IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 8, March 2025
Impact Factor: 7.67

Solar Based E-Uniform for Soldier, Used for Temperature Control and GPS Tracking

Harde Satyam Kuldeep, Gunjal Shreyash Dattatraya,
Matkar Mahesh Sunil, Prof. Gaikwad S. V
Department of E&TC Engineering
Amrutvahini Polytechnic, Sangamner

Abstract: *Soldiers deployed in extreme environments face significant challenges due to fluctuating weather conditions, which can lead to heat exhaustion, hypothermia, or dehydration. Traditional military uniforms offer limited thermal protection, requiring additional layers that may hinder mobility. This paper proposes a Solar-Based E-Uniform that integrates solar power, Peltier-based temperature regulation, GPS tracking, a landmine detection system, and GSM-based communication to enhance soldier safety and operational efficiency. The system is designed to function in summer and winter modes, adjusting body temperature as needed. Using thin-film solar panels embedded in the fabric, energy is harvested and stored in a 12V DC lead-acid rechargeable battery. The uniform also includes a landmine detector to identify explosive threats, improving battlefield safety. Additionally, the emergency alert system ensures real-time distress communication in critical situations. This smart uniform aims to improve survivability, increase endurance, and optimize energy usage in combat zones and remote locations. By integrating advanced materials, renewable energy, and threat detection technology, the proposed system significantly enhances soldier protection and operational efficiency.*

Keywords: Solar energy, e-uniform, temperature regulation, GPS tracking, Landmine Detector

DOI: 10.48175/IJARSCT-24557