

Smart Charging Station

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Abstract – Solar energy refers to capturing the energy from the sun and subsequently converting it into electricity. We can use that electricity to light up the street, homes and business and power our machines as well. Solar energy is today used in number of ways; as heat for making hot water, cooking and generate the electricity with solar cells or heat engines and to take salt away from the sea water. Electric vehicle is one which is operated by electric energy, instead of internal combustion engines or gases for power. Electric vehicle is used in order to avoid the ozone depletion, global warming, and depletion of fuel and mainly to avoid pollution. PV (Photovoltaic) systems are one of the abundant renewable energy to produce electricity, green, pure and source of energy where power is generated from sunlight converting into electricity by the use of PV solar cell. Here we are developing a solar based coin charging station for electrical vehicles and overcome the disadvantage like charging method and cost. This type of system can use at public places like Bus station, Railway station and also rural areas. This station primarily used for charging the EV and secondarily for charging the electronic devices like phone, laptop, batteries, etc.

Keywords – solar energy, DC source, ARDUINO, relay, RFID, charging station, voltage booster.

I. INTRODUCTION

Today's world human being wish to work fast and efficient way to achieve ease manner. The fast moving world can't imagine a world without vehicles or without electricity.

We feel won't rotate without these things. Air, water, oxygen, food and shelter and adding the electric power, vehicle, electronic devices for this modern world. Vehicles which is used for travelling long distance or to reach the destination at time. Transport facilities are through air, water, roadways and railways. The transport mainly classified based on the engine system as electrical vehicle and non-electrical vehicles. Electrical energy is used in the electrical battery to power the vehicle. People moving to electric vehicle for reasons like depletion of fuel, pollution and cost of the fuel. Electric vehicle which destroys the above disadvantages. Electric vehicles which in the market are slow-charging method using AC charging equipment. Slow charging method is the main disadvantage of this system. Currently, fast charging method is at high cost. It take 8 hours to charge 800 V battery. Another disadvantage of the system there is limited station and most of them use to charge their vehicle at their homes, this causes the high price. In this paper we discuss about the charging system, to overcome the disadvantage of charging time. This station about its source of renewable energy and booster.

II. LITERATURE SURVEY

Now a days, people like to move fastly and finish their work efficiently. Comparing other vehicle, Electrical vehicle having least number of papers and projects. In Coin based mobile battery charger with high security published in YEAR: 2016 contains the details of the coin is detected by cantilever type sensor. Detect the coin weight and give the digital value using ADC, controller check the value and find the coin is original or not.

In the paper of Mobile battery charger on coin insertion YEAR:2017 detailed that Implement mobile battery charge on coin insertion system. The charging time period is calculated by using Atmel 8951 microcontroller. After that microcontroller display the remaining time period. When the time period reach to zero power supply will cut by using relay circuit.

Automatic gadget charger using coin detection paper in the YEAR: 2015, set the upper and lower limit of coin, capture image from an infinite input by the camera. Convert the RGP image to separate the background from the regarding, check limits all images based on which ever threshold interval values lives display the value of coin.

III. EXISTING METHOD

At present day today life AC charging system is used and it is not available at all places and expensive, which make

the charging period long. AC chargers which occupy space. DC chargers also ensure a much more efficient use of high-cost parking spaces in urban areas compared to AC chargers. The main problem they are high cost charging systems. The main disadvantage of the existing system is charging period and space.

Disadvantages:

- During rainy seasons and cloudy day, acquire low efficient.
- Only used metal coins.
- Most of the charging station is non-renewable energy.
- It consume more time to charging the electric vehicle

IV. PROPOSED TECHNOLOGY

We use ac charging method in our day to day life. Due to this it create a many problem like high charging time, high cost, only used metal coins, etc., To overcome this problems we suggest a new idea for charging electric vehicle. Instead of AC charging we use DC charging for time consume, use smart card and RFID card reader. It has the user friendly environment. It take only small place to install it.

So we can install it in anywhere. It can charging the vehicle within 2 to 3 hours. By using the DC charging we can attain more efficient. In this technology we use solar panel for producing the electric energy. Solar energy is one of the most abundant renewable energy resources.

Solar energy is attained from the sunlight. The light energy is converted to electric by solar panel. Solar consist of number of photovoltaic cells. Converted electric energy is stored in Battery for absence of sunlight period. The electric energy is transferred to the load (Electric vehicle).

RFID card reader is used for collect the data from the users. It is used to collect and store the data. We use LCD display for show the information like Amount details, Charging time, Voltage level. The frequency range of RFID card reader is 10 to 15Hz. In this technology we use

Relay for cut off and on the power. Relay is turned on when the RFID card was read. It is turned off when the time downs to zero. When the relay is turned off charging of electric vehicle is also cut off. If the use of DC charging, the user can get electricity for very low cost.

Advantages:

- Easy to use.
- It can be used at any time.
- Less time to charging.
- Also using Smart cards

Block Diagram:

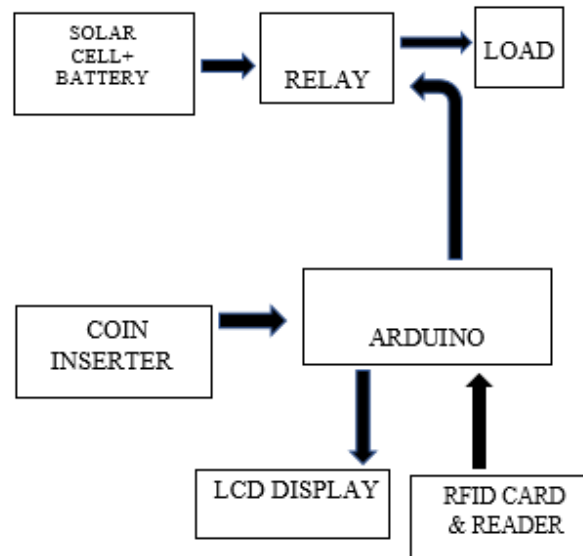


Fig.1. Block diagram.

V. WORKING PRINCIPLE

In recent times, there have lot of technologies developed for charging the mobile phones. Where the electrical energy from the solar PV cell. The solar energy converts light energy into DC current. The converted DC energy is used for charging the mobile phones. Here Solar energy is used because solar is the abundant renewable energy resource. In the solar PV cell panel of size 1659x992x40mm, and it produces the 36WP. High transparency solar glass. Usually, in the electrical vehicles voltage range between 400V to 800V. From the solar panel we get required power. One solar Photo Voltaic cell produce 0.7V and using 60 cells, we get 250W.

In some cases we need above 1000W, let's to be connect 7 panels. It contain 420 cells and producing a 1600W power. The relays are used in a wide variety of application throughout industry. A relay is the type of electrical switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contact in multiple contact forms. The function of the relay is open and close circuits electromechanically or electronically. For example relay contact is normally open, there is an open contact when the relay is not energized. Now a days different type of relays are used in the protecting system such as electromagnetic relays, solid state relays, hybrid relays, thermal relays, reed relays. The electromagnetic attraction is the basic working principle of relay. When the relay circuit senses the fault current, electromagnetic field is energises, which used to produce the temporary magnetic field. Relay which is used to control a circuit by a separate low-power signal, or must be controlled by one signal. For example digital

computers and telephone exchange system and automation system and also the relay used to control one among many circuits. The relay were used in two fields. Relay basically is that current flowing in one circuit leads to the opening or closure of another circuit. One field is an amplifier, and another one is retransmitted. Relays are manufactured to operate quickly. It reduces arcing in high

Voltage applications. When electric current is passed through the coil in which coil is placed inside the relay and it generates a magnetic field. In coin inserted section, inserting the coins like Rs.1, Rs.2, Rs.5 or card swiping like ATM card. First the inserted coin is to be detected original or duplicated. The detection is done by the Arduino. After the coin is original then the mobile charge as its particular time duration. Either the inserted coin is duplicate then no any process will be done coin directly out by refund box. Arduino is the microcontroller like a small computer on a single integrated circuit containing a processor core, memory and programmable input/output peripherals. The important part for us is that a microcontroller contains the processor (which all computers have) and memory, and some input/output pins that you can control and also it is the major hardware components. It consists of both a microcontroller and piece of software that runs on your computer that is used to write a data and upload a code in to the physical board. RFID (Radio-frequency identification)

Used to the objects are track automatically with the help of attaching and also identify the required details automatically. RFID is one intelligent automatic plant irrigation system concentrates water in plants regularly without human monitoring using a moisture sensor and humidity. The system uses a hardware component method of automatic identification and data capture. The tags contain electronically stored information. Arduino consists of 14 digital input/output pins. Vin is the input voltage can supply through this pin or the voltage can be supplied via the power jack. And then the 5V regulate power supply is used to power the microcontroller and the other components on the board. Maximum current drawn is 50mA. Ground (GND) pins are also placed in the arduino. A liquid-crystal display is a flat-panel display. And also the electronically modulated optical device that uses the light modulating properties of liquid crystals combined with polarizers. It do not emit light directly, instead using a backlight monochrome. LCD'S consume the power much less power than LED. It works based on the principle of blocking light rather than emitting it. The LCD connected displays the messages as and when required. And also it displays the how much of amount inserted.

VI. CONCLUSION

A method of charging E-vehicles are manufactures has designed and developed whenever required. When we are going for a long travel are forget to charge this project

extended its welcome to solve. This project is about coin charging the small unit can charged to get through the distance in case of emergency and which can be also inserted with smart cards like credit cards, debit cards and many government approved cards for paying purpose. The future of this project can extended by introducing the updated battery to withstand the loss and withstand the

battery charging, voltage booster for reducing the charging time and decrease the losses and link the module of RFID tag to the governmental organisation so that the payment method can accessed easily. The microprocessor here we are using the ARDUINO and be changed in order to get the better performance.

VII. FUTURE SCOPE

This method is not only useful for today's world but also motivate and update the next generation. Because people travel around the world requires cell phone for communication and vehicle for travelling purpose. The issues of charging is avoided by this project. The expectation of this project is to launch all over the world, especially at rural arrears and highways, since we are developing.

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