

# SMS Based Accident Alert with GPS Coordinates

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**Abstract** - The paper deals with accident detection system that occurs due to carelessness of the person who is driving the vehicle. As the usage of vehicle is increasing drastically, the hazards due to vehicle is also increased. The main cause for accident is high speed, drunk, and drive, diverting minds, over stress and due to electronic gadgets. This introduces accident alerting system which alerts the person who is driving the vehicle. If the person is not in a position to control the vehicle, then the accident occurs. Once the accident occurs to the vehicle, this system will send information to registered mobile number.

**Key Words:** Global Positioning System(GPS), Global System for Mobile communication(GSM), Accelerometer

## 1. INTRODUCTION

In present days the rate of accidents can be increased rapidly. Due to employment the usage of vehicles like cars, bikes can be increased, because of this reason the accidents can be happened due to over speed. People are going under risk because of their over speed, due to unavailability of advanced techniques, the rate of accidents can't be decreased. To reduce the accident rate in the country this paper introduces the optimum solution. Automatic alert system for vehicle accidents is introduced; the main objective is to control the accidents by sending a message to the registered mobile using wireless communications techniques. When an accident occurs at a city, the message is sent to the registered mobile through GSM module in less time. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. GPS system will help in finding the location of the accident spot. The proposed system will check whether an accident has occurred and notifies to nearest medical centers and registered mobile numbers about the place of accident using GSM and GPS modules. The location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

## 2. EXISTING SYSTEM

- Based on the survey, till now, even hospital aided informs the live status of patient, there is no any smart system to inform patient live condition to nursing home through online

- Also it is must to inform immediately about accident to relatives and police station to proceed legal activities.

## DISADVANTAGES:

- No automated system for information sharing.
- Time delay may occur to begin treatment.

## 3. HARDWARE DESCRIPTION

### 3.1 GSM MODULE

For providing communication between the GPS, GSM and the allocated mobile number GSM SIM900 module is preferred. The name SIM900 says that, it is a tri band work ranging a frequency of 900MHz to 1900 MHz such as EGSM900 MHz, PCS 1900 MHz and DCS 1800 MHz. Receiving pin of GSM module and transmitting pin of GPS module are used for communication between the modules and the mobile phone



Fig.1 GSM module

### 3.2 GPS MODULE

To find the location on the earth the whole is divided into some coordinates where the location can be easily captured by a module called GPS module. Here the GPS used is SIM28ML. This GPS module will find the location of the vehicle and the information fetched by the GPS receiver is received through the coordinates and the received data is first send to Arduino and the information is transmitted to the saved contact through GSM module. The frequency is operated in the range of 1575.42 MHz

and the output of GPS module is in NMEA format which includes data like location in real time.

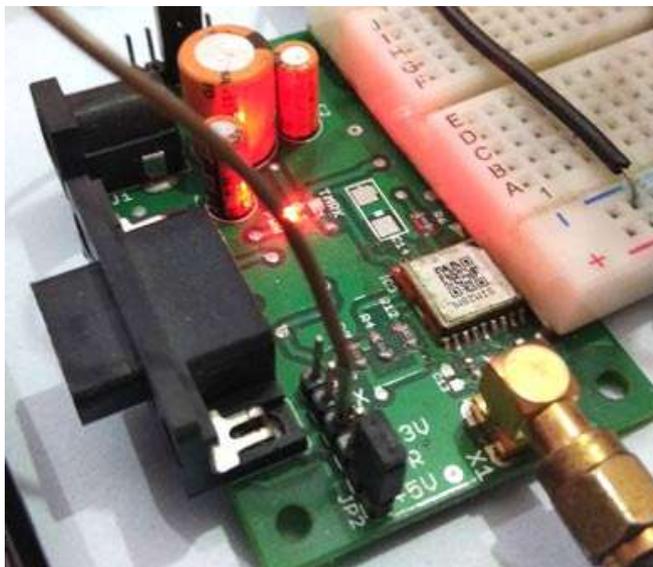


Fig.2 GPS module

### 3.3 ARDUINO

The Arduino UNO is a widely used open-source microcontroller board based on the ATmega328P microcontroller and developed by Arduino.cc. The Arduino is the major control unit to detect or alert when an accident occurs. It collects the data from vibration sensor, GPRS and GSM modules and reflects the output either in display system or through a message. Here vibration sensor plays a major role. This vibration sensor will receive the vibrations of the vehicle which in turn acts as the accident detection module. Arduino gathers the information from all other modules and sends the message to the receiver through GSM module

### 3.4 ACCELEROMETER

Pin Description of accelerometer:

1.Vcc	5volt supply should connect at this pin
2.X-OUT	This pin gives an Analog output in x direction
3.Y-OUT	This pin gives an Analog output in y direction
4.GND	Ground
5.ST	This pin used for set sensitivity of sensor

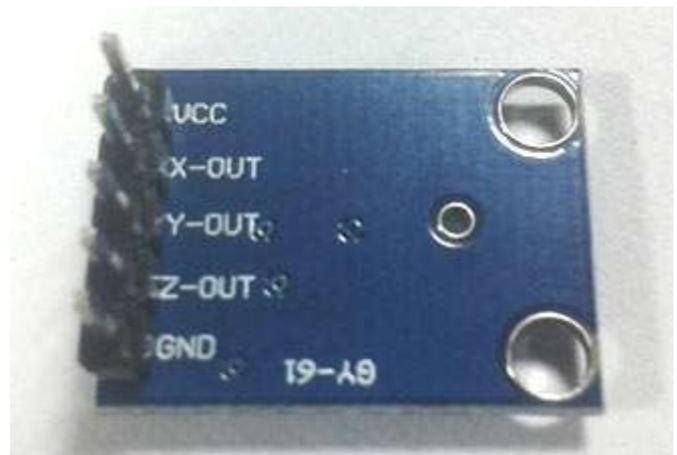


Fig:3 Front side of the Accelerometer

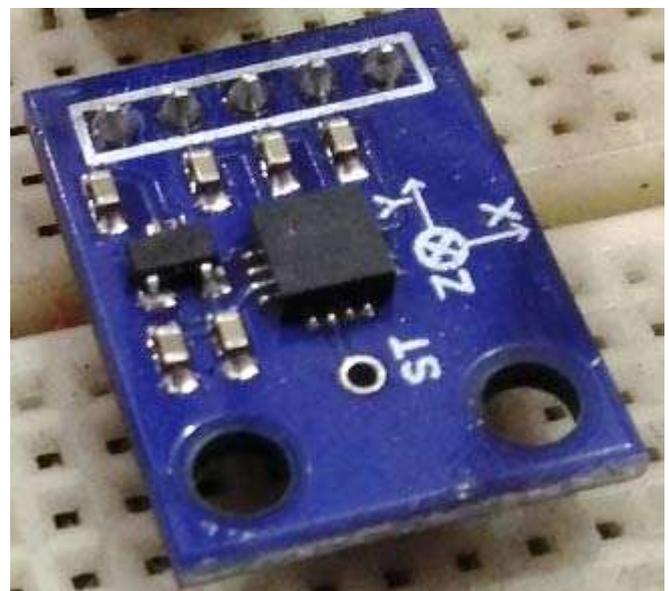


Fig:4 Back side of the Accelerometer

### 4. CIRCUIT EXPLANATION

Circuit connections of this vehicle accident alert system project is simple. Here TX pin of GPS module directly connected to digital pin number 10 of Arduino. By using software serial library here, we have allowed serial communication on pin 10 and 11 and made them RX and TX respectively and left the RX pin of GPS module open. By default, pin 0 and 1 of Arduino are used for serial communication but by using the software serial library, we can allow serial communication on other digital pins of the Arduino. 12V supply is used to power the GPS module.

GSM module TX and RX pins of are directly connected to pin D2 and D3 of Arduino. For GSM interfacing, here we have also used software serial library. GSM module is also powered by 12v supply. An optional LCD'S data pins D4, D5, D6 and D7 are connected to pin number of 6, 7, 8 and 9 of Arduino. Command pin RS and EN of LCD are connected with pin number 4 and 5 of

Arduino and RW pin is directly connected with ground. A potentiometer is also used for setting contrast or brightness of LCD.

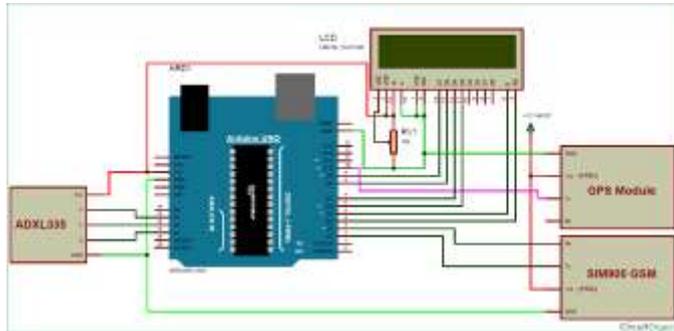


Fig.4 Working module of Accident detection and Alert system

An Accelerometer is added in the system for detecting an accident and its X and Y axis ADC output pins are directly connected to Arduino ADC pin A1 and A2.

### 5. WORKING EXPLANATION

In this project, Arduino is used for controlling whole the process with a GPS receiver and GSM module. GPS receiver is used for detecting coordinates of the vehicle, GSM module is used for sending the alert SMS with the coordinates and the link to google map.

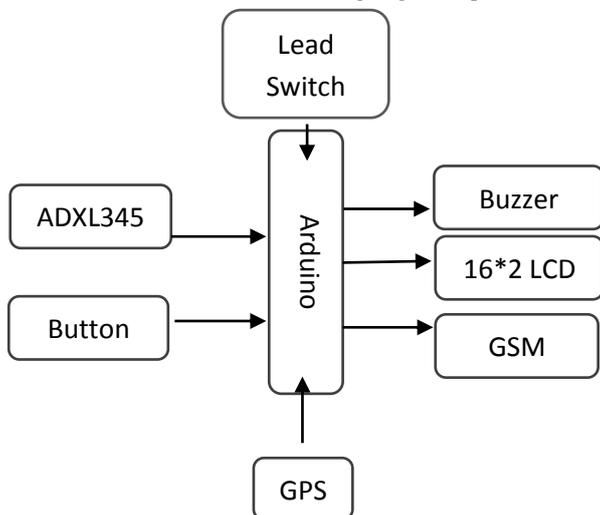


Fig.5 Block Diagram of Accident detection and Alert system

Accelerometer namely ADXL345 is used for detecting accident or sudden change in any axis. And an optional 16\*2 LCD is also used for displaying status messages or coordinates. We have used GPS Module SIM28ML and GSM Module SIM900A. When we are ready with our hardware after programing, we can install it in our vehicle and power it up. Now whenever there is an accident, the car gets tilt and accelerometer change its axis values. These values read by Arduino and checks if any change occurs in

any axis. If any change occurs, then Arduino reads coordinates by extracting \$GPGGA string from GPS module data and send SMS to the predefined number to the police or ambulance or family member with the location coordinates of accident place. The message also contains a google map link to the accident location, so that location can be easily tracked. When we receive the message then we only need to click the link and we will redirect to the google map and then we can see the exact location of vehicle, in knots(1.852KPH), is also sent in the SMS and displayed on the LCD panel.

### 6. RESULTS AND DISCUSSIONS

Whenever accident of vehicle is occurred then the device sends messages to given mobile number.



Fig.6 Interfacing controller with all other modules

### CONCLUSION

The proposed system deals with the accident alerting and detection. Arduino is the heart of the system which helps in transferring the message to different devices in the system. Vibration sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. Using GPS, the location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a vibration sensor which is used as major module in the system.

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