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Electric Vehicle Charging With Dynamo

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ABSTRACT: Electric vehicle (EV) is gaining increasing attention for having unique features such as low emission, high efficiency, quiet operation etc. However, the chemical batteries have many short comings such as limited cycle life, limited power density as well as high cost. In the present rendition electric vehicle is not self- charging and endures with more batteries. In this project, in addition with the electricvehicle technology we are adding up dynamos with the vehicle. Conventionally, dynamos are used for lighting purpose in bicycle. Here we are using dynamos for running the vehicle as well as charging the vehicle. The fully automated solar grass cutter is a fully automated grass cutting robotic vehicle powered by solar energy that also avoids obstacles and is capable of fully automated grass cutting without the need of any human interaction. The system uses 12V batteries to power the vehicle movement motors as well as the grass cutter motor. We also use a solar panel to charge the battery so that there is no need of charging it externally. The grass cutter and vehicle motors are interfaced to an AT mega family microcontroller that controls the working of all the motors. The rate of electric vehicle is controlled by controller, which guarantees the electric vehicle security, which is done by Controller. In order to provide an efficient acceleration of an electric vehicle, we use BLDC motor. The results confirm that petrol and diesel can be exists for current scenario, so futurescope depends only on electric bike.

KEYWORDS: Battery, Motor, wheel, voltage Regulator

I.INTRODUCTION

The classic boost converter is not a good choice for the high step-up conversion due to following three reasons. Firstly, an extremely high duty-cycle must be used to obtain the steep conversion ratio, which causes serious losses on the power devices due to their parasitic parameters. Secondly, low on-resistance active switches and good performance diodes cannot be adopted due to the high voltage stress. The most worrisome effect is greenhouse gasses which are caused because of the transportation sector conducted to increase the life of the battery and to increase the long run operation to eliminate the issue of limited and constrained power in the battery of Electric vehicles. The components and control strategy are not only the limited components of an EV system. The other means of improvement of the EV is the charging strategy in the transportation sector. During the peak demand duration the issue of electric burden will increase. To overcome this drawback of charging the EV we require certain methods. The direct influence of generation, transmission and distribution of the power is implemented by an interleaved DC charging solar system applied for the electric vehicle transportation technology. The best option for electrification is the OFF grid or the standalone charging system.

It eliminates the need for connecting charging utilities like transmission and distribution renewable energy

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resources as they meet the power needs. Solar power, wind energy, water and geothermal are the most common renewable energy sources. To meet the power crisis issues and suggest clean, economical, sustainable power resources the solar charging seizes the researcher's attention. The proposed application of power charging causes many issues as they are solely based only on the solar energy system. The photovoltaic combined with the power grid system and photovoltaic standalone charger is an excellent method for solar energy which has been proposed. To increase the conversion efficiency of the PV array both the power grid system and the PV standalone charger are required to make it a suitable converter because the efficiency of the PV array is small when compared to the capacity of the battery storage. To make this application more optimized conventional boost converter is used.

The photovoltaic cells supply maximum power based on the atmospheric condition particularly at the maximum power point. Maximum power point is more desirable to operate in a PV system than the conventional power sources. Depending upon the photovoltaic arrays temperature and the isolation intensity the maximum power point locus varies over a wide range. Maximum power point locus is also affected by the instantaneous shading of the panel and the aging of PV cells. Due to the load's electrical characteristics the problem is further complicated. The network which matches the time and interface with the varying source and the load varying with potential is required to achieve the maximum power point operation. This matching network is called the MPPT. At the changing atmospheric conditions and load variation the operation of MPPT ensures. The pulse width modulated is most commonly used in the dc - dc converter in the front end at the MPPT power stage. In standalone operation the entire power stage is constituted by the pulse width modulated and dc link capacitor is used in the grid connected.

II.PROPOSED SYSTEM

The proposed PFC-based bridgeless DC-DC (BL-DC-DC) converter-fed BLDC motor drive. A single-phase Supply followed by a filter and a BL-DC-DC converter is used to feed a VSI driving a BLDC motor. The BL-DC-DC converter is designed to operate in DICM to act as an inherent power factor Pre regulator.

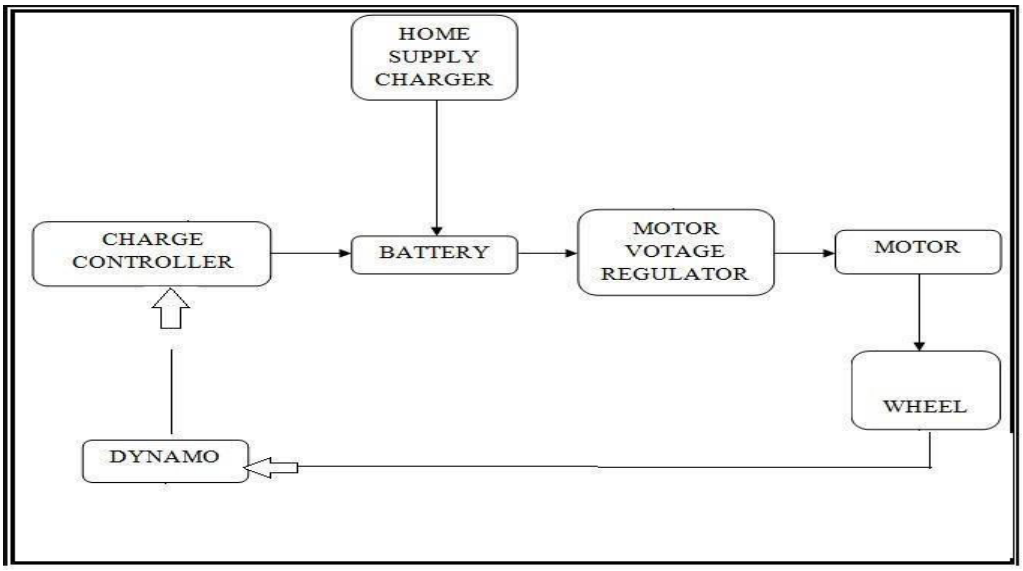

Fig.1. Block Diagram

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A dynamo is an electrical generator that creates direct current using a commutator. dynamos were the first electrical generators capable of delivering power for industry, and the foundation upon which many other later electric-power conversion devices were based, including the electric motor, the alternating-current alternator, and the rotary converter. Today, the simpler alternator dominates large scale power generation, for efficiency, reliability and cost reasons. A dynamo has the disadvantages of a mechanical commutator. Also, converting alternating to direct current using rectifiers (such as vacuum tubes or more recently via solid state technology) is effective and usually economi Motor voltage Regulator Voltage regulator, any electrical or electronic device that maintains the voltage of a power source within acceptable limits. The voltage regulator is needed to keep voltages within the prescribed range that can be tolerated by the electrical equipment using that voltage.

A charge controller, charge regulator or battery regulator limits the rate at which electric current is added to or drawn from electric batteries to protect against electrical overload, overcharging, and may protect against overvoltage. Also called an "AC adapter" or "charger," power adapters plug into a wall outlet and convert AC to a single DC voltage. Computers use multiple DC voltages, and the power adapter is the external part of the power supply for a laptop. The additional DC voltages are created by internal circuits. Desktop computer power supplies are in one internal unit, which converts AC to all DC voltages. An electric motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor's magnetic field and electric current in a wire winding to generate force in the form of torque applied on the motor's shaft. An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode.

III.RESULTS AND DISCUSSION

For technical computing MATLAB is a high performance language which integrates with computation, visualization and programming. It is an interactive system in an array and it does not require dimensioning. It allows us to solve many technical computing problems. MATLAB is a high-performance language for technical computing. It integrates Computation, visualization, and programming environment. Furthermore, MATLAB is a Modernprogramming language environment: it has sophisticated data structures, contains Built- in editing and debugging tools, and supports object-oriented programming. These factors Make MATLAB an excellent tool for teaching and research. MATLAB has many advantages compared to conventional computer languages for solving technical problems. It also has easy to use graphics commands that make the visualization of results immediately available. Specific applications are collected in packages referred to as toolbox. There are Toolboxes for signal processing, symbolic computation, control theory, simulation, optimization, and several other fields of applied science and engineering.

MATLAB has four signed and four unsigned integer classes. Signed types enable you to work with negative integers as well as positive, but cannot represent as wide a range of numbers as the unsigned types because one bit is used to designate a positive or negative sign for the number. Unsigned types give you a wider range of numbers, but these numbers can only be zero or positive. Variables are defined using the assignment operator. MATLAB is a weekly programming language because types are implicitly converted. It is an inferred typed language because variables can be assigned without declaring their type, except if they are to be treated as symbolic objects, and that their type can change.

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Values can come from constants, from computation involving values of other variables, or from the output of a function. This is a high-level matrix/array language with control flow statements, functions, data structures, input/output, and object-oriented programming features. It allows both "programming in the small" to rapidly create quick and dirty throw-away programs, and "programming in the large" to create complete large and complex application programs.

This is the MATLAB graphics system. It includes high-level commands for two- dimensional and three-dimensional data visualization, image processing, animation, and presentation graphics. It also includes low-level commands that allow you to fully customize the appearance of graphics as well as to build complete Graphical User Interfaces on your MATLAB applications. This is the set of tools and facilities that you work with as the MATLAB user orprogrammer. It includes facilities for managing the variables in your workspace and importing and exporting data. It also includes tools for developing, managing, debugging, and profiling M- files, MATLAB's applications.

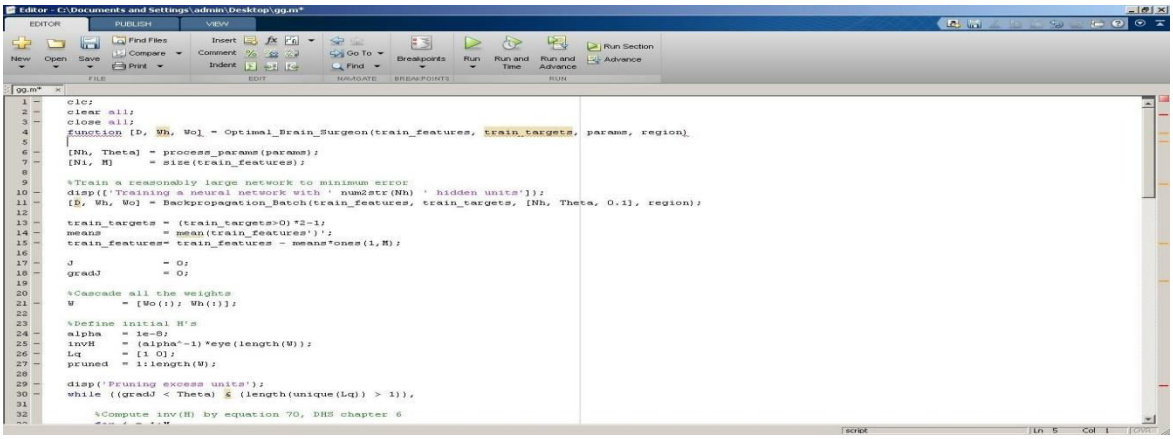

Fig.2. Simulation Window

IV. HARDWARE IMPLEMENTATION

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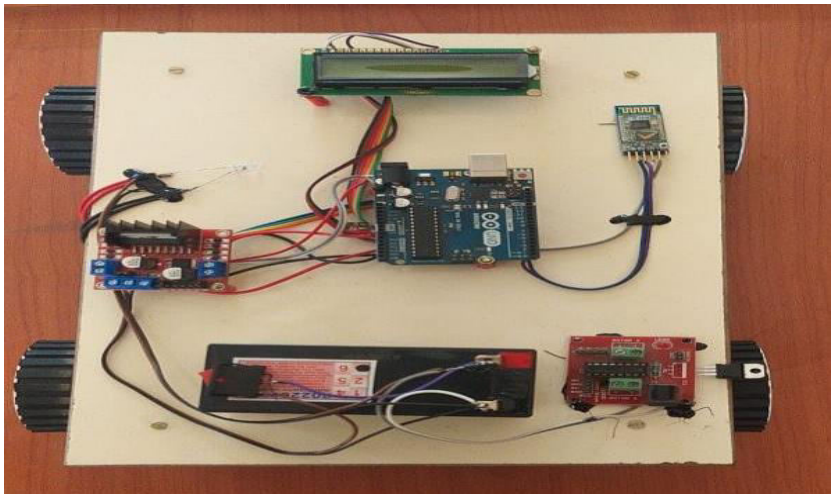

Fig.3. Hardware Implementation

A single-phase Supply followed by a filter and a BL-DC-DC converter is used to feed a VSI driving a BLDC motor. The BL-DC-DC converter is designed to operate in DICM to act as an inherent power factor Pre regulator.

The speed of the BLDC motor is controlled by adjusting the dc-link voltage of VSI using a single voltage sensor. This allows VSI to operate at fundamental frequency switching (i.e., electronic commutation of the BLDC motor) and hence has low switching losses in it, which are considerably high in a PWM-based VSI feeding a BLDC motor. The components and control strategy are not only the limited components of an EV system. The other means of improvement of the EV is the charging strategy in the transportation sector. During the peak demand duration the issue of electric burden will increase. To overcome this drawback of charging the EV we require certain methods. The direct influence of generation, transmission and distribution of the power is implemented by an interleaved DC charging solar system applied for the electric vehicle transportation technology. The best option for electrification is the OFF grid or the standalone charging system.

V.CONCLUSION

A PFC based BL-DC-DC converter-fed BLDC motor drive has been proposed for a wide range of speeds and supply voltages. A single voltage sensor-based speed control of the BLDC motor using a concept of variable dc-link voltage has been used. The PFC BL-DC-DC converter has been designed to operate in DICM and to act as an inherent power factor pre regulator. An electronic commutation of the BLDC motor has been used which utilizes a low-frequency operation of VSI for reduced switching losses. The proposed BLDC motor drive has been designed and its performance is simulated in MATLAB/Simulink environment for achieving an improved power quality over a wide range of speed control. Finally, the performance of the proposed drive has been verified experimentally on a developed hardware prototype. A satisfactory performance of the proposed drive has been achieved and is a recommended solution for low-power applications.

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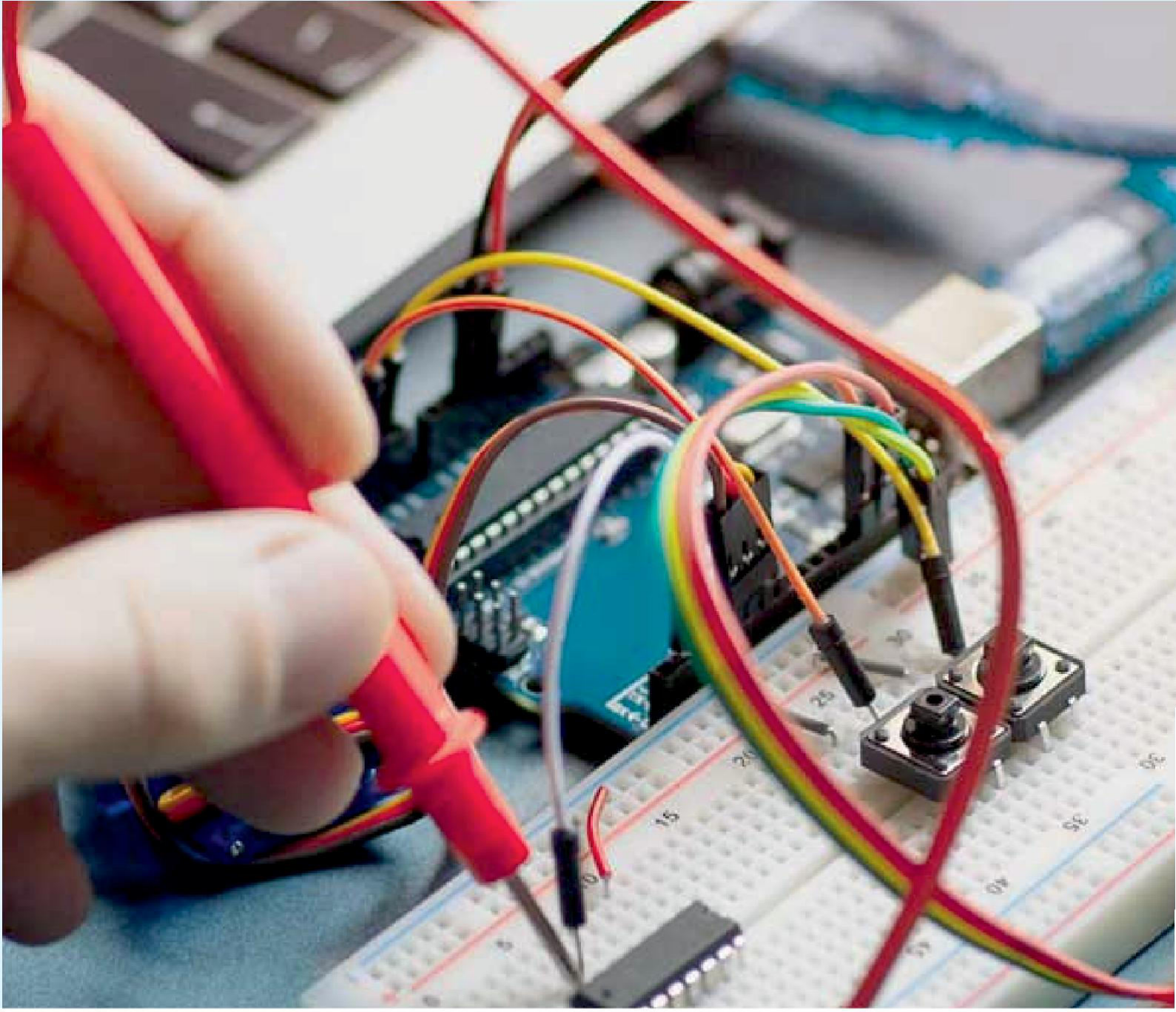

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