

TELEMEDICAL MILITARY JACKET

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Abstract— *It is always difficult for army soldiers to establish and maintain contact with base camps while dealing with various geographical areas and difficult weather conditions. It is very important to monitor health status of the dispatched soldiers fighting against enemies and difficult weather conditions. Telemedical jacket helps to overcome all these issues. Telemedical jacket monitors the health status of individual soldiers by measuring heartbeats and blood oxygen level. It also points the location of the soldiers using GPS . This all data is sent over to the base station via GSM. This process helps to guide the soldiers about location and to provide them with proper medical attention in event of severe health issues. By using this technology army can pursue critical operations with proper control over the soldier's health condition.*

I. INTRODUCTION

The nation's security is monitored by nation's 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. Nations lose many soldiers in war fields as there is no proper health backup and connectivity between the soldiers on the war-fields and the officials at the army base stations. At the point when the officers are on a mission and spread out on the field it becomes troublesome for their authority to monitor their area location. The achievement and disappointment of the mission depends mainly on the trooper's security and also mission design. The essential parameters are their wellbeing points of interest, current area, effective correspondence and ongoing data. An intelligent human tracking system can solve these issues. This can give location area data together with wellbeing parameters of individual trooper who is occupied with basic mission and can't give information progressively. This system can likewise be utilized for safety and security of any individual in everyday life.

In this undertaking a model of such system is being created that transmit individual information in genuine time by means of remote system. It is an idea for deciding the geographic area of a human and transmitting this data to a remote place. The main aim of this work is to find 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.

II. LITERATURE SURVEY

In situation of wars and military pursuit activities, officers gets harmed and stick in difficult situations. To discover officers and to communicate with armed force base station there is need of GPS gadget for finding troopers, Wireless Body Area Sensor Networks (WBASNs) to detect wellbeing related parameters of troopers and a remote handset to transmit the information remotely. G. Raj, S. Banu, has examined on ongoing favorable position in developing innovation, in the field different wearable, convenient ,light weighted and little estimated sensor that have been produced for checking of the human physiological parameters [6] .The body sensor arrange (BSN) comprises of numerous biomedical and physiological sensors, for example, pulse sensors , Electrocardiogram (ECG) sensor, electro-dermal action (EDA) sensor which can be set on human body for wellbeing checking progressively [1]. Shruti Nikam, Supriya Patil, Prajka Power, V.S. Bendre [3] had introduced an thought for the wellbeing of troopers. There are numerous instruments which can be utilized to see the wellbeing status of officers and also ammo on them. The Bio sensor which comprise of different sorts of little physiological sensors, transmission modules have extraordinary handling abilities and can encourages the ease wearable answers for wellbeing checking.

Additionally as expressed by Dinesh Kumar Jaiswar, Sanjana S Repal in their study, P.S. Kurhe, S.S Agrawal had presented a framework that offers capacity to track the officers at any minute moreover ,the fighters will be ready [2] to speak with control room utilizing GPS facilitate in their pain. This framework is solid, vitality productive for remote fighter wellbeing checking and their area following. It can send the detected and handled parameters of officer continuously. As proposed by P.Kumar, G.Rasika , It empowers to armed force control space to screen wellbeing parameters of warriors like heartbeat, body temperature, and so forth utilizing body sensor systems.[7] The parameters of warriors are estimated persistently using remotely transmitted utilizing GSM.

III. SYSTEM DESIGN

The proposed system of Telemedical Soldier Jacket Consist of 6 major components

1. The microcontroller
2. The Biosensor
3. The GPS module
4. The GSM module
5. The OLED display
6. The Power Supply.

The soldier's equipment to be carried consist of these components which are integrated with each other.

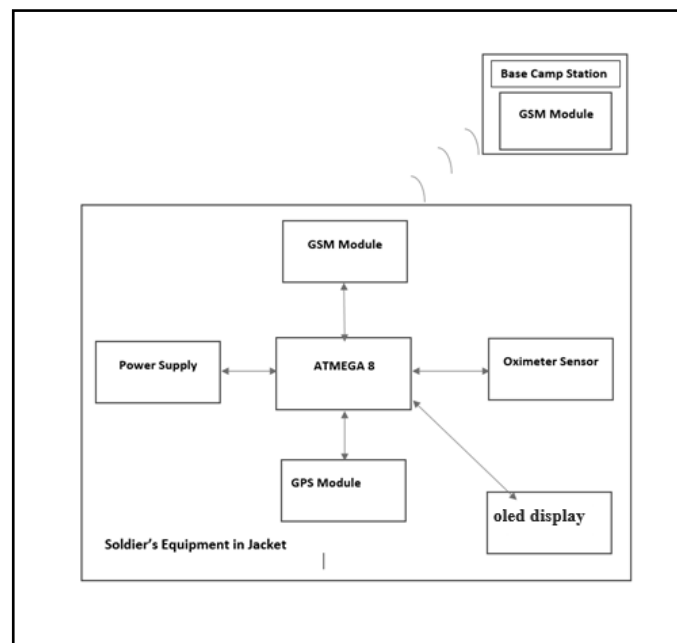


Figure 1 Block Diagram of Telemedical Soldier Jacket

The Biosensor module is situated on the jacket in such a way that the infrared sensors passes directly above or near a major vein of the soldier. This will help the sensor to gather data of parameters like heartbeats and oxygen level with more accuracy. The temperature sensor senses the drop or rise in the body temperature of soldier. The difference between the reflectivity of the infrared light due to volume of blood that varies in accordance with heartbeat helps in calculating the heartbeat. Also the Spo2 component in heamoglobin has different absorption coefficient of infrared light in oxygenated blood and deoxygenated blood thereby giving us the accurate oxygen level in the blood. GPS points the exact location of the GPS module on the earth by providing us with the exact earth coordinates in the form of Latitude and Longitude.

All this data is transferred to the microcontroller. The microcontroller processes the information to digital form and stores all the data in the data registers. All these stored parameters are sent to the base station using GSM. The GSM module is programmed to send these parameters via SMS to the base station that consist of similar GSM module. By monitoring the biosensor's parameters and tracking the location of the soldier, decision is taken and necessary help is provided or message is back to the soldier which he or she can read on oled display . All the parameters are also read by the soldier on the display. All these equipment runs on power which is provided by the portable battery which also carried by the soldier.

IV. METHODOLOGY:

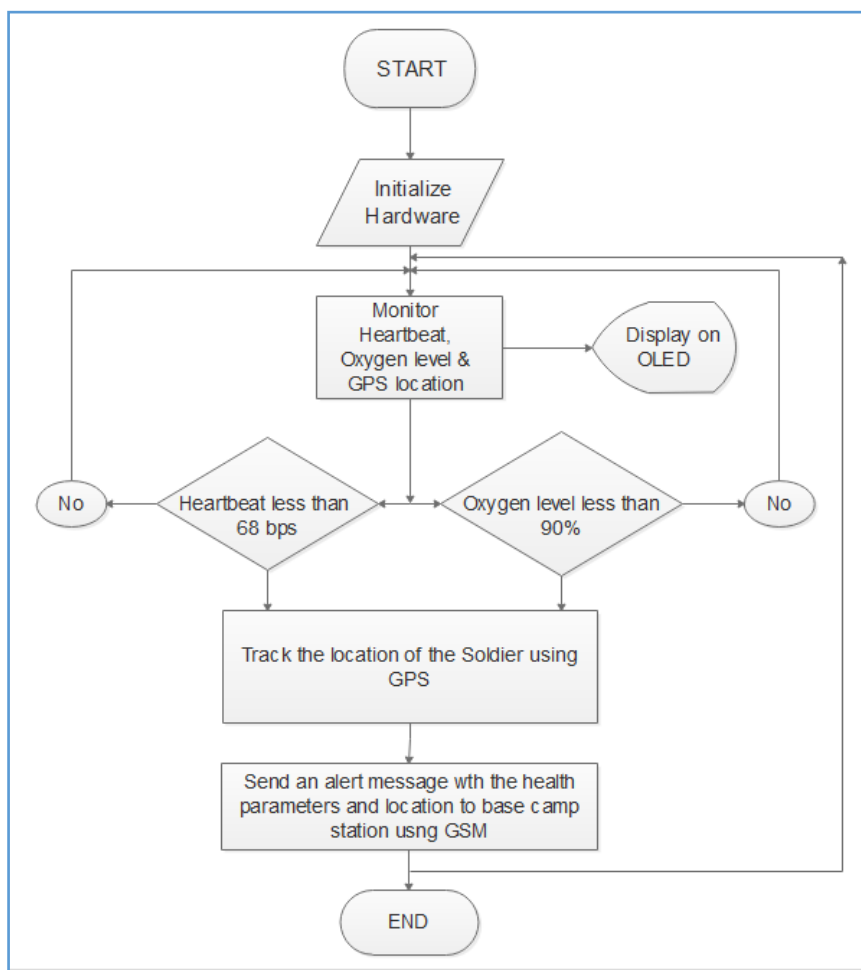


Figure 2 Flowchart for Implementation of Telemedical Jacket

Initially all the components and hardware is studied by us which included ATMEGA microcontroller , SIM900 GSM module , GPS module, MAX30100 oximetric sensor. We have interfaced oximetric sensor with microcontroller to check whether the sensor was measuring parameters accurately. Similarly we have interfaced the GPS module and microcontroller to track the exact location. Also GSM module was interfaced with microcontroller and SMS is sent via AT commands to remotely available GSM mobile. Finally we interfaced all the components to microcontroller. Further we tested and debugged all the errors and ensured that the system was working within specified range.

V. ACTUAL IMPLEMENTATION

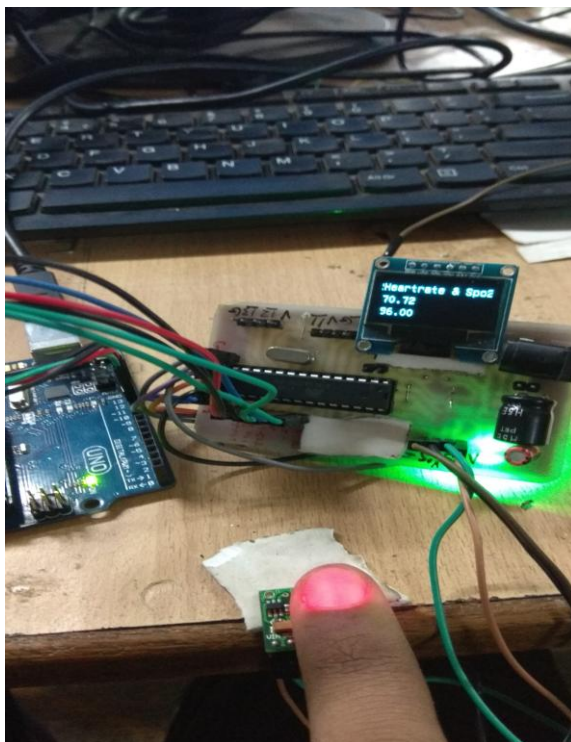


Figure 3 Actual implementation

The above image shows the actual implementation of project hardware. We can see the oximetric sensor measuring the heart pulse and oxygen level of the user and displaying it on the lode display. Further the results for GSM and GPS are shown in figure 4

VI. TEST AND RESULTS

The below messages that include the health status and location are sent by the GSM module to the destined mobile situated at Base station number that is coded into the microcontroller. The parameters sent include heart rate, oxygen level and the location of the soldier jacket in longitude and latitude .

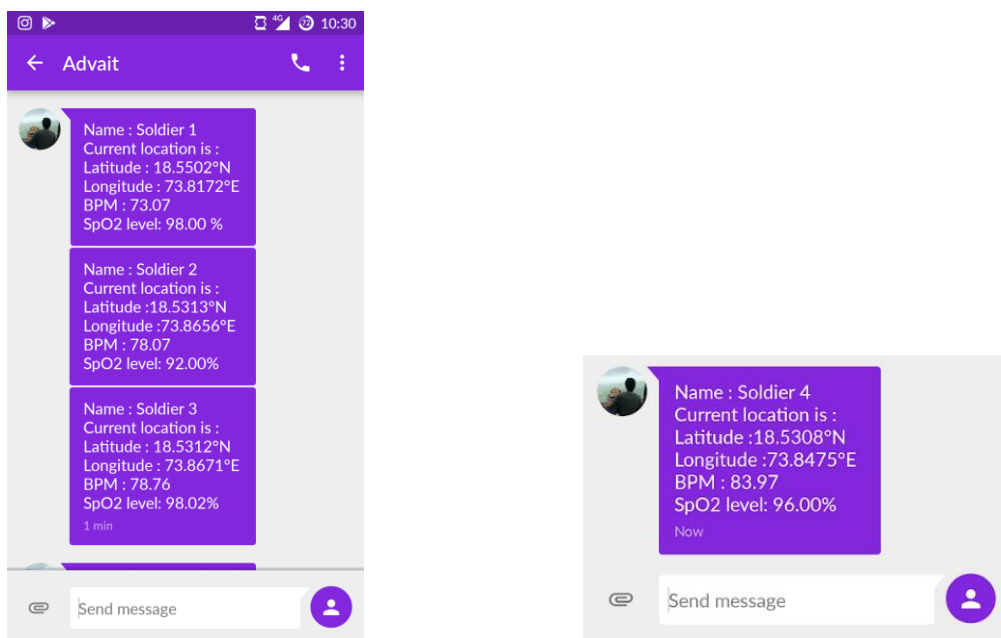


Figure 4 GSM messages received from Soldier Jacket

Hence from the above observation we can tally the following results :

User	Heart pulse rate in bps	Oxygen level in percent	Location in earth coordinates
Soldier 1	73.07	98%	18.5502°N 73.8172°E
Soldier 2	78.07	92%	18.5313°N 73.8656°E
Soldier 3	78.76	98.02%	18.5312°N 73.8671°E
Soldier 4	83.97	96%	18.5308°N 73.8475°E

Table 1 Observation table

VII. 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 sent to the base station so that field commander will take necessary action.

VIII. REFERENCES

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