الآيـة

قال الله تعالى {لاَ يُكَلِّفُ اللّهُ نَفْسًا إِلاَّ وُسْعَهَا لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا اكْتَسَبَتْ رَبَّنَا لاَ تُؤَاخِذْنَا إِن نَّسِينَا أَوْ
أَخْطَأْنَا رَبَّنَا وَلاَ تَحْمِلْ عَلَيْنَا إِصْرًا كَمَا حَمَلْتَهُ عَلَى الَّذِينَ مِن قَبْلِنَا رَبَّنَا وَلاَ تُحَمِّلْنَا مَا لاَ طَاقَةَ لَنَا بِهِ وَاعْفُ عَنَّا
وَاغْفِرْ لَنَا وَارْحَمْنَآ أَنتَ مَوْلاَنَا فَانصُرْنَا عَلَى الْقَوْمِ الْكَافِرِينَ}

صدق الله العظيم

سورة البقرة الآية (286)

DEDICATION

I would like to dedicate this work to my mother, father, husband and my family. Also to all who helped me.

ACKNOWLEDGMENT

I grateful to Almighty ALLAH for directing me on the right path in pursuing the requirement of the full thesis work. There are many people I would like to thank who have helped me in completing my research. I truly indebted and wish to express my gratitude to my supervisor **Dr. Awadalla Taifour Ali** for his excellent supervision and support during every stage of this study work, without which, it would not have been possible for me to complete this study successfully. I would like to thank Sudan University of Science and Technology and respectful staff, without whom I couldn't reach to my goal.

ABSTRACT

known that any electrical appliance is controlled manually by a switch that controlling the on/off of electrical device. The aim of this thesis is to design and implementation of a system that control the electrical appliances via mobile phone. System contains two parts, remote controller (mobile phone) and control circuit containing microcontroller (Atmega16), Dual Tone Multi Frequency (DTMF) decoder, ULN2803 darlington driver, relays, mobile phone as well as for devices to be controlled. The system has a mobile phone installed in control circuit, when a user dials the number of the phone, the system automatically answers the call then waits for the user to press the command button. The receiver phone receives the DTMF signal and sends it to the microcontroller after processing with DTMF decoder. Then the microcontroller, based on the received signal, controls the different relays connected through ULN2803 (Darlington transistor) and triggers the required appliance. The mobile phone will operate outdoors a whereas the control unit will operate indoors. Also Proteus software is used for system simulation. The remote unit (mobile) remotely controlled (turned off /on) the electrical device successfully.

مستخلص

معلوم أن أي جهاز كهربائي يتم التحكم فيه يدوياً بواسطة مفتاح لتشغيله أو إيقافه. الهدف من هذا البحث تصميم وتنفيذ نظام يقوم بالتحكم في الأجهزة الكهربائية بواسطة الهاتف المحمول . يتكون النظام من جزئيين وحدة تحكم عن بعد (هاتف محمول) ودائرة تحكم تحتوي متحكم دقيق (Atmega16)
بالإضافة للأجهزة المراد DTMF decoder, ULN2803 Darlington driver, relays, telephone التحكم بها. في البداية يتم الاتصال من الهاتف المحمول للمستخدم عبر النظام العالمي لشبكة الاتصالات المتنقلة (جي اس ام) إلي الهاتف المثبت مع دائرة التحكم. الهاتف يستقبل إشارة النغمة الثنائية متعددة الترددات ويرسلها الي المتحكم الدقيق بعد معالجتها بكاشف النغمة الثنائية متعددة الترددات. الإشارة تكبر ثم ترسل إلي المرحلات التي توصل مع الأجهزة المراد التحكم بها. الهاتف المحمول سوف يعمل في الخارج في حين أن وحدة التحكم تعمل في الداخل . أيضا تم استخدام برنامج المحاكاة Proteus من أجل محاكاة النظام. تم التحكم في الأجهزة الكهربائية بنجاح وذلك بتشغيلها وإيقافها بواسطة الهاتف المحمول.

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LIST OF ABBREVIATIONS

A/D	Analogue to Digital
ALU	Arithmetic Logic Unit
Bps	Bit per second
BSC	Base Station Controller
BSS	Base Station Subsystem
BTS	Base Transceiver Station
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
DTMF	Dual-Tone Multi-Frequency
EEPROM	Electrically Erasable Programmable Read-Only Memory
ETSI	European Telecommunications Standards Institute
GMSC	Gateway Mobile Services Switching Center
GSM	Global System for Mobile communication
IC	Integrated Circuit
IMSI	International Mobile Subscriber Identity
I/O	Input /Output
MS	Mobile Station
MSC	Mobile services Switching Center
NSS	Network and Switching Subsystem
OMC	Operation and Maintenance Center
OSS	Operation and Support Subsystem
PC	Program Counter
PIN	Personal Identification Number
PSTN	Public Switched Telephone Network
PWM	Pulse Width Modulation
RAM	Random Access Memory
RF	Radio Frequency
RISC	Reduced Instruction Set Computer
ROM	Read Only Memory
SIM	Subscriber Identity Module
SP	Stack Pointer
SPM	Store Program Memory
SRAM	Static RAM
TRS	Trip Ring Sleeve
TTL	Transistor Transistor Logic
VLR	Visitor Location Register