DESIGN A BATTERY CHARGER CONTROLLER FOR ELECTRIC VEHICLE (EV)

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DESIGN A BATTERY CHARGER CONTOLLER FOR ELECTRIC VEHICLE (MECHANICAL)

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A report submitted in fulfillment of the requirements
for the award of the Bachelor of
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"I hereby declare that I have read this project report and in my opinion this project report is sufficient terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering with Automotive Engineering."

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I Mohd Hafizi bin Shaarani declare that this report entitled " *Design a Battery Charger Controller (Mechanical)* " is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : ....
Name : Mohd Hafizi b. Shaarani
Date : ....

I dedicated this meaningful project to my beloved mom..

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ABSTRACT

This report is an outcome of the work I have carried out in doing and completing my final year project, Design a Battery Charger Controller for Electric Vehicle (Mechanical). The paper presents another design of battery charger controller that potentially can be apart of an EV system or somehow an explanation on the idea of basic battery charger controller in EV development process. It is an electronically project which required knowledge in electric and electronic field. The overall duty is to analyze the previous design of battery charger controller circuits and come out with a better design as suggestion of the battery charger controller which using microcontroller as the controller of the controller. The report starts with an introduction on EV, the advantages and disadvantages. Then a further introduction describe on the variety of battery type and their suitability to be used in the project. After gathering all the relevant information, the project undergoes design process. The knowledge gathered before is used to make a design which refers to problem statements that suitable for the project. There are comparisons and considerations are made in the designing stage based on self ability and condition. The project follows with writing the programming for the microcontroller using Visual Basic software in C language. The circuit then will be test as it will be the result for the ability of solving the problem statements of the project. At the end, when all the process mentioned above is done, the material for report writing is gathered. The report writing process will be guided by the University Malaysia Pahang final year report writing guide. This process also included the presentation slide making for the final presentation of the project. The project ended after the submission of the report and the presentation slide has been presented

.

ABSTRAK

Laporan ini adalah hasil dari kajian saya dalam menyiapkan Projek Sarjana Muda saya bertajuk Rekaan Pengawal Pengecas Bateri untuk Kereta Elektrik (Mekanikal). Laporan ini membentangkan sebuah lagi rekaan pengawal pengecas bateri yang berpotensi menjadi sebahagian daripada sistem kereta elektrik masa hadapan atau paling tidak menjadi rujukan tentang idea asas sebuah pengawal pengecas bateri dalam proses menghasilkan sebuah kereta elektrik. Ia adalah sebuah projek elektonik yang memerlukan pemahaman dalam bidang elektrik dan elektronik. Keseluruhan tugas adalah untuk manganalisis rekaan litar pengawal pengecas bateri yang dihasilkan terdahulu dan memberikan cadangan lebih baik dalam merekabentuk sebuah pengawal pengecas bateri iaitu menggunakan microcontroller yang bertindak sebagai pengawal. Laporan ini dimulakan dengan pengenalan kepada kereta elektrik; kelebihan dan kelemahannya. Lanjutan pengenalan menyentuh kepelbagaian bateri yang digunakan dan kesesuaiannya untuk digunakan dalam projek ini.tentang kepentingan kekunci kereta dan kepentingannya kepada keselamatan kereta. Apabila semua maklumat berkaitan selesai dikumpulkan,projek ini akan diteruskan dengan fasa rekabentuk. Maklumat dan pengetahuan yang dikumpulkan digunakan untuk mengeluarkan sebuah rekaan berdasarkan kenyataan masalah yang sesuai dengan projek ini. Perbandingan dan pertimbangan telah dibuat dalam peringkat ini berdasarkan kemampuan dan keadaan sekeliling. Projek diteruskan dengan menulis kod program untuk microcontroller yang digunakan dengan menggunakan software Visual Basic dalam bahasa C. Rekaan litar akan diuji sebagai kayu ukur tentang kebolehannya menyelesaikan kenyataan masalah projek ini. Akhir sekali,laporan lengkap akan dirangka dan ditulis mengikut garis panduan yang ditetapkan oleh Universiti Malaysia Pahang.Selain laporan lengkap, slaid pembentangan juga akan disiapkan pada fasa teakhir projek ini.Projek ini berakhir dengan rasminya apabila ia berjaya dibentangkan dan laporan akhir dihantar.

TABLE OF CONTENT

SUPERVISOR'S DECLARATION	**i**
STUDENTS'S DECLARATION	**ii**
DEDICATION	**iii**
ACKNOWLEDGEMENT	**iv**
ABSTRACT	**v**
ABSTRAK	**vi**
TABLE OF CONTENT	**vii**
LIST OF FIGURE	**x**
LIST OF SYMBOLS	**xii**
LIST OF ABBREVIATION	**xiii**

CHAPTER 1 INTRODUCTION

1.1 Introduction	**1**
1.2 Project Background	**3**
1.3 Objective	**4**
1.4 Problem Statements	**4**
1.5 Project Scope	**4**

CHAPTER 2 ELECTRIC VEHICLE OVERVIEW

2.1 Advantages of Electric Vehicle	**5**
2.2 Disadvantages of Electric Vehicle	**6**
2.3 Issues with batteries	**7**
2.3.1 Lead-acid	**8**
2.3.2 Nickel metal hydride	**9**
2.3.3 Zebra	**9**
2.3.4 Lithium Ion	**10**

2.4 Other issues 11

2.4.1 Charging stations and battery swapping 11

2.4.2 Other in-development technologies 12

2.4.3 Mechanically rechargeable batteries 12

2.4.3.1 Battery charger for vehicles 12

2.4.3.2 Electric vehicle's battery 13

2.5 Basic idea of battery charger controller 14

2.6 Battery charging 15

2.6.1 Lithium Ion charging mechanism 15

2.7 The battery charger controller circuit 18

2.7.1 Single cell 150mA charger 18

2.7.2 3 cell, 3A charger using the LP2952 19

2.7.2.1 improving the design 21

2.7.3 LM3420 battery charger controller 21

2.7.4 3 cell, 3A charger using the LM3420 22

CHAPTER 3 METHODOLOGY

3.1 Introduction 25

3.2 Project Flow Chart 26

3.3 Design method 28

3.3.2 Design circuit 28

3.3.3 Hardware analysis 28

3.3.3.1 PIC16F877A 29

3.3.3.2 Relay 30

3.4 Develop program code 31

3.5 Modification 32

3.6 Analysis 32

CHAPTER 4 RESULT AND DISCUSSIONS

4.1 Introduction 33
4.2 The battery charger controller schematic diagram 33
4.3 Modification 36
4.3.1 Voltage sensor 36
4.3.2 Battery test 37
4.3.3 Parameters consideration 37
4.4 The battery charger controller circuit 38
4.5 Writing the program code for PIC16F877A 39
4.6 The circuit testing 41

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction 44
5.2 Recommendation on Future Work 44
5.3 Conclusion 45

REFERENCES 47

APPENDICES

A The closer look of the circuit 51
B PIC16F877A Program code 53
C Project Gantt Chart 1 54
D Project Gantt Chart 1 55

LIST OF FIGURES

Figure No.	Title	Page
2.1	The invention of a charging station located at car park	14
2.2	A car park at the charging station and the charger start to operate	14
2.3	Typical charge profile for a Li-Ion cell using 1c voltage charging	16
2.4	Battery equivalent circuit	18
2.5	Single cell Li-Ion battery charger	19
2.6	3-cell, 3A charger using LP2952 regulator	20
2.7	Block diagram of LM3420	22
2.8	3-cell, 3A charger using LM3420 regulator	23
3.1	Project Flow Chart	26
3.2	PIC16F877A microcontroller	29
3.3	Basic idea of how a relay work	30
3.4	10 Amp Relay	31
4.1	12 V Lithium Ion Battery Charger Controller circuit using	34

	PIC16F877A and 2 units Relay	
4.2	Block diagram of the battery charger controller circuit	35
4.3	Potentiometer	37
4.4	The 12 V Lithium Ion battery charger controller using potentiometer	38
4.5	Program code setup for the battery charger controller	40
4.6	The circuit testing result	42

LIST OF SYMBOLS

η	energy conversion efficiency
P_e	electrical input power
P_m	mechanical output power
V	input voltage
I	input current
T	output torque
ω	output angular frequency
W	Watt
kW	kilowatt
h	hour
A/Am	Ampere
mA	miliAmpere
^oC	degree celcius
MHz	MegaHertz

LIST OF ABBREVIATIONS

AC	Alternative Current
DC	Direct Current
V	Volt/Voltage
EV	Electric Vehicle
ICE	Internal Combustion Engine
RESS	Rechargeable Electric Storage System
FEV	Full Electric Vehicle
RPM	Revolution Per Minutes
PFC	Power Factor Correction
ESR	Equivalent Series Resistance
LCD	Light Crystal Display
LED	Light Emission Display