

# Design and Implementation Duo Electric Bike

R.Rameshbabu/Assistant professor /MECH

C.Devarajan, R.Sankaralingam

Indra Ganesan College of Engineering, Trichy-12

devarockz8112@gmail.com, sankarlingam54@gmail.com

**Abstract:** Since the fuel prices not only in India but throughout the world are increasing day by day, there is a tremendous need to search for an alternative to conserve these natural resources. Thus, the solar vehicle is an electrical vehicle that provides that alternative by harnessing solar energy to charge the battery and provide the required voltage to run the motor. Since India is blessed with nine months of sunny climate, the concept of a solar vehicle is friendly in India. An electrical vehicle combines the use of solar energy as well as a dynamo that runs through the throttle to charge the battery to run the vehicle. Thus, a solar hybrid vehicle can become a very vital alternative to the fuelled automobile; thus, its manufacturing is essential.

**Keywords:** Cloud Computing, Global Positioning System (GPS), General Packet Radio Services (GPRS), Global System for Mobile Communications (GSM), Internet of Things (IOT), Open-Source Hardware (OSH)

## 1. INTRODUCTION

An electric scooter is a battery-operated one-person capacity vehicle that is specially designed for people with low mobility. It is generally used by those who have difficulty walking or standing for long periods of time. Scooters are available in three common designs: those intended for indoor use, those for outdoor use, and those that are used for both. An electric scooter is different from a motorized wheelchair, in that the wheelchair is generally intended for indoor use and usually costs a great deal more.



An electric scooter may have three wheels or four. Since it runs on battery power, it does not create pollution. A typical electric scooter requires a pair of batteries, but the batteries are rechargeable. The length of time an electric scooter can run on each charge depends significantly on its battery's type and capacity. The most common batteries are advertised to run for about eight hours, and between 20-30 miles, before needing to be charged.

### Solar vehicle:

Solar vehicles are developed to reduce the pollution caused

by conventional bikes. To develop a low cost application for rural and remote areas where fuels are not available to drive two-wheelers so that they can run this bicycle on renewable solar energy. The solar energy from the sun is free of cost and is used to drive the motor. When there is no sunlight or the batteries are drained, the bicycle should still be running.



The solar bicycle is different from other vehicles. The PV panel saves more power and gives the bicycle the required range. The solar panel will be charged while the bicycle is running. We can also use pedalling operation when sufficient energy is not available.

The solar electric bicycle is meant as a challenge to get, on sunny summer days, the most pedal assistance as possible out of the solar panel used. The solar electric bicycle is easily accessible, safe and practical with limited maintenance requirements due to a minimum of mechanical parts used. It is ideal not only for the experienced cyclists but also for those non-athletes, the elderly and individuals with health problems.

A solar vehicle is an electric vehicle powered completely or significantly by direct solar energy. Usually, photovoltaic (PV) cells contained in solar panels convert the sun's energy directly into electric energy. The term solar vehicle usually implies that solar energy is used to power all or part of a vehicle's propulsion. Solar power may be also used to provide power for communications or controls or other auxiliary functions.

## COMPONENTS AND TECHNOLOGIES

### Solar panel

A photovoltaic module or photovoltaic panel is a packaged interconnected assembly of photovoltaic cells, also known as solar cells. The photovoltaic module, known more commonly as the solar panel, is then used as a component in a larger photovoltaic system to offer electricity for commercial and residential applications



FIG 1.1

### Controller

As speed considering on the measurement results from the the noise effect of PWM control method, and the characteristics of the dc motor, it is expected that we could control the speed of the dc motor stably and highly efficiently . In ordinary times the dc motor is driven by change of a transmission in this system and as the speed of it decreases due to the overload, the load induction unit works automatically to accelerate it with the maximum efficiency of the system. The speed results from the system, the noise effect of PWM control method, and the characteristics of the dc motor, it is expected that we could control the speed of the dc motor stably and highly efficiently. In ordinary times the dc motor is driven by change of a transmission in this system and as the speed of it decreases due to the overload, the load induction unit works with the maximum efficiency of the system. The speed of the dc motor therefore, can be regulated. The application layer positioned at the very top for facilitating in delivery of The maximum speed of a bicycle is 30 kmph. Its required

#### Throttle :

to vary the speed depending upon the road conditions & traffic. Therefore an accelerator or a throttle is necessary. Throttle allows us to drive the motor from zero speed to full speed. The throttle is fitted on right side of the handle bar and is connected to controller. The throttle converts DC

automatically to accelerate it with the maximum efficiency of the system. The speed of the dc motor, therefore, can be regulated.

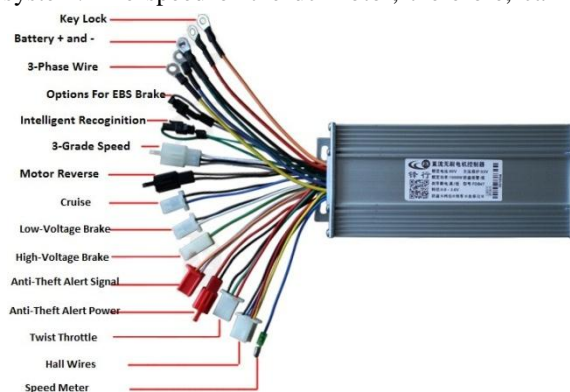
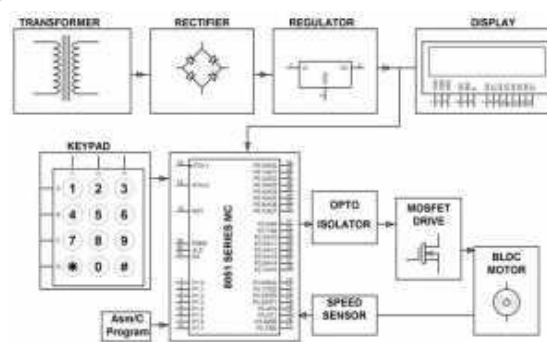


FIG1.2

### Speed control

Speed control of BLDC motor is essential for making the motor work at desired rate. Speed of a brushless dc motor can be controlled by controlling the input dc voltage. The higher the voltage, more is the speed.

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voltage from battery to an alternating voltage with variable amplitude and frequency that drives the hub motor at different speeds. It consists of MOSFET transistors and a small microprocessor. This throttle is technically referred to as a Hall Effect type



## THROTTLE

### Specification of throttle :

Material: Plastic

Color: Black

Cable Length: Approx. 1.8 m / 70.87 inch

3 Wires: Black (Earth Wire), Green (Hall Signal), Red (+ 5 V)

Applicable Handlebar Diameter: Approx. 22.5 mm / 0.88 inch

One primary problem of this system is the wastegate will start to open well before the actual desired boost pressure is achieved. This negatively affects the threshold of boost onset and also increases turbocharger lag. For instance, a spring rated at 7 psi may allow the wastegate to begin to (but not fully) open at as little as 3.5 psi (0.24 bar).

Achieving moderate boost levels consistently is also troublesome with this configuration. At partial throttle, full boost may still be reached, making the vehicle difficult to control with precision. Electronic systems can allow the throttle to control the level of boost, so that only at full throttle will maximum boost levels be achieved and intermediate levels of boost can be held consistently at partial throttle levels.

**Lithium-ion battery applications:** Lithium-ion batteries are popular because of their high energy density and other properties – and as the technology improves and prices reduce, they are proliferating in many applications. Here are some examples for Li-ion battery applications:

**Portable power packs:** Li-ion batteries are lightweight and more compact than other battery types, which makes them convenient to carry around within cell phones, laptops and other portable personal electronic devices.

**Uninterruptible Power Supplies (UPSs):** Li-ion batteries provide emergency back-up power during power loss or fluctuation events. Office equipment like computers, as well as IT servers and complete data centers, must be protected from power interruptions to prevent data loss. Back-up power is also needed in the medical and health care industries to guarantee consistent power supply to life-saving medical equipment.

**Electric vehicles:** The automotive industry is creating a demand for Li-ion battery packs to provide power sources for electric, hybrid or plug-in hybrid electric vehicles. As Li-ion batteries can store large amounts of energy and can be recharged many times, they offer good charging capacity and long lifespans.

Without a boost controller, air pressure is fed from the charge air (compressed side) of the turbocharger directly to the wastegate actuator via a vacuum hose. This air pressure can come from anywhere on the intake after the turbo, including after the throttle body, though that is less common.

### Conclusion :

Self charging Electric scooter is modification of existing electric scooter. It is suitable for both city and country roads, This scooter is cheaper, simpler in construction & can be widely used for short distance travelling especially by school children, college students, office goers, villagers,

postmen etc. It is very much suitable for young, aged peoples. It can be operated free of cost. This scooter is that it does not consume valuable fossil fuels thereby saving cores of foreign currencies. It is

eco-friendly, economical & pollution free, as it does not have any emissions. Moreover it is noiseless and can be recharged with the AC adapter in case of emergency or cloudy weather. By using solar panel batteries are self charged

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