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 2, May 2025
Impact Factor: 7.67

Dynamic Solar Wireless Charging for Electric Vehicles: An Arduino Nano-Controlled Inductive Power Transfer System

Monu R. Prajapati[1], Deepak Kumar[2], Rohan Chaurasia[3], Sujeet Maurya[4], Mahtabul Haque[5]
[1234]B. Tech Students, Electrical Engineering Department
[5]Assistant Professor, Electrical Engineering Department
R.R. Institute of Modern Technology, Lucknow, India

Abstract: *The escalating demand for sustainable transportation has propelled the adoption of electric vehicles (EVs), yet challenges persist in charging infrastructure, including reliance on cables and grid dependency. This study proposes a solar-powered wireless EV charging system that integrates Inductive Power Transfer (IPT) technology to enable seamless energy transmission. Unlike conventional plug-in systems, this design eliminates physical connectors, leveraging solar energy harvested via photovoltaic panels to power a 12V battery. The stored DC energy is converted to high-frequency AC through an inverter, transmitted wirelessly via primary and secondary copper coils, and rectified for EV battery charging. The system employs an Arduino Nano microcontroller for real-time control, enhancing efficiency by activating transmission only when vehicles are detected. Experimental results demonstrate 67% efficiency, offering a scalable, eco-friendly solution for dynamic charging.*

Keywords: Electric vehicle (EV), wireless charging, solar power, Arduino Nano, inductive coupling

DOI: 10.48175/IJARSCT-26205