

**DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG**

FINAL REPORT OF DIPLOMA PROJECT

AC TO AC CONVERTER

TRIAC LIGHT DIMMER

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**ZUHAILEY BIN MOHAMED MUSTAPA
2001360645**

**RAJA EDDY SHARUL EZWAN BIN RAJA MAHMOOD
2001127076**

SUPERVISOR:

ENCIK MOHAMAD ADHA BIN MOHAMAD IDIN

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ABSTRACT

The power electronics have proceeded quickly since 1960. Around 1960-1970 thyristors and triacs came to market. Using those components it was quite easy to make small and inexpensive light dimmers which have good efficiency. Electronics controlling also made possible to make them easily controllable from remote location. This type of electronic light dimmers became available after 1970. Nowaday it is used in very many locations like homes, restaurants, conference rooms and in stage lighting.

Solid-state light dimmers work by varying the "duty cycle" (on/off time) of the full AC voltage that is applied to the lights being controlled. For example, if the voltage is applied for only half of each AC cycle, the light bulb will appear to be much less bright than when it get the full AC voltage, because it get less power to heat the filament. Solid-state dimmers use the brightness knob setting to determine at what point in each voltage cycle to switch the light on and off.

Typical light dimmers are built using thyristors and the exact time when the thyristor is triggered relative to the zero crossings of the AC power is used to determine the power level. When the thyristor is triggered it keeps conducting until the current passing though it goes to zero (exactly at the next zero crossing if the load is purely resistive, like light bulb). By changing the phase at which you trigger the triac you change the duty cycle and therefore the brightness of the light.

That is roughly how light dimmer works and we will discuss more detail about the circuit operation in Chapter 2.

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CHAPTER 1

INTRODUCTION

1.1 Background

Our project paper is a basic on a house lighting system. It is important, therefore for the project to cover throughout the functional and preface of the light dimming system and the same time is to understand.

A Light Dimming System is actually circuit that some people use for saving power reason.

Normal light dimmers are designed to only dim non-inductive loads like light bulbs and electric heaters. Normal light dimmers are not suitable to dim inductive loads like transformers, fluorescent lamps, neon lamps, halogen lamps with transformers and electric motors. There are special dimmers available for those applications.

Light dimming is based on adjusting the voltage which gets to the lamp. Light dimming has been possible for many decades by using adjustable power resistors and adjustable transformers. Those methods have been used in movie theatres, stages and other public places. The problem of those light controlling methods have been that they are big, expensive, have poor efficiency and they are hard to control from remote location.

Our system is very flexible and can be installed in any situation. It very simple to construct and is quite economical too.