

Soldier Health and Location Tracking System

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Abstract:-For the moment, all countries are attaching the highest priority to their safety. The war rages across the land, the water, and the capture of one of the most powerful nation. The country's armed forces consist of three professional military services, the Army, the Navy and the air force. The soldiers who make it up, as well as all of the armed forces, which tend to die due to a lack of medical care, and emergency situations, and the soldiers involved in the mission, or special events, the loss on the field of battle, and lose contact with the agency. In order to overcome these problems, we were forced to build the project with the help of a wireless Body Sensor Networks (WBANS), a temperature sensor, a heartbeat sensor, etc., to monitor their health, and when it is needed. In addition, with the help of GPS navigation, we have to know the exact position of the soldiers, and when it is needed. The use of the oxygen sensor, we can monitor the condition of the environment, so that the spirit can give us the extra tools needed. The communication between the soldiers and the public authorities is defined by the GSM. Any deviation of the measured values for the wireless Body sensors (WBASNs) is to be regarded as a mobile trigger in order to create a communication between the soldiers and the base station, and transmit it to the current state and health of the recipient. With all of this equipment, we have been trying to implement a basic foot soldier protection system, a low-cost, simple, portable, and accurate device. The enemies of the territory, it has to do not only with a physical threat, but also with the stress and fatigue due to the long-term operation, or for the lack of sleep. Therefore, for security purposes, we require a tool for the remote control, the ability and the health of the soldiers. Thus we use of biosensors, a tool for health monitoring. A GPS tracking system is also used, in order to track down the location of the troops. In addition, a GSM modem is also used to refer to the wired whether or not the system. Any deviation of the measured values for the wireless Body sensors (WBASNs) is to be regarded as mobile triggers in order to create a communication between the soldiers and the base station, and transmit it to the current state and health of the recipient. With all of this equipment, we have been trying to implement a basic foot soldier protection system, a low-cost, simple, portable, and accurate device. In the modern world, at war with the enemy is a vital factor in the security of the country. Of these soldiers, play a critical role to play in the armed forces. The enemies in the territory of the need to address not only physical threats, but also the stress and apathy due to the long duration and / or sleep deprivation. Therefore, for security purposes, we require a tool, in order to track the performance and health of the soldiers. The goal of this project is to develop a system that tracks the situation, as well as to monitor the health of the soldiers. In this project, the exact location and the health of the parameters of the soldiers who can be sent to the base station in real-time, so that the relevant data is being received.

Keywords: *Barometric pressure sensor, GPS, GSM, WBASNs, Zig Bee, Arduino Mega, ZigBee, GPS, Soldier,*

Tracking, Heart- Rate Sensor, Temperature Sensor, Air Quality Sensor, Humidity Sensor.

I. INTRODUCTION

The state's safety is monitored and kept by using military, navy and air-pressure. The critical and important function is of squad dies who sacrifice their existence for his or her united states. There are many concerns regarding the safety of the soldier. Soldiers entering the enemy traces often lose their lives because of lack of connectivity, it is very crucial for the army base station to acknowledge the area as well as health reputation of all squad dies. India has already misplaced such a lot of soldiers in struggle- fields as there was no proper health backup and connectivity among the squad dies at the war-fields and the officials on the navy base stations. These days on 29 September 2016, an army confrontation between India and Pakistan started; Indian infantrymen carried out a surgical strike in opposition to militant release pads across the road of control in Pakistani-administered Azad Kashmir, and inflicted "sizeable casualties". Indian infantrymen are especially regarded for his or her courage, despite scarce ammunitions and protection measures; they have many triumphs to their credits. All should be without a doubt concerned about the protection of the squad dies, so we've got decided to build a task as a way to effectively keep a take a look at on the fitness status of the soldier, and his precise area to equip him with important scientific treatments as quickly as viable. Soldier's tracking is performed the usage of GPS and GSM is used to offer Wi-Fi conversation system. For tracking the fitness parameters of soldier we are the usage of bio clinical sensors consisting of temperature sensor and heart beat sensor. An oxygen degree sensor is used to screen atmospheric oxygen so if there are any climatic changes the soldiers will be ready as a result. So this paper focuses on monitoring the vicinity of soldier from GPS, that is beneficial for control room station to recognize the exact place of soldier and therefore they'll guide them and it is for high- pace, short range, soldier-to-soldier wireless communications to relay statistics on situational consciousness with Bio-clinical sensors, GPS navigation. In nowadays world, the science and era are developing hastily with new innovations, innovations and with improve stage in their implementations. Those emerging advance technologies are firmly tailored by using protection services to offer some protection systems to our squad dies. There are numerous parameters via which defense services can provide protection to the soldiers. The state's safety is monitored and kept with the aid of army, military and air-force. The vital and vital role is of infantrymen who sacrifice their existence for his or her u. s. There are numerous concerns concerning the safety of

these soldiers. The destiny soldier needs to be more increase technologically in each essential state of affairs like struggle or any secret task. In complete international, several evaluation structures currently being arranged, just like the usa' future force warrior (FFW) and also the United Kingdom's future infantry Soldier era (FIST) and they have a plan of creating definitely modern-day combat method. Helmet attached screens, executed of supplying facts from maps and video the use of sorts of movements can be taken in case of disaster. This technology reduces the rescue time and search operation effort of navy rescue manage unit. This device makes use of GPS module, ZigBee module and Wi-Fi body area sensor community to file all parameters in real time and send it to the manage station. The special sorts of sensors used on this machine are temperature sensor, air excellent sensor, humidity sensor and heart-fee sensor which enables in deciding the health reputation of that precise soldier. GPS module used within the machine allows in locating the placement of the soldier. For this reason with this gadget, it's far feasible to put into effect a low cost mechanism to shield the valuable human existence at the conflict discipline.

II. LITERATURE REVIEW

In times of war, military and search operations, soldiers are injured and sometimes they get hurt. In order to find the soldiers, and the provision of health surveillance, Army, base station, and, if necessary, the device's GPS location, in order to identify the soldiers, WBASNs to determine the health-related parameters, and the wireless transmitter for the wireless transmission. No-Beng Lim, Di, Ma, Bang Wang, Zbigniew Kalbarczyk, Ravishankar K. Lajer, Kenneth L. Watkin and discuss the most recent of the benefits of plant production technology, as well as the steel-based, portable, light weight, and small sensors that have been developed for monitoring of human physiological parameters .The body Sensor Network (BSN) is made up of a lot of biomechanical and physiological sensors, such as pressure sensor, an electrocardiogram (ECG) sensors, and the skin-of the electrical activity of the sensor (EDA), which can be placed on the human body, in order to provide real-time health monitoring. Shruti Nikam, Supriya Patil, Prajktash, L. S. Bendre put forward the idea of a soldier's safety. Many of the tools that can be used to show the state of health of the troops, as well as guns and ammo are not available. The biosensor is composed of various types of small physiological sensors, transmission modules; it has a broad range of technical capabilities and is able to unlock creation of the low-cost, portable solutions for health monitoring. Also, the reported Dinesh Kumar Jaiswar, Sanjana's Repal the study, P. S., Kurha, etc., S. Agrawal of the system, which makes it possible to look at the soldiers, who, at any time, in addition, the soldiers are able to communicate with the control room's GPS co-ordinates of the anxiety. Location tracking has been of significant importance since the Second world War, when the armed forces to recognize that it is a good choice for navigation, positioning, targeting, and fleet management, to the show. This system is reliable and

efficient for the monitoring of their health and tracks their location. It is capable of transfer sizes, and the treatment of soldiers in real-time. It allows the army to the control room to monitor the health parameters such as heart rate, body temperature, etc., with the help of a network of body sensors. The soldiers of the parameters that are measured are transmitted wirelessly over the GSM. Then share out the technology, track, navigate to the soldiers, among the soldiers, such as information, speed, distance, altitude, and in the WATER, so as to military personnel, to plan military strategy. The base station takes the place of the GPS-men. At the base station, you can see the current status of the soldiers to set the phone to use a GSM mobile, and, therefore, the corresponding action can be detected.

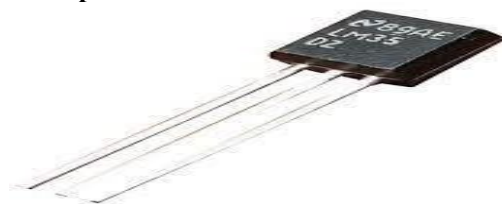
III. HARDWARE REQUIREMENT AND OVERVIEW OF SYSTEM

A. 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 4mA current draw at 5V. To use it simply clip the pulse sensor to earlobe or fingertip.

B. 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.

C. Microcontroller ATmega328p



The ATmega328 is a single –chip microcontroller created by ATmega in the mega AVR family. The Atmel 8-bit RISC-based microcontroller combines 32kB ISP flash memory with read- while-write capabilities, 1KB EEPROM, 2kB SRAM, 23 general purpose I/P lines, 32 general purpose working registers, three flexible timer/counter with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, 6-channel 10-bit A/D converter programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between n 1.8-5.5 volts. The device achieves throughput approaching 1 MIPS per MHz.

D. LCD display



Alphanumeric displays are used in a wide range of application, include palmtop computer, word processor. Available as an optional extra is the serial LCD firmware, which allows serial control of the display. This option provides much easier connection and use of the LCD module. The firmware enables microcontroller to visually output user instruction or reading onto an LCD module. All LCD command is transmitted serially via a single microcontroller pin. The firmware can also be connected to the serial port of a computer.

E. GSM Module



GSM, which stands for Global System for Mobile communications , reigns as the world’s most widely used cell phone technology. Cell phones use a cell phone service carrier’s GSM network by searching for cell phone towers in the nearby area. GSM module is a breakout board and minimum system of SIM900 Quad-band/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).

F. GPS Module



The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites.

G. Arduino Uno



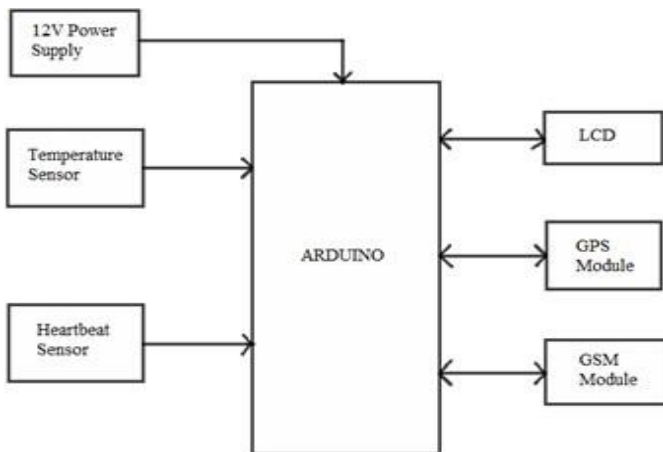
Arduino is an open source, PC paraphernalia and programmed organization, endeavor, and client group that plans and produce microcontroller packs for constructing programmed devices and intelligent object that can detect and control questions in the real world. The inception of the Arduino extend began 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.

H. Power Supply

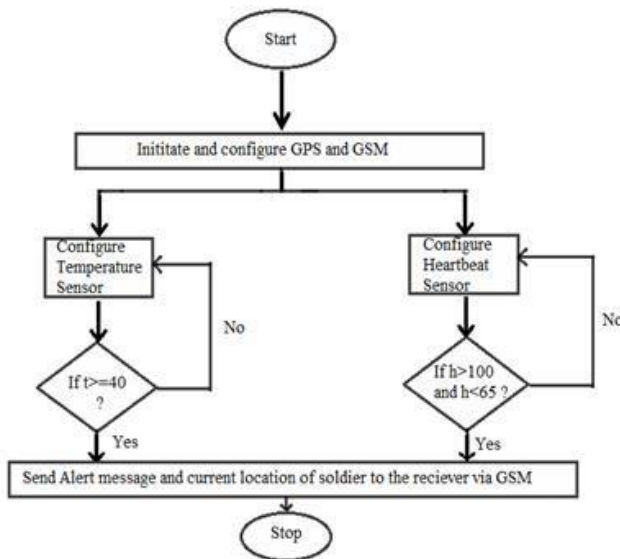
AC adapters are used with electrical devices that require power but do not contain internal components to derive the required voltage and power from mains power. The internal circuitry of an external power supply is very similar to the design that would be used for a built-in or internal supply. External 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.

IV. BLOCK DIAGRAM AND FLOW CHART

Block Diagram



Flow Chart



VI. RESULT

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.

VII. CONCLUSION

Soldiers security and safety: GPS tracks position of soldier anywhere on globe and also health system monitors soldier's vital health parameters and environmental situation which provide security and safety for soldiers.

Less complex circuit and less power consumption: Use of PIC 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.

So in this way concept of tracking and navigation system is very useful for soldiers when they are on military field during war. And also for base station so that they can get real-time view of soldier.

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