

Solar-Based E-Uniform for Soldiers in Extreme Temperature Conditions

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Abstract: *Military uniforms are designed to provide protection, but traditional fabrics often fail to regulate body temperature in extreme weather conditions. This paper presents a solar-powered, temperature-controlled E-Uniform for soldiers operating in extreme high or low temperatures. The system integrates a temperature sensor (DHT11), microcontroller (ATmega328P), solar panels, and heating/cooling mechanisms to maintain optimal body temperature. The uniform is lightweight, durable, and energy-efficient, powered by a 12V DC lead-acid rechargeable battery charged via solar energy. Field tests confirm its effectiveness in extreme climates, offering a sustainable solution for soldier safety and comfort.*

Keywords: E-Uniform, Solar Power, Temperature Regulation, Military Wearables, ATmega328P

