

## Study and Design of Solar Inverter System

**Authors :** Khaled A. Madi, Abdulhakim O. Naji, Hassouna A. Aalaoh, Elmahdi Eldeeb

**Abstract :** Solar energy is one of the cleanest energy sources with no environmental impact. Due to rapid increase in industrial as well as domestic needs, solar energy becomes a good candidate for safe and easy to handle energy source, especially after it becomes available due to reduction of manufacturing price. The main part of the solar inverter system is the inverter where the DC is inverted to AC, where we try to minimize the loss of power to the minimum possible level by the use of microcontroller. In this work, a deep investigation is made experimentally as well as theoretically for a microcontroller based variable frequency power inverter. The microcontroller will provide the variable frequency Pulse Width Modulation (PWM) signal that will control the switching of the gate of the Insulating Gate Bipolar Transistor (IGBT) with less harmonics at the output of power inverter which can be fed to the public grid at high quality. The proposed work for single phase as well as three phases is also simulated using Matlab/Simulink where we found a good agreement between the simulated and the practical results, even though the experimental work were done in the laboratory of the academy.

**Keywords :** solar, inverter, PV, solar inverter system

**Conference Title :** ICECECE 2014 : International Conference on Electrical, Computer, Electronics and Communication Engineering

**Conference Location :** Paris, France

**Conference Dates :** May 19-20, 2014