IOT based solar E-Uniform for soldiers

The aim of the project is to develop an electronic uniform for soldiers. The system has a cooler and warmer system inside it. The cooler/ warmer are powered through a peltier module. To run this system, we are using solar energy is obtained stored into the battery through charging circuit.

Soldiers are very important people who always strive for the security of the country. They are supposed to work at extreme temperatures (very high or very low temperatures). This will lead to health damage. So, a E- uniform is designed to avoid adverse effects caused due to temperature changes.

The controlling device of the project is PIC microcontroller. Metal sensor, GSM, GPS, panic switch, peltier plate, buzzer and Relays along with peltier plate and cooling fan are interfaced to PIC microcontroller. Microcontroller will switch on the peltier plate to provide the hot/cool to the soldier at inside of the jacket. When the person presses the panic switch, microcontroller will take the location from GPS module and sending this location to the predefine mobile number through GSM modem in the form of latitude and longitude values and upload the data into the thingspeak cloud through ESP8266 WI-FI module. The status of the project will display on LCD module. This uniform consist of contains metal detector, if the sensor detects metal this data process to the microcontroller, then microcontroller will activate the buzzer for alerts. All this equipment is placed in soldier jacket and solar panel on the soldiers cap. solar energy is obtained stored into the battery through charging circuit. Battery power is used to run this system. To achieve this task microcontroller lode program written in embedded C language.

The features of the project are:

1. Storage of solar energy to a rechargeable battery.
2. Using peltier module for generating the cool/warm.

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3. SOS based alerting system

4. GSM based SMS alerting system.

5. GPS based location tracking system.

6. IOT based monitoring system.

7. Visible alerts using LCD display.

The project provides the following learning's:

1. Solar panel working.

2. IOT technology.

3. GSM technology.

4. GPS technology.

5. Peltier effect.

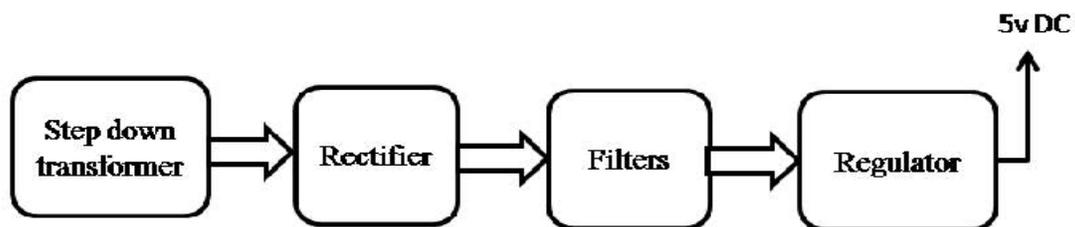**The major building blocks of this system are:**

1. Solar panel.

2. Charging circuit.

3. Rechargeable battery.

4. Temperature sensor.

5. GSM modem

6. GPS module

7. LCD display

8. PIC Microcontroller

9. Reset Crystal oscillator

10. LED indicators

11. Relays with driver.

12. Peltier module.

13. Metal detector.

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14. Buzzer.

15. Esp8266wi-fi module.

16. Panic switch.

Software's used:

1. PIC-C compiler for Embedded C programming.

2. PIC kit 2 programmer for dumping code into Micro controller.

3. Express SCH for Circuit design.

Regulated Power Supply:

5v DC

| Step down transformer | → | Rectifier | → | Filters | → | Regulator |

 Block Diagram:

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