

## **TABLE OF CONTENT**

APPROVAL SHEET CAPSTONE DESIGN FINAL PROJECT BOOK .....	i
STATEMENT OF ORIGINALITY .....	ii
TIMELINE REVISION DOCUMENT .....	iii
FOREWORD.....	iv
THANK YOU NOTE.....	v
TABLE OF CONTENT.....	vi
LIST OF IMAGES .....	ix
LIST OF TABLES.....	x
LIST OF ABBREVIATIONS.....	xi
ABSTRACT .....	xii
ABSTRACT .....	xiii
CHAPTER I NEEDS ANALYSIS .....	1
1.1 Background of the Problem .....	1
1.2 Supporting Information .....	2
1.3 Constraint.....	8
1.4 Requirements to Be Fulfilled.....	9
1.5 Purpose .....	9
CHAPTER II SPECIFICATION AND VERIFICATION .....	10
2.1 Product Specifications .....	10
2.1.1 The given PLC signals can be recognized with CAN Bus Protocol as an embodiment of the Electric Vehicle system. ....	10
2.1.2 The instrument is capable of transferring and receiving data for the EVCS and EVCAN Simulator.....	11
2.2 Verification .....	11
CHAPTER III SOLUTION DESIGN MODEL .....	13

3.1 Solution Concept .....	13
3.1.1 Function diagram .....	13
3.1.2 Solution Characteristics .....	14
3.2 Design Plan of System Solution Concept.....	15
3.2.1 Block Diagram Level 0.....	15
3.2.2 Block Diagram Level 1.....	16
3.2.3 Block Diagram Level 2.....	18
3.3 Component selection .....	20
3.3.1 Types of Case Material.....	20
3.3.2 Microcontroller .....	21
3.3.3 Power Line Communication Module.....	21
3.3.4 CAN Module .....	22
3.3.5 Voltage Sensor.....	23
3.3.6 Power Supply .....	24
3.3.7 HMI ( Human Machine Interface).....	25
3.3.8 Conclusion of Component Selection .....	25
3.4 Chosen System Design and User Manual.....	27
3.4.1 System Design .....	27
3.4.2 System's User Manual .....	28
3.5 Timeline .....	29
CHAPTER IV SOLUTION IMPLEMENTATIONS .....	32
4.1 System Implementation .....	32
4.1.1 Sub System Communication KQ330.....	32
4.1.2 Subsystem EVCAN Simulation.....	38
4.1.3 Subsystem EVCS Simulation .....	40
4.2 System Implementation Work Analysis .....	42
4.3 Final System Integration Results .....	45

CHAPTER V .....	49
5.1 System Testing.....	49
5.1.1 Specification 1 Testing .....	49
5.1.1.1 Testing Step .....	49
5.1.1.2 Testing Result .....	50
5.1.1.3 Analysis of Testing .....	50
5.1.2 Specification 2 Testing .....	51
5.1.2.1 Testing Step .....	51
5.1.2.2 Testing Result .....	52
5.1.2.3 Analysis of Testing .....	54
5.2 Summary and Suggestions.....	55
5.2.1 Summary.....	55
5.2.2 Suggestions.....	55
BIBLIOGRAPHY.....	57
ATTACHMENTS.....	59
ATTACHMENT CD-1 .....	68
CODING.....	70