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INSTITUTE OF SCIENCE AND TECHNOLOGY
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Sl. No.	Title of the collaborative activity	Name of the collaborating agency with contact details	Name of the participant	Year of collaboration	Duration	Nature of the activity
2019-20	Dragonfly Algorithm for optimal allocation of D-STATCOM in Distribution Systems, 4th international conference on artificial intelligence and evolutionary computations in engineering Systems	Advances in Intelligent Systems and Computing, Springer, Published 15-Jan, 2020	V.Tejaswini, D.Susitra	2019		Research Publication as book chapter
	Implement Using KY Converter for Hybrid Renewable Energy Applications: Design, Analysis and Implementation	Intech open book chapter "Advanced Statistical Modeling, Forecasting, and Fault Detection in Renewable Energy Systems" Published on April, 2020	M. Pushpavalli, N.M.Jothi Swaroopan	2020		Research Publication as book chapter
	Comparative Analysis and Performance of DSTATCOM Device	Advances in Intelligent Systems and Computing, Springer, Published 15-Jan, 2020	K.Swetha and V.Sivachidambaranathan	2019		Research Publication as book chapter

	Using PI and Second-Order Sliding Mode Control					
	Dynamic Modeling and Control of MicroGrid by using Renewable Energy Sources	International Conference on Emerging Trends in Power Systems and Power Electronic Devices	Nusettychennaiah, R. Vanitha	2019		Research Publication as book chapter
	Smart Garbage Monitoring System using IoT	International Conference on Computational and Bio Engineering,CBE 19	V.Vijeyakaveri,V.Meenakshi	2019		Research Publication as book chapter
	Development of wind-solar hybrid system using multi input KY boost converter results from the simulation mode	Journal of Green Engineering	Mrs. M.Pushpavalli,N.M.Jothi swaroopan	2020		Research paper publication
	KY converter with fuzzy logic controller for hybrid renewable photovoltaic/wind power system	Transactions on Emerging Telecommunications Technologies	Mrs. M.Pushpavalli,N.M.Jothi swaroopan	2020		Research paper publication
	IOT based statistical performance improvement technique on the power output of photovoltaic system	Journal of Ambient Intelligence and Humanized Computing (2020)	Sivagami P, Jothiswaroopan N	2020		Research paper publication
	Optimal control strategy using PV based LUO converter for a micro grid to an unelectrified zone	Journal of Green Engineering (2020)	Sivagami P, Jothiswaroopan N	2020		Research paper publication
	Smart methodology for performance improvement of energy sources for home	Microprocessors and Microsystems (2020)	Sivagami P, Jothiswaroopan N	2020		Research paper publication

application					
Comparison of solar based closed loop dc-dc converter using PID and ANN control for shunt motor drive	International Journal of Power Electronics and Drive Systems, 2019, 10(3), pp. 1324-1328	Jayaprakash, S., Ramani, R., Kavitha, M., Nayagam, V.S.	2020		Research paper publication
Dual-output dc-dc converter for rl and rle load	Journal of Advanced Research in Dynamical and Control Systems, 2020, 12(4 Special Issue), pp. 49-54	Jayaprakash, S., Ramani, R., Senthil Nayagam, V., Kavitha, M., Jesudoss, A.	2020		Research paper publication
Error Measurement of LCC Resonant Converter for X-Ray	Russian Journal of Non-destructive Testing	Bhuvaneswari.C,Samuel Rajesh Babu	2020		Research paper publication
Renewable energy based bidirectional converter for grid	Journal of Green Engineerring	Bhuvaneswari.C.Samuel Rajesh Babu	2020		Research paper publication
Performance measure of LCC resonant converter for high voltage power supply	International Journal of Recent Technology and Engineering (IJRTE)	Bhuvaneswari.C,Samuel Rajesh Babu	2020		Research paper publication
Design of led street lighting using arduino	JARDCS	Ms.Meenakshi.V,S.paramasivam	2020		Research paper publication
Design of LCL filter in front end converter suitable for grid connected wind electric generators	Journal of scientific and industrial Research,vol.78(12),pp.896-899,	Ms.Meenakshi.V,S.paramasivam	2020		Research paper publication
Wireless power transmission for dynamic charging of battery appliances in multipurpose smart solar	International Journal of Engineering and AdvancedTechnology	Senthil Nayagam, V., Premalatha, L	2020		Research paper publication

	bag				
	Implementation of zvs based isolated double step down dc to dc converter for e-vehicle battery charging or dc load application	Journal of Green Engineering	Senthil Nayagam, V., Premalatha, L	2020	Research paper publication
	Optimization of power losses in electric vehicle battery by wireless charging method with consideration of the laser optic effect	Measurement and Control (United Kingdom)	Senthil Nayagam, V., Premalatha, L	2020	Research paper publication
	Analysis of bridgeless converter model for power factor correction	Computers and Electrical Engineeringthis link is disabled	Meena Devi., Premalatha, L	2020	Research paper publication

Dragonfly Algorithm for Optimal Allocation of D-STATCOM in Distribution Systems

[V. Tejaswini](#) & [D. Susitra](#) 

Conference paper | [First Online: 09 February 2020](#)

614 Accesses | **1** Citations

Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 1056)

Abstract

In distribution systems, parameters like outage of components, sudden or continuous load growth may cause power quality problems like excessive power losses, voltage instabilities, etc. To compensate power quality problems, usage of custom power devices is most effective approach. To get the best performance, custom power devices must place in optimal locations. Hence, this paper proposes a new swarm intelligence-based dragonfly algorithm (DA) to determine optimal placement of D-STATCOM in the radial distribution systems. DA algorithm is inspired by unique and rare swarming behaviors of dragonflies in nature. Power losses minimization and voltage profile improvement are considered as main objectives for solving optimization problems. The proposed DA model is compared with conventional methods like genetic (GA) and PSO in terms of convergence and cost analysis.

Implement Using KY Converter for Hybrid Renewable Energy Applications: Design, Analysis, and Implementation

WRITTEN BY

Pushpavalli Murugan and Jothi Swaroopan Nesa Mony

Submitted: February 1st, 2019, Reviewed: December 4th, 2019, Published: April 1st, 2020

DOI: 10.5772/intechopen.90755



FROM THE EDITED VOLUME

Advanced Statistical Modeling, Forecasting, and Fault Detection in Renewable Energy Systems

Edited by Fouzi Harrou and Ying Sun

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Comparative Analysis and Performance of DSTATCOM Device Using PI and Second-Order Sliding Mode Control

[K. Swetha](#)  & [V. Sivachidambaranathan](#)

Conference paper | [First Online: 09 February 2020](#)

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Part of the [Advances in Intelligent Systems and Computing](#) book series (AISC, volume 1056)

Abstract

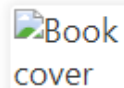
In distribution systems, more number of power quality problems are there; out of them, harmonics plays major role; these are caused by the nonlinear devices used in the distribution network. In distribution systems, it is around 75% problems which are caused due to especially harmonics. Harmonics exists due to nonlinear devices used in distribution system. These harmonics are compensated by a distribution static compensator (DSTATCOM). By using this injection or absorption of reactive power, voltage and current fluctuations, harmonics elimination can achieve. It is shunt connected device by using this, shunt current compensation can be performed. In this paper detailed explanation about DSTATCOM and the amount of injected current at source side, total harmonic distortion in injected currents are explain with total harmonic distortion values by using prosperous control technique of DSTATCOM is compared with conventional PI controller. Simulation results are obtained by using MATLAB/SIMULINK software.

Dynamic Modeling and Control of Micro- Grid by using Renewable Energy Generating Sources

👤 Nusettychennaiah,R. Vanitha

Abstract

Micro grids are going to be one of the most significant elements for future force frameworks. Micro grid idea coordinates a lot of miniaturized scale sources without upsetting the activity of fundamental utility grid. This hybrid Micro grid comprises of PV/wind vitality hotspots for DC and AC networks separately. Energy storage frameworks might be associated with either AC or DC Micro grids. This endeavor presents a control of a little scope network structure on a limited territory dealt with from wind and sun fueled based half and half vitality authority. Powerful motor nearly new because wind essentialness change survive twice dealt with acceptance alternator (DFIG) along with a array store act related with a run like the mill DC transport of them. A sun powered photovoltaic (PV) display is used to change over sun based force, whatever move cleared by affecting ordinary DC transport like DFIG testing a DC-DC support converter mod a savvy action. Sudden force along with recurrence hold contained over a roundabout point control based on effective boundary surface converter, whatever last gotten together by hang nature. It modifies affecting recurrence at mark reliant above striking vitality aligned about sudden bunch, whatever moves sliding up charging either discharging based on powerful battery. Effective structure continue again prepared through struggle during wind power cause continue distant. The pair breeze as well as sun controlled imperativeness squares, have most extreme force point following (MPPT) latest theory rule calculation. Powerful structure obtained proposed being achieved modified action infectious idea about entire powerful handy positions. Sensational structure move in like manner given a game plan of outer force sustain being sudden array accusing of no other essential. A reenactment miniature like structure endure made in Mat lab condition including reproduction results are given being different action for instance unviability like wind either daylight based energies, inconsistent along with nonlinear weights, below capacity like charge based on sudden array.



[International Conference On Computational And Bio Engineering](#)

↳ CBE 2019: **Advances in Computational and Bio-Engineering** pp 421–428 | [Cite as](#)

Smart Garbage Monitoring System Using IoT

[V. Vijeya Kaveri](#) , [V. Meenakshi](#), [B. Bharathi](#) & [J. Albert Mayan](#)

Conference paper | [First Online: 07 July 2020](#)

232 Accesses

Part of the [Learning and Analytics in Intelligent Systems](#) book series (LAIS, volume 16)

Abstract

Development of Wind-Solar Hybrid System using Multi Input KY Boost Converter Results from the Simulation Model

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Abstract

A hybrid connection of clean energy sources like solar and wind energy with a new novel multi input KY converter is used to extract the input from this alternative energy sources and delivered to the AC load with the help of inverter arrangement. This system is analyzed using the simulation model of hybrid renewable energy sources, 1.under open loop condition 2.under transient conditions 3.under closed loop condition. The closed loop system used to maintain constant and quality power with the support of the Proportional Integral (PI) controller. The steady state error and time response parameters are taken into basis for the analysis of controller. The entire system gives the constant output on the load side if any one of the renewable energy is disconnected.

Keywords: Multi input KY converter, Hybrid renewable energy, PI controller, Simulation model, closed loop system.

KY converter with fuzzy logic controller for hybrid renewable photovoltaic/wind power system

M. Pushpavalli✉ N. M. Jothi Swaroopan

First published: 26 June 2020 | <https://doi.org/10.1002/ett.3989> | Citations: 2

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Abstract

Smart grid includes power generation, transmission, distribution, information integration, metering, management, and protection. All these domains are interconnected through smarter communication. Smarter communication is possible since it's a two-way flow of information by wireless and wired communication. Generation domain of smart grid consists of renewable variables (wind solar), renewable nonvariables (hydro biomass, geothermal, pump storage), and nonrenewable nonvariables (nuclear, coal, gas). Wind and solar energy, are thought to be the principle properties of sustainable power source for power generation and are developing at a quicker rate throughout a previous couple of decades. In numerous tasks, high voltage conversion converters have a basic influence in boosting the low output voltages of green power facilities to the high voltage is difficult due to voltage ripple and total harmonic distortion. This article comprises novel coordination of KY converter (KYC) with fuzzy logic for photovoltaic (PV) and wind power system. A many inputs KYC for grid-connected hybrid PV/wind power system by extracting as much renewable energy as possible to using the fuzzy logic controller (FLC) are introduced. The main goal of the process is to follow the greatest force from the sustainable power sources and to overhaul the precision of the absolute system by increasing power factor. With the motivation behind concentrate the greatest power, a FLC has been embraced, right now. Wind energy is rectified and then both PV and wind outputs are given to the FLC. The implementation is done using MATLAB/SIMULINK.

IOT based statistical performance improvement technique on the power output of photovoltaic system

[P. Sivagami](#)  & [N. M. Jothiswaroopan](#)

Journal of Ambient Intelligence and Humanized Computing **12**, 5029–5043 (2021) | [Cite this article](#)

299 Accesses | **8** Citations | [Metrics](#)

Abstract

Green electricity gains emphasis not only due to technological progress but also because of deployment of non-renewable energy resources and abundant of renewable energy resources. Global demand for the power increasing yearly is met with the help of green energy. The sources which paved the way for green power generation are solar, wind, tidal etc. The parameters of green power generation to be monitored becomes essential to enhance the power output. Without human interaction there is a simple and easy way for monitoring the parameters, with the help of Internet of Things (IOT). Among available resources PV (Photovoltaic) plant generation is advantageous among all other resources because of easy installation and power production. PV plants of MW capacity are sometimes installed in very remote locations. Interfacing the plant using internet helps to monitor and evaluate the performance of PV arrays continuously. Performance impairment could be due to several factors like drop in efficiency, hotspots, manufacturing defects, insufficient insolation, shadow, orientation of panels, soiling etc. Quality control and good engineering practice helps in overcoming most of these factors. Soiling or accumulation of dust is one important factor which requires frequent attention as dust accumulation will hinder the light reaching the solar

Optimal Control Strategy Using PV Based LUO Converter for a Micro Grid to an Unelectrified Zone

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Abstract

Today's world, it is callous to envision the lifestyle without the provision and processing activities which use electrical energy, and its supply. In recent years, research concentrates not only on the design to effectuate the procreation of energy from sources which is available in plenteous but also contributes to the technical development in the environment. The sources that does not impoverish are renewable energy sources. It helps in providing pollution free and charge free power without any interruption. It is a challenging issue to design a controller of high performance to ensure system stability under any operating conditions such as disturbances due to environmental factors like irradiance and temperature in case of SOLAR and also load disturbances that is changes in load. The boosting techniques becomes mandatory for the fluctuating output of PV array. A frame work consisting of Photo Voltaic array (PV) array with positive super lift LUO converter for DC-DC conversion, H-bridge inverter for DC-AC conversion, with fuzzy controller on the converter side and sliding mode controller on the inverter side respectively. Fuzzy and Sliding Mode Controller (SMC) has high dynamic performance, robustness under fluttering parameters. In order

Smart methodology for performance improvement of energy sources for home application

P. Sivagami ^a , N.M. Jothi Swaroopan ^b

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<https://doi.org/10.1016/j.micpro.2020.103042>

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Abstract

The integrated solar and wind serves as a major contributor's for clean electrification in many nations. In this technical era energy crisis is primary issue due to depletion of nonconventional resources. Solar and wind available are chargeless. The hybrid energy can be installed for domestic or commercial purpose, it is required to meet impetration of power. To meliorate the pursuance of the hybrid energy, installed the continuous real time monitoring becomes necessary. IoT helps in monitoring the system by providing the detailed values of different parameters of plant over a dedicated IP address. This helps to maintain the plant over long distances by getting to know the values and thus maintain it to the desired levels. IoT helps in communicating the performance of the power generated and helps controlling the switch over between the energy sources available. A framework for energy source integrated with IoT is proposed to have fly back converter in continuous conduction mode along with multilevel inverter

Comparison of solar based closed loop DC-DC converter using PID and ANN control for shunt motor drive

S. Jayaprakash, R. Ramani, M. Kavitha, V. Senthil Nayagam

Abstract

This paper explained details of Comparison of solar based closed loop DC -DC converter using PID and ANN Control for Shunt motor drive. Solar panel output is given to full bridge converter, stepup transformer, full wave converter, π filter and Shunt motor drive are connected. Comparator compare the set value and the output signal of the motor produce a signal, based on the signal, full wave converter produce the voltage to run the motor, Speed of motor, Torque and Armature current, Rise time, Peak time, Settling time and Steady state error are measured and evaluated by experimental. A circuit operation and simulation designed for a 1000 RPM speed of shunt motor arrived and tested.

Dual-Output DC-DC Converter for RL and RLE Load

 S. Jayaprakash, R. Ramani, V. Senthil Nayagam, M. Kavitha and A. Jesudoss

Abstract

This paper has presented about single-input dual output DC-DC Converter. Low or medium voltage applications are connected as input side and the large voltage compounds are connected in output of this converter. Solar energy devices as connected to the input side output side less voltage and more voltage applications are connected. In this circuit, voltage stress and inductors sizes are minimized as follow has efficiency and power factor value are increased. In case of RL Load and motor load current and voltage are measured. The simulation and experimental results are presented and verified.

Error Measurement of LCC Resonant Converter for X-Ray

[C. Bhuvaneswari](#)  & [R. S. R. Babu](#)

Russian Journal of Nondestructive Testing **56**, 375–385 (2020) | [Cite this article](#)

83 Accesses | **1** Citations | [Metrics](#)

Abstract

X-rays are devices immensely used for diagnosis and treatment in medicinal field. X-rays are very popular as they are used in non-destructive testing. An X-ray device uses a high voltage power supply which can be produced by DC-DC converters. Resonant converters are prominent among the dc-dc converters for X-ray application as the switching is done at zero current and zero voltage. This paper presents a LCC resonant converter based PID controller tuned with optimization algorithms for non-linear system. Differential evolution optimization (DEO), grey wolf optimization (GWO) and grasshopper optimization algorithms (GOA) are used to identify the local minima in time domain system. The objective functions considered are minimization of integral absolute error (IAE), integral square error (ISE) and integral time absolute error (ITAE). The convergence curve is also plotted for the different optimization algorithms using MATLAB Simulink to study the convergence time.

Renewable energy based bidirectional converter for grid

March 2020 - [Journal of Green Engineering](#) 10(3):544-558

Authors:



Bhuvaneswari Chandrasekar

Sathyabama Institute of Science and Tec...



R. Samuel Rajesh Babu



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Abstract

This paper presents a Hybrid Photovoltaic and Wind based energy system for power flow management in grid based applications. The power flow is managed effectively by a DC-DC Converter and a multilevel inverter. A Cuk Converter is used as a DC-DC Converter with reduced number of power conversion stages and the multilevel inverter is used for conversion of dc power to ac power and supply it to the grid. The system is simulated using Matlab Simulink and results tabulated. The simulated results have also been verified experimentally with a Hardware implementation.

Performance Measure of LCC Resonant Converter for High Voltage Power Supply

Bhuvaneswari C, Samuel Rajesh Babu. R

Abstract: This Work presents the Design and Analysis of LCC Resonant Converter for Power Supplies which are used for high Voltages. LCC Resonant Converter was designed and simulated in both Open loop and closed loop in Matlab Simulink. The Closed loop was found to have a lesser steady state error as compared with that of the open loop. The Stress across the Switches was measured for different input voltages and found that it is linearly proportional to the input voltage. Also the Output Voltage was plotted against different load conditions.

Keywords: LCC Resonant Converter, X-Ray, High Voltage Power Supply, Voltage Stress.

I. INTRODUCTION

X-Rays were initially discovered by Roentgen in 1901. X-Rays have many applications out of which their uses in the Medical field is endless. In Medicinal Field, X-Rays are being used for detection and Treatments. X-Rays are used to detect damages in tissue bones, Fractures and to view adverse effects.. Hard X-Rays have high energies as compared to Soft X-Rays. In Medicine, X-Rays are used for Fluoroscopy and Radioscopy. Fluoroscopy is used for medical imaging and Radioscopy is used for giving radiology treatments for patients affected with cancer. The Other uses of X-Rays include Material Testing, Food Inspection, Electrical Testing and also in Agriculture. In Material Testing X-Rays are used to find shrinkage or blow holes in Metal Castings. X-Rays are used to find the quality of the products in Sealed and packed foods in industries. Also in testing Printed Circuit Boards and to check the

on Energy stored in the resonant tank and Resonance elements stress. Based on the value of the parameters, the value of Q with minimum tank size is selected for automotive applications [4]. The optimum design curves were drawn after selecting the value of the Resonant Inductor. For the optimum size the hardware was developed. To measure the resonant tank size, the Resonant tank Energy and the power has been considered as the parameters [5]. Various Design Methodologies for LCC Resonant Converter has been done. The design can be based on Rectifier non-conduction angle, the Switch Power factor or also can be based on Series Inductor, Series Capacitor and Series Inductor [6]. The optimized resonant tank helps to reduce the turn-off losses of IGBT by increasing the lossless snubber capacitances. The Converter is operated with renewable energy system with over voltage and over current Protection [7]. The normalized behavior of LCC Resonant Converter has been analyzed and the tank gain at resonance has been studied. Also the Output Voltage has been analyzed for varying load conditions [8]. The duty cycle is adjusted based on Phase Shifting. By adjusting the switching frequency, the LCC Resonant Converter can work with a higher load variation [9]. This Work Comprises of Design and analysis of LCC Resonant Converter for Power Supply used for high voltages. The Design of Resonant Converter has been done for high Voltage and high power. The designed converter has been simulated in Matlab. The Voltage stress of the MOSFET Switches has been studied

Design of Led Street Lighting Using Arduino

 V. Meenakshi*, J. Femila Roseline and M.L. Bharathi

Abstract

In order to lessen the control utilization in emerging country like India this paper has been focused. Here monitoring is done on the street light energy consumption and its proper utilization. The IR sensor detected the vehicle movement, the sensor precise the vehicle movement a set of street lights to the front of the vehicle is turned on and the rear street lights are turned off .So manpower is eliminated and power consumption is done. Street light control system includes Arduino, Light Emitting Diode (LED), Liquid crystal display (LCD), Global System for Mobile (GSM),Light dependent resistor(LDR), allows continuously monitoring the whole scheme from a host computer and operating it in various modes. Power to the street lights is done using solar power as its source. Turn on lights during day time is limited by Phototransistor. The whole sensors and electronic components are implemented using an Arduino.

 Volume 11 | 04-Special Issue

 Pages: 18-22

Title:	Design of LCL Filter in Front End Converters Suitable for Grid Connected Wind Electric Generators
Authors:	Meenakshi, V Paramasivam, S
Keywords:	MATLAB;LCL filter;DFIG;SVM
Issue Date:	Dec-2019
Publisher:	NISCAIR-CSIR, India
Abstract:	The design of LCL filter is cumbersome, still interesting to know the facts and figures of it in the wind industry. To reduce the bulky inductor size, minimize the grid current ripple and to mitigate the effects of distortion due to high switching frequency in the inverter by Space vector modulation. Apart from this, by the implementation of suitably designed LCL filter, the grid power factor is enhanced with minimum voltage dissipation across the filter and permissible loss in the damping resistor with low electromagnetic interference. This paper summarizes the filter design along with the mathematical expressions to prove the design procedure. It also gives the dynamic model of filter with simulation using Simulink/MATLAB. The transfer function of the LCL filter in grid side is computed and the subsequent frequency domain approach using Bode plot has been presented. The total harmonic distortion with reduced ripple component is observed in the grid current for various filters are shown in the simulated results.

Wireless Power Transmission for Dynamic Charging of Battery Appliances in Multipurpose Smart Solar Bag

V.Senthil Nayagam¹, L. Premalatha²

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Abstract: As the world is leading towards smartness in all the working aspects with this modernization, smart solar bag which performs many applications has brought a new application specific product in to the society. Smart means intelligent, with the usage of solar energy and wireless charging its smartness raised a step ahead. It is intelligent enough to perform various tasks in our everyday life. It can be user friendly product to students, employee's and even to military soldiers as well. Arduino UNO is the brain of the solar bag has a capability of controlling multi-tasking features. The power supply for the equipments to be charge will be obtained from solar panel which is fixed in the front portion of the smart bag. The Electromagnetic field detector (RFID) will be used in order to identify the objects kept in the bag using RFID tag so that forgetfulness can be avoided. There will be an emergency buzzer button which will send the location of the victim to the nearest police control room in the case of emergency. There will be a light attached in the bottom left side of the smart bag which will be used as torch light in the night time. There will be another feature used for tracking our phones and bags in case of theft by using Bluetooth and GPS.

Keywords: Arduino, Solar Panel, RFID, Wireless Power Transmission, GSM, GPS.



Implementation of ZVS Based Isolated Double Step down DC to DC Converter for E-Vehicle Battery Charging or DC Load Application

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Abstract

This paper, the isolated double step down DC-DC converter with high potency with fewer ripples is proposed. The double step down converter can be utilized for battery charging of the E-Vehicle according to the ground clearance variations or various battery capacities in various E-Vehicles. When Compared to the existing full-bridge converters, the proposed converter having a feature of double change of magnitude with reduced voltage stress at the first aspect of the electrical device. Similarly the voltage stress of three primary switches reduced to half of the input voltage by zero voltage switching (ZVS) is of course achieved for all switches with lower output electrical device energy of the switches. Therefore, without increasing the complexity of the hardware implementation the modified DC-DC converter is designed, also the proposed converter inherently prevents electrical device saturation drawback caused by the DC part of the electrical device. An experimental setup is made to verify the performance of the proposed converter.

Optimization of power losses in electric vehicle battery by wireless charging method with consideration of the laser optic effect

V Senthil Nayagam , L Premalatha

First Published January 7, 2020 | Research Article |  Check for updates

<https://doi.org/10.1177/0020294019885158>

[Article information](#) 



Abstract

This work mainly deals with replacing the wired power transmission method for charging electric vehicle with the help of an efficient wireless power transmission method. For identifying an efficient wireless power transmission method, the inductive power transfer method and the laser optic method are taken into consideration to charge the electric vehicle battery. These methods are compared by hardware implementation for various conditions. Wireless power transmission is an emerging technology utilized to charge the electric vehicle battery through an air gap. The use of this new charging technique is due to its easy access from annoying charging cables, better efficiency, and smaller charging time. Also, it contributes to the remarkable reduction of pollutants and carbon dioxide (CO₂) emissions into the atmosphere by the conventional vehicles. However, the implementation of inductive charging for electric vehicle still presents challenges in terms of power transfer efficiency, transmission distance, utilization of heavy batteries with ripple-free and charging time, and stress on compensation network to maintain resonant condition for maximum power transfer. This system will be verified through the simulation in MATLAB/Simulink environment. The simulation results of the inductive power transfer method and the comparison of hardware setup results with laser optic hardware setup have to be verified.

Optimization of power losses in electric vehicle battery by wireless charging method with consideration of the laser optic effect

V Senthil Nayagam , L Premalatha

First Published January 7, 2020 | Research Article |  Check for updates
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Article information 

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Abstract

This work mainly deals with replacing the wired power transmission method for charging electric vehicle with the help of an efficient wireless power transmission method. For identifying an efficient wireless power transmission method, the inductive power transfer method and the laser optic method are taken into consideration to charge the electric vehicle battery. These methods are compared by hardware implementation for various conditions. Wireless power transmission is an emerging technology utilized to charge the electric vehicle battery through an air gap. The use of this new charging technique is due to its easy access from annoying charging cables, better efficiency, and smaller charging time. Also, it contributes to the remarkable reduction of pollutants and carbon dioxide (CO₂) emissions into the atmosphere by the conventional vehicles. However, the implementation of inductive charging for electric vehicle still presents challenges in terms of power transfer efficiency, transmission distance, utilization of heavy batteries with ripple-free and charging time, and stress on compensation network to maintain resonant condition for maximum power transfer. This system will be verified through the simulation in MATLAB/Simulink environment. The simulation results of the inductive power transfer method and the comparison of hardware setup results with laser optic hardware setup have to be verified.