

**FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
JOHOR**

**FINAL REPORT:
*ELECTRONIC SAFETY DRAWER***

MUHSIN BIN SALES

2012759007

MOHAMAD AFIZ BIN AMBOTUO

2012750465

MUHAMMAD HAFIZH BIN ABDUL RAHIM

2012948113

SUPERVISOR:

AMAR FAIZ BIN ZAINAL ABIDIN

ACKNOWLEDGEMENT

Thanks to Allah ﷻ for the blessing of letting us completing this project successfully and right on time. We are grateful to be given this opportunity to work as a team for this project. We would like to express our deepest appreciation to those who provided us the possibilities to complete this report.

A special gratitude to our final year project supervisor, Mr. Amar Faiz Bin Zainal Abidin, whose contribution in stimulating suggestions and encouragement, his helping hand to coordinate our project especially in writing this report and also in constructing the programming of our project. For all his undivided effort in making this project successful is appreciated and will not be forgotten by our group members.

Besides that, we would like to thank our family and friends for all the support throughout this project. First of all, we would like to thank our family for providing us with unconditional support of moral as well as financial wise. In addition, big thank you for all our badge-mates who have helped us in giving good advices and also interactive ideas for the development of this project.

Last but not least, with our sincere gratitude and appreciation, we want to thank those who are involved in making this project a big success. Without the help from all of you, we will not be able to complete this task as smooth as it has been.

ABSTRACT

The project that we have built was from a motivation to improvise the existing electronic safe box. Besides, the motivation to learn the coding and programming of the arduino to the servomotors, the numeric keypad, RGB LED and to the numeric keypad also boosted to design this project. In addition, to complete the diploma of electrical engineering also motivated us to pursue and finish the project.

The objective of this project is to improvise the old model safety box available in the market which is very low on security level because the normal safe box uses key and the chances to lost the key is high. So this will be a problem for the owner to make sure the key is kept at a safe place. So the use of safety drawer is becoming less popular. Moreover, there are many breaking safety drawer cases nowadays because the old model safety drawer is too easy to be break. So the main purpose of this project is to increase the security of the safety drawer by using a servo lock mechanism which is better than the old lock, also it is a keyless safety drawer and this safety drawer allow multiple users unlike the old safe box.

The method used in this project in electronically programmed by using the arduino as the brain of this project. It is connected to the servomotors, the numeric keypad, the RGB LED and the LCD display. The programming of the arduino and the servomotors is used to lock or unlock the drawers depending on the correct or incorrect password inserted. If the password is correct, the servomotors will rotate 90 degree and the drawer will be unlocked but if the wrong password is inserted, the servomotors will not rotate and the drawer is still lock. While the coding for the arduino and the numeric keypad is to charge the row and column of the keypad to insert the password. Furthermore, the programming connecting the arduino to the RGB LED was used to light up green (indicating the password is correct) or red (indicating the password is wrong). Besides, the programming for the arduino and the LCD is to display the desired output on the LCD. For instance, if the correct password is inserted, the LCD will display "ACCESS GRANTED" but if the incorrect password is inserted, the LCD will display "!ACCESS DENIED!".

After successfully built the electronic based safety drawer, it can be said that the objectives of this project has been achieved. This project was invented to overcome the issues faced by the normal safe box. Users just have to remember the passwords and not to worry about the lost of keys like the safe box. This project was designed by electronically programmed arduino that runs the program. By having this electronic safe drawer, users will feel safe and satisfied to keep their valuable possessions.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

ABSTRACT

LIST OF FIGURES.....	1
LIST OF TABLES.....	3
LIST OF ABBREVIATIONS.....	4
CHAPTER 1 INTRODUCTION.....	5
1.1 Background of Study.....	5
1.2 Problem Statement.....	6
1.3 Objectives of Research.....	7
1.4 Scope of Study.....	8
CHAPTER 2 MATERIALS ANDDD METHOD.....	9
2.1 Methodology.....	9
2.1.1 Design Flow Chart.....	10
2.2 Equipment and Component.....	12
CHAPTER 3 CIRCUIT DESIGN AND OPERATIONS.....	18
3.1 Schematic Diagram.....	18
3.2 Circuit Operations.....	19
CHAPTER 4 RESULT AND DISCUSSION.....	24
4.1 Software Simulation Result.....	24
4.2 Hardware Implementation Result.....	25
4.3 Circuit Testing and Troubleshooting.....	44
4.4 Discussion.....	45
CHAPTER 5 CONCLUSION AND RECOMMENDATION.....	46
5.1 Conclusion.....	47
5.2 Recommendation.....	48
REFERENCE.....	49
APPENDICES.....	50

CHAPTER 1

INTRODUCTION

1.1 Background Study

A safety drawer is a secured container usually used to keep valuables. Safety drawer can be used at all times without giving trouble for the users. It's up to the users how they are going to use the safety drawers. It can be used to keep valuable such as money, gold and jewellery or maybe some others use it to keep important or private documents from reach of other.

It is important to have our own personal safe drawer to prevent from our important stuff been stolen or reached by kids. Safety drawer can also be used in office department so that all staff have their own private compartment.

In this project we are going to build a safety drawer with some improvement. We are going to use arduino microcontroller to handle the programming. The main reason we are using arduino is to use a number pad as password rather than normal keys that are easily lost.