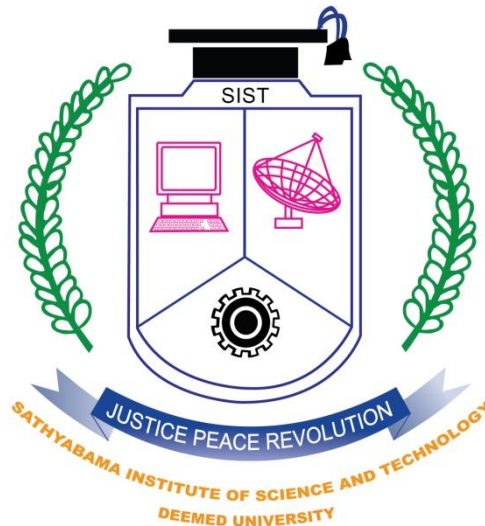


INTELLIGENT TRAFFIC SYSTEM FOR EMERGENCY PURPOSE

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering Degree in
Electrical and Electronics Engineering

by

KOTEESWARI.K(Register No. 37140045)
NEETHUPRIYA.M.S (Register No. 37140059)



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade “A” by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119**

APRIL 2021



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

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Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai – 600 119
www.sathyabama.ac.in

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **KOTEESWARI.K** (37140045) and **NEETHUPRIYA.M.S** (37140059) who carried out the project entitled **"INTELLIGENT TRAFFIC SYSTEM FOR EMERGENCY PURPOSE"** under my / our supervision from to .

Internal Guide

(Name in Capital letters with Signature)

External Guide (if Applicable)

(Name in Capital letters with signature)

Head of the Department

(Name in Capital letters with Seal & Signature)

Submitted for Viva voce Examination held on _____

Name:

Signature:

Internal Examiner

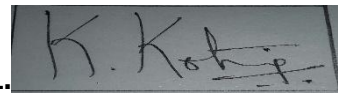
External Examiner

DECLARATION

I **KOTEESWARI.K** and **NEETHUPRIYA.M.S** hereby declare that the Project Report entitled “**INTELLIGENT TRAFFIC SYSTEM FOR EMERGENCY PURPOSE**” done by me under the guidance of **Dr.V.SIVACHIDAMBARANATHAN** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering / Technology degree in Electrical and Electronics Engineering.

DATE:

1.



2.



PLACE:

SIGNATURE OF THE CANDIDATE

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We are pleased to acknowledge our sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

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ABSTRACT

Traffic is the most basic issue in metropolitan urban areas. Traffic light turns out to be more important to give issue less, tranquil driving and contamination less environment to individuals. The work is designed to develop a Emergency based dynamic traffic signal system. The signal changes automatically on sensing the emergency at the junction. This automated traffic controlling system is built using the microcontroller-based platform of the Arduino Uno board. Here the Arduino is programmed in such a way that, the prescribed ambulance have temperature and heart rate and also fire was incorporated in the transmitter unit which transmits the signals, and it was received by the receiver in the traffic signal using ZigBee communication technology and the light of the traffic signal was automatically switched by the input signals by the receiver.

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LIST OF SYMBOLS AND ABBRIVIATIONS

AARS - Automatic Ambulance Rescue System

AREF – Reference voltage for analog inputs

BPM - heart beats per minute

DSRC - Dedicated Short Range Communication

EEPROM - electronically erasable programmable read-only memory

HVAC - Heating, ventilation, and air conditioning

ITS - Intelligent Transportation Systems

LED – Light emitting diode

OBUs - on-board units

RSUs – road side units

RTOS - real-time operating system

RX – receiver signal

SRAM - Static Random Access Memory

TTL - Transistor–transistor logic

TX–transmitter signal

UART - Universal asynchronous receiver-transmitter

CHAPTER 1

INTRODUCTION

1.1.EMBEDDED SYSTEM

An embedded system may be a controller programmed and controlled by a real-time operating system (RTOS) with a zealous function within a much bigger mechanical or electrical system. It's embedded as part of a full device often including hardware and mechanical parts. The embedded system are used to control many day-to-day devices. Most of the microprocessors are manufactured to function as an embedded system component.

Generally, Embedded systems samples are low power consumption, small size, rugged operating ranges, and low cost. This comes at the value of limited processing resources, which makes them harder to program and to interact.

However, by building intelligence mechanisms on top of the hardware, taking advantage of possible existing sensors , and also the existence of a network of embedded units, one can manage the available resources at the unit and also at the network levels as to provide augmented functions.

As an example, intelligent techniques are often designed to manage power.

Embedded Computer Sub-Assembly for Electronic robot. These systems are generally found in automotive,consumer, medical,industrial, commercial and military applications.

In telecommunications systems, these systems are used from telephone switches for the network to cell phones at the highest user.

Computer networking also uses dedicated routers and network bridges to route data. Consumer electronics such as MP3 players, printers, cell phones, digital cameras, game consoles and GPS receivers.

Household appliances like microwave ovens, machines like washing machines and dishwashers include this system to supply flexibility, efficiency , and features.

1.2.CLASSIFICATIONS OF EMBDDED SYSTEMS

Advanced HVAC systems use networked thermostats to control temperature which will change by time, more accurately and efficiently. In home automation, this system uses

wired as well as wireless-network which is familiar with controlling lights, climate, security, audio/visual, surveillance, etc., for sensing and controlling.

Like traffic lights, factory controllers, and largely complex systems like hybrid vehicles, MRI, and avionics Embedded systems range from portable devices like digital watches and MP3 players, to large stationary installations. Complexity varies from low with one microcontroller

1.3.BLOCK DIAGRAM OF AN EMBEDDED SYSTEM

An inserted framework as a rule contains an implanted processor. Many appliances that have a digital interface microwaves, VCR as well cars utilize this systems.

Some embedded systems include a software package. Others are very specialized resulting in the entire logic being implemented joined program. These systems are embedded into some device for some specific purpose apart from to produce general purpose computing

1.4.APPLICATIONS OF EMBEDDED SYSTEMS

- In automobiles, embedded systems are used to control, safety of engine and body, very system in robotics, entertainment and multimedia in cars, E-com access, mobiles, etc.
- in telecommunications embedded systems are part of networking, mobile computing, and wireless communications, etc.
- Embedded system in smart cards include banking, telephone and security systems.
- In satellites and missiles, this system is used in defense, for communication, and aerospace
- In computer networking & peripherals this system may be a part of image processing, networking systems, networking cards, monitors.
- In digital consumer electronics this system may be a part of set-top boxes (used for television), DVDs, high definition Televisions (HD-TVs) as well as digital cameras.

CHAPTER 2

LITERATURE SURVEY

1. Tandrima Chowdhury; Smriti Singh; S. MaflinShaby, “**A Rescue System of an advanced ambulance using prioritized traffic switching**”. 2015 International Conference of Innovations in information, Embedded and Communication Systems (ICIIECS)

This paper presents the design and Traffic congestion and tidal flow management are two major problems in modern urban areas which lead to road accident and loss of life. To carry out this, we present Automatic Ambulance Rescue System (AARS).The primary thought behind this plan is emergency vehicle can reach easily to medical clinic on schedule, by precisely controlling traffic signals in way. The rescue vehicle is constrained by control unit which gives the briefest way for arriving at emergency clinic and controls traffic signals. The sensor detects the spot and the closest emergency vehicle arrives at the mishap spot. The traffic signals in the way of the emergency vehicle are controlled. The emergency vehicle is guided to medical clinic by worker through most limited course. The vehicle unit introduced in vehicle detects the mishap and sends the area of the mishap to the fundamental worker in the emergency vehicle segment. The principle worker discovers the emergency vehicle, closest to the mishap spot and furthermore briefest way between rescue vehicle, mishap spot and closest medical clinic.

2. K. Athavan; G. Balasubramanian; S. Jagadeeshwaran; N. Dinesh,”**Automatic Ambulance Rescue System**”,2012 Second International Conference on Advanced Computing & communication Technologies.

Traffic congestion and tidal flow management are serious issues in present day metropolitan territories, which have caused a lot ruining for the emergency vehicle. Also street mishaps in the city have been unremitting and to bar the death toll because of the mishaps is much more significant. To carry out this we present a plan called AARS (Automatic emergency vehicle salvage framework). The fundamental topic behind this plan is to give a smooth stream to the rescue vehicle to arrive at the medical clinics on schedule and accordingly minifying the terminationThe thought behind this arrangement is to execute an ITS which would control absolutely the traffic lights in the method of the crisis vehicle. The rescue

vehicle is constrained by the focal unit which outfits the most insufficient course to the emergency vehicle and furthermore controls the traffic signal as indicated by the rescue vehicle area and in this manner arriving at the clinic securely. The worker additionally decides the area of the mishap spot through the sensor frameworks in the vehicle which experienced the mishap and hence the worker strolls through the rescue vehicle to the spot. This plan is completely computerized, consequently it discovers the mishap spot, controls the traffic signals, assisting with arriving at the clinic on schedule.

3. Oliver Sawade; Bernd Schaufele; IlyaRadusch, "**Collaboration over IEEE 802.11p to enable an intelligent traffic light function for emergency vehicles**",2016 International Conference on Computing, Networking and Communications (ICNC). With the approach of agreeable computerized capacities a large group of novel capacities gets possible - helpful driver help frameworks (CoDAS). We present a model for a novel collective vehicle-2-foundation collaboration with the "mechanized crisis vehicle green-light" (AEVGL) work. In our methodology we join traffic signal foundation with Dedicated Short Range Communication (DSRC) over IEEE 802.11p to address a major issue: mishaps containing crisis vehicles at crossing points. In AEVGL we use correspondence to preemptively switch traffic signals to red for intersection traffic to permit safe entry of the moving toward crisis vehicle even in low correspondence infiltration situations. This capacity can fill in as plan for other novel lightweight CoDAS capacities with a quite certain degree. GLOSA and AEV are right now tried in the TEAM IP task to encourage AEVGL.
4. Lee, W.H.; Chou, C.M.; Kuo, Y.H.; Hung, W.L.; Chang, D.W. "**Development of a Roadside Unit Middleware for Vehicular Ad-Hoc Network Based Intelligent Transportation Systems.**" Published in the journal "Journal of Internet of things" Vol 18, No 6(2017).

Vehicular Ad-hoc Networks (VANETs) are an arising innovation used to build remote organizations among vehicles and among vehicles and side of the road units (RSUs) for Intelligent Transportation Systems (ITS). In this paper, a RSU middleware which upholds correspondence with on-board units (OBU) and a cloud place is proposed, and a few center modules are carried out, including correspondence the executives, traffic strategy the executives, and distant administration modules. The RSU can handle the traffic lights as indicated by

momentum traffic conditions and be overseen by a distant customer, it can likewise give an early admonition to drivers through the traffic occasion distinguishing proof and cautioning framework, and consequently perform rerouting to dodge gridlock. The proposed RSU middleware is executed on Linux and tried on a PC, and conveyed to an implanted advancement board. The exhibition assessment results show that the RSU middleware can simultaneously deal with more than 5,000 (mimicked) OBUs, and it functions admirably in a steadiness test for over one month while taking care of more than 100 (reenacted) OBUs each second. The proposed RSU middleware is an open source structure, which permits engineers to redo it for more VANET-empowered ITS applications.

CHAPTER 3

PROJECT DESCRIPTION

3.1.EXISTING SYSTEM

- There's loss of life due to the delay caused in the arrival of ambulance to the hospital within the golden hour. It might be of great use to the ambulance, if the traffic signals within the path of the hospital are ON. They're using traffic system which isn't capable to regulate the traffic because traffic is major issue in our Country, especially in urban areas.
- In existing method doesn't have any solution for Emergency vehicle like ambulance, fire brigade, police cars face many problem to succeed in their destination due to holdup , resulting loss of human lives.

3.2.PROPOSED SYSTEM

- A replacement design for automatically controlling the traffic signals and achieving the above mentioned task in order that the ambulance would be ready to cross all the traffic junctions without waiting.
- The traffic system has got to give more priority to emergency situations.
- During this system, traffic clearance is completed by turning Red signal into Green signal. within the proposed system, the vehicles are sensed and processed through the sensor and ZigBee modules. the aim of the proposed system is to automatically switching the traffic light for emergency vehicle.

3.3.BLOCK DIAGRAM

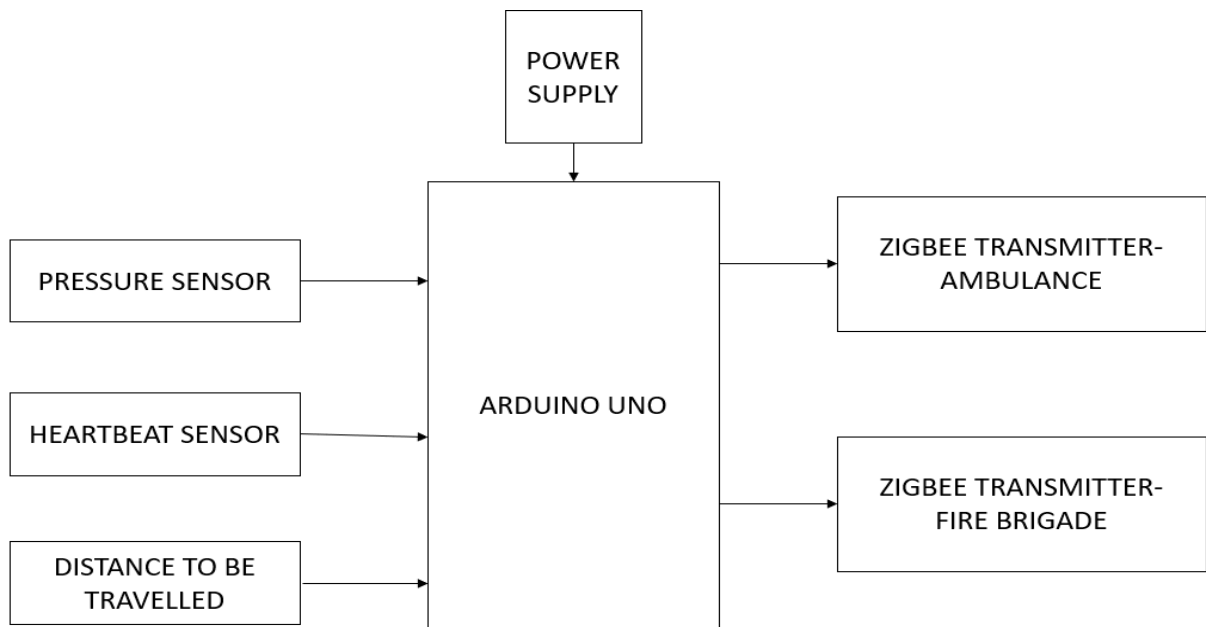


Fig.3.1.Block diagram of Emergency vehicle section

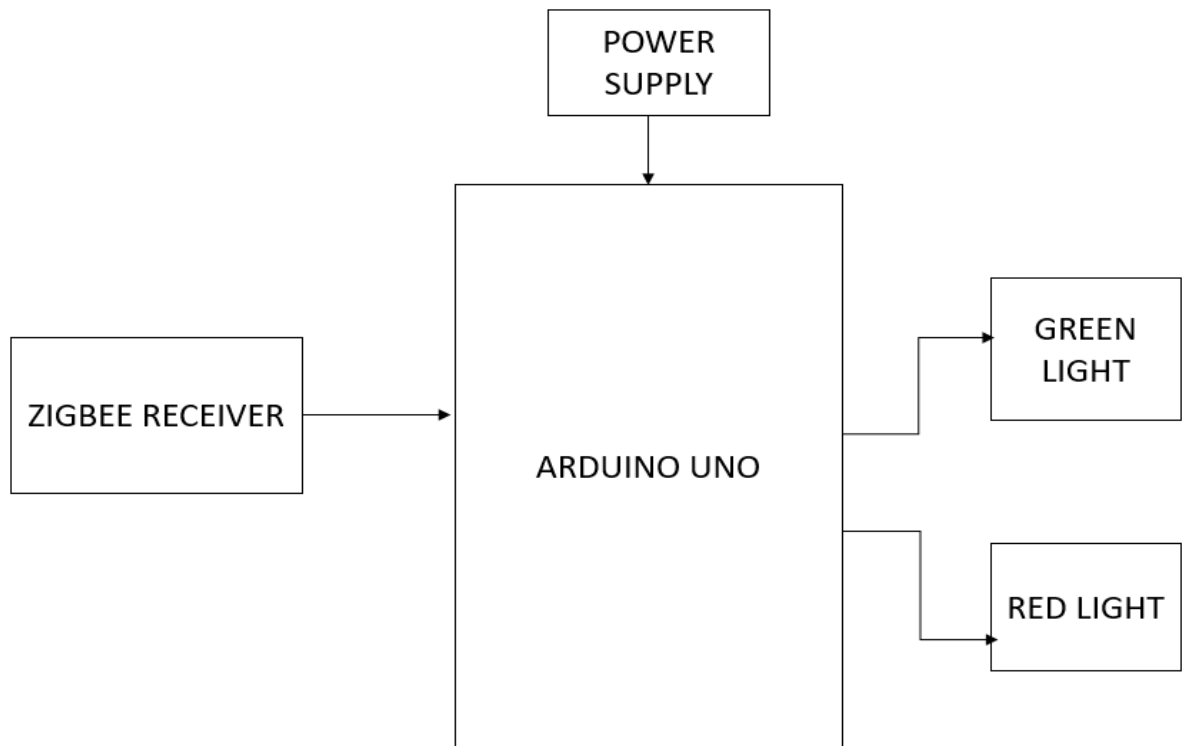


Fig.3.2.Block diagram of Traffic signal section

3.4.CIRCUIT DIAGRAM

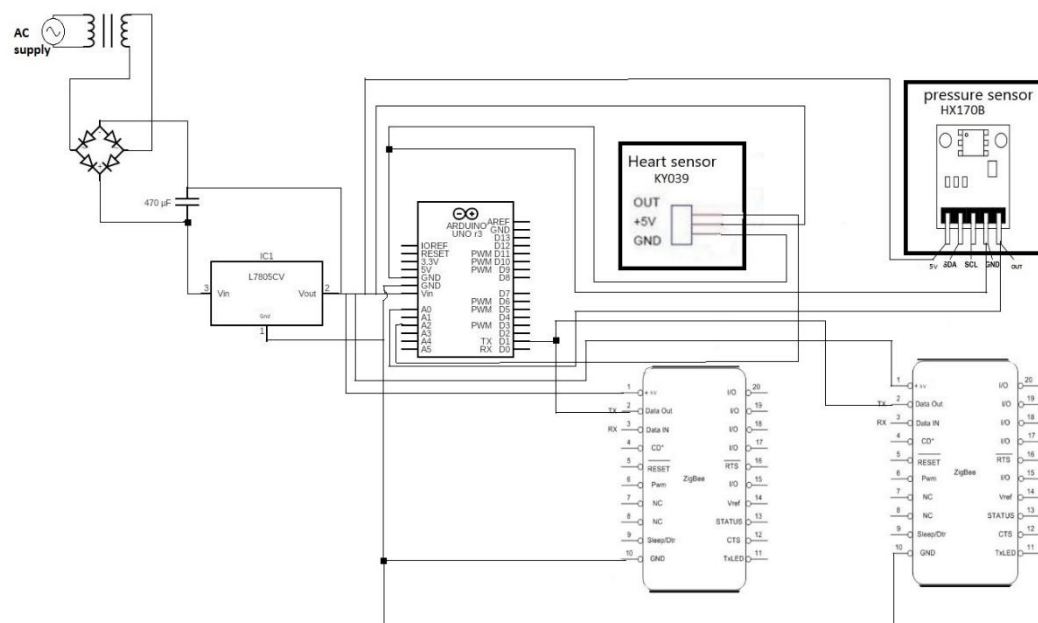


Fig.3.3. Circuit diagram of Emergency vehicle section

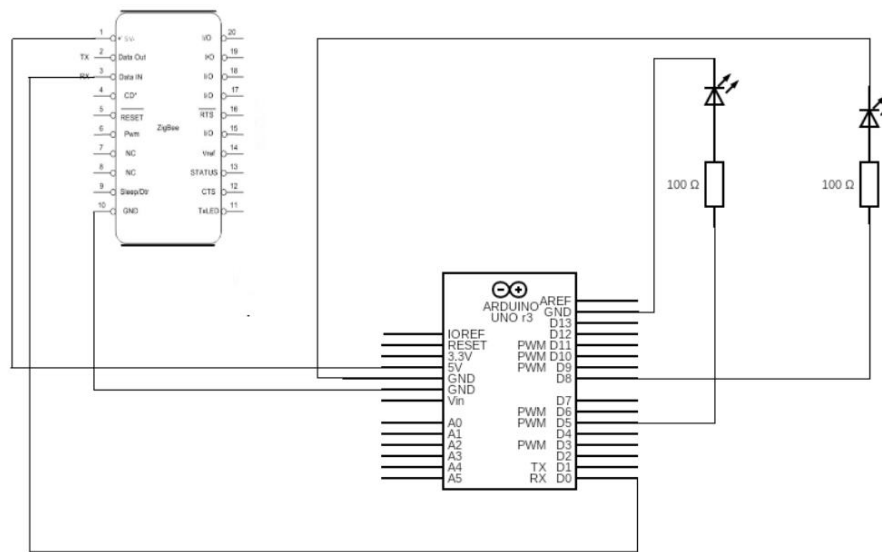


Fig.3.4.Circuit diagram of Traffic signal section

3.5.CONCEPT EXPLANATION

Our project mainly concentrates on saving human life by clearing the traffic jam and giving the way to the emergency vehicles. First, we have inserted the ZIGBEE module inside the emergency vehicle. ZIGBEE module is used here for the wireless communication, it will send the data, which is sensed by sensors placed inside the vehicle. Sensed data is collected by the microcontroller (ARDUINO UNO) and transferred via the ZIGBEE.

We have included the priority based concept here. It consists some cases, in case of the ambulance, if the patient's condition is normal and no other emergency vehicle faced the same signal junction, then automatically signal light in the ambulance facing way will turn to green.

By our exploration of the sensor as which would be giving the best indication of patients critical condition, we came to choose heart beat sensor and pressure sensor.

With these sensors, by some certain conditions we can know the patient's condition and it will really help to change light accordingly.

If ambulance and fire engine facing the Same signal junction, the first come first out concept will take place and signal lights will change accordingly.

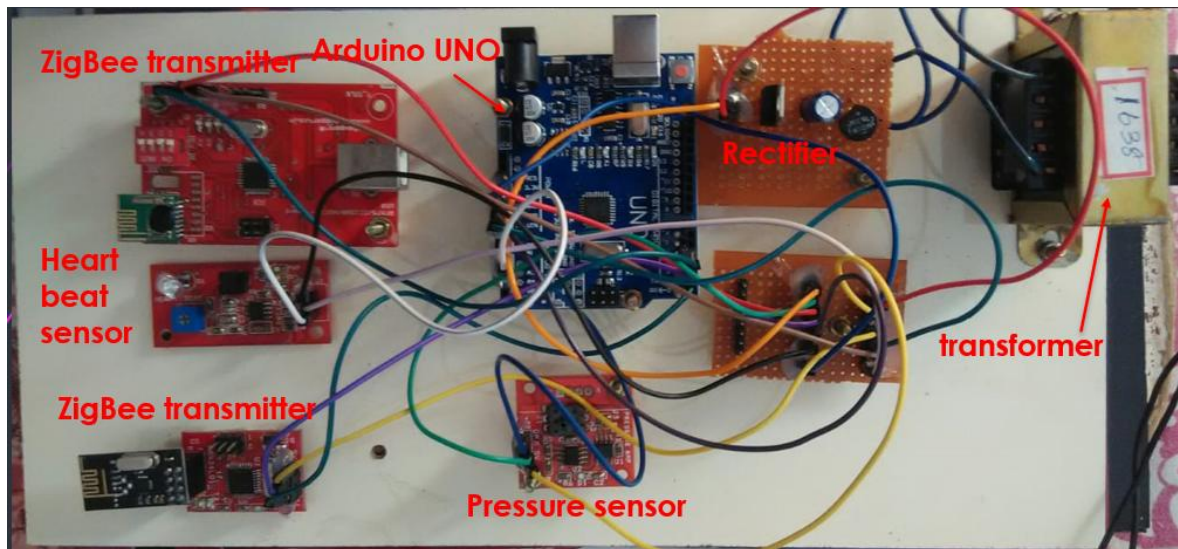


Fig.3.5. Emergency vehicle section

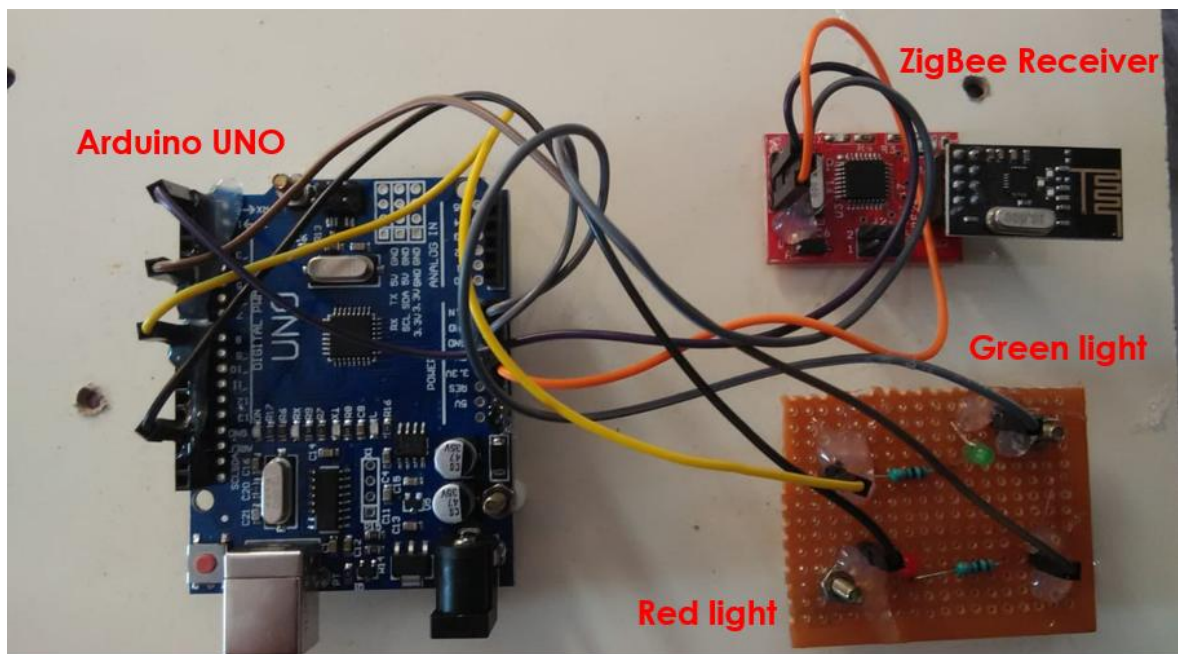


Fig.3.6. Traffic signal section

CHAPTER 4

HARDWARE REQUIREMENTS

- ARDUINO UNO
- HEARTBEAT SENSOR
- PRESSURE SENSOR
- ZIGBEE TRANSMITTER
- ZIGBEE RECEIVER
- GREEN LED
- RED LED

4.1.ARDUINO UNO

The Arduino Uno is a microcontroller board supported by the ATmega328. It consists of 14 digital input/output pins out of which 6 are most typically used as PWM output pins. Another six pins as analog input pins, an ICSP header, a 16 MHz ceramic resonator, an influence jack, an USB connection and a push. It contains things that's required to support a micro-controller. User just has got to connect it to a computer or laptop with a USB cable or power it with an AC-to-DC converter or battery to indicate it ON. The difference between the previous boards and Uno is that it does not use the FTDI USB-

to-serial driver chip, whereas it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. The updated version (Revision 2) of the Uno board consists of a pull-up resistor to pull the 8U2 HWB line to ground, making it easier to put into DFU mode. Revision 3 of the board has the subsequent new features:

- 1.0 pinout is an output pin which is added with SDA and SCL pins that are almost as same because the AREF pin and two other newly placed pins that almost replace the RESET pin, the IOREF that has shield to adapt to the voltage which is being provided from the board. Nowadays, shields became compatible with both the board that use the AVR, which operate with 5V and with the Arduino Uno whose operating voltage is 3.3V. The second could also be a not connected pin, that's reserved for future purposes.
- Stronger RESET circuit.
- At mega 16U2 replace the 8U2. "Uno" means one in Italian and is understood on mark the upcoming release of Arduino 1.0. The Uno and version 1.0 are getting to be the reference versions of Arduino, moving forward. The Uno is that the newest in an exceedingly series of USB Arduino boards, and also the reference model for the Arduino platform; for a comparison with previous versions.

4.1.1.POWER

Vin pin provides the input voltage to the Arduino board when it's using an external power which may be a regulated power supply or connected to a laptop/ computer using an USB cable. The supply voltage can be given through this pin or via a DC power jack that can access through this pin.

5V-supply pin supplies 5V regulated input to the board. The board can be powered with supply from a DC power jack of 7-12V or the USB connector of 5V supply or the Vin pin of the board of 7-12V. If the supply voltage is supplied by 5V or 3.3V pins, it bypasses the regulator and hence the board gets damaged.

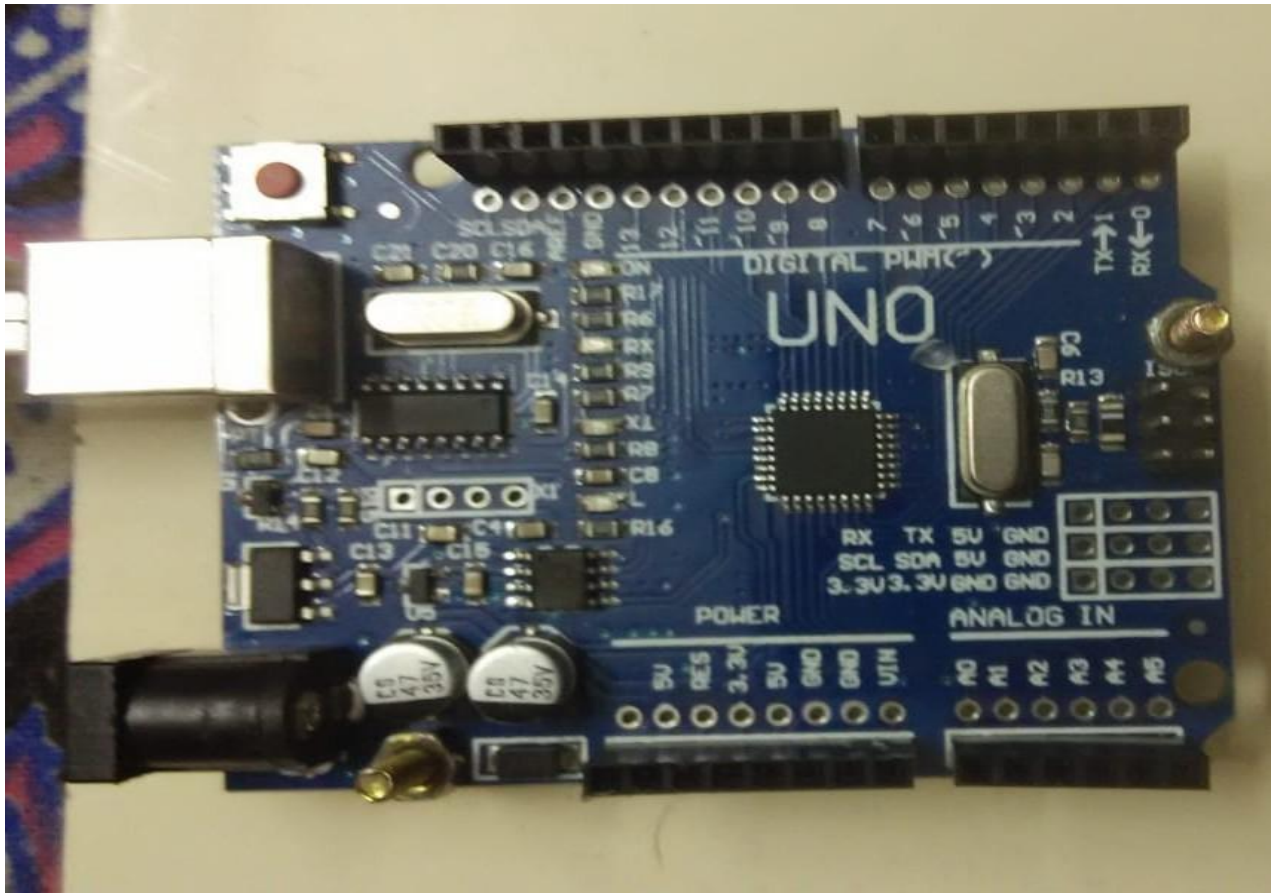


Fig 4.1 Arduino Uno board

- A 3.3-volt supply generated by the on-board regulator. Maximum current draw is 50 mA. GND-Ground pins.

4.1.2.MEMORY

The size of ATmega328 is 32KB. Out of which 0.5KB is used for bootloader. It consists of SRAM of 2KB and EEPROM of 1KB, which can be read and written using EEPROM library. Using three functions – pin Mode(), digital Write() and digital Read() user can

use the 14 digital pins of the board to input and output data/signals and they are operated at 5V. The maximum send and receive current for each pin is 40mA. If the current is greater than 40mA, the internal pull-up resistor of 20-50K Ω disconnects the circuit.

4.1.3.SPECIALIZED FUNCTIONS

- Serial pins: these pins are used to receive (RX) and transmit (TX) serial data. 0-RX and 1-TX. These pins are connected to the RX and TX pins of ATmega8U2 USB-TTL serial chip.
- External Interrupts: 2 and 3: these pins are also called interrupt pins and they interrupt when a low or falling / raising edge or a change in value occurs.
- PWM pins: the pin number - 3, 5, 6, 9, 10, and 11 are called the PWM pins. When the input is given to these pins, the output would be 8-bit PWM signal along with analog Write() function.
- SPI communication: the pin number 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK) supports SPI communication. This communication is done using SPI library.
- LED: there is an inborn digital pin number 13 on the board which provides LED. When the value is 1 or high, the LED is turned ON and when the value is 0 or low, the LED is turned OFF. The Uno has 6 simple sources of info, named A0 through A5, each one of these pins provides 10 bits of resolution i.e 1024 different values. The default measurement of values will be from low to high i.e from ground or zero to 5V. By this process it is possible to change the end range using a pin called AREF pin and function called analog Reference().
- TWI communication: SDA or the pin A4 and the SCL pin or A5 pins support TWI communication. This communication is done using a library called Wire library.

There several different pins on the board:

- AREF pin – Reference voltage for analog inputs. This pin used with analog Reference().

- Reset pin – This pin brings the line LOW to reset the microcontroller. It is typically used to shield which blocks the microcontroller. The mapping of the Atmega8, 168, and 328 is similar to that of the Arduino UNO.

- The communication of Arduino UNO is much larger as it can communicate to a computer, another Arduino and other microcontrollers as well.

The ATmega328 gives UART TTL (5V) consecutive correspondence, which is available on automated pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this successive correspondence over USB and appears as a virtual com port to programming on the PC.

The '16U2 firmware uses the standard USB COM drivers hence external driver is not required. Regardless, on Windows, a .inf record is required. The Arduino programming joins a constant screen which grants fundamental artistic data to be delivered off and from the Arduino board. The RX and TX LEDs on the board will streak when data is being sent through the USB-to-consecutive chip and USB relationship with the PC (anyway not for successive correspondence on pins 0 and 1). A Software Serial library thinks about consecutive correspondence on any of the Uno's modernized pins. The ATmega328 also maintains I2C (TWI) and SPI correspondence. The Arduino programming fuses a Wire library to deal with use of the I2C transport.

4.1.4.USB Overcurrent Protection

The Arduino Uno includes a resettable poly fuse that protects your computer's USB ports from shorts and overcurrent. An additional layer of protection is provided by the fuse even though most of the computers have an internal protection. If a current of more than 500mA is applied at the USB port, the fuse comes into action and breaks the connection of the overloaded current.

4.1.5.Physical Characteristics

The maximum length and width of the Uno PCB are 2.7 and 2.1 inches respectively, with the USB connector and power jack extending beyond the previous dimension. There are four holes for the screws to fix the board to a case or a surface. The gap between the 7th and 8th digital pins is 0.16”.

4.2.HEART BEAT SENSOR

The contraction and expansion of the valves in the heart with lub-dub sound while the blood is forced from one region to another is heartbeat. the amount of times the heart beats per minute (BPM), is that the heart beat rate and therefore the beat of the heart and that may be felt in any artery that lies near the skin is that the pulse.

2.1.PRINCIPLE OF HEARTBEAT SENSOR

- The heartbeat sensor relies on the principle of photo plethysmography. It measures the change in volume of blood through any organ of the body which causes a change within the intensity level through that organ (a vascular region). just in case of applications where heart rate is to be monitored, the timing of the pulses is more important. The flow of blood volume is set by the speed of heart pulses and since light is absorbed by blood, the signal pulses are corresponding to the center beat pulses.

4.2.2.PRIMARY APPLICATIONS OF HEARTBEAT SENSOR

- It can work as a digital heart rate monitor system.
- It can monitor patient's health.
- it can be used to monitor robotic applications such as bio-feedback, etc.,
- The heart pumps blood through the blood vessels due to which the finger becomes a bit more opaque and hence the amount of light that reaches from the LED detector will become very less.
- Whenever a pulse is detected by the detector, the signal is varied. This varied signal is converted to an electrical pulse and gets triggered and amplified through an amplifier.

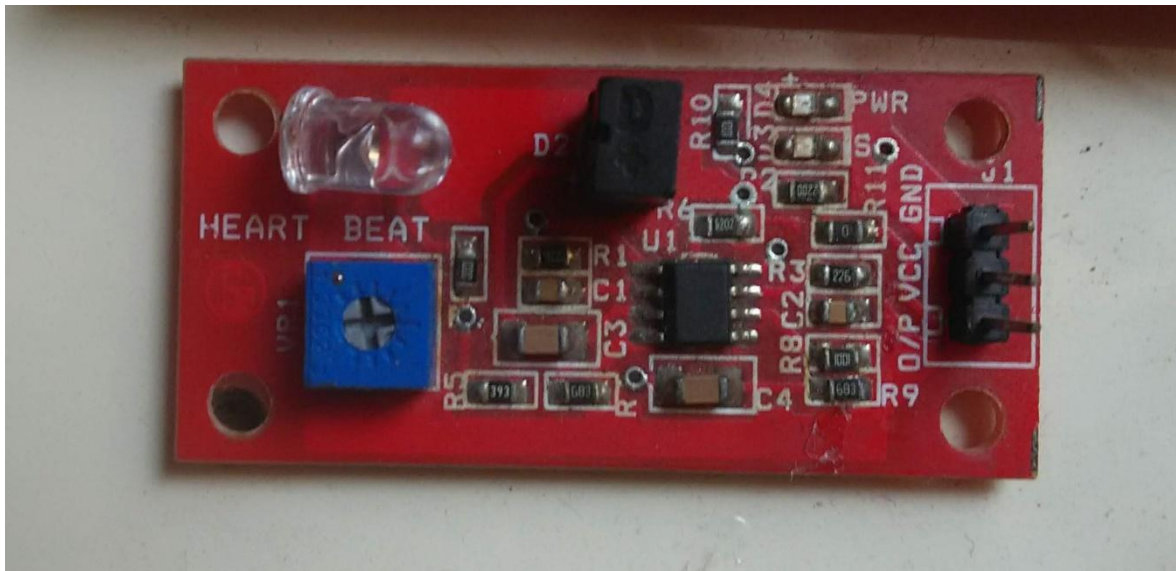


Fig.4.2.heart beat sensor

4.3.PRESSURE SENSOR

- Pressure sensors are devices that are used to measure the force or pressure applied on a particular device or any other appliance. The operating pressure of a pressure sensor is chosen based upon what value the intended system requires.
- The SI unit for pressure is that the Pascal (N/m²), but other common units of pressure include pounds per area unit (PSI), atmospheres (atm), bars, inches of mercury (in Hg), and millimeters of mercury (mm Hg). A pressure measurement will be described as either static or dynamic.
- These sensors can measure pressure of mainly liquids and gases. Pressure is a kind of force that is required to prevent a fluid from being expanded and it can be expressed in terms of force per unit area. The pressure sensor which acts as a transducer generates a proof when pressure is applied on it. For the needs of this text, such a proof is electrical.
- These sensors are used to control and to monitor applications in our day to day life. These sensors can indirectly measure few other quantities such as, fluid flow, water level, etc., These sensors can also be called as piezometers, pressure senders, pressure indicators, pressure transducers, pressure transmitters and manometers, among other names.

- Pressure sensors can vary drastically in application suitability, technology, performance, design, and price. A conservative estimate would be that there's also over 50 technologies and a minimum of 300 companies making pressure sensors worldwide.
- There is also a category of pressure sensors that are designed to measure in a dynamic mode for capturing very high speed changes in pressure. Model applications for this sort of sensor would be in the estimating of ignition pressure in a motor chamber or in a gas turbine. These sensors are usually fabricated out of piezoelectric materials, for example, quartz.
- These sorts of sensors are generally called a squeezing factor switch. Some pressure sensors, for example, those found in some rush hour gridlock authorization cameras, work in a twofold (off/on) way, i.e., when pressing factor is applied to a pressing factor sensor, the sensor acts to finish or break an electrical circuit. Packaged in a double in-line setup, the NPC-1210 Series is planned for printed circuit board mounting.
- The NPC-1210 series of solid-state pressure sensors are designed to provide a cost effective solution for applications that require calibrated performance over a wide temperature range. Discretionary pressing factor port and lead setups give predominant adaptability in low profile applications where pressure association direction is basic.

4.3.1.FEATURES

- High affectability
- High precision
- Wide material temperature range.
- Solid, MEMS innovation, high unwavering quality.
- Easy to utilize, an assortment of reach to browse. simple to introduce in OEM hardware.
- Interchangeable
- Temperature repaid 0°C to 60°C (32°F to 140°F)

- CB mountable bundle
- DIP bundle
- Solid-state unwavering quality
- Individual gadget recognizability

4.3.2.APPLICATIONS

- Car: tire pressure measure, vehicle-mounted vacuum apparatus, the MAP sensors, analytic gear, auto sensors
- Medical: patient checking and indicative hardware, for example, circulatory strain screen, clinical instrument, and screen.
- Industrial mechanization
- Industry: air powered brake switch, versatile pressing factor measure, for example, computerized pressure check, climate screen.
- Air stream screens
- Process control
- Medical gear
- Underground link spill discovery
- Ventilation
- Respirator checking
- Pressure detecting
- Altitude detecting
- Flow detecting
- Level/profundity detecting
- Leak testing
- Ratio metric Correction of Transducer Output.

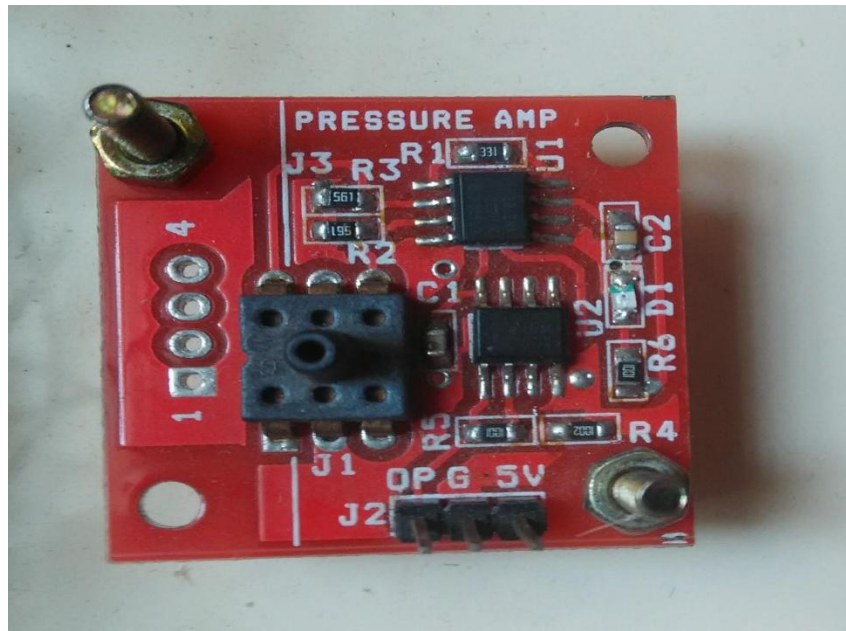


Fig.4.3.pressure sensor

4.4.ZIGBEE

RFM75 information modem working at 2.4 Ghz recurrence fifty-fifty duplex mode with programmed exchanging of get/communicate mode with LED sign. Gets and Transmits sequential information of flexible baud pace of 9600/4800/38400/19200 bps at RS232 level for direct interfacing to PC Serial port or such gadgets. This model can work with other 2.4 Ghz Sensor installed models (TTL, 30 meter reach) or RFM75 modem can be utilized for applications that need two way remote information transmission. It includes high information rate and longer transmission distance. The correspondence convention is self-controlled and totally straightforward to UI. The module can be inserted to your present plan so remote correspondence can be set up without any problem.

4.4.1.FEATURES

- RS-232 direct interface
- TTL support
- Separate LED for RX,TX and force
- 30Mtr territory
- 4 bit channel determination
- Programmable yield power
- Variable payload length from 1 to 32bytes

- Automatic parcel preparing
- 6 information pipes for 1:6 star organizations
- 4-pin SPI interface with greatest 8 MHz clock rate 7
- 20-pin 4x4mm QFN bundle

4.4.2.Applications

- Wireless PC peripherals
- Wireless gamepads
- Wireless sound
- Remote controls
- Home computerization
- Toys

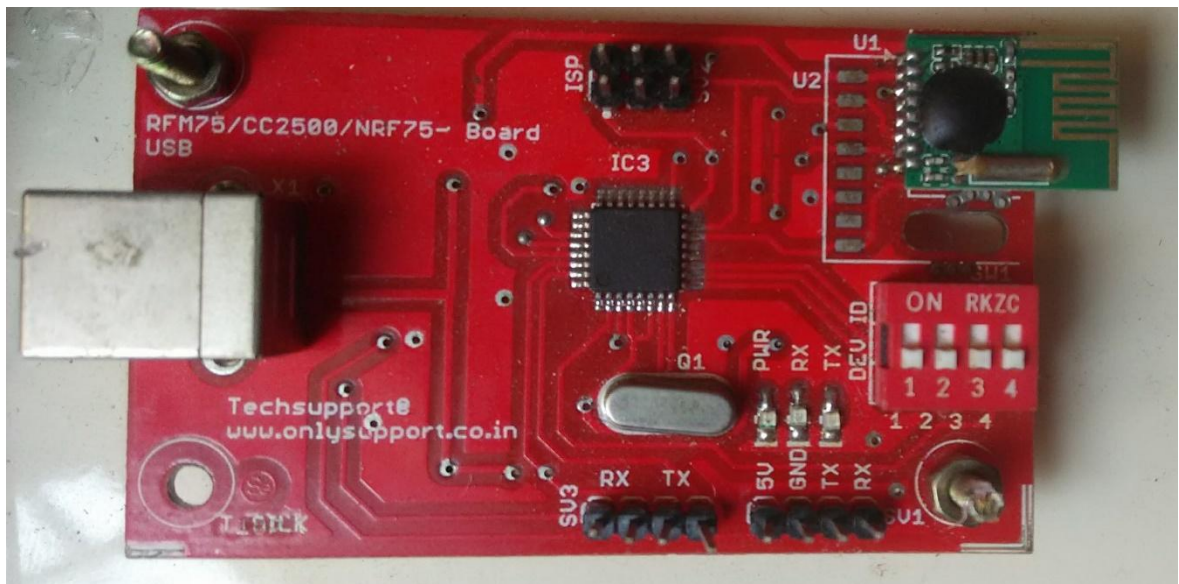


Fig.4.4. ZigBee Transmitter module

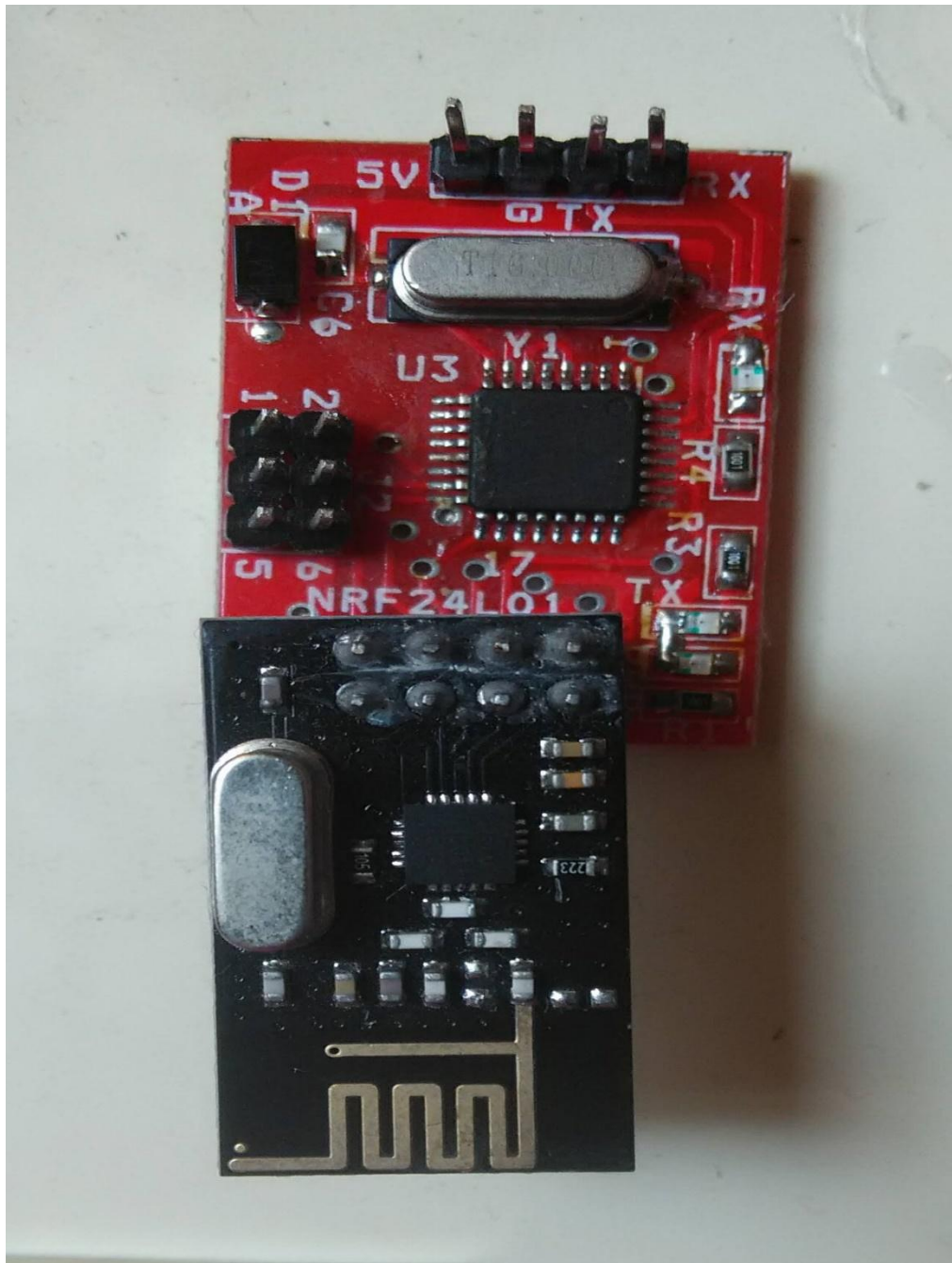


Fig.4.5.ZigBee receiver module

CHAPTER 5

SOFTWARE REQUIREMENTS

SOFTWARE REQUIREMENTS ARE:

- EMBEDDED C
- ARDUINO IDE

5.1 EMBEDDED C

Embedded C is most mainstream programming language in programming field for creating electronic devices. Every processor utilized in electronic framework is related with implanted programming.

Embedded C programming assumes a vital part in performing explicit capacity by the processor. In everyday life we utilized numerous electronic gadgets like cell phone, clothes washer, advanced camera, and so forth. These all gadget working depends on microcontroller that are modified by embedded C.

The embedded C code written in above block outline is utilized for flickering the Drove associated with Port0 of microcontroller.

In implanted framework programming C code is liked over other language. Because of the accompanying reasons:

- Easy to understand
- High Reliability
- Portability
- Scalability

Capacity is an assortment of articulations that is utilized for playing out a particular assignment and an assortment of at least one capacities is known as a programming language. Most shoppers know about application programming that give usefulness on a PC. Installed programming anyway is frequently less obvious, yet no less confounded. In contrast to application programming, installed programming has fixed equipment necessities and capacities, and expansion of outsider equipment or programming is carefully controlled.

Implanted programming needs to incorporate all required gadget drivers at assembling time, and the gadget drivers are composed for the particular equipment. The product is exceptionally reliant on the central processor and explicit chips picked. Most implanted computer programmers have at any rate a passing information on understanding schematics, and perusing information sheets for parts to decide utilization of registers and correspondence framework. Change between decimal, hexadecimal and paired is helpful just as utilizing bit control.

Web applications are infrequently utilized, in spite of the fact that XML documents and other yield might be passed to a PC for show. Document frameworks with envelopes are regularly missing as are SQL information bases.

Programming advancement requires utilization of a cross compiler, which runs on a PC yet delivers executable code for the objective gadget. Troubleshooting requires utilization of an in-circuit emulator, JTAG or SWD. Programming engineers frequently approach the total piece (operating system) source code.

Size of the capacity memory and Slam can fluctuate altogether. A few frameworks run in 16 KB of Blaze and 4 KB of Slam with a central processor working at 8 MHz, different frameworks can equal contemporary computers.[8] These space prerequisites lead to more work being done in C or inserted C++, rather than C++. Deciphered dialects like Essential (while for example Parallax Propeller can utilize arranged Essential) and (Java ME Implanted 8.3 is accessible for example ARM Cortex-M4, Cortex-M7 microcontrollers and more established ARM11 used in Raspberry Pi and Intel Galileo Gen. 2) are not normally utilized; while an execution of the deciphered Python 3 language – MicroPython – is anyway accessible explicitly for microcontroller use, for example 32-digit ARM-based, (for example, BBC microbit) and 16-cycle PIC microcontrollers.

Correspondences among processors and between one processor and different segments are fundamental. Other than direct memory tending to, normal conventions incorporate I²C, SPI, sequential ports, and USB.

Interchanges conventions intended for use in implanted frameworks are accessible as shut source from organizations including InterNiche Innovations and CMX Frameworks. Open-source conventions come from uIP, lwip, and others

This program discloses how to utilize structure inside structure in C utilizing typical variable. "student_college_detail" structure is pronounced inside "student_detail" structure in this program. Both design factors If it's not too much trouble, note that individuals from "student_college_detail" structure are gotten to by 2 dab(.) administrator and individuals from "understudy are ordinary construction factors.detail" structure are gotten to by single spot(.) administrator.

A Keyword may be a special word with a special aiming to the compiler (a compiler as an example, may be a software that's wont to convert program written in C to Machine Code). as an example, if we take the Keil's Cx51 Compiler (a popular compiling program for 8051 based Microcontrollers) the subsequent are a number of the keywords:

- bit
- sbit
- sfr
 - small
 - large

These are few of the numerous keywords related to the Cx51 C compiler together with the quality C Keywords.

5.2.ARDUINO IDE

To fabricate hardware projects Arduino IDE is utilized. It comprises a physical and programmable circuit board, just as piece of programming which is likewise decided as Integrated Development Environment which runs on our PC to transfer code to actual board.

For the valid justification and exceptionally simple access with additional fascinating rationales individuals are simply utilizing Arduino stage. Arduino isn't needing for any additional equipment to stack the code into it, it itself prepared to take the projects for the electronic undertakings. To embed the new code to the Arduino we just use USB link, and Arduino ide utilizes the worked on rendition of the C++.Arduino gives the norm from factor it will break the miniature regulator capacities to an open bundle.

Craftsmen, fashioners, specialists, programmers, amateurs, are exceptionally intrigued to utilize Arduino. So clearly it is intended for the people who are truly enthusiastic about imagination.

Arduino can speak with catches, engine, speakers, sensors any remaining peripherals even our advanced mobile phone moreover. It can get the information from gps, wi-fi module to get the information from source. This consolidated adaptability with the way that the Arduino programming is liberated from cost and equipment sheets are exceptionally modest, prompted the clients who are contributing the code for Arduino based venture.

For the various kinds of ventures, there are numerous assortments of Arduino for certain unprecedented contrasts.

Projects composed utilizing Arduino Software, which is called portrays. These representations are composed inside the content manager and are saved with the record expansion. `.ino`. The supervisor has highlights as cutting or gluing and just as looking or supplanting the content. The message region sends the input in saving and trading just as showing botches. The reassure gives the message yield by Arduino Software (IDE), which is including whole blunder messages and the other data as well. the underside righthand corner of the window shows the designed board and port. Toolbar fastens consistently permit us confirming and transferring programs, making, opening, and saving the representations, and opening the chronic screen when we need. An Arduino IDE is ordinarily moderate, yet it gives a some-total stage projects which are identified with Arduino based. Most elevated menu bar has quality choices as well. the middle segment of the Arduino IDE may be the simple content tool in where you can enter the whole code for customized. the underside part of the IDE is committed to a yield window that is acclimated see the situation with the arrangement, what extent memory has been utilized, any mistakes that were found inside a program, and furthermore different other significant messages. Tasks made utilizing the Arduino are called outlines, and such portrays are generally written in an incredibly cut-down variant of C++ (various C++ highlights are excluded). Since programming a microcontroller is the very surprising thing from programming the PC, there are assortment of gadget indicated libraries. This occasionally befuddles clients who think Arduino is modified in an "Arduino language." However, the Arduino is, truth be told, customized in C++. It simply utilizes remarkable libraries for the gadget.

The Arduino IDE upholds the dialects C and C++ utilizing extraordinary principles of code organizing. The Arduino IDE supplies a product library from the Wiring project, which gives numerous regular information and yield strategies. Two essential capacities to start the outlining and essential program circling which are incorporated and associated with `sub principle()` to an executable cyclic exe program with GNU,

additionally embedded with IDE. The Arduino IDE has the avrdude program to change the exe code to message record with encoding to hexadecimal which is stacked to Arduino by program loader.

5.4.Simulation results:

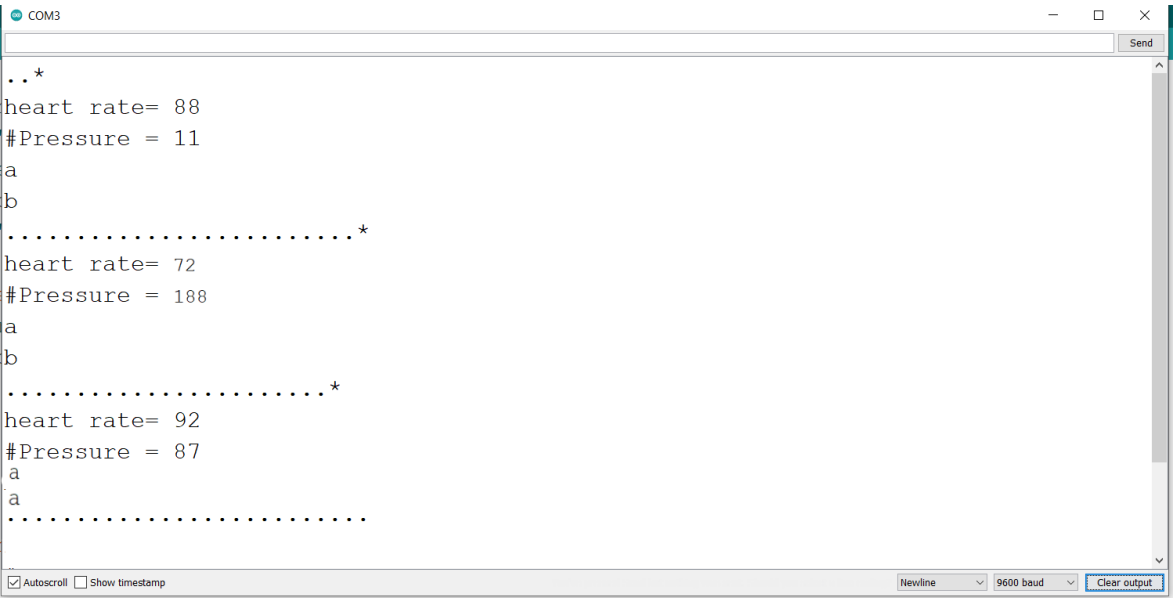


Fig.5.1. Simulation results in case of ambulance

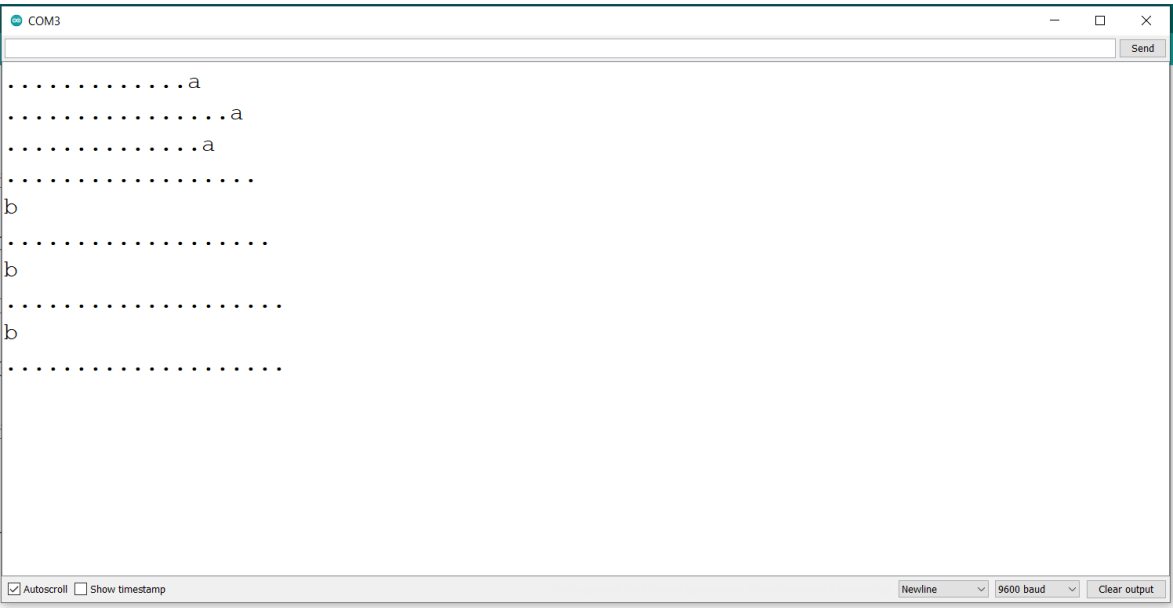


Fig.5.2. Simulation results in case of any other emergency vehicle

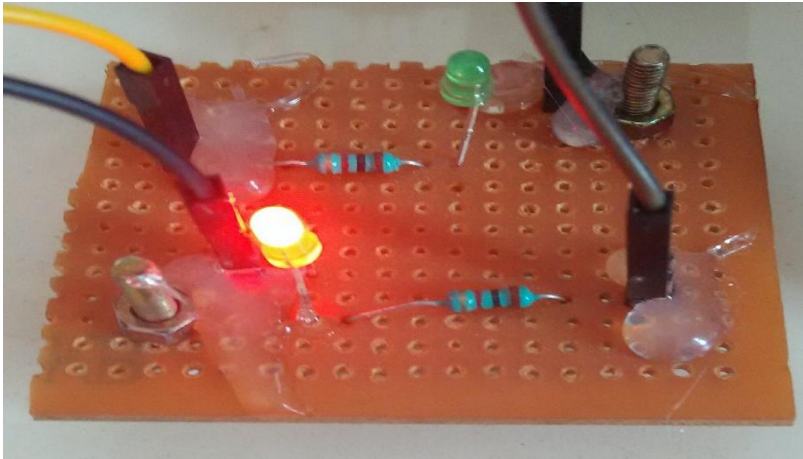


Fig.5.3.Before emergency vehicle

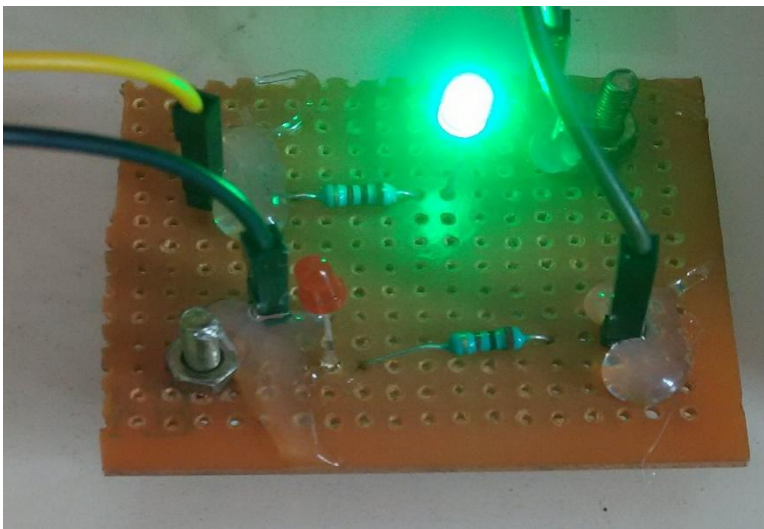


Fig.5.4.When emergency vehicle approaches

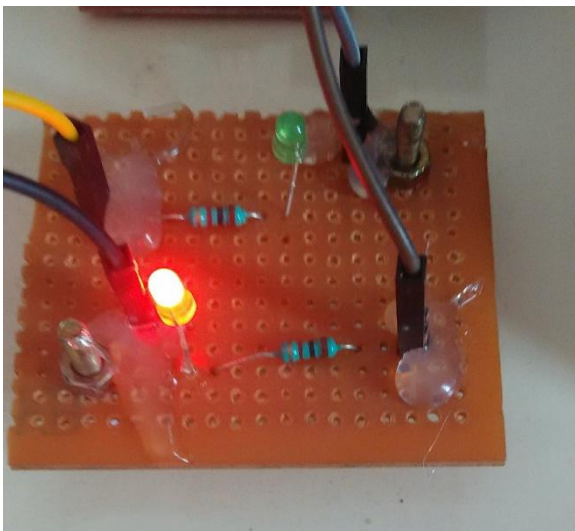


Fig.5.5(a)

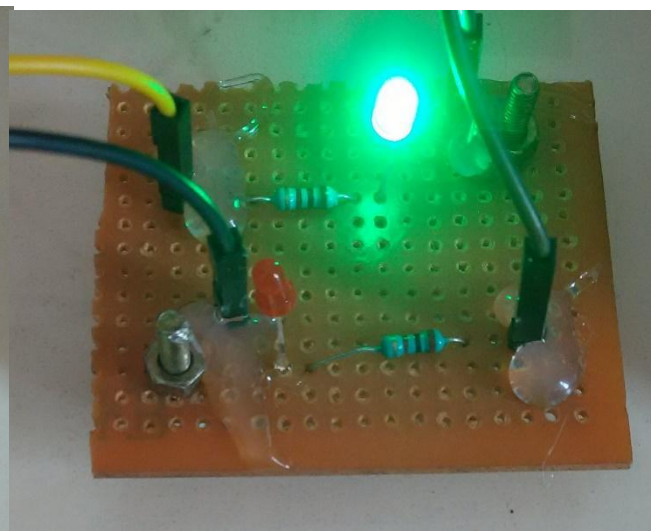


Fig.5.5(b)

Fig.5.5.(a),Fig.5.5(b)When two emergency vehicle approaches

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1.CONCLUSION

This paper presented the low cost real time dynamic traffic light control system through sensors for the reducing the trip time and neglecting the fixed delay in signals. The Dynamic Traffic Light switching is experimented and transmitted through microcontroller in which dynamic time management is performed. By introducing this system we can able to manage any sort increase in vehicle demand. These Traffic light system which are advanced signaling devices positioned at pedestrian crossings, road intersections and other places to control the flow of traffic.

6.2.FUTURE SCOPE

In future we will be having more scope for prototype, because increase in population definitely gives the impact of increment in traffic jam. So that definitely we can face more problems and it will affect our mind, body and it will create high unbearable impacts to our daily life. We may be cannot save the human life at time. We assure our project make a beautiful way to overcome this problem and save our lives.

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