

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ
وَرَسُولُهُ وَالْمُؤْمِنُونَ ^ص وَسَتُرَدُّونَ إِلَى
عَالِمِ الْغَيْبِ وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ
تَعْمَلُونَ)

[سورة التوبة: 105]

Dedication

This work is dedicated to our mothers, fathers and all our family members, who passed on a love of reading and respect for education.

**A mother's heart is the key
The key to success
A mother's heart is a ribbon
That ties your future together**

**A father's heart is a pencil
That write down plans
A father's heart is love
That fall in love with**

Acknowledgement

Foremost, we would like to express our sincere gratitude to our advisor Dr.Khalifa Altayb Khalifa for his guidance, instruction and support.

We would also like to show our gratitude to the all our teachers for sharing their pearls of wisdom with us during the course of this research We are also immensely grateful to for their comments on an earlier version of the manuscript, although any errors are our own and should not tarnish the reputations of these esteemed persons.

Abstract

The issue of security is very paramount in all life term, especially valuable items such as cars. Therefore there is need to develop a system to provide aid in the security of vehicles .The security system involves the user to enter a password in order to enable or disable the system as well as starting the car engine remotely, by using GSM technology the user can simply send an SMS to perform any of the pervious actions, this technology allows the user to use the system from anywhere. The system will only response to messages from owner's phone number but in some special cases it can be used from another number.

المستخلص

مسألة الأمن تعتبر من المسائل المهمة للغاية في جميع جوانب الحياة، وخاصة الأشياء الثمينة . تعتبر السيارات من الممتلكات التي تستحق الحماية و تأمينها من السرقة ومن هنا وجدت الحاجة لتطوير نظام الحماية الداخلي لها. عليه تم عمل نظام أمني ذو مستوى عالي يتوجب فيه على المستخدم إدخال كلمة السر من أجل تشغيل أو إيقاف نظام التأمين أو بدء تشغيل محرك السيارة عن بعد، هذا النظام يعتمد على النظام العالمي للاتصالات التي تمكن المستخدم ببساطة من إرسال الرسائل القصيرة من أي مكان لتنفيذ الأوامر ، وعملية الإستجابة لهذه الأوامر تكون فقط في حال مطابقة رقم هاتف المالك للرقم الذي تم حفظه مسبقا في نظام الحماية المدمج. هنالك بعض الحالات الخاصة التي يتيح فيها النظام للمستخدم إستخدام رقم هاتف آخر لتنفيذ الإيقاف أو التفعيل لأمر الحماية أو أمر التشغيل للماكينة .

Table of Contents

Chapter One Introduction	1
1.1 Preface	2
1.2 Problem Statement.....	3
1.3 Proposed solution	3
1.4 Objectives	4
1.5 Methodology.....	4
Chapter Two:Literature Review	7
2.1 Technical background:	7
2.1.1 Basic components of ignition system:	7
2.1.1.1 Battery:.....	7
2.1.1.2 Ignition switch:	7
2.1.1.3 Ballast resistor:.....	8
2.1.1.4 Ignition coil:	8
2.1.1.5 Contact breaker:	8
2.1.1.6 Distributor:	8
2.1.1.7 Spark plugs:.....	9
2.1.2 Operation of ignition system.....	9
2.1.3 Motors:	11
2.1.3.1 Dc motor:	11
2.1.3.2 Stepper motor:.....	12
2.1.3.3 Servomotor:.....	14

2.1.4 Relay switching circuit	16
2.1.5 AT commands:	17
2.1.5.1 Types of Commands:	18
2.1.6 SMS Packet Format	19
2.2 Literature Review	21
Chapter three: Anti-theft System Design	26
3.1 Block diagram:	26
3.1.1 DC Relay	26
3.1.2 GSM module	26
3.1.3 Car engine	27
3.1.4 Microcontroller	27
3.1.5 Battery	27
3.2 Basic system operation	27
3.3 Scenarios:.....	31
3.3.1 Scenario-1 (main scenario)	31
3.3.2 Scenario-2 (network failure)	32
3.3.3 Scenario-3 (wrong password)	32
3.3.4 Scenario-4 (passwordchange)	32
Chapter Four: Software Simulation and Hardware	34
4.1 Simulation.....	34
4.1.1 Software flowchart.....	35
4.1.2 Simulation results	37

4.2 System Circuit	41
4.2.1 System circuit results.....	42
Chapter Five: Conclusion and Recommendations	48
5.1 Conclusion.....	48
5.2 Recommendations.....	48
References	49
Appendix A	50-53
Appendix B	54-63

LIST OF TABLES

TABLE NO.	TITLE	PAGE
2.1	Advantages, Disadvantages and Applications of DC motors	13
2.2	Advantages, Disadvantages and Applications of Stepper motor	14
2.3	Advantages, Disadvantages and Applications of Servomotors	15
2.4	Relay merits and demerits	16
3.1	Relay1 and Relay2 Status	29
3.2	Control Messages and System Response	31
4.1	Arduino pins connections	35

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
2.1	The Ignition System	7
2.2	DC motor operation	12
2.3	Relay switch circuit	16
2.4	SMS packet mobile terminated	19
2.5	SMS packet mobile originated	20
3.1	Block diagram	26
3.2	position of the control system at car ignition system	28
3.3	Relay1 position	28
3.4	Relay2 position	28
3.5	The control message	30
4.1	Simulation of Engine Lock and Control System	34
4.2	Software flowchart	36
4.3	Enable Ignition System	37
4.4	Starting Ignition	38
4.5	Disabling System	39
4.6	Wrong Message	40
4.7	system circuit	41
4.8	System response and feedback for enabling message	42
4.9	System response and feedback for disabling message	43
4.10	System response and feedback for starting message	44
4.11	System response and feedback for wrong message	45
4.12	System response for unknown number	46