Advanced Vehicle Security System with Theft control and Accident Notification

This Project presents an automotive localization system using GPS and GSM-SMS services. The system permits localization of the automobile and transmitting the position to the owner on his mobile phone as a short message (SMS) at his request. This system is also provided with emergency switch which can be turned off through an SMS. This switch takes the responsibility to turns OFF the engine and can be turned ON only after receiving a predefined password from the owner of the vehicle.

The system can be interconnected with the car alarm system and alert the owner on his mobile phone. This tracking system is composed of a GPS receiver, Microcontroller and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The Microcontroller processes this information and this processed information is sent to the user/owner using GSM modem. Microcontroller also gets the speed of the vehicle and sends it to user/owner.

The presented application is a low cost solution for automobile position and status, very useful in case of car theft situations, for monitoring adolescent drivers by their parents as well as in car tracking system applications. The proposed solution can be used in other types of application, where the information needed is requested rarely and at irregular period of time (when requested).

This system is also can be interfaced with Vehicle airbag system. This enable it to monitor the accident situations and it can immediately alerts the police/ambulance service with the location of accident.

In case of vehicle theft situations the owner can know the vehicles current location and based on that he can stop the vehicle by sending a predefined SMS message to this system. After receiving SMS message from owner this system automatically stops the ignition system hence the vehicle will not function any more.

Features:

1. Remote communication using GSM modem from anywhere in world.

2. GPS based location Identification.

3. Sends location in the form of latitude and longitude.

4. Automatic accident location alert to police/ambulance.

5. Theft control through GSM short message service.

Applications:

1. VIP vehicle tracking.

2. Can also be used for Child or animal tracking.

3. Vehicle Security Applications.

4. Ambulance tracking.

5. Navigation systems.

This project provides exposure to the following technologies:

1. GSM modem.

2. GPS receiver.

3. Interfacing GSM modem and microcontroller.

4. Interfacing GPS Receiver with Microcontroller.

5. NMEA Protocol implementation.

6. AT commands for Modem interfacing.

7. Embedded C programming for microcontroller.

8. PCB designing.

The Major Building blocks of this project are:

1. Regulated Power Supply.

2. Microcontroller.

3. GPS Receiver.

4. GSM Modem.

5. Buzzer with driver.

6. LCD with driver.

7. LED Indicators

8. Accident Identification Sensor.

9. Ignition Controlling Circuitry

Software used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.

Regulated Power Supply:

```
Step down          Rectifier          Filters          Regulator  →  5v DC
transformer
```
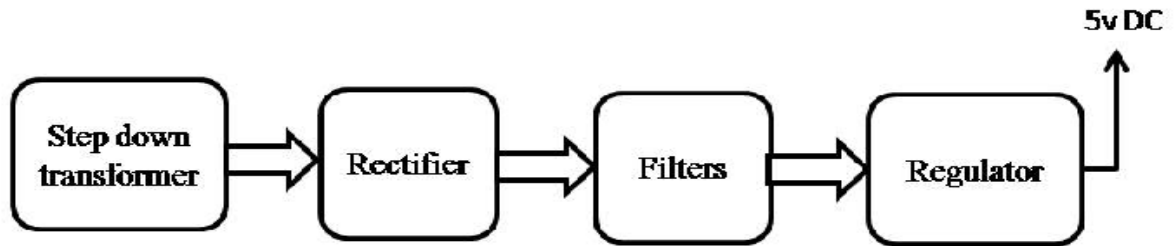
Block Diagram:

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```
                         Regulated power supply

GPS         RS 232                                Ignition         Ignition
Receiver    interfacing                           control          Control
                                                  driver

GSM         RS 232                                LCD              LCD
modem       interfacing        Micro              driver
                               controller
Accident                                          Buzzer           Buzzer
Identification sensor                             driver

Crystal Oscillator                                LED indicators
```