UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TIME DELAY SWITCH

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Power) with Honours.

by

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BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: TIME DELAY SWITCH

Sesi Pengajian: 2020

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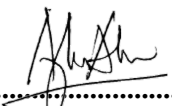

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I hereby, declared this report entitled **TIME DELAY SWITCH** is the results of my own research except as cited in references.

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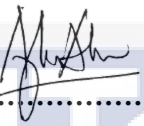
APPROVAL

This report is submitted to the Faculty of Electrical Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical and Electronic Engineering Technology (Industrial Power) with Honours. The member of the supervisory is as follow:

Signature:  .....

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ABSTRAK

Sekarang ini, ramai orang mengambil mudah tentang penjimatan elektrik di rumah kediaman mahupun di tempat-tempat awam. Dengan cara adanya ‘time delay switch’ ini, ia dapat menjimatkan penggunaan elektrik di rumah kediaman mahupun di tempat-tempat awam. Suis ini berfungsi sebagai pemati alatan elektrik seperti lampu dan kipas. Suis ini menggunakan cip ‘microcontroller’ kerana cip yang digunakan amatlah kecil dan boleh diguna pakai dimana-mana tempat yang bersesuaian. Suis ini mempunyai pilihan masa seperti 15 minit, 30 minit dan satu jam untuk suis ini bergungsi. Cip ‘microcontroller’ ini juga berfungsi sebagai otak kepada suis ini kerana tanpa cip ‘microcontroller’ ini, suis ini tidak akan berfungsi untuk mematikan alatan elektrik secara sendirinya.

ABSTRACT

Nowadays, lack of awareness on electricity savings for residential building and public area. With the time delay switch, its able to reduce electric usage for residential building and public area. This switch react as to off the appliances like lamp and fan. This switch is using microcontroller chip which it have a small size of chip and can be use in any suitable place. It also have adjustable timer to lock its usage time like 15 minutes, 30 minutes and 1 hour. Microcontroller chip is function as brain for switch because without it, the switch unable to function to stop the electrical appliance automatically.

DEDICATION

Thank you very much and have my gratitude to my beloved parents, supervisor, and all my friends that has helped and undoubtedly encouraged me to complete this final project successfully.

ACKNOWLEDGEMENTS

Alhamdulillah, praise and blessing of Allah Al-Mighty for his blessing upon us. It is with innermost sense who given me healthiness of physical and mental, strength, tolerance and capability to complete this final project. I would like to thanks to my one and only supervisor, Mr. Azhar Bin Ahmad because he always encourages and gives guidance in solving problems for this final project.

Besides that, I would like to thanks to my friends from BEEI class because they give me few idea to overcome certain problem that happen during progress for my final project.

My family was so helpful in giving me the moral support I needed when I was almost in despair in completing this project. Lastly, I would like to thank to everyone that assist me in any way possible in order to complete this project according to the timeline given.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

UTeM	**Universiti Teknikal Malaysia Melaka**
CO2	**Carbon dioxide**
kWh	**kilo Watt hours**
GWh	**Giga Watt hours**
CPU	**Central Processing Unit**
RAM	**Random Access Memory**
ROM	**Read Only Memory**
I/O	**Input and Output**
VLSI	**Very-Large Single Integration**
ALU	**Arithmatic and Logic Unit**
PC	**Program Counter**
EPROM	**Erasable Programmable Read Only Memory**
ACSII	**American Standard Code for Information Interchage**
IDE	**Integrated Development Environment**
AC	**Alternate Current**
DC	**Direct Current**
IC	**Integrated Circuit**
PIC	**Programmable Intelligent Computer**
LED	**Light Emitting Diode**

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduces a project that includes this project's background statement of problems, objective and scope of work.

1.2 Project Background

Time delay switch is built to easy the user that always forget to switch off the light or fan after they use and it can make their electricity bills increase in a month. This time delay switch can be install near to the switch of light or fan.

Inside the time delay switch, it have been install a microcontroller chip that react as time delay to switch off the light or fan. Microcontroller have a small size of chip that used as a system that have processor and memory can used in embedded system. This microcontroller also used in the machinery like car, smartphone, computer system and many electronics appliances.

Installing microcontroller into the time delay switch is a better idea compare installing big size chip like Arduino. This is due microcontroller characteristics that can be reusable, energy efficient and safe cost. When the size is smaller, it can be reduce the space that the equipment need and others component can shared the space.

1.3 Problem Statement

There have type of person that ignore about the electricity saving in their house because they can effort their electricity bills but now they have campaign about saving electricity and many company have involve to the campaign to saving electricity. Most of time, people forget that they have switch on the light and fan but not switch off until they notice by themselves.

1.4 Objectives of Research

The objectives of this project as follow:

1. To reduce usage of electricity.
2. To increase energy efficiency.
3. To cut off the power supply.

1.5 Work Scope of Project

The scopes of this project are follows:

1. The project use microcontroller to monitor the output timer

1.6 Report Outline

The structure and layout of the thesis are as follow:

Chapter 1 – Introduction: This chapter will concisely explain about the introduction for this project which include the problem statement, objectives and scopes of the project.

Chapter 2 – Literature Review: This chapter will discuss about what is energy efficiency, time delay and microcontroller,

Chapter 3 – Methodology: This chapter will describe about the methodology of this project, which will explain the details of each method used for developing this project and procedure taken to complete this project.

Chapter 4 – Result & Discussion: This chapter will justify about the result of the output data from the hardware.

Chapter 5 – Conclusion & Recommendation: This chapter will conclude about the whole project and recommend for future work.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

2.1.1 Energy efficiency

Energy efficiency is one of the essitial pillars at International level. Technical factors standardization can help to improve energy efficiency technologies, solution and ultimately achieving the objectives of improving energy efficiency and reduce CO2 emissions. Electricity has become a vital necessary in the modern world for everybody. Strengtening energy management measures importance given the increasing difficulty in accessing energy resources and global environmental issue particularly climate change.

Improving energy efficiency effort are importance view of the growing difficulty in accessing energy resources and global environmental issue expecially at the climate change. Utilization of energy resources is necessity for the survival and progress of human civilisation. After all inefficiency use of electricity energy leads significantly to global warming. More than 50% of domestic consumers in Malaysia use less that 200kWh of electric monthly. As more electrical and electronic products that number has been steadily descreasing.

Mass production has helped cut the price of electrical and electronic product. Growing energy usage just mean rising living costs and affection the ecosystem. Success in reducing green house gas emissions or energy consumption will depend solely on reducing the use of electricity wothout compromising consumer living.

Energy efficiency thats where people use less energy to do the same or more work without risking the comfort or actual desired output. For example, the product that labelled as 5-star energy efficiency is rated 25% more efficient in energy consumption compared to a non-energy efficient product. This means why an energy efficientcy product use 25% less than standadized respond and reduces the envirinmenta impact of 25% of carbons during its duration if usage.

Figure 2.1: 5-star sticker label at electrical appliances

1kWh of electricity can release almost 0.67kg of CO2 (carbon dioxide) average at 35% efficiency of electrical supply. A total 90838GWh of electricity has been sold in Malaysia based on the 2009 Energy Commision survey. The domestic sector makes up 20% of total consumption and emits Carbon footprints of 12.17 million tonnes. A 20% rise in energy efficiency in the domestic sector would be able to minimize more than 36.33 million tons of CO2 and can save RM42.06 Billion between 2025 to 2030 if non efficient goods are phased out from the Malaysian market fully by 2020.

Some rather savings do not include the prevailing savings from industrial sectors and commersial sectors that use other goods that are used in their operations by domestic consumers, namely multimedia devices, refrigerators, air conditioners, kettles and so on.

Figure 2.2: Example of building that implement energy efficiency

2.1.2 Time Delay

Relays guide the switching on electronic and electrical equipment and computer. People rely on relays to activate the host of machinery, appliances and equipment from motor to cell phones to boiler fans and trains.

Time delay have built-in function in any electrical and electronic equipment. Time delay can be triggered in different ways to minimize the amout of energy used to start the large manufacturing machinery or to turn on and off light or workstation at time intervals. People could used to be ensure that various components of the system operate at scheduled intervals separately, along with :

- Productions

Time delay can be used in a variety of ways to control the loads or manufacturer process. For example, a time delay will guarantee items move between one conveyor to another when needed to avoid items pilling up on top of each others on a conveyors.

- Safety

Example of safety requirement, boiler adn other steam turbines need ventilation to get rid of gases and prevent explosion possibilities. A time delay provide a scheduled the time frame to clear the chamber of noxious gases.

Figure 2.3: Steam turbine inside boiler

A time delay is usually activated either by controlling a connection or by transmitting an input current. Either with a dry contact remote controller such as a float switch, push button and limit switch that triggered the signal which can be designed as well as with voltage. That have many type of time delay which exist and their timing functions vary considerably.

Time delay have different functions. Different system setup using different type of time delay. The most comman time delay timers in use are on-delay and off-delay timers. Certain types include timers for the timebase on operation, the repeat cycle and the flasher.

I. On-delay timer

On-delay timer is at normally open condition and when the input voltage or power is applied, the output will energised and the time will delay for a while. To switch off the output or reset the time delay, the source need to be removed.

Often known as hold on operation timer, they are most often used for blower engines to hold the process for a given period of time after a electric, gas or oil heater has been started turning on. On delay timer are often used to schedule the start time for several motor or compressors that the key switch triggered. This helps minimize current of spike in the power line. Other device including thief and interference alarm systems, computing of power supply, control of the new motor in the oven and control of the fan.

Figure 2.4: On delay timer

II. Off-delay timer

Off- delay timer also referred to delay on release or delay to triggered timer because to accept the triggered when the input voltage is being applied. The output will energized by apply by

removed for starting the time delay. An production at the end of the time delay cycle is deenergized. If the triggered is active over the delay, it will reset the function.

In air conditioning system, off delay timer is used to hold th blower in operation for somthing like a given period of time just after thermostat ha turned off the cooling compressor. They could also be used for a specified time to control electrical components and motors such as battery operated dryer in industrial laundries.

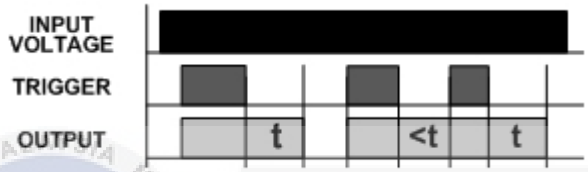

Figure 2.5: Off delay timer

III. Interval on operate

The output for interval on timers also called on shoot timers always energized and the delay time begin when the supply voltage is applied. Once the delay period is over the output has will deenergized. The supply voltage must be removed o allow to resetting the time delay.

Depending on the particulat model choosen, interval on time delay could be used for a range of various purposes and requesting commercial and industrial applications. Some security alarm systems are made up of interval timers. Others uses include synchronized phases for electric welding device, seat belt alerts for automotive seats, scanning equipment and pump station.

Figure 2.6: Interval on operate

IV. Flasher

Onve a flasher is connected to the output voltage, the connections energized and deenergized sequentially. On cycle and off cycle time are equivalent in duration. The timer is reset when the voltage is disconnected and then reactivated. Flasher timers are widely associated for security devices, signal lights and serial timers such as those used for lighting airport walkways.

Figure 2.7: Flasher

V. Repeat cycle

Repeat cycle timer have two functions so cycles can be controlled autonomously. These cycles may go on repeating as long as the voltage applied to the transmitter time delay. A few repeat cycle timers, the first start upoff timer while some started on timer. For illustration, they can be used to turn the lamps flash on and off in combination with each others.