GPS AND GSM BASED ERROE FREE ACCIDENT IDENTIFICATION & INFORMATION SYSTEM

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ABSTRACT:

Now a day, it became very difficult to know that an accident has occurred and to locate the position where it has happened .There is no system of identification and intimation regarding an accident in previous. Later on the SMS service begins for intimation and purpose. GPS and GSM make the usage for intimation and identification of place. When an accident occurs the information only be sent through GSM but there is no possibility to locate the spot. This project presents an automotive localization system using GPS and GSM-SMS services So the main intention of the project is to find the accident spot at any place and intimating it to ambulance through GPS and GSM networks. The GPS based vehicle identification module contains vibrating sensor GSM module and a GPS modem connected to the microcontroller. The receiver section consists of a GSM receiver and a PC. The transmitter section consists of a micro controller, GPS module, Key Pad, LCD, GSM transmitter and vibration.

Keywords:- GPS,GSM ,Microcontroller

1. INTRODUCTION

The main intention of this project is to find the accident spot at any place and intimating it to ambulance through the GPS and GSM networks. The GPS based vehicle accident identification module contains vibrating sensor GSM module and a GPS modem connected to the microcontroller. Global System for Mobiles (GSM) technology is used to establish cellular connection. GPS is used to trace the position of the vehicle.

2. EMBEDDED SYSTEM:

Embedded systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reason such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

Wireless communication has become an important feature for commercial products and a popular research topic within the last ten years. There are now more mobile phone subscriptions than wired-line subscriptions. Lately, one area of commercial interest has been low-cost, low-power, and short-distance wireless communication used for \personal wireless networks." Technology advancements are providing smaller and more cost effective devices for integrating computational processing, wireless communication, and a host of other functionalities. These

embedded communications devices will be integrated into applications ranging from homeland security to industry automation and monitoring.

They will also enable custom tailored engineering solutions, creating a revolutionary way of disseminating and processing information. With new technologies and devices come new business activities, and the need for employees in these technological areas. Engineers who have knowledge of embedded systems and wireless communications will be in high demand. Unfortunately, there are few adorable environments available for development and classroom use, so students often do not learn about these technologies during hands-on lab exercises. The communication mediums were twisted pair, optical fiber, infrared, and generally wireless radio.
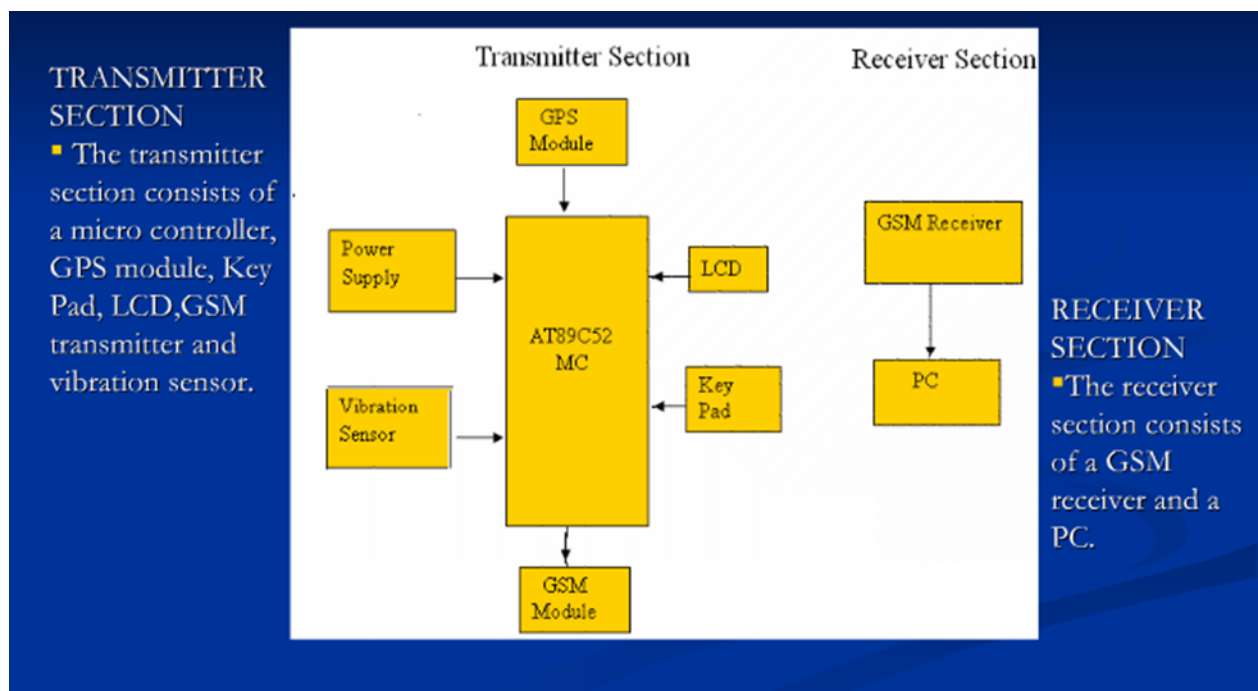
BLOCK DIAGRAM:

Fig: 1.1 Transmitter/Receiver sections

2.1 BLOCK DIAGRAM DISCRIPTION:

Here we have mainly two different blocks,those are tracking and location viewing blocks in this first we going to know about tracking systemIn this project we will place this vehicle trcking system in vehicle. The Block diagram consists of a GPS modem, a GSM modem, a Micro controller, an ignition switch, DC motor,a LCD Display and power supply.

A GPS modem is used to get the signals and receive the signals from the satellites. In this project, GPS modem get the signals from the satellites and those are given to the microcontroller. The signals may be in the form of the coordinates; these are represented in form of the latitudes,

longitudes and altitude.A GSM modem is used to get the messages from the mobile and as well as reading the message also. There after sending the acknowledgement will be done. Before operating this GSM modem first we have to insert the SIM card in this modem. Then the total receiving and sending the messages will be done based on this number. First the concerned person has to register for that number and second one is viewing and controlling section the vehicle like tracking and bloking.

In this system mainly we have microcontroller, powersupply, LCD, GSM, Pc, keypad .By that particular keypad of keys only we are sending request for track and block ing of vehicle.here we two switches one for sending request for tracking the vehicle location and another for blocking the vehicle .A Micro controller is a heart of this project.

The total controlling action will be done through this micro controller. Based on the signals given to the micro controller that will be totally controlled at the output section. If we send the message like "TRACK" to the GSM modem at viewing and controlling section it will get recieved by tracking section which is placed in the vehicle, it will send signals to the micro controller to track the vehicle and if sensing message by view and control section is "BLOCK" means the system get blocked by microcontroller of controlling operation Upon receiving the signals, the micro controller will switched-off the ignition part of that vehicle. Then the vehicle does not move at any inch.

An ignition switch plays the key role in the vehicle, for moving. If it is in off condition, the vehicle does not move at an inch. In this project, for completely stopping the vehicle we are just switched-off the ignition switch with the help of the micro controller.

A LCD display is used at the output section. To display the status of the GSM and GPS. The maximum power supply required to operate the hardware circuitry is +5V DC voltage.

These embedded communications devices will be integrated into applications ranging from homeland security to industry automation and monitoring. They will also enable custom tailored engineering solutions, creating a revolutionary way of disseminating and processing information. With new technologies and devices come new business activities, and the need for employees in these technological areas. Engineers who have knowledge of embedded systems and wireless communications will be in high demand. Unfortunately, there are few adorable environments available for development and classroom use, so students often do not learn about these technologies during hands-on lab exercises.

2.2 MICROCONTROLLER

A Micro controller consists of a powerful CPU tightly coupled with memory, various I/O interfaces such as serial port, parallel port timer or counter, interrupt controller, data acquisition interfaces-Analog to Digital converter, Digital to Analog converter, integrated on to a single silicon chip.

If a system is developed with a microprocessor, the designer has to go for external memory such as RAM, ROM, EPROM and peripherals. But controller is provided all these facilities on a single chip. Development of a Micro controller reduces PCB size and cost of design.
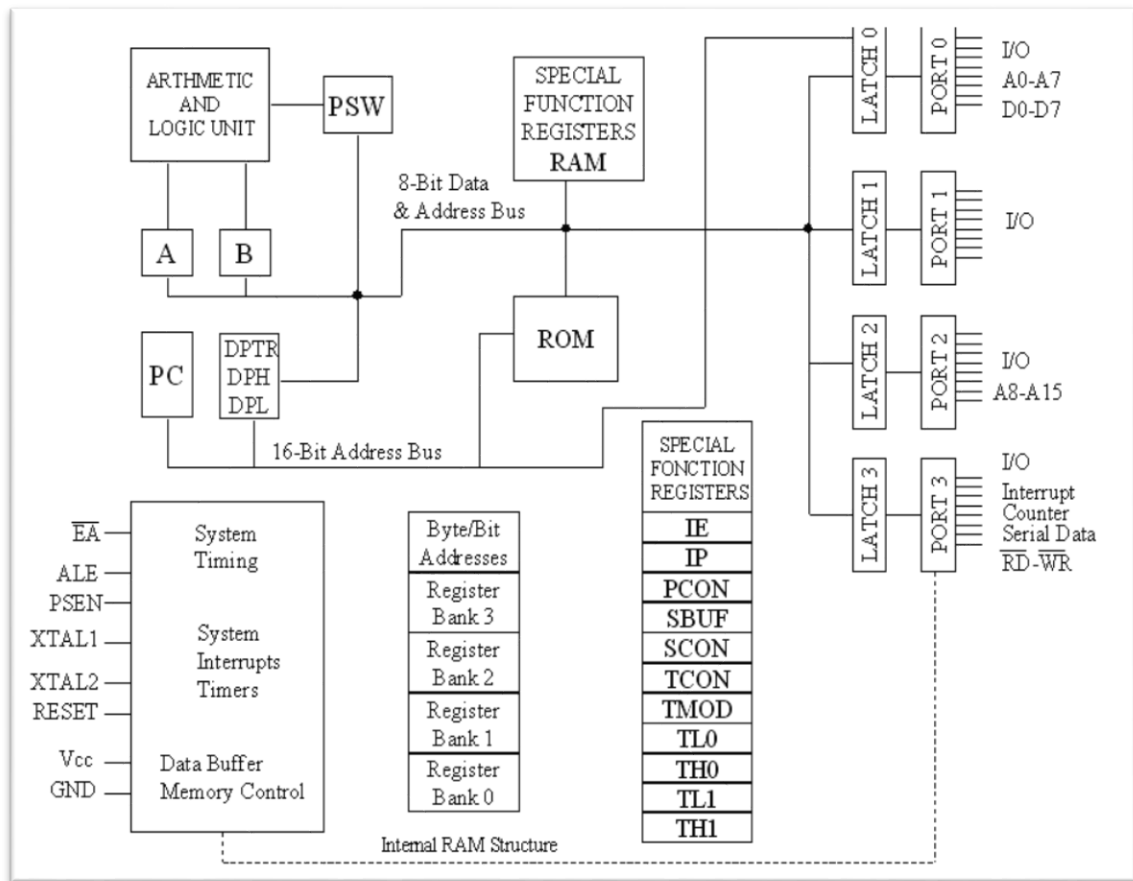
Fig: 1.2 Circuit diagram of Microcontroller

2.3 KEYPAD

Keypads are a part of HMI or Human Machine Interface and play really important role in a small embedded system where human interaction or human input is needed. Marti x keypads are well known for their simple architecture and ease of interfacing with any microcontroller. In this part of tutorial we will learn how to interface a 4x4 matrix keypad with AVR and 8051 microcontroller. Also we will see how to program then in Assembly and C.

2.4 LCD

Liquid crystal displays (LCDs) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

2.5 GPS MODULE

Global Positioning System (GPS) technology is changing the way we work and play.

You can use GPS technology when you are driving, flying, fishing, sailing, hiking, running,

biking, working, or exploring. With a GPS receiver, you have an amazing amount of information at your fingertips. Here are just a few examples of how you can use GPS technology. The Global Positioning System (GPS) is a satellite-based navigation system that sends and receives radio signals. A GPS receiver acquires these signals and provides you with information. Using GPS technology, you can determine location, velocity, and time, 24 hours a day, in any weather conditions anywhere in the world— for free.

2.6 GSM Modems

A GSM modem can be an external modem device, such as the Waveform FASTRACK Modem. Insert a GSM SIM card into this modem, and connect the modem to an available serial port on your computer.A GSM modem can be a PC Card installed in a notebook computer, such as the Nokia Card Phone.A GSM modem could also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port on your computer. Phones such as the Nokia 7110 with a DLR-3 cable, or various Ericsson phones, are often used for this purpose.
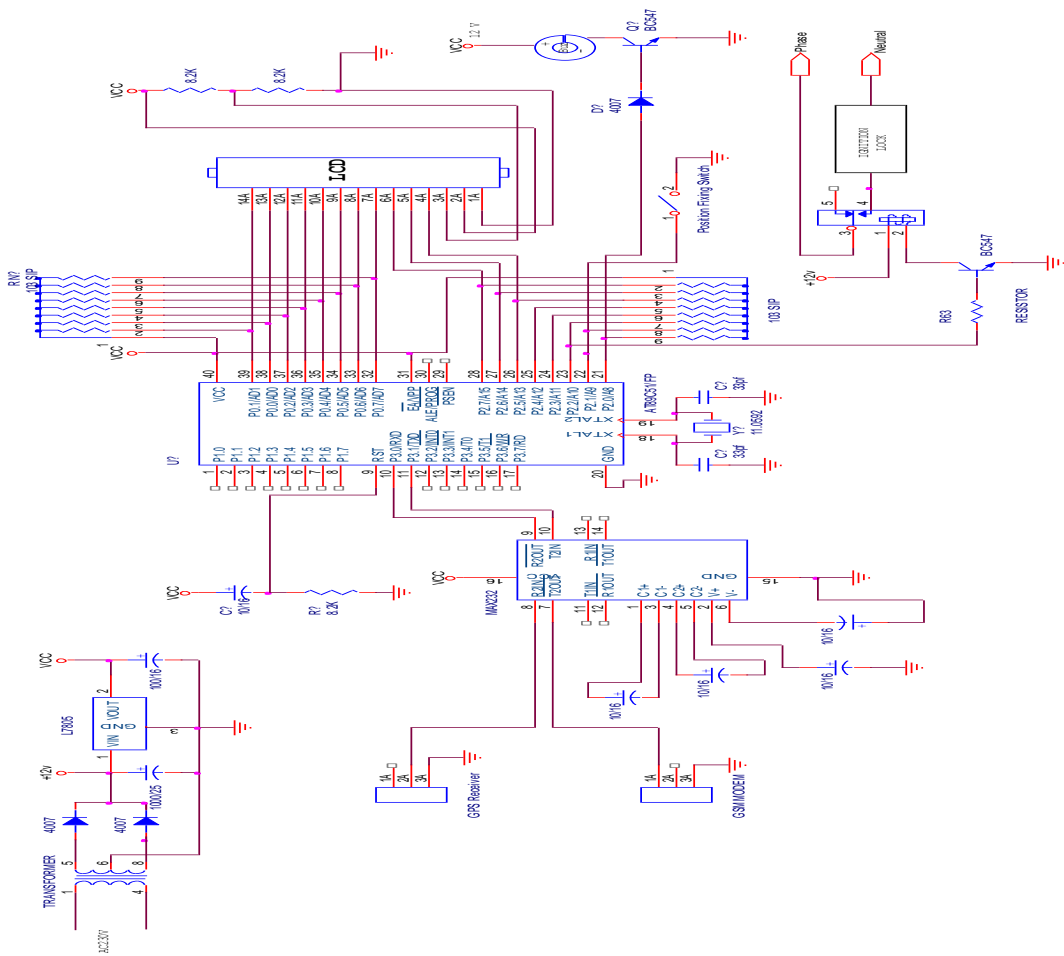
Circuit Diagram :

Fig: 1.3 Circuit diagram of GPS and GSM systems

3 SCHEMATIC EXPLANATION

GPS connections:

Pins	connections
1	VCC (+5v)
2	This pin is connected to the 3rd (TXD) of the MAX -232 IC
3	This pin is connected to the 2nd (RXD) of the MAX -232 IC
4	GND
5	GND

3.1 MAX-232 connections to microcontroller

Pins	connections
11	This pin is connected to P3.1 (TXD) of the Micro controller
12	This pin is connected to P3.0 (RXD) of the Micro controller
13	This pin is connected to 3rd pin (TXD) of DB-9 connector
14	This pin is connected to 2nd pin (RXD) of DB-9 connector
15	Ground
16	VCC (+5v).

3.2 LCD connections to Micro controller

Pins	Connections
1	VSS (ground)
2	VCC (+5V)
3	10k pot
4	RS, this pin is connected to P2.7 of the micro controller
5	R/w, this pin is connected to P2.6 of the micro controller
6	EN, this pin is connected to P2.5 of the micro controller
7-14	(D0-D7) these pins are connected to the port (P0) of the micro controller

3.4 Latch Connections to Micro controller

Pins	Connections
9, 16	P3.0
2, 13	P3.1
19	P3.6
1	P3.7
10	GND
20	VCC
Ignition switch	P2.0

Pc Connections

Pins	connections
1	VCC (+5v)
2	This pin is connected to the 2nd (RXD) of the MAX -232 IC
3	GND

4 ADVANTAGES:

➢ The vehicle which is undergone to an accident can be identified by using tracking technology without any delay. The immediate medication will be provided to the accident victims in remote areas.

➢ GPS vehicle tracking systems can also monitor the fuel consumption of a company's fleet so that managers can work towards a more economical and environmentally friendly fleet of vehicles.

➢ Tracking systems can also help people to map out the shortest routes a driver can take which can help to save time, money and fuel.

4.1 DISADVANTAGES:

➢ The anti GPS tracker disrupter will knock out GPS logging

➢ GPS tracking system which may be operating on a vehicle,

➢ using GPS disrupter system will make it very hard for anyone to keep tabs on a vehicle.

5. CONCLUSIONS:

In todays World,s Human beings can use GPS AND GSM BASED ERROR FREE ACCIDENT IDENTIFICATION AND INFORMATION SYSTEMs" To minimize the deaths and the severe conditions due to accidents the GPS and GSM technologies are used where the immediate action would be take place by the ambulance/police service which might reduces the severity.

REFERENCE:

1 Claburn, Thomas (March 4, 2009). "Court Asked To Disallow Warrantless GPS Tracking". *Information2Week*. Retrieved 2009-03-18.

2 Lynn Stoddart, Open Architecture, A New Concept in Vehicle Location Systems, (IPS 1994).

3MicroprocessorHallofFame".Intel.http://www.intel.com/museum/online/hist_mi cro/hof Retrieved 2007-08-11.

4 IEEE Projects of Microcontroller/www.ieee projects.com

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Dr. K.A.Lathief received his M.Tech degree in Electronics& Communication Engineering from IASE University Rajasthan from 2005.He received PhD degree in Communication Engineering from Magadha University from 2007. Currently working as Professor in the department of Electrical and Computer Engineering, Wolaitasodo University, Wolaitasodo, Ethiopia. His main research Interests are Communication areas of Satellite, Cellular Mobile, VSAT Networking and Wireless Environments and Modern Antennas and Optical Fiber Communications. He has got 7 years Industrial and 16 years of teaching experience. He has published seven research papers in various international journals. He has 4 memberships in various international journals.