SOLDIER HEALTH AND POSITION TRACKING SYSTEM

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ABSTRACT

In today's world the security of the nation is depends upon the enemies' warfare and so the safety of the soldiers is considered as vital role in it. A country's arm forces consist of three professional uniformed services: the army, the navy, and the air force. Concerning the soldiers safety there are many instruments to view their health status as well as ammunitions on the soldiers. To overcome the safety concern we had build this project which using wireless body area sensor network such as temperature sensor, heartbeat sensor etc will monitor the health status of the soldier whenever required. Also using GPS we can track the soldier's exact location whenever required. These devices are being added to weapons, firearms, and militaries such as the Israeli an Army which 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.GSM module can be used for effective range of high-speed transmission, short-range and soldier-to-soldier wireless communications that will be required to relay information on situational awareness, tactical instructions, and covert surveillance related data during special operations reconnaissance and other missions. 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.

Keyword: - *GPS module, GSM module, Heart beat Sensor, Temperature ,Arduino UNO*

1. INTRODUCTION

The infantry soldier of tomorrow promises to be one of the most technologically advanced modern warfare has ever seen. Around the world, various research programs. The challenge was to integrate the piecemeal components into a lightweight package that could achieve the desired result without being too bulky and cumbersome or requiring too much power. The infantry soldier of tomorrow promises to be one of the most technologically advanced modern warfare has ever seen. Around the world, various research programs. The challenge was to integrate the piecemeal components into a lightweight package that could achieve the desired result without being too bulky and cumbersome or requiring too much power.

2 .LITERATURE REVIEW

During, wars and military search operations, soldiers gets injured and sometime becomes losses. To find soldiers and provide health monitoring, army base station and need GPS device for locating soldiers, WBASNs to sense health related parameters of soldiers and a wireless transceiver to transmit the data wirelessly. Hong Beng Lim, Di Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar k. Lyer, Kenneth L. Watkin has discussed on recent advantage

in growing technology, and on various wearable, portable ,light weighted and small sized sensor that have been developed for monitoring of the human physiological parameters .The body sensor network (BSN) consists of many biomedical and physiological sensors such as blood pressure sensors , Electrocardiogram (ECG) sensor, electr dermal activity (EDA) sensor which can be placed on human body for health monitoring in real time [1]. Shruti Nikam, Supriya Patil, Prajkta Power, V.S. Bendre [3] had presented an idea for the safety of soldiers. There are many instruments which can be used to view the health status of soldiers as well as ammunitions on them. The Bio sensor which consist of various types of small physiological sensors, transmission modules have great processing capabilities and can facilitates the low-Cost wearable solutions for health monitoring. Also as stated by Dinesh Kumar Jaiswar, Sanjana S Repal in their survey, P.S. Kurhe ,S.S Agrawal had introduced a system that gives ability to track the soldiers at any moment additionally ,the soldiers will be able to communicated with control room using GPS coordinate in their distress. The location tracking has great importance since World War II, when military forces realized its usefulness for navigation, positioning, targeting and fleet management. This system is reliable, energy efficient for remote soldier health monitoring and their location tracking. It is able to send the sensed and processed parameters of soldier in real time. It enables to army control room to monitor health parameters of soldiers like heart beat, body temperature, etc. using body sensor networks. The parameters of soldiers are measured continuously and wirelessly transmitted using GSM.

3. OVERVIEW OF THE SYSTEM

3.1 Heart Beat 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 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 4 mA current draw at 5V. To use it simply clip the pulse sensor to earlobe or fingertip
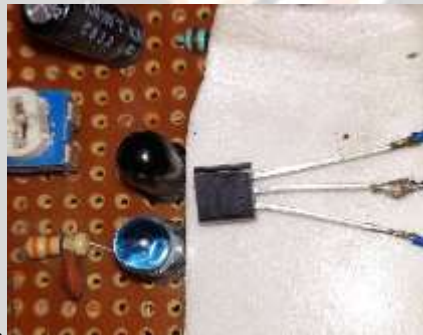
3.2 Temperature Sensor

The LM35 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.

3.3 GPS Modem

Neo-6M-0-001 GPS is a USRT 6 M module. It will be used to track the position of the soldier. It gets connected to at-most 32 satellite and will give the exact longitude and latitude readings. In this way it will track the exact position. While originally a military project, GPS is considered a dual-use technology, meaning it has significant military and civilian applications. It operates in the range -40 degree Celsius to 85 degree Celsius and at 2.7V-5V. Also it has a tracking and navigation sensitivity of -161 dBm.

3.3 GSM Module

GSM module is a breakout board and minimum system of SIM900A Dual-band GSM/GPRS module. It can communicate with controllers via AT commands (GSM 07.07, 07.05 and SIMCOM enhanced AT Commands). This module supports software power on and reset. It has a quad-band 850/900/1800/1900 MHz and a dual-band 900/1900 MHz. It has control via AT commands, a very low power consumption of 1.5mA (sleep mode).
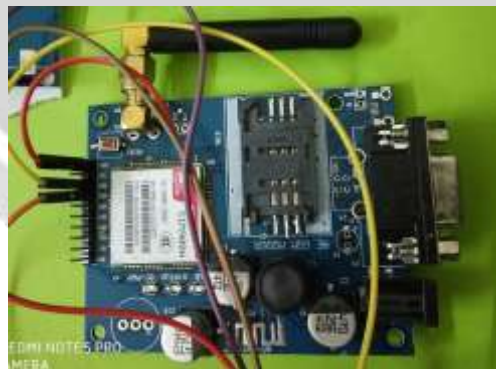

3.4 Arduino UNO

The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with a AC-to-DC adapter or battery. Arduino

Uno Board varies from all other boards and they will not use the FTDI USB-to-serial driver chip in them. It is featured by the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.
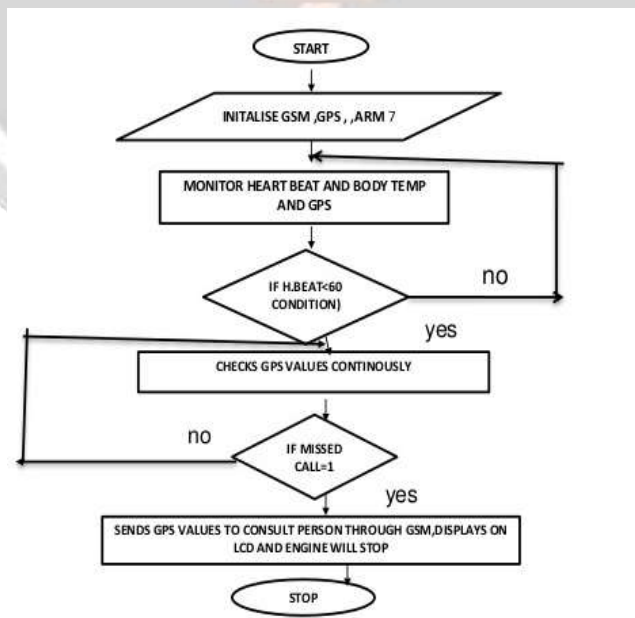

4. BLOCK DIAGRAM
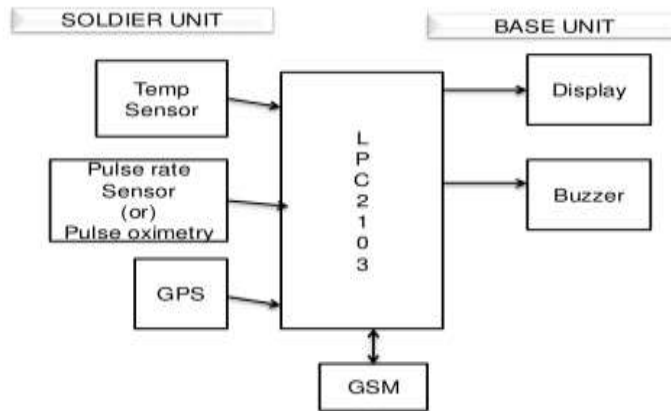
FIG.1: BLOCK DIAGRAM

5. FLOW CHART

FIG.2: FLOW CHART

6. RESULT

The result is as shown below. A message is send on the registered number confirming about GSM and GPS configuration. Later as the normal body parameters deviates an alert message is send to base station along with the precise location of the soldier.

7. 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.

8. REFERENCES

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