



# Design and Implementation of Portable Belt for Soldiers Using GPS and GSM Modem

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**Abstract**— Present scenario of nations security has become an important constrain. During war, tactics is main factor in any country's security. There are many concerns regarding the safety of the soldiers M-Health enables GPS (Global positioning system) tracking of these soldiers using Smart sensor. GPS used to log the longitude and latitude so that direction can be known easily. A personal server will provide the connection to the server at the base station using a wireless communication. Every soldier's belt is integrated with GSM (Global system for Mobile communication) module which enables the communication with the base station in case of injuries & calamities. In the proposed schema idea is to introduce a location tracking device for soldiers as well as to update status of the soldiers during the war.

**Keywords** — GSM, GPS, Sensors

## I. INTRODUCTION

The Indian Army is the world's second largest standing volunteer army. Its primary mission is to ensure the national security and defense of the Republic of India from external aggression and threats, and maintaining peace and security within its borders. Soldier in army typically facing death. He always stick on to his responsibility. He fights in most troublesome terrains, on mountains and hill, in plains and forest, in battle field. . As the citizens of the nation It is our responsibility to assist our soldiers, so we are introducing we are introducing the project which will be very useful for providing health condition of the soldiers and make available of medical aid to them in dangerous situation in the battlefield. In our system we are mainly Focusing on Soldier's health in terms of his body temperature and his heartbeat. If soldier gets wounded and becomes unconscious by gunfire then his heart beats gradually increases or sometimes it decreases. In this Situation the information about current heart beat rate will be sent to the base station. If heart beat either increase over threshold level or decreases below the threshold level, a message will be automatically sent to the base station through GSM (Global System for Mobile Communication) modem. There are two switches warning switch and emergency switch In case if the soldier finds the unusual things happening around him .he can inform to the base station by toggling the warning switch if there is an immediate emergency he can toggle the emergency switch once he toggles any of these switches the message will be sent to the base station along with his location through GSM. GPS (Global Positioning System) is used to track the exact position of the soldier using latitude and longitude values. . Just in case if soldier is hurt then by victimization the GSM electronic equipment connected to the device will send a SMS to the base station. The goal of this project is to develop a cost efficient, less power consumption, reliable and most importantly a portable device which will help the soldier in terms of security, health and mainly to save the life of a soldier.

## II. RELATED WORK

### [1] Soldier Tracking and Health Monitoring Systems.

**Authors:** Shweta Shelar, Nikihl Patil, Manishjain Sayahli Chowdri and Smita Hande.

This paper proposes the concerns regarding the safety of the soldiers. This system enables GPS (Global positioning systems) tracking of these soldiers. It is possible by M-Health. The M-health can be defined as mobile computing, medical sensors and communication technologies for health care. In this system, smart sensors are attached to the body of soldiers. This is implemented with a personal server for complete mobility. [6]

### [2] GPS based soldier tracking and health indication system with environmental analysis

**Authors:** Govindaraj A, Dr. Sinduja banu.

This paper mainly gives the idea of soldier security and sensors. In soldier's security, bio-sensors systems gives different types of small physiological sensors, Barometric sensor and Oxygen analyser sensor, transmission modules and processing capabilities Soldier-to-soldier wireless communications is established through the communication channel that will be required to relay information on situational awareness, tactical instructions, and covert surveillance related data during special operations reconnaissance and other missions. [2]

### [3] Health Monitoring and Tracking of Soldier Using GPS

**Authors:** Pavan Kumar, Ghadge Rasika Vijay, Patil Vidya Adhikrao

This paper gives the idea of portability of the system. The devices are being added to weapons, firearms, and militaries. Such as the Israel Army are exploring the possibility of embedding GPS devices into soldiers' vests and uniforms so that field commanders can track their soldier's movements in real time. By using these equipment's we are trying to implement the basic life-guarding system for soldier in low cost and high reliability. [6]

### III. PROBLEM STATEMENT

A challenging problems associated with the existing systems are the complexities such as portability issues the device which was interfaced with less application and consumes more power. Signalling was the major issue because of old model sim 300, GPS had no external antenna.

### IV. PROPOSED SYSTEM

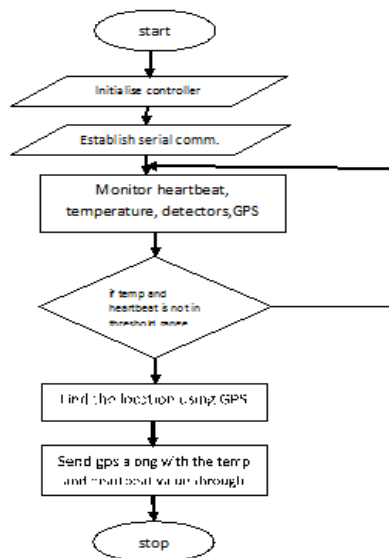
Implementation of proposed system is to be done using Embedded System consisting of an ARM controller and different types of sensors to indicate the health status, protect the soldiers and tracking of soldiers.

- *Security and Safety for Soldiers:* GPS tracks position of soldier anywhere on globe and also health system monitors soldier's vital health parameters which provides security and safety for soldiers.
- *Continuous Communication is Possible:* Soldiers can communicate anywhere using GSM which can help soldier to communicate among their squad members whenever in need.
- *Less Complex Circuit and Power Consumption.* Use of ARM processor and low power requiring peripherals reduce overall power usage of system. Modules used are smaller in size and also lightweight so that they can be carried around.

### V. METHODOLOGY

The methodology adopted for this project is to use Non-invasive sensors to measure heart beat rate and body Temperature. GSM modem is used as the communication channel between the soldier and the base station to provide desired output. All the components used in the circuit are low powered and cost efficient. The acquired data is real time and is sent through Analog to Digital Converter and into Micro controller. [4]

### FLOW CHART



*The flowchart of GPS and GSM with health sensors will show the flow of data in the soldier unit.*

### SYSTEM ARCHITECTURE

The system architecture gives the structural view of our system it is the conceptual model of the system. Fig shows how the system works. It consists of ARM controller and various sensors and detector the metal detector is used to detect an armed man around the soldier and gives the signal to the soldier. The metal detector is used to detect an armed man around the soldier and gives the signal to the soldier. PIR (Passive infrared) is used to sense the moving object around the soldier.

The two switches is used to send the signal to the base station concerning the situation there are two biometric sensors temperature sensor and heart beat sensor which gives the current health status of the soldier.

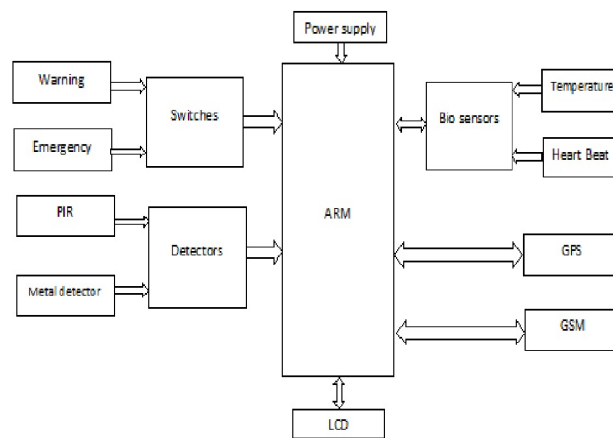


Fig 2: The proposed architecture

## VI. CONCLUSION

The Integrated Portable System once developed would help in finding Health status of soldier with measures of Pulse Rate and body temperature. The system would also help in locating the soldier's position by using GPS. The information will be sent to the base station through GSM modem so that further necessary action could be taken.

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