EEE DEPARTMENT, VELTECH MULTITECH, UG BEST PROJECTS

2013-2014

IMPLEMENTATION OF SINGLE PHASE NON-TRANSFORMER PHOTOVOLTAIC INVERTER FOR ACHIEVING OPTIMUM EFFICIENCY

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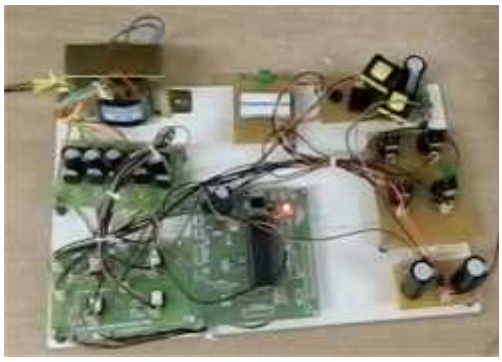
This project proposes a new transformer less, single-phase PV inverter with five switches and four diodes. The proposed topology generates no common-mode voltage, exhibits a high efficiency.

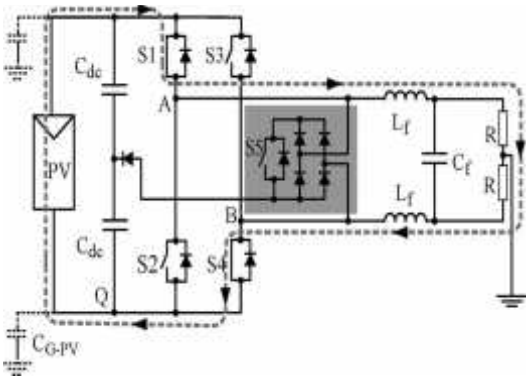
Grid-connected PV systems include a line transformer in the power-conversion stage, for galvanic isolation between the grid and the PV system, thus providing personal protection. Furthermore, it strongly reduces the leakage currents.

But the efficiency is largely decreased due to the power losses and the line transformer is large, heavy and expensive. This paper proposes a new topology that generates no varying common-mode voltage and smaller in size and weight compared to conventional PV systems with galvanic isolation.

Hardware Kit



Circuit diagram



The proposed topology generates no common-mode voltage, exhibits a high efficiency, and can operate with any power factor.

It is an alternative solution for the bidirectional switch, used to generate the zero-voltage state.

The constant common-mode voltage of the HB-ZVR topology and its high efficiency make it an attractive solution for transformer less Photovoltaic applications.

SWITCHED BOOST INVERTER FOR STANDALONE DC NANOGRID APPLICATIONS

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- Switched boost inverter (SBI) is a single-stage power converter derived from Inverse Watkins Johnson topology.
- Unlike the traditional buck-type voltage source inverter (VSI), the SBI can produce an ac output voltage that is either greater or less than the available dc input voltage.
- Another advantage of SBI is that it can supply both dc and ac loads simultaneously from a single dc input. These features make the SBI suitable for dc NANOGRID applications. In this the SBI is proposed as a power electronic interface in dc NANOGRID.
- This also presents a *dc* synchronous reference- frame-based controller for SBI, which regulates both dc and ac bus voltages of the NANOGRID to their respective reference values under steady state as well as under dynamic load variation in the NANOGRID. The hardware design is implemented by the PIC16F877A controller circuit.

Hardware Kit

HARDWARE REQUIREMENTS

- **Power MOSFET : IRF840**
- **Driver IC : IR2112**
- **Capacitor : 470uF (25V) ; 1000uF**
- **Controller : PIC16F877A**
- **Regulators : LM7805 ; LM7812**
- **Diodes : 1N4000 ; 1N5408**
- **Inductors : 100uH ; 200uH; 1mH**
- **PV Panel : 12V**

MICROCONTROLLER BASED AUTOMATIC FUSE CUTOFF AND FAULT IDENTIFICATION AND PROTECTION IN DISTRIBUTION SYSTEM

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The main aim of this project is to include automation in the distribution side of the power system.

In distribution system, whenever the fuse blown in the distribution transformer or the fault occurred in distribution line (L-G, L-L-G, L-L-L-G) due to unexpected event.

The local people have an attention to convey this information to local EB sub station and then they inform line man to clear the fault.

The proposed system is deals with the automatic identification of fuse cut off, fault and protecting the system from the development of fault

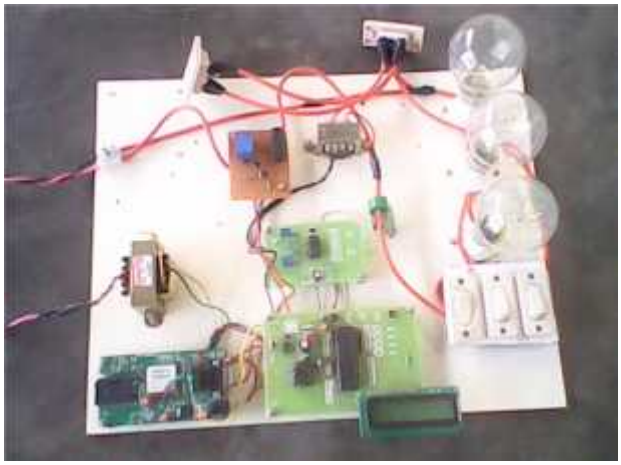
In the proposed system we include the indicative and protective automation system for the power distribution system.

Consider a single EB substation, the power distributed to local customers in many ways by number of distribution transformer.

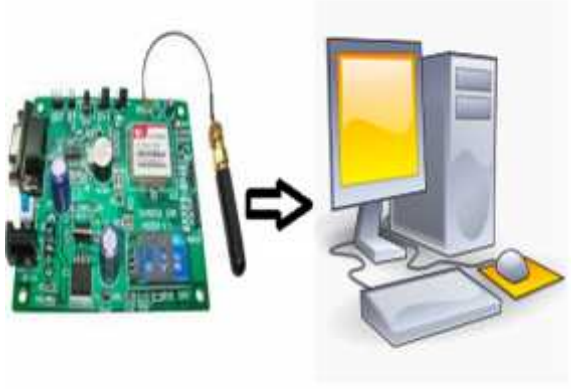
In the proposed model every distribution transformer is given with unique ID code.

Whenever the fuse blown or fault occurs, automatically information is send to local EB substation and line man mobile from the particular transformer ID.

HARDWARE KIT



LOCAL EB CONTROL SECTION



ENERGY MANAGEMENT IN SMART BUILDINGSUSING HYBRID SOURCES

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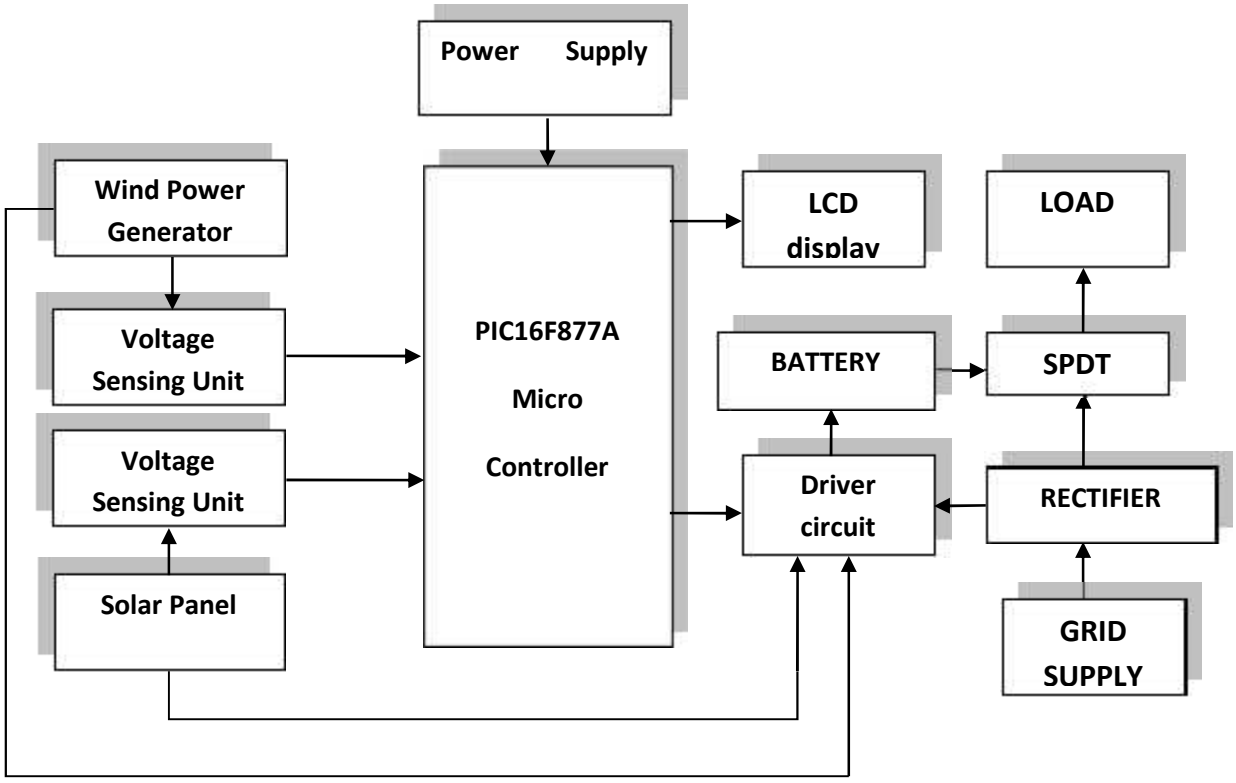
The project describes about the management of renewable energy in household buildings. Distributed energy generation is one of the methods that reduce energy transmission wastages and it also reduces the usage of grid supply.

Thereby, reducing the cost of energy usage. Distributed energy generation is implemented by using more than one energy source capable of supplying the load separately.

Distributed generation (DG) uses many small onsite energy harvesting deployments at individual buildings to generate electricity.

PROPOSED MODEL BLOCK DIAGRAM



HARDWARE REQUIREMENTS

- **Solar Panel** **Wind Power generator**
- **Battery** **LCD ,SPDT**
- **Driver Circuit** **PIC16F877a**
- **Rectifier** **DC motor**

IMPLEMENTATION OF TEMPERATURE COMPENSATION TECHNIQUE WITH ULTRASONIC RANGING FOR OBSTACLE IDENTIFICATION

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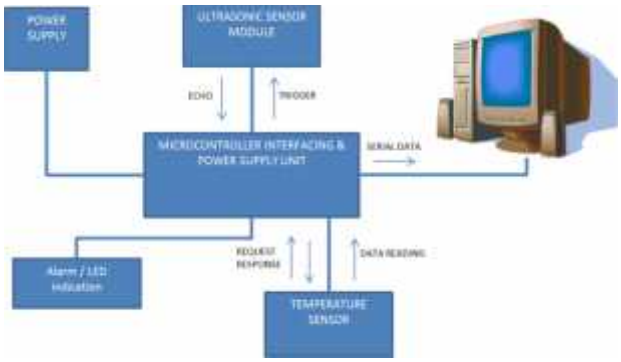
The main aim of the project is to reduce the error in the distance measured by ultrasonic sensor using temperature compensation.

With the help of this we are implementing a system to give alarm once an obstacle is identified within a specified distance.

PROPOSED SYSTEM



HARDWARE KIT

WORKING PROCEDURE

STEP 1: Distance is measured with the help of ultrasonic sensor.

STEP 2: Temperature sensor measures the environment temperature.

STEP 3: The microcontroller computes the distance with temperature Compensation.

STEP 4: The computer receives serial data (temperature and distance) from the controller with the help of ZigBee and MATLAB based compensation is done and displayed.

STEP 5: If the distance is below particular value (say 5 or 10 cm), buzzer Alarm is given to indicate the presence of an obstacle.