



SMART CHARGING WITH SOLAR PANEL AND COMMUNICATION WITH LI-FI

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Abstract: The project was developed as a part of importance of Solar charging in Electric Vehicle and the communication through Li-Fi along with it. The charging of the vehicle takes a lot of time and this time can be very boring for the user of the vehicle. To solve this problem and decrease the charging time of the vehicle this project is made. The charging will be done with the concept of Solar charging and instead of solar energy we will be using the LED light of high luminous intensity. The project will use the brightness of the Smd LEDs which have a very high luminous intensity and boost the charging of the battery. Along with the charging of the battery there will be a communication process through the solar panel with the concept of Li-Fi. This process will entertain the user of the car along with the fast charging.

Keywords: *Li-Fi, Smd LEDs, Solar Panel.*

I. INTRODUCTION

Currently, the charging of electric cars is done by the power stations which charge the battery of cars with the electricity. The proposed system consists of media sharing with charging, the user will get updated with the current happenings in the world, user will enjoy efficient charging time period with the visual and audio output of the system. As the data will be transmitted through LED panel. This data will be used for providing news, videos, audio, Television entertainment, Internet and shareable media. The LEDs which are used in panel are designed to be as sharing of media and having sufficient lux that can generate sufficient energy for charging of batteries throughout the whole conversion of energy. As firstly the power is transmitted to the LED panel this phenomenon occurs as the conversion of electrical energy into light energy. This is one conversion of energy. As the data will be transmitted in the form of electrical pulses to the LED panel. So this data will be converted from electrical to light. Now the second conversion will be light to electrical pulses. The light which is having sufficient lux will fall on solar panel which is designed to give sufficient input to the batteries at a level of charging. For data transmission there is a specific part designed in the solar panel for receiving of this data in form of light. The amplifiers/analog to digital converter are used to extract this data from physical light to electrical signal. This electrical signal will go to electrical devices such as displays, speakers and many more electrical devices. This output will be helpful for the user to not to get bored during charging time period. The transmission of data to LED panel will be processed from charging station. The primary data will be received through the receptor which are in built in charging station. This data can be achieved from internet, pre-loaded media, Television media, etc. This information will be transmitted only when vehicle come at desired position which is meant for charging. The proposed system helps in charging the Electric vehicle with the concept of solar charging and along with solar charging it will also help the Electric vehicle in communication with the help of Li-Fi concept. The user can play music or listen to news while charging the Electric Vehicle. The System having charging through the setup of a Solar plate and LEDs Setup.

The data will be communicated throughout the system with a flexible speed of transferring and receiving rate so that interruption of communication will not occur. Throughout this process the battery of vehicle also gets charged with a certain charging input which are meant to be designed for fast charging purpose. It's also providing media system by Li-Fi which can be used for entertainment purpose. As the system will consist of data sharing and this will be done with the help of visible light communication that meant to be as Li-Fi communication. This data will be transmitted through wireless communication with the concept of Li-Fi communication. Now for transferring of power to the solar panel there is an LED panel is set up. The LEDs are of 1.8 volt and 20 mA as they are surface mounted LEDs. The data is transferring through amplifier having suitable power to make turn on LEDs.

DESCRIPTION OF THE INVENTION

I- *Problem Addresses By The Invention*

The concept of Li-Fi was first advanced and utilized by Professor Harald Haas from University of Edinburgh, United Kingdom. This was done at the TED worldwide talk in 2011. Li-Fi innovation was given a position of "one of 50 best creations of 2011" on TED world webpage on the web. Li-Fi innovation was given a position of "one of 50 best creations of 2011" on TED world webpage on the web. In October 2011, industries players formed the Li-Fi consortium, whose aim is to propagate the awareness of high speed optical wireless systems and with it conquer the limited amount of space available for radio-based wireless spectrum by exploiting a totally different part of the spectrum. The system 'Smart charging with Li-Fi communication' consist of efficient charging having media sharing along with it. This system deals with the concept of solar charging and Li-Fi fundamentals. The main concept of our project is to charge the vehicle along with the media sharing to the vehicle. What will user do when vehicle is charging? Will user get updated from current situation in remote areas/low network area? Will user enjoy the time period of charging of vehicle? Here is the solution. As the system consists of media sharing with charging, the user will get updated with the current happenings in the world, user will enjoy efficient charging time period with the visual and audio output of the system. As the data will be transmitted through LED panel. This data will be used for providing news, videos, audio, Television entertainment, Internet and shareable media. The LEDs which are used in panel are designed to be as sharing of media and having sufficient lux that can generate sufficient energy for charging of batteries throughout the whole conversion of energy. As firstly the power is transmitted to the LED panel this phenomenon occurs as the conversion of electrical energy into light energy. This is one conversion of energy. As the data will be transmitted in the form of electrical pulses to the LED panel. So this data will be converted from electrical to light. Now the second conversion will be light to electrical pulses. The light which is having sufficient lux will fall on solar panel which is designed to give sufficient input to the batteries at a level of charging. For data transmission there is a specific part designed in the solar panel for receiving of this data in form of light. The amplifiers/analog to digital converter are used to extract this data from physical light to electrical signal. This electrical signal will go to electrical devices such as displays, speakers and many more electrical devices. This output will be helpful for the user to not to get bored during charging time period. The transmission of data to LED panel will be processed from charging station. The primary data will be received through the receptor which are in built in charging station. This data can be achieved from internet, pre-loaded media, Television media, etc. This information will be transmitted only when vehicle come at desired position which is meant for charging.

II- *State of Art*

As the system will consist of data sharing this will be done with help of visible light communication that meant to be as Li-Fi communication. This data will be transmitted through wireless communication designed to be used the concept of Li-Fi communication. As the vehicle has limited batteries having limited discharging period that can be lead to miss happening during long journey time period. In this system there are several extra batteries implanted for emergency purpose. These batteries are meant to be charged by this 'Smart charging system with Li-fi Communication'. When the main batteries are charging at the same time these batteries will also get charged and throughout the whole process the user can enjoy the time person of charging with the Li-Fi communication setup. As the power rating of this charging system will be sufficient that can be used as fast charging system and hence can charge batteries in a short period of time.

III- *Proposed System*

1. There will be an LED (smd) strip for giving sufficient light energy for powering up solar plate.
2. A solar plate is installed in bottom section of vehicle.
3. When vehicle will come on charging station the LED strips will turn on and thus the solar plate will generate power in form of voltage and current.

The LEDs which are used in panel are designed to be as sharing of media and having sufficient lux that can generate sufficient energy for charging of batteries throughout the whole conversion of energy.

4. Need to maintain the rate of charging current through power source.
5. System designed as to be mentioned parameters
6. System designed as to be configuration-LED ratings should be 2.5 volt 180 mA at max. Panel of LED is to be designed for 5000 LED So power should be-2250 watt Now solar panel should be designed as – 48 volts and 150Ah Power output should be 7200 watts.

Net power should be equal with adding error must be 6500 watts.

For Lifi media sharing there will a special arrangement of data transmission through LED in same set of LED strips. For Li-Fi communication speed of transmission should be of high frequency that cannot be easily seen fluctuated[Fig:01]. In transmitter side, when we interface 3.5mm jack to sound source LED will glow however there is no fluctuation in the power of light when the sound source is OFF. When you play the sound, you will see that there is incessant change in power of light. At the point when you increment the volume, LED's force is changing quicker than the human eye can follow[Fig:01].

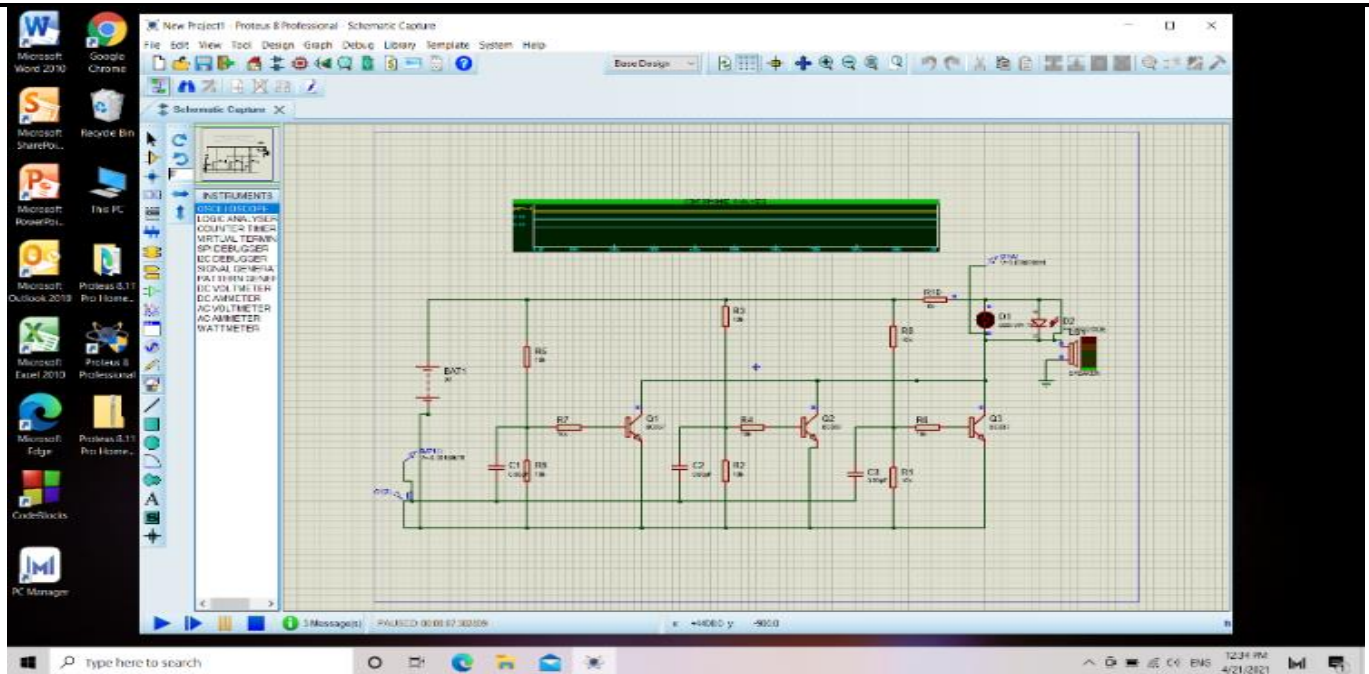


fig:01 proteus simulation for communication with li-fi

Solar panel is delicate to such an extent that it can catch little power change and correspondingly there is change in the voltages at output of solar panel, when the light of LED falls on the panel, voltages will differ as per the intensity of light. Then voltages of solar panel are fed into amplifier Speaker which amplifies the signal and giving the audio output by speaker.

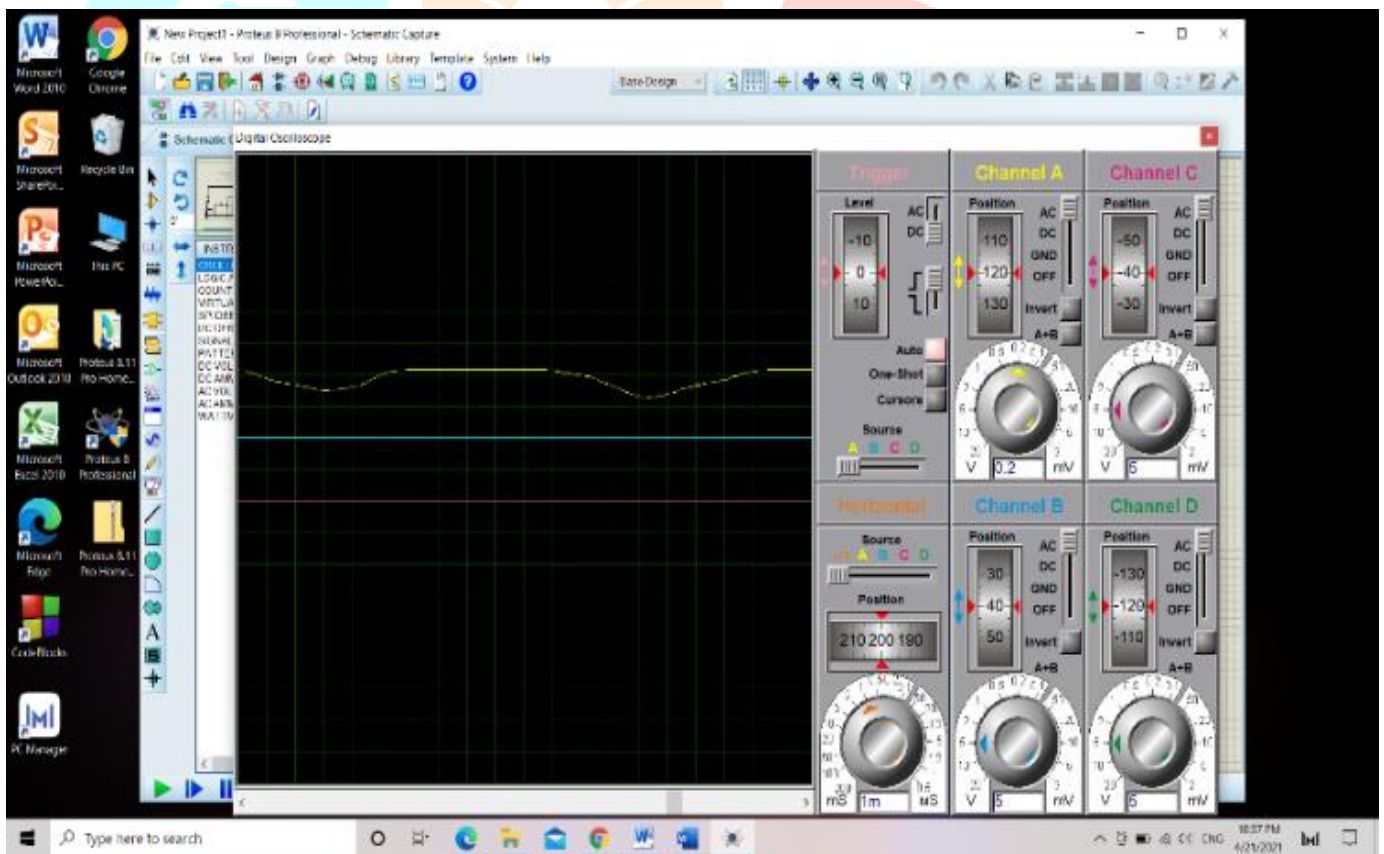
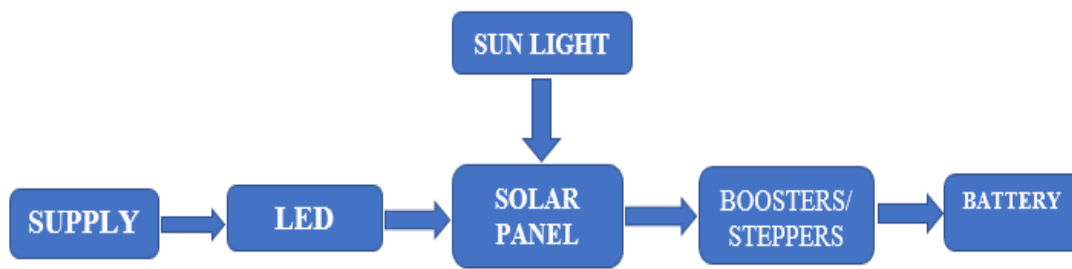


fig:02 audio output waveform

For Charging:



For Entertainment system:



RESULT

Solar cells respond to smd led much the way they do to solar power because solar and led both put off light waves that the solar cells can collect and convert into energy.

Smd Led need to be bright enough, if Led are glow enough then the light wavelengths are similar enough to the sun's Ultraviolet waves that the solar cells can convert the energy into useable power. This process works because the solar panel cells roughly match the sun's spectrum, which allows the light to be absorbed.

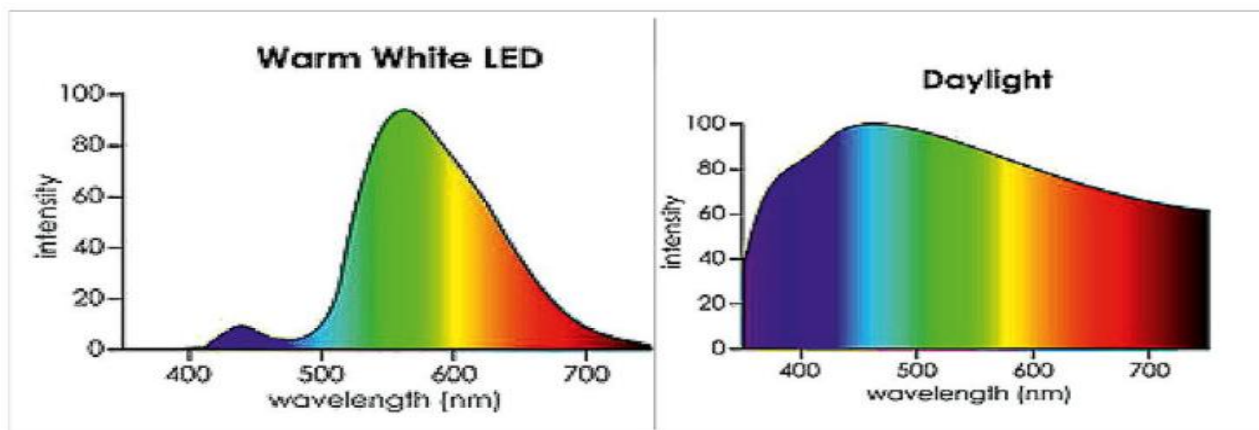


fig:03 comparison led wavelength and sunlight wavelength

So the System having charging with data communication will provide an efficient way of charging through the setup of a Solar plate and LEDs Setup.It's also provided fast charging system. As the fast charging will occur at 20A of current supply, the system will be designed as the rating in between 150-200Ah which will be sufficient for delivering power that can be used as fast charging.This system also provided media system through Li-Fi is going to be integrated in same system for making easier and reliable communication which can be used for entertainment purpose by user.

ADVANTAGES

- The charging system is efficient and useful in Cloudy days as well as in night.
- The charging system provides fast charging as per the system to be designed.
- The charging system with Li-Fi is time conserving and used for entertainment purpose.
- The design of the project is technically advanced by the integration with Li-Fi concepts.
- The project supports media sharing (for entertainment).
- The technology used is easy to install and setup in vehicles.
- There is less complexity due to the easiest integration of whole system.
- The technology is economical as can be used in foggy and cloudy days and is user Eco-friendly.
- New concept and methodology of charging.

DISADVANTAGE

According to the earlier conversation however coordinating LI-FI with solar panel has many benefits even so a few disadvantage might be there as the system will consist of data sharing this will be done with help of visible light communication that meant to be as Li-Fi communication. This data will be transmitted through wireless communication designed to be used the concept of Li-Fi communication. As the vehicle has limited batteries having limited discharging period that can be a big problem during long journey time period.

FUTURE OUTCOMES

The concept implies Fast Charging and will be very beneficial and economical in the future in context with the Electric Vehicle. The concept can be modified and expanded other than Communication and Media Sharing with the improvement in the technology. Li-Fi systems with led lights can be provide free internet access also to the users, Light Fidelity communication is a high-speed communication and has no harmful radiations associated with it. So, it is an eco-friendly communication and has no harmful effects on the environment.

It is also very convenient for working in rainy and cloudy days. The concept is new and technically advanced and the setup is also very compatible with size and storage efficiency. Moreover, this system is very fast and secure also.

CONCLUSION

The System having charging with data communication will give an effective method of charging through the arrangement of a solar plate and LEDs Setup. The information will convey all through the system with an adaptable speed of transferring and accepting rate so interference of correspondence won't happen. Throughout this process battery of vehicle also get charged with a certain charging input which are meant to be designed for fast charging purpose. This project will save the charging time and also be able to communicate without any wires connected for transmission of audio signals and it has a large scope in the coming future.

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