

# WOMEN SAFETY DEVICE WITH GPS, GSM AND HEALTH MONITORING SYSTEM

Piyush Kumar Verma<sup>1</sup>, Arpit Sharma<sup>2</sup>, Dhruv Varshney<sup>3</sup>, Manish Zadoo<sup>4</sup>

<sup>1,2,3</sup>UG student, Department of ECE, IMS ENGINEERING COLLEGE GHAZIABAD, INDIA

<sup>4</sup>Associate Prof. IMS ENGINEERING COLLEGE GHAZIABAD, INDIA

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**ABSTRACT:** *In light of the present situation of the metro cities and other big cities, women security has emerged as one of the most important requirements in our country. In this world of advanced technology and smart electronics it is required to have a simple and cost-effective safety gadget that helps the victims during unforeseen dangers. This paper covers descriptive details about the design and implementation of prototype for an electronic gadget which has the potential to serve as a safety wear in the coming years. The device consists of a switch, microcontroller (ATmega328P), GSM module (SIM900), GPS module (Neo-6M), buzzer, and pulse sensor (SEN-11574). The main working of this project is that anytime a woman senses danger, all she has to do, is to hold on the button of the device. Once the device is activated, it tracks the place of the women using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to already registered mobile number and the police control room. The pulse sensor checks the pulse of victim and in abnormal health situation the device also sends current GPS location to ambulance at every 10 sec in form of SMSs. The main advantage of this system is that this device small and easy to carry. The use of sophisticated components ensures accuracy and makes it reliable.*

**KEYWORDS:** Emergency Button, BUZZER, GPS Tracker and GSM Module, Security, Sensors, Etc.

## INTRODUCTION:

In today's world, women safety has become a major issue in our country as women can't step out of their house at any time, especially during night. It is primarily due to fear of violence against them or being physically or sexually abused. The fear of harassment against women is not only the condition at outside but it may also happen at homes. Even in the 21st century where the technology is rapidly growing and new gadgets are being developed but still women and girls are facing problems. They often work across ethnic, religious, political, and cultural divides to promote liberty. We know that our society is all aware of importance of women safety, but it is also a duty of individual that they should be properly protected. Not only this, we must create such an environment in our society that women must feel secured outside their house even

when they are alone at any time. Women are not so physically fit as compared to men so in case of a need a helping hand would be a boon for them. The best way to reduce probability of becoming a victim of violent crime (robbery, sexual assault, rape, domestic violence) is to recognize, defense and look up resources to help you out of hazardous situations. If a women is in dilemma or get split from friends during a night out or someone is following with bad intention (sexual assault) or don't know how to find back residence then this device with her will guard her and bring assistance when she needs it by giving her current location and health conditions to her associates and control center through SMS and call. This device not only provides family and police support but also helps in getting medical support as fast as possible.

## PURPOSE:

- The purpose of designing this gadget is: To design and develop easy-to-use personal safety gadget. To employ Arduino Uno (ATmega328P microcontroller) for the gadget.
- To integrate Arduino circuit board with a SIM900 GSM Modem to send SMS and calls.
- To use the present technology for enhancing social welfare by providing a low cost device for timely and reliable communication.

## DESCRIPTION:

### 1. DESIGN OVERVIEW

**Battery:** 9v battery is used to power the circuit.

**Voltage Regulator (7805):** The microcontroller and associated circuitry works at 3.3V-5V supply. The voltage regulator 7805 is used to obtain a 5 V DC output. Also LED indicators are used for indicating these voltages.

**Push Switch:** When push button is pressed then it will send signal to microcontroller, then microcontroller will send the GPS co-ordinates via GSM to the police station or to the family members. In case medical requirement this GSM also calls ambulance.

**Controller(ATmega328P):** The Atmel 8-bit AVR RISC-based microcontroller combines 32kB ISP flash memory with read-while-write capabilities, 1kB EEPROM, 2kB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts. The device achieves throughput approaching 1 MIPS per MHz

**GPS Module (Neo-6M):** It stands for Global Positioning System, which gives the current date, time, longitude, latitude, altitude, speed, and travel direction / heading among and other data of any device. It can be interfaced with normal 5V Microcontrollers with the help of the in-built 3V-5V converter unit. It consists of 4 Pins are 5V, TX, RX, and GND. This standalone 5V GPS Module does not require external components. It consists of internal RTC Back up battery and can be directly connected to USART of the microcontroller.

**GSM (SIM900A):** GSM which stands for Global System for Mobile Communication is a digital mobile telephony system. SIM900 can fit almost all the space requirements in the M2M application with dimensions of 24mm x 24mm x 3 mm. This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs and calls. The processor is also in charge of a SIM card which needs to be attached to the outer wall of the module. The module works on voltage between 3.4 and 4.5 V.

**Pulse Sensor (SEN-11574):** The Pulse Sensor Amped is a plug-and-play heart-rate sensor for Arduino. It essentially combines a simple optical heart rate sensor with amplification and noise cancellation circuitry making it fast and easy to get reliable pulse readings. It sips power with just 4mA current draw at 5V so it's great for mobile applications.

**Buzzer:** It is used as an alarm to the nearby people so that they may understand that that someone is in need.

## 2. WORKING

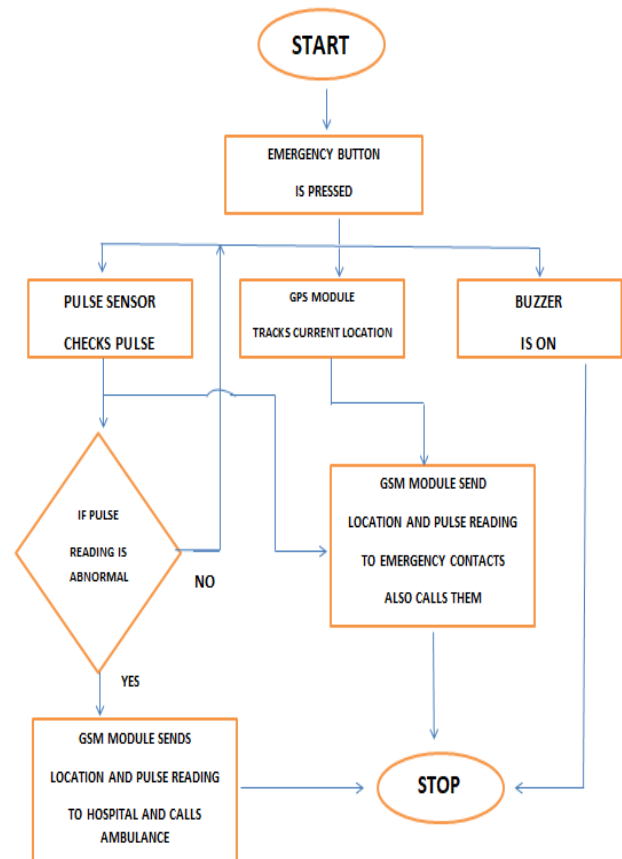
The main purpose of our project is to provide security to the women from dangerous situations. This device consists of a key or button which can be pressed by the women when she is in need or when she feels insecure. As the

switch is pressed by the women the microcontroller gets the command and it takes the current latitude and longitude value of the victim with the help of GPS module. Not only this, the pulse sensor also becomes active and starts sensing the pulse value of the victim and sends this value to the microcontroller.

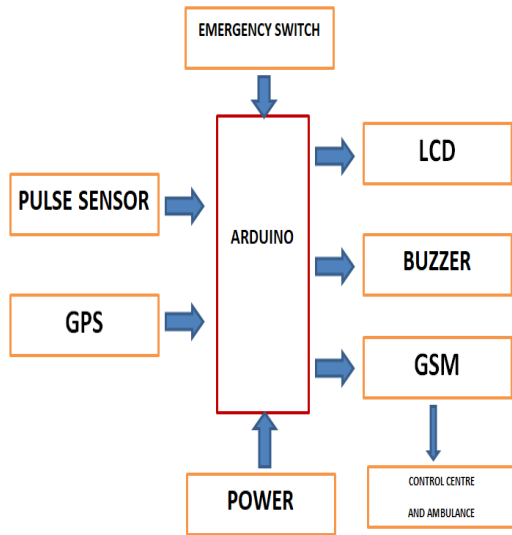
The microcontroller switch ON the buzzer present in the device so that nearby people may notice the critical condition and may come to rescue. And microcontroller sends the SMS of current location and pulse reading to the registered mobile number of the family member and police with the help of GSM module. The GSM sends the current location and other data at every 10sec so that if victim is changing its current location continuously then that can be easily traced by police. And this GSM module also calls the family member and police station.

In case if the pulse reading also goes abnormal then the microcontroller command the GSM module to send the pulse reading by SMS and to call the ambulance so that the immediate medical help can be provided.

### FLOW CHART:



**BLOCK DIAGRAM:**



**APPLICATIONS**

- It is used for safety of women.
- It can also be used for child tracking during school time.
- It can also be used as a vehicle tracking system.

**FUTURE SCOPE**

- This device is can be made so small that it can be used as a hand band.
- This device can be compatible with mobile phones.
- Voice messages can be sent during need.
- Voice recorder and camera can also be added to the system.

**CONCLUSION**

The proposed design will deal with critical issues faced by women during night and provide security with advanced technology. While the society may or may not change its mind set but this device will help to feel women independent.

**REFERENCE**

1. Suraksha. A device to help women in distress: An initiative by a student of ITM University Gurgaon. efytimes.com. 2013. Available from: <http://efytimes.com/e1/118387/SURAKSHA-A-Device-To-Help-Women-In-Distress-An-Initiative-By-A-Student-Of-ITM-University-Gurgaon.pdf>

2. Pantelopoulos A, Bourbakis NG. A survey on wearable sensor-based systems for health monitoring and prognosis. IEEE Transactions on Systems, Man and Cybernetics – part C: Applications and Reviews. 2010 Jan; 40(1):1–12.

3. Toney G, Jaban F, Puneeth S. et al. Design and implementation of safety arm band for women and children using ARM7. 2015 International Conference on Power and Advanced Control Engineering (ICPACE); Bangalore. 2015 Aug 12-14. p. 300–3.

4. Vigneshwari S, Aramudhan M. Social information retrieval based on semantic annotation and hashing upon the multiple ontologies. Indian Journal of Science and Technology. 2015 Jan; 8(2):103–7.

5. Chand D, Nayak S, Bhat KS, Parikh S. A mobile application for Women’s Safety: WoS App. 2015 IEEE Region 10 Conference TENCON; Macao. 2015 Nov 1-4. p. 1–5.

6. Sethuraman R, Sasiprabha T, Sandhya A. An effective QoS based web service composition algorithm for integration of travel and tourism resources. Procedia Computer Science. 2015; 48:541–7.

7. Gowri S, Anandha Mala GS. Eicacious IR system for investigation in textual data. Indian Journal of Science and Technology. 2015 Jun; 8(12):1–7.

8. George R, Anjaly Cherian V, Antony A, et al. An intelligent security system for violence against women in public places.