

# Solar based E-Uniform for Soldiers

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## Abstract

Solar based E-Uniform gives better protection to the soldiers who are working in extreme weather conditions. Solar Panels are used to power up the internal circuitry of the E-uniform. A 12 V DC lead acid rechargeable battery is used for storing the energy. We are using conventional battery charging unit also for giving supply to the circuitry. AT89S52 micro controller is the heart of the circuit as it controls all the functions. A voltage sampler is interfaced with the system using ADC 0808 to get the voltage generated from battery as a display on a 16X2 LCD. The project is operated in summer mode and winter mode. By selecting the mode of operation, we are operating the H-Bridge IC such that it can drive body heater/cooler. The heater/cooler in turn will help us to provide chilling or warming effect inside the uniform which helps the soldier to bear to any kind of external environment. The metal sensor will detect the metal like bomb and intimate the soldier with a buzzer indication. The GSM is interfaced with the microcontroller and GPS is also interfaced such that the tracking of the entire soldier is observed. And the location is messaged to the particular concern person /dept. This Uniform will make the soldier to work in any kind of environment.

**Keywords:** Microcontroller, Solar Panel, Rechargeable Battery, Temperature Sensor, Heart Rate Sensor, Image, Astronomy, Process, Simulation, Result, Application, Remote Detection.

## 1. Introduction

Warriors are the Army's most imperative asset. Warriors assume an essential part to ensure one's nation. The term warriors incorporate administration men and ladies from the Army, Air Force, Navy and Marine. While giving security to the country, they might confront inconveniences in hot/ frosty climate conditions. Both exceptionally hot and icy temperatures could be unsafe to well-being .[1]This venture is a solution for this circumstance. In this venture an E-Uniform is planned which gives better security to the officers who are working in great climate conditions [1]. Temperature sensor is utilized for check the temperature whenever. The LM 35 is an exactness circuit temperature sensor, whose yield voltage is directly relative to the Celsius (Centigrade) temperature. In this undertaking we are going to plan an E-Uniform which gives better assurance to the fighters who are working in amazing whether conditions. This Uniform will make the trooper to work in any sort of environment. Here we are utilizing Solar Panels to control up the inside hardware of the E-uniform. A 12 V DC lead corrosive rechargeable battery is utilized for putting away the vitality [2].

## 2. Proposed System

After doing a lot of research and study some papers found out to be valuable resources for the development of the project. All contain different methodologies and techniques which are used to achieve efficient and user friendly uniform for Soldiers [5].

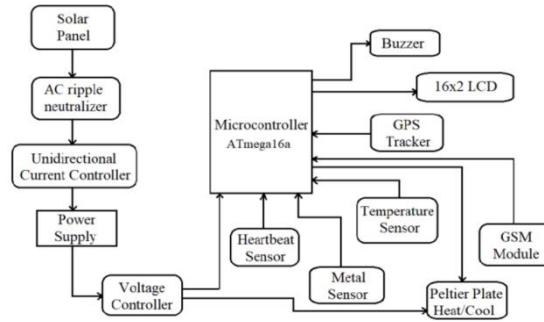


Fig. 1 : Block diagram of the proposed uniform system

### 3. Proposed Methodology

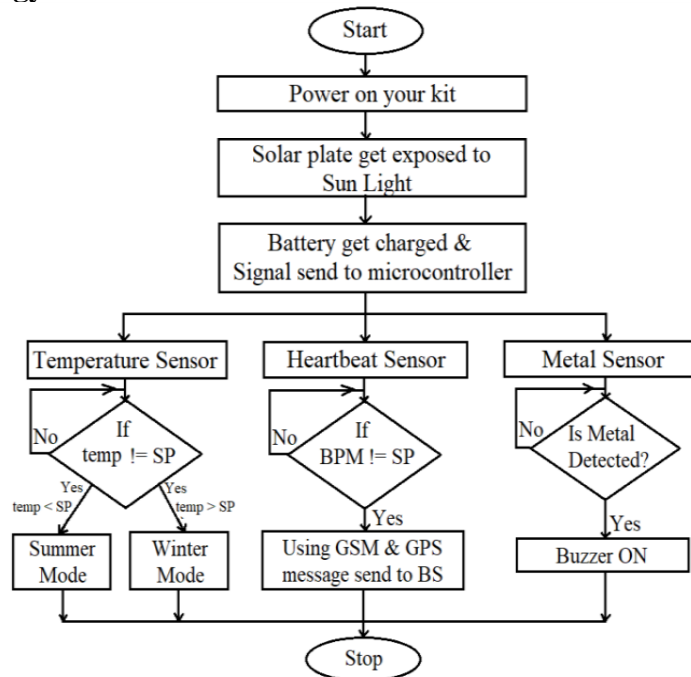


Fig. 2 : Proposed methodology flow chart

The proposed methodology could be best explained in the form of a flow-chart as shown in the Fig. 2, where the details about how the project could be implemented is shown [8].

### 4. Heartbeat Sensor



Fig. 3 : Heart beat sensor used

The heartbeat sensor is intended to give an advanced yield of warmth beat when a finger is set on it as shown in the Fig. 3. At the point when the heartbeat finder is working, the beat LED flashes as one with every heartbeat. This computerized yield can be associated with a microcontroller straightforwardly to gauge the Beats Per Minute (BPM) rate. It deals with the guideline of light by blood move through the finger at every heartbeat [9].

## 5. Metal Sensor

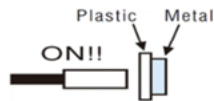


Fig. 4 : Metal sensor used

Inductive proximity sensors can only detect metal targets as shown in the Fig. 4. They do not expose to non-metals targets such as plastic, wood, paper and ceramic. Unlike photoelectric sensors, this allows inductive proximity sensors to detect a metal object through the opaque plastic [10].

## 6. Solar Panel



Fig. 5 : Solar panel used

The solar panel used is shown in the Fig. 5. Recently included component for our undertaking is – Solar Panel. As we were confronting issue for consistently release of 12v battery utilized at recorded. We at long last chose to go for sun oriented board renewable vitality source.

## 7. LCD

LCD stands for liquid crystal display. LCD used is 16 by 2. It contains the 16 pin. 8 pin is used for data communication, read, write, enable, Brightness control and 4 pins for power supply. It is used to display data [12].

## 8. Conclusions

Soldiers are one of the important factors in a country. Because they are the forces who protect our country day and night living behind sleep and rest. Solarbased E-Uniform provides better protection to the soldiers who add extreme weather. This Uniform made the soldier work in any kind of environment. So, he could work efficiently without heat stress or cold stress.

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