

Soldier Monitoring System using Zigbee

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Abstract: In today world scenario the security of a nation is depends upon military, air-force and navy of our country. The backbone of all the forces are our soldier. During wars, Military search operation, surgical strike and terrorist attacks operation soldier gets injured and sometime become losses. There are many concerns regarding the safety and health of soldier. This project ability to monitor the health and location of soldier in real time application. This technology helps to minimize searching operation and rescue time effort. This system used GPS to track exact the location of soldier and various sensors to monitor the health of soldier. The various sensors like Temperature sensor, Humidity sensor and Heart Beat sensor. The Temperature sensor monitor the Temperature of soldier, Humidity sensor monitor humidity of soldier and Heart Beat sensor Monitor pulse rate of soldier. This system record all parameters of soldier can be sent control base station in real time so that the necessary or appropriate actions can be take place in case of emergency and crisis. The control base station can access the current status of soldier which is displayed on Personal Computer. The main proposed of system soldier-to-soldier communication and this communication can be done wireless networking using Zigbee. This system provide predefine message selection switches. This message like Ammunition, Help, backup, etc. This project easy to understand, wearable and simple to operated technology which is the most important factor of this project.

Keywords: Arduino Mega board, GPS, Temperature sensor, Humidity sensor, Heart Beat sensor, Zigbee.

1. Introduction

In modern age, a soldier updating advance technology level of their implementation. The 21st century soldier technology and science is growing faster with new inventions, innovation. 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. The soldier lives and dies for the nation. During wars, Military search operation, surgical strike soldier gets injured and sometime lose their life. It is our responsibility to help and protect our soldiers.

Soldiers entering the enemy territory often lose their lives due to lack of connectivity, it is very important for the army control base station to know the location as well as health status of all the soldiers. So many soldiers get lost 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 control base stations. All must be really concerned about the safety of

the soldiers, so 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 tracking is done by using GPS and Zigbee module which is used to provide wireless communication system. To monitoring the health parameters of soldier we are using sensors such as Temperature sensor, Humidity sensor and Heart Beat sensor. The Temperature sensor monitor the Temperature of soldier, Humidity sensor monitor humidity and Heart Beat sensor Monitors pulse rate of soldier. The proposed system will be helpful in the real-time continuous monitoring of soldier's health parameters and location. Pulse rate, humidity with body temperature can be monitored along with the location tracking of the soldiers using GPS can be monitored using the proposed system. The transmission of these parameters to the control base station is carried out by Zigbee module. The control room receives the position and orientation of soldier from GPS. Further, soldiers can be guided for the correct directions during the operations using GPS.

These devices will improve situational awareness not only for the host but also for co-located military personnel who will exchange information using wireless networks. The challenge was to integrate these piece meal components into a light weight package that could achieve the desired result without being too bulky and cumbersome or requiring too much power. One of the fundamental challenges in military operations lies that the soldiers are not able to communicate with control base station. The main proposed of system soldier-to-soldier communication and this communication can be done wireless networking using Zigbee. This project easy to understand, wearable and simple to operated technology which is the most important factor of this project. Hence, a portable, wireless, low cost tracking system with high reliability is the need of hour for the protection of valuable life of the soldiers on the battlefields. Further, the said mechanism must also be real-time in nature so that the immediate and effective rescue operations can be initiated. Motivated from these issues, a portable real-time tracking mechanism is proposed in this paper.

2. Related work

Shweta Shelar, Nikhil Patil, Manish Jain, Sayali Chaudhari, Smita Hande, In this paper, they have focused on helping the soldiers by providing medical assistance at the battlefield. They

have considered the soldier's health in terms of heart beat and body temperature of the sensor. For providing this type of facility GPS is used for tracking the soldiers. In case if soldier is injured then by using the GSM modem attached to the device an SMS will be sent to hospitals in the vicinity or to the base station to provide help [1].

M. V. N. R. P. Kumar, G.R. Vijay, P.V. Adhikrao and B.S. Vijay kumar, In this paper they found their idea from the mountaineers as mountaineers uses wrist watch for tracking their position, to know the temperature of their surroundings, to know the direction [2].

Govindaraj A., Dr. S. Sindhuja Banu, In this paper, they had focused on tracking the position of the soldier and measuring the various health parameters using different biomedical sensors. The main aim of using GPS is to track the position of the soldier so that the personnel at the base could guide them at the war field and side by side could check the body temperature of the soldier. Keypad is used for giving any type of input if needed [3].

Shruti Nikam, Supriya Patil, Prajkta Powar, V. S. Bendre, In this paper, they mentioned that infantry soldiers face the most fundamental problems like establishing communication with the base station and tracking their position whether they are on the correct path or not, due to this many soldiers either get lost their lives or get stuck in the enemies trap. With the help of this gadget soldiers will be able to make communication with base station, also will be able to find the right path by the guidance that would be provided by the team at the base. This help in reducing the losses of lives of our soldiers. The military personnel will exchange the information through wireless communication and with the help of biomedical sensors, GPS and GSM all this will be possible [4].

P.S. Kurhe, S.S. Agrawal, In this paper, it is possible to transmit the data which is sensed from remote soldier to the base station's PC by using wireless transmission device like GSM. The accuracy of this system may affected by some factors such as weather, environmental conditions around the soldier's unit and GPS receiver. The future works in this system may include the optimization of the hardware components, by choosing a suitable and more accurate GPS receiver. By improving the routing algorithm can be make this system more powerful and energy efficient. Upgrading this system is easy which makes it open to an advanced future [5].

Prof. Pravin Wararkar, Sawan Mahajan, Ashu Mahajan, Arijit Banerjee, Anchal Madankar, Ashish Sontakke, In this paper, they had proposed an idea of tracking the position of soldier as well as to give the health status of the soldier, which enables the army base station to plan the strategies according to current situation during war. Use of GPS tracking device and RF transceiver module provide the wireless system to monitor the health parameters and location tracking of soldiers. By using this system, the army base station will come to know the position of soldier and the health parameters such as body temperature and blood pressure of soldiers [6].

The health monitoring and tracking system can be implemented by using RF module and GPS tracking system. By using GPS device, we will able to give proper location of soldier and also can monitor the health parameters by temperature sensor and heart beat sensor. Thus, we can help the soldiers in panic condition from army control room by communicating with them during war [6].

Hock Beng Lim, Di Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar K. Iyer, Kenneth L. Watkin, In this paper, we have completed only an initial design of individual sensor nodes and developed a basic prototype of the system to collect the sensed data. In future, we will try to develop an integrated data management system and a web portal which will enable users to have easy access of data [10].

3. Conclusion

From this review paper survey, it is concluded that the proposed most of the projects are based on GSM and WI-FI module used for information transmission. But this system only communicated with control base station. So, we are using Zigbee not only soldier-to-soldier communication take place but also work as an information transmission system. Soldier can communicate with each other in the range of 1 to 1.3 km using Zigbee module. We have used Arduino mega is the main control unit here since it has many input and output ports are available and it is very cheap than any other available controllers. The main advantage of soldier-to-soldier communication is that it can communicate with nearest soldier. In this system, we have our control base station for receiving soldier information like Health as well as soldier monitoring. This system is also work as a transceiver. This project easy to understand, wearable and simple to operated technology which is the most important factor of this project.

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