

USER DEFINED MULTI-APPLICATION INVERTER USING IGBTs.

*[Project sponsored by Karnataka State Council for Science and Technology, Bangalore
under 37th Student Project Programme]*

Project Report Submitted by

**Thanveer B
(4NM10EC113)**

**Swetha Clara Jose
(4NM10EC112)**

**Meera R
(4NM10EC049)**

**Alaka R Shenoy
(4NM11EC401)**

UNDER THE GUIDANCE OF

**Dr. M K Parasuram
Director, Dept. of ECE
NMAMIT, Nitte**

**Mr. Sudharshana
Asst. Professor, Dept. of ECE
NMAMIT, Nitte**

in partial fulfillment of the requirements for the award of the Degree of

***Bachelor of Engineering
in***

Electronics and Communication

from

Visvesvaraya Technological University, Belgaum



**DEPARTMENT OF
ELECTRONICS & COMMUNICATION ENGINEERING
N.M.A.M. INSTITUTE OF TECHNOLOGY**

**(An Autonomous Institution under VTU, Belgaum)
(AICTE approved, NBA Accredited, ISO 9001:2008 Certified)
NITTE -574 110, Udupi District, KARNATAKA**

April 2014

ABSTRACT

Inverters are required for DC to AC power conversion at desired voltage and frequency. Commercial inverters are single-purpose and are only available for general applications. This project aims at designing a multi-application, variable voltage and variable frequency Single-phase Inverter operating from DC supply with an output which has low capacity. The inverter is designed using Insulated Gate Bipolar Transistors (IGBTs) and Sinusoidal Pulse Width Modulation (SPWM) control.

The gain of the inverter is controlled using Sinusoidal PWM. SPWM is chosen as its distortion factor and lower order harmonics are significantly reduced. Microcontroller is used for generating the PWM signals. The output voltage needs to be varied as per the load requirement. Also the output voltage must remain constant when input DC varies and for changing load to compensate for voltage drop in switches (IGBTs). Hence the inverter design includes a feedback network. In case the inverter is used as induction motor drive, the ratio of voltage to frequency needs to be maintained constant. Hence Variable Voltage Variable Frequency (VVVF) or V/F, the most common speed control method, is utilized. The speed of the motor is varied by varying the supply frequency and maintaining V/F constant.

The inverter can be used in applications such as motor drives, lighting circuits, electric welding, induction and dielectric heating.