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A SOLAR POWERED CHARGING STATION FOR SCOOTERS WITH RFID TAG

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Abstract: ***In this project, we present the solar powered security charging station which would be a great addition to cities around the world, as it would provide a secure and eco-friendly way to charge electric scooters. It would also help to reduce congestion and pollution, making cities cleaner and more livable. The prime objective of this work is to demonstrate how technology can be used to make our cities more sustainable, secure, and convenient.***

Keywords Keywords— ARDUNO UNO, POWER 5V, RFID EM 18, Solar, Relay 12V

1. INTRODUCTION

A solar PV source is one of the most interesting technologies among the other renewable energy sources, Photovoltaic (PV) panels, commonly called solar cells, are simply converters. When exposed to light, solar cells are capable of producing electricity without any harmful effect to the environment or device, that is power can be generated for many years while requiring minimal maintenance and operational costs.Automatic identification and access control system has become most necessary to overcome the security threats faced by many solar charge stations organizations . By installing the system at the entrance will only allow the authorized persons to enter the organization.In such a way, suspicious persons can be caught which will surely improve the security level in the organization. Radio frequency identification (RFID) is a wireless technology that can be used to develop the access control system.
The system hardware consists of RFID tickets, RFID readers, computer terminals, optical networks, computer servers and site controllers.The reader at the site reads the data inside the e-ticket and transmits it to the computer

terminal and servers though the network. The data is decrypted at the terminal and its authenticity is verified.This system identification and authentication process is carried out at three sub¬levels namely the sale sub- system, the decision sub-system and the management sub¬system. All these processes communicate with each other through database information.The hardware of the system consists of RFID tag and reader operating at a frequency of 125khz for authentication, inductive loop for metal detection, capacity sensor for counting vehicles, we have developed an automatic vehicle parking control system based on RFID technology.
The RFID reader sense the proper tag to permit the solar power supply to E-vehicle once tag sensed it permits the solar power otherwise not permit. Here arduino used to implement our project.Here, we have three RFID tag idl is true and remaining id's are false. If False tag detected the relay never turn on the solar power supply to boost converter otherwise the relay turn on and permit supply to the boost converter module. The Putty communication shows the charging time and charge rate.When an AC signal is applied across the bridge rectifier, during the positive half cycle, terminal A becomes positive while terminal B becomes negative. This results in diodes D 1 and D 3 to become forward biased while D 2 and D 4 become reverse biased.During the negative half-cycle, terminal B becomes positive while the terminal A becomes negative.This causes diodes D 2 and D 4 to become forward biased and diode D 1 and D 3 to be reverse biased. The module radiates 125KHz through its coils and when a 125KHz passive RFID tag is brought into this field it will get energized from this field.

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LITERATURE SURVEY

In paper[1] E-scooters are controversially discussed as a new mobility alternative for cities. The rapid growth of the shared use e-scooter market has raised questions about environmental sustainability and public benefits in many cities worldwide. The high dynamics of the market and insufficient public data available about the concrete business processes of shared e-scooters are making clear statements about the ecological effects difficult. The paper aims to conduct a life cycle assessment using Berlin as an example for shared e- scooters

In paper[2] To address the negative effects of car use, conventional and electric bicycles are often proposed as environment-friendly alternatives. The aim of this research is to identify the prospects of a modal shift towards conventional and electric bicycles based on a case study analysing the mobility generated by the three main campuses of the University of Liege in Belgium

In paper[3] Means and modes of transport in urban environments are changing. The emergence of new means of personal transport, such as e-scooters or e-bikes, combined with new concepts such asvehicle sharing'are changing urban transport. A greater social awareness of the harmful effects of polluting gases is leading to the adoption of new e-mobility solutions. A sustainable e-scooter recharging dock has been designed, built, and put into operation in a small town north of the city of Valencia (Spain).

In paper[4] This article deals with the multimode operation of a photovoltaic (PV) array, a battery, the grid and the diesel generator (DG) set-based charging station (CS) for providing the continuous charging and uninterruptible supply to the household loads. In this CS, a single voltage source converter operates the CS in an islanded mode, the grid connected mode and the DG set connected mode (DGM) and performs various tasks, such as power management among different energy sources and charging the electric vehicles (EVs).

In paper[5] With the rapid development of electric vehicles (EVs), the dramatic rise in the demand for electricity is creating heavy pressure on local grids. The combination of renewable energy and alscharging stations (EVCSs) provides a promising solution for alleviating the scarcity of electricity. In this paper, a finite-horizon Markov decision process (MDP) model is proposed for the optimal control of a photovoltaic (PV)-assisted EVCS in a university campus.

PROPOSED SYSTEM

RFID tags replaces both bar codes and the traditional security systems creating a smart libraries. Check out the stations that can also be automatically proctored possible with easy way, intuitive interfaces, since Page 1 several items in the pile can be grabbed at one time. Book returns can also be automated with the checkins and database updates completed parallely in the book return chute. RFID technology uses are limitless process, flexible and easier to use than other forms of data collection technology.

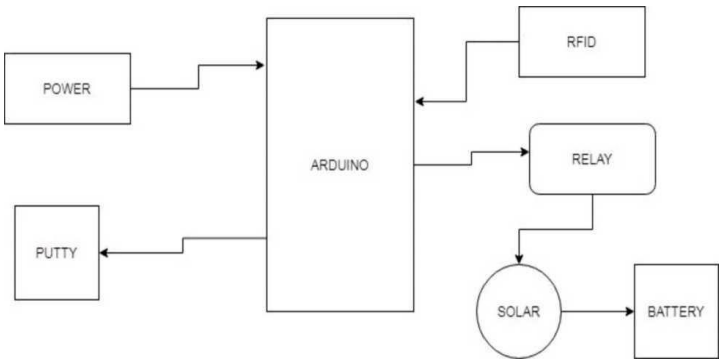

Figure 1 : Block diagram

The RFID reader experience the proper tag to permit the opportunity strength deliver to E-automobile as soon as tag sensed it lets in the opportunity strength in any other case now no longer allow. Here, we have got 3 RFID tag idl is genuine and last identifications are false. If False tag detected the relay in no way prompt the opportunity strength deliver to boost converter in any other case the relay prompt and allow deliver to the increase converter module. The Putty communication shows the charging time and charge rate.

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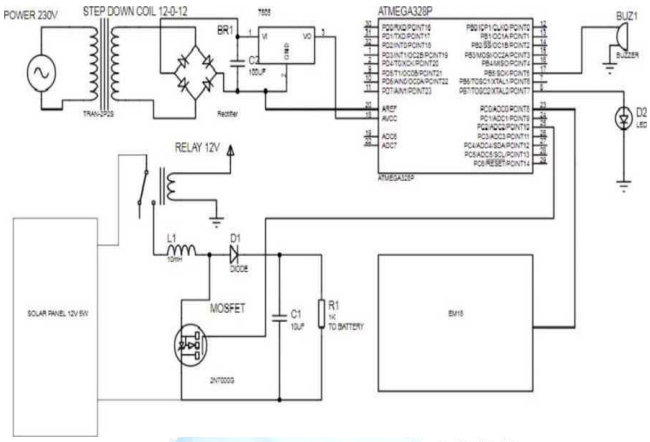

Figure 2: Circuit Diagram of Proposed System

When an AC sign is implemented throughout the bridge rectifier, at some stage in the advantageous 1/2 of cycle, terminal A turns into advantageous even as terminal B turns into terrible. This results in diodes DI and D3 to turn out to be ahead biased even as D2 and D4 turn out to be opposite biased. During the terrible 1/2 of-cycle, terminal B turns into advantageous even as the terminal A turns into terrible. This reasons diodes D2 and D4 to turn out to be ahead biased and diode DI and D3 to be opposite biased. The module radiates 125KHz thru its coils and whilst a 125KHz passive RFID tag is delivered into this discipline it's going to get energized from this discipline. These passive RFID tags usually incorporates CMOS IC EM4102 which may get sufficient energy for its acting from the field generated with the aid of using the reader. By converting the modulation modem thru the coils, tag will remand the statistics contained inside the manufacturing facility programmed reminiscence array. The increase converter is hired to "step-up" an enter voltage to a few better degree, required with the aid of using a load. This precise functionality is finished with the aid of using storing strength in an inductor and freeing it to the weight at the subsequent voltage. This short word highlights some of the greater not unusual place pitfalls whilst the usage of increase regulator.

Hardware Description

To make the project work and remain stable, the atmost important hardwares to be noted are Arduino UNO board and RFID Reader Module RC522. We may also need some connecting wires, breadboard, RFID tags and also a laptop.

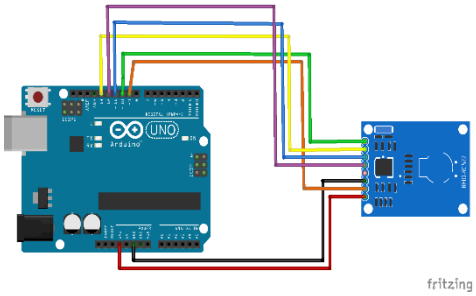

Figure 3 : Aurdino

RELAY:

The relay module could be a separate hardware device used for remote device switching. With it you'll be able toremotely control devices over a network or the internet.

Figure 4 : Relay

BOOST CONVERTER:

The boost converter is to "step-up" an input voltage to high level, required by a load. This is achieved by storing energy in an inductor and releasing it to the load at the next voltage. This brief note highlights a number of the more common pitfalls when using boost regulators.

Figure 5 :Boost Converter

SOLAR PANEL :(5W range 12V RANGE)

A PV module, is an assembly of PV cells mounted in framework for installation. Solar panels use sunlight as a source of energy and generate DC electricity, a set of PV modules is termed a PV Panel, and a system of Panels is an Array.

Figure 6 : Solar panel

TRANSFORMER:

Step Down the Voltage Level 230V AC is converted into 12V AC employing a transformer. 12V 1A output of stepdown transformer is an RMS value and its peak value is given by the merchandise of root with RMS value, which is approximately 17 V.

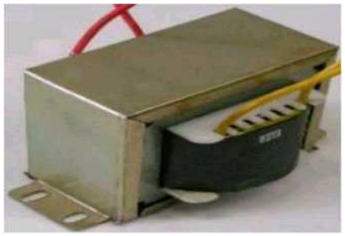

Figure 7 : Transformer

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SOFTWARE DESCRIPTION

PUTTY SOFTWARE:

PUTTY could be a free and open-sourc terminal emulator, serial console and network file transfer application. It may also hook up with a interface. The name "PuTTY" has no official meaning.

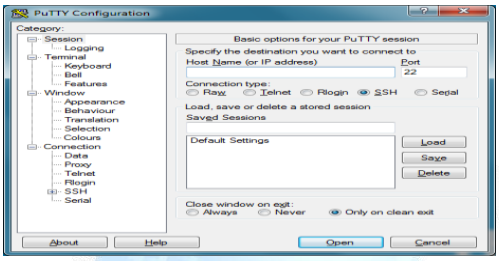

Figure 8: Putty Software

RFID based totally protection and rate manage gadget is extra comfy and speedy replied in comparison to the other gadget like biometric. The advantage of the RFID device is touch-less and works with out-line-of-sight. with the aid of the use of arduino it is simple to get right of entry to and works in no time even as burning the code it's far like plug and play tool, customers can change the function accordingly by way of the usage of arduino. it is easier to apply and accurate also, therefore this undertaking can be useful for implementation of get admission to control software for monitoring gadget as well as presenting the safety blessings. This mission can improve by way of elevating the range of reader wherein the tag read.

RFID based security and charge control system is more secure and fast responded as compared to the other system like biometric. The advantage of the RFID system is contact-less and works without-line-of-sight. By using arduino it is easy to access and works very quickly while burning the code it is like plug and play device. Users can change the function accordingly by using arduino. It is easier to use and accurate also. Hence this project can be useful for implementation of access control application for tracking system as well as providing the security benefits. This project can improve by raising the range of reader in which the tag read.

Advantages over other ID technologies

Designed specifically for the libraries, RFlabels also single offer the following benefits over the traditional barcodes:

- Combining both the material identification and security into one tag or transponder, By, saving cost and time
- Multiple items can be read out at a time, resulting in the speedy circulation
- RFID labels or smart labels shall be attached to this divergent media, such as CDs, DVDs and other print and non¬print medias
- Tags are read or write, providing flexibility in encoding and decoding process
- Durable labels i.e., designed to the last lifetime of the item they able to identify
- While a laser scanner must read the bar codes, RFIDs emits a radio signal that can be picked up and restored from a remote site that is , 'line¬of¬sight' that involved in the bar codes is not important for capturing the item data.
- The major disadvantage of RFID technology is its cost and the complexity in their maintenance.

RESULT AND OUTPUT

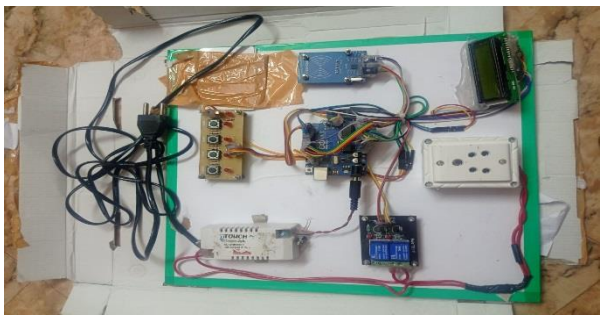

Figure 9 : Output

As shown in the above diagram, connections are made successfully and then we observed the output by taking the help of mobile phone prototype. The mobile phone gets charged successfully. In the same way the hardware equipment with exact connections will give charge for an e-vehicle using RFID tag.

CONCLUSION

RFID based totally protection and rate manage gadget is extra comfy and speedy replied in comparison to the other gadget like biometric. The advantage of the RFID device is touch-less and works with out-line-of-sight. with the aid of the use of arduino it is simple to get right of entry to and works in no time even as burning the code it's far like plug and play tool, customers can change the function accordingly by way of the usage of arduino. it is easier to apply and accurate also, therefore this undertaking can be useful for implementation of get admission to control software for monitoring gadget as well as presenting the safety blessings. This mission can improve by way of elevating the range of reader wherein the tag read.

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