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1.3.3 Percentage of students undertaking project work/field work/ internships (Data for the latest completed academic year)

Dept: EEE   **Academic Year: 2019-2020**

Sl.No	Description	Page No
1	Project Work Details	2-68

A MODIFIED SEPIC CONVERTER FOR PHOTOVOLTAIC ENERGY HARVESTING SYSTEM

A PROJECT REPORT

Submitted by

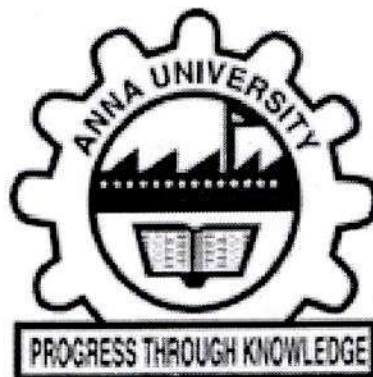|	
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in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

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ANNA UNIVERSITY :: CHENNAI 600 025

SEPTEMBER 2020

2

ANNA UNIVERSITY : CHENNAI 600 025

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INTERNAL EXAMINER   EXTERNAL EXAMINER

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ABSTRACT

A new modified single switch ended primary inductor converter (MS2 – SEPIC) based high step-up DC-DC converter is presented. The proposed topology uses the coupled-inductor (CL) technique and a voltage tripler rectifier which results in a high voltage gain for the converter. The switching loss has been reduced significantly because of the owing to the quasi resonance operation of the circuit created by the leakage inductance of the CL along with circuit capacitors. The main advantage of modified SEPIC converter circuit is that it has a standard gain for a given duty cycle. The operational principles and steady state analysis are discussed. The MS2-SEPIC is interfaced at Dual Input mode with PV system, battery and a resistive load at the output terminal.

CHAPTER – 8
CONCLUSION

The MS2-SEPIC converter response was simulated and analyzed using MATLAB Simulink software. A 100Ω resistive load was used to analyze the output response. A PV module (6V, 14.68A) was connected at the input terminal of the MS2-SEPIC converter and the output response was measured. The irradiance was also varied throughout the simulation time.

The boost factor was found out to be 6.5 with an efficiency of 78.3973%. After simulating this model, a Battery (7.18 V) was used as a backup power supply when the irradiance fell below $400W/m^2$. An ideal switch was used to facilitate the switch from PV to battery during low irradiance period and again back to PV when irradiance increased. The boost factor was found out to be around 3.6. The efficiency was calculated to be 84.19%.

The entire simulation was carried out with the circuit components being chosen from the Simscape library employing physical signals.

Modified SEPIC converter with magnetic coupling is the most advanced scheme in order to achieve a very high static gain for low input voltage and high output voltage applications. The main advantage of modified SEPIC converter circuit is that it has a standard gain for a given duty cycle.

FAULT DIAGNOSIS OF BRUSHLESS DC MOTOR
USING BUILT-IN HALL SENSORS

A PROJECT REPORT

Submitted by

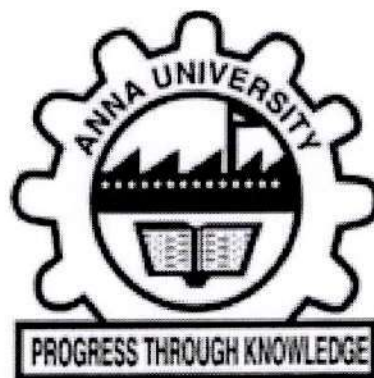|	
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ABSTRACT

The proposed algorithms are simple and only use hall sensors for fault detection, and hence lead to a simple and cheaper fault diagnosis system. This project already exists as a motor fall detection system using hall sensor. We are proposing bypass motor is run as a secondary motor in case fault. Fault in the motor is indicated by the buzzer and also display the bypass message in the LCD display. During fault condition, current is applied to the bypass motor. Then motor runs at normal condition. Motor fault will be stored in the cloud through IOT. We are view the motor fault and run time in the LCD display. When the motor will be in fault, buzzer was on. Below 750 RPM the BLDC motor fault will occur then the current bypass the motor so the motor will be run. Above 750 RPM the motor will be normally run buzzer will off position. We are proposing only fault detection of the motor using IOT and current bypass the motor.

CHAPTER – 9

CONCLUSION

9. CONCLUSION

Thus, we are proposing fault detection of BLDC motor. The project already exists in a motor fault detection system using hall sensor. We are proposing a bypass motor as secondary motor to connect to the supply instead of fault motor. The fault is indicated by the buzzer and also displays the bypass message to the LCD display. When the message received the current is applied to the bypass motor. When the motor runs below 750 RPM motor then fault current will bypass the dc motor buzzer will active. After current bypass the motor, it runs above 750 to 1500 RPM. Then motor will run normally. View the page in IOT using NODE MCU. In Future enhancement, Fault will be easily identified. It is help for industrial application .fault motor easily monitor the display. It helpful for all application in depends on AC.

9

SMART IOT MONITORING SYSTEM FOR AGRICULTURE WITH PREDICTIVE ANALYSIS

PROJECT REPORT

Submitted by

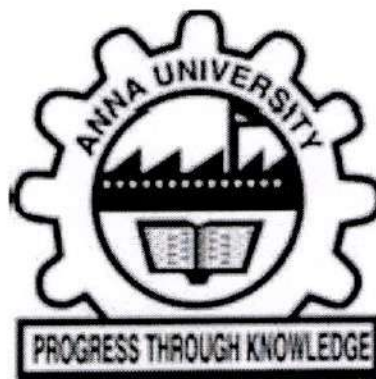|	
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SEPTEMBER 2020

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

The use of IoT devices system provides an automated solution for data prediction. Water pump gets automatically off when system finds enough moisture in the soil Whenever system switched on or off the pump, a message is sent to the user via IOT module, updating the status of water pump and soil moisture. The water pump and the spray motor are added by using crane concept. This system is very used in Farms, gardens, home etc., This system is completely automated and there is no need for human intervention Also, the sensor readings are transmitted to a Thing speak channel to generate graphs for analysis.

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CHAPTER – 8

CONCLUSION

Saving energy and resources, so that it can be utilized in proper way and amount. Farmers would be able to smear to right amount of water at the right time by automatic irrigation.

Avoiding irrigation at the wrong time of day, reduce runoff from overwatering saturated soils which will improve crop performance. Automated irrigation system uses values to turn motor ON and OFF. Motors can be automated easily by using controllers and no need of labour to turn motor ON an OFF. It is precise method for irrigation and a valuable tool for accurate soil moisture control in highly specialized greenhouse vegetable production.

HIGH GAIN DC-DC STEP UP

CONVERTER WITH

MULTILEVEL OUTPUT VOLTAGE

A PROJECT REPORT

Submitted by

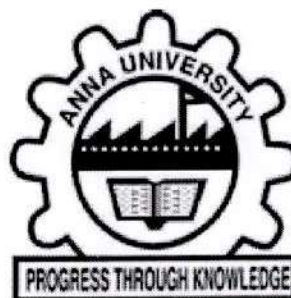|	
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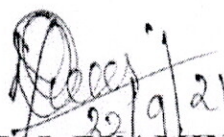**SIGNATURE**

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EXTERNAL EXAMINER

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ABSTRACT

In this project a very high gain step up DC-DC converter of multilevel output voltage is proposed. Maximum voltage gain in conventional Boost converter like, switched inductor converter, cascaded Boost converter, switched capacitor converter etc. are limited due to extreme duty cycle (i.e. duty cycle near to unity). Operation at extreme duty cycle leads to, serious reverse recovery problem at the switches, high conduction losses, high electromagnetic interference etc. Isolated converter such as fly-back converter, push-pull converter, forward converter, bridge converters etc. overcomes the above issues, where basically a transformer or coupled inductor is used to Boost the voltage. But, inclusion of transformer or coupled inductor introduces voltage spike at the main switch and power loss due to leakage inductance. Recently, DC micro-grid gets major importance because of the significant increase in DC loads and demand of high quality power. These DC loads require different voltage levels based on their power ratings. Photo voltaic source (PV) is one of the prime source of energy in DC micro-grid. A very high voltage gain converter is the need for DC micro-grid because of low PV source voltage. In this regard, here a step up DC-DC converter topology is proposed, which possess a very high voltage gain characteristic. The proposed converter operates in continuous conduction mode.

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A MAXIMUM POWER POINT TRACKING FOR PHOTOVOLTIC MONITORING SYSTEM USING IOT TECHNIQUE

A PROJECT REPORT

Submitted by

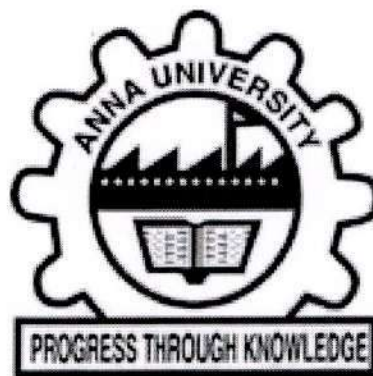|	
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APRIL 2020

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INTERNAL EXAMINER

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ABSTRACT

Integrating the Internet of Things (IoT) technology in solar photovoltaic (PV) systems is considered as an important aspect for monitoring, supervising and performances evaluation. The main aim of this work is to design a low-cost high precision monitoring system for the maximum power point tracking (MPPT) in a PV system. Two electronics board have been developed: a data acquisition sensing and a DC-DC boost converter. The maximum power point tracking of the generated solar power can be done using programable PIC microcontroller. The designed monitoring board consists of an embedded board (NODE MCU based upon ATmega2560), current and voltage sensors, voltage regulator Mini BEC, LCD Display, and a WiFi module ESP8266 to transmit the monitored data (*IPV, VPV, VL, IL* an*d D*) on the internet. In addition, a website named Smart things with separate unique account ID and new channel has created for this project has been also designed to store and display the monitored data in real time using python. User can monitored anywhere through out the world by using internet and also, the maximum power point tracking of the solar possible. Based on the monitored data the users can check easily if the system works well or not by just comparing the measured output power with the one expected by a model.

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CHAPTER 9

CONCLUSION

In this project a Maximum power point of the solar energy is tracked with low-cost monitoring system for maximum power tracking in a photovoltaic module is designed. The PIC microcontroller programed with MPPT for solar panel hence the output is maintained constant.

The IoT technique using Node MCU which has inbuild Wi-Fi module to connect with internet is used in order to monitor data such as Vpv, Ipv, VL, IL, and D in real time on a smart things' website throughout the world. This technology makes it possible in particular to improve the monitoring, the performance and the maintenance of the photovoltaic generator.

The designed system can analyzes and /or check the status of parameters being measured in a photovoltaic system. It can be mainly used to control the evolution of the maximum output power on line. Some options will be considered in the future, for example: the detection of faults and the failure of the sensors, receiving warning messages if the system is damaged and remote sensing monitoring.

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MULTI RESONANT POWER CONVERTER FOR IMPROVED DUAL-FREQENCY INDUCTION HEATING
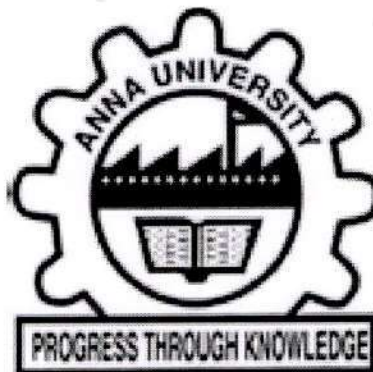
A PROJECT REPORT

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INTERNAL EXAMINER

EXTERNAL EXAMINER

ii

SMART FAULT DETECTION IN UNDERGROUND CABLE

A PROJECT REPORT

Submitted by

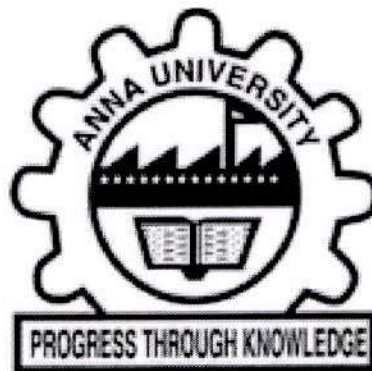|	
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EXTERNAL EXAMINER

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ii

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ABSTRACT

In this project we are going to determine the distance and location of underground cable fault in Km. Underground cable system is common in major areas like metropolitan and cosmopolitan cities. When fault occurs due to some reason, the detection of fault location is difficult. To overcome these difficulties, we are developed a system to find out exact fault location and types of fault using IOT. In this project, we use a standard theory that is when dc voltage is applied at the feeder through resistor, the current would vary depending upon the location of the fault. In this we are using ARDUINO board and IOT technology. IOT is used to store the output data and share these data to the concern person.

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CHAPTER – 9

CONCLUSION

9. CONCLUSION

The proposed system can be used for underground cables. This system uses an ARDUINO Uno board. Here the current sensing circuits made with a combination of resistors are interfaced to ARDUINO. We have proposed a low-cost solution to enhance the remote monitoring capability of existing industrial system. Thus, the project on Underground cable fault detection using ARDUINO was done and the distance of the fault from the base station in code was displayed on the LCD and mobile application simultaneously. In this project faults up to a distance of 1km can be detected. It is secure, robust and low-power consuming. By using ARDUINO controller, we can find our fault location on our mobile application. Once faults occur in the cable, the output unit displays the fault location. It will show at what distance the fault occurred, along with the Fault location and the nature of fault occurs will be displayed on our mobile application as well as in LCD display.

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Electricity From Rainwater Harvesting

A PROJECT REPORT

Submitted by

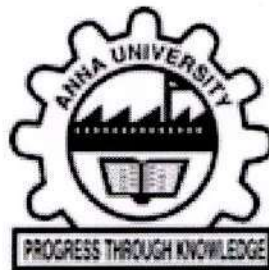|	
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Conclusions and Recommendations

The goal of this project was to provide energy from rainwater to charge cell phones or batteries for light in areas that had a lot of rainfall but minimal electricity. We identified Liberia as a case study area for our implementation due to it having a yearly rainfall rate of over 2500 millimeters (98.4 inches) a year (Golder Associates, 2012) and less than 1.2% electrification rate in rural areas (Liberia Institute of Statistics and Geo-Information Services, 2013). Using estimates for Liberian rainfall rates, our system could produce 2,664 Joules of energy in only a 30-minute rainstorm with a flow of 8 gallons per minute. This is enough to charge a cellphone approximately 13%. A monthly approximation for the number of cell phones can be made based on the system efficiency of 15%, a roof of 5 meters by 3 meters, a height of 3 meters, and using data for the average rainfall in the rainiest month, which is June and 533 millimeters (21.9 inches) of rain (Golder Associates, 2012). Based on these considerations 1.8 cell phones could be charged. It must be noted that only the accumulated rainfall for June was considered as opposed to the number, intensity, and duration of the storms in June. If a flow rate of less than 4 gallons per minute occurs, the system as it is may not even be able to start so that energy would need to be neglected. Therefore, less phones may be able to be charged then this reported 1.8 cell phones. Overall the project goal of producing energy from rainwater was achieved. This system would be more cost-effective if the energy produced was able to charge more cell phones in a given month. More energy could be generated if a higher efficiency was realized, which is possible given the recommendations provided in Section 5.2.

Expenses

The total cost of this system is important to consider as we are proposing it in low-income regions such as Liberia. The fundamental materials the system required were the gutters, downspout, connectors, gutter hangers, and hardware. Based on the images of homes in Liberia, not all homes

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FACE DETECTION BASED ATM SECURITY SYSTEM USING EMBEDDED LINUX PLATFORM(RASPBERRY PI)

A PROJECT REPORT

Submitted by

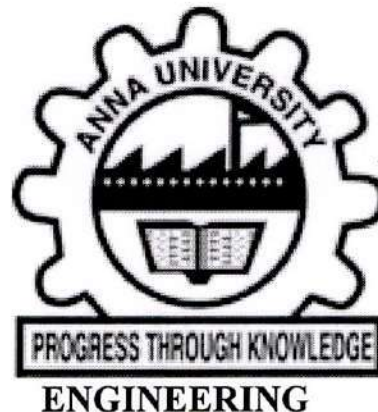|	
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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

In order to provide reliable security solution to the people, the concept of smart ATM security system based on Embedded Linux platform is suggested in this paper. The study is focused on Design and Implementation of Face Detection based ATM Security System using Embedded Linux Platform. The system is implemented on the credit card size Raspberry Pi board with extended capability of open source Computer Vision (OpenCV) software which is used for Image processing operation. High level security mechanism is provided by the consecutive actions such as initially system captures the human face and check whether the human face is detected properly or not. If the face is not detected properly, it warns the user to adjust him/her properly to detect the face. Still the face is not detected properly the system will lock the door of the ATM cabin for security purpose. The officials should verify then the door will be unlock otherwise it will remain lock.

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CHAPTER 7

CONCLUSION

The smart ATM security system based on embedded Linux platform is suggested here. Security is provided by detecting the face of the person in a systematic way. The system is smart in the way that if the person tries to cover his / her face, it gives warning message for proper detection of face.The implementation of ATM surveillance by using smart sensors and GSM/GPRS modem took advantages of the stability and reliability of sensor characteristics. The security features were enhanced largely for protection of ATM's when compared to previous systems. The whole system will be built on the technology of embedded system which makes the system more safe, reliable and easy to use. Therefore the proposed surveillance system here utilizes the latest technology like smart sensors and GSM/ GPRS modem which as a system has a very good endurance in the long run, which makes it ideal for protecting the ATM. Thus this system will be able to thwart physical attacks on the ATM and alerts necessary people to take action at any time and save people from lot of hardships involved in the ATM attacks.

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32

SMART VEHICLE PARKING
SYSTEM BY IOT
A PROJECT REPORT

Submitted by

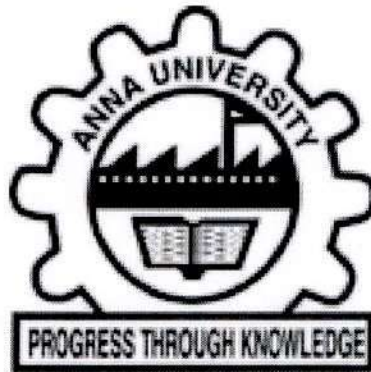|	
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EXTERNAL EXAMINER

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33
34

ABSTRACT

•This project "Vehicle Parking System" is aim at implementing a digital parking system. This Vehicle parking system will enhance the utilization of parking space and help user check the availaability of the parking space remotely since the system is connected to the Internet. Automated car parking is a method of automatically parking and retrieving cars that typically uses a system of pallets, lifts and carriers, By Parking in this way, the floor area and volume of the garage can be used much more efficiently. The intention is to compact more cars in the same space, and to reduce the space needed to park the same number of cars. Automated car parks can be sited above or below ground, or combination of both.

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CHAPTER 10
CONCLUSION AND FUTURE ENHANCEMENT
10.1 CONCLUSION

India is a nation in which Agriculture plays a prime role. Smart soil parameters estimation system of agriculture work would help farmers by suggested the right crop based on soil nutrients to increase the crop productivity. By using the test data from the sensor are compared with the trained data in the cloud. The NPK values are matches then it suggest the suitable crop for the particular soil. Based on the suggestion of crop thus the farmers plant the suitable crop increasing the yield and increasing the overall productivity of the nation.

10.2 FUTURE ENHANCEMENTS

The sensing techniques can be added along with the npk estimation. The sensing techniques like ph, moisture can also be included to identify the more parameters in the soil. The future updated algorithm can be used to improve the security of the data and provide more accuracy.

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IMPLEMENTATION OF SENSOR-LESS PHOTOVOLTATIC POWER RESERVE CONTROL WITH SIMPLE REAL-TIME MPP ESTIMATE

A PROJECT REPORT

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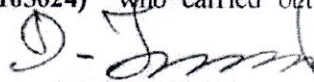
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ABSTRACT

Power reserve control (PRC) without energy storagebecomes essential for modern photovoltaic (PV) power plants tomeet the increased ancillary service requirements such as gridfrequency support. Conventional PRC strategies show obviouslimitations to estimate the available maximum power point(Pavai), such as additional hardware requirements, implementationdifficulty and slow estimation speed. Originated fromthe linear characteristic of PV curves in the constant currentregion (CCR) and a Lambert-W function for voltage linear reference, Pavai is estimated separately in separate steps ratherdirectly measured or estimated. The proposed strategy doesnot requires any additional hardware such as the irradianceand temperature sensors, which realizes sensorless control with reduced cost. Furthermore, cumbersome procedures of curvefitting with sophisticated operating points sampling and keyparameters determination in the real-time Pavai estimation byusing the conventional PRC methods can be also eliminated. Inthis strategy, the operating point with a curtailed power level is allocated at the left-hand side of the MPP, which guarantees thestability of PV systems under varying conditions. The developedstrategy exhibits fast speed to estimate Pavai, high robustness,and good compatibility with existing PV systems. Experimental results under various scenarios are provided tovalidate the effectiveness of the proposed strategy.

Chapter 6

CONCLUSION

In this project, a novel PRC method is proposed with a boostconverter. A comparison between the proposed method andthe previous Pavai estimation methods for the PRC is shownin TABLE I. Compared to the prior PRC methods, four mainadvantages of the proposed method can be summarised:

1) The proposed method can be implemented without anyadditional hardware requirements.

2) Unlike the other methods, Pavai is estimated separatelyin separate steps rather than directly estimated or measured.3) Furthermore, the proposed method can always to operateat Plimit.

4) Besides, the proposed method is very fast and effectiveunder various weather conditions, especially under fastsolar irradiance changing.Both of simulation and experimental results validated theeffectiveness of the proposed method. Various testing conditionsbetween the proposed method and the control schemein [32] are compared and analyzed. The proposed method isencapsulated with three signal

A QUAZI Z SOURCE NETWORK
BASED THREE PHASE INVERTR
USING SPACE
VECTOR PWM TECHNIQUE

A PROJECT REPORT

Submitted by

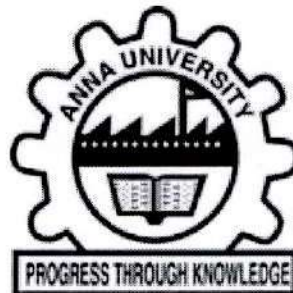|	
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41

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ABSTRACT

Transformer based Z-source (trans-Z-source) inverters are recently proposed to extend the traditional Z-source inverter with higher buck-boost capabilities as well as reducing the passive components at the same time. A new scheme for high boost trans-Z-source inverter is proposed in this project. In the traditional trans-Z-source inverters for high boosting voltages, the modulation index can be high by increasing the transformer turns ratio.

The proposed topology has two transformers, two capacitors and three diodes in the Z-impedance network. With less active and passive components and low shoot-through duty ratio the new topology produces an output voltage with high quality and low THD.

The new method is compared with previously proposed schemes in terms of voltage stresses on diodes and capacitors, efficiency, voltage gain, and Switching Device Power (SDP) factor of the diodes. The operating principles of the new scheme along with the transformer leakage inductance effects on the voltage gain have been investigated through

Detailed analytical and mathematical derivations. The validity and effectiveness of the new circuit have been verified by mat lab simulations.

4

CHAPTER-6

CONCLUSION

CONCLUSION

This project has presented a new Z-source inverter topology. Compared to the previous Z-source inverter, the improved topology has several merits. 1) The Z-source capacitor voltage stress is reduced greatly to perform the same boost ability; thus, low-voltage capacitors can be utilized to reduce the system cost and volume; 2) The inrush current and resonance of Z-source capacitors and inductors in traditional topology can be suppressed with a proper soft-start strategy. The space vector PWM technique reduces the DC utilization and reduces the losses. Simulation and experimental results verified the aforesaid merits of the proposed topology.

SCOPE

➢ The DSPIC controller operating speed is very less, The FPGA controller can solve this problem.

➢ The closed loop control technique we can implement it for getting good efficiency.

➢ The modified SVPWM can reduce the switching losses also.

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A ULTRASONIC BASED HAND GESTURE
OF CONTROLLED ROBOT

A PROJECT REPORT

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ABSTRACT

The aim of our project is to develop hand gesture controlled robot for this purpose The acquired hand images are treated as controlled images algorithm based by Arduino microcontroller. A new approach is proposed for target detection and location to control a distant robot in real time using ultrasonic sensor. The project involved components using MPU6050 , which is a 3-axis accelerometer sensor , other 3-axis is gyroscopic sensor and the controller part is Arduino . The project is based on wireless communication . Where the data from the hand gesture is transmitted to the robot over RF link(RF transmitter – Receiver part). The application of the project is wireless controlled robots and its very useful in many application like remote surveillance ,military , wheelchairs , industrial grade robotic arms

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CONCLUSION

The objective of this project was to design and implement an ultrasonic distance measurment device. The first step in that is control of the robotic arm through human gestures. 3- axis accelerometer by measuring the amount of accleration due to gravity tha angle it is tilled at with respect to the earth by sensing the amount of aynamic acceleration. Thus the ongoing research suggests that it is very much possible to make a robot mimic human movements in the near future. Our project gives an early study of this technology which could one day revolutionize the way humans and machine could interact. The control of robot through the leap mems sensor is still in the developmental stages but is a promising new technology. It is quite possible that the robots of the future will be able to mimic humans and the applications of this feature are limited only to one's imagination.

IMPLEMENTATION OF LUO CONVERTER USING PHOTO VOLTAIC CELL

A PROJECT REPORT

Submitted by

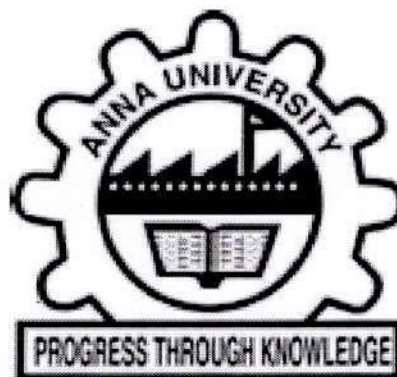|	
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INTERNAL EXAMINER

EXTERNAL EXAMINER

2

ABSTRACT

This project deals with solar photovoltaic (SPV) array fed system using a single phase induction motor (1ph IM) drive. The mid-point converter having two split capacitors is used to provide the required voltage pulses for phase windings excitation of single phase motor. It operates at fundamental frequency to reduce the switching losses. Luo converter is used in proposed system among different types of DC-DC converters for maximum power point tracking (MPPT) algorithm and for soft starting of IM. Both the inductors of Luo converter are operated in continuous conduction mode (CCM) which results in a low switching losses and minimal switching stress compared to any other buck-boost converter. The proposed SPV array fed water pumping system employs an incremental conductance (INC) algorithm for MPPT and for soft starting of the motor. The speed of SRM is controlled using variable DC link voltage depending upon the insulation levels of SPV array.

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CONCLUSION

The detailed analysis of the modified positive output Luo converter is presented and the related equations are derived. The converter draws a high value of current through the switch during the switch ON time, this drawback however can be overcome by using this converter in solar PV applications where inherently the current from the PV panel is limited. Thus the application of this converter as a first stage of a transformer-less single-phase grid connected Solar PV system has been proposed for feeding solar energy into the distribution network. The control of this converter also ensures an MPP operation. The boosted voltage is then fed to the grid with the help of an H-bridge converter. The control scheme for this stage ensures a lower harmonics in the injected current into the grid. A simulation model of the proposed system with its control strategy is developed. The simulation results of the behaviour of the modified positive output Luo converter under constant irradiance as well as variable irradiance. The simulations results show the feasibility of the application of this converter in the proposed configuration.

A LOW COST LED BASED SOLAR SIMULATOR
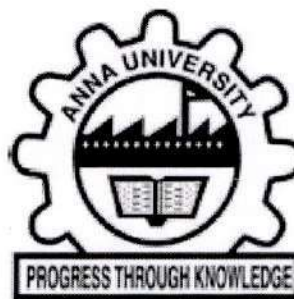
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INTERNAL EXAMINER

EXTERNAL EXAMINER

53

54

ABSTRACT

Recent improvements in light-emitting diode (LED) technology has allowed for the use of LEDs for solar simulators with excellent characteristics. In this paper, we present a solar simulator prototype fully based on LEDs. Our prototype has been designed specifically for light soaking and current-voltage (I(V)) measurements of amorphous silicon solar cells. With . The densely packed LEDs provide power densities equivalent to 4 suns for AM1.5g or 5 suns with all LEDs at full power with no concentrator optics. The concept of modular LED blocks and electronics guarantees good uniformity and easy up-scalability. Instead of cost-intensive LED drivers, low-cost power supplies were used with current control, including a feedback loop on in-house developed electronics. This prototype satisfies the highest classifications (better than AAA from 400 to 750 nm) with an illuminated area of 18 cm × 18 cm. For a broader spectrum, the spectral range could be extended by using other types of LEDs or by adding halogen lamps. The space required for this can be saved by using LEDs with higher power or by reducing the maximum light intensity. The LED solar simulator propose produce the electricity in solar energy using battery and bug boost converter and run with led application.

iii

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CHAPTER 6

Result and discussion

☐ The pico is a high accuracy variable, or fixed spectrum, solar simulator equipped with easy implementation into any testing facility or research lab.

☐ Using our One-Click Sun™ software, the picoreplicates the spectral and intensity profiles, at a user defined geographic location, time, or season.

☐ Designed with accuracy and versatility as priority, the pico can be customized for any research project, or solar cell testing

CHAPTER 7

CONCLUSION

Our proposal uses less LEDs than commercial solutions, both in types and in number, reaching an emission close to 1 sun. Class AAA is achieved in a 1 cm2 central area, but the irradiance is stable and homogeneous enough to perform characterizations in cells of a wider area, up to 25 cm2. The system is 3-D printed in ABS plastic and can be reproduced easily. The validity of the system was checked using the 91 150-V

calibrated silicon solar cell system by Newport. boost the voltage in solar LED it is perform low cost simulator in application it achieve high intensity of emitting surface in the energy power.

AAA achieved in new port of LED in 91-150v.

A High-Efficiency Active-Boost-Rectifier-Based Converter with A Double-Pulse Duty Cycle Modulation

A PROJECT REPORT

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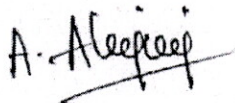
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ABSTRACT

A highly-efficient isolated resonant converter with a novel modulation method is proposed for delivering power from photovoltaic (PV) modules to the dc microgrid. The proposed modulation method allows the converter to boost low input voltages and regulate a wide input voltage range. The converter design is based on a series resonant converter (SRC) which operates at the resonant frequency to achieve highest efficiency under nominal input voltage condition. Under shadowed or low irradiance conditions of PV panels, the converter will operate with the proposed "double-pulse duty cycle" modulation method to step up the voltage for the dc microgrid connection. With the proposed modulation method, the output switches serve for both synchronous rectification and voltage boost function. This method enables a higher voltage boost ratio than SRC without adding additional switches while operating at the resonant frequency. A 300-W hardware prototype with gallium-nitride devices is built to verify the performance of the proposed converter and modulation method. The converter achieved a peak efficiency of 98.9% and a California Energy Commission weighted efficiency of 98.7% under nominal input voltage condition.

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CHAPTER 8

CONCLUSION

a high-efficiency active-boost-rectifier-based converter is proposed for modular PVs in dc microgrid applications. A novel double-pulse duty cycle modulation scheme is proposed to ensure that the converter not only keeps the benefits of the highly-efficient SRC converter, but also achieves a higher voltage gain than SRC and a wide-range regulation ability without adding additional switches while operating under fixed-frequency condition. The proposed converter has the following distinct features. (1) Compared to the conventional variable frequency LLC resonant converter, it has lower circulating energy due to the fixed frequency operation.

A SEPIC AC/DC SINGLE STAGE
SOFT SWITCHING PFC CONVERTER

A PROJECT REPORT

Submitted by

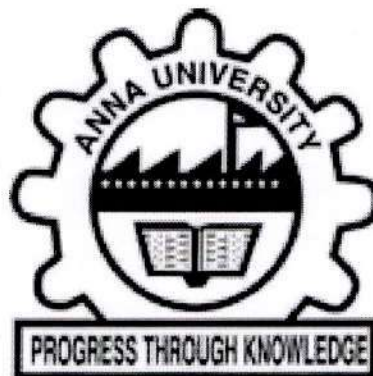|	
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In partial fulfilment for the award of the

degree of

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

M.I.E.T. ENGINEERING COLLEGE, TRICHY
ANNA UNIVERSITY : CHENNAI 600 025
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ANNA UNIVERSITY : CHENNAI 600 025

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PRINCIPAL
M.I.E.T. ENGINEERING COLLEGE
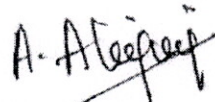GUNDUR, TIRUCHIRAPPALLI-620 007.

BONAFIDE CERTIFICATE

Certified that this project report "**A SINGLE STAGE AC/DC SOFT SWITCHING PFC CONVERTER**" is the bonafide work of "**JUDITH.A (812416105020), NISHA.U (812416105038)** and **NIVEDHA. S (812416105039)**" who carried out the project work under my supervision.

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INTERNAL EXAMINER

EXTERNAL EXAMINER

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ABSTRACT

Active pulsating energy buffering (PPB) characteristic can efficiently reduce the two times-line frequency electricity garage requirement in a single-phase rectifier. Existing single-phase solutions with active PPB should utilize greater than two energetic switches of their circuits. Compared with conventional unmarried-lively-switch solutions without energetic PPB (e.g. A boost PFC rectifier), the fee of extra semiconductor switches and gate force circuitry in a lively PPB-based totally rectifier might not be justified for low power applications. This paper offers a family of unmarried-switch unmarried-phase rectifier with active PPB. Taking benefit of the on-time and off-time of an unmarried transfer, the proposed rectifiers are formulated with the aid of merging two converters that are respectively duty and frequency controlled.

The total number of semiconductor elements is reduced in the proposed topology which results in lower cost and higher efficiency. The operating modes of the proposed converter are discussed and prototype of the proposed converter is implemented. The obtained simulation and prototype results are provided to verify the converter analysis and operation.

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CONCLUSION

This project presents a family of single-switch single-phase rectifiers, featuring low-harmonic line currents, stable dc output voltage, and no electrolytic capacitors. These converters are derived by integrating two cascaded PWM converters (non-isolated or isolated) operated in DCM and CCM (or CCM and DCM), respectively. Different from Integrated High-Quality Rectifier Regulators, which have identical circuit topologies, the proposed converters take advantage of both duty cycle and switching frequency as control inputs, thereby enabling simultaneous active power factor correction, active pulsating power buffering, and output voltage regulation.

IMPLEMENTATION OF AN IOT BASED ENERGY MONITORING SYSTEM FOR MANAGINNG SMART HOMES

A PROJECT REPORT

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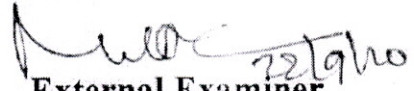**Prof. D.TAMILSELVAN**

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ABSTRACT

Machining workshop is a widely distributed manufacturing system that consumes massive energy in a low efficiency. In recent years, the increasing pressure from energy price and environmental directive have forced machinery manufacturers to address energy efficiency monitoring and management to improve economic benefits and environmental performance. However, due to the complicated energy flow and dynamic energy changes of the machining workshop, machinery manufacturers still lack an effective method to monitor and manage the energy efficiency in a practical manner. To this end, this paper proposes an energy efficiency monitoring and management system with the support of the newly emerging Internet of Things (IoT) technology. Firstly, the energy characteristics and energy efficiency indicators of the machining workshop are analyzed and defined. Then the framework of the IoT based energy efficiency monitoring and management system is proposed. The key approaches for energy efficiency monitoring and management are then illustrated. Finally, an industrial application is demonstrated to validate the effectiveness and benefits of the proposed system. With the application of the proposed system, potential opportunities for energy consumption decrement and energy efficiency improvement can be identified. Machinery manufacturers can easily reduce energy consumption and energy cost by managing the machining process.

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