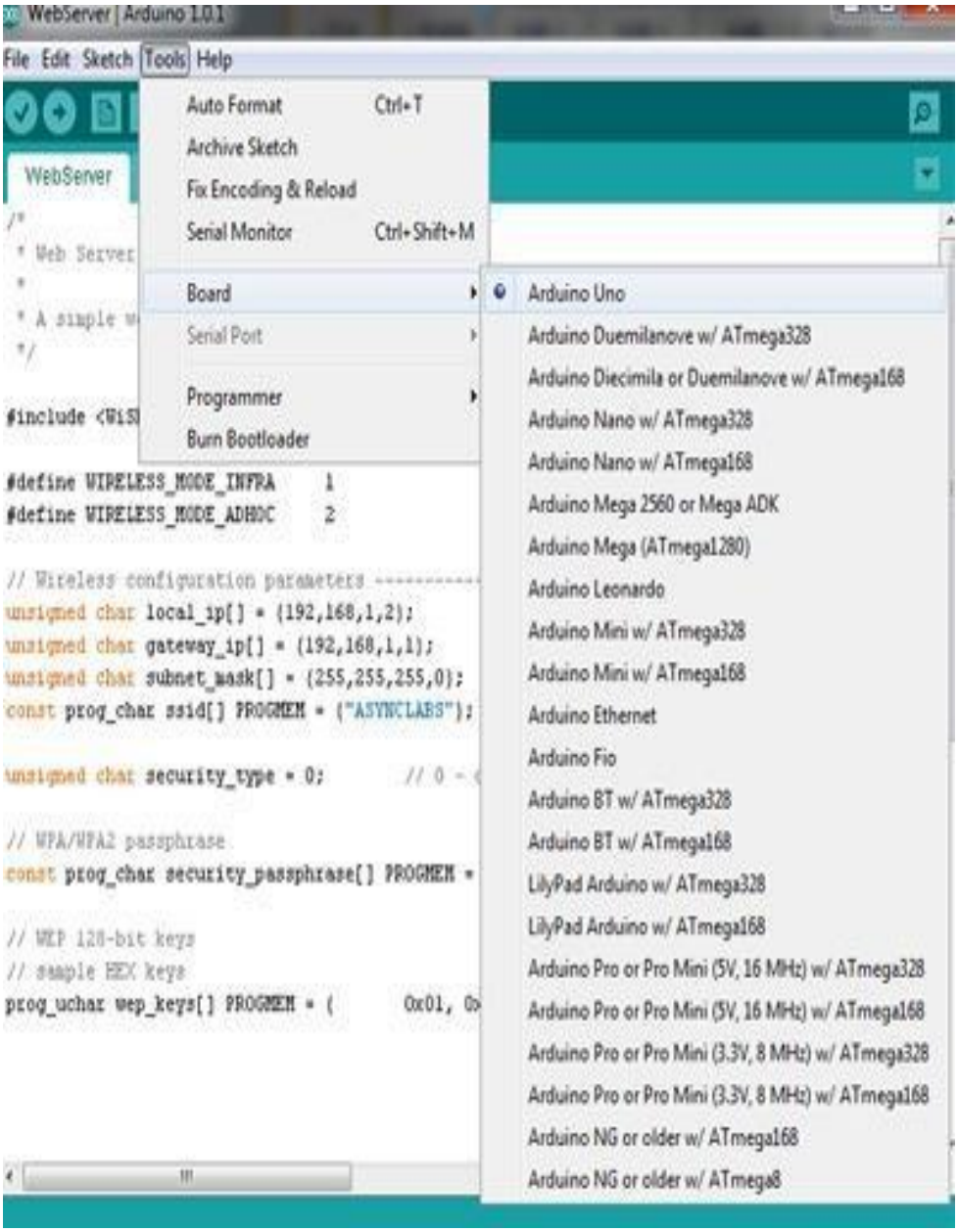

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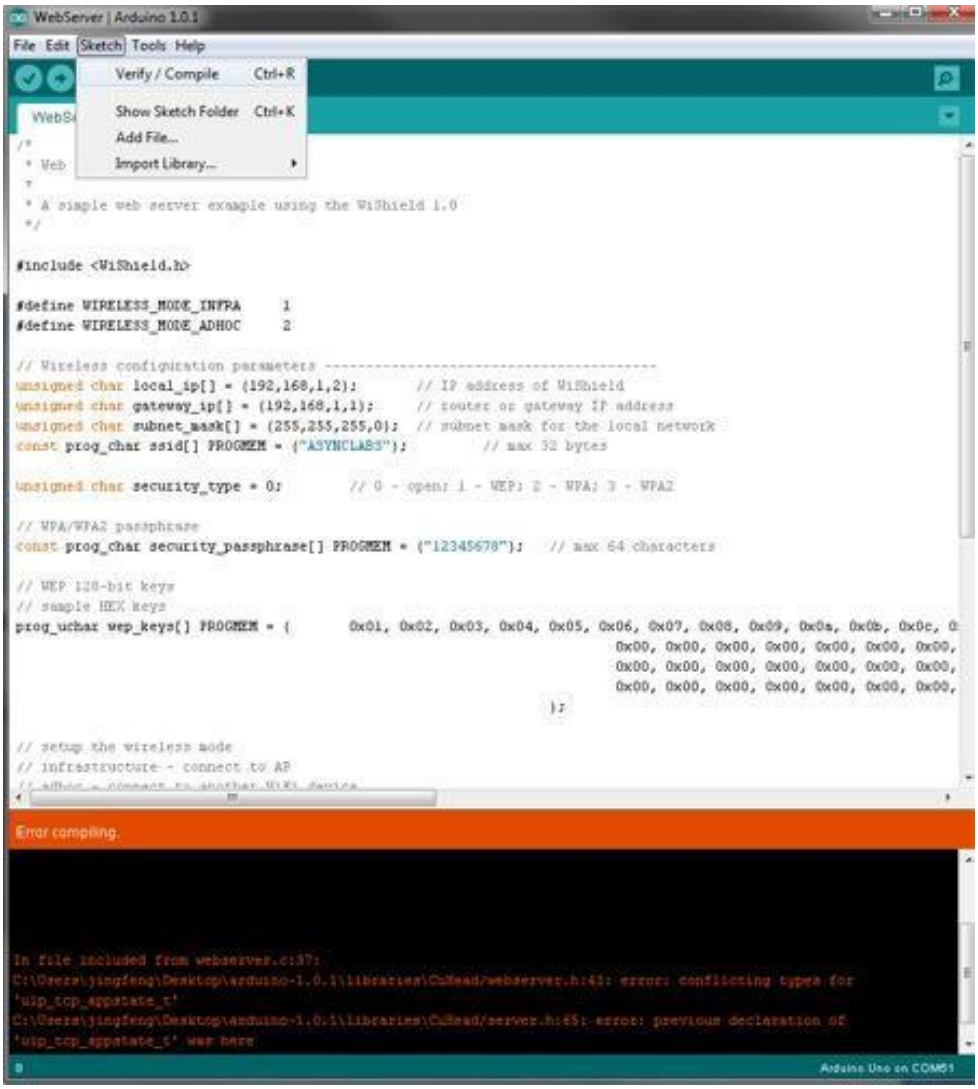
Click Sketch-> Verify/Compile:



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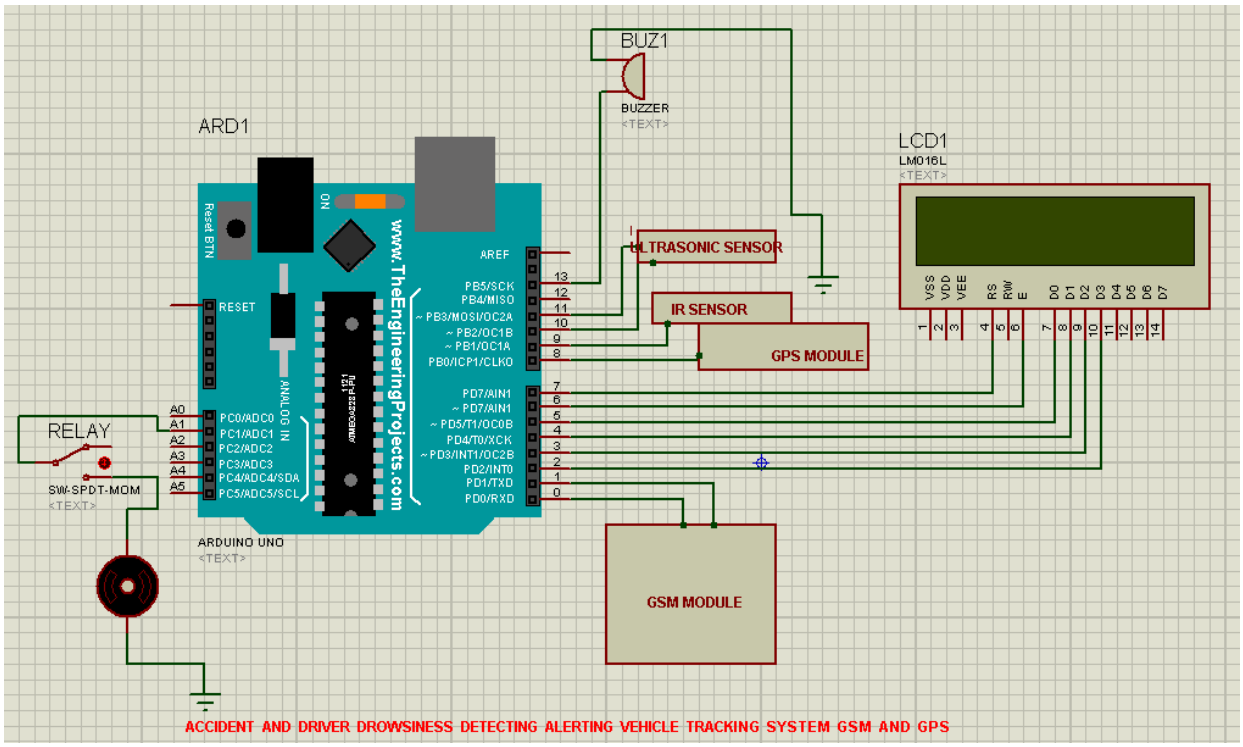
CHAPTER-5

EXPLANATION OF RESULT

The controller used in this project is Arduino which is used for controlling all the modules in the circuit. The two major parts other than controller is GPS module which is used as a receiver and other module is GSM. To receive the coordinates of the vehicle GPS module is used and GSM will send the received coordinates to the user through SMS. There is an additional LCD which is used for displaying status message or coordinates. When a person is driving the vehicle met with an accident then the vibrations of the vehicle is received by the vibration sensor and the sensor acts as a accident detection module which further send the information to the micro controller and the location of the vehicle is received through GPS module and the coordinates of the vehicle is send to the GSM module. The received information is send to arduino uno. The received coordinate's information is collected and is send to the respected person through SMS.

Schematic diagram:



Circuit diagram.

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FLOW DIAGRAM:

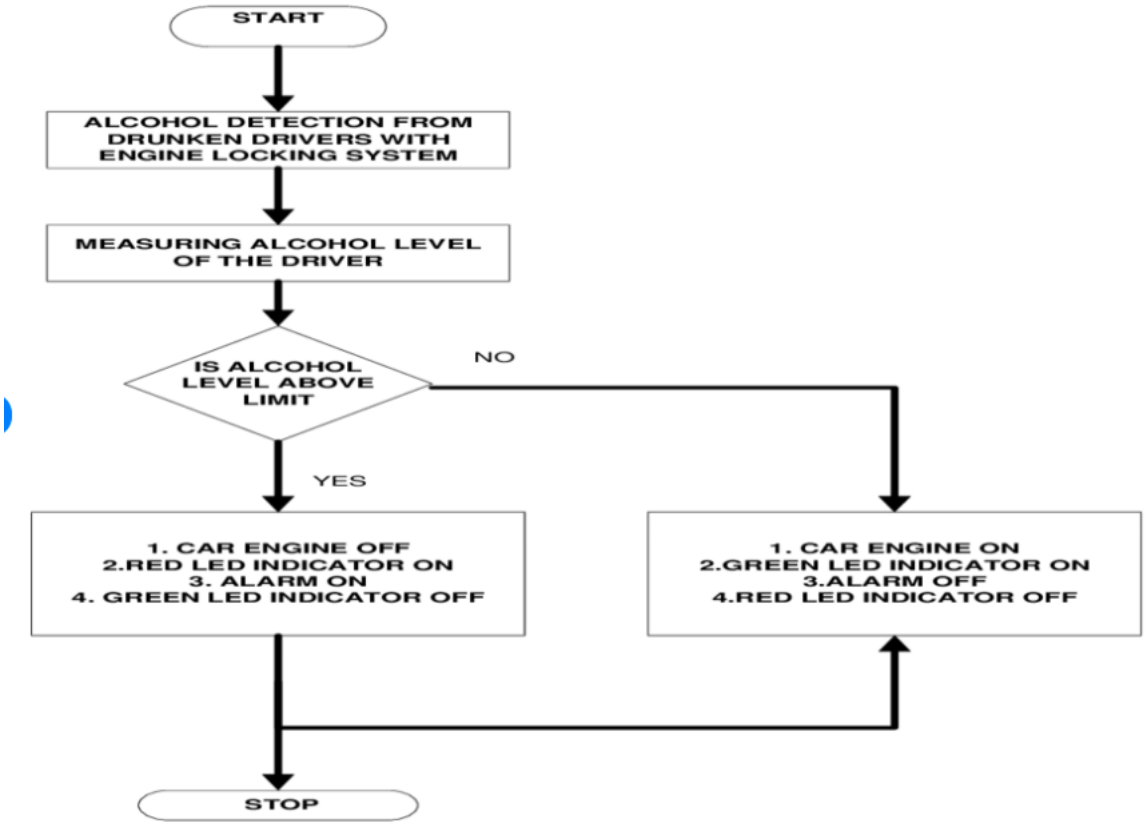

Fig.2. Flow chart.

Initially vehicle starts by ignition key. After ignition key activates Arduino checks alcohol sensor and accident sensor (limit sensor). If anyone sensor activates then motor (Engine) will be OFF. If alcohol sensor, accident sensor not activated and ignition key ON then motor (Engine) will be ON. Sensors data will be displayed on LCD. SMS will be sending when any sensor activated. While sending SMS Arduino sends GPS values to track vehicle position. Buzzer will be ON when any sensor gets activated. When Vehicle is in running mode we can get location by sending request SMS to modem.

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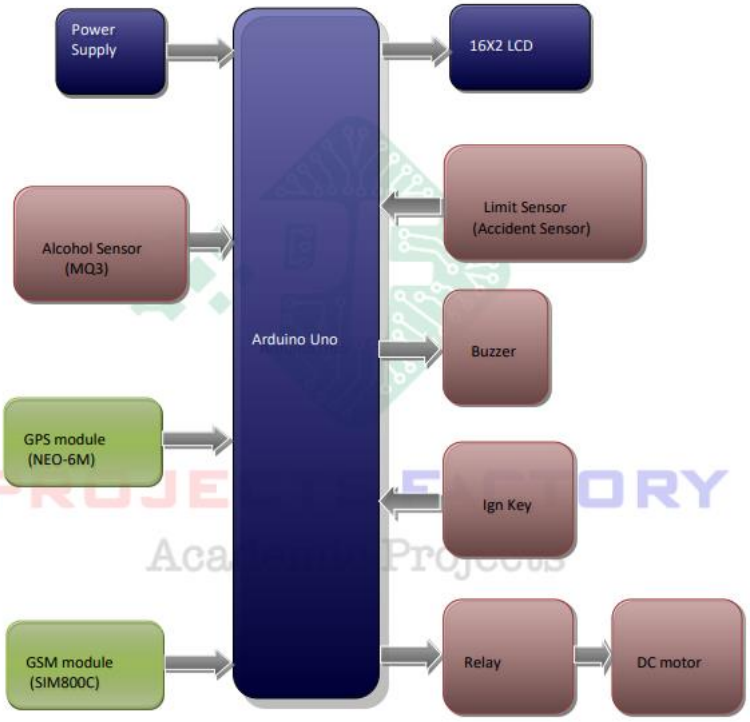

OPERATION WITH KIT IMAGES:

The proposed system deals with the accident alerting and detection. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. Using GPS the location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

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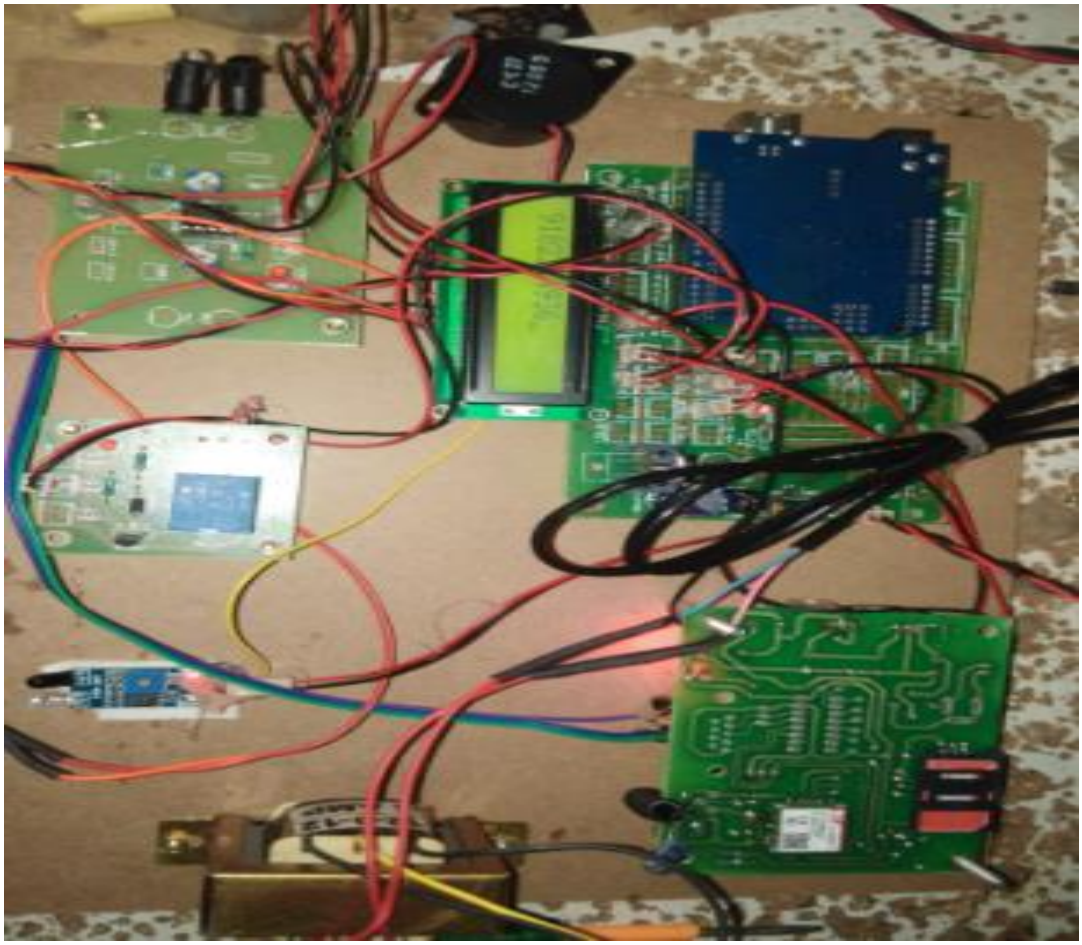

Fig.5.1.Hardware kit image.

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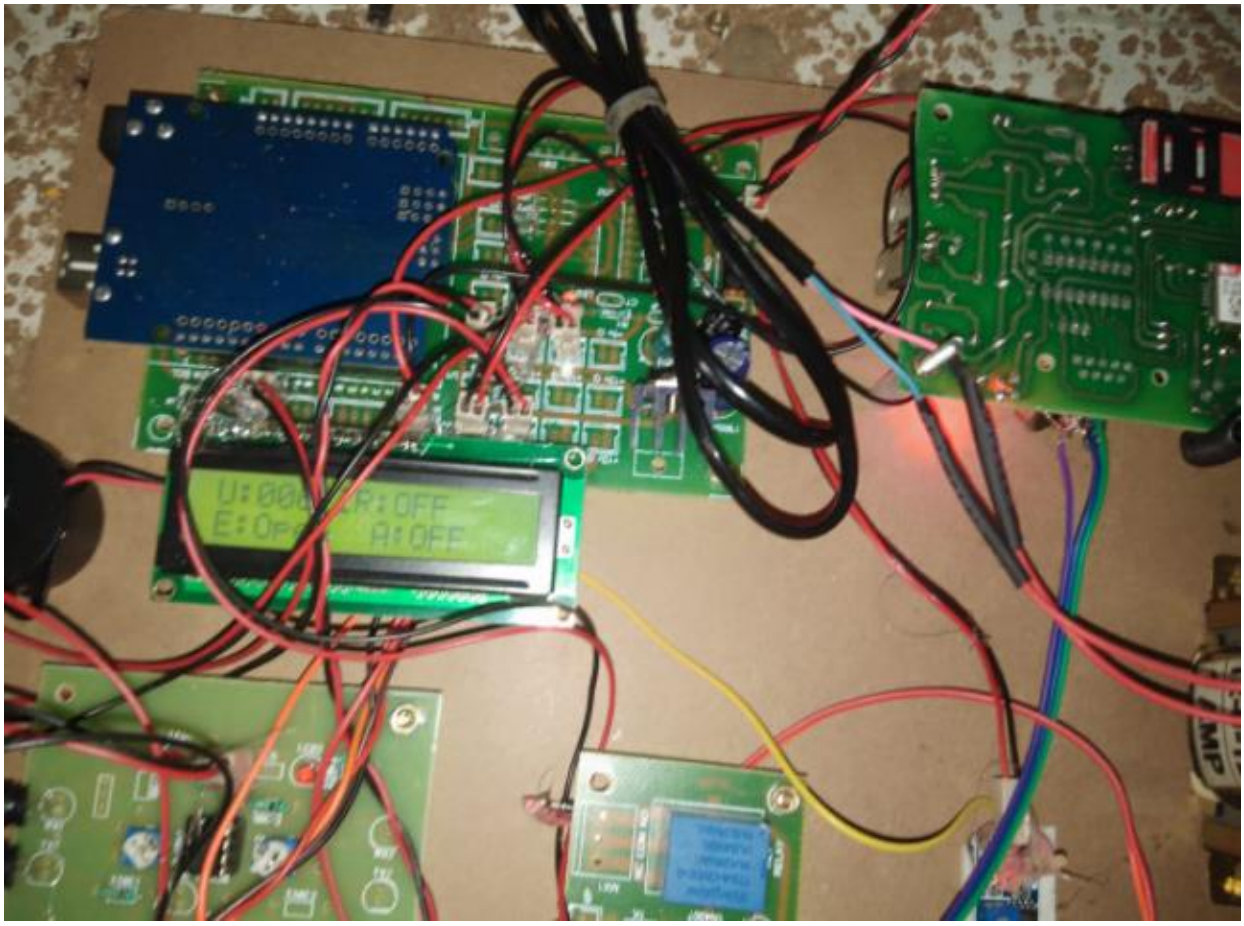

Fig.5.2. Accident detected time indicated in LCD.

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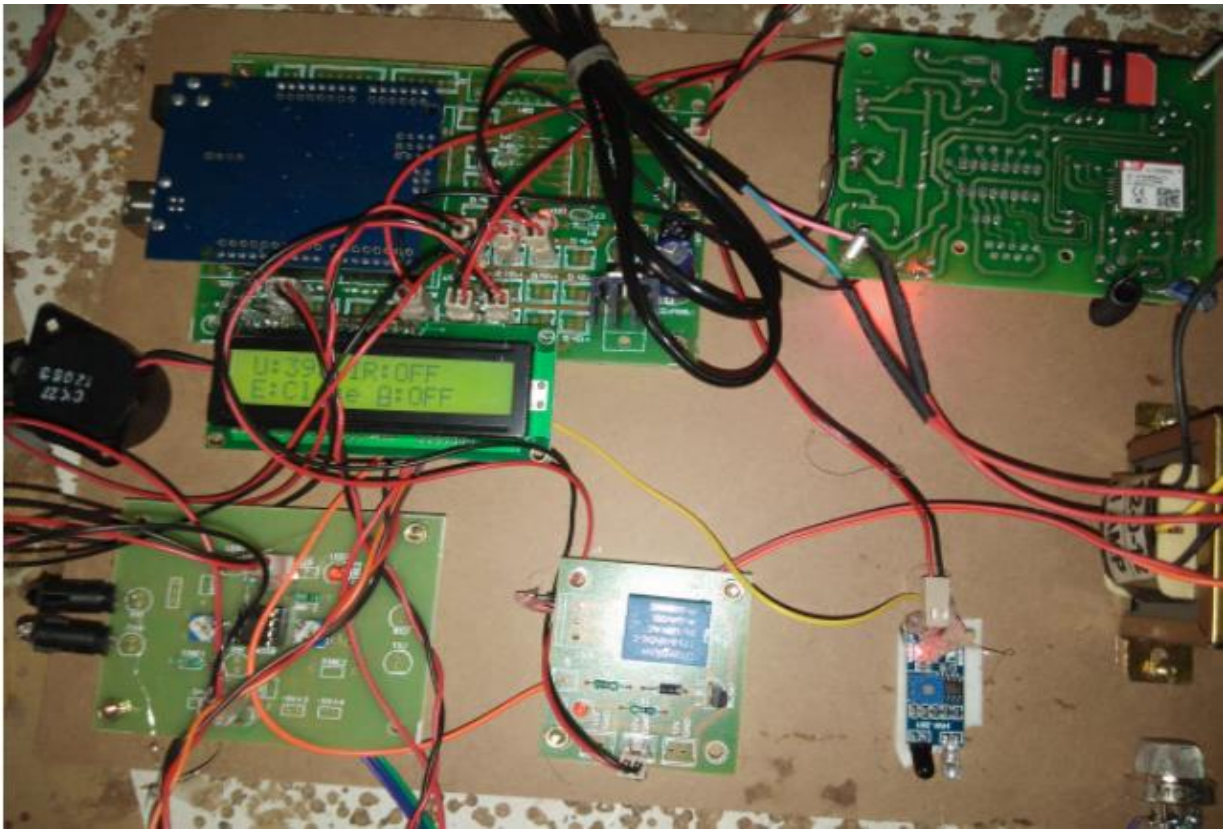

Fig.5.3. Eyes closed indication.

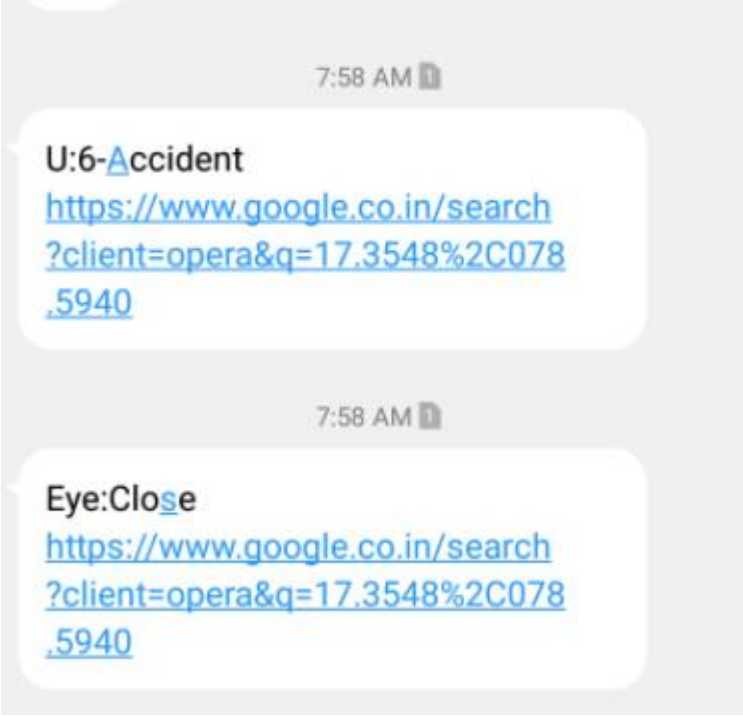

Fig.5.4. Ultrasonic sensor accident indication in Mobile.

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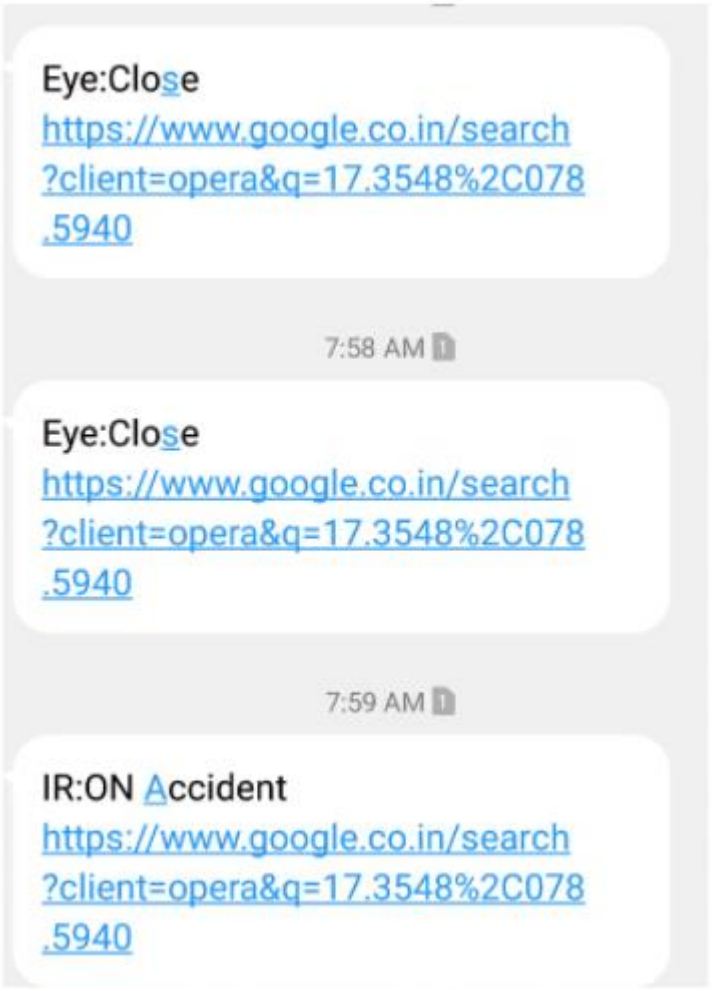

Fig.5.5. Eyes closed indication and IR sensor accident indication.

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CHAPTER-6

ADVANTAGES

- Purpose of our project is to help solving real life problem in very cost effect way.
- It alerts the truck driver as well as the owner of the company. Whenever the driver feels drowsy and closes his eyes for more than a second, the buzzer is blown. As a result, it alerts the driver.
- It also warns the owner of the truck driver by sending him text messages.
- As a result the accident ratio decreases. Hence, our project if commercially developed will help in saving the precious life of truck driver & money of the owner.

CHAPTER-7

CONCLUSION AND FUTURE SCOPE

CONCLUSION:

The proposed programmed accident identification system can be a rescuer of life for the individuals who are concerned in light of street crash. It can assume a fundamental part to lessen the passing rate in accidents. The proposed system is exceptionally easy to understand that even a non-specialized individual can utilize it without any problem. The system comprises of equipment and programming segments. The equipment unit includes accident identification sensors that are constrained by PICO board and is fitted in the vehicle. Then again, programming part is Android versatile application introduced in drivers Smartphone which is utilized to get the point by point map. In general, benefits of this system are minimal expense, secure and simple to user. The system introduced in this work lessens the demise setbacks brought about by the street accidents.

FUTURE SCOPE:

As a future work, a further analysis can be tried to improve the accuracy of detection phase and reduces the probability of false positive signs that are generated from being the user is inside or outside the car when the vehicle is travelling at a low speed. Therefore, it is suggested that the researchers investigate in the field of "Activity Recognition" based on smartphone sensors, which is used to detect the current activity of the user whether he is driving, walking, running. Also, a voice recognition module can be constructed and added to the proposed system to differentiate between airbag deployment and benign noise. Achieving this enhancement would increase the proposed system reliability and decrease false positive signs.

CHAPTER-8

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