Vehicle To Vehicle Communication Using Zigbee Technology.

T.Rahuraman, M.Mohan

Lecturer (Sr.G)/ECE
Lecturer/ECE
Rajagopal Polytechnic College, Gudiyattam-632602. Vellore district, Tamilnadu, India.

ABSTRACT: In this Paper suggestions are proposed for periodic monitoring of vehicular movement using Zigbee with inter-vehicular communication. Even though separate tracks are available in highways, accident takes place when vehicle comes from service road or heavy vehicle changes the track to overtake. Zigbee include long battery life, low-cost for installation and easy maintenance and enhancing road safety and handling traffic congestion.
**Keywords:** Zigbee, Intelligent Transportation System (ITS), Arduino , Sensors and GPS

I.   INTRODUCTION

The expeditious increase in the vehicle populace around the globe, Particularly in India has prompted inquire about in the specialty of Intelligent Transportation System (ITS). Vehicle-To- Vehicle (V2V) communication is a framework intended to transmit data amongst vehicles and different objects on the road in real time. V2V communication is more effective than current automotive original equipment manufacturer embedded system for lane departure, adaptive cruise control, blind spot detection, rear parking sonar and backup camera because V2V technology enables ubiquitous 360-degree awareness of surrounding threats. The main objective of the project is to alert the driver when he closes to the front vehicle. The idea is that, if collision avoidance systems can work between vehicles, then every car on the road will be safer by avoiding accidents before they can ever happen. The importance of autonomous or semi- autonomous vehicles for intelligent transport systems (ITS) is increasing.V2V technologies are simple to implement primarily because of their reliance on wireless communication. Having low power and information rate, ZigBee happens to be utilized broadly in V2V communication. In this paper, propositions are initiated towards enhancing road safety and handling traffic congestion.

BLOCK DIAGRAM TRANSMITTER
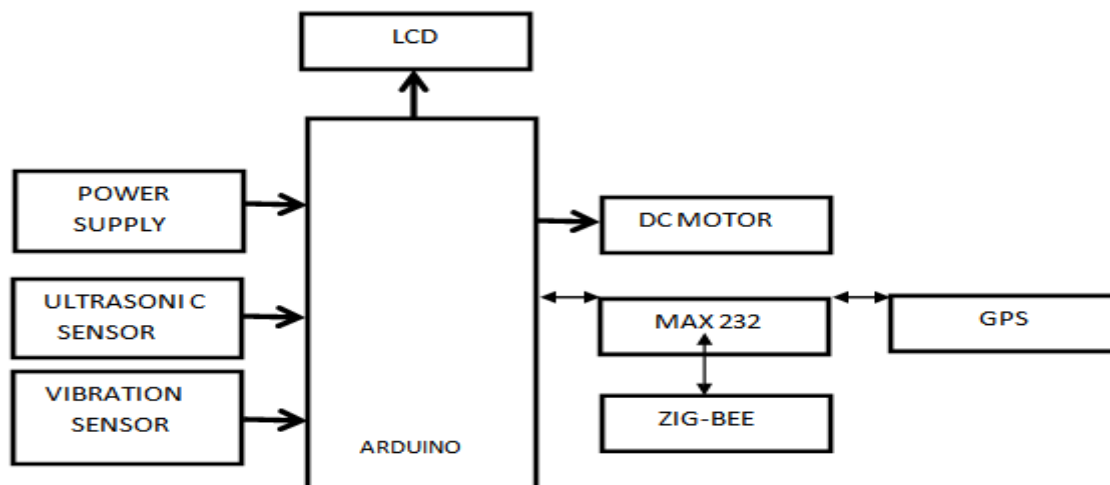
RECEIVER
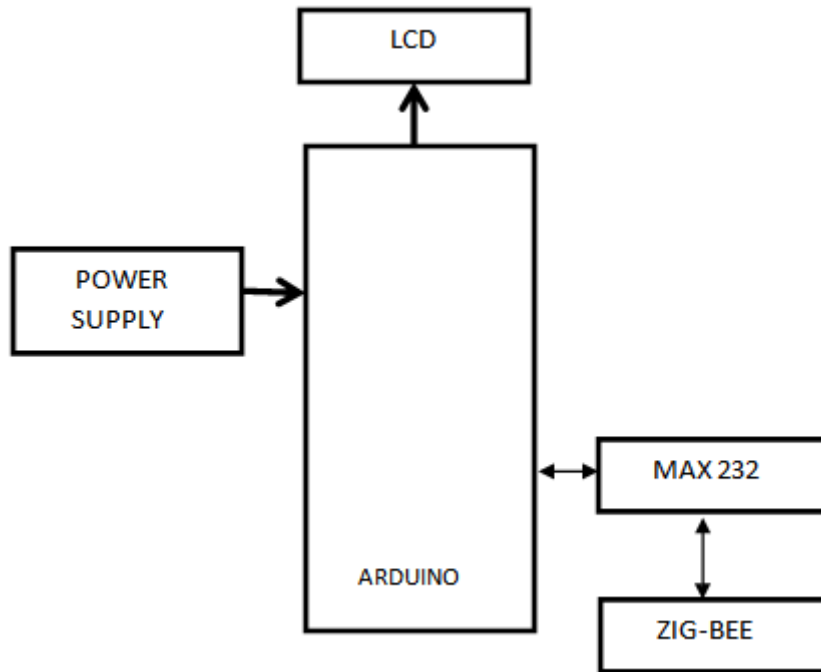
HARDWARE REQUIRMENTS

- PIC16F877A
- ULTRASONIC SENSOR
- VIBRATION SENSOR
- ZIGBEE
- GPS
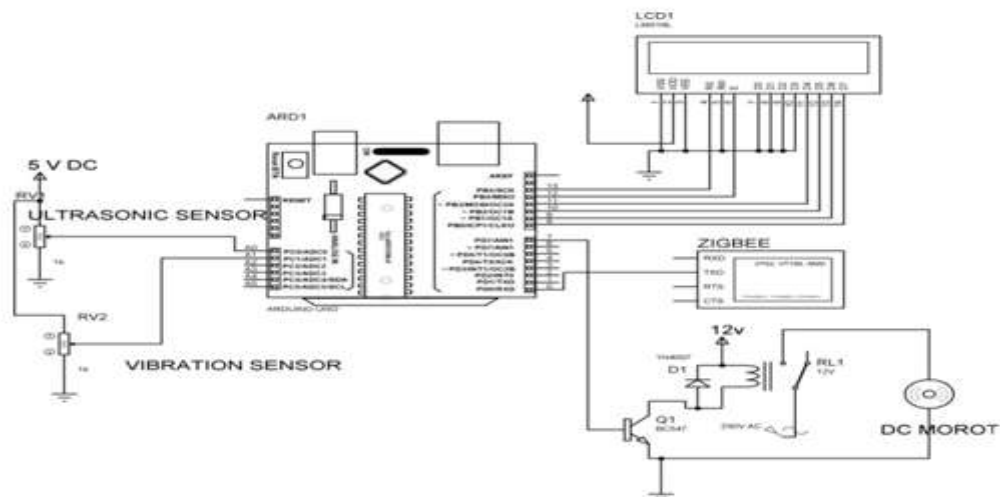- PC

SOFTWARE REQUIREMENTS:
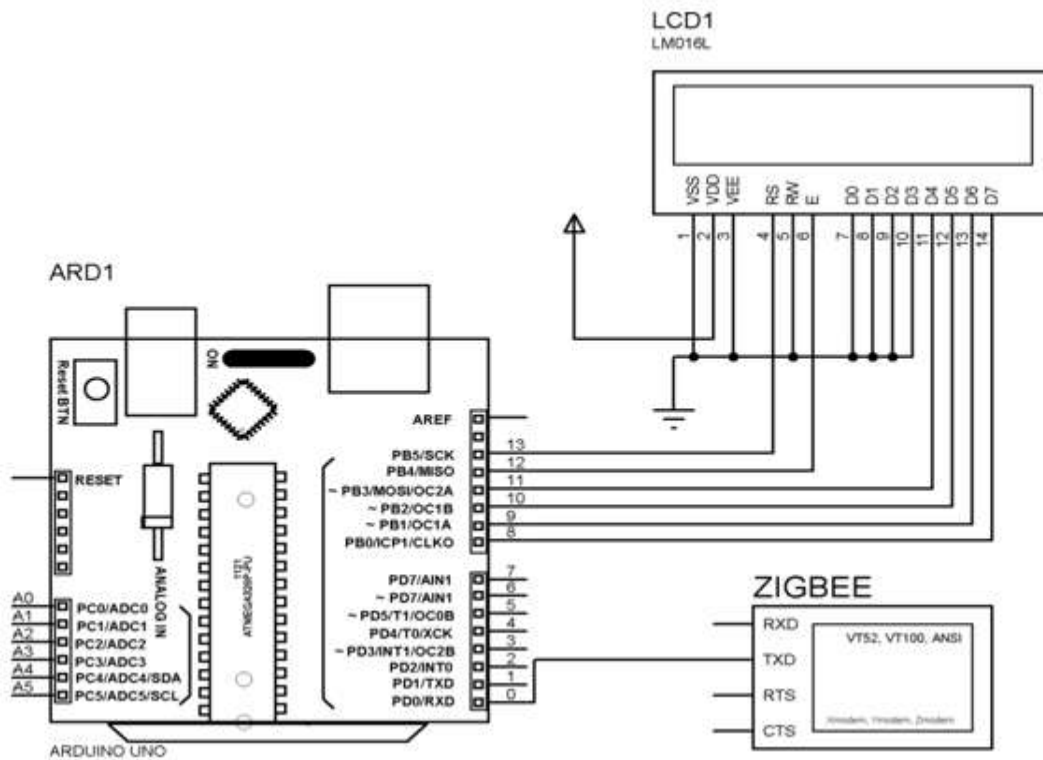**IDE (integrated development environment) – programing software**
ARDUINO IDE

LANGUAGE
Embedded C language

II. CIRCUIT DIAGRAM:

Transmitter section

Receiver section

ARDUINO UNO

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists and anyone interested in creating interactive objects or environments".

ZIG-BEE

ZIG-BEE is the set of specs built around the IEEE 802.15.4 wireless protocol. The IEEE is the Institute of Electrical and Electronics Engineers, a non-profit organization dedicated to furthering technology involving electronics and electronic devices. The 802 group is the section of the IEEE involved in network operations and technologies, including mid-sized networks and local networks. Group 15 deals specifically with wireless networking technologies, and includes the now ubiquitous 802.15.1 working group, which is also known as Bluetooth®. The standard itself is regulated by a group known as the ZIG-BEE Alliance, with over 150 members worldwide.

While Bluetooth® focuses on connectivity between large packet user devices, such as laptops, phones, and major peripherals; ZIG-BEE is designed to provide highly efficient connectivity between small packet devices. As a result of its simplified operations, which are one to two full orders of magnitude less complex than a comparable Bluetooth® device, pricing for ZIG-BEE devices is extremely competitive, with full nodes available for a fraction of the cost of a Bluetooth® node.

ZIG-BEE devices are actively limited to a through-rate of 250 Kbps, compared to Bluetooth®'s much larger pipeline of 1Mbps, operating

on the 2.4 GHz ISM band, which is available throughout most of the world.

ZIG-BEE has been developed to meet the growing demand for capable wireless networking between numerous low-power devices. In industry ZIG-BEE is being used for next generation automated manufacturing, with small transmitters in every device on the floor, allowing for communication between devices to a central computer. This new level of communication permits finely-tuned remote monitoring and manipulation. In the consumer market ZIG-BEE is being explored for everything from linking low-power household devices such as smoke alarms to a central housing control unit, to centralized light controls.

The specified maximum range of operation for ZIG-BEE devices is 250 feet (76m), substantially further than that used by Bluetooth® capable devices, although security concerns raised over "sniping" Bluetooth® devices remotely, may prove to hold true for ZIG-BEE devices as well.

Due to its low power output, ZIG-BEE devices can sustain themselves on a small battery for many months, or even years, making them ideal for install-and-forget purposes, such as most small household systems. Predictions of ZIG-BEE installation for the future, most based on the explosive use of ZIG-BEE in automated household tasks in China, look to a near future when upwards of 60 ZIG-BEE devices may be found in an average American home, all communicating with one another freely and regulating common tasks seamlessly.

GHz Radio frequncy MODEM

RF modem can be used for applications that need two way wireless data transmission. It features adjustable data rate and reliable transmission distance. The communication protocol is self controlled and completely transparent to user interface. The module can be embedded to your current design so that wireless communication can

be set up easily.

Features
- Automatic switching between TX and RX mode.
- FSK technology, half duplex mode, robust to interference.
- 2.4 GHz band, no need to apply frequency usage license.
- Protocol translation is self controlled, easy to use.
- High sensitivity, reliable transmission range.
- Standard UART interfaces TTL (3-5V) logic level.

Stable, small size, easier mounting

III. CONCLUSION AND ADVANTAGES

1) The greatest benefit of connectivity is that it can transform a group of independent vehicles sharing a road into a cohesive traffic system that can exchange critical and demanding information about road and traffic conditions in real time.
2) Enhancing vehicle throughput.
3) This correspondence between self-sufficient vehicles to keep away from this impact discharge drivers from taking part in the physical and mental activities related with driving, enabling them to use this time on other gainful and productive activities en route

4)Third world nations battle with an absence of transportation foundation, for example, streets, scaffolds, and open transport, which is blocking and hampering their financial advancement. Reception of this model by these creating nations may save them the expenses related with extending capital-serious foundation.

REFERENCES

[1]. "ZigBee specification," ZigBee Alliance, December 2004,
[2]. http://www.zigbee.
[3]. https://scholar.google.co.in/scholar?hl=en&as_sdt=0,5&as_vis=1&q=vehicle+to+vehicle+communication+using+zigbee+ieee+xplore
[4]. S. S. Dorle, D. M. Deshpande, A. G. Keskar and Megha Chakole "Vehicle Classification and Communication Using Zigbee Protocol"., Nov.2010
[5]. http://www.istubisecsens.org/publications/its8.pdf
[6]. Development Of Alert Security Home System Using ZigBee Technology ",UniversitiTeknologi Malaysia, 2013