

قال تعالى:

"فَمَنْ يُرِدُ اللَّهُ أَنْ يَهْدِيَ يَشْرَحْ صَدْرَهُ لِإِسْلَامٍ وَمَنْ يُرِدُ أَنْ يُضْلِلَ يَجْعَلْ صَدْرَهُ ضِيقًا حَرَجًا
كَأَنَّمَا يَصْعَدُ فِي السَّمَاوَاتِ كَذَلِكَ يَجْعَلُ اللَّهُ الرَّجُسُ عَلَى الدِّينِ لَا يُؤْمِنُونَ"

صدق الله العظيم

الأنعام الآية 125

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All praise and thanks is due to Almighty ***ALLAH***, the creator and sustainer of the worlds. I wish to thank Him for all that He has gifted us with, although, He can never be praised or thanked enough.

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Single out for thanks my parents, my family and friends. I also thank all those who have provided me assistance and guidance.

DEDICATION

I dedicate this effort

TO

My beloved mother

My great father

A gift to my brothers and sisters

To all people who helped me in this study.

ABSTRACT

Building automation is now very widespread in all the developed countries to ease the management of buildings like schools, hospitals, public edifices, private houses and so on.

In this project, a feasible Building Automation System based on very cheap distributed microcontroller architecture is designed. A power line communication network is established to link those microcontrollers; so there is no need to install proprietary cables or a wireless network.

The Power Line Communication (PLC) technology utilizes the power cables as a communication channel. A radio frequency signal of a few hundreds of Hz up to a few tens of MHz is transmitted through the power lines. The power line communication has distance and frequency limitations which depend on the type of power line used. The device performs the operation of data transfer through the power line and connects controllers to the power lines; is called the Power Line Modem (PLM).

This report presents the design and implementation of Building Automation over Power Line, this model contains a user interface, irrigation system and lighting system; those systems are connected through the power line network.

التجريـد

عملية أتمـة المـبـانـي واسـعـة الـانتـشـار في كـثـيرـ من الـبـلـدـانـ المـتـطـورـة بـغـرـضـ تـبـيـسـيرـ اـدـارـةـ المـبـانـيـ مثلـ: المـدارـسـ، المـسـتـشـفـاتـ، المـرـاـفـقـ الـعـامـةـ وـالـمـنـازـلـ. فيـ هـذـاـ المـشـرـوـعـ تمـ تـصـمـيمـ نـظـامـ تـحـكـمـ فيـ المـبـانـيـ مـسـتـنـدـاـ الـمـتـحـكـمـاتـ الـدـقـيقـةـ الـمـوزـعـةـ ذاتـ الـأـسـعـارـ الـزـهـيدـةـ، كـمـاـ تـمـ تـأـسـيـسـ شـبـكـةـ تـحـكـمـ عـبـرـ خـطـوـطـ الـكـهـرـبـاءـ لـرـبـطـ تـلـكـ الـمـتـحـكـمـاتـ الشـيـءـ الـذـيـ يـغـنـيـنـاـ عـنـ تـشـيـتـ كـوـاـبـلـ خـاصـةـ أوـ شـبـكـةـ تـحـكـمـ لـاسـلـكـيـةـ.

إنـ تـكـنـلـوـجـيـاـ الـاتـصـالـ عـبـرـ خـطـوـطـ الـكـهـرـبـاءـ تـسـخـدـ كـوـاـبـلـ الـكـهـرـبـاءـ كـفـنـةـ اـتـصـالـ؛ـ فـاـشـارـةـ رـادـيوـ بـتـرـدـ يـسـاـوـيـ مـئـاتـ الـهـيـرـتـزـاتـ حـتـىـ عـشـرـاتـ الـمـيـقـاهـيرـتـزـاتـ يـتـمـ نـقـلـهـاـ مـنـ خـلـالـ خـطـ الـكـهـرـبـاءـ. إنـ تـقـنـيـةـ الـاتـصـالـ عـبـرـ خـطـوـطـ الـكـهـرـبـاءـ لـهـاـ تـقـيـيـدـاتـ لـلـمـسـافـةـ وـالـتـرـدـدـ وـالـتـيـ تـعـتـمـدـ عـلـىـ نـوـعـ خـطـ الـكـهـرـبـاءـ الـمـسـتـخـدـمـ. فـالـجـهاـزـ الـذـيـ يـقـومـ بـعـمـلـيـةـ نـقـلـ الـبـيـانـاتـ عـبـرـ خـطـوـطـ الـكـهـرـبـاءـ وـيـرـبـطـ الـمـتـحـكـمـاتـ بـخـطـ الـكـهـرـبـاءـ يـسـمـىـ بـمـوـدـمـ الـاتـصـالـ عـبـرـ خـطـوـطـ الـكـهـرـبـاءـ.

ويـعـرـضـ هـذـاـ تـقـرـيرـ تـصـمـيمـ وـتـنـفـيـذـ نـمـوذـجـ مـبـسـطـ لـتـوـضـيـحـ فـكـرـةـ التـحـكـمـ فيـ المـبـانـيـ منـ خـلـالـ خـطـوـطـ الـكـهـرـبـاءـ، هـذـاـ النـمـوـجـ يـحـتـويـ عـلـىـ:ـ وـاجـهـةـ الـمـسـتـخـدـمـ،ـ نـظـامـ رـيـ وـنـظـامـ الـاضـاءـةـ،ـ كـلـ هـذـهـ الـأـنـظـمـةـ مـوـصـلـةـ عـبـرـ خـطـ الـكـهـرـبـاءـ.

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List of abbreviations and Symbols

BAPOL	Beauty Art Products on Line
BAS	Building Automation System
HMI	Human Machine Interface
IDE	Integrated Development Environment
IP	Internet Protocol
LDE	Light Diode
MCU	Microcontroller Unit
OLE	Object Linking and Embedding
PIR	performance Infrared Radial Sensor
PLC	Power Line Communication
PLM	Power Line Modem
TCP	Transmission Control Protocol
SQL	Structured Query Language
VB	Visual Basic