

INTELLIGENT ACCIDENT DETECTION AND AMBULANCE RESCUE SYSTEM

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ABSTRACT

Now-a-days lots of accidents happen on highways due to increase in traffic and also due to rash driving of the drivers. And in many situations the family members or the ambulance and police authority is not informed in time. This result in delaying the help reached to the person suffered due to accident. Our project with GPS and GSM is designed to avoid such situations. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle unit. Most of the times we may not be able to find accident location and the reason behind the accident because we don't know where accident will happen and why it happens. Correspondently the hospital unit can easily take further treatment and medicines.

1.INTRODUCTION

Nowadays accident are occurring in many places in order to avoid the accident many of the ideas have been develop but all of them in research work only. This paper proposes a real time solution for avoiding accident. The Alcohol sensor, which checks if the person has consumed alcohol or not. The eye sensor makes sure that the person in driver seat does not falls a sleep. The vibration sensor attached to the vehicle will sense the other vehicle comes near to our vehicle. The vibration will be send to the lcd display in front of the driver. Incase of occurrence of accident with the help of the GPS and GSM alert message will be send to the hospital regarding accident.

We can broadly define an embedded system as a microcontroller-based, software-driven, reliable, real-time control system, designed to perform a specific task. It can be thought of as a computer hardware system having software embedded in it. The designed & developed system is installed in the vehicle. The main concept in this design is introducing the mobile communications into the embedded system. Automotive industry uses Inter-Integrated Circuit (I²C) as the in-vehicle network for the Engine Management, the body electronics like door and roof control, air conditioning and lighting as well as for the entertainment control. Nowadays all most all car manufacturers have also started implementing I²C based vehicle automation. I²C Communication protocol networks used in engine management to connect several ECUs. I²C uses only two bidirectional open-drain lines (SDA) and serial clock line (SCL), pulled up with resistors. Typical voltages used are +5v or +3.3 v,

although systems with other voltages are permitted. The I²C reference design has a 7-bit address space, with a rarely-used 10-bit extension. Common I²C bus speed are the 100kbit/s standard mode and 400kbit/s fast mode ,1 Mbit/s fast mode plus or Fm+, and 3.4Mbit/s High speed mode .

2.BLOCK DIAGRAM

3.1.1 Vehicle Unit

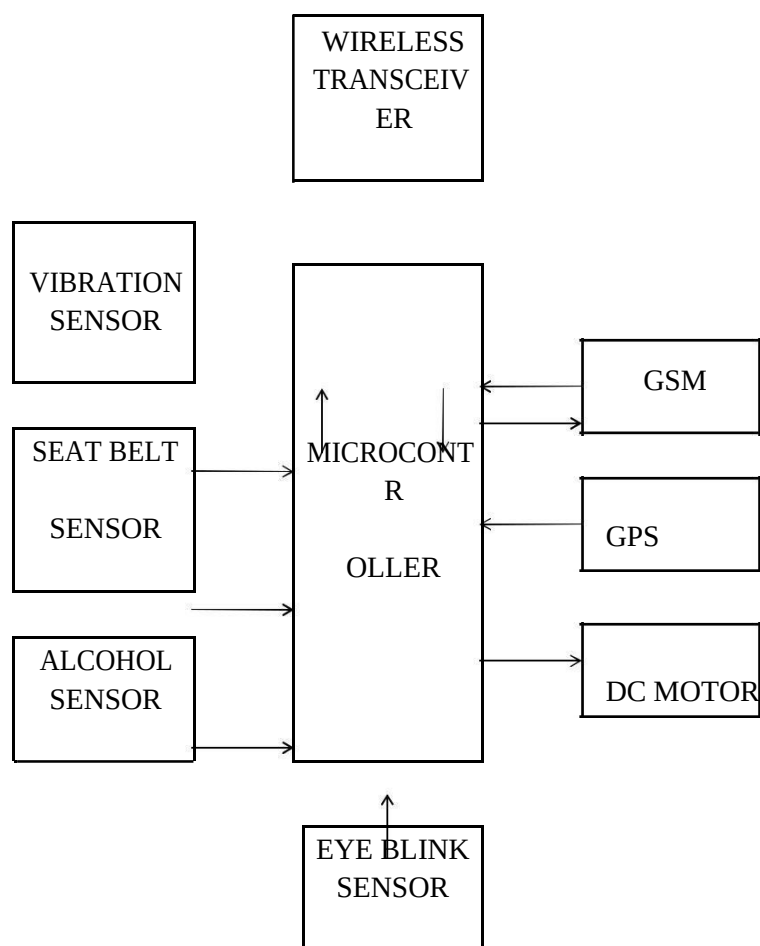


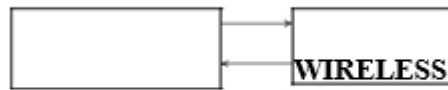
Figure 2. Block Diagram Of vehicle unit

DESCRIPTION

Under this unit the major sensors are eyeblink sensor, vibration sensor, seat belt sensor and Alcohol sensor will sense the appropriate senses and process the signals through microprocessor unit. The Wireless transceiver will send the signals. GSM and GPS and the location of the place will be send to the hospital unit.

3.1.2 Speed Control Unit

SCHOOL UNIT



MICROCONTROLLER TRANSCEIVER

COLLEGE UNIT



MICROCONTROLLER ← TRANSCEIVER

Figure 3.1.1 collage unit and school unit

DESCRIPTION

When a microcontroller unit goes near to the school unit, the wireless transceiver will makes the unit to get slower. Similarly for the College the same process occurs.

HOSPITAL UNIT

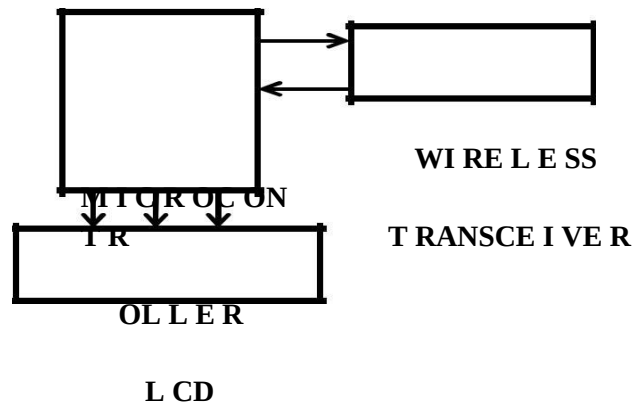
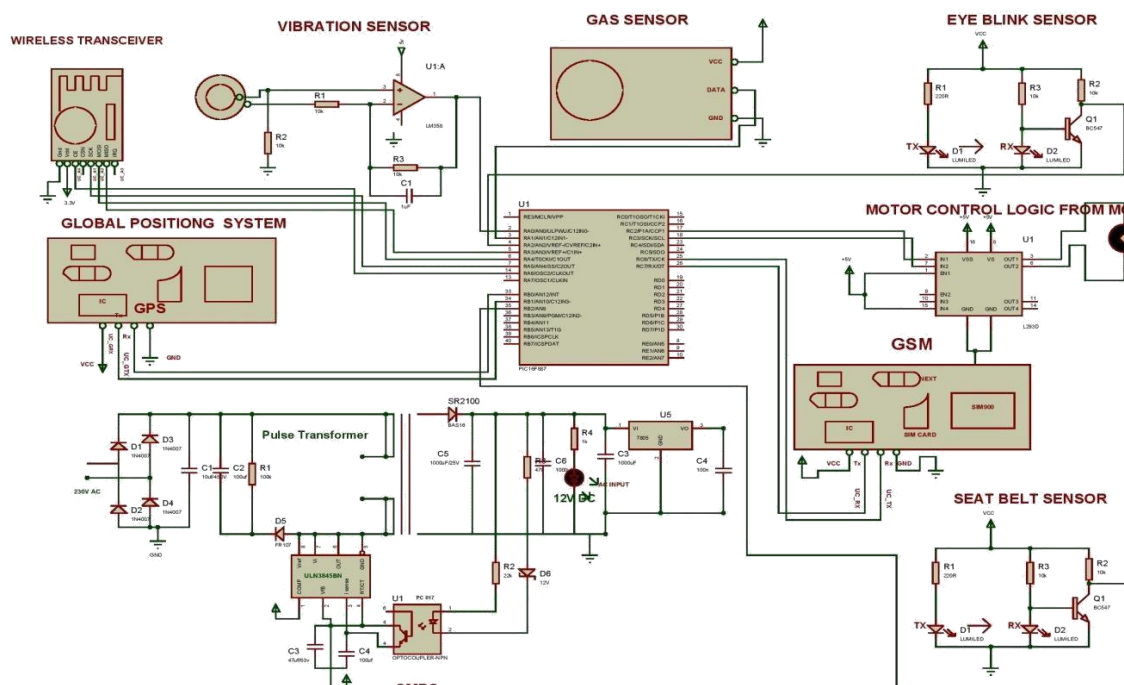


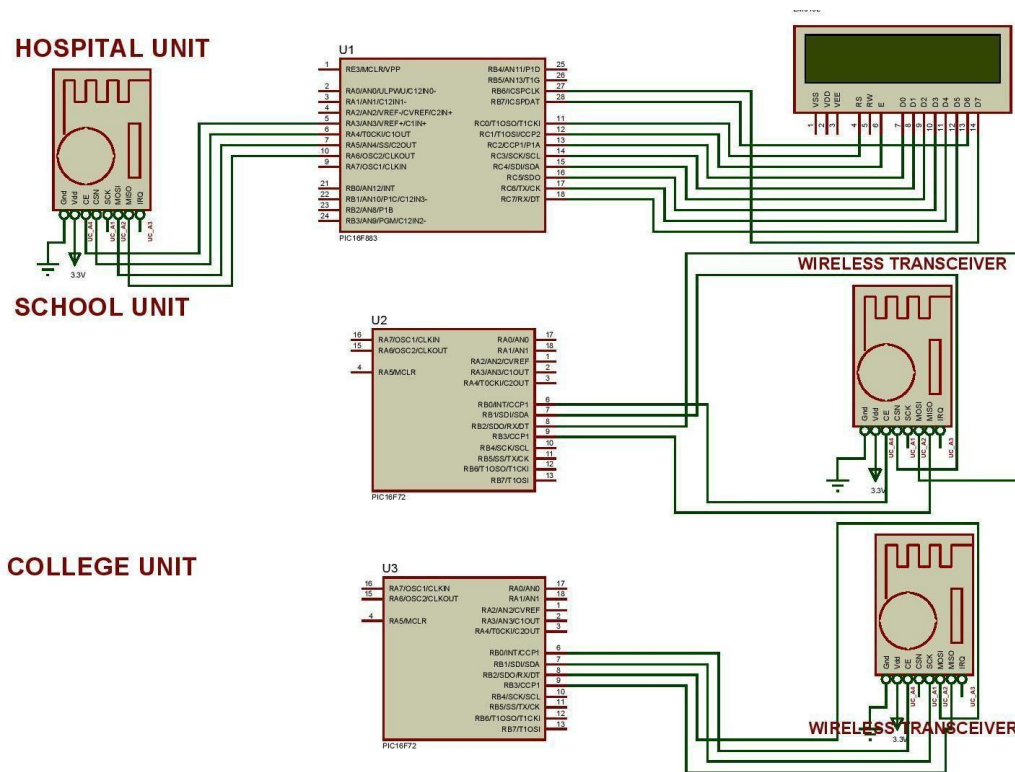
Figure3.1.2 hospital unit

DESCRIPTION

Here through a wireless transceiver, the message signals will be displayed in LCD

3.PROPOSED SYSTEM CIRCUIT DIAGRAM





Description

First the vehicle unit system includes automatic speed control, accident detection, information sending module and security module also it includes GSM and GPS technology. The vehicle accident detection and alert system with SMS to the user defined mobile numbers. Microcontroller sends the alert message through the GSM MODEM including the location to hospital unit or a rescue team. Then the Hospital unit or rescue team can immediately trace the location through the GSM MODEM, after receiving the information. The DC motor used to control the over speed of the vehicle automatically when travelling through speed control zones like school, college, hospital, etc.

4. HARDWARE IMPLEMENTATION

4.1 PIC Microcontroller

Peripheral Interface Controller (PIC) was originally designed by General Instruments. In the late 1970s, GI introduced PIC 1650 and 1655 – RISC with 30 instructions. PIC was sold to Microchip. Features: low-cost, self-contained, 8-bit, Harvard structure, pipelined, RISC, single accumulator, with fixed reset and interrupt vectors.

Pin Diagram of PIC16F887

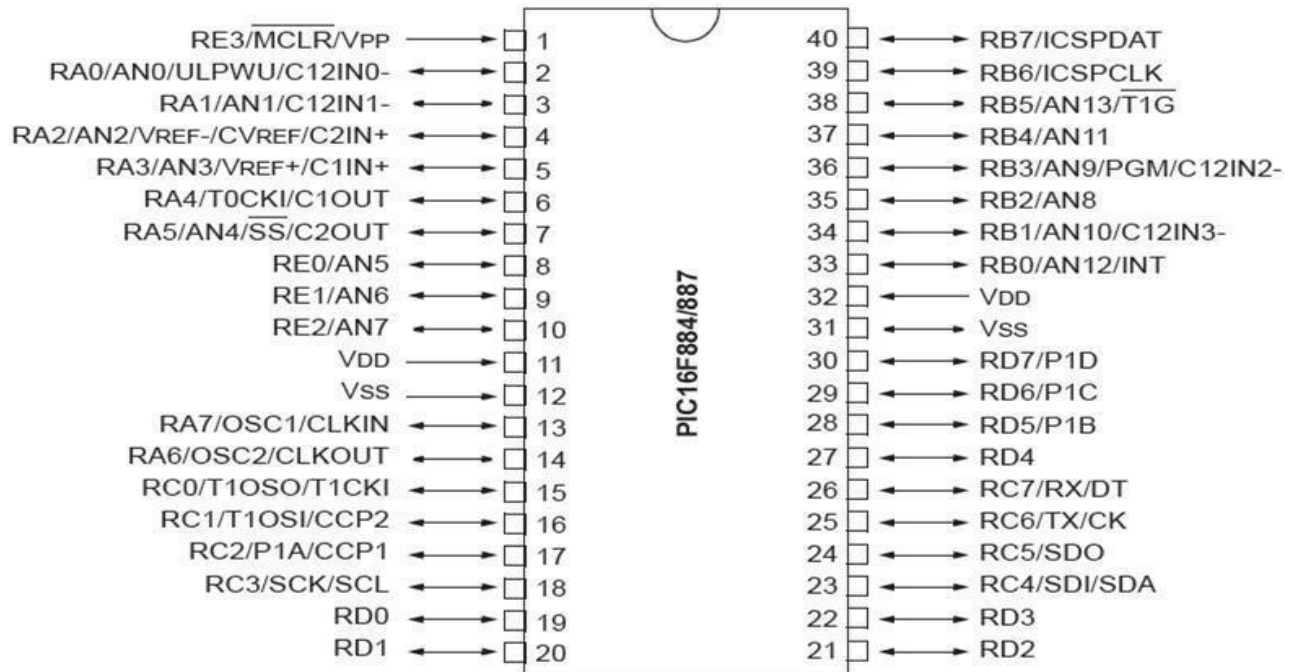


Figure 4.1 Pin Diagram of PIC16F887

4.2 RFM75

RFM75 is a GFSK transceiver operating in the world wide ISM frequency band at 2400- 2483.5 MHz. Burst mode transmission and up to 2Mbps air data rate make them suitable for applications requiring ultra low power consumption. The embedded packet processing engines enable their full operation with a very simple MCU as a radio system. Auto re-transmission and auto acknowledge give reliable link without any MCU interference. RFM75 operates in TDD mode, either as a transmitter or as a receiver. The RF channel frequency determines the center of the channel used by RFM75. The frequency is set by the RF_CH register in register bank 0 according to the following formula: $F_0 = 2400 + RF_CH \text{ (MHz)}$. The resolution of the RF channel frequency is 1MHz. A transmitter and a receiver must be programmed with the same RF channel frequency to be able to communicate with each other. The output power of RFM75 is set by the RF_PWR bits in the RF_SETUP register. Demodulation is done with embedded data slicer and bit recovery logic. The air data rate

can be programmed to 250Kbps, 1Mbps or 2Mbps by RF_DR_HIGH and RF_DR_LOW register. A transmitter and a receiver must be programmed with the same setting. In the following chapters, all registers are in register bank 0 except with explicit claim.



Figure.4.2 RFM Transmitter and Receiver (TRANSCEIVER)

4.4.1 Block Diagram For Rfm75

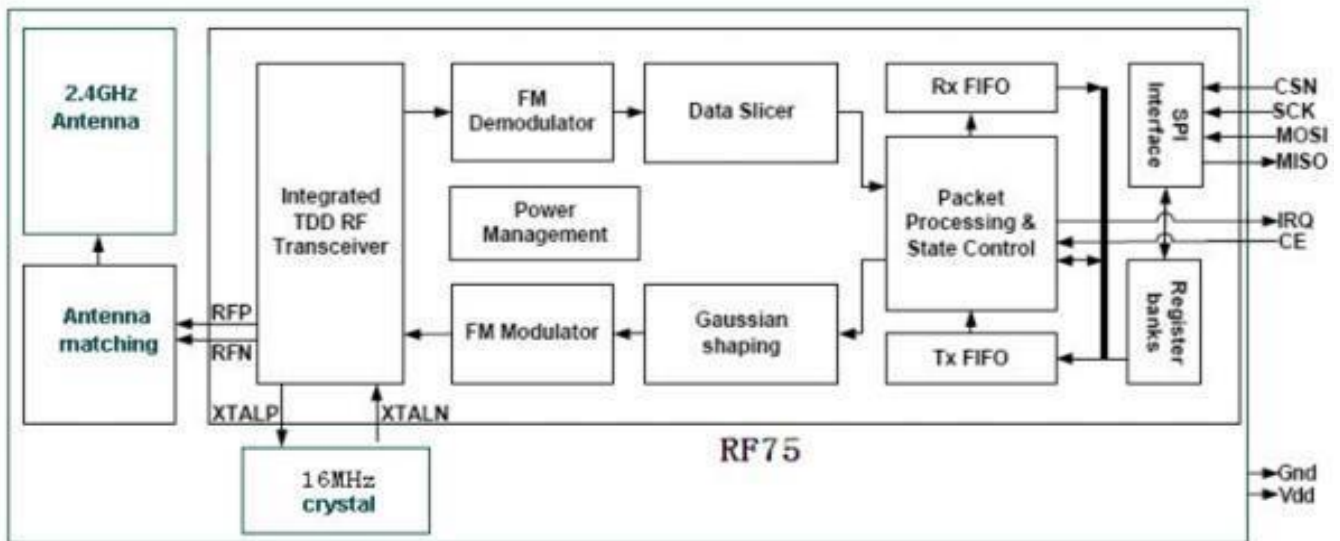


Figure. 4.3RFM75 Block Diagram

4.4.2 Pin Functions

Table 4.17 RFM75 Pin Functions

Name	Pin Function	Description
GND	Ground	Ground (0 V)
VDD	Power	Power Supply (1.9 V to 3.6 V DC)
CE	Digital Input	Chip Enable Activates RX or TX mode
CSN	Digital Input	SPI Chip Select, Active low
SCK	Digital Input	SPI Clock
MOSI	Digital Input	SPI Slave Data Input
MISO	Digital Output	SPI Slave Data Output with tri-state option
IRQ	Digital Output	Maskable interrupt pin, Active low

4.3 Gas Sensor

MQ-6 gas sensor has high sensitivity to Propane, Butane and LPG, also response to Natural gas. The sensor could be used to detect different combustible gas, especially Methane, it is with low cost and suitable for different application.

SOFTWARE IMPLEMENTATION

5.1 Proteus

Proteus 7.0 is a Virtual System Modeling (VSM) that combines circuit simulation, animated components and microprocessor models to co-simulate the complete microcontroller-based designs. This is the perfect tool for engineers to test their microcontroller designs before constructing a physical

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6.Normal Simulation Layout

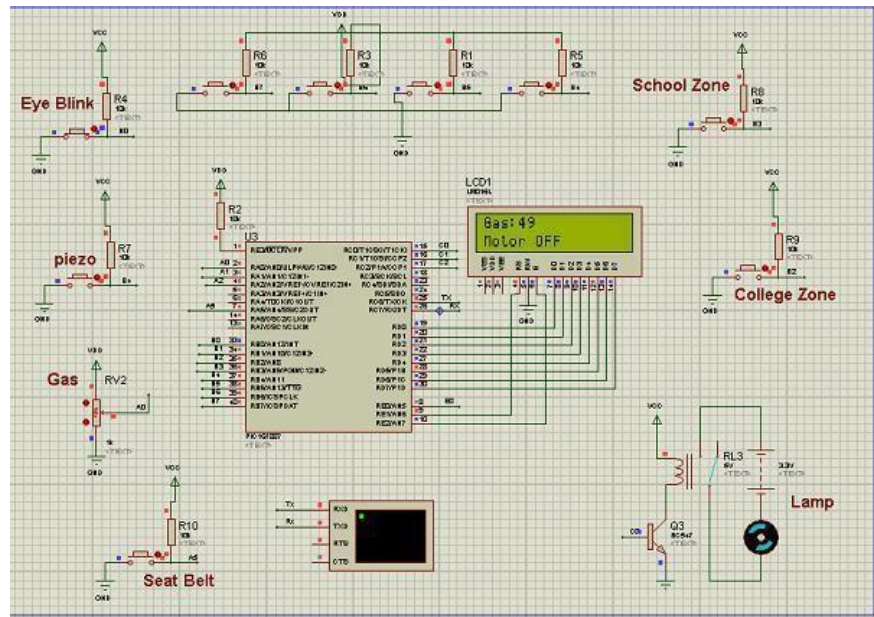
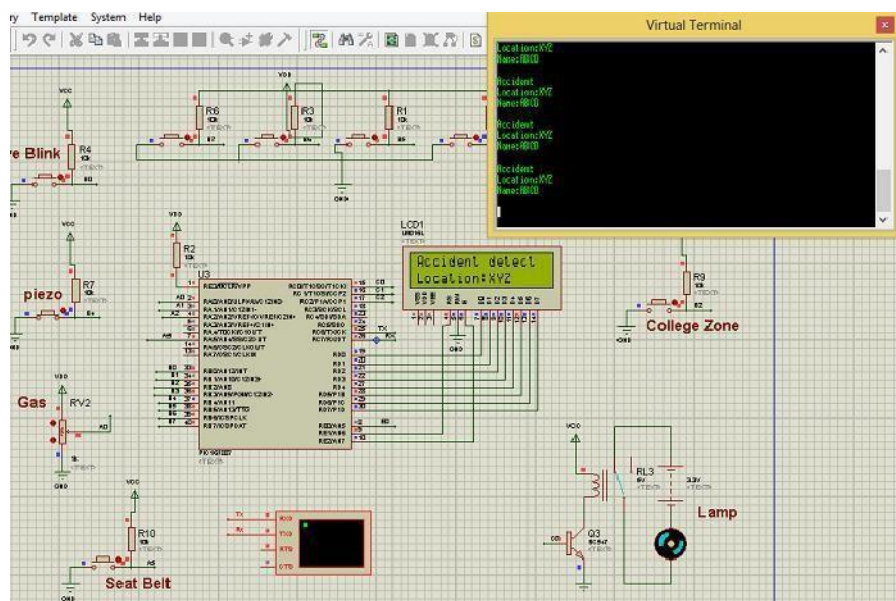


Figure 6.1 initialcondition

Description

The unit is initial condition. when check to all condition.

6. vibration sensor activated



Description

when vibration sensor activates the location will be displayed in lcd. and driver name will be displayed in lcd.

6. Gas Sensor Activated:

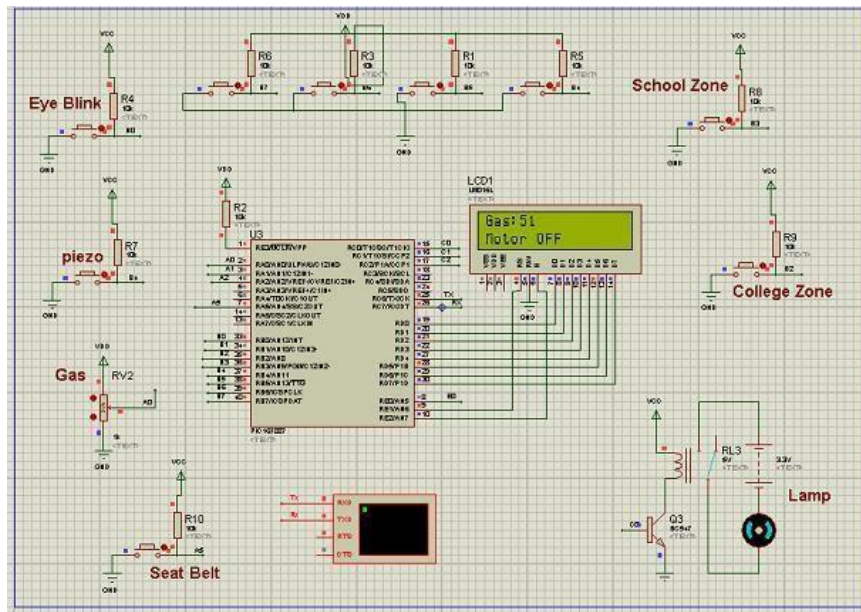


Figure 6.3 gs sensor activated

Description

When gas sensor activates, the engine stop immediately, to check alcohol consumption of driver it will stop the engine of the vehicle.

7.HARDWARE OUTPUT



In that condition is the person in driver seat does not falls a sleep. It is activated the sensor . it is sensed the signal to transmit the controller then to take immediate action.

8. CONCLUSION

In this paper we have proposed an Intelligent accident detection unit, which will be helpful for rescuing ambulance from the traffic areas. This system provides an message unit that sends the message to the hospital unit, if the accident occurs. It also provide almost total protection of vehicle.

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