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Vehicle To Vehicle Communication Using Zigbee

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Abstract: 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. In this project suggestions are proposed for periodic monitoring of vehicular movement using zigbee with inter-vehicular communication. Zigbee consists of long battery life and low-cost for installation. It enhance roadway safety and handling traffic congestion, easy to maintenance.

Keywords: Zigbee, Ultrasonic sensor, Vibration sensor, GPS, Arduino, LCD.

I. INTRODUCTION

The expeditious increase within the vehicle popular round the globe, particularly in India has prompted inquire about within the specialty of Intelligent Transportation System (ITS). V2V communication is more practical than current automotive original equipment manufacturer embedded system for lane departure, adaptive controller, blind spot detection, rear parking sonar and backup camera because V2V technology enables ubiquitous 360-degree awareness of surrounding threats. The most objective of the project is to alert the during force when he closes to the front vehicle. The thought is that, if collision avoidance systems can work between vehicles, then every car on the road are safer by avoiding accidents before they will ever happen. The importance of autonomous or semi-autonomous vehicles for intelligent installation is increasing. V2V technologies are simple to implement primarily thanks to their reliance on wireless communication. Having low power and knowledge rate, zigbee happens to be utilized broadly in V2V communication. During this paper, propositions are initiated towards enhancing road safety and handling traffic holdup.

Literature Survey: Soyoung Hwang and Donghui Yu [6] The design and implementation of a remote monitoring and controlling system using ZigBee networks. This system targets a home network. Web services and a smart phone are used for the client system to monitor and control the home. P. Rohitha, P. Ranjeet Kumar, N. Adinarayana, T. Venkat Nrayana Rao [4] Zigbee is an IEEE 802. 15.4 standard for data communications dealing business and consumer devices. It is designed for low power consumption enabling batteries to last forever. The zigbee standard provides network, security, and application support services operating on top of the IEEE 802. 15.4 Medium Access Control (MAC) and Physical layer wireless standard. It employes a group of technologies to enable scalable, self-organizing, self healing networks that can manage various data traffic patterns. Rens van der Heijden [5] Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) systems are promising for increasing road capacity, avoiding accidents, providing web or entertainment services. V2V refers to communication between vehicles and V2I refers to the communication between vehicles and other communication entities located within a fixed infrastructure. Because many of these transmit sensitive data such as identification, position, and speed of the vehicle, a high level of security and privacy insurance is a perquisite for broad acceptation of these communication system. Mrs Vaishalini D. Khairnar, Dr. S.N. Pradhan [7] The specific application of wireless communication, automotive Wireless Communication also called as Vehicle to Vehicle this http URL explains the technology used for automotive Wireless Communication along with the various automotive applications relying on wireless communication. Automotive Wireless Communication gives drivers a sixth sense to know whats going on around them to help accidents and improve traffic low. Dr. S.S. Riaz Ahamed [3] Zigbee is an established set of specifications for wireless personal area networking (WPANs), i.e. digital radio connections between computers and related devices. Zigbee makes possible

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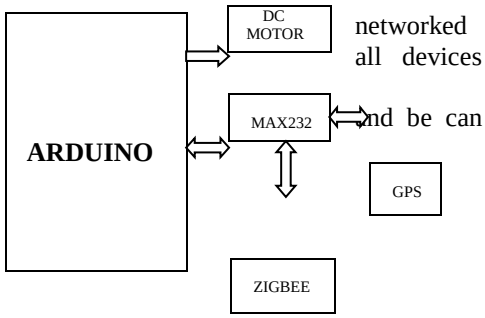
completely homes where are able to communicate be controlled by a single unit.



networked all devices

nd be can

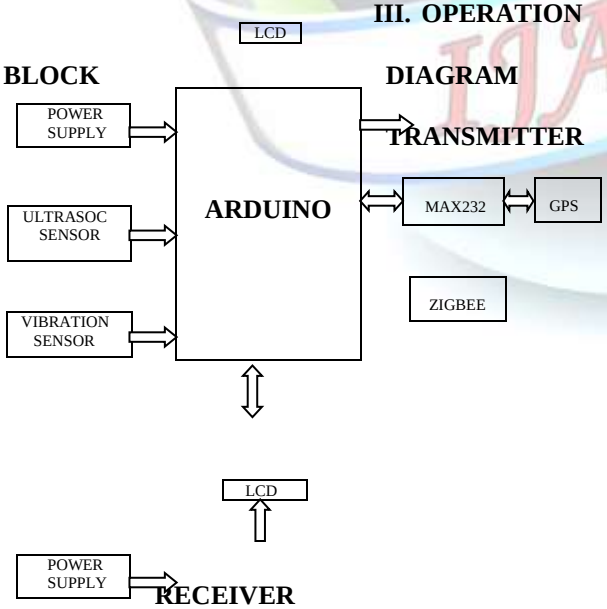
II. METHODOLOGY

The transmitter which consists of three inputs. The power supply which is given to the ARDUINO is externally given. The ultrasonic sensor which sense the signal & gives the data to the Arduino the third input for the Arduino is the vibration sensor. The max232 is the input & output for the processor. GPS is to find out the location. The DC motor which supplies the power to the EMF. The Dot-matrix LCD is to display the vehicle.

The data's are to stored in the ZIG-BEE to transmit. The external power supply is given the arduino-Uno which contains the data. The LCD for display. The data is fed from the ZIG-BEE to the Arduino which displays in the output.

III. OPERATION

BLOCK DIAGRAM



TRANSMITTER

RECEIVER

3.1 ZIGBEE

ZIG-BEE is that the set of specs built round the IEEE 802.15.4 wireless protocol. The IEEE is that the Institute of Electrical and Electronics Engineers, a non-profit organization dedicated to furthering technology involving electronics and electronic devices. The 802 group is that the section of the IEEE involved in network operations and technologies, including mid-sized networks and native networks. Group 15 deals specifically with wireless networking technologies, and includes the now ubiquitous 802.15.1 unit, which is additionally called Bluetooth. The quality itself is regulated by bunch called the ZIG-BEE Alliance, with over 150 members worldwide. While Bluetooth focuses on connectivity between large packet user devices like laptops, phones, and major peripherals. ZIG-BEE is consists to provide highly efficient connectivity between small packet devices. ZIG-BEE devices are actively limited to a through-rate of 150Kbps, compared to Bluetooth's much larger pipeline of 1Mbps, operating on the 2.4GHz ISM band, which is offered throughout most of the plant. The new level of communication permits finely-tuned manipulation and remote monitoring.

In the consumer market, the ZIG-BEE which 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 maximum range of desired operation for ZIG-BEE devices is 250 feet (76m). The Bluetooth capable devices which is employed substantially. Although security concern raised over 'sniping' Bluetooth.

2.4GHz Rdio frequency MODEN

RF modem may be used for applications that require two way wireless data transmission. It features adjustable rate and reliable transmission distance.

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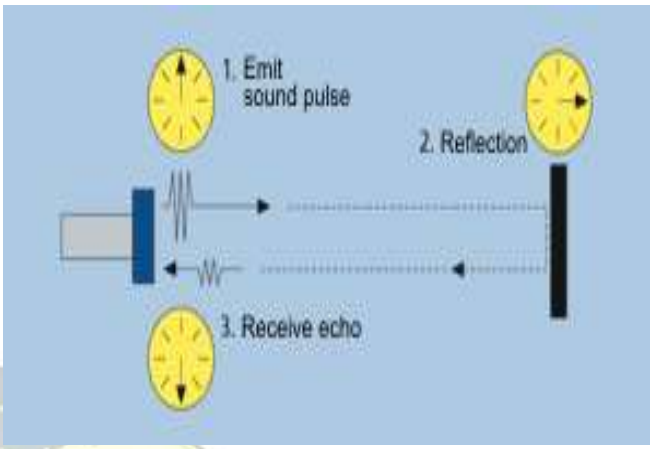

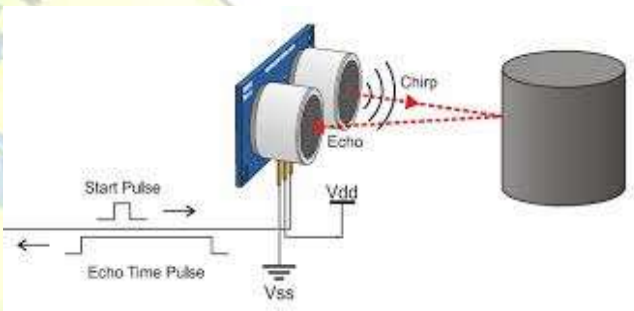

The communication protocol is self controlled and completely transparent to programme. The module may be embedded to your current design in order that wireless communication may be founded easily.

3.2 ULTRA-SONIC SENSOR

In the Ultrasonic sensors which emit short, high-frequency sound pulses at short intervals. These propagate within the air at the speed of sound. The signals if they strike an object they are reflected back as echo signals in the sensor. Which itself the computes target supported the time-span which between the emitting signal and receiving the echo.

Features

- Deflection Range: Up to 12m.
- Nominal Frequency: 40 kHz.
- Operating Temperature: -30oC to + 85oC.
- Excellent Directivity and Sensitivity.

Speed of sound

The speed of sound "C" in air is $C \approx 331.5 + 0.61\ \theta$ (m/s), where θ is the air temperature (^{O}C). The speed of sound changes as the air temperature changes, and this result in temperature-based distance measurement error.

3.3 GPS-GLOBAL POSITION SYSTEM

The U.S operated, deployed, financed, and designed the global positioning system may be satellite based, radio positioning and time transferring system.

3.4 LCD

LCD may be a flat panel display, electronic computer display or computer screen that uses the sunshine modulating properties of liquid crystals…(LCDs)

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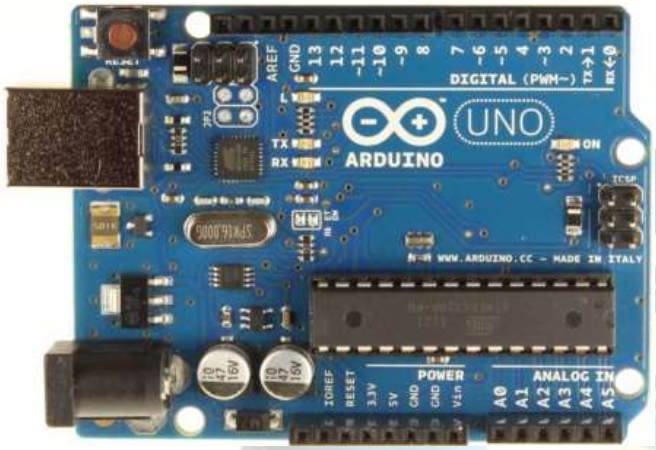
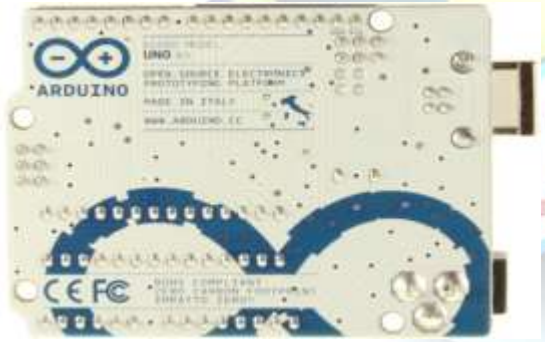
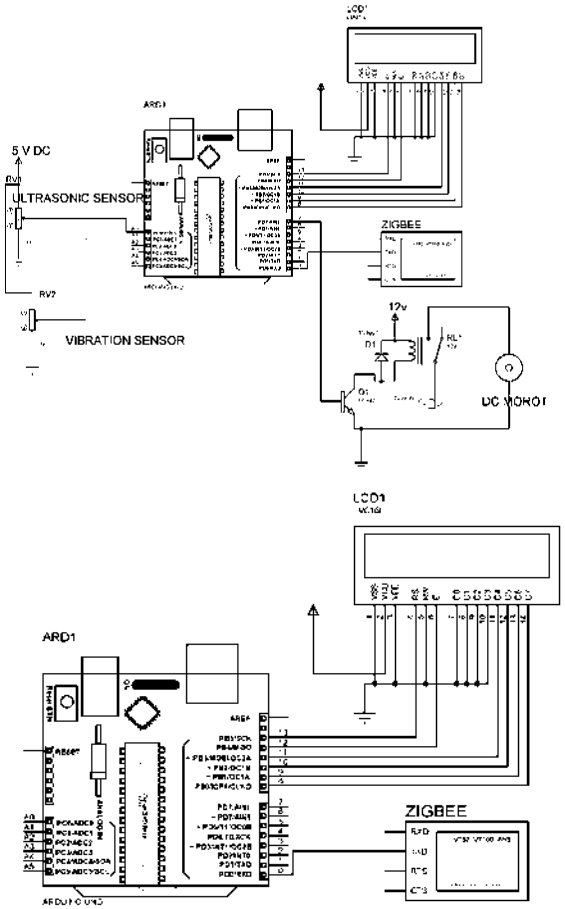
3.5 ARDUINO UNO

Arduino may be a open-source electronics prototyping platform and supported flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists and anyone fascinated by creating interactive objects or environments.







IV. CIRCUIT DIAGRAM

Transmitter section & Receiver section

4.1 WORKING

Emerging wireless technologies for vehicle-to-vehicle (V2V) communication promises reduce assorted fatal roadway accidents by giving warnings. This technology demonstrates that protocol achieves low latency emergency warnings is scenarios. Zigbee technology may be a wireless electronic communication provided between vehicles designed around low-power batteries for lasting forever. The ultrasonic sensors provided the measurement of signals that also transmit & receive ultrasonic signals. Vehicles are designed to own a smooth means of transportation supported on the principle of reliability and safety however, thanks to reasons like human-error, circumstantial error, negligence accident happen and plenty of attention is taken by the technologies to reduced traffic accidents, V2V technologies

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are very simple to implement because of wireless communication. Zigbee communicates the knowledge between two vehicle and distance measurement between these vehicles is created by ultrasonic sensor. The entire process was controlled by arduino and sends a sign to buzzer and zigbee after the space range is obtained. The most aim of this project is to alert the driving force that a vehicle has comes before. Zigbee is that the high level communication protocol that uses small and low-power digital radios supported the IEEE 802.15.4-2006 standard for wireless personal area networks (WPANs) like wireless headphones. It's suitable for low rate and low power consumption like Bluetooth and Wi-Fi. Ultrasonic sensor is additionally called as transducer that sends and receive the signal and works on the principle of radar or sensor. It evaluates the attributes of a target by interpreting the echoes from sound waves of radio.

V. CONCLUSION

We have constructed, tested and verified the working of vehicle-to-vehicle (V2V) and verified the working. Our project is very useful to prevent from accidents. The usage of this system can highly increase safety and efficiency of transportation system. While making improvements in this system we can bring out the more reliability and safety in the vehicular field.

REFERENCES

[1]. Ana Roxin "Inter-Vehicle Communication-Research Report" HAL archievesouvertes.fr, October 2014.

[2]. "The 8051 microcontroller and embedded system" by Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay ISBN-13: 978-0131194021

[3]. "The role of zigbee technology in future data communication system" by Dr.S.S.RiazAhamed.

[4]. Wireless Networking Through Zigbee Technology" ISSN: 2277 128X Step-uping Zigbee network communication by P. Rohitha, P. Ranjeet kumar, N. Adinarayana, T. Venkat narayana rao

[5]. Security Architecture in V2V and V2I Communication by Rens van der Heijde.

[6]. "Remote Monitoring and Controlling System Based on Zigbee Networks" by Soyoung Hwang and Donghui Yu.

[7]. "V2V COMMUNICATION SURVEY – (WIRELESS TECHNOLOGY)" ISSN: 2229-6093 by Mrs. Vaishalini, D. Khairnar, Dr S.N. Pradhan.

[8]. WirelessCommunicatioNITS.pdf.

[9]. Zigbee Alliance, Zigbee.

[10]. Ieeexplore.ieee.org/document/5680697.