SELF SALVATION – The Women's Safety and Security module

[1] J.Nagaraju, [2] M.Srinivas Reddy, [3] V.Sadanandam

[1] Asst.Prof, [2] Asst.Prof , [3]Asst.Prof
[1]ECE Department
[1]MLRIT, Dundigal, Hyderabad, India

Abstract— The purpose of the project is to provide security for woman. In case of emergency situations woman will press an emergency button which will activates the GPS for location tracking and a SMS is sent to the police and family members of woman along with time. The main idea of our project is to help the women's to prevent the increase in regular kidnap and chain snatchings. Here we are providing three methods of Safety and security for women. In each method there will be an alertness that is sent to the existing Phone Numbers through GSM technology. The purpose of using GPRS is that to track the location and position. Also a Smart Phone app is developed for controlling and alert system.

Keywords: GPS (Global Positioning system), GSM (Global satellite Mobile)

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I. INTRODUCTION

Now a day's attacks on woman is increasing day by day and in the case of where she can't take a mobile and dialup to police or other family members, our proposal will be very much helpful in such cases in not only informing about attacks but also in giving the exact location of the women to nearby police station for necessary action. Women will be provided with a equipment which is not visible to others the equipment consists of GPS (Global Positioning System) module by which we can get the geographical location and these location values are displayed on the LCD (Liquid Crystal Display). In the case of any emergency conditions she can press a button once then the location information will be tracked and sent to police and family members so that she will be protected in proper time. This idea is an "Incremental Innovation". To the existing technology we have included additional features like sending an alert message to the parent and police station phone numbers. Here, we are providing three levels of security for WOMEN. (1) Smart push button System.   (2)   Location identification using GPRS.

(1) Smart push button System:
If any person wants to make an attempt on women then by pressing a button it will send alert message to the parents or friends phone numbers and also to the nearest police station. Pushing the button-1 1st time it will capture the Longitude and latitude values which will be displayed on the LCD screen. Pushing the button 2nd time call will go to the existing parent phone number. Pushing the button-2 1st time it will continuously makes the alert sound with flashing LEDs. Pushing the button-2 2nd time it will stops the sound.

(2) Location identification using GPRS:
The method of security is through GPRS we can track the women/vehicle position. by sending SMS "TRACK" to the existing phone number we can get the captured values of Longitude and latitude values and from this we can find exact location of the place.

I. Components Required:
a)   ARM7LPC2148
b)   MAX232
c)   LCD Display
d)   GSM MODEM
e)   GPS MODULE
f)   Buzzer
g)   Switches
h)   Power Supply
i)   Relay
j)   LEDs

Software Tools:

i.   Kiel IDE
ii.   Embedded-C programming
iii.   Flash magic

ARM-7 Micro Controller (LPC2148):
It is the best controller suited for learners and project purposes as it has Mother Board and Daughter Board. No external power supply is required as it takes power from the USB itself. It has a real time clock with battery holder, bidirectional buffer, On/Off switch with power indication.

GSM-Module (SIM300):
GSM (Global System for Mobile communications) is the technology that underpins most of the world's mobile phone networks. The GSM platform is a hugely successful wireless technology and an unprecedented story of global achievement and cooperation. GSM has become the world's fastest growing communications technology of all time and the leading global mobile standard, spanning 218 countries. GSM is an open, digital cellular technology used for transmitting mobile voice and data services. GSM operates in the 900MHz and 1.8GHz bands GSM supports data transfer speeds of up to 9.6 kbps, allowing the transmission of basic data services such as SMS. It 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. It uses an excellent quality GSM Modem SIM300 which comprises of an on board SMA connector with a 3db antenna. It is highly compatible, flexible and is small in size. This module has an embedded powerful TCP/IP protocol stack.

GPRS634R Module:

GPS (Global Positioning System) technology is used to find the location of any object or vehicle to monitor a child continuously using satellite signals. Three satellite signals are necessary to locate the receiver in 3D space and fourth satellite is used for time accuracy. GPS will give the information of parameters like longitude, latitude and attitude. With the help of these parameters one can easily locate the position of any object. In this GPS technology, the communication takes place between GPS transceiver and GPS satellite.

The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. With a tiny configuration of 24mm x 24mm x 3 mm, SIM900 can fit almost all the space requirements in your M2M application, especially for slim and compact demand of design.

SIM900 is designed with a very powerful single-chip processor integrating AMR926EJ-S core " Quad - band GSM/GPRS module with a size of 24mmx24mmx3mm " SMT type suit for customer application " An embedded Powerful TCP/IP protocol stack " Based upon mature and field-proven platform, backed up by our support service, from definition to design and production.

I.   Block Diagram:

II.   Schematic Diagram:
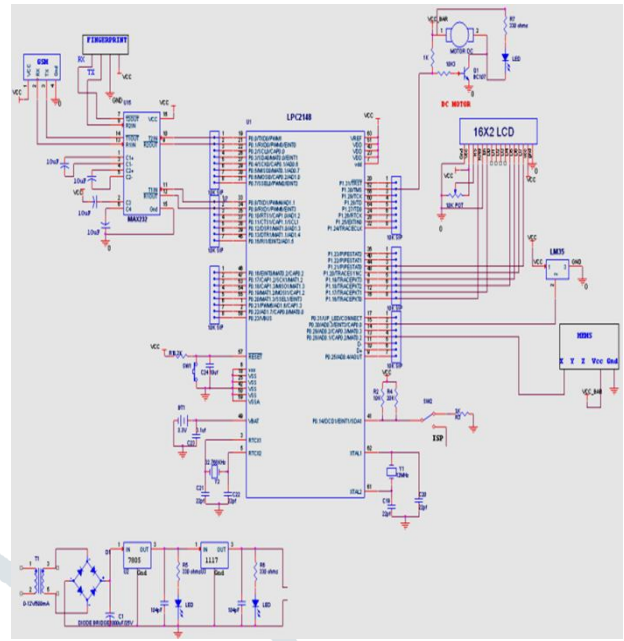
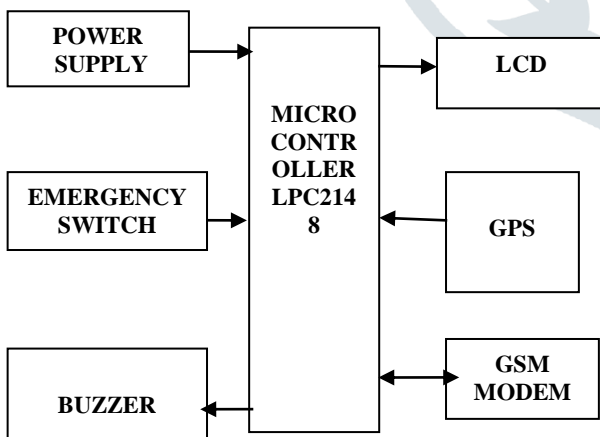### III.   Components Description:
✓   LPC2148 ARM7 Microcontroller:

- LPC2148 is a arm7 microcontroller which provides a special functioning of access many inputs which overcome the drawback of microcontroller.
- These have emulation and embedded trace support that combines the micro controller with embedded high speed flash memory.
- A wide memory interface and unique accelerator architecture allow 32 bit code execution at maximum clock rate.
- For critical code an alternative of 16-bit instruction set reduces code by 30% minimal performance penalty.
- Due to their small size and low power consumption, these have ideal applications and miniaturization is important requirement. It supports serial communication interface.

(1)   Features :

- NXP ARM7TDMI LPC2148 microcontroller with 512 Kbyte program Flash and 32+8 Kbyte SRAM.

- 12.0000 MHz crystal for maximum execution speed and standard serial bit rates − Phase-locked loop (PLL) multiplies frequency with five; 60 MHz.
- Onboard Peripherals − 2x16 character LCD with background light − Joystick switch − UART-to-USB bridge interface on UART #0 − USB 2.0 device interface − RGB-LED, each color can be controlled via PWM signal − 8 LEDs − Temperature sensor (LM75) on I2 C bus − Pushbutton on P0.14 (interrupt input) − 8x8 LED matrix, controlled via shift registers.
- LPC2148 Education Board has Embedded Artists AB − Interface to Max Stream XBee™ module (note that XBee module is not included) − Piezoelectric buzzer − 2 Analog inputs − Low-pass filtering of PWM signal − 1 Analog output − Reset button.
- Connectors − Mini-B USB connector to UART#0 UART-to-serial bridge) − Mini-B USB connector to LPC2148 device interface − MMC/SD memory card connector − JTAG − 64 pin expansion connector, all LPC2148 I/O pins are available on connector − 2.1 mm power supply connector.
- 2 Kbit I2 C E2 PROM for storing non-volatile parameters • Onboard low-dropout voltage and reset generation. − Generates +3.3V (and +5V if 9-15VDC is used to power the board) − +3.3V available for external circuits, up to 300 mA.
- Power supply − 9-15 VDC, ≥200 mA from 2.1 mm power connector − Can also be powered directly from any of mini-B USB connectors.
- Simple and automatic program download (ISP) via UART-to-serial bridge channel − Circuit that automatically controls the boot loader from UART-to-serial bridge channel.
- Dimensions: 156 x 110 mm − Four layer PCB (FR-4 material) for best noise immunity 1.3 Expansion Boards The 64 pin expansion connector, with all LPC2148 I/O pins available.

✓ **GSM-Module (SIM300) :**

- These products are widely used for GSM voice communications and TCP or IP stacks.
- These products offer a high quality serial TTL interface for easy and direct interface to microcontroller.
- Uses the extremely popular SIM 300 GSM module Provides the industry standard serial RS232 interface Provides serial TTL interface for easy and direct interface to microcontroller Provision for 3V lithium battery holder Can be used for GSM voice

communications, data/Fax, SMS, GPRS and TCP/IP stack Can be controlled through standard AT commands Operating Voltage: 7-15 AC or DC.
- SIM300 is a triband GSM modem being able to operate only in 900,1800,1900MHz band.

(1) **General features :**
  - Tri-Band GSM/GPRS 900/1800/1900 MHz.
  - GPRS mobile station class B .
  - Compliant to GSM phase 2/2+
    − Class 4 (2W @ 850/900MHz)
    − Class 1 (1W @ 1800/1900MHz)
  - Dimension: 40mm x 33mm x 2.9mm
  - Weight: 8 g
  - Control via AT commands (GSM 07.07, 07.05 and SIMCom enhanced AT Commands)
  - SIM application toolkit
  - Supply voltage range 3.4V...4.5V
  - Low power consumption
  - Normal operation temperature: -20°C to +60°C
  - Restricted operation temperature: -30 °C to -20 °C and +60 °C to +80 °C
  - Storage temperature: -40°C to +85°C

(2) **Specifications for SMS via GSM** :
  - Point-to-point MO and MT
  - SMS cell broadcast
 - Text and PDU mode

(SIM900) :

SPECIFICATIONS:
- Quad-Band 850/ 900/ 1800/ 1900 MHz
- GPRS multi-slot class 10/8
- GPRS mobile station class B
- Compliant to GSM phase 2/2+ o Class 4 (2 W @850/ 900 MHz) o Class 1 (1 W @ 1800/1900MHz)
- Dimensions: 24*24*3mm
- Weight: 3.4g
- Control via AT commands (GSM 07.07 ,07.05 and SIMCOM enhanced AT Commands) Low power consumption: 1.0mA(sleep mode)
- Operation temperature: -40°C to +85 °C\ Specifications for Fax Group 3, class 1 Specifications for Data GPRS class 10: max. 85.6 kbps (downlink)
- PBCCH support Coding schemes CS 1, 2, 3, 4 CSD up to 14.4 kbps

- USSD Non transparent mode PPP-stack Specifications for SMS via GSM/GPRS Point to point MO and MT
- SMS cell broadcast Text and PDU mode Software features 0710 MUX protocol embedded TCP/UDP protocol FTP/HTTP Special firmware
- MMS Java (cooperate with Iasolution) Embedded

Hardware Working Module:
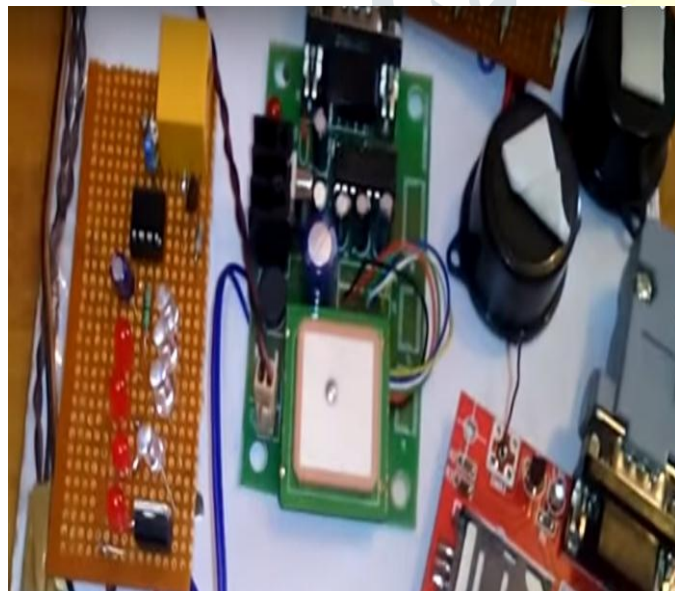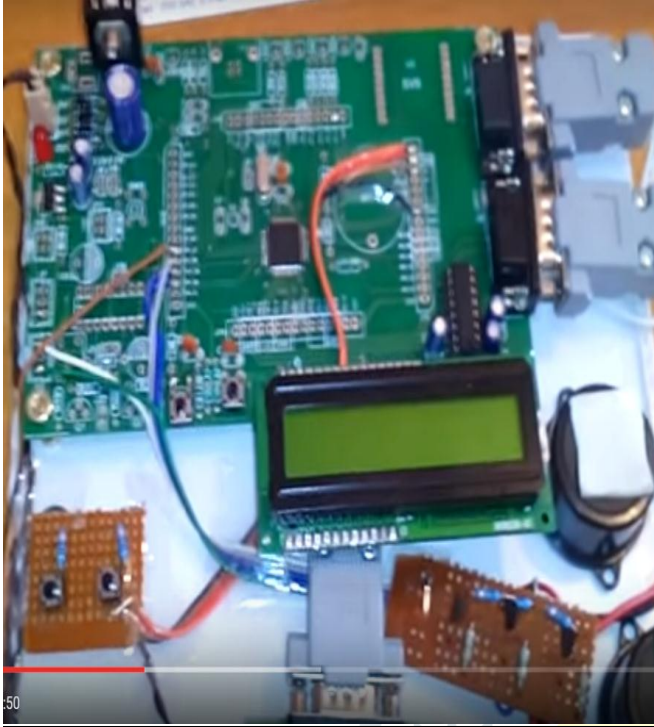
Applications:

- To prevent the Children kidnapping attempts.
- To minimize the women kidnapping attempts.
- To decrease the chain snatching attempts.
- It is also helpful for aged persons or senior citizens whenever they are missed or forgotten their home place.
- It is useful for the complications being faced by the people who require help when they are helpless. Old citizens who are being encountered by sudden attacks require help at that moment.
- It is also useful for aged patients whenever they require any emergency.

Future scope:

- We can make the existing module in to a smart device like a hand watch or ring.
- We can also make an app for women security and safety applications.

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