

# Soldier Health and Position Tracking System

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**Abstract-** *In enemy territory soldiers not only have to deal with the physical threat, but also with stress and fatigue caused by protracted operations or lack of sleep. So for the security purpose we need a tool for remote soldier performance and health monitoring. So in this project a tool is implemented using biosensors for health monitoring purpose. Also a GPS system is used in order to track the location of soldier. Additionally a GSM modem is also used to make the system wirelessly compatible. Any abnormalities in the readings of wireless body area sensor network (WBASNs) is considered as a trigger for GSM to establish the connection between the soldier and base unit and send current location and health status to the receiver. By using all this equipments we had tried to implement the basic guarding system for the soldier in low cost, light weighted, portable and precise device.*

## I. INTRODUCTION

The nation's security is monitored and kept by army, navy and air-force. The important and vital role is of soldiers who sacrifice their life for their country. There are many concerns regarding the safety of the soldier. Soldiers entering the enemy lines often lose their lives due to lack of connectivity, it is very vital for the army base station to know the location as well as health status of all soldiers. India has already lost so many soldiers in war-fields as there was no proper health backup and connectivity between the soldiers on the war-fields and the officials at the army base stations. Recently on 29 September 2016, a military confrontation between India and Pakistan began; Indian soldiers conducted a surgical strike against militant launch pads across the line of control in Pakistani-administered Azad Kashmir, and inflicted "significant casualties".

Indian soldiers are mainly known for their courage, in spite of scarce ammunitions and safety measures; they have many triumphs to their credits. All must be really

concerned about the safety of the soldiers, so we have decided to build a project which will efficiently keep a check on the health status of the soldier, and his precise location to equip him with necessary medical treatments as soon as possible.

Soldier's tracking is done using GPS and GSM is used to provide wireless communication system. For monitoring the health parameters of soldier we are using bio medical sensors such as temperature sensor and heart beat sensor. An oxygen level sensor is used to monitor atmospheric oxygen so if there are any climatic changes the soldiers will be equipped accordingly.

So this paper focuses on tracking the location of soldier from GPS, which is useful for control room station to know the exact location of soldier and accordingly they will guide them and it is for High-speed, short range, soldier-to-soldier wireless communications to relay information on situational awareness with Bio-medical sensors, GPS navigation.

## II. HARDWARE REQUIREMENTS

The hardware requirements are as follows

### A. Arduino Uno



Fig. 1: Arduino Uno

Arduino is an open source, PC paraphernalia and programmed organization, endeavor, and client group that plans and produce microcontroller packs for

constructing programmed devices and intelligent object that can detect and control questions in the real world. The inception of the Arduino extend began at the Interaction Design Institute in Ivrea, Italy. The equipment reference plans are appropriated under a Creative Commons Attribution Share. The device operates between 1.8-5.5 volts. The ATmega328 is a single-chip microcontroller created by ATmega in the mega AVR family. The device achieves throughput approaching 1 MIPS per MHz.

B. Heartbeat Sensor:



Fig. 2: Heartbeat Sensor

The sensor used in this project is pulse sensor-SEN-11574. Heart rate data can be really useful for determining the health status of a person. The pulse sensor amp'd 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 4 mA current draw at 5V. To use it simply clip the pulse sensor to earlobe or fingertip.

C. Temperature Sensor

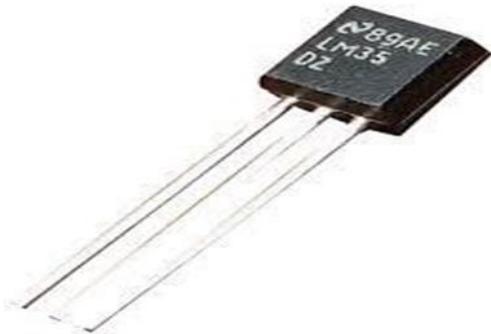


Fig. 3: Temperature Sensor

The LM 35 series are precision integrated-circuit temperature devices with an output voltage linearly-

proportional to the centigrade temperature. The LM35 device has an advantage over linear temperature sensor calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient centigrade scaling. To find the health status of soldier base station should know the body temperature and pulse rate of the soldier. So we are using LM35 body biosensor as it is a low cost temperature sensor and it does not require signal conditioning. The LM35 generates a higher output voltage than thermocouples and may not require that the output voltage be amplified. As the temperature increase above the specified value the GSM module will immediately alert the Base station and thus will not wait for heart beats to go out of the normal range.

D. Power Supply

AC adapters are used with electrical devices that require power but do not contain internal components to derive the required voltage and power from mains power. The internal circuitry of an external power supply is very similar to the design that would be used for a built-in or internal supply. External power supplies are used both with equipment with no other source of power and with battery-powered equipment, where the supply, when plugged in, can sometimes charge the battery in addition to powering the equipment. Use of an external power supply allows portability of equipment powered either by mains or battery without the added bulk of internal power components, and makes it unnecessary to produce equipment for use only with a specified power source; the same device can be powered from 120 VAC or 230 VAC mains, vehicle or aircraft battery by using a different adapter. Another advantage of these designs can be increased safety; since the hazardous 120 or 240 volt mains power is transformed to a lower, safer voltage at the wall outlet and the appliance that is handled by the user.

E. GPS Module



Fig. 4: GPS module



sensor and heartbeat sensor measure temperature (in Celsius) and heartbeat (in BPM) of the soldier respectively. If temperature (t) exceeds 40 and heartbeat (t) is not in between 65 and 100 then GPS tracks the exact location of the soldier and sends an alert message to the authority by using GSM module.

#### IV. RESULTS

A message is send on the registered number confirming about GSM and GPS configuration. Later as the body parameters (temperature and heartbeat) deviates from the given threshold values, an alert message is send to base station along with the precise location of the soldier. The health status of soldier is shown in Fig.9.

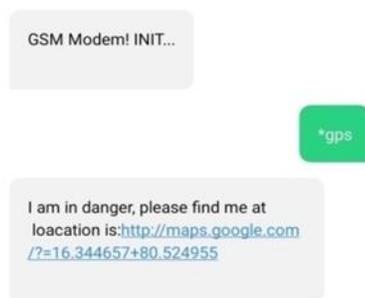


Fig.9: Result

#### CONCLUSION

From the above implementation we have concluded that the communication hurdles between the soldiers and authorities at the base unit is overcome using GSM, the precise location and health parameters are known using GPS and wireless body area sensor network (WBASNs) respectively and with the GSM modem all information is send to the base station so that field commander will take necessary action. In order to bring real time solution for the problems being faced by soldiers in war filed, we can dial an emergency call by using advanced versions of GSM module, if the soldier health parameters crosses threshold value or soldier co-ordinates goes out of a certain / pre-decided track.

#### REFERENCES

- [1] Sweta Shelar, Nikhil Patil, Manish Jain, Sayali Chaudhari, Smita Hande (8th March, 2015).” Soldier Tracking and Health Monitoring Systems”. Proceedings of 21st IRF International Conference, Pune India. ISBN: 978-93-82702-75-7 pages: 82-87.
- [2] Dineshwar Jaiswar, Sanjana S. Repal (2015, July).”Real Time Tracking and Health Monitoring of Soldier using ZigBee Technology”. International Journal of Innovative Research in Science, Engineering and Technology: a Survey. Vol 4, Issue 7 pages 5560-5574.
- [3] Shruti Nikam, Supriya Patil, Prajakta Powar, V.S.Bendre.”GPS Based Soldier Tracking and Health Indication System”. International Journal of Advanched Research in Electrical, Electronics and Instrumentation Engineering, Pune, Maharashtra, India. Vol 2, Issue 3.
- [4] Pangavne S. M., Choudhary Sohanlal & Pathak Bhavik (2015).”Real Time Soldier Tracking System”. IOSR Journal of Electronics and Communication Engineering (IOSR-JECE), Nashik, Maharashtra: pp. 21-24.
- [5] P.chakravarth, S.Natarajan, M.Anto Bennete “GSM based soldier tracking system and monitoring using wireless communication” Department of Electronics and Communication, published in September 1st, 2017.
- [6] Akshita v.Armarkar, Deepika J, Punekar, Mrunali, p.Kapse, Shweta Kumari, Jayshree Shelka “Soldier health and position tracking system” Department of ETC engineering , volume 7 issue no..3
- [7] Patil Akshay , Shelake Balaji, Pinjari Raju, Mirajkar P.P “GPS based soldier tracking and health monitoring”, Department of ETC engineering, volume 40 issue:03 March 2017.
- [8] Shruthi Nikam, Supriya Patil, Prajkata Powar, V.S.Bendre “GPS based soldier tracking and health indication system”, Department of E&TC , PIMPRI CHINCHWA COLLEGE OF ENGINEERING, volume 2, issue 3, March 2013.
- [9] Govindiraj A, Dr.S.Sindhurja Banu “GPS based soldier tracking and health indication system with environmental analysis”, Department of

Electronics and Communicaton Engineering  
volume 2, issue 12, Decemember 2013.

- [10] Zeeshan Raza,Kamaran Liaquat,Shahazad Ashraf  
“Monitoring of soldier health and transmission of  
secret codes”,NFC instutution of engineering  
volume 8 no 2,june 2017.