Navigation System For Female Safety

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Abstract: This paper delivers the safety for female using the embedded technology.GPS receiver is used to track the current location of the women who is in danger. At the same time the location will be transferred through GSM to the predefined contacts and nearby police station. Additionally this system emerges a shock wave around 12V which does not cause major injury to the attacker and using this, the victim can escape from that place. This device is user friendly and portable. The techniques used here can be implemented in handbag.

Keywords: GPS, GSM, Microcontroller, Shock,generator, LCDdisplay, APR9600, Mobile

1. INTRODUCTION

Nowadays, women were shining in all the fields. But the violence against them have been increasing day by day. In an understanding of society as patriarchal, 'violence against women' is conceptualized, meaning unequal relations between men and women. In addition, the term "gender-based violence" refers to any acts or threats of acts aimed at physically, sexually or psychologically harming women or causing them to suffer, which affect women disproportionately. Sexual harassment is a sexually harmful and importune behaviour. In order to reduce the crime against women ,GPS and GSM technologies has been evolved.

GPS is a navigation device which is used to track the current location with date and time. Currently, there are 24 satellites circling the earth. In GPS, calculation of location is based on radio signals travelling from the satellite to the GPS receiver. GPS technology is found in applications such as cell phones ,vehicles, wristwatches to shipping containers and ATM's. GSM is a communication device that enables eight simultaneous calls to the same radio frequency using a narrow TDMA band.

2. RELATED WORKS

In [1]authors discusses that this electronic device operating based on facial expressions by using multiple cameras.

In this module, edge detection, low pass filtering, histogram equalization, binary image processing are the methods used to recognize images. In[2] this paper depicts its construction, improvement and exploitation of GPS and GSM technology for the tracking of vehicles. In[3]author discussed augmented trepidation about sexual harassment in the administrative centre and specialized interconnecting region. The guidance programs were held to provide both male and female perception and prevent risk situation inappropriately in an alternative direction. In[4] authors describes the position data(i.e. longitude and latitude) which is extracted from the RMC(Recommended minimum data for GPS) of NMEA protocol of the GPS receiver. In [5] authors explained the importance of app called Vith U app. In this app on tapping the button twice, a message along with the location is sent to the preloaded contacts.

3. SYSTEM DESCRIPTION

A. Design Consideration

1. Arm7LPC2148
2. GPS,GSM
3. Emergency Keys
4. APR9600
5. Shock generator
6. Mobile

B. Proposed Methodology

The intimation of this paper is to secure women who is in danger by the development of technologies such as GPS and GSM technology. Smart handbag for women is specially constructed for the safety of women. The device will get activated when the supply is provided.GPS and GSM which are interfaced with ARM starts to work. It shows the current position of device. By using GPS, location(latitude and longitude)of women can be determined. Two emergency keys are present in this device. If she presses the first emergency key, location of women is known with the help of GPS. After that location will be transferred to the predefined contacts through GSM. Then, APR will be interfaced with ARM. A voice command could be provided by the APR. By pressing the second emergency key shock waves can be generated around 12V which provides less pain to an attacker.

C. Block Diagram

The ARM7 LPC2148 is ARM7TDMI-S Core Microcontroller that is a 16/ 32-Bit64 Pin (LQFP) Microcontroller from Philips (NXP).This Microcontroller unit(MCU) having 512KB Flash memory and 40KB Static RAM. The Onboard crystal frequency for maximum speed is 12MHZ.Also having Real Time Clock(RTC) with 32,768KHZ crystal and Battery Backup option. 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 B in 1ms.
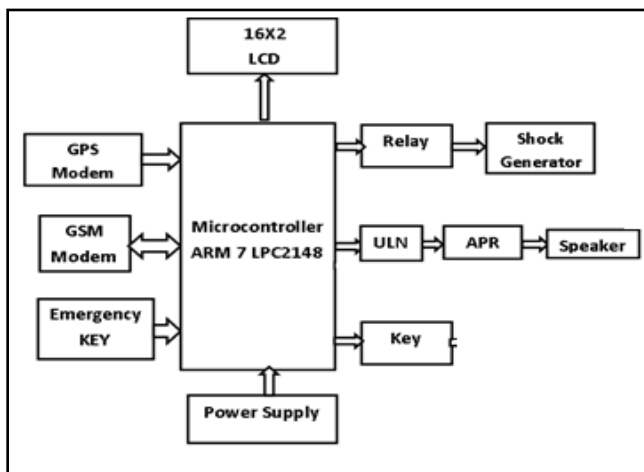

Figure 1. I/P side of the device

The external power can be AC or DC, with a voltage between the 230V AC input (9V / 12V,1A output). The ARM board produces + 5V with a voltage regulator LM7805, which supplies the peripherals. LM1117 Positive regulator + 3.3V used for peripherals related to processors and processors. User can select either USB or Ext power supply via JP14 for power supply and USB communication. Separate switch on / off (SW24) for board power control.

It has general purpose I / O (GPIO) in a small LQFP64 package up to 45 of 5 V tolerant fast general purpose I / O pins.
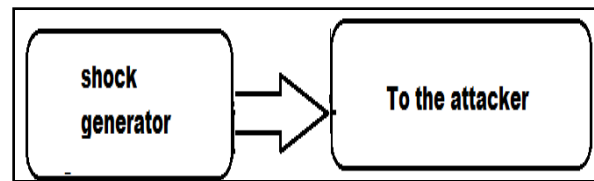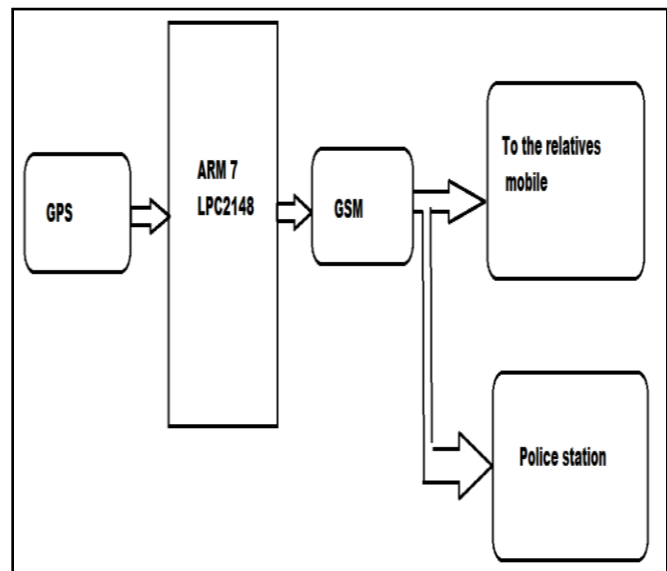

Figure 2. O/P side of the device

Figure 3. O/P side of the device

GPS

GPS is a quick and intelligent routing and rerouting and smarter destination search. It is a space-based_satellite navigation system that provides location and time system that provides location and time information in all weather conditions.
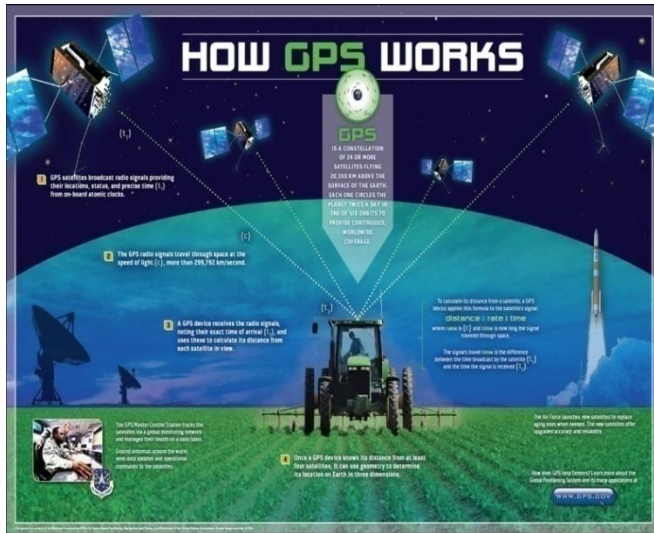
Figure 4. working of GPS

Figure 6. GSM MODEM

GPS receiver can caluculate its position many times in one second and calculate its speed and direction. A GPS receiver shows where the victim is and how fast thery are moving ,also indicates their direction .GPS receiver provides the information about victim's location.
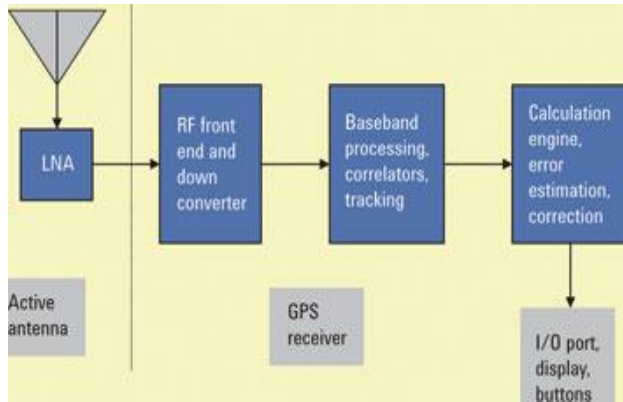
GSM has been designed with a moderate level of security of service. The system was designed to authenticate the subscriber using a key and challenge response pre - shared. Communications can be encrypted between the subscriber and the base station.
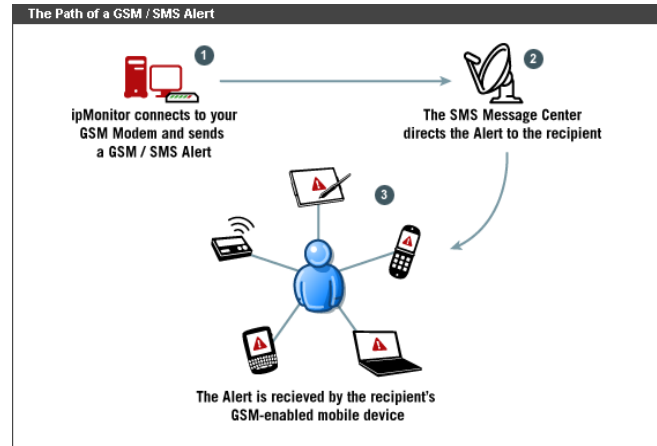

Figure 5. Building unit of GPS

Figure 7. Working of GSM

GSM

GSM is a cellular network that connects cell phones in the immediate vicinity by searching for cells. The distinctive part of GSM is Subscriber Identity Module(SIM) where the predefined contacts will be stored.

AT commands are used to control the GSM modem. Selectively there are two AT commands are used namely, AT+CMGF and AT+CMGS for setting and sending the message in text mode.

APR

The APR9600 device provides 40 to 60 seconds of genuine single-chip voice recording, non-volatile storage and playback. There is no need for external IC. APR also has a low power consumption feature that can be selected by the user. Playback and recording operations on the chip circuit are managed.

Depending on the desired operation, several messaging modes are available. These modes define the style and length of the message. Before the design starts, the designer selects the desired operating mode. The device supports three modes of message management, MSEL1, MSEL2, M8.

4. SHOCK GENERATOR

It transforms the low voltage of 9 V batteries into high enough power for shocking effect when touched, but will not be in the range to create any permanent or fatal damage.The victim can escape from that place by producing this electric shock waves.

5. SOFTWARE USED

The reproduction of software for Navigation system for female safety is taken out in step by step.
1.   Hyper Terminal
2.   Keil uvision 4 for ARM
3.   Philips utility

•   Hyper terminal emulator capable of connecting to systems through TCP/IP Networks, Dial-Up Modems, and COM ports. The location can be viewed using this software as NMEA format. NMEA is a National Marine Electronics Association. This data includes the complete PVT (position, velocity, time) solution computed by the GPS receiver. A single sentence consists of latitude, longitude, time, number of satellites used , universal time. It is just a ASCII text. The sentence looks like

•   The feature is Multi-project workspaces in the µVision4 IDE allow you to work with multiple projects at the same time. The uvision editor and debugger integrates in a single application that provides seamless embedded project development environment.

•   Philips utility software is used to download the program in to on -chip processor.The appropriate baudrate and device should be selected properly. Using the Philips

utility arm based embedded codes are easily download to the on-chip processor. It is also having the advantage of easily erasable and downloading the another code with in seconds.

6. RESULTS

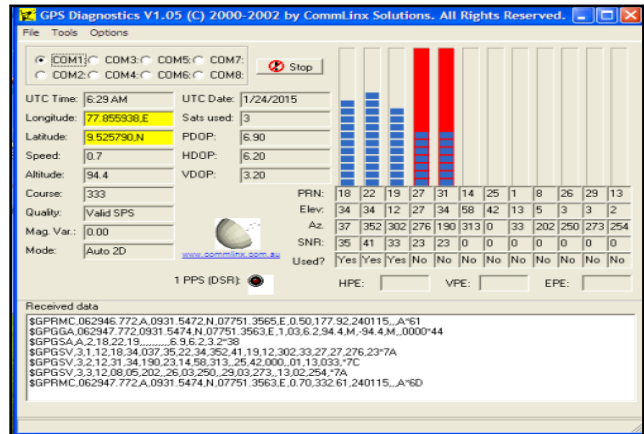 Screenshot of latitude and longitude

Figure 7. Using Hyper Terminal

It shows the current latitude and longitude of the victim using GPS receiver.

LCD Display

Figure 8. LCD display

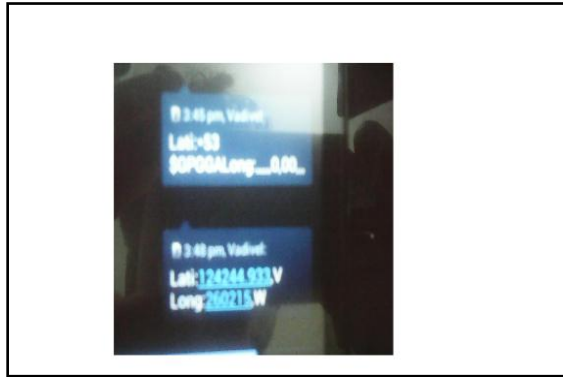When the device gets activated it displays Arm based Female safety system.

Figure 9. Message attained through GSM

The appropriate person received the latitude and longitude of the victim when the key is pressed

7. CONCLUSION

This tracking down system provides guidance for women under risk situation. It   enhances their safety. By the arrangement of hardware and embedded software ,this high speed device provides more safety to women. Future work includes that the device can automatically activates without pressing the emergency keys.

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