IOT & RFID Wireless Vehicles Charging Using Arduino

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Abstract:
Due to decrease on petroleum product and diminish ecological contamination, the utilization of electric vehicles (EV) is quickly expanding, rather than ignition motor vehicles. The primary concern issue of the EV clients is being tended to through different charging strategies. The vital trouble in execution of EV is course of action of charging framework. The remote charging framework (WCS) is a most loved choice in the developing EV market. As the new time of the auto, the business is quickly changing from an IC motor vehicle to an electric vehicle. The interest for an electric vehicle is expanding, these lead to an expansion in charging station too. In this task, a remote charging framework is utilized to charge the vehicle remotely by means of inductive coupling. we essentially need to leave the vehicle on the charging spot. The transmission of electrical energy from source to stack from a distance with next to no directing wire or links is called Wireless Power Transmission. This framework doesn't need any human cooperation. The aftereffect of this venture is we can charge our vehicles remotely by means of inductive coupling and can transfer the vehicle numbers to the cloud which are put away in RFID labels. Remote power transmission may be one of the advancements that are one stage towards what's to come. This undertaking can open up additional opportunities of remote charging that can use in our day-to-day routines.

I. INTRODUCTION

We live in a universe of mechanical progression. New innovations arise every single day to simplify our life. Notwithstanding every one of these, we actually depend on the traditional and regular wire framework to charge our ordinary electronic devices.

The goal of this paper is to carry out an electric vehicle remote charging station and charging stage to send electrical power remotely through space and charge the battery of an electric vehicle. The framework will work by utilizing inductive coupling to send power from a transmitter to a resistive burden or battery of an electric vehicle.

Electrical Vehicles otherwise called plug-in electric vehicles determine all or part of their power from power provided by the electric framework. They incorporate AEVs and PHEVs. AEVs (every electric vehicle) are controlled by at least one electric engines. They get power by connecting to the framework and store it in batteries.

Similarly, as there is an assortment of innovations accessible in ordinary vehicles, module electric vehicles (otherwise called electric vehicles or EVs) have various features that can have various drivers' requirements. A noteworthy component of EVs is that drivers can connect them to charge from an off-board electric power source. This finds them from half and half electric vehicles, which supplement an inward burning motor with battery power yet can't be connected.

II. EXISTING METHODOLOGY

In existing we doesn't have any wireless power transformation techniques. Instead, we are using Wired power transmission which cannot be find everywhere. So here we are implementing Wireless Power transmission.

DRAWBACKS:

Wired creates messy as we need to connect wires manual work may be involved.

III.. PROPOSED METHODOLOGY

In transmitter we interface RFID reader to Arduino it is connected to relay which is connected to transmitter coil. when RFID tag is swiped over RFID reader, Arduino will send signal to relay then the power starts transferring to the coil. Using ferrite coils the voltage is travelled from transmitter side to receiver side. LCD shows weather the RFID tag valid or not and status of the charging. After RFID tag is swiped over RFID reader, then the power starts transferring from transmitter coil to receiver coil. charging time is uploaded in the cloud server by using NODE MCU. Again, we need to swipe over RFID reader to stop the charging.
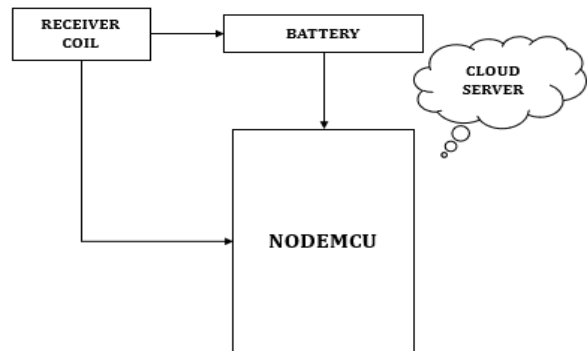
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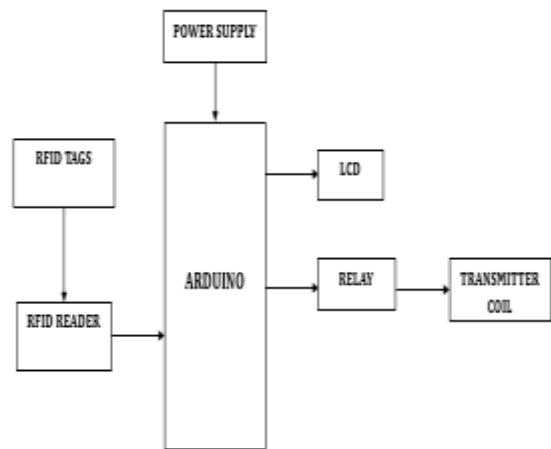
Block diagram for transmitter

RECEIVER
Block diagram for receiver

ARDUINO UNO

The Mcu is a simple-to-use yet influential and effective system that has garnered attention in both the leisure and commercial sectors. Because the Arduino is open-source, the hardware is inexpensive, easy to use and free to download and install. This tutorial is geared for ME2011,any other pupils who are encountering the Arduino for the first time. Hunt the web, for professional Arduino enthusiasts; there are more than enough resources.
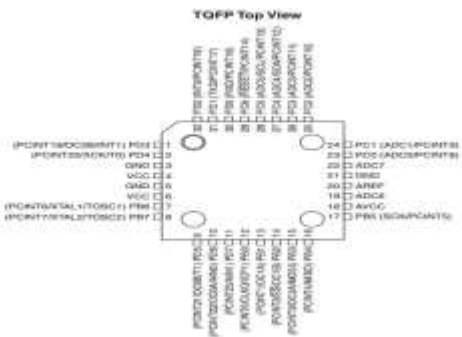

Fig.1Arduino uno

The Arduino programming language is a heavily modified version of C/C++. If you're familiar with C, programming the Arduino will be a breeze. There's no need to be concerned if you don't know C because a couple of orders are expected to perform important responsibilities.

PIN CONFIGURATIONS
Fig.2 Arduino Uno Pin Configurations

NodeMCU:

NodeMCU is an open-source kernel and development kit that helps you to design your own Iot technologies product.
The board has many GPIO pins that may be used to link it to other devices to a variety of platforms are good for making PWM, I2C, SPI, and UART sequential interchanges.

The interface of the module is on a very basic level disconnected into two areas including both Firmware and Hardware where past unexpected spikes popular for the ESP8266 Wi-Fi SoC and later relies upon the ESP-12 module. The firmware relies upon Lua – A setting up language that isn't hard to get, giving a clear programming environment layered with a fast-coordinating language that partners you with a remarkable specialist neighbourhood.
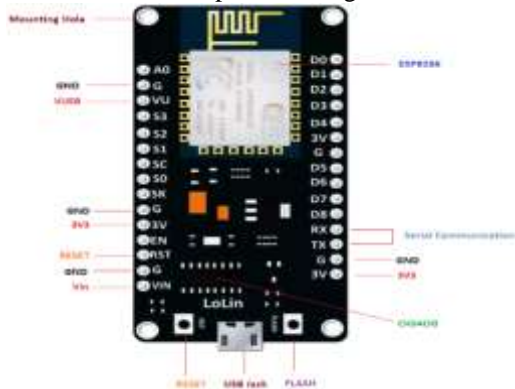

Fig.3Node MCU

USB to UART converter is brought at the module that permits in changing USB measurements to UART insights which explicitly knows about the language of sequential correspondence.

Instead of the typical USB port, MicroUSB port is covered withinside the module that associates it with the PC for twin purposes: programming and controlling up the board.

The board comprises of notoriety LED that squints and turns off quickly, providing you with the contemporary prominence of the module in case it's far running pleasantly while related with the PC.

The limit of module to set up a flawless WIFI association among channels makes it an extraordinary inclination for consolidating it with various implanted contraptions like Raspberry Pi.

WIRELESS POWER TRANSMISSION COILS

The 5V 2A Large Current Wireless Charger Module Transmitter Receiver Charging Coil Module is for an assortment of little electronic items, remote charging, power supply improvement, and plan, with a little size, simple to utilize, high productivity,   low value attributes.

Remote charging curls is little yet crucial in the   remote charging framework. Proficiency of force Transfer is firmly identified with Q plant of essential and auxiliary curls, their sizes, materials just as the distance between of the coils. The attributes of the transmitter and collector loops are urgent to accomplish low power transmission misfortunes. The legitimate choice and situating of the transmission and collector curls impacts the proficiency of the energy transmission.

Fig.4wireless Power Transmission coil

RFID reader and Tag:

RFID stands for radio frequency identification. RFID labels are little chips (also referred to as a smart card or a meeting card) that are used in our daily life to unlock doors, enter

vehicles, and so on. Together with an RFID reader, these tiny chips form the RFID framework.

During the Second World War, RFID innovation was first used to distinguish enemy aircraft. RFID innovation has advanced from that point forward and is currently being utilized in a wide range of businesses. A perfect model is a savvy stockroom where RFID innovation is utilized to

mechanize the warehousing system.

Two sides of a RFID system are 1) RFID Reader and 2) RFID Tag. Information is put away electronically in the RFID tag. The Reader gathers this information utilizing electromagnetic waves. Labels can just store a couple of kilograms of information bytes.

RFID READER

Fig.5 RFID Reader

RFID module Inside the RFID reader is a wireless communication system. It is also known as an analytical expert. After regulating, the reader continually broadcasts reception apparatus flags. When an RFID tag is positioned within in the distance of a reader, it stimulates the tag through electromagnetic waves and gathers data from it.

RFID TAG

A RFID tag is seen in the illustration (brilliant card moulded tag). RFID labels may be found in a variety of sizes and forms. The Tag includes an integrated circuit (IC) for storing data, a reception equipment for sending and receiving data, and a modulator. Tags are relatively tiny and can only store a few bits of information.

Fig.6 RFID Tag

LCD DISPLAY:

LCD (Liquid Crystal Display) technology is being used in scratch pad screens and other mini-PCs. LCDs, like LED and gas-plasma technology, allow for far slimmer presentations than cathode beam tube technology (CRT). LCD displays use far less energy than LED and gas screens since they emit light rather than concealing it.

Fig7.LCD Display

For dynamic framework show, an LCD is either manufactured using an uninvolved lattice or a showcase network. The dynamic framework LCD is also known as a meagre film transistor (TFT) display. Every crossing point of the network with pixels has a matrix of conductors in the uninvolved LCD lattice. To control the light for any pixel, two conductors on the lattice convey a current. A working framework contains a transistor at each pixel crossing point, which means that controlling the brightness of a pixel requires less current.

Some remote network LCDs include double filtering, which means they look at the matrix twice with current in the meanwhile as the initial invention only took one sweep. Dynamic lattice, on the other hand, is a more advanced idea.

A 16x2 display is a common attribute found in a variety of devices and circuits. These modules, which include more than seven parts, as well as other multi-fragment LEDs, are popular. The grounds for this are as follows: LCDs are inexpensive; they are easily programmable; they have no restrictions on displaying unique and even bespoke characters (unlike in the seven pieces), gestures, cetera.

The 16x2 Display suggests that 16 digits may be displayed for each line, and there are two such lines. In this LCD, each character is shown in a 5x7 pixel lattice. This LCD has two registers, specifically Command and Data.

The command register stores the instructions delivered to the Display. The command is an instruction sent to Display to do a present task, such as introducing it, cleaning its screen, establishing the position of the pointer, managing presenting, and etc. The data register will hold the data that will be shown on the Display. The data is the ASCII incentive for the character to appear on the Display.

Battery:

A rechargeable battery is an energy storage device that can be charged again after being discharged by applying DC current to its terminals.

Rechargeable batteries take into consideration numerous utilizations from a cell, decreasing waste and for the most part giving a superior long interest as far as dollars invested for usable gadget energy. This is valid in any event, considering in the higher price tag of battery-powered and the necessity for a charger.

A rechargeable battery is for the most part a more reasonable and manageable substitution to one-time utilize batteries, which produce current through a compound response in which a receptive anode is devoured. The anode in a battery-powered battery gets devoured too yet at a slower rate, taking into account many charges and releases.

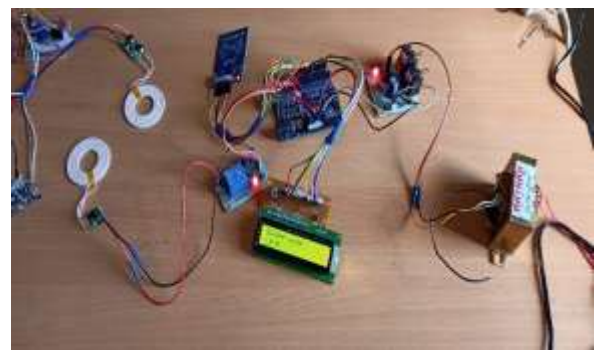*Fig.8 Battery*

IV. RESULT AND DISCUSSION:

Fig.9Before swiping card

Fig.10After swiping card
Fig.11Charging

V. CONCLUSION

The objective of this venture was to plan and execute a remote power move and remote charger for low power gadgets through full inductive coupling. Subsequent to investigating the entire framework bit by bit for improvement, a circuit was planned and carried out. Test results showed that critical enhancements as far as power move effectiveness have been accomplished. It was depicted and exhibited that full inductive coupling can be utilized to convey power remotely from a source loop to a heap curl and charge a low power gadget. The Wireless Power Transmission would supplant the ordinary innovation.

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