HOME AUTOMATION SYSTEM USING X-10 MODULES FOR 240v MAINS POWER COMMUNICATIONS.

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ABSTRACT

This thesis describes the design and development of an intelligent home system using X-10 modules for 240V mains power communications. This system replaces "dumb" electrical outlet and switches found throughout the home with "intelligent" modules controlled by a central computer or central controller.

The prototype system consists of a central controller as a transmitter, power line interface (PLI) circuit and a lamp module and appliance module as a receiver. A networking of existing power lines connects these modules and they are assigned with house code and unit code. The controller to identify the modules and to send commands to perform multiple actions by the modules uses these codes. The PLI is used as cost effective ways of coupling X-10 signals/codes onto the AC power line.

The specifications and criteria of the system are developed against the available product that is realized in 110V. The system has been tested individually to check its functionality. Only transmitter and receiver gave reliable results while PLI gave erroneous results. Possible causes for the errors are discussed and a study about the power quality in Malaysia need to be done before implementing this system.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Home automation is predicted to become a boom industry today. It may have different meanings to people. One group may think of switching on and off lights by timers. Others may imagine an environment, in which all system of the home, that offer comfort, security, entertainment and communication to the residents, are well developed and thus can learn from the change of the living situation and can react to them.

The home automation systems offer more comfort to the household. Moreover, they may even help to save money, because these systems switch off lamps, devices, the heating, the air condition and the irrigation plant for the lawn, if they are not used. In this case the system can be adapted to the residents' live style individually. Thereby the programming of the smart home is very flexible.

Home automation systems mainly act in the background. The systems shall process the daily repeating routines, without bothering the residents with it. Nevertheless, they must allow the residents to interfere and to switch off the automation at any time.

Nearly every modern home already has a number of automated devices. These can include:

- Simple (or programmable) thermostats.
- Motion sensors to control lighting, etc.
- Intercom systems.
- Telephone caller ID boxes.
- Automatic garage door openers.
- Electronic door locks.
- Security systems of varying complexity.
- Messaging systems.
- Automatic sprinkler systems.