



Solar Wireless Electric Vehicle Charging System

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ABSTRACT:

The automotive industry is quickly transitioning from IC engine vehicles to electric vehicles as we enter a new era of automobiles. The growing demand for electric vehicles is also driving up the number of charging stations. In this idea, the automobile is charged wirelessly through inductive coupling using a wireless charging system. All we have to do is pull the automobile into the charging station. Wireless Power Transmission is the process of sending electrical energy from a source to a load over a distance without the need of cables or other conducting wires. Nikola Tesla's greatest invention was the idea of wireless power transfer. There is no need for human contact with this technology. One technology that may be a step towards the future is wireless power transmission. With the help of this project, wireless charging may become more practical for everyday usage.

Introduction:

One of the main issues facing the globe today is the energy crisis. By keeping a close eye on our energy usage and preventing energy waste, we may somewhat mitigate the current energy problem. People today deal with a lot of issues, such as power theft. Power theft has a direct impact on our nation's economy and may qualify as a serious crime. Energy theft will be easily detected by this method. The Atmega 328 microcontroller powers this Internet of Things electricity metre. It is equipped with a GSM module for mobile connectivity and a WiFi module for IOT connectivity. Users can receive information by SMS on this module. Additionally, the microprocessor of this smart electricity metre receives the current reading from a current sensor.

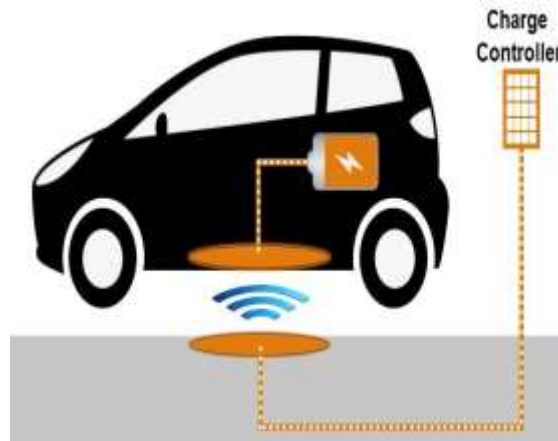
. In order to configure the system, we must establish an SMS connection between our cell phones and the system. Information will be disseminated on the set number in the event of an emergency. For the unit, for which we have four buttons, we must establish costs. We are able to specify pricing for the unit with the use of buttons. The IOT panel displays reading as soon as the machine is turned on. The way that you read will alter throughout time. If energy is stolen, it will be detected and shown on the IOT screen. Even the information will be sent to the specified phone via SMS. To prevent theft, the operator can use IOT to turn off the system after receiving the alarm. Additionally, it reveals how to disable the system's message on a mobile device.

Wireless Power Transmission (WPT)

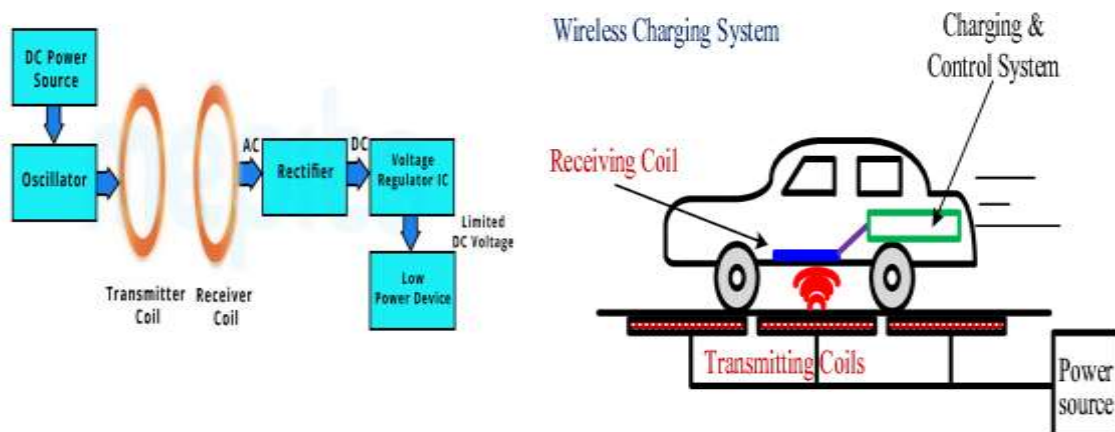
The efficient transfer of electric power over an environment or a vacuum without the use of cable or any other material is known as wireless power transmission, or WPT. Applications where electricity distribution is required instantaneously or continuously but conventional lines are prohibitively expensive, inconvenient, dangerous, undesired, or impractical can employ this. Resonant induction can be used for mid-range power transmission, electromagnetic wave power transfer for long-range power transmission, and inductive coupling for short-range power transmission. With the use of WPT technology, power can now be sent to areas that would not otherwise be feasible or feasible. Using an inductive coupling to charge an electric vehicle's battery may be the next big thing.

Objectives:

This study aims to create a wireless charging station and platform for electric vehicles so that they may be charged and electrical power can be transmitted wirelessly through space. Inductive coupling will be used by the system to transfer power from a transmitter to an electric vehicle's battery or resistive load.



Block Diagram



Software Requirements

Arduino IDE

The ATmega328p microcontroller IC with Arduino bootloader makes a lot of work easier in this project as Arduino code is written in C++ with an addition of special methods and functions, which we'll mention later on. C++ is a human-readable programming language. When you create a 'sketch' (the name given to Arduino code files), it is processed and compiled to machine language.

The Arduino Integrated Development Environment (IDE) is the main text editing program used for Arduino programming. It is where you'll be typing up your code before uploading it to the board you want to program. Arduino code is referred to as sketches.



Figure 1: Arduino IDE

MAJOR HARDWARE COMPONENTS

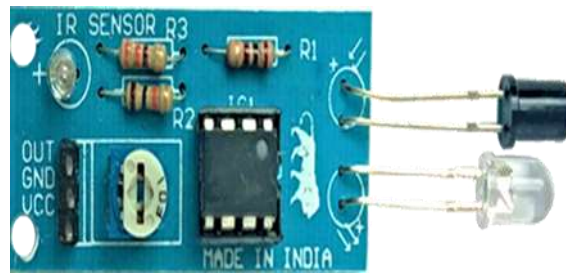
Arduino Nano

"The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328P released in 2008. It offers the same connectivity and specs of the Arduino Uno board in a smaller form factor. The Arduino Nano is equipped with 30 male I/O headers, in a DIP30-like configuration, which can be programmed using the Arduino Software integrated development environment (IDE), which is common to all Arduino boards and running both online and offline. The board can be powered through a type-B mini-USB cable or from a 9 V battery."



IR Sensor:

An infrared sensor is an electronic device, that emits to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, which can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode that is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.



Rechargeable Battery:

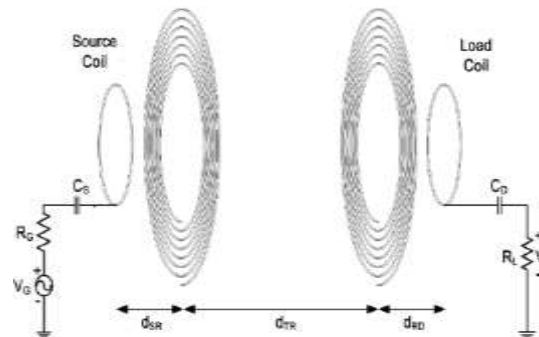
A rechargeable battery, storage, secondary battery, or accumulator is a type of electrical battery which can be charged, discharged into a load, and recharged many times, while a non-rechargeable or primary battery is supplied fully charged, and discarded once discharged. Several different combinations of electrode materials and electrolytes are used, including lead – acid, nickel cadmium (NiCd), nickel metal hydride (Ni-MH), lithium ion (Li-ion), and lithium-ion polymer (Li-ion polymer).

- Lead acid battery universal
- Voltage: 12 V
- Capacity: 1.3 Ah
- Dimensions: 151 mm x 65 mm x 95 mm



Copper Coil

The wireless power transmission can be defined as, the energy can be transmitted from the transmitter to a receiver through an oscillating magnetic field. AC current back into DC current, that becomes working power. Wireless Power Transfer Circuit requires components of this circuit mainly include 20-30 magnet wire (gauge copper wire), A battery-1, transistor (BC548) and LED. The construction of this circuit comprises of a transmitter and a receiver.



Advantages

- Environmentally Friendly – The most compelling reason to drive an electric vehicle is to help the environment. When compared to gasoline-powered vehicles, they do not emit poisonous emissions that pollute the air.
- No Costs of Fuel or Gas – Because electric automobiles do not require fuel or gas to operate, consumers may avoid the escalating costs of these items. All you have to do now is connect and you'll be ready to travel the additional 100 miles.

Conclusion

We are introducing the Wireless Power Transmission in this system. As the number of electric vehicles on the market rises. Our cars can be charged wirelessly using this method. This system demonstrates the effectiveness of the charging station's deployment in upcoming technologies. In summary, this research presents a comparative analysis of different smart parking, charging, and hybrid charging-parking systems that can address a range of connected problems. It also includes a table that compares different research papers. There are numerous approaches and strategies for parking and pricing that are covered.

Future Scope

based on new technology and policy standards. This section ought to illustrate WEVC's future. The global EV list is expanding rapidly these days. The two conceivable approaches to WEVC under the trend of industrial prosperity are how to guarantee sustainable growth in EV ownership and how to give uncontrolled EV development full rein. Furthermore, WEVC may become even more competitive with the introduction of new building materials, technologies, and concepts. More sophisticated features can also be advantageous for powerful electrical equipment. First, reversal losses provide a significant additional source of energy waste in the WEVC system, in addition to flux leakage.

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