

Wireless Power Transfer of Renewable Energy

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Abstract : We cannot imagine the world without electric power. Generally the power is transmitted through wires. This project describes an original idea to avoid the harmful usage of electrical wires which involve tedious process of organizing them. Imagine a future in which wireless power transfer is feasible: cell phones, household robots, mp3 players, laptop computers and other portable electronics capable of charging wirelessly, instead of using bulky batteries. This paper describes about the utilization of solar energy and the wireless transmission of the generated power. The solar power is first stored in a battery then transferred through wireless medium by inductive coupling. There is a high thrust for renewable energy to mitigate the effect of global warming. The inductive power transfer has wide applications along with renewable energy. To demonstrate this solar based wireless power transfer system for home appliances has been developed. The advantage of this project is to increase the usage of renewable energy resources in order to reduce the CO emissions. And also the wireless power transfer system is a new way to transfer the power to the load rather than the conventional method of transferring power through livewires.

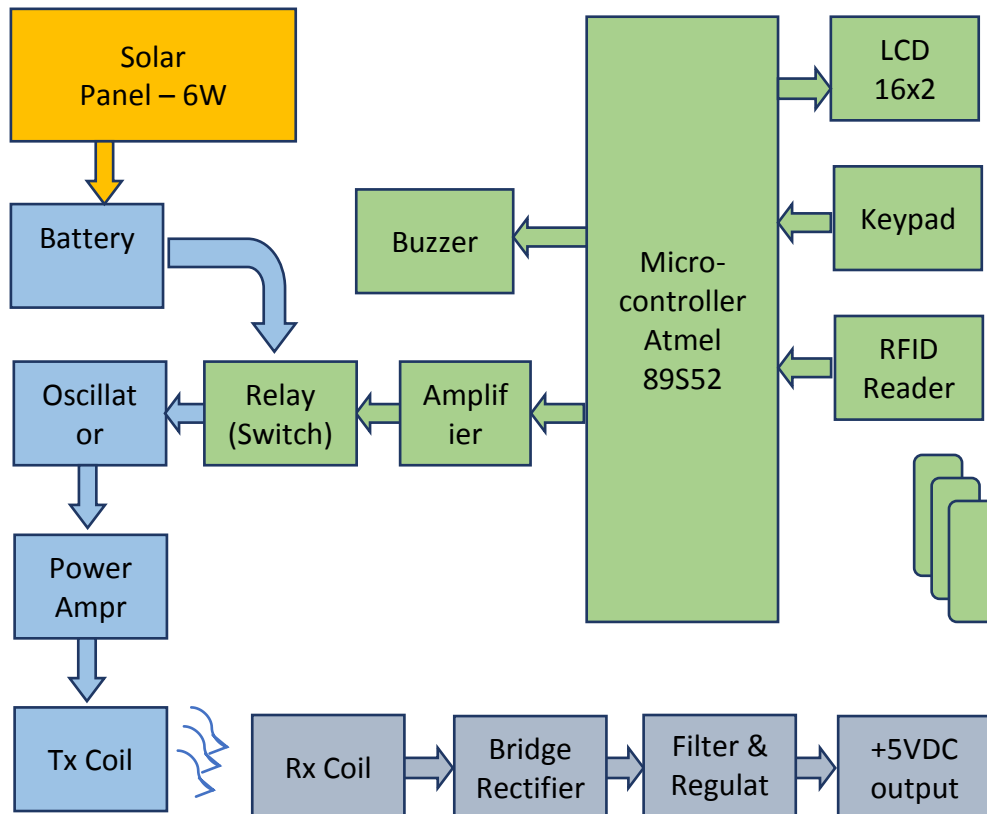
Keywords—inductive charging, non-radiative energy transfer, renewable energy sources, wireless power transfer system (WPTs).

I INTRODUCTION

Wireless power transmission is the transmission of electrical energy from a power source to an electrical load. Wireless power transmission (WPT) is an efficient way of transmitting electric power from one point to another through vacuum or atmosphere wirelessly. This paper describes about wireless power transfer system using inductive coupling. With the abundant solar energy in our country, it is essential to extract the maximum solar power at higher efficiency, since the construction of the solar panel is very expensive. The idea of wireless power transfer can be look back to 1820 when Andre-Marie Ampere invented his principle which states that an electric current produces a magnetic field. Nikola Tesla experimentally demonstrated wireless power transfer in 1891. Tesla was conducted an experiment and he developed a model for resonant circuit that is able to couple a high frequency current into another resonant circuit of a similar type. With his circuit, he was able to transmit power wirelessly i.e. without any physical interconnecting conductor to power a light bulb. Hence the wireless power transfer system is necessary to move on to a new technological world. This will reduce the complexity of the power transmission. And also protection is improved in this wireless power transmission system. We are in the energy deficit era because of huge demand from the consumers. This increases alternative source of energy to utilize more power. In India from the Sun we can extract more energy. Solar energy is the right alternative energy source to utilize. To decrease the usage of non-renewable energy source we can go for solar energy.

II BLOCK DIAGRAM

Microcontroller 89s52 acts as a main control unit for the proposed system. It controls all operations sequentially according to the designed software algorithm. Keypad and LCD acts as a user interface to communicate with the system. Keypad used is a 4x3 Matrix keypad for entering the numbers. LCD 16x2 displays alphanumeric characters. EM – 18 based RFID reader is used to complete the payment process. Wireless passive RFID tags are used as a prepaid billing card. The power from the solar panels is stored in the lead acid battery, which can be further used to transmit power wirelessly. The transmission of the power is based on the Tesla coils concept. The relay switch plays an important role in controlling power through the Primary coil. The receiving coils receive the power which is the regulated and filtered to provide 5v dc.



Atmel 89s52 also interfaces with the keypad for typing the charging duration and a secured pin for the payment. LCD is used for display of duration of charging and for the other purposes. Buzzer is provided to give a beep sound after the charging is completed. So the user can disconnect his device.

III WORKING

First the user keeps his RFID Tag on the RFID reader and enters a four digit numeric password with the help of keypad, which is then sent to the microcontroller. The microcontroller reads the data and authenticates the user input and displays the information of user via LCD display such as user name and remaining balance. The user then enter the amount of charging time that he wants to charge his mobile. The microcontroller acknowledges the information and starts the charging process using relay circuit. During this process for maximum current flow to the battery of the mobile, the distance between the transmitter and receiver should be less than 8-10cm. Buzzers will inform the user about the time remaining for the mobile to be charged. As the time for charge is over the microcontroller automatically stops the charging and the transaction is successfully complete.

IV ADVANTAGES

- Renewable energy(SOLAR)
- Wireless transfer independent of standard connectors.
- Isolation from electrical shock.
- It has less consumption of electricity.
- Rust free and waterproof
- Convenience

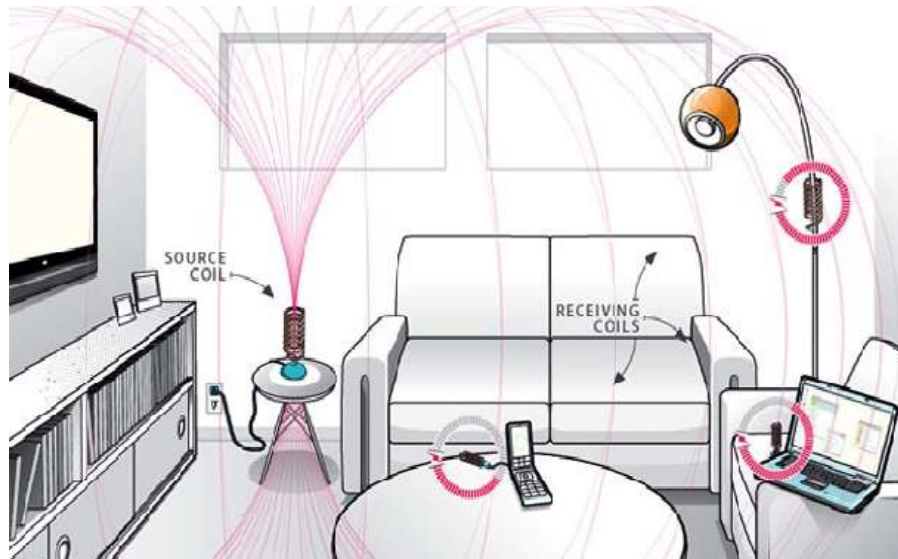
V APPLICATIONS

- Smartphone's and wearable's
- Notebooks and tablets
- Power tools and service robots, such as vacuum cleaners
- Multi copters and electric toys
- Medical devices
- In-car charging.

VI FUTURE SCOPE

IHS Market analyst David Green:

In 2016, just under 240 million devices with wireless charging capabilities shipped worldwide, he says. "But growth can be massive," "By 2025, you'll be talking over 2 billion devices a year will ship with wireless charging."



VII CONCLUSION

The Solar based wireless power transfer of energy has been implemented in this project. Instead of using of conventional current, we made use of Tesla coil concept to charge mobile phones.

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