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ECO-FRIENDLY CHARGING STATION

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Abstract - *In upcoming day the availability of non-renewable resources will be decreasing ,so we can use the renewable resource which is available in the form of sunlight wind etc. The world population is growing continuously which becomes the main reason to see increment in the number of vehicle that cause more pollution .To reduce this air pollution we can create the module, "ECO-FRIENDLY CHARGING STATION". The 75% of the pollution are created due to use of large number of petroleum vehicle per year. The unavailability of non-renewable resources like, petrol, diesel will lead to many problems in our daily life style, therefore the vehicle manufactures are focusing on the production of electric vehicle. In this project we will discuss the concept of transmission of electric power wirelessly using renewable source (solar panel). The transfer of power is taken place by electromagnetic coupling. The solar panel then converts the light energy into electrical energy and is stored in battery. This energy passed to primary coil in the form of electromagnetic coupling with the secondary coil. In this two coil i.e., primary and secondary coil the flux is produce and EMF is generated.*

Keywords- Solar panel, Battery charger, Electric vehicle, Inductive power transfer

1. INTRODUCTION

We are living in 21st century and we are fully dependent on non-renewable resources like fossil fuel, which are more expensive and the availability of this resources are decreasing day by day. This paper will be fully based on the wireless transmission of electric power. In wireless charging the generation of power should be eco-friendly, safe and non-hazardous .On the basis of resonant magnetic coupling we can transfer the electric power to the electric vehicle wirelessly. The inductive coil work as transformer. The construction is based on two inductive coil i.e. transmitter coil (primary coil) and another is receiver coil (secondary coil) in which the electromagnetic coupling occurs, which leads to the production of flux and EMF is generated. Then the power is passed wirelessly to the electric vehicle and the vehicle gets charged

2. LITERATURE REVIEW

We have went through various papers identified with the similar technology which is utilized for various purposes.

[1]. This paper gives the Wireless Power Transfer (WPT) system in view of Inductive Power Transfer (IPT) with Super Capacitor (SC) energy capacity. The proffered system is fitting for dynamic charging Electric Vehicles (EVs), where motions of energy should be devised without overburdening the utility lattice or EV battery

[2]. —Vehicle-to-layer (V2L) innovation sanctions bidirectional charging of the electric vehicle (EV) and speeds up power layer auxiliary and helps us. Regardless, battery bundle in EV might progress in cell dynamic varieties over the long time. This is because of the developmental intricacy and electrochemical orderings in the battery pack. These expansions might emerge in V2L frameworks due to: earliest, extra charging and releasing progressions to control layer; second, outside wrecks; and third, long unfurling's to high temperatures. A picky reference of these enhancements is because of blemished sensors. Wherefore, it tends to be argued that the battery packs in EV are profoundly dependent on the observing of these in-cell changes and their result of spread with each implicated part. In this article, a visualization based plan to exhibit the strength of variety incited sensors is proposed. Initial, an engendering model is refined to foresee the in-cell changes of a battery pack by astute the covariance utilizing a middle based assumption. Second, a derive model is created to recognize and isolate every variety. This is acquired by inferring a restrictive likelihood based thickness work for the calculations. The proposed observing system is assessed utilizing exploratory estimations gathered from Lithium-particle battery pack in EVs.

[3]. The reliable condition of charge (coC) online assessment is a significant pointer that connects with driving scopes of electric vehicles (EV). The connection between open circuit voltage (OCV) and CoC assumes a fundamental part in CoC assessment for lithium-particle batteries. To contrast and the conventional steady OCV (IO) examination and the low current OCV (LO) test, an original OCV test which consolidates IO test with LO test (CIL) is proposed in this paper composing. In view of the irreproachable boundaries online recognizable proof of the double polarization (DP) battery model, two CoC assessment calculations are connected on the precision, heartiness and simultaneousness speed for the whole CoC locale. In the mean time, the complementary investigation of the three OCV CoC connections fits by the comparing OCV tests is challenged as

far as the CoC web based assessing underneath different temperatures.

[4]. While wide scale organization of Plug-in Electric Vehicles (PEVs) offers guaranteeing benefits, for example, natural increases, energy security and monetary soundness, it likewise represents specific network safety described difficulties. Dissimilar to control network security, PEV online protection is essentially under-investigated. Be that as it may, digital assaults on PEVs might prompt damaging positions, for example, unavailable EVs through Denial-of-Charging (DOC) or battery pack hurt by means of cheating. In this work, we endeavour to resolve this issue by inspecting control-arranged ways for PEV network safety. Demonstratively, we centre around planning calculations for distinguishing digital assaults that might possibly influence PEV battery packs during charging. We talk about two calculations: (I) Static Detector which appropriates just estimated factors, and (ii) Dynamic Detector which uses the conversance of framework elements alongside the estimations. Moreover, we mean a channel based plan approach for the Dynamic Detector that investigations a multi-objective rules including strength and attack responsiveness

3. EXISTING SYSTEM

Sample of The EV charging station consists only a power converter topology. Then, it is connected to the existing electrical grid using a rectifier and a DC converter to transfer the energy to the existing electrical grid in the electric vehicle or vice versa, but it can always remain the stability of the processes. As an example, when the EV is connected to the charging station, the behavior of the charging station will change accordingly to the converter operation either by rectification or inverter mode to the EV. Accordingly, the EV considers the power converter to be a non-linear information source during the rectification mode. Meanwhile, the EV battery will effectively add to the frequency variation/interrupts of the power network framework on which cannot be controlled. For this situation, assuming that the grid matrix is distributed in a flow , the power streams between the grid and the battery can't be suitable for giving a quick charging condition to the EV. This issue doesn't just influence the power streams but also additionally it decreases the power component and grid frequency at the grid network supply. Accordingly, the EV should act as a nonstop essential recurrence control to the grid network side that won't interfere with the stability of the grid system. In the mean time, as seen from inside the EV viewpoint, the capacity to give a high response to the condition of charge (COC) of the battery is additionally essential. Yet at this point we should also consider EV battery rectification mode is likewise we should also think of problems faced by current system are Lack of Standardization, Power Infrastructure Updates, Lack Of service Options, Cost Of Electricity

4. PROPOSED WORKED

The fundamental standard of wireless charging is same as transformer working. There are the two coil in used which is the transmitter coil and receiver coil. The DC power is transformed to a high-frequency alternating current, which is then delivered to the transmitter coil. The receiver coil is then cut by an alternating magnetic field, resulting in AC power output. But the most important thing for efficient wireless charging is to maintain the resonance frequency between transmitter and receiver coil. To maintain the resonant frequency compensation network is added at both sides. Finally, power from the receiver is sent to the battery for charging. In this the arduino nano ATmega328 is a programmed with the IR Sensor When the IR Sensor detects the car entering the station it sends data data to arduino. Then the arduino switches on the Relay and the current passes from the battery to the primary winding which is present at the station . Then wireless power transmission takes place and the EV gets charged. The LCD gives the details of the process going on simultaneously

5. BLOCK DIAGRAM AND COMPONENT DETAIL

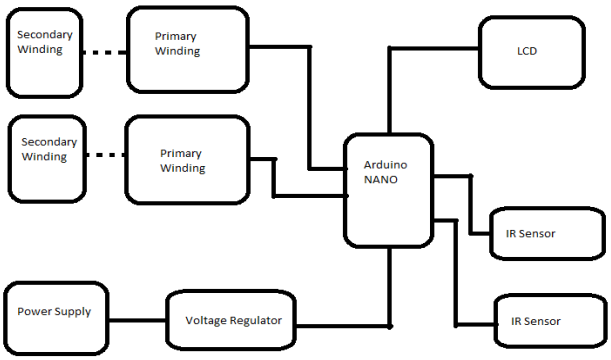

Fig -1: Block Diagram of Eco-friendly Charging Station

5.1 Solar Panel

Photovoltaic (PV) cell which is an electrical device that converts light energy into electrical energy.

Solar panel is suitable for charging 6V battery (approx).

The solar panel Direct current output voltage is know to be about 5v and the output current is about 100mA.

The total maximum output power from this solar panel is expected to be 0.5W.

Fig -2: Solar Panel

5.2 Battery

Electric power is provided to battery and its positive terminal is cathode and adverse terminal is anode.

controlling electrical gadgets like spotlights, cell phones and electric vehicles.

A battery is a gadget comprising of at least one electrochemical cells with outer associations for

Fig -3: Rechargeable Battery

5.3 SPDT Relay

By opening and shutting it is a controlling gadget which can ON/OFF an electrically worked switch.

A hand-off which can comprise set of information terminal for a solitary or a various control sign and set of working contact terminal.

A hand-off may have quite a few contact in various structure that contact are connect, break contact and mix contact.

The circuit can be constrained by transfer which having low pass sign or one sign can constrained by a few circuit.

The utilized of hand-off as a sign repeater along significant distance broadcast, hand-off can get signal from one circuit and communicated to other circuit..

Fig -4: SPDT Relay

5.4 2N2222A Transistor

2N2222A transistor is an NPN type transistor in which the collector and emitter will be left open i.e. reverse biased.

When the base pin is held at ground and will be remain in closed position i.e., forward biased. When the signal is allowed to base pin

The terminal which is marked negative is considered to be the source of electrons that will flow through an external electric circuit to get to the positive terminal

It is common that NPN bi-polar junction transistors used for general purpose low power amplifying is switching application.

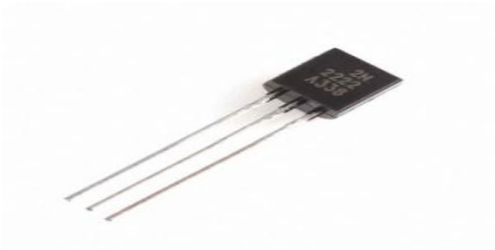

Fig -5: 2N2222A Transistor

5.5 Arduino Nano

Arduino nano circuit board with arduino IDE are capable of reading analog and also digital input signal with the help of different sensor, activating the motor, turning LED ON/OFF and so many other such activities can be performed.

The arduino Nano is having every one of the functionalities which is performed by sending a bunch of directions to the ATmega328 primary microcontroller can the board by means of arduino IDE.

The arduino board additionally manages incorporates power USB, Voltage controller, gem oscillator, The voltage Pin (3.3v,5v,gnd,Vin),A0 to A5 simple pins frosts pin, power drove pointer, Tx& Rx drove's , 14 computerized input/yield pins, Aref, and Arduino reset.

The arduino project began in 2003 as testing program..

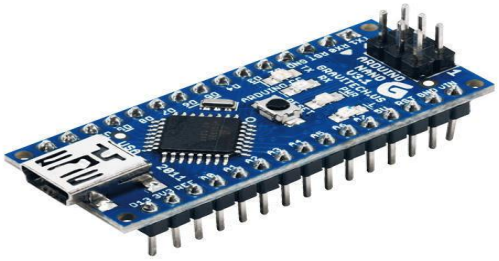

Fig -6: Arduino Nano

5.6 LCD (Liquid Crystal Display)

LCD(Liquid Crystal display)screen is an electronic presentation module and track down wide scope of utilizations.

A 16*2 LCD show is a very simple module that has two controllers into 16 pin device.

Simple to program with arduino IDE software single led backlight included can be darkened effectively with a resistor supply voltage is 5V.

The display is a 5*7 pixel are two resistor in namely, command and data the command is stored the instruction and data is show in LED.

The LCD is 16*2 is the 16 segment(columns) and 2 lines(rows). It functions as the 4-cycle and 8-bit mode. The availability of LCD show in colour green and blue backdrop illumination.

The without backdrop illumination LCD is 1mA current consume.

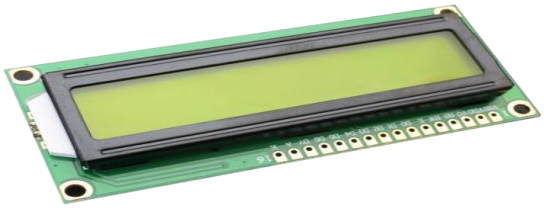

Fig -7: LCD

5.7 Inductive Coil

There are two types of coil present in inductive coil one is primary coil (transmitter) and another is secondary coil (receiver).

The electric current flowing through primary coil, create the magnetic field is couple to secondary coil.

The primary coil act as a inductor, it can stored energy associated magnetic field. Due to electromagnetic induction, the primary coil's primary current is interrupted quickly, the magnetic field collapses rapidly, and a high voltage pulse is formed in the secondary coil. The distance between primary coil and secondary coil are 1.5mm apart.

Fig -8: Transmitter & Receiver Coil

5.8 Electric vehicle

The first electric vehicle produced by USA in 19th century.

The electric vehicle can be charged from external source of electricity. The number of electric vehicle increased from 2% in 2016 to 22% in 2030.

The electric drive vehicle is depends on one or multiple motor.

That is why the current generation has change to look at slight increase in global warming, pollution, natural resources and so on.

Fig -9: Electric Vehicle Prototype

5.9 LED

A device which can produce light on electrical and electronics equipment.

LED is a semiconductor based device.

It leads to the combination of electron and holes..

Fig -10: LED

5.10 I2C MODULE FOR LCD

It is otherwise called I2C Module. It has overall 20 male pins, 16 pins are faced to rear side and 4 pins faced towards front side. The 16 pins for associate with 16x2 LCD and the 2 pins out of 4 pins are SDA and SCL. SCL is the serial clock pin and SDA is the data pin. The remaining 2 pins for power supply (Vcc and ground).

There is a POT on the I2C Module. We can increase the contrast of the LCD display by rotating this POT. And also there is a jumper fixed on the module. When we eliminate the jumper, the backlight of the LCD display will go OFF.

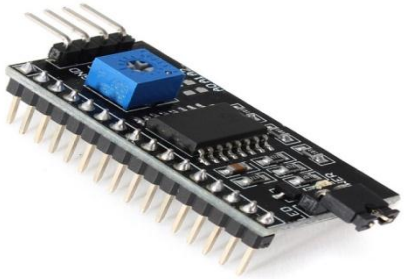

Fig -11: I2C Module

6. CONNECTION DIAGRAM AND FLOWCHART

Arduino nano pin D2, D3, D4,D5 is connected to LCD - D4 D5 D6 D7.

Arduino naoo pin two is connected to relay transistor BC547.

Transmitter coil is designed such that it has centre tap of 30 turns of copper coil at one end of coil which is connected to Emitter of Transistor 2N2222 and thr other end is connected to Base of Transistor and centre is connected to battery negative. The Collector is connected to positive terminal of battery.

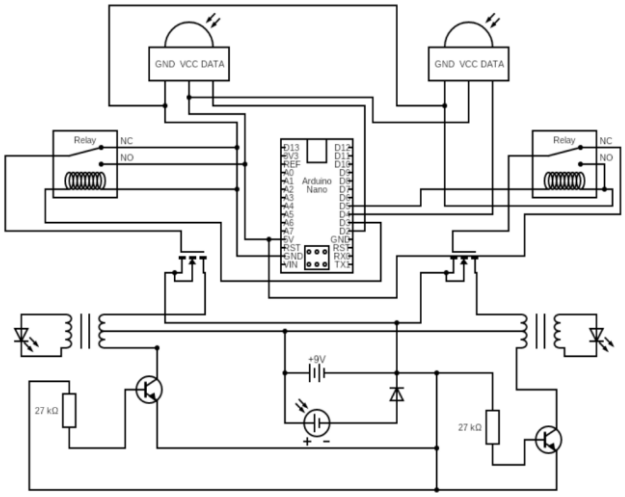

Fig -11: Schematic Circuit

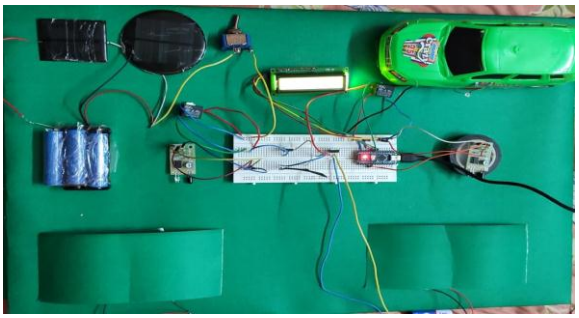

Fig -12: Prototype model of Eco-friendly charging station

6.1 Flowchart

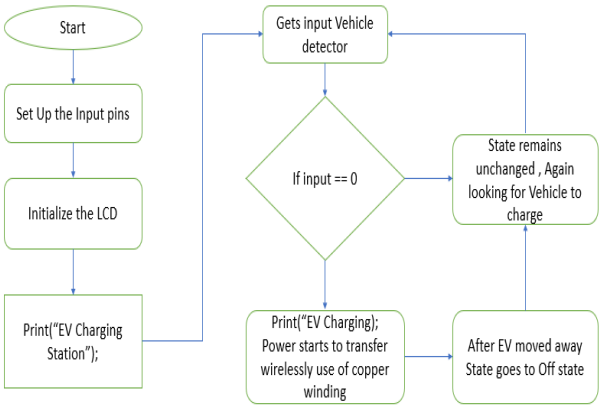

Chart -1: Working Flow chart

7. ADVANTAGES

It makes device more sufficient and thus desirable acquire by removing requirement for a power part chord a battery replacement.

Wireless charging offers no corrosion as the electronics are surrounded away from water or oxygen in the atmosphere.

Decrease of E-waste by reducing requirement of power chords and Our project encourages the customer to adapt Ev's

8. CONCLUSIONS AND FUTURE SCOPE

The transportation sector now accounts for the majority of carbon dioxide emissions. Because electric vehicles emit 54 percent less carbon dioxide per mile than conventional vehicles, their continuous use will help to mitigate this impact.

EV batteries convert 59 to 62 percent of their energy into vehicle movement, compared to 17 to 21 percent for gas-powered vehicles. EV drivers pay roughly $1.2 per gallon to charge their vehicles, which is less than half the cost of gasoline. An electric vehicle's average yearly operating cost is $485, compared to $1,117 for a conventional vehicle.

Our project encourages the customer to adapt Ev's.

In future Integration With IOT And Using App To Identify The Location Of The Charging Station And Charge Percentage Available In The Station And Also The Time Expected To Be Taken To Get Fully Charged can be developed,

It Improves The Charging Performance, And Also Minimizes Energy Losses By Autonomously Activating Only The Coils With The Highest Transfer Efficiencies.,

We can try Implementing The WPT Technology Directly In Highways So That The Ev's Can Get Charged On The Go And Reduce The Stand - By Time

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