## AUTOMATED ELECTRICAL INSTALLATION SOFTWARE FOR TWO STOREYS BUILDING

This thesis presented in partial fulfillment for the award of the Bachelor in Electrical Engineering (Hons)

UNIVERSITI TEKNOLOGI MARA



ZAINUDDIN B AB RAHMAN
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR

**ACKNOWLEDGEMENT** 

In the name of Allah, the Most Beneficent and the Merciful. All praises being to Allah, lord of

the Universe, which also bless and regard to Nabi Muhammad S.A.W. His companion and the

people who follow His path.

I would like to express my thanks to Assoc. Prof. Dr. Noraliza Hamzah for her guidance and

support throughout the development of this project. I also would like to express my utmost

gratitude to all people especially En Rudzuan as JKR engineer and who have been involved

directly or indirectly in this project.

My deepest appreciations also to my beloved parents,

and my beloved family members for their moral and spiritual support.

Lastly, I would like to express a million thanks to my understanding friends because of co-

operation and discussion assisting with the idea in developing the project. I also would like to

wish a very thankful for those have been support and giving me encourage.

Thank you very much

Zainuddin B Ab Rahman

Faculty of Electrical Engineering

Universiti Teknologi MARA

40450 Shah Alam, Selangor.

**MAY 2009** 

iii

## **ABSTRACT**

This project presents automated electrical installation software designed for two storeys building. The project involved two storeys mosque. The mosque which is a ground floor and the first floor. The scope includes workspaces for ground floor and first floor. The design involved equipment design, size and type of cable and lastly protection design. The design of electrical design such lighting, socket outlet, cable sizing and telecommunication follow the rules and regulation. The primary concern when the designing electrical installation in how electrical distribution is design in a facility. This case study will involve MATLAB program using Graphical User Interfaces (GUI) by considering lighting, cable sizing and voltage drop.

Finally, the MSB was designed by using the data or demand from the load. After the result had been done, the MATLAB program was designing to find lighting design, cable sizing and voltage drop.

## TABLE OF CONTENTS

CON	PAGE		
Decl	iii		
Ackı	iv		
Abst	$\mathbf{v}$		
Tabl	le of Contents	vi	
List	of Figures	x	
List	xi		
Abb	previations	xii	
CHA	APTER 1		
INT	RODUCTION		
1.1	Introduction	1	
1.2	Objective of Study	2	
1.3	Scope of Work	3	
CHA	APTER 2		
INS	TALLATION CHARACTERISTICS		
2.1	Total Connected Load and Maximum Demand		
2.2	Diversity		
2.3	Calculation of Cable size	7	
	2.3.1 Ambient temperature correction factor	7	
	2.3.2 Grouping correction factor	8	
	2.3.3 Thermal insulation factor	9	
2.4	Voltage Drop Calculation	9	
	2.4.1 Voltage drop formula	10	
2.5	Protection Against Overload	10	
	2.5.1 Required condition for overload protection	11	
2.6	Protection against Short Circuit	12	
	2.6.1 Required conditions for short circuit protection	12	

2.7	Circuit Breaker		14
	2.7.1 M	finiature circuit breaker (MCB)	14
	2.7.2 M	foulded case circuit breaker (MCCB)	15
	2.7.3 R	esidual current operated circuit breaker (RCCB)	16
СНА	PTER 3		
EAR'	THING IN	ISTALLATION	
3.1	Method o	of System Earthing	18
3.2	Earthing in Low Voltage System		
	3.2.1 T	T System	20
	3.2.2 T	N-S System	20
	3.2.3 T	N-C-S System	21
	3.2.4 T	N-C and IT System	21
СНА	PTER 4		
MAT	LAB PRO	GRAMMING	
4.1	Overviev	v of Graphical User Interface (GUI) software	22
	4.1.1 G	raphical User Interface (GUI)	22
4.2	How Does a GUI Work?		23
4.3	Importing Data		
4.4	Programming the Push Buttons 2		
4.5	Running the GUI 26		

13

2.6.2 Adiabitic Equation