

## GSM Based Automatic Vehicle Accident Detection with GPS Based Location Identification and Messaging System Using ARM7 TDMI Processor

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### ABSTRACT:

This Project presents an an automatic vehicle accident detection system using GPS and GSM modems. This detection and messaging system is composed of a GPS receiver, LPC2148 Microcontroller and a GSM Modem. GPS Receiver gets the location information from satellites in the form of latitude and longitude. The LPC2148 Microcontroller processes this information and this processed information is sent to the user/owner using GSM modem. A GSM modem is interfaced to the MCU.

The GSM modem sends an SMS to the mobile and informs about this accident. This enable it to monitor the accident situations and it can immediately alerts the police/ambulance service with the location of accident. This project uses regulated 5V, 500mA power supply. Unregulated 12V DC is used for relay. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

### Explanation of Each Block.

#### ARM7:

This project is built around the LPC2148 microcontroller. The LPC2148 are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate.

For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC,

USB PORT, PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

**GSM – Global System for Mobile Communication** is used as a media which is used to control and monitor the transformer load from anywhere by sending a message. It has its own deterministic character. Thereby, here GSM is used to monitor and control the DC motor, Stepper motor, Temperature sensor and Solid State Relay by sending a message through GSM modem.

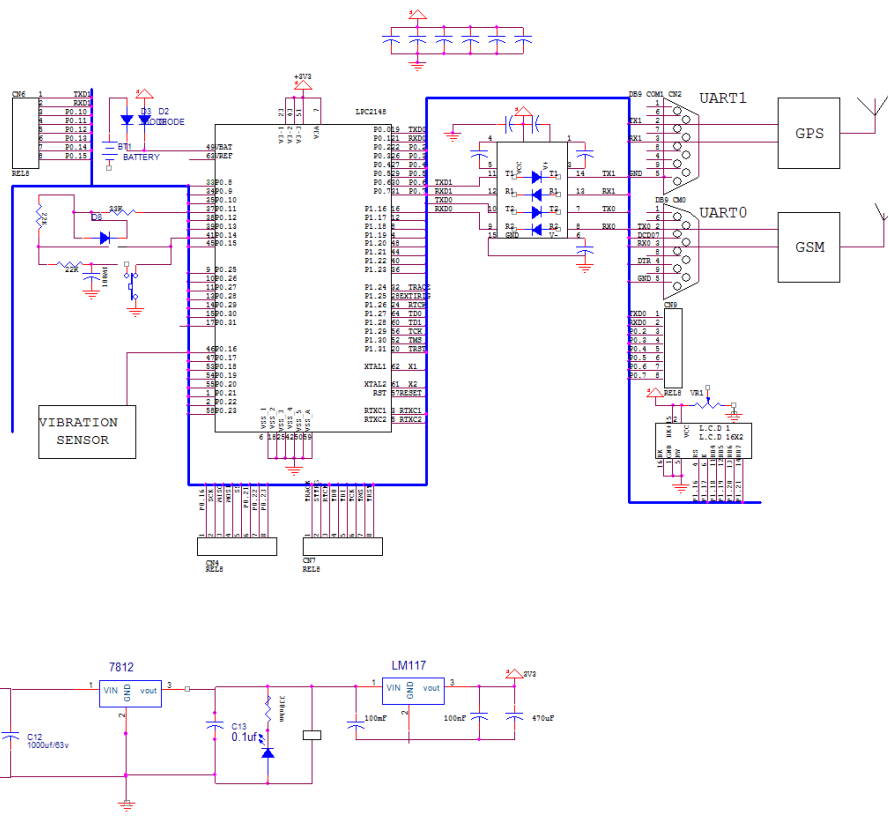
Hence no need to waste time by manual operation and transportation. Hence it is considered as highly efficient communication through the mobile which will be useful in industrial controls, automobiles, and appliances which would be controlled from anywhere else. It is also highly economic and less expensive; hence GSM is preferred most for this mode of controlling.

#### GPS - Global Positioning System:

GPS is used in vehicles for both tracking and navigation. Tracking systems enable a base station to keep track of the vehicles without the intervention of the driver where, as navigation system helps the driver to reach the destination.

Whether navigation system or tracking system, the architecture is more or less similar. When an accident occurred in any place then GPS system tracks the position of the vehicle and sends the information to the particular person through GSM by alerting the person through SMS or by a call.

## Schemantic Diagram:



## SOFTWARES KEIL SOFTWARE:

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

## PROLOAD:

Proload is a software which accepts only hex files. Once the machine code is converted into hex code, that hex code has to be dumped into the microcontroller placed in the programmer kit and this is done by the Proload. Programmer kit contains a microcontroller on it other than the one which is to be programmed. This microcontroller has a program in it written in such a way that it accepts the hex file from the keil compiler and dumps this hex file into the microcontroller which is to be programmed

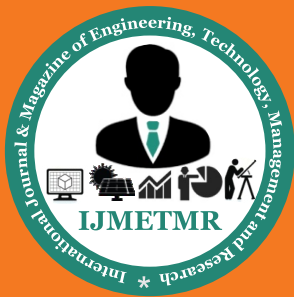
## CONCLUSION:

This project presents vehicle accident detection and alert system with SMS to the user defined mobile numbers.

The GPS tracking and GSM alert based algorithm is designed and implemented with LPC2148 Microcontroller in embedded system domain. The proposed Vehicle accident detection system can track geographical information automatically and sends an alert SMS on accident condition. Experimental work has been carried out carefully. The result shows that higher sensitivity and accuracy is indeed achieved using the project. A keypad is also provided to enter the user defined mobile numbers of his choice. EEPROM is interfaced to store the mobile numbers permanently. This made the project more user-friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry.

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