

Smart Warrior Life Preserver Using IoT

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ABSTRACT

In today's world, Soldiers are very essential part of any nation's security system. During, wars and search operations soldiers get injured and many of them lose their lives. There are many concerns regarding the safety of the soldiers. In addition, this project detects the intruder arrival into the border and an emergency switch which gives an alert to the other soldiers and the control station to track the location and monitor health of the soldiers in real time who become lost and get injured in the battlefield. This system enables to army base station to track the location and monitor health of soldiers using GPS module and wireless body area sensor networks (WBASNs), and transmits the information through the IOT to the control. It is low cost and high reliability.

Keywords: Temperature Sensor, heart rate sensor, pir sensor,CC3200, IoT.

I.INTRODUCTION

Modern military operation are conducted in complex, multidimensional, highly dynamic and disruptive environment sometime with unanticipated partners and irregular adversaries. The adaption of the Internet of Thing (IoT) to military applications proved to have substantial impact on soldier on an off the battlefield. In order to maintain safety and ensure

mission success, critical real-time situational awareness must be available to the soldier in the battlefield. These advanced technologies were developed in special version for combat and noncombat military application.

II.METHODS AND MATERIAL

EXISTING METHOD

During the war in the area where dense forest, mountains or snow fall occurs, it becomes very difficult to trace our soldiers. Also after the end of war, we can't say anything about how many soldiers are died if few out of them are missing. We even have to try hard to find out missing soldier. To solve above problems, this system helps to great extent with additional benefits like information about health status of soldiers.

PROPOSED METHOD

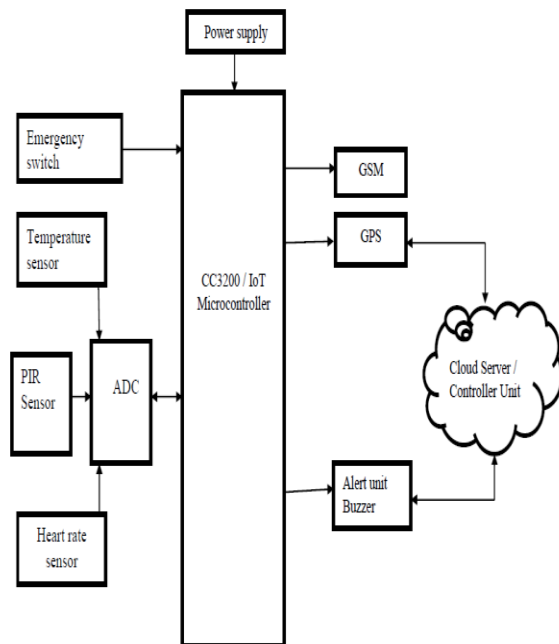
This system enables to army base station to track the location and monitor health of soldiers using GPS module and wireless body area sensor networks (WBASNs).An emergency switch which gives an alert to the other soldiers and the control station to track the location and monitor health of the soldiers in real time who become lost and get injured in the battlefield. We transmit the information through IOT to the control

unit. Here we also use PIR sensor for the intruder alert.

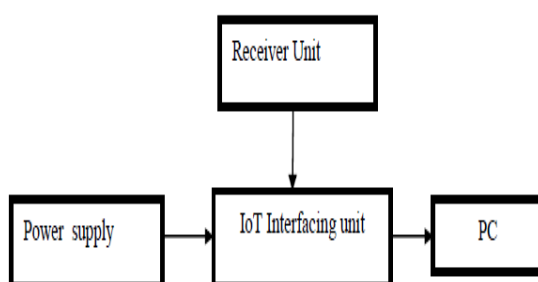
III.RESULTS AND DISCUSSION

BLOCK DIAGRAM

SOLDIER UNIT



MONITORING UNIT



TEMPERATURE SENSOR

Temperature meter or thermometer is a device that measures temperature gradient using a variety of different principles. The temperature sensor in which some physical

change occurs with temperature, it immediately sends the message to the monitoring unit. A thermometer has two important elements: the temperature sensor in which some physical change occurs with temperature, plus some means of converting this physical change in to a numerical value. The output voltage of this sensor is analog, so it must be converted to digital to deal with it easily. The analog output voltage converted to 8-bit digital number by using the internal ADC of MSP430.

HEART RATE SENSOR

Heart beat sensor is designed to give digital output of heart beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

FEATURES

- Microcontroller based SMD design
- Heart beat indication by LED
- Instant output digital signal for directly connecting to microcontroller
- Compact Size
- Working Voltage +5V DC

APPLICATIONS

- Digital Heart Rate monitor
- Patient Monitoring System
- Bio-Feedback control of robotics and applications

PIR SENSOR

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared

(IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. All objects with a temperature above absolute zero emit heat energy in the form of radiation. Usually this radiation isn't visible to the human eye because it radiates at infrared wavelengths, but it can be detected by electronic devices designed for such a purpose. The term passive in this instance refers to the fact that PIR devices do not generate or radiate any energy for detection purposes. They work entirely by detecting the energy given off by other objects. PIR sensors don't detect or measure "heat"; instead they detect the infrared radiation emitted or reflected from an object.

APPLICATIONS OF PIR SENSOR

- All outdoor Lights
- Lift Lobby
- Multi Apartment Complexes
- Common staircases
- For Basement or Covered Parking Area
- Shopping Malls
- For garden lights

FEATURES

- Complete with PIR, Motion Detection.
- Dual Element Sensor with Low Noise and High Sensitivity.
- Supply Voltage – 5V.
- Delay Time Adjustable.
- Standard TTL Output.

POWER SUPPLY

This is a small +6v switched mode power supply circuit. The circuit has internal current limiting and thermal production capacity.

CC3200 CONTROLLER

Created for the Internet of Things (IoT), the Simple Link CC3200 device is a wireless MCU that integrates a high-performance ARM Cortex-M4 MCU, allowing customers to develop an entire application with a single IC. With on-chip Wi-Fi, Internet, and robust security protocols, no prior Wi-Fi experience is required for faster development. The CC3200 device is a complete platform solution including software, sample applications, tools, user and programming guides, reference designs, and the TI E2E™ support community. The device is available in a QFN package that is easy to layout. The applications MCU subsystem contains an industry-standard ARM Cortex-M4 core running at 80 MHz. The device includes a wide variety of peripherals, including a fast parallel camera interface, I2S, SD/MMC, UART, SPI, I²C, and four-channel ADC. The CC3200 family includes flexible embedded RAM for code and data and ROM with external serial flash boot loader and peripheral drivers.

APPLICATIONS

- Cloud Connectivity – Internet Gateway
- Home Automation – Industrial Control
- Home Appliances – Smart Plug and Metering
- Access Control – Wireless Audio
- Security Systems – IP Network Sensor Nodes Smart Energy

EMERGENCY SWITCH

Emergency switches are used for a variety of applications. If a soldier needs an

immediate help, they will press this switch. Suddenly the message will be send to monitoring unit.

A/D CONVERTER

An analog to digital converter is a device that converts a continuous physical quantity to a digital number that represents the quantity's amplitude. It produces the equal digital value for a Temperature sensor and Heart beat sensor output.

GSM900

The term GSM900 is used for a GSM system which operates in any 900 MHz. The 900 MHz band defined in the ETSI standard includes the primary GSM band (GSM-P), the extension (E-GSM) and the part of the 900 MHz band that is reserved for railways (R-GSM). The total GSM900 band defined in the standard ranges from 876 - 915 MHz paired with 921 - 960 MHz. Mobiles transmit in the lower band and base stations transmit in the upper band. In daily life, the term GSM900 band is used for the parts of the band that are used by the GSM operators to offer public services, which exludes the R-GSM band. This part of the band that remains ranges from 880 - 915 MHz paired with 925 - 960 MHz band.

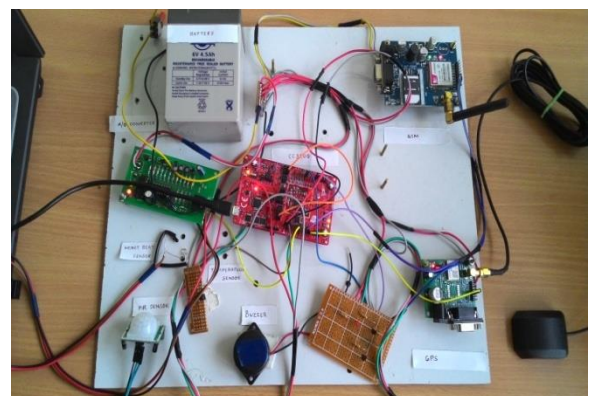
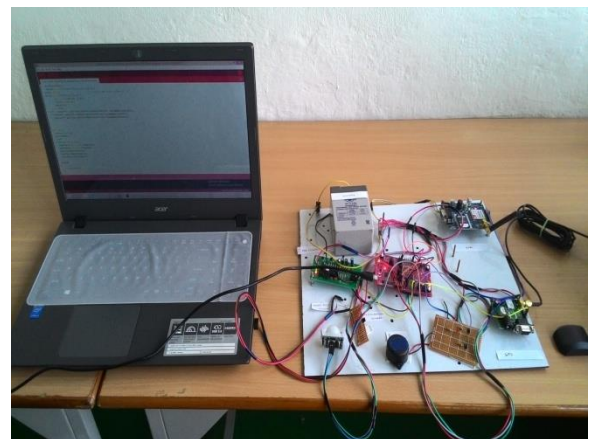
GPS (Global Positioning System)

GPS technology became a reality through the efforts of the American military, which established a satellite-based navigation system consisting of a network of 24 satellites orbiting the earth. GPS is also known as the NAVSTAR (Navigation System for Timing and Ranging). *GPS works* all across the world and in all weather conditions, thus helping users track locations, objects, and even individuals! GPS technology can be used by any person if they have a GPS receiver.

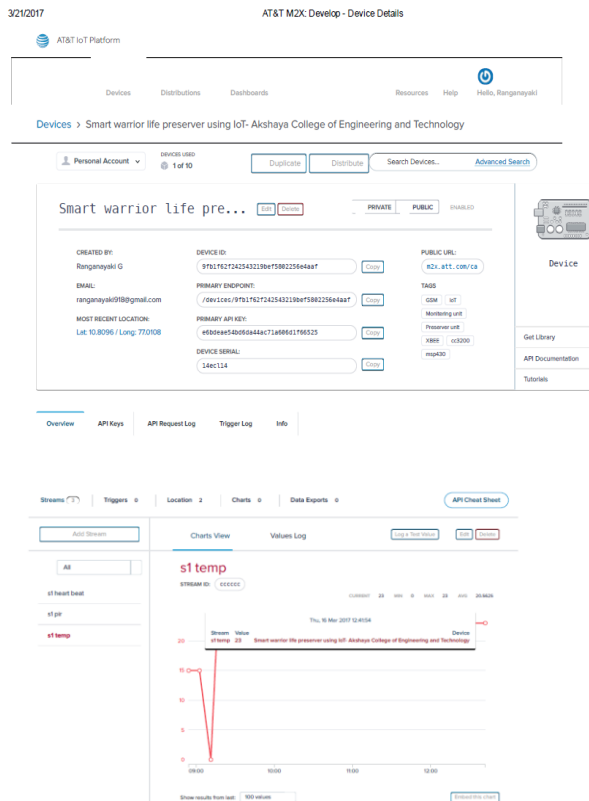
INTERNET OF THINGS

The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. Using IoT, the monitoring unit will monitor the current status of the soldiers.

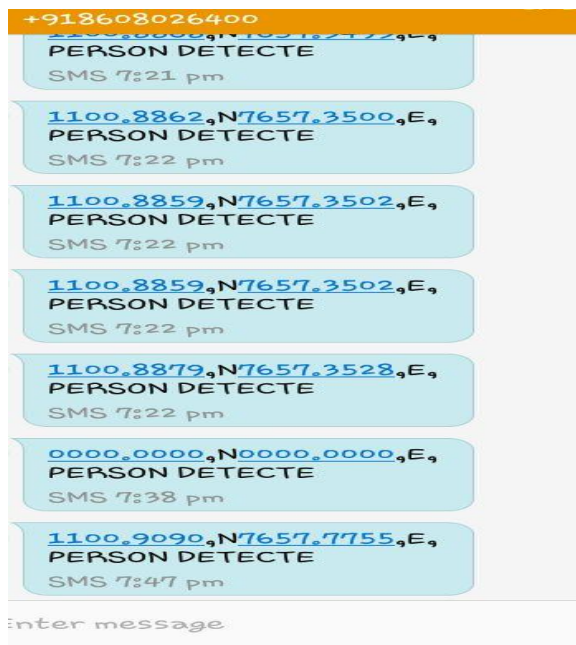
HARDWARE OUTPUT



IOT OUTPUT



GSM OUTPUT



SOFTWARE TOOL

Energia TI-Software is used as programming tool for CC3200. Energia is an open source & community-driven integrated development environment (IDE) & software framework. Energia 18 (aka Energia 1.6.10E18) is based on the latest and greatest Arduino IDE. This release features the new board or library manager. Default the Energia installation comes with support for the MSP430. Other cores such as TivaC, CC3200, MSP432 can be installed through the board manager by selection Tools.

IV. CONCLUSION

Hence, we have designed this model for the welfare of our soldiers and for their safety and also for the fortune of our country. Through this concept the monitoring unit will get the alert when the soldier is in abnormal condition and when intruder enters into their location. So that the soldier can be rescued immediately.

V. REFERENCES

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