ISSN No: 2348-4845
International Journal & Magazine of Engineering, Technology, Management and Research
A Peer Reviewed Open Access International Journal

Getting Data When Accident Occur And Also The Location

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Abstract

Security in travel is primary concern for everyone. This Project describes a design of effective alarm system that can monitor an automotive / vehicle / car condition in traveling. This project is designed to inform about an accident that is occurred to a vehicle to the family members of the traveling persons. This project uses a pizeo-electric sensor which can detect the abrupt vibration when an accident is occurred. This sends a signal to microcontroller This Project presents an automatic vehicle accident detection system using GPS and GSM modems. The system can be interconnected with the car alarm system and alert the owner on his mobile phone. This detection and messaging 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 LPC2148 controller 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 predefined mobile number 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.

Over View Of Embedded Systems

Embedded systems are electronic devices that incorporate microprocessors with in Their implementations. The main purposes of the microprocessors are to simplify the system design and provide flexibility. Having a microprocessor in the device means that removing the bugs, making modifications, or adding new features are only matters of rewriting the software that controls the device. Or in other words embedded computer systems are electronic systems that include a microcomputer to perform a specific dedicated application. The computer is hidden inside these products. Embedded systems are ubiquitous. Every week millions of tiny computer chips come pouring out of factories finding their way into our everyday products.

Embedded systems are self-contained programs that are embedded within a piece of hardware. Whereas a regular computer has many different applications and software that can be applied to various tasks, embedded systems are usually set to a specific task that cannot be altered without physically manipulating the circuitry. Another way to think of an embedded system is as a computer system that is created with optimal efficiency, thereby allowing it to complete specific functions as quickly as possible.

Embedded systems designers usually have a significant grasp of hardware technologies. They used specific programming languages and software to develop embedded systems and manipulate the equipment. When searching online, companies offer embedded systems development kits and other embedded systems tools for use by engineers and businesses.

Embedded systems technologies are usually fairly expensive due to the necessary development time and

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built in efficiencies, but they are also highly valued in specific industries. Smaller businesses may wish to hire a consultant to determine what sort of embedded systems will add value to your organization.

Research Issues

This project to help for easy identification of crash detection and actions should takes place as early as possible. This Project describes a design of alarm system that can monitor an automotive / vehicle / car condition in traveling. Security in travel is primary concern for everyone. This Project presents an automatic vehicle accident detection system using GPS and GSM modems.

Literature Survey

I am followed two base papers to implement of my project the two papers. The first paper is "A Black box alert system for crash recovery and prediction using mems&RFIDTechnology which is Submitted by K.Amarendraprasad,Fahimuddin,shaik in (LICAEjuly-2012).In this paper they are briefly discussed about the project which is in a critical situation many vehicles faces accident, due to this lot of person lost their lives. Some people can be saved at that time, but because of lack of information, time and place it may not be possible. Our project will provide an optimum solution to that draw back. An accelerometer can be used in a car alarm application. Dangerous driving can be detected with an accelerometer.

Second paper is "Design and Implementation of black box alert system for crash recovery of automobiles and prediction using MEM accelerometer" which is submitted by M.S Siva Prasad in IJCMR in November 2012 (ISSN 2278-733X). Ina critical situation many vehicles undergo accident; due to this a lot of persons lost their lives.

This project will provide an optimum solution for preventing accidents. Dangerous driving can be detected with an accelerometer according to this project when a vehicle met with an accident immediately the vehicle number and persons contact number will be send to control room or a rescue team by using GSM Technology. Mechanical Systems (MEMS) is the integration of mechanical elements, sensors, actuators, and electronics on common silicon Substrate through micro fabrication technology.

In My Project "Design and Implementation for crash recovery of vehicles by using Arm7" Submitted in IJIRD in July 2013(ISSN2278-0211). This Project presents an automatic vehicle accident attenction system using GPS and GSM modems. The project is built around the ARM7 LPC2148 controller. This micro controller provides all the functionality of the SMS alert system. It also takes care of filtering of the signals at the inputs. The uniqueness of this project is, not only alerting the neighbors by its siren, but also it sends a caution SMS to four mobile numbers and automatically vehicle door opens.

Objective Of The Project

The main objective of this project to help for easy identification of crash detection and actions should takes place as early as possible. This Project describes a design of effective alarm system that can monitor an automotive / vehicle / car condition in traveling. Security in travel is primary concern for everyone. This Project presents an automatic vehicle accident detection system using GPS and GSM modems. The project is built around .the ARM7 LPC2148 controller. This micro controller provides all the functionality of the SMS alert system. It also takes care of filtering of the signals at the inputs. The uniqueness of this project is, not only alerting the neighbors by its siren, but also it sends a caution SMS to four mobile numbers and automatically vehicle door opens

Arm Processor Review:

ARM stands for Advanced RISC Machines. It is a 32 bit processor core, used for high end application. It is widely used in Advanced Robotic Applications. It performs number of instruction in a single cycle compare with other controllers it have advanced features. The Arm CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit

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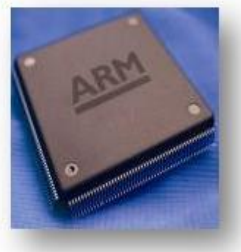
code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power .



History and Development:

- ARM was developed at Acron Computers ltd of Cambridge, England between 1983 and 1985.
- RISC concept was introduced in 1980 at Stanford and Berkley.
- ARM ltd was found in 1990.
- ARM cores are licensed to partners so as to develop and fabricate new microcontrollers around same processor cores.

Key features:

1. 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
2. 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory.

128-bit wide interface/accelerator enables high-speed 60 MHz operation.

3. In- System Programming/In-Application programming (ISP/IAP) via on-chip boot loader

software. Single flash sector or full chip erase in 400 ms and programming of

256 bytes in 1 ms.

Historical Background

The invention of the transistor at Bell Telephone Laboratories in 1947 sparked a fast-growing microelectronic technology. Jack Kilby of Texas Instruments built the first integrated circuit (IC) in 1958 using germanium (Ge) devices. It consisted of one transistor, three resistors, and one capacitor. The IC was implemented on a sliver of Ge that was glued on a glass slide. Later that same year Robert Noyce of Fairchild Semiconductor announced the development of a planar double-diffused Si IC. The complete transition from the original Ge transistors with grown and alloyed junctions to silicon (Si) planar double-diffused devices took about 10 years. The success of Si as an electronic material was due partly to its wide availability from silicon dioxide (SiO2) (sand), resulting in potentially lower material costs relative to other semiconductors.

Related work:

The use of mobile devices for gathering traffic information is not a new concept; several works indicate the feasibility of an ITS based only on location samples gathered by mobile phones. An early work describes an analytical method for evaluating real-time ITS based on data collected from GPS devices in probe vehicles: a 3-5% of penetration in the traffic flow is enough for adequate traffic estimation. Recent experiments with a system implemented solely on mobile phones show encouraging results for the feasibility and the accuracy of the traffic estimation (compared to that obtained by fixed sensors): a 2-3% penetration of mobile phones running the application in the total car flow suffices for accurate estimation of

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the average speed. Moreover, commercial navigation applications already integrate location samples from mobile phones in their algorithms for route guidance . However, security and privacy of similar traffic systems remain open challenges and research is conducted in several projects. Successive location updates by a smart phone, even without any identifier, contain spatial and temporal correlation that can be used as indirect identifiers. These can be exploited to reconstruct user paths with tracking techniques . Then traces can be processed and matched in order to infer frequently visited places, e.g., home or workplace, and finally reveal the user identity. To mitigate such threats, several solutions using cloaking techniques or privacy preserving sampling techniques have been proposed. These solutions are complementary to our proposal. In this paper we do not consider this kind of threat against the dataset of location samples. Rather, our goal is to guarantee the anonymity of the location samples and protect the system security. Relevant research in security is conducted for vehicular communication systems .Multiple short-term anonymized certificates, termed pseudonyms, can provide authentication while enhancing location privacy. These certificates are used for a short time and then have to be changed .Group signatures are also proposed, in order to reduce the overhead of pseudonym management. As they are significantly costlier (in terms of communication and computation overhead) than classic public key cryptography, special care must be taken for the overall secure vehicular communications system design Group signatures are also used in credentials systems such as Idemix that provide anonymity for authenticated transactions to services. In our proposed architecture we will use group signatures; based on initial implementation results.

Power Supply

Power supply" is sometimes restricted to those devices that *convert* some other form of energy into electricity (such as solar power and fuel cells and generators). A more accurate term for devices that convert one form of electric power into another form (such as transformers and linear regulators) is power converter. The most common conversion is from AC to DC.

Global System For Mobile Communications(Gsm)

4.2.1 Definition of GSM

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.

GSM (Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 kbit/s, together with the transmission of SMS (Short Message Service).

4.2.2 SIM900A Overview

Designed for global market, SIM900A is a dual-band GSM/GPRS engine that works on frequencies EGSM900MHz and DCS 1800MHz. SIM900A features GPRS multi-slot class 10/ class 8 (optional) and supports theGPRS coding schemes CS-1, CS-2, CS-3 and CS-4.With a tiny configuration of 24mm x 24mm x 3mm, SIM900A can meet almost all the space requirements in yourapplications, such as M2M, smart phone, PDA and other mobile devices.

The physical interface to the mobile application is a 68-pin SMT pad, which provides all hardware interfacesbetween the module and customers' boards.

- The keypad and SPI display interface will give you the flexibility to develop customized applications.
- Serial port and Debug port can help you easily develop your applications.
- One audio channel includes a microphone input and a speaker output.
- Programmable General Purpose Input & Output.

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The SIM900A is designed with power saving technique so that the current consumption is as low as 1.5mA inSLEEP mode.

The SIM900A is integrated with the TCP/IP protocol; extended TCP/IP AT commands are developed for customers to use the TCP/IP protocol easily, which is very useful for those data transfer applications.

GSM Modem

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

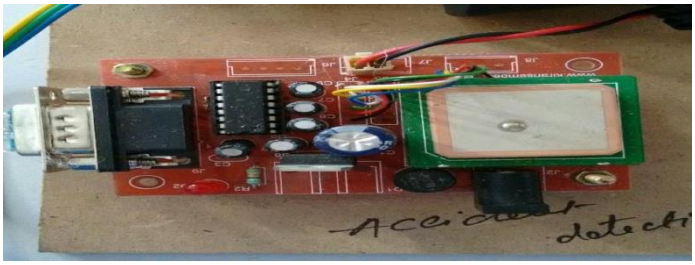
GLOBAL POSITIONING SYSTEM(GPS)

GPS Basics

The Global Positioning System (GPS) is a space-based global navigation satellitesystem (GNSS) that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver. When people talk about "a GPS," they usually mean a GPS receiver.

The Global Positioning System (GPS) is actually a constellation of 27 Earth-orbiting satellites (24 in operation and three extras in case one fails). The U.S. military developed and implemented this satellite network as a military navigation system, but soon opened it up to everybody else. Each of these 3,000- to 4,000-pound solar-powered satellites circles the globe at about 12,000 miles (19,300 km), making two complete rotations every day.

GPS Device



Rf Module

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. This wireless communication may be accomplished through optical communication or through radio frequency (RF) communication.

For many applications the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and/or receiver.RF modules are widely used in electronic design owing to the difficulty of designing radio circuitry. Good electronic radio design is notoriously complex because of the sensitivity of radio circuits and the accuracy of components and layouts required to achieve operation on a specific frequency.

Dc Motor

In any electric motor, operation is based on simple electromagnetism. A current carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel.

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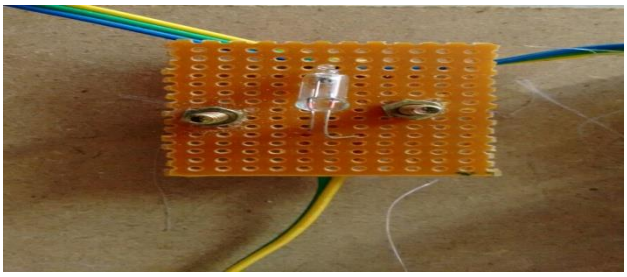
The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion

Every DC motor has six basic parts -- axle, rotor (a.k.a., armature), stator, commutator, field magnet(s), and brushes. In most common DC motors (and all that Beamers will see), the external magnetic field is produced by high-strength permanent magnets[1]. The stator is the stationary part of the motor -- this includes the motor casing, as well as two or more permanent magnet pole pieces. The rotor (together with the axle and attached commutator) rotate with respect to the stator. The rotor consists of windings (generally on a core), the windings being electrically connected to the commutator. The above diagram shows a common motor layout -- with the rotor inside the stator (field) magnets.

Sensor

A sensor (also called detectors) is a device that measures a measurable attribute and converts it into a signal which can be read by an observer or by an instrument. for example, a mercury-in-glass thermometer converts the measured temperature into expansion and contraction of a liquid which can be read on a calibrated glass tube. a thermocouple converts temperature to an output voltage which can be read by a voltmeter.

Vibratator sensor:



Vibration is one of the most popular phenomena that exists in our daily life, which is everywhere and at all the time. Vibration is generated as a result of mechanical disturbance from sources such as music/sound,noise,engine,wind and many more. Detection of vibration is an important sensor technology for monitoring the operation of machines, bridges and buildings,warrantofsecurity,prediction of natural disasters and more. As we know, thevibration sensor testing technology has been developed gradually from early last century.

Relay

A relay is a simple **electromechanical switch** made up of an electromagnet and a set of contacts. Relays are found hidden in all sorts of devices. In fact, some of the first computers ever built used relays to implement Boolean gates. In this article, we will look at how relays work and a few of their aplications. A relay is used to isolate one electrical circuit from another. It allows a low current control circuit to make or break an electrically isolated high current circuit path. The basic relay consists of a coil and a set of contacts. The most common relay coil is a length of magnet wire wrapped around a metal core. When voltage is applied to the coil, current passes through the wire and creates a magnetic field. This magnetic field pulls the contacts together and holds them there until the current flow in the coil has stopped. The diagram below shows the parts of a simple relay.

Liquid Crystal Display

LCD stands for **L**iquid **C**rystal **D**isplay. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons.The declining prices of LCDs.

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1. The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
2. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
3. Ease of programming for characters and graphics.
4. These components are "specialized" for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD.

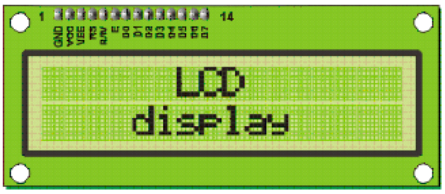

Figure 4.13 LCD

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (*Hitachi*) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics

keil software

It is possible to create the source files in a text editor such as Notepad, run the Compiler on each C source file, specifying a list of controls, run the Assembler on each Assembler source file, specifying another list of controls, run either the Library Manager or Linker (again specifying a list of controls) and finally running the Object-HEX Converter to convert the Linker output file to an Intel Hex File. Once that has been completed the Hex File can be downloaded to the target hardware and debugged. Alternatively KEIL can be used to create source files; automatically compile, link and covert using options set with an easy to use user interface and finally simulate or perform debugging on the hardware with access to C variables and memory. Unless you have to use the tolls on the command line, the choice is clear. KEIL Greatly simplifies the process of creating and testing an embedded application.

Projects

The user of KEIL centers on "projects". A project is a list of all the source files required to build a single application, all the tool options which specify exactly how to build the application, and – if required – how the application should be simulated. A project contains enough information to take a set of source files and generate exactly the binary code required for the application. Because of the high degree of flexibility required from the tools, there are many options that can be set to configure the tools to operate in a specific manner. It would be tedious to have to set these options up every time the application is being built; therefore they are stored in a project file. Loading the project file into KEIL informs KEIL which source files are required, where they are, and how to configure the tools in the correct way.

KEIL can then execute each tool with the correct options. It is also possible to create new projects in KEIL. Source files are added to the project and the tool options are set as required. The project can then be saved to preserve the settings. The project is reloaded and the simulator or debugger started, all the desired windows are opened. KEIL project files have the extension

Simulator/Debugger

The simulator/ debugger in KEIL can perform a very detailed simulation of a micro controller along with external signals. It is possible to view the precise execution time of a single assembly instruction, or a single line of C code, all the way up to the entire application, simply by entering the crystal frequency. A window can be opened for each peripheral on the device, showing the state of the peripheral. This

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enables quick trouble shooting of mis-configured peripherals. Breakpoints may be set on either assembly instructions or lines of C code, and execution may be stepped through one instruction or C line at a time. The contents of all the memory areas may be viewed along with ability to find specific variables. In addition the registers may be viewed allowing a detailed view of what the microcontroller is doing at any point in time. The Keil Software 8051 development tools listed below are the programs you use to compile your C code, assemble your assembler source files, link your program together, create HEX files, and debug your target program. µVision2 for Windows™ Integrated

Development Environment: combines Project Management, Source Code Editing, and Program Debugging in one powerful environment.

- C51 ANSI Optimizing C Cross Compiler: creates relocatable object modules from your C source code,
- A51 Macro Assembler: creates relocatable object modules from your 8051 assembler source code,
- BL51 Linker/Locator: combines relocatable object modules created by the compiler and assembler into the final absolute object module,
- LIB51 Library Manager: combines object modules into a library, which may be used by the linker,
- OH51 Object-HEX Converter: creates Intel HEX files from absolute object modules.

What's New in µVision3?

µVision3 adds many new features to the Editor like Text Templates, Quick Function Navigation, and Syntax Coloring with brace high lighting Configuration Wizard for dialog based startup and debugger setup. µVision3 is fully compatible to µVision2 and can be used in parallel with µVision2.

Conclusion Of The Project

The project "**Getting Data When Accident Occurs And Also The Location Tracking**" provide emergency responders with crucial information at the earliest possible time. Reducing the time between when an accident takes place and when it is detected can reduce mortality rates.Conventional in-vehicle accident detection and notification systems, such as On Star, are effective in reducing the time gap before first responders are sent to the scene. These systems, however, are expensive and not available in all vehicles

Future Scope Of The Project

In future we can interface different sensors with this paper, such as alcohol detector, drowsiness detector, heart rate detector, etc. In terms of these we can really prevent accident and save life. Security sensors to identify theft can also be added. It can be reprogrammed to switch off vehicle and track the vehicle in theft.

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