DESIGN AND IMPLEMENTATION OF ALARM MONITORING SYSTEM BASED ON GSM

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Abstract: - This system designs a wireless communication method using GSM to transmit data to the preset of treatment centers whenever an accident occurs. The vehicle is equipped with a GSM and a GPS module. The treatment center process the data received from the GSM module of the vehicle and identifies the location of the vehicle. The GPS module helps in tracking the location and state of the vehicle.

Keywords- ARM, GPS, GSM, Google Map API.

I. INTRODUCTION

With the problem of global population aging increasing, lack of medical hardware at the near of accident place, inadequate accident sense system performance and other related issues have become increasingly prominent. This paper presents the design and implementation of scene of the accident alarm system based with wireless network communications based on ARM, GPS and GSM, Pre-set of treatment centre as the information processing terminal for the location display and warns the alarm for the treatment people near by the accident location. When considering security in mobile systems, in common with most other systems, our main objectives are in preventing

- Providing disaster or security management system for an industry or home system.
- Alarming system is implemented for alerting people
- Using wireless GSM technology a message can be send to owner or user through SMS or by CALL

However, user expectations for instant communication and ease of use, present a number of unique challenges in the mobile environment. The original first generation mobile employed a simple electronic security system to confirm that the terminal (user) should be allowed access to the service (predefined mobile numbers fixed in controller for its security implementation).

The disaster system is built around the micro controller from Atmel. This micro controller provides all the functionality of the disaster system. A maximum no. of sensors can be connected to the system. A power supply voltage of 5 VDC is available for each sensor at the corresponding wiring terminals

II. SYSTEM DESIGN

This project consists of wireless communication for communication with the accident sense system and the Pre-set of treatment centre. The project is divided into two parts. The main part is the Pre-set of treatment unit, which acts as an Information processing unit Individual vehicle is equipped with a system called as accident sense system, which consists of GSM and GPS. When the accident occurred, Vehicles state and locations will be transmitted to the Pre-set of treatment centre through wireless communication technologies of GSM through short message format. Location information of the vehicle is tracked using the GPS module. The information of mobile vehicle is transmitted to the Pre-set of treatment unit. The Pre-set of treatment unit consists of the microcontroller with and GSM module. The GSM module in this section receives the short messages transmitted from each of the vehicle when accident occurs. After receiving related information; the treatment centre will display this information on its map i.e. on PC. With receiving alarm information, the treatment Centre staffs who are on duty will notice the handler who is the nearest to the scene of the accident in time, in order to reach the location of accident occurred, and gain more treatment time for the accident injured, and lower the accident mortality, as well as reduce incidents impacting time on the traffic. The accident sense system using ARM and GPS is effective than the existing system.

A. Hardware Circuit Design

The hardware circuit is mainly composed of six parts: MCU (Micro Controller Unit) unit, alarm indicating circuit, alarm signal input interface circuit, GSM communication module interface circuit, wireless transmitter and receiver circuit and power supply. The schematic diagram of hardware circuit is shown in Figure

The alarm system's major function includes: (1) carry on the judgment to the alarm signal and then determine the kinds of the Accident; (2) establish communications with the GSM module, complete the initialization of the GSM module and the personalization of the alarm system; (3) complete the data protocol conversion between the MCU and the GSM module, transform the alarm information into the data format in accordance with the SMS protocol and passed it to the GSM module for transmitting, simultaneously dial a fixed-line
B. Design of Alarm Signal Input Interface Circuit

This alarm system uses sirens to indicate the working status of the entire system: for indicating online status of the GSM module; and indicating signal strength; and for indicating Accident cases; and for indicating the power Supply.

C. Design of GSM Module Interface Circuit

The entire alarm system is mainly designed in accordance with the 3.3V interface circuit level, while the RS232 circuit requires 5V input and output level, and GSM terminal needs to provide users with TTL level serial output. Therefore we may need a level conversion circuit for 5V~3.3V or 3.3V~5V, here we used MAX232 to achieve the inter conversion. Currently, engineers of our country have begun to use the GSM module such as Falcom’s A2D Series, Wavecome’s WMO2 series, Siemens’s TC35 series, Ericsson’s DM10/DM20 series, ZTE’s ZXGM18 series and so on, moreover the function and usage of these modules is not very different.[3] Among these modules the performance-to-price ratio of Siemens’s TC35 series module is very high, and they already have the domestic wireless apparatus network card, therefore, we selected in this design is TC35i of the Siemens’s TC35 series. The TC35i module is the latest Siemens wireless module, small, compact design, function compatible with the TC35, and easy to upgrade to the GPRS module. The module combines RF (Radio Frequency) circuit and baseband in one, and can provide users with a standard AT command interface for data, voice, short messages and fax. Furthermore it can provide convenient, fast, reliable and secure data transmission for the user’s application development and design.

The core of the system software is the communication between MCU and GSM module, and the technical difficulty is how to set and use the AT commands. The AT commands are modem control commands, the establishment of wireless channel, data transmission and other operations are all done through it. The flow chart of main program is shown in Figure (3) below.
Along with the wireless communication technology's unceasing progress, the use of mobile network operators to offer remote monitoring and data transmission has been widely used in various fields. Especially the GSM data transmission plan based on MCU such as the GSM alarm system, automatic meter reading system and soon has gained more and more people's attention. This article introduced the concealed GSM monitor and alarm system for Vehicle, which has the characteristics of easy installation, alarm security and quickly, adapted to the needs of the market well.

IV. CONCLUSION

GSM MODEM

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it may be a mobile phone that provides GSM modem capabilities. A GSM modem could also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer.

GPS MODEM

The Global Positioning System (GPS) is a space based radio-navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control. GPS is operated and maintained by the Department of Defence (DOD). The GPS is a constellation of satellites in orbit around the Earth which transmit their positions in space as well as the precise time. It is the receiver that collects data from the satellites and computes its location anywhere in the world based on information it gets from the satellites.

V. REFERENCES