

Eco-Friendly Bus

Ashwini M. Gorade, Priyanka K. Mathe, Sneha B. Sable, Swapnil R. Gadekar

Abstract— This paper aims at the possibility of charging the electric vehicles wirelessly using inductive coupling scheme. We are exploring a key enabling element that will overcome problem associated with charging of moving electric vehicles and which will successfully demonstrate the feasibility of wireless power transfer directly to vehicle cruising at highway speed, via magnetically-coupled resonating coils located in the roadbed and in the vehicles. This paper uses two sources of energy for wireless charging which are inductive coupling scheme and solar energy. Also it uses RFID technique for authentication of vehicles. This paper will contribute to overcoming a critical limitation of existing electrical vehicles by offering range at competitive costs in development of eco-friendly bus.

Index Terms: Eco-friendly, RFID, Inductive coupling

I. INTRODUCTION

This paper aims at extending the wireless power transfer to the charging of moving electric vehicle. Electricity is used form of energy. However they are presently neither range nor competitive than conventional vehicle. Electrical vehicle offers superior energy efficiency while offering an enormous potential for reducing CO₂.

II. LITERATURE SURVEY

Wireless power transmission using satellite based solar power system. A wireless power transmission using microwave is a system which contains satellite based solar power system microwave generator, microwave transmitter, microwave receiver. The power received on earth is converted into AC for useful purpose.

III. BLOCK DIAGRAM

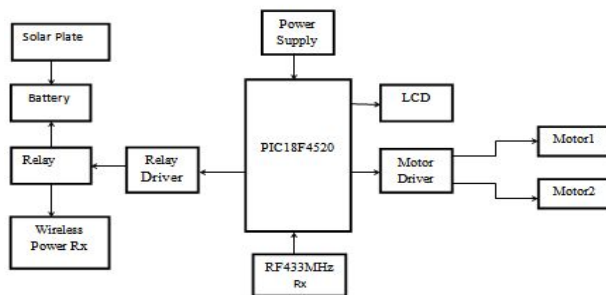


Fig.1: Bus Unit

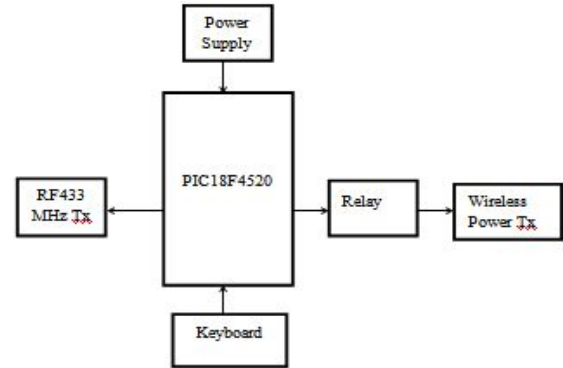


Fig.2: Bus Stop Unit

IV. PROPOSED SYSTEM WITH WORKING PRINCIPLE

1. Bus Stop Unit:-

At bus stop unit, the bus verification unit identifies the bus by sending the bus info to controller. Then the controller switches ON the relay driver circuit. Then the relay activates “contactless power generation circuit” through inductive coupling where the battery gets charged. The status of the battery is displayed on LCD. RF wireless module will send the bus location updates to depo.

2. Bus Unit:-

In bus unit, it consists of wireless zone receiving circuit and solar panel, through which charging of the battery is done.

V. SPECIFICATION OF HARDWARE

1) Microcontroller

The signals from EM transponder are given to the Microcontroller. Microcontroller processes all these signals and gives data to LCD display.

2) EM reader

When EM transponders come in the range of EM reader it will read the unique id number.



Fig.3: RFID Reader

i) Active RFID



Fig.4: RFID Tag

Identification system in which tags have their own power source (usually a battery), enabling them to broadcast an identifying signal. This extends the range of the tags and the capability for communicating advanced information such as location.

ii) Passive RFID

Identification system, in which the tags are not powered, relying on active signals from the location transmitters for their response. This limits the range of the tags to a few feet.

3) LCD display

It is used for the displaying the information.

4) Relay

It is used to drive AC/DC Load & also used for auto switching purpose.

5) Solar cell

It is used to convert sun energy into electrical energy. Photovoltaic (PV) systems convert light energy directly into electricity. The simplest systems power the small calculators we use every day. More complicated systems will provide a large portion of the electricity in the near future. PV represents one of the most promising means of maintaining our energy intensive standard of living while not contributing to global warming and pollution

6) Battery

A battery is a device that converts chemical energy directly to electrical energy. There are two types of batteries, disposable batteries, which are designed to be used once and discarded, and rechargeable batteries, which are designed to be recharged and used multiple times.

VI. CONCLUSION

We are trying to develop wireless charging system which is having the RFID authentication for the moving vehicle using inductive coupling principle. This will reduce the emissions of harmful gases such as CO₂ or SO₂ that are produced by the fuel vehicles.

VII. REFERENCE

- [1] Ashwini Lohar¹, Akshaya Wankahede², Ashwini Chapt³, Prof. Swati Jagtap⁴, Assistant Professor, Department of Electronics and Telecommunication Engineering, P.C.C.O.E., Pune, "Wireless Chargeable Eco-friendly Bus", IJSRD-International journal for scientific research & development, Vol. 3, Issue 02, 2015.
- [2] Hemant M. Dighade¹, Akhilesh A. Nimje² ¹Student, B. E. Final Year (Electrical Engineering), Guru Nanak Institute of Engg. and Tech., Nagpur-441 501, ²Associate Professor, Electrical Engineering, Guru Nanak Institute of Engg. and Tech., Nagpur-441 501, "Wireless Power Transmission Using Satellite Based Solar Power System", Volume 2, Issue 10, October 2013.
- [3] F. Risch, "Electrified roadway activities at the Bavarian technology center for electric drives", Transportation Research Board, 26th January 2011, Washington DC.
- [4] A. Brooker, M. Thorton and J. Rugh, "Technology improvement pathways to cost-effective vehicle electrification", SAE 2010 World Congress and Exhibition, 12th April 2010, Detroit.
- [5] Prashansa¹, Aditya Duggal¹, Manish Kumar Srivastava³, UG Student, Department of Electrical Engineering, S.S.E.T., S.H.I.A.T.S, Allahabad, Uttar Pradesh, India Associate Professor, Department of Electrical Engineering, S.S.E.T. ., S.H.I.A.T.S, Allahabad, Uttar Pradesh, India, "An Innovative Design of Wireless Power Transfer by High Frequency Resonant Coupling", International Journal of Innovative Research in Science, Engineering and Technology, Vol. 4, Issue 7, July 2015.
- [6] Satheesh Kumar M., Prof. Ramesh Y. Mali, University of Pune, "Application of Intelligent Transportation System Using RFID System", International Journal of Engg. Research and General Science Volume 2, Issue 4, June-July 2014.