ITS Base Vehicle to Vehicle communication

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***Abstract*— Traffic safety is become very essential within the ITS environment. Many of these applications required real-time communication with high reliability. Obtaining safety and meet the traffic details is possible by designing a ptrotocol for vehicles. ITS enables elements within the transport system such as commuters, vehicles,traffic elements such cars allow them to communicate with each other. Wireless data communication between vehicles is one the technologies which has improved the deployment of the ITS applications. In Vehicle to Vehicle (V2V) Vehicles communicates directly with with each other. In two vehicle communication they were send signals to each other and communicate over a wireless media. The vehicle to vehicle communication usefull to get safety by avoiding crashing of vehicles allowing vehicles in transit to send position, speed data and panic information to one another over Wireless network. Depending upon how the technology is implemented, the vehicle's driver may simply receive a alert of the any hazard is there or the vehicle itself may take pre-emptive actions such as braking to slow down.**

***Keywords*: Sonar Sensor, Android application, PIC (16F877)**

I. INTRODUCTION

In the recent years, traffic accidents have is one of the leading causes for death all over the world, hence road safety has been greatly concerned..now adays there are so many problems of convience when moving on the roads. On board Vehicle-to-vehicle(V2V) communication, as a promising technique of intelligent transportation system, has been proposed to meet these needs.
fig. shows the V2V communication

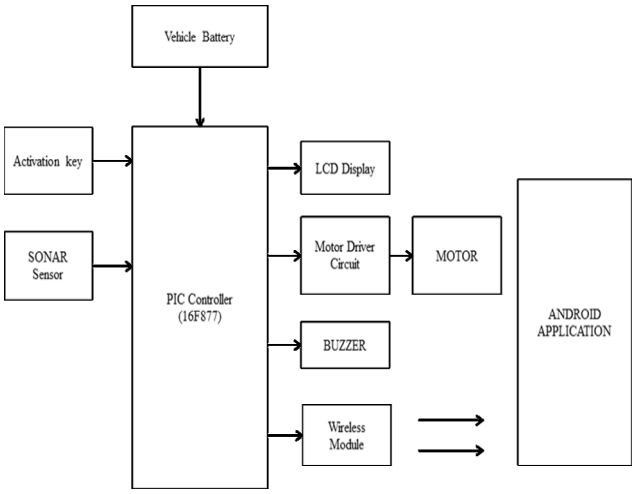
Every vehicle is also a router and allows sending messages over multihop to more distant vehicles and roadside stations. The routing algorithm is depend on the position of the vehicles and is able to handle fast changes of the network topology. Control technology comes into play at local and higher layers of the architecture. Uncertainties, delays, partial measurements, safety and performance objectives, and other aspects must be considered, and the system must be capable of making automatic or semiautomatic decisions, providing warnings/ information and potentially effecting action.

Fig: vehicle to vehicle communication

II. WORKING PRINCIPLE

Using vehicle-to-vehicle (V2V) communication, a vehicle can detect the position and movement of other vehicles up to a quarter of a kilometer away. In a real world where vehicles are equipped with a simple antenna, a computer chip and GPS (Global Positioning System) Technology, your car will know where the other vehicles are, additionally other vehicles will Know where you are too whether it is in blind spots, stopped ahead on the highway but hidden from view, around a blind corner or blocked by other vehicles. The vehicles can anticipate and react to changing driving situations and then instantly warn the drivers with emergency warning messages. If the driver doesn't respond to the alerts message, the vehicle can bring itself to a safe stop, avoiding a collision.

III. BLOCK DIAGRAM



The signals from sensor are given to the Microcontroller. Microcontroller processes all these signals and gives data to LCD display. Bluetooth module is used for sending information to another Buzzer is used to give an alarm to the driver if the pressure inside the tire reduces below a set value which is indicated by the pressure sensor BJT is used for this purpose along with the buzzer.Motor is an output device; its speed will be varied according to the speed set by the switches. The speed can be varied by varying the voltage given to the PWM converter (using keypad). The speed of DC motor is directly proportional to armature

voltage and inversely proportional to flux. By maintaining the flux constant, the speed can be varied by varying the armature voltage. Batteries store energy being produced by given generating source and when this source is unavailable this energy can be used by loads. The inclusion of storage in any energy generating system will increase the availability of the energy. Sonar sensors send ultrasonic waves toward objects and receive the reflected waves (echo) back from them. They thereby detect the presence of the objects and determine the distance to them.

An sonar sensor can determine the distance to an object by measuring the difference in time between the sound wave being transmitted and the echo being received and also capture the material property and structure of the object by measuring the strength of the reflection.

A) WIRELESS TECHNOLOGY :Bluetooth (IEEE 802.15.1)

Bluetooth module is used for sending information to another vehicle.

Specification of Bluetooth

1. Operating voltage: 5vdc
2. Current: 25mA
3. Low-cost and low-power
4. Provides a communication platform between a wide range of “smart” devices
5. Not limited to “line of sight” communication .

B) PIC16F877 :

The signals from sensor are given to the Microcontroller. Microcontroller processes all these signals and gives data to LCD display.

SPECIFICATION OF PIC16F877

Current: 25mA sink/source per I/O

Operating voltage:2.0V to 5

Operating speed: DC – 20 MHz clock input

DC – 200 ns instruction cycle

Up to 8K x 14 words of Flash Program Memory,

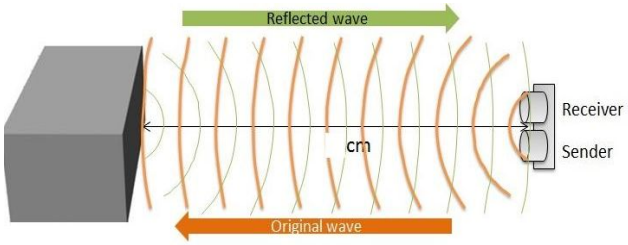
Up to 368 x 8 bytes of Data Memory (RAM),

Up to 256 x 8 bytes of EEPROM Data Memory

Pinout compatible to other 28-pin or 40/44-pinPIC16CXXX and PIC16FXXX microcontrollers

Self Programming

C) *SONAR SENSOR*



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Sonar sensors transmit ultrasonic waves into the air and detect reflected waves from an object. There are many applications for sonar sensors, such as in intrusion alarm systems, automatic door openers and backup sensors for automobiles.

Sonar sensors (also known as **transceivers** when they both send and receive, but more generally called **transducers**) work on a principle similar to radar or sonar, which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively.Active sonar sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor, measuring the time interval between sending the signal and receiving the echo to determine the distance to an object. Passive sonar sensors are basically microphones that detect ultrasonic noise that is present under certain conditions.

Fig:sonar sensor

The range of the target is determined by the "time lagging" between transmitted pulse and the received "echo". Generally microwave and ultrasonic frequencies are used in RADARS Our HC-SR04 sonar sensor works similar to the RADAR mechanism but in a simplified manner. This sensor consists of four PINS.

PIN DESCRIPTION OF SONAR SENSOR HC-SR04

1.Vcc----------connect to 5V dc
2.Trigger----------pulse input that triggers the sensor
3.Echo----------indicates the reception of echo from the target
4.Gnd----------ground

D) LCD DISPLAY

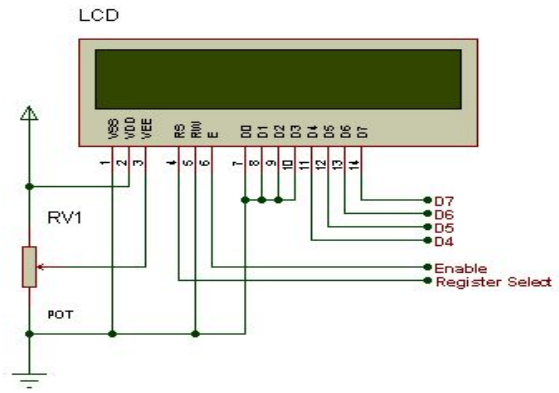

Fig:lcd display

LCD's are very simple to interface with the controller as well as are cost effective.The LCD requires 3 control lines (RS, R/W & EN) & 8 (or 4) data lines. The number on data lines depends on the mode of operation. If operated in 8-bit mode then 8 data lines + 3 control lines i.e. total 11 lines are required. And if operated in 4-bit mode then 4 data lines + 3 control lines i.e. 7 lines are required. How do we decide which mode to use? It's simple if you have sufficient data lines you can go for 8 bit mode & if there is a time constrain i.e. display should be faster then we have to use 8-bit mode because basically 4-bit modetwice as more time as compared to 8-bit mode

IV. CONCLUSION

This project is Overview of different vehicular communication with regard to Intelligent Transportation System, also the Vehicle to Vehicle (V2V) communication using DSRC Standard is described. This also discussed some of the application challenges and proposes a new protocol which provides congestion control polices. This protocol defines congestion control policies for emergency warning messages so that a low emergency warning message delivery delay can be achieved and a large number of co-existing abnormal vehicles can be supported. It also introduces a method to eliminate redundant emergency warning messages, exploiting the natural chain effect of emergency events.

V. References

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