

An Improved Active Power Filter Performance for Renewable Power Generation System

Prof. Pravinkumar Jangle, Prof. Shital yende

Electrical Engineering
Suryodaya College of Engineering & Technology, Nagpur

Abstract

This paper presents current control scheme base single phase inverter that improve power quality, the inverter improve power factor and reduce current harmonics. The compensation performance of the proposed active power filter and the associated control scheme under steady state and transient condition is demonstrated through simulations and experimental result. Unbalance current generated single phase non linear load.

Keyword- Micro-controller (PIC), solar power plate, active power filter.

1. Introduction

Energy is the primary requirement of human's capacity to do work. In the electric power industry, energy is more narrowly defined as electricity supplied overtime, expressed in KWH energy may be in the form of thermal, biomass, ocean, tidal, wave energy or electrical and mechanical energy is divided into two part. Nonrenewable energy source and renewable energy sources.

Nonrenewable energy source: Sources of energy which may exhaust in the near future are called as Non-renewable energy sources. Ex. Coal, oil, gas, fuel.

- It is limited source.
- Generate in long time.
- Easily available.

Renewable energy source: Renewable energy are found in the form of nature source. Ex. Solar, wind, biomass, thermal, tidal, wave energy. It is unlimited source of energy. It is easily available in the world.

A photovoltaic system converts sunlight into electrical energy. The basic device of a photovoltaic system is the PV cell. Panels can be grouped to form large photovoltaic array. Several cell connected in series and parallel or a grouped of panel. The PV not a good choice for grid connection system mode has been chosen for this work to operate inverter as a current source because this minimize the effect of voltage harmonics on the output current and improve the power factor quality. The the great number of domestic electronic base application has deteriorated. The quality of the power mains system. The non linear load generates current harmonics conventional solution like active filter for reducing the current harmonic. These strategies have been use mostly by considering fix harmonic compensation for balance or unbalance load. The proposed scheme are simplicity, modeling and implementation.

2. Literature Review

Mr. Pablo Acuna state that power generation distribution system with renewable power generation source consists of various type of the power generation unit and different types of load. Renewable source like solar energy issue to generate electricity for residential users and small industries. maximum energy possible from sun. Electrical energy consumption is random and unpredictable. Due to this it may be single. The voltage at which photovoltaic module can produces maximum power is called maximum

Power point. The efficiency photovoltaic cell is inverse by the mean of wiper to avoid dust & moisture stagnation over panel surface. It can be use in small industries and residential areas.

1. Flash program memory (32 Kbytes for PIC18F2520/4520 devices).
2. A/D channels (10 for 28-pin devices, 13 for 40/44-pin devices).
3. I/O ports (3 bidirectional ports on 28-pin devices, 5 bidirectional ports on 40/44-pin devices).

4. CCP and Enhanced CCP implementation (28-pin devices have 2 standard CCP modules, 40/44-pin devices have one standard CCP module and one ECCP module).
5. Parallel Slave Port (present only on 40/44-pin devices).

This scheme presents a fast and accurate signal tracking capability. This characteristics avoids voltage fluctuations performance.

Control of voltage within inverter using PWM technique:

One of the most promoting means of controlling the inverter output voltage is to incorporate time ration control within the inverter using a suitable scheme. This inverter is known as pulse with modulated invertors (PWM).

Advantages of PWM:

- It is possible to control the output voltage without significantly adding to the total number of power circuit component of the inverter .The output voltage can be changed by changing the with of the pulses.
- It is also possible to substantially reduce lower order harmonic frequencies.

3. Block Diagram of Proposed System:

The block diagram of this system represents the solar energy generation system for residential load.

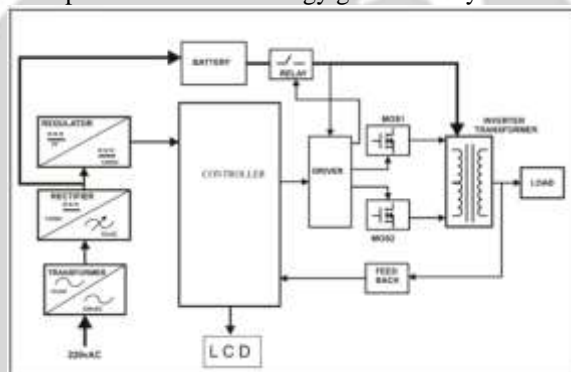
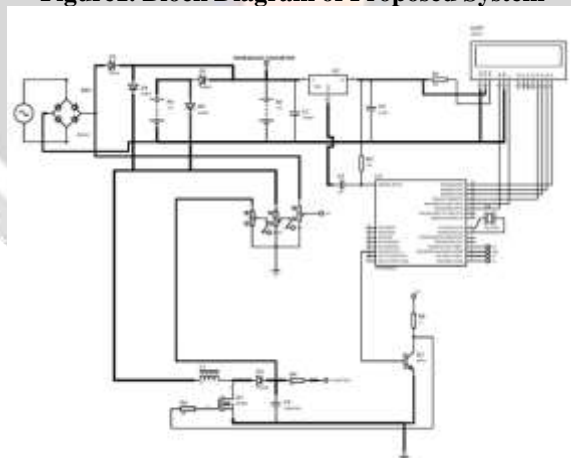


Figure1. Block Diagram of Proposed System



4. Circuit diagram of proposed system:

The renewable energy source like solar power plant give to variable DC supply converter gives variable DC output. Bridge diode is an electronic device. It an arrangement of four diode in a bridge circuit configuration that provide same polarity of output. When used in its most common application for conversion of an alternating current is an electric current which periodically reverse direction. When solar supply is high battery will be charge. If solar supply voltage low battery does not charge and direct goes to the buck boost converter. Two different topologies are called buck boost converter. Both of them can create a output voltage greater than the input voltage, down to almost

zero. Buck boost converter increase the voltage and direct battery charge through the micro-controller. The micro-controller requires constant 5VDC. Hence unregulated supply given to regulator IC 7805 which give constant 5VDC to micro-controller. If input voltage of IC is varied then output of IC 7805 is constant. This 5VDC is given to micro-controller, LCD, Opto-coupler, driver and zero crossing detectors.



Experimental kit

5. Conclusion:

This characteristic avoids harmonic fluctuation performance. This scheme are represent to it's simplicity, modeling and implementation, improving transient response .Improved dynamic current harmonics and reactive power compensation scheme for power distribution system with generation from renewable sources has been proposed to improve the current quality of the distribution system. Simulated and experimental results have proved that the proposed predictive control algorithm is good alternative to classical linear control methods.

6. References:

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