



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**TO DEVELOP AUTOMATIC WIRE CUTTER**

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

by

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FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING

TECHNOLOGY

2019

**BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA**

Tajuk: to develop automatic wire cutter

Sesi Pengajian: 2019

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## DECLARATION

I hereby, declared this report entitled to develop automatic wire cutter 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 Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Mechanical Engineering Technology (Automotive) with Honours. The member of the supervisory is as follow:

Signature: .....

Supervisor : Mohd Yunos bin Ali

## ABSTRAK

Pemotong Wayar Automatik dengan Menggunakan Pengawal Mikro Arduino Uno (*Automatic Wire Cutter using Arduino uno Microcontroller*) dibina supaya wayar dapat diukur dan dipotong secara automatik mengikut kehendak dengan ukuran panjang yang tepat. Ianya akan dapat digunakan di kedai elektrik dan elektronik. Tenaga dan masa dapat dijitakan. Projek ini terbahagi kepada perisian dan perkakasan. Untuk perisian, bahasa pengaturcaraan arduino uno diguna untuk mengawal keseluruhan sistem seperti tombol tekan, paparan LCD dan motor. Secara umumnya, projek ini merangkumi bahagian mekanikal, elektronik, perisian dan pengawalan.

## **ABSTRACT**

Automatic Wire Cutter with Arduino Uno (Automatic Wire Cutter Micro Arduino Uno (Automatic Wire Cutter using Arduino uno Microcontroller) is built so that the wire can be measured and cut automatically according to the requirements of the exact length. It will be used in electrical and electronics stores. Energy and time can be saved. This project is divided into software and hardware. For software, arduino programming language is used to control the entire system such as numbered keypad, LCD display and motors. In general, this project covers the mechanical, electronic, software and controlling parts.

## **DEDICATION**

I am particularly dedicated to my beloved guardians and relatives, whose uplifting statements and conjointly for their unending affection, support and fortification all through the entire time of finishing my composed reports. To my kind and strong undertaking supervisor Mr. Mohd Yunos bin Ali who have interminably constantly upheld me and listens to my issues and who is his great cases have taught me to buckle down for the things that I seek to accomplish. I conjointly commit this work to all my kindred companions who have never-endingly given supportive gestures all through the postulation. I will have the capacity to ceaselessly value all they acknowledge oversaw. I confer this work and gave exceptional due to all the general population that have helped all through the complete four year college education venture at direct or in other way.



## ACKNOWLEDGEMENTS

‘In the name of God the merciful and the most generous’

I give thanks to God the great for giving the opportunity to complete this report safely and effectively and most profound appreciation for the help and bolster are extended to the following people who in one way or another have contributed in making this consider conceivable.

Moreover, to Mr. Mohd Yunos bin Ali my supervisor thank you for giving me the support, advices, guidance, valuable comments, suggestions and provisions that benefited his much in the completion and success of this task that had been given to me.

Lastly but not least, thanks to my family in supporting me in terms of financial and their unwavering encouragement to complete the task that had been given to me.

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>TABLE OF CONTENTS</b>	<b>x</b>
<b>LIST OF TABLES</b>	<b>xiv</b>
<b>LIST OF FIGURES</b>	<b>xv</b>
<b>LIST OF APPENDICES</b>	<b>xvii</b>
<b>LIST OF SYMBOLS</b>	<b>xviii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xix</b>
<b>LIST OF PUBLICATIONS</b>	Error! Bookmark not defined.
<b>CHAPTER 1      INTRODUCTION</b>	<b>1</b>
1.1    Introduction	1
1.2    Automatic Wire Cutter using Arduino Uno Microcontroller	1
1.3    PROJECT DESCRIPTION	2
1.4    Problem Statement	2
1.5    Objective	3
1.6    Project Scope	4
<b>CHAPTER 2      LITERATURE REVIEW</b>	<b>5</b>
2.1    Introduction	5
2.2    Project Concept	5

2.3	Microcontroller	6
2.3.1	Microcontroller Arduino Uno	7
2.3.2	Comparison between Arduino Board	8
2.4	Servo Motor	9
2.5	LCD	11
2.6	DC Motor	12
<b>2.6.1</b>	<b>Direct Current Motor Operation</b>	<b>13</b>
2.7	Stepper Motor	14
<b>2.7.1</b>	<b>How Stepper Motors Work</b>	<b>16</b>
2.8	REVOLUTION OF WIRE CUTTER	18
<b>2.8.1</b>	<b>History of Wire Cutter</b>	<b>18</b>
<b>CHAPTER 3</b>	<b>METHODOLOGY</b>	<b>21</b>
3.1	Introduction	21
3.2	Process Design	21
<b>3.2.1</b>	<b>Flow Chart</b>	<b>22</b>
<b>3.2.2</b>	<b>Project Planning</b>	<b>23</b>
<b>3.2.3</b>	<b>Program Development</b>	<b>25</b>
<b>3.2.4</b>	<b>Design Hardware</b>	<b>25</b>
<b>3.2.5</b>	<b>Stepper Motor Calculation</b>	<b>26</b>
<b>3.2.6</b>	<b>Pulley</b>	<b>27</b>

<b>3.2.7</b>	<b>Wire Holder Set</b>	<b>28</b>
<b>3.2.8</b>	<b>Cutting Points</b>	<b>29</b>
<b>3.2.9</b>	<b>Closing Design and Hardware Arrangement</b>	<b>30</b>
<b>CHAPTER 4</b>	<b>DECISION AND DATA ANALYSIS</b>	<b>32</b>
4.1	Introduction	32
4.2	Project Hardware Setup	33
<b>4.2.1</b>	<b>Project Operating</b>	<b>34</b>
4.3	Reference Angle Calculation	35
4.4	Analysis of the Project	36
4.5	LCD Test Display	39
4.6	Overall Testing	41
<b>CHAPTER 5</b>	<b>CONCLUSIONS AND DATA ANALYSIS</b>	<b>42</b>
5.1	Conclusion	42
5.2	Proposed Improvements in the Future	43
<b>5.2.1</b>	<b>Mechanism</b>	<b>43</b>
<b>5.2.2</b>	<b>System</b>	<b>43</b>
<b>5.2.3</b>	<b>Design Size</b>	<b>44</b>
<b>REFERENCES</b>	<b>45</b>	



## LIST OF TABLES

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
Table 3.1:	Motor Rotation Detail	26
Table 4.1:	Analysis of Calculation and the Real Output of the Project	36
Table 4.2:	Overall Testing	41

## LIST OF FIGURES

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 1.1:	System Architecture Diagram	2
Figure 2.1:	Basic System of Micro Controller	6
Figure 2.2:	Figure of Arduino Uno	7
Figure 2.3:	Servo motor	9
Figure 2.4:	Cristal Liquid Display (LCD)	11
Figure 2.5:	DC Motor	12
Figure 2.6:	DC Motor Operation	13
Figure 2.7:	Stepper Motor	15
Figure 2.8:	Rotational of Stepper Motor	16
Figure 2.9:	Automatic wire cutter using ARM 7	20
Figure 2.10:	Type of Cutter	20
Figure 3.1:	Methodology Phase	21
Figure 3.2:	Flow Chart of Overall Project	22
Figure 3.3:	The Project Block Diagram	23
Figure 3.4:	Size of The Pulley	27
Figure 3.5:	3D Drawing of Pulley	28

Figure 3.6: Positioning of the Wire Holder	28
Figure 3.7: 3D Image of a Wire Retaining Set	29
Figure 3.8: Dimension and Cutting Angle of Cutting Blade	29
Figure 3.9: 3D Drawing of Cutter Point	30
Figure 3.10: Overview of the Switch Panel, Push Button and LCD Display	31
Figure 3.11: Wire Input Space	31
Figure 3.12: Wire Release Space	31
Figure 4.1: Hardware Setup	33
Figure 4.2: Side View of the Hardware	34
Figure 4.3: Graph from Calculation Measurement	<b>Error! Bookmark not defined.</b>
Figure 4.4: Graph from output measurement	38
Figure 4.5: Display after system is ON	39
Figure 4.6: Display to insert length of wire	39
Figure 4.7: Display to insert the quantity	40
Figure 4.8: Display to confirmation of the length and quantity to cut	40
Figure 4.9: Push Button	40
Figure 0.1: Appendix Gant Chart	48



## LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix 1	Gant Chart	48

## LIST OF SYMBOLS

<b>D, d</b>	-	Diameter
<b>F</b>	-	Force
<b>g</b>	-	Gravity = 9.81 m/s
<b>I</b>	-	Moment of inertia
<b>l</b>	-	Length
<b>m</b>	-	Mass
<b>N</b>	-	Rotational velocity
<b>P</b>	-	Pressure
<b>Q</b>	-	Volumetric flow-rate
<b>r</b>	-	Radius
<b>T</b>	-	Torque
<b>Re</b>	-	Reynold number
<b>V</b>	-	Velocity
<b>w</b>	-	Angular velocity
<b>x</b>	-	Displacement
<b>z</b>	-	Height
<b>q</b>	-	Angle

## **LIST OF ABBREVIATIONS**

**PCA**      Principal Component Analysis

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

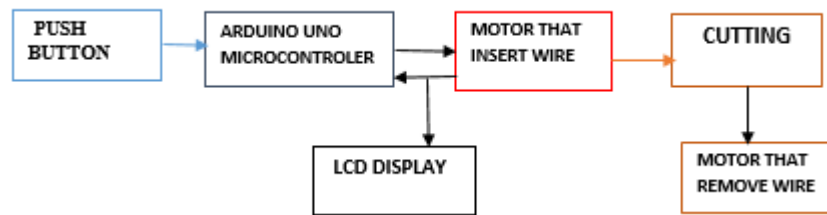
In the electronics sector, wires are widely used as component for an electrical connection for variety usage. Apart from this, despite from electrical appliances, it also commonly used in wiring. Wire cutters are commonly used to cut the length and size of the wire according to the desired requirements of the user. Wire cutter have a cutting point that act as indicator for a precision cutting towards the material. In this project, Automatic Wire Cutter with Arduino Uno Micro Controller is designed to save time and energy in wire cutting work and does not involve in any human behavior.

### 1.2 Automatic Wire Cutter using Arduino Uno Microcontroller

Automatic Wire Cutter using Arduino Uno is a project that designed to facilitate users in the process of wire cutting work. The Arduino Uno is used to control the entire element in this project such as motors and mowers.

### 1.3 PROJECT DESCRIPTION

The basic overview of this project is to cut the wire according to the user's requirement or to cut the wire according to the given size. By entering the desired wire size using a numbered keypad, the signal will be sent to the system. The system will control the motor and the cutter where the motor feeds in the wire to the cutter according to the desired size. At the same time, the LCD display will display the size of the wire. The cutters will cut off the wires and wires that have been cut out by themselves. The system block diagram is shown in Figure 1.1.



**Figure 1.1: System Architecture Diagram**

### 1.4 Problem Statement

Arduino microcontroller is now the most relevant escort system in the world. This is because almost all applications in the world today use Arduino micro-controllers whether the electronics sector or the medical sector. The use of this controller on Automatic wire cutter is because most existing wire cutters are less practical in terms of time and energy. Users can use existing wire cutters but are forced to manually measure and cut.

Therefore, Automatic Wire Cutter with Arduino Micro Controller is designed to facilitate wire cutting process. It can save users time and energy. The Arduino Microcontroller controls project elements such as motors and cutters. The motor is used

to feed the wire into the cutter and remove the cut wire, while the cutters are used to cut the wire.

### **1.5 Objective**

The main objective of producing Automatic Wire Cutter with Arduino Micro Controller is:

- I. Measure and cut wires automatically.
- II. Programing the Arduino Micro Controller as the ultimate controller of Automatic Wire Cutter.

## 1.6 Project Scope

This project use the Arduino Micro Controller to control the motor, the cutter , push button and LCD display. Two motor such as stepper motor and servo motor to be used in this project where the first one is stepper motor that used as a wire feeder, the stepper motor to move the cutter and cut the wire . Push button are used to insert the size of the wire into the system while the LCD display displays the size.

Additionally, this project is limited to the following:

1. Using Arduino Uno.
2. This project is a prototype system.
3. Suitable for various wires of size not exceeding 5 AWG.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

In producing a project on either a large scale project or a prototype-based project, the most important aspect is knowledge, research, and research on the project to be done. This chapter will explain the details of the selection of components to get the best results. The objective of this chapter is to define ideas as well as to understand the problem solving method in completing this project.

#### 2.2 Project Concept

This Automatic Wire Cutting Project works to automatically cut off the wires at the desired size of the user. In the context of measurement, users need to include the size of the wire they want to cut into the system using the push button . The wires will be fed into the gauge motor and at the same time it will begin to measure. After reaching the desired size, the motor will stop and the wire cutter driven by the stepper motor will cut the wire. The entire project system is fully controlled by the arduino uno micro controller.