

**DESIGNING AND CONSTRUCTING FPGA BASED THREE PHASE INVERTER  
SYSTEM FOR VARIABLE SPEED CONTROL APPLICATION**

By

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### STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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Henry Erlande Lika

**ABSTRACT**

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APPLICATION**

By

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In recent years, Power Electronics experienced a rapid growth due to many factors. One of the factors is the applications of variable speed control. Switching mode from DC to AC inverter is used in AC motor drives and supplies in which the objective is to produce sinusoidal AC output where the magnitude and the frequency can be controlled. This thesis uses the PWM (Pulse Width Modulation) modulated three phase inverter system. In order to control the voltage output, by changing its amplitude and frequency modulation ratio. This thesis uses three phase inverter system of MOSFET (Metal Oxide Semiconductor Field Effect Transistor), driven by a driver in which the signal of PWM will be controlled by FPGA (Field Programmable Gate Array). The feedback to control the speed of the motor will be encoder and the voltage output. The experiment shows that the feedback can be detected and controlled by controller. The experiment also shows that the output can be varied successfully although there are still rooms to be improved for further development.

Keywords: FPGA, Three Phased Inverter, Variable Speed Control, PWM

## DEDICATION

I dedicate this thesis to my family, lectures and friends. Without their support the completion of this thesis may not be achieved.



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