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Health and Position Monitoring System

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Abstract:

Now a days we know that there is the big problem of security of soldier so by considering this problem we have design a system .based on that we can solve this problem . In this project the exact location and health status parameter of soldier can be sent to be base station in real time so that the appropriate action can be taken in case of crisis. GPS is used to log the longitude and latitude so that direction can be known easily. Here to find the health status of the soldier we are using the body temperature sensor to measure the temperature of body as well as heart beat rate to measure heart beat rate of soldier. The IoT makes the entire monitoring process fast, efficient and the decisions can be taken in less amount of time. So by using these equipment's we are trying to implement the basic life guarding system for soldier in low cost and high reliability. After doing all the connection Process we will get the output as a message at the base station and it will also display the result on LCD display.

The component which we have taken are Arduino UNO, GPS Module, GSM Module,LCD Display.

I. INTRODUCTION

In current world scenario, the security of a nation is the uttermost important factor and the security of nation depends on the army force. Without the soldier it would be nearly impossible to protect a nation. There is a necessity to develop a wearable technology which isn't bulky and dissipates very little power in the defense sector so that the location and vital health parameters of the soldiers can be tracked in real time when he is on the battlefield.

II. In the world, the Indian army stands second largest force. The role played by the soldier is very important for the nation security. However, the army is suffering from lot of health issues in the remote place due to unavailability of medical treatment at a proper time which may result in the death/loss of the soldier. The lack of communication with the control room regarding the health status and location of the soldier would lead to loss of the soldier too. This can be reduced if the real time information is available to control room as well as another fellow soldier who are nearer to the victim soldier. The cost of the soldier life is very important. During the battle the soldier may accidentally land up in the enemy location without his knowledge, so he may need guidelines to know his current location.Other than the battle field injuries, the soldier may also suffer from extreme climate condition and fall sick, in such situation if care is taken then the life of the soldier would be saved. This can be achieved by using the IOT. The health parameter such as heart rate, ECG and body temperatures are monitored continuously and communicated with the control room automatically. When the soldier feels that he is lost, he can send an emergency message voice message alert to the control room and request for location using an android application which provides the longitude and latitude of the soldier using GPS.

I. LIETERATURE REVIEW

Many efforts were reported by different academicians and researchers to track the location of the soldiers' along with their health condition on the battlefield.

the idea of localizing the co-ordinates of position. The idea of continuous health monitoring of soldier. The idea of tracking the current location of the soldier using GSM and GPS technology and even the bomb near the surrounding of the soldier.

II. SYSTEM DESCRIPTION

The system used in this health and position monitoring is as follow;

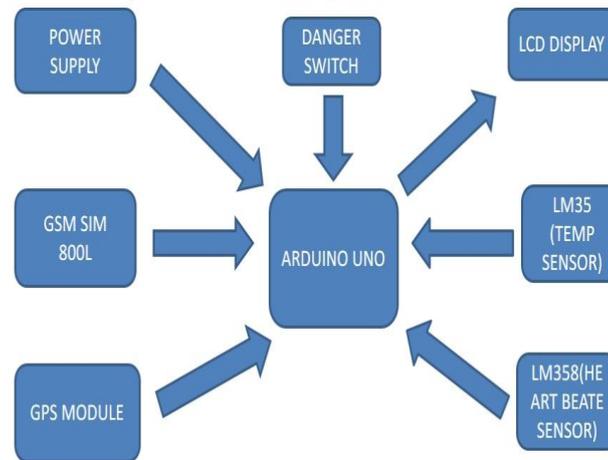


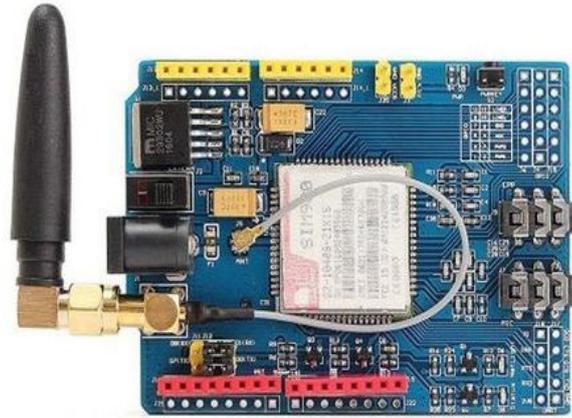
Figure 1. Block diagram of Health and Position Monitoring System

As shown in above diagram the Arduino UNO which have 8051 microprocessor plays the main function of microcontroller in the system. The architecture is comprised of 8051 micro controller, GPS receiver, GSM component, panic button, LCD display and various biomedical sensors such as temperature sensor, Heart beat sensor. The GSM and GPS component is used to communicate with the control room regarding the health status and location of the soldier. The soldier normal body parameters rates are recorded in the memory of the micro controller. When it falls certain defined threshold, an alert voice message is sent automatically to the control room. For example, if Temperature sensor detects that the Temperature of the person is not normal, and then it sends a message as Temperature abnormal repeatedly as it goes above Threshold to the control room and also it displays on the LCD. The temperature sensors record the body temperature of the soldier based of the environmental condition. The heart beat sensor initially records the normal heart beat rate of that particular soldier and stores in the memory of the controller, once the heart rate falls below or exceeds the threshold value, then a message is sent to the control room. The body rate of the soldier is measured and reports it if it is not normal. On receiving the message, a necessary action can be taken to provide the medical help at a proper time. We have also implemented a button also known as panic button so that when a soldier is in a panic situation like enemy are attacking or if he feels that he is lost, then he can communicate with the control and other fellow soldier by pressing the panic button which in turn sends an alert message to the concerned control room/other soldier as EMERGENCY. Once the control room receives the Emergency message they track the location of the soldier and communicate with them to provide the required help.

A). ARDUINO UNO



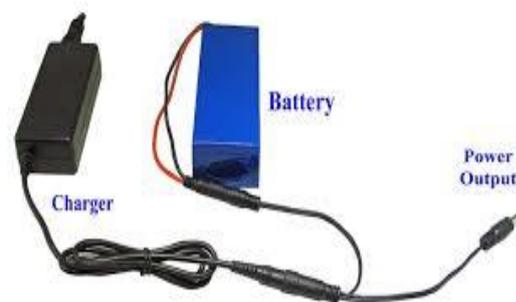
The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC- to-DC adapter or battery to get started .

B]. SIM900 GSM MODULE

SIM900A GSM Module is the smallest and cheapest module for GPRS/GSM communication. It is common with Arduino and microcontroller in most of embedded application. The module offers GPRS/GSM technology for communication with the uses of a mobile sim. It uses a 900 and 1800MHz frequency band and allows users to receive/send mobile calls and SMS. The keypad and display interface allows the developers to make the customize application with it. Furthermore, it also has modes, command mode and data mode. In every country the GPRS/GSM and different protocols/frequencies to operate. Command mode helps the developers to change the default setting according to their requirements.

C].GPS Module

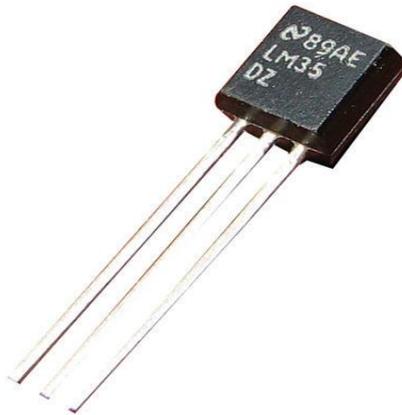
This is a complete GPS module that is based on the NEO-6M. This unit uses the latest technology to give the best possible positioning information and includes a larger built-in 25 x 25mm active GPS antenna with a UART TTL socket. A battery is also included so that you can obtain a GPS lock faster This GPS module gives the best possible position information, allowing for better performance with your Ardupilot or other Multirotor control platform.

D].POWER SUPPLY

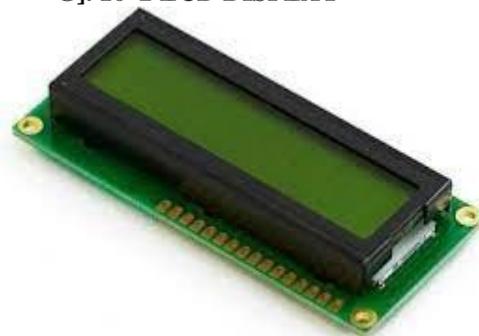
The most important section in every electronic circuit is the power supply. For the proper working of all components an unaltered power supply is needed. The supply must be capable of providing the necessary power for each component.

E]. PULSE SENSOR

Pulse 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 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.

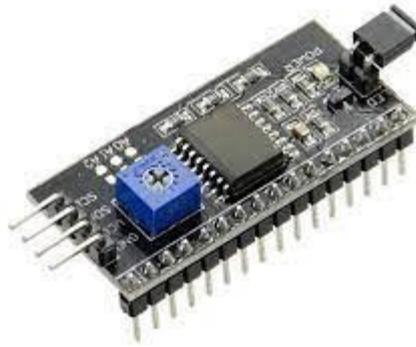
F]. Temperature Sensor: LM35

LM35 is a temperature sensor which is widely used to measure body temperature. This device is rated to operate over a -55°C to 150°C Temperature range. The normal human temperature is around 37°C . Hence, a threshold value in the range of 30 to 40°C is considered.

G]. 16*2 LCD DISPLAY

the term [lcd stands for liquid crystal display](#), which shows all types of output on the screen. in this project we will get an output like longitude and altitude(position), temperature and Heartrate of the person who is using this device.

H]. I2C MODULE



This Module has a inbuilt PCF8574 I2C chip that converts I2C serial data to parallel data for the LCD display.

Table1. Threshold level of sensor

Sensor	Threshold level
LM35	35>Temp>39
Hear beat(min)	50>Beat>120
GPS	Not receiving
Panic button	On

IV.HARDWARE DESIGN

In a hardware implementation, Arduino UNO is placed as a microcontroller which is based on ATmega328 to control the hardware. On the UNO board, It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs. then we have used an GMS Module to track the location , GSM SIM Module for transferring the message from persons position to base station, LCD display for showing the output which is interfaces with I2C Module

Hardware design Hardwareimplementation consists of the following:

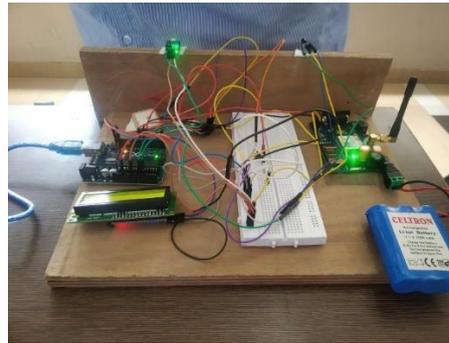
- Arduino UNO
- GSM Module
- GPS Module
- LCD Display
- I2C Module
- LM35 (Temperature Sensor)
- LM358(Heart Beat Sensor)
- 9v Battery or 9v adapter
- Jumper wires

V.TRUCTURAL PARAMETER OF ARDUINO UNO

The programming of the Arduino which act as the microcontroller is the heart of the system which plays a vital part to act the system accurately and with small amount of support. codes of the Arduino are only designed at C + + language and which need the system according to the user teaching. These codesare only designed for this sample starting placeautomation system. These codes have particularly used pins in the Arduino which theonly be used for this type of sample system. Thehardware of the system is designed according tothese codes. Here is the link of the codes used in this sample system .

VI.EXPERIMENT TEST

Based on the operation of making observations and work guided, attempt to look at the outcome of the system.



Figure,2 showing the Hardware

Design of sample starting place a complete work system of health and position monitoring system in a lower scale made on a wooden sheet. Most updated way of communication to any person is cellphones but the cellphones can not tell us the health status of any person, but health sensing component can. which we have used in this project. With the help of this project we can get any person health condition with its appropriate location. and we also have an danger/panic push button which a user can press to tell that he is in danger. So, For example if we have any older person at home we can use this system to know his health condition and its location. Again we can also use this project for elementary school student if he get lost he can tell us his/her position with the help of push button and we can also use this project for the disabled people.

Most important our country protector (ARMY) can also use this project to save their life and we can also use this project for planning an attack.

VII.RESULT AND DISCUSSION

```
void setup() {
  pinMode(switchPin, INPUT);
  pinMode(buzzerPin, OUTPUT);
  Serial.begin(9600);
  while (!Serial) continue;
}

void loop() {
  int switchState = digitalRead(switchPin);
  if (switchState == HIGH) {
    digitalWrite(buzzerPin, HIGH);
    delay(500);
    digitalWrite(buzzerPin, LOW);
  }
  Serial.println(switchState);
}
```

Fig.3 code on Arduino ide software

We have done the code on Arduino ide software and we have got an proper compilation result of our program.

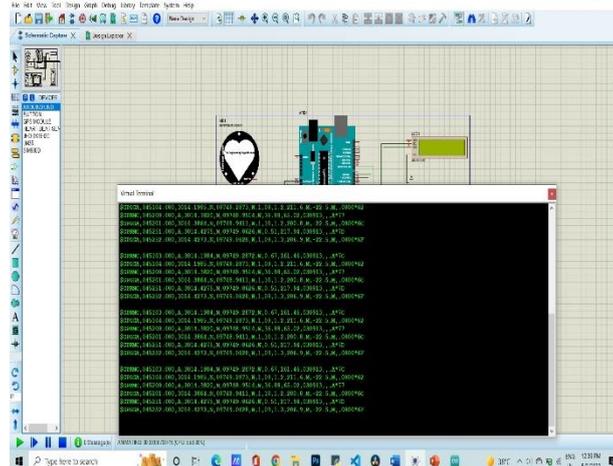


Fig.4 Result of Simulation

Above figure shows the simulation output of circuit diagram and the code which we uploaded in it. It shows an dialog box showing an output like Latitude and Altitude of the system.

A message is send on the registered number confirming about GSM and GPS configuration. Then we can have a correct Position of emergency location.

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.

Along with this a person Health Condition can also be known to the his/her team so that they can take appropriate action,without wasting Time.

VIII. CONCLUSION

From this we conclude that based on our system we are able to communicate with the person who has wear our system. We can locate the position of the person using GPS Module. We can get the health condition of the person using the sensor which we have taken, that is LM35 Tempreture sensor , LM358 Heart beat sensor.

REFRANCES

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