

## Implementation of Vehicle Safety Driving System Using Raspberry PI Processor and WSN

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### **ABSTRACT:**

*This research is basically on an electronic device which can be used at the time of emergency while driving a vehicle. It has embedded the concept of wireless communication i.e. Zigbee, GSM and many other sensors by the help of which immediate help can be delivered to the person who has met with an accident. The overall structure is based on the raspberry processor. Also the key role of DTMF has been implied by the help of which appropriate user can control the security options of vehicle if it is theft. Research content uses the technology of Zigbee for the transmission of message to the other vehicle in the time of need of their help as well as for serving the prospective of safe and sound driving the functions like drivers alcohol detection, vehicle speed slowing and automatic car lock with collision detection is used.*

**Keywords:** *Raspberry Pi processor, Regulated Power Supply, Buzzer, Display Unit, Accident sensor, Smoke sensor, Control Unit, Zigbee, Gsm, RS232.*

### **I.INTRODUCTION:**

In the recent years, the vehicle communication technology has gained the popularity in industrial field. By the use of V2P (vehicle to person) communication and V2V (vehicle to vehicle) communication they can be used for the purpose of observing safety and security. The concept of vehicle communication is in existence due to the accidents caused because of human error or by lack of concentration on road while driving or by applying sudden brake on front vehicle on roads. Last year in India only during the time period of January to May

31, total accident in a city i.e. Delhi 325 lives were claimed in accidents. 14,000 cases of drunk driving were reported and 45,158 cases of speed over speeding were report only in capital city of India. Though the survey of indianexpress.com 16 deaths and 58 roads injures are reported in India in every hour with sharing of fatal accidents in the total being up from 18 per cent in 2003 to 25 in 2012". With another statistics by times of India, total vehicle thefts are 40 in a day in the capital city of India only. With the vehicle communication onboard the vehicle theft will reduce significantly because owner can reach the vehicle location simply through the help of vehicle communication. As per the previous works [1] by Dr.S.S.Riaz Ahamed i.e. the role of ZigBee technology in future data communication system" briefs about how the implementation of this technology can be embedded with different aspects for better outcomes. [2]. Also the work by Soyoungh Hwang and Donghui Yu explains the Remote Monitoring and Controlling Systems concept Based on ZigBee Networks and [4] the basics of micro-controller algorithm design has been studied from "The 8051 microcontroller and embedded system" by Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay for this research whereas the [5] need of this type of device for the society is conveyed by the previous work of V2V COMMUNICATION SURVEY. Also the idea of the security in the vehicles has been attained from the work [6] of Rens van der Heijde from the reference Security Architectures in V2V and V2I Communication and the idea for the design of such advance device has been considered from the [10] Miller, J. M., & Nicastri, P. R. (1998). The next generation automotive electrical power system

architecture: Issues and challenges. Proceedings of the 17th digital avionics systems conference, Bellevue, WA, USA, Session II, Book. In our work the basic difference is the combination of all this mentioned technology on-board by the help of AT89S52 through which in less expenditure we can combine all technology and can help the society with an advanced device for their vehicle

## II. RELATED WORK:

### 2.1 TRANSMITTER:

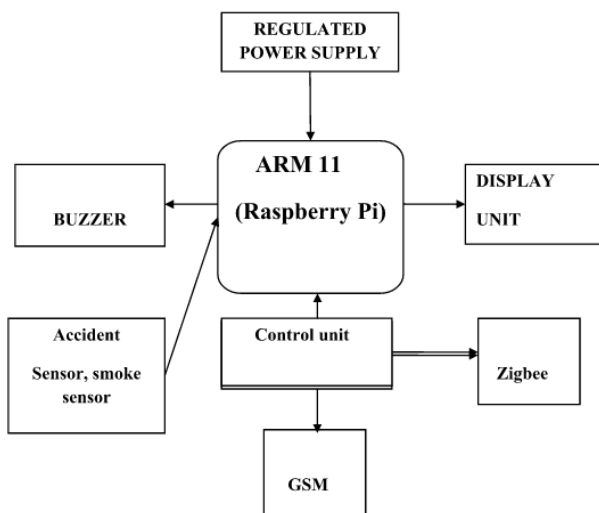


Figure-1: Block diagram of transmitter

### 2.2 RECEIVER:

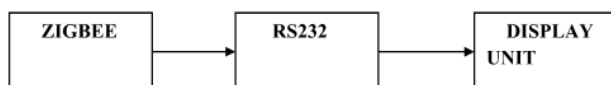


Figure-2: Block diagram of receiver section

### 2.3 EXISTING METHOD:

In the existing method vehicle are moving in the one direction we don't know what is going on inside the vehicle .if any problems occurs we don't know only the person in vehicle can know about what problem occurred to the vehicle to transfer the data from one vehicle to another we use our project.

### 2.4 PROPOSED METHOD:

In proposed system we extend our data transmission to devices for transmission data from one vehicle to

another we use ZIGBEE technology in that vehicle what the situation is going on we will get the information through accident and smoke sensor through ZIGBEE communication we are sending the data. By this we can overcome many problems.

## III.HARDWARE COMPONENTS:

### 3.1 RASPBERRY PI PROCESSOR:



Figure-3: Raspberry Pi diagram

The Raspberry Pi board involves a processor and snapshots chip, Random Access Memory (RAM) and more than a few interfaces and connectors for external devices. Some of these instruments are main others are optional. It operates in the identical method as a ordinary pc, requiring a keyboard for command entry, a show unit and a vigor give. considering that raspberry Pi board operates like pc it requires 'mass-storage', but a tough disk pressure of the variety observed in a ordinary pc is not relatively in maintaining with the miniature dimension of Raspberry Pi.

### 3.2 GSM MODEM:

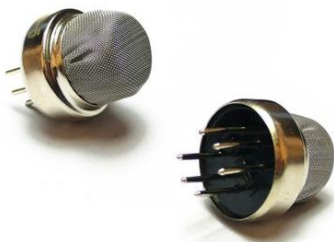
A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. The working of GSM modem is based on commands, the commands always start with AT (which means Attention) and finish with a character. For example,

the dialing command is ATD, ATD3314629080; here the dialing command ends with semicolon. The frequency range specified for GSM is 1,850 to 1,990 MHz (mobile station to base station).

### 3.3 ZIGBEE MODULE:

ZigBee is a low-cost, low-power, wireless mesh networking proprietary standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking provides high reliability and larger range. The ZigBee Alliance, the standards body that defines ZigBee, also publishes application profiles that allow multiple OEM vendors to create interoperable products.

### 3.4 SMOKE SENSOR:



**Figure-4: Smoke sensor**

MQ2 flammable gas and smoke sensor detects the concentrations of combustible gas in the air and outputs its reading as an analog voltage. The sensor can measure concentrations of flammable gas of 300 to 10,000 ppm. The sensor can operate at temperatures from -20 to 50°C and consumes less than 150 mA at 5 V.

Connecting five volts across the heating (H) pins keeps the sensor hot enough to function correctly. Connecting five volts at either the A or B pins causes the sensor to emit an analog voltage on the other pins. A resistive load between the output pins and ground sets the sensitivity of the detector. Please note that the picture in the datasheet for the top configuration is wrong. Both configurations have the same pin out consistent with the bottom configuration. The resistive

load should be calibrated for your particular application using the equations in the datasheet, but a good starting value for the resistor is 20 kΩ.

### IV. RESULTS:



**Figure-5: Hardware of the project**

### V. CONCLUSION:

Vehicle to Vehicle Safety Device is a device indulge with the recent technology and includes the methodology based on the combination of Zigbee, GSM and many other modules by the help of which immediate support can be provided to anyone in need of it. This project is Raspberry pi based project. As a part of as a part of studying the analysis circuits and programs on linux. In this paper a brief description is provided by the medium of Block Diagram. Also the results and implementation is being discussed here.

### VI. REFERENCES:

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