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Solar Wireless Electric Vehicle Charging System

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Abstract: *This paper describes the design of sun powered charging station for charging of electric vehicle describes design of solar powered charging station for charging of electric vehicle that solves the important thing downside of fuel and pollution. electric cars have now hit the street international and are slowly developing in numbers. other than environmental blessings electric motors have additionally established beneficial in lowering value of tour by changing gas by using strength which is way cheaper. nicely here we increase an EV charging device that solves with a completely unique modern answer. This EV charging of vehicles without any wires, No need of prevent for charging, automobile fees while transferring, sun electricity for preserving the charging gadget going, No outside power deliver wished. The machine makes use of a solar panel, battery, transformer, regulator circuitry, copper coils, AC to DC converter, atmega controller and lcd display to develop the gadget. The machine demonstrates how electric cars can be charged while shifting on the street, getting rid of the want to prevent for charging. as a result the system demonstrates a solar powered wi-fi charging device for electric cars that can be incorporated in the street.*

Key Word*: Battery; Micro Controller; Embedded System; Transformer; Microprocessor; Electric Vehicle;*

I.INTRODUCTION

Electric powered cars (EVs), represents a new concept within the shipping zone round the world. it is anticipated that the marketplace percentage of EVs will exponentially develop, comprising 24% of the U.S. light vehicle fleet in 2030, representing 64% mild automobile sales on this year. on this context, the EVs battery charging technique should be regulated to maintain the power best inside the energy grids. though, with the proliferation of Evs a considerable amount of strength might be stored in the batteries, raising the possibility of the energy waft in the opposite feel. inside the destiny smart grids, the interactivity with the EVs may be one of the key technologies, contributing to the electricity grid self sufficient operation. The concept of the on-board bidirectional charger with V2G and V2H technology is introduced [1].
the electric vehicle has turn out to be more aggressive whilst in comparison to the traditional inner combustion engine car due to lower carbon dioxide emission and raising fossil fuels. however, the EV was no longer broadly followed into the marketplace because of some obstacles which include high car price[2]. restrained charging infrastructure and limited all electric powered power. EVs are motors which can be both partially or absolutely powered on electric energy. electric powered automobiles have low jogging expenses as they have got fewer shifting components for upkeep and also are very environmentally pleasant as they use very little fossil[3].

II.ELECTRIC VEHICLE

An electric car (EV) is a automobile that makes use of one or greater electric automobiles or traction motors for propulsion. An electric powered vehicle can be powered via a collector system by way of power from off-vehicle resources, or can be self-contained with a battery, sun panels, fuel cells or an electric powered generator to convert gas to power[4]. EVs encompass, however aren't limited to, road and rail automobiles, floor and underwater vessels, electric powered plane and electric powered spacecraft. EVs first came into life within the mid-19th century, while strength become among the desired methods for motor automobile propulsion, imparting a level of consolation and simplicity of operation that couldn't be finished by the fuel motors of the time. modern-day internal combustion engines were the

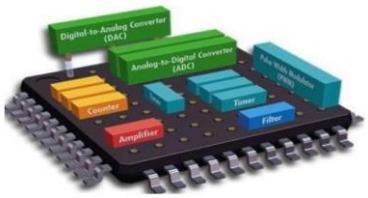
dominant propulsion technique for motor cars for nearly a hundred years, but electric power has remained common in other automobile types, which includes trains and smaller automobiles of all sorts[5].

III. INTRODUCTION TO EMBEDDED SYSTEM

3.1: What Is an Embedded System

An embedded machine isa microprocessor- or microcontroller-primarily based machine of hardware and software designed to carry out dedicated capabilities within a bigger mechanical or electric device.An embedded gadget is a microcontroller-based, software program pushed, dependable, actual-time control system, autonomous, or human or network interactive, working on various bodily variables and in various environments and offered right into a aggressive and fee conscious market[6].Its motive is to control the tool and to permit a person to engage with it[7].

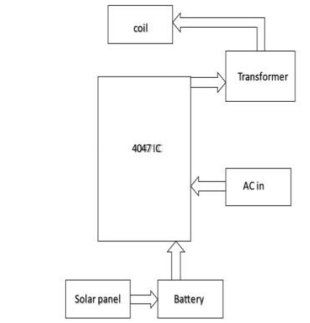
An embedded system is not a computer gadget this is used typically for processing, not a software program gadget on laptop or UNIX, now not a conventional enterprise or precise software [8].

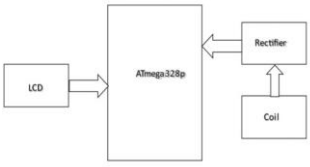


3.2: Applications of Embedded Systems

Embedded systems are utilized in specific packages like vehicles, telecommunications, clever cards, missiles, satellites, pc networking and virtual client electronics..

3.3: Block Diagram





IV.HARDWARE REQUIREMENTS

4.1 Hardware Components

1. Atmega 328p
2. 4047 IC

3. 1N4007
4. Coil
5. LED
6. 16*2 LCD display

4.1.1: Atmega 328p

The Atmel ATmega328P is a 32K 8-bit micro controller based at the AVR architecture. Many commands are finished in a single clock cycle presenting a throughput of almost 20 MIP Sat 20MHz[9]. The ATMEGA328-PU is available in an PDIP 28 pin package and is suitable for use on our28 pin AVR improvement Board. The computer on one hand is designed to perform all the overall motive tasks on a single gadget like you can use a computer to run a software to perform calculations or you may use a pc to shop a few multimedia file or to get entry to net through the browser, while the microcontrollers are meant to carry out only the specific responsibilities, for e.g., switching the AC off automatically while room temperature drops to a sure described limit and again turning it ON while temperature rises above the described restrict[10].

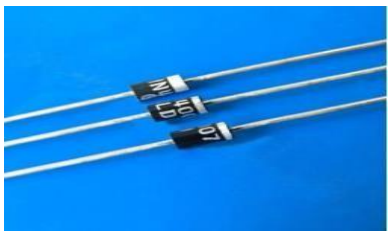
4.1.2: 4047 IC

The CD 4047 IC is one type of multivibrator including a high voltage. The operation of this IC may be completed in two modes like Mono stable & Astable. This IC requires an outdoors resistor & capacitor to decide the output pulse width in the monostable mode & the o/p frequency within the astable mode[11]. This IC operates at 5 Volts, 10 Volts, 15Volts & 20Volts. The 4047 IC is aCMOSmultivibrator that works in two modes like monostable &astable[12]. The 4047 IC packages consist of a extensive range like generation of the pulse wave, sine wave, and DC sign to AC sign conversion, and so on.

4.1.3: IN4007

Diodes are used to transform AC into DC those are used as 1/2 wave rectifiers or complete wave rectifier.3 factors must be kept in mind whilst the use of any form of diode.

1.most forward current capacity
2.maximum reverse voltage ability
3.maximum ahead voltage capacity



4.1.4: Coil

A circle, a series of circles, or a spiral made via coiling. 2 : a long skinny piece of material that is wound into circles.

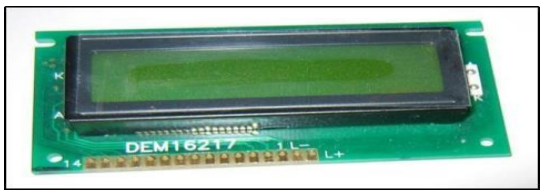
4.1.5: LED

LEDs are semiconductor gadgets. Like transistors, and other diodes, LEDs are made from silicon. What makes an LED give off light are the small amounts of chemical impurities which can be added to the silicon, together with gallium,

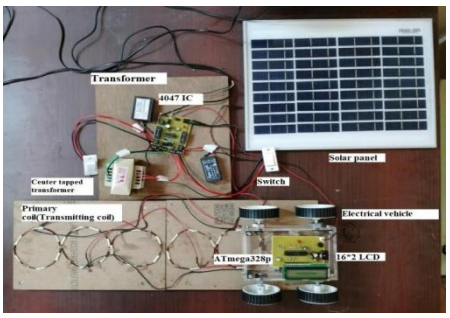
arsenide, indium, and nitride[13]. while cutting-edge passes thru the LED, it emits photons as a byproduct. regular light bulbs produce mild by heating a metallic filament until its white hot. due to the fact LEDs produce photons directly and not through warmness, they're a ways greater efficient than incandescent bulbs.

4.1.6: 16*2 LCD

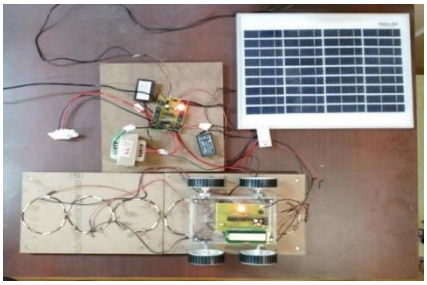
That is the instance for the Parallel Port. this example would not use the Bi-directional characteristic observed on more moderen ports, consequently it ought to work with most, if not all Parallel Ports. It however would not display the usage of the reputation Port as an input for a sixteen character x 2 Line liquid crystal display Module to the Parallel Port[14]. these liquid crystal display Modules are very common these days, and are pretty easy to work with, as all the common sense required strolling them is on board.



V.HARDWARE OUTPUTS



The gadget makes use of a sun panel, battery, transformer, regulator circuitry, copper coils, AC to DC converter, atmega controller and liquid crystal display display to broaden the gadget. The device demonstrates how electric cars can be charged while moving on the road, casting off the need to stop for charging[15]. The solar panel is used to electricity the battery thru a rate controller. The battery is charged and stores dc power. The DC energy now wishes to be converted to AC for transmission. For this reason we here use a transformer.



The power is converted to AC the use of a transformer and regulated the use of regulator circuitry. This energy is now used to strength the copper coils which can be used for wireless energy transmission. A copper coil is likewise hooked up under the electric vehicle.

while the vehicle is pushed over the coils power is transmitted from the transmitter coil to ev coil. Please notice the electricity continues to be DC contemporary that is brought about into this coil[16]. Now we convert this to DC again in order that it can be used to price the EV battery.

We use AC to DC conversion circuitry to convert it back to DC cutting-edge. Now we additionally measure the

input voltage using an atmega microcontroller and display this on an lcd show[17]. thus the device demonstrates a solar powered wireless charging gadget for electric powered automobiles that may be included in the road

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