Applied GIS

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

SOLAR POWER INVENTER WITH DUAL AC OUTPUT

A SABIHA

ASSISTANT PROFESSOR

asabiha.227@gmail.com

C RAMESH BABU

ASSISTANT PROFESSOR

ramesh.babu224@gmail.com

G VAMSI KRISHNA

ASSISTANT PROFESSOR

kvamsi706@gmail.com

DEPARTMENT OF EEE in Sri Venkateswara Institute of Technology,

N.H 44,Hampapuram, Rapthadu, Anantapuramu,Andhra Pradesh 515722

ABSTRACT:Solar panels that employ two inverter transformers to provide two separate AC outputs to loads—the majority of which are for household appliances—are the subject of this paper's design. Due to the ever-increasing need for energy and the steadily diminishing supply of fossil fuels, we are turning our attention to renewable energy sources, which are sustainable, environmentally benign, and the limitless power supply of the future. Among renewable energy sources, solar power has been around the longest. With an input voltage of 12V and an output voltage of 220V with 50Hz dual AC output, the proposed inverter produces 100W of electricity.A light-dependent resistor (LDR) sensor was used to assess the light intensity. Because the solar panel's output voltage is too high for the Arduino's receiver, a voltage divider was used to measure the voltage. The current sensor module, which can detect the current produced by the solar panel, was lastly used to measure the current.

The Arduino received these parameters as input and displayed the result on the LCD screen. You can see the voltage, current, and light intensity shown on the LCD panel. The goal of an Arduino board is to transform the analogue parameter input into a digital signal that can be read out by an LCD screen. Device cases also need to be designed to be easily transportable, which is another aspect of this project.

Key words: SOLAR PANEL, INVERTER, DC VOLTAGE, DC CAPACITOR, SWITCHING DEVICES, DUAL TWO LEVEL INVERTER, DV/DT, GRID VOLTAGE, SIMULATING CIRCUIT, MATLAB SIMULINK.

INTRODUCTION

In the last ten years, renewable energy sources like solar photovoltaic (PV) have grown in popularity because to rising environmental consciousness and tax breaks offered by the Pakistani government for PV systems. Solar photovoltaic (PV) integration with smart load control approaches will improve the

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

system-wide as it lowers the enormous expense of the power bill. Renewable energy sources have been under scrutiny due to persistent concerns about the finite supply of fossil fuels and the rapid deterioration of environmental conditions. Some of the most progressive nations in the world are offering financial incentives to businesses and individuals that use renewable energy sources (RES) to power innovative systems. Keeping the air conditioner on We developed the Solar Power Inverter in response to the growing demand for solar energy. The Power Inverter is the brains of the Solar Energy System, as most contemporary comforts need 220 volts AC. Connected to the utility grid, it can charge the batteries, much as a fully autonomous solar power system would, and it also changes the low voltage 12 volts DC to the 220 volts AC that most appliances use. With the help of an onboard charger, these specialised inverters can extract power from a battery, regulate the battery's charge, and then send any surplus power back to the utility grid. An inverter is a piece of electrical equipment that changes the voltage and frequency of alternating current (AC) from direct current (DC) using the right transformers, switches, and control circuits. No moving parts are used by solid-state inverters.

components, and they find use in anything from tiny computer switching power supplies to massive electric utility high-voltage direct current applications that transfer massive amounts of power. Supplying alternating current (AC) from direct current (DC) sources, such batteries or solar panels, is a typical usage for inverters.
The globe is focusing on starting to create new energy and associated technologies since the energy crisis is becoming worse. Currently, the photovoltaic industry is being guided by the need for large-scale solar power production and the need of renewable energy on a grand scale [1, 2]. The grid and PV power plants now confront additional issues related to security, stability, and dependable operation as a result of the unique features of grid-connected PV power stations compared to traditional power production. An enhanced technique for controlling PWM inverters is detailed in the article [3]. Through the use of voltage signals received from the DC side of the inverter—also known as the outer loop—to control the grid voltage and the inverter's voltage reference from the AC side of the load, the voltage source inverter control technique primarily manages the grid's phase angle.

current flowing out of the inner loop, which is the output [4]. There will be no impact on the outer loop's outcomes from the inner loop's procedure. The two groups came together to build a power-type PWM inverter bridge circuit that employs a synchronised transformation of two reverse diodes. Changing the modulation rate of the PWM inverter allows one to acquire the required power. Consequently, the most important concerns in the electric power system revolve on the ability of the grid-connected PV generating inverter control system to reach maximum power point tracking (MPPT) and guarantee good power quality of the solar cells [5]. An improved pulse width modulation (PWM) inverter control system that is single phase grid linked is presented in this research. Commonly, these lower control frameworks make use of diesel generators, and in some cases, several generators are installed to meet their power requirements.In order to cut down on their use of diesel generators, many of these buildings are opting for Solar PhotoVoltaic (SPV) systems as backup power due to rising costs and environmental consciousness. Solar photovoltaic (SPV) systems, which convert sunlight into electricity, are often installed on top of buildings to provide the base load need. Common components of a rooftop beat SPV system include the following.

depending on its type: Renewable energy systems Controllers for charging Reverse Transformers Structures for attaching modules

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

Turning point for departure The cables Framework for metering In addition to these parts, having access to the finest rooftop area without shadow is a must. The minimum amount of shade-free space needed to install a standard 1kW framework on a home roof is around 30 square metres. Free frameworks and matrix-associated frameworks are the two types of rooftop beat SPV frameworks. You may choose between lattice-free structures with and without battery drop. In order to put the surplus electricity generated during the day to use later on, or in situations when there is insufficient solar power due to cloud cover or other factors, batteries are used. Here is a typical outline of a rooftop beat structure that uses battery power and sunlight. Batteries are often passed over since they are expensive, need a lot of guesswork, and need to be changed out periodically. Therefore, a building chooses a battery move down framework or one without battery reinforcement based on the size and requirement of the framework. In the second scenario, the framework is often approximated such that electricity generated during the day
This SPV uses the energy it generates during the day to satisfy its energy needs; during the night or when that isn't enough, it draws power from the grid or uses a diesel generator.

LITERATUREREVIEW

Title-1:

A Single Stage Grid Connected Inverter Topology for Solar PV Systems with Maximum Power Point Tracking.

Author:

"A Single Stage Grid Connected Inverter Topology for Solar PV Systems With Maximum Power Point Tracking" was published in the IEEE Transactions on Power Electronics by S. Jain and V. Agarwa.

DISCRIPTION:

For PV systems that are linked to the grid, this study suggests an architecture for the inverters that is both high-performance and simple. While monitoring the maximum power output from the PV array, the suggested setup may increase the typically low voltage of the array and transform the solar dc electricity into high-quality ac power to feed into the grid. The current that is injected into the grid is subject to restrictions on total harmonic distortion in accordance with the IEEE-519 standard. Among the many appealing aspects of the suggested topology are its reduced size, increased efficiency, lower cost, and improved PV array utilisation. In addition, the PV array improves the system's overall safety since, according to the suggested architecture, it seems as a floating source to the grid. We offer the recommended topology after doing a review of the current topologies that are appropriate for single-stage, grid-connected PV applications. You will find a comprehensive steady-state study that details the design process and provides expressions for the peak stresses experienced by the device. Discontinuous conduction mode operation also requires a certain condition on the modulation index "M" for the suggested inverter architecture to be controlled by sinusoidal pulsewidth modulation. The findings of all analyses, simulations, and experiments are detailed here.

Title-2:

Power sharing in parallel inverter swithd if ferent types of loads," in IET Generation,Transmission& Distribution.

Author:

"Power sharing in parallel inverters switched by different types of loads" (IET Generation, Transmission & Distribution, A. Ketabi, S.S. Rajamand, and M. Shahidehpour, 2018).

DISCRIPTION:

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

Multiple distributed generation (DG) units that are linked in parallel and have coordinated control techniques make up a microgrid. These units may switch between grid-connected and islanding modes of operation. Due to their ability to enhance system power quality, decrease feeder losses, and relieve strain on major transmission networks, microgrids are garnering a lot of interest. System stability and load power sharing among the several parallel-connected DG units are paramount in islanded microgrids. Unfortunately, when using the traditional droop control technique, you'll always encounter issues with active and reactive power sharing. These difficulties stem from factors like DG feeder impedance mismatch and varying DG unit ratings. In light of this, this study compares and summarises active power sharing using adaptive/improved droop control, network-based control approaches, and cost-based droop schemes. It is challenging to share reactive power properly alone utilising the increased virtual impedance approach, because nonlinear and imbalanced loads might further impact reactive power sharing when active power is regulated. Consequently, they enhance the hierarchical control techniques with the

standard sway pedals and digital impedance techniques. To achieve proper reactive power sharing for islanded microgrids and eliminate the effect of communication delays on hierarchical control, improved hierarchical control approaches have been proposed. These approaches include algorithms based on graph theory, multi-agent systems, the gain scheduling method, and predictive control. Lastly, the article delves into the next tendencies in research on isolated microgrids.

Title-3:

Effect of grid inductance on grid current quality of parallel grid connected invertersystemwithoutputLCLfilterand closed loop control.

Authors:

The impact of grid inductance on the quality of grid current in a parallel grid-connected inverter system with an output LCL filter and closed-loop control was studied by W. Choi, W. Lee, and B. Sarlioglu.

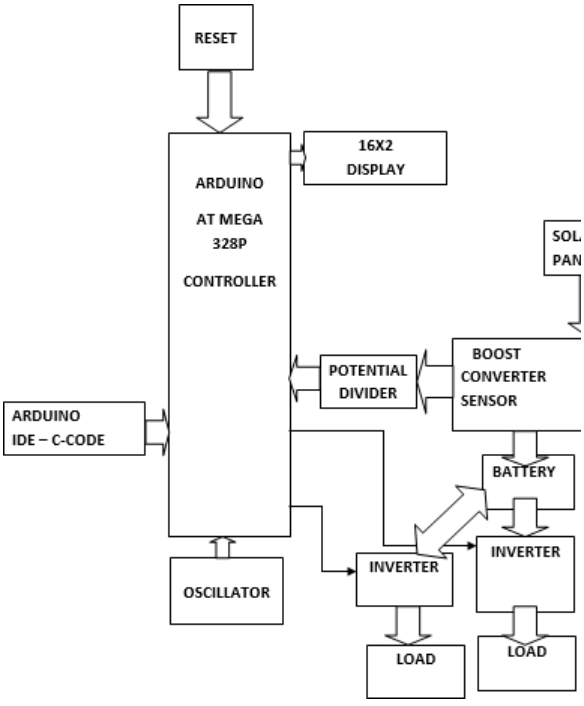
DESCRIPTION:

Power electronics interfaces known as grid-connected inverters (GCIs) link renewable energy sources that are located off-grid to the power grid. To keep the grid's power quality good and to make dispersed energy resources work better, it

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

Knowing the features of GCIs and how to handle them appropriately is crucial for their many uses. This research examines the impact of grid inductance on grid current quality in the context of several inverters connected to the grid in parallel. The model incorporates a power controller, a voltage-oriented PI controller, the grid, an output LCL filter, and three-phase, two-level voltage source inverters. Mathematical models are used for parallel GCI systems. Various grid inductances are used to study the frequency responses of the grid current. The impact of grid inductance on grid current and power quality is shown via the use of a MATLAB Simulink simulation of a parallel grid-connected inverter system.

BLOCK DIAGRAM



LED:

Radioactive recombination is a property of this semiconductor diode. Producing an electron-hole pair calls for a certain quantity of energy. Recombining an electron with a hole releases the same amount of energy. Such recombination and the emission of photons are possible outcomes of this liberated energy. Experience the audible manifestation of the energy dissipated when the electro transitions from the conduction band to the valence band. Another possibility is that the lattice libration-inducing photon bursts caused by the released energy. At last, it's possible to transmit the liberated energy to another electron.

SOLARCELL

The technology that converts solar radiation into usable electricity is called a photovoltaic cell, although it goes by many other names. Made of silicon amalgam, the photovoltaic cell is an electrically-free device. There are machines that can't make do with the 1 or 2 watts that a single cell can provide. In order for a photovoltaic cluster to function, sunlight is required. Climate factors, such as fog and haze, significantly affect the amount of solar energy received by the display and, by extension, its operation. For PV, most of the modules have an efficiency of about 10% to 20%.

ARDUINOUNO

Based on the ATmega328, the Arduino Uno is a board for microcontrollers (datasheet). It has a 16 MHz artistic resonator, 6 basic data sources,

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

14 digital input/output pins (6 of which may be used as PWM outputs), a USB connection, a power connector, an ICSP header, and a reset button. It has all the necessary components to support the microcontroller, such as a USB connection for connecting it to a computer or an AC-to-DC adapter or battery for powering it up initially. A key differentiator between the Uno and all preceding boards is the absence of the FTDI USB-to-serial driver chip. Instead, it boasts a USB-to-series converter version of the Atmega16U2 (Atmega8U2 up to variation R2).

LCD(LIQUIDCRYSTALDISPLAY)

The fluid gem show screen is an electronic show module that finds many applications due to its ease of programming, ability to display unique and bespoke characters (unlike in seven segments), live lines, and so on. Most often used are character and graphical LCDs. Displays on character LCDs may include numbers, special characters, ASCII characters, and other such information. Two sixteen by two There are two lines that can display 16 characters each, as shown by the LCD. In particular, the Command and Data registers are included on this LCD. In response to commands sent to the LCD, the summon enrol records them. A command is a series of instructions supplied to an LCD to carry out a certain task, such as powering on, off, cleaning the screen, adjusting the display, and so on. Data for the LCD display is saved in the information enrol. The data is an approximate ASCII representation of the characters that will be shown on the LCD.

SolarPanel

Electrically connected and fastened solar panel modules in a companion configuration. A collection of interconnected solar cells in a photovoltaic module. In lucrative and suburban applications, the solar module may be used as a module of a greater photovoltaic system to generate and distribute power. Modules are priced according to their DC output power under STC, which typically falls within the 100–320 watt range. An 8% efficient 230 watt module will have double the area of a 16% efficient 230 watt module, for example, since the two modules have the same rated output but different levels of efficiency. The low power output of a single solar module necessitates the usage of many components in most connections.

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

A solar panel is a device that collects energy from the sun's rays and uses that energy to generate electricity or heat.Solar panels are made up of many individual solar cells, also called photovoltaic cells, which work together to produce energy via the photovoltaic effect. Solar panels have these cells spread out in a grid arrangement.Another way to put it is as a collection of photovoltaic modules attached to a framework. A PV module consists of six by ten solar cells that are packed and linked together.In terms of durability, these panels are top-notch. Solar panels have a very long lifespan. They lose just about 1% to 2% (perhaps even less) of their efficacy after a year.Crystalline silicon solar cells constitute the majority of solar panels. One way that homeowners may battle the harmful emissions of greenhouse gases and contribute to a decrease in global warming is by installing solar panels on their houses. The use of solar panels does not result in the release of any harmful pollutants. They help us use less fossil fuels as well. and conventional power sources, both of which have their limitations. Calculators are only one example of the many modern electronic devices that rely on solar panels to power their operation.Solar panels have many benefits, but their high price tag is their only real downside. Because they require sunshine to charge, solar panels are often placed outside.A solar panel is a kind of energy harvesting device that uses the sun's rays to produce heat or electricity. Assuming a photovoltaic (PV) model is a packed and linked assembly of six to ten solar cells. The solar array of a photovoltaic system, which produces and distributes solar power for homes and businesses, is composed of solar photovoltaic panels. Under typical testing conditions, the DC output power of each module—which usually falls somewhere between 100 and 365 Watts—is what ties them together.Due to the restricted power output of a single Solar Module, most installations employ a combination of modules.Panels or areas of solar modules, an inverter, batteries, a tracker, and wiring are the usual components of a photovoltaic system. Solar modules use the sun's rays to power generators, however The Effect of Photovoltaics. A large number of models relied on water. Based crystalline Silicon cells or thin film cells based on Casnout telluride or silicone .Either the top or bottom layer of the module might serve as its structural element. Mechanical damage and moisture should also be kept at bay from cells. Although most solar modules are inflexible, thin-film cell technology has made semi-flexible versions possible. Here we are use a solar panel that utilises the sun's rays to charge a mobile device. It's a 15-watt model. The 7 Ah or 7000 mAh tiny battery charging panel is purpose-

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

built for this purpose. Solar is the leading solar brand in India, offering a wide range of solar products, including panels. To gently charge a 12V car or deep cycle battery, the 10 watt, 12 volt solar panel is more than enough power. Assists in powering small equipment like pumps, lights, fans, and TVs, stereos, and VCRs in boats, cabins, and trailers.

OSCILLATOR

Oscillators are circuits that, when turned on, generate an alternating waveform that is both continuous and repetitive. In essence, oscillators change a current's direction of flow from a the components of its circuit decide upon the frequency of the alternating waveform that should be produced from the direct current (DC) supply. A circuit that generates an electrical signal that oscillates at regular intervals, often in the form of a sine wave, square wave, or triangle wave, is called an electronic oscillator. Oscillators are devices that change the alternating current signal from direct current that comes from a power source.

POTENTIALDIVIDER

In order to create a changeable potential difference, a potential divider employs resistors (or thermistors / LDRs) in a straightforward circuit. In addition to controlling the volume of a music system, they can also regulate the temperature of a freezer and detect changes in ambient light. Voltage dividers, often called potential dividers, are passive linear circuits in electronics that take an input voltage (Vin) and output a value (Vout) that is a fraction of it. When the input voltage is divided among the divider's components, the outcome is voltage division. The input voltage is applied across the resistor pair, and the output voltage emerges from the connection between them. A basic example of a voltage divider would be two resistors linked in series.
Common applications for resistor voltage dividers include attenuating signals at low frequencies, generating reference voltages, or reducing the amplitude of a voltage for measurement purposes. Voltage dividers made of resistors alone may be accurate enough for direct current and low frequencies; however, voltage dividers with capacitive elements added to compensate load capacitance are used when frequency response over a wide range is required, like in an oscilloscope probe. A capacitive voltage divider measures high voltage in electric power transmission.

BOOSTCONVERTERSENSOR

A boost converter, also known as a step-up converter, is a kind of direct current (DC)

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

power converter that increases the voltage and decreases the current going from the supply to the load. This kind of switched-mode power supply (SMPS) has a diode, a transistor, and some sort of energy storage device, such as a capacitor, an inductor, or a mix of the two. A capacitor (or inductor) filter is often attached to the output (the load-side filter) and the input (the supply-side filter) of such a converter to lessen voltage ripple. A greater voltage is often achieved by stacking cells in series in battery power systems. However, in many high voltage applications, adequate cell stacking is not feasible owing to space constraints. Boost converters have the ability to lower the number of cells while increasing the voltage. Lighting systems and hybrid electric vehicles (HEVs) are two battery-powered applications that use boost converters. Batteries, solar panels, rectifiers, or DC generators are all viable DC power sources that may supply the boost converter. A DC-to-DC conversion is a procedure that transfers one DC voltage to another DC voltage. Boost converters are a kind of DC-to-DC converters that produce an output voltage higher than the input voltage. As it "steps up" the source voltage, a boost converter is also known as a step-up converter. There is a difference between the source and output currents due to the conservation of power (P=VI).

MOSFET

A kind of insulated-gate field-effect transistor, the metal-oxide-semiconductor field-effect transistor (MOSFET, MOS-FET, MOS FET) is made by carefully oxidising a semiconductor, usually silicon, to form the transistor. The electrical conductivity of the device is controlled by the voltage of the covered gate; this property allows the device to be utilised for signal amplification or switching based on the amount of voltage provided. Mohamed M. Atalla and Dawon Kahng developed the MOSFET in 1959 and debuted it in 1960 at Bell Labs. Between 1960 and 2018, an estimated thirteen sextillion (1.3×1022) MOSFETs were produced, making it the most produced device in history and the fundamental component of contemporary electronics.It's the most common power device and the most frequent semiconductor device in digital and analogue integrated circuits (ICs) [2].[4] It's a little transistor that has been mass-produced for many uses; it has been crucial in the digital revolution, silicon era, and information age; and it has revolutionised the electronics industry and the global economy. In order to provide room for high-density integrated circuits (ICs) like memory chips and microprocessors, the scaling and miniaturisation of metal-oxide semiconductor field-effect transistors (MOSFETs) has been a

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

major factor in the exponential expansion of IT since the 1960s. One may say that the MOSFET is the "workhorse" of the electrical sector.

Compared to bipolar junction transistors (BJTs), a MOSFET's ability to adjust the load current with nearly minimal input current is a major benefit.From its "normally off" state, the conductivity of an enhancement mode MOSFET may be increased by applying voltage to the gate terminal. Applying voltage to the gate of a depletion mode MOSFET may decrease the conductivity from the "normally on" condition.[5] In addition to being readily scaled down to smaller dimensions, MOSFETs are able to achieve excellent scalability as miniaturisation continues. Compared to BJTs, they are smaller, have a lower power consumption, permit a greater density, and have a quicker switching speed—all of which make them excellent for digital signals and large-scale integration. High manufacturing yield is achieved by using MOSFETs because to their low cost and relatively easy processing methods. Single-gate or multi-gate MOSFETs are also possible, and they may be made either as components of MOS integrated circuit chips or as individual devices (such a power MOSFET). Due to the fact that MOSFETs may be manufactured using p-type or n-type semiconductors, CMOS (Complementary MOS) logic allows for the creation of switching circuits with very low power consumption. Usually, when you hear the term "metal-oxide-semiconductor" (MOS), what comes to mind are semiconductors (usually silicon), oxide insulation, and metal gates.[1] On the other hand, a layer of polycrystalline silicon may serve as the gate material in some MOSFETs, thus the "metal" part of the name isn't always accurate. In addition to oxide, It is also possible to achieve strong channels with lesser applied voltages by using various dielectric materials. An additional component of MOSFETs is the MOS capacitor.

DESCRIPTIONS OFDEVELOPMENTWORK

Electrons flowing from the negative to the positive direction are used by solar panels to generate direct current power. We utilise alternate current for most of our household equipment. The ongoing flow of electrons from negative to positive is what produces this alternating current (AC). Depending on the load, the voltage of an appliance powered by AC energy may be changed. Solar panels can only generate direct current (DC), hence an inverter is necessary to convert DC to alternating current (AC). The primary function of this system is to charge inverters with solar power. Many organisations are choosing to adopt solar energy because of all the advantages it offers. The inverter is charged by the sun's rays shining on the solar panels.

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

When the electricity goes off, the inverter kicks in. Electronically, the inverter transforms DC power into AC power. The inverter is charged whenever there is power. These solar panels always face the sun, or maintain their surface perpendicular to the sun's beams, to guarantee that they absorb the sun's energy to the fullest possible extent. A 12-volt battery, a 15-watt solar panel, a charger, a DC inverter, a MOSFET switch, and an ATmega 328 microcontroller make up this system. A natural source of energy, solar power helps to charge the battery. The inverter is charged by the battery as we turn on the loads, converting DC to AC. The setup transformer then raises the voltage needed to operate the gadget. A metal-oxide-semiconductor field-effect transistor (MOSFET) controls the voltage and supplies current to an electrical load. The AC load is powered by our system's solar panel technology.

THE OPENEND WINDINGTRANSFORMERBASEDSOLAR:

INVERTERTOPOLOGYFOR VOLTAGE SHARING:

For high-power grid-connected solar applications, the only thing that modular parallel inverter designs need to do is make sure that the inverter modules share current evenly. Because all of the inverter modules in a parallel setup draw power from the same DC bus, greater DC bus potentials are required. The inverter switching devices and DC link capacitors are subjected to excessive voltage stress due to the kilovolt range of DC bus voltages used to simulate the grid voltage. In this study, we provide a different approach to the parallel solar PCS architecture that shares the voltage among the inverters for a certain power rating, taking into account the reduced dependability caused by excessive voltage stress.

An open-end winding transformer's main winding would link the individual inverters to the output phase terminal in the suggested setup (Fig.1), while the transformer's secondary winding would link to the utility grid.

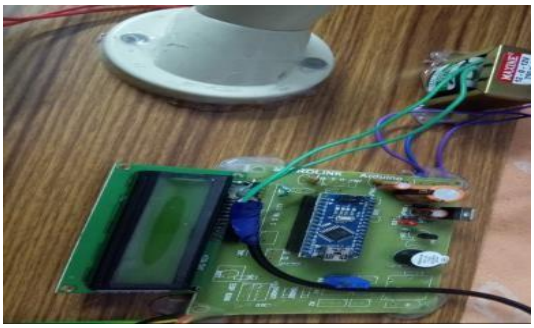
When the individual inverters are linked in a back-to-back configuration with the transformer, as shown in Figure 1, the full AC voltage across the transformer's primary is sensed by the 180° phase-shifted AC voltages generated by each inverter, even though only half of the DC bus voltage is used, in contrast to the traditional parallel topology. Implementing coordinated closed-loop control for the suggested inverter architecture allows us to monitor the maximum available power throughout each solar farm, which is used to create switching pulses for the individual linverters. In order to monitor the separate solar farms' maximum power point tracking, the MPPT algorithm for each inverter is used,

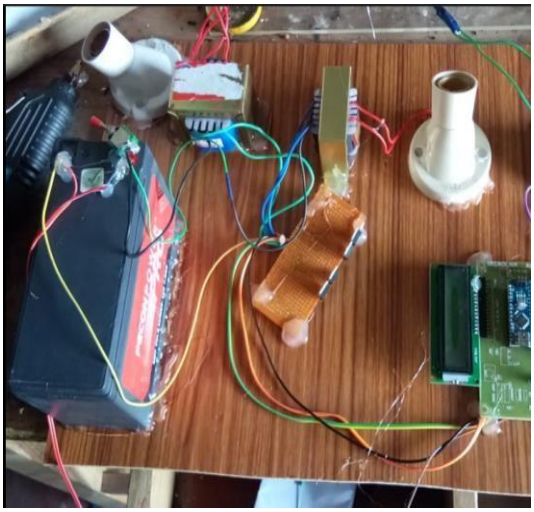
ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

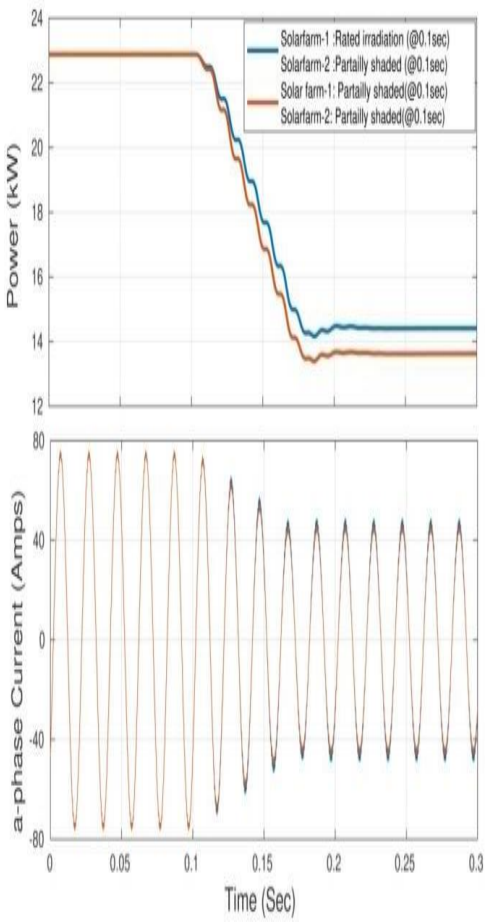
as seen in Figure 2. In order to calculate the available power between inverter-1 and inverter-2, the MPPT algorithm (shown in Fig.2) logs the DC bus voltage and current of each inverter.In order to get the combined voltage reference Vref, as illustrated in Fig.2, the perturband observe approach is used to monitor the reference voltages (V1ref and V2ref) that correspond to the maximum power points of inverter-1 and inverter-2, respectively, relative to the provided DC voltage. With respect to the maximum power point, the total reference voltage (Vref) equals

operate the individual inverters by means of the central closed-loop control's switching pulse generation.

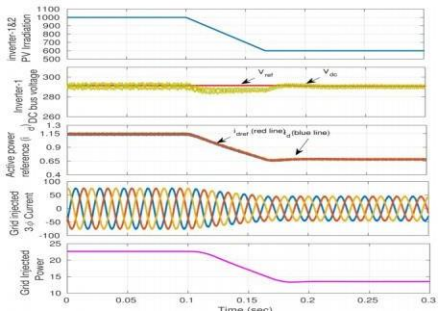
WORKINGMODEL:







ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021



FINALEXPERIMENTALSETUP

CONCLUSION

Instead of using a single stage parallel inverter design, this paper suggests using a dual two level inverter PCS that is based on an open end winding transformer. The MATLAB simulation demonstrates that, in contrast to the traditional parallel architecture, the suggested arrangement shares power among the inverter modules according to voltage. The suggested setup reduces strain on the DC link capacitor and switching devices by dividing up the DC voltage. This study successfully tracks the maximum PowerPoint by implementing a coordinated closed-loop controller and designing a compensation using small-signal analysis for the suggested topology. Partially shading the solar farm proved the effectiveness of the closed-loop controls that were put into place. Compared to the traditional architecture, this study shows that at all irradiations, the maximum power available across the DC terminals of the PCS is flowing into the grid at half the DC bus voltage. Improved dependability is only one benefit of lowering DC potentials throughout inverter module scans, which also minimise voltage stress on inverters.

REFERENCES

1. S.JainandV.AgarwaL ,"A Single Stage Grid Connected Inverter TopologyforSolarPVSystemsWith MaximumPowerPointTracking,"in IEEE Transactions on Power Electronics ,vol.22, no.5, pp.1928-1940, Sept.2007.

ISSN: 1832-5505
Vol-9 Issue-01 Jan 2021

2. A.Ketabi,S.S.Rajamandand M.Shahidehpour," Power sharing in parallelinverterswithdifferenttypes of loads," in IET Generation, Transmission &Distribution, vol.11, no.10, pp.24382447, 1372017.
3. W.Choi, W.LeeandB.Sarlioglu," Effect of grid inductance on grid current quality of parallel grid connected inverter system with output LCL filter and closed loop control," 2016 IEEE Applied Power Electronics Conference and Exposition(APEC) , LongBeach, CA,2016, pp.26792686.