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Smart Home Using Z Wave Wireless Communication

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ABSTRACT: Home Automation Company is rapidly growing for house hold people. Because it is providing support systems for the house hold people, disabled people, elder people and especially those who are live alone. This paper details the overall design of a Z wave wireless communication between home appliances by using Internet of Things (IoT). In this paper we allowing the Z wave wireless protocol control to residential appliances by using mobile application. This Z wave wireless protocol which are relatively cheap when compare to other protocol. Using internet we communicate with both Z wave wireless module and residential appliances.

KEYWORDS: Home automation, Z wave wireless protocol, Internet of Things (IoT), Smart phone.

I. INTRODUCTION

Such as lighting control, fan control, television control, air conditioner control, water heater control, security systems, automatic gate control, valve control, audio system control, smoke detection and motion capture. These appliances easily access in anywhere in the world using smart phone. The system should be very easy to configure, and also reasonably cheap. C.Nagarajan *et al.*[4,8,11] has proposed the smart home using Z wave wireless communication. Z wave is a wireless communication protocol used primarily for smart homes appliances.

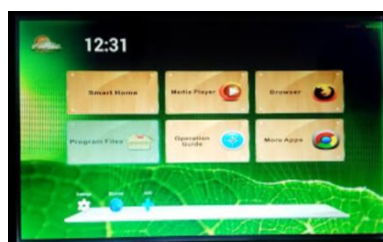


Figure 1: Smart Home System

II. INTERNET OF THINGS

The IoT is a giant network. The internet of things is the concept of connecting any device to the internet and to other connected devices. The devices and objects with built in sensors are connected to an Internet of Things platform. These powerful IoT platforms can pinpoint exactly what information is useful and what can safely be ignored.

IoT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security systems. Long-term benefits could include energy savings by automatically ensuring lights and electronics are turned off.

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Figure 2:IoT Based Smart Home System

III. Z WAVE WIRELESS PROTOCOL

Z wave is a wireless protocol. It is a low power consumption and low cost wireless standard. The standard frequency range of Z wave is 865.2Mhz. It is a mesh network using low-energy radio waves to communicate from appliance to appliance. Z wave is limited to 232 total devices.

A Z wave system can be controlled via the Internet from a smart phone, tablet or computer, and locally through a smart speaker. We are using the android mobile to control whole home appliances.



Figure3:Z wave wireless communication

IV.BLOCK DIAGRAM

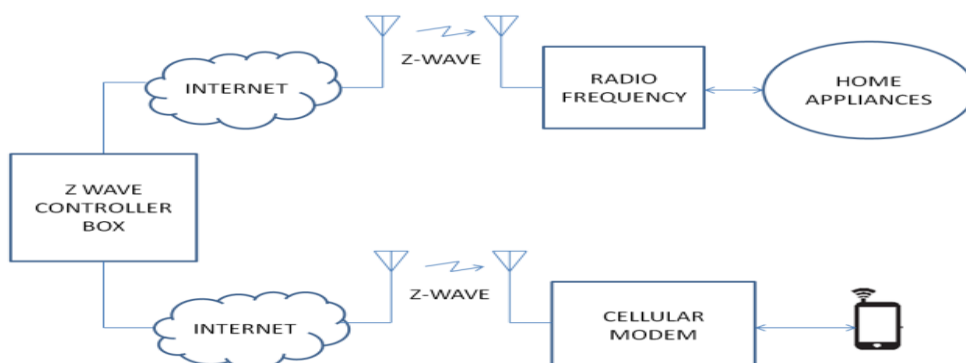


Figure 4: Block Diagram of Smart Home Using Z wave Wireless Communication.

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V. HARDWARE DESIGN

In this project we present the hardware of Z wave controller box. This is a main hardware using in this project.

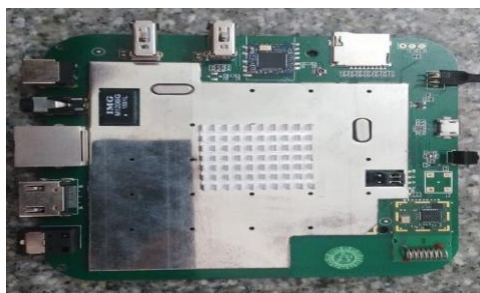


Figure 5:Z wave Controller Box

Z wave is allowing smart devices to connect and exchange control commands and data with each other. With two-way communication through mesh networking and message acknowledgment, the Z wave protocol helps alleviate power issues and brings low-cost wireless connectivity to home automation, offering a longer-range alternative to Bluetooth and a lower-power alternative to Wi-Fi .

FEATURES

- Two way communications
- Mesh networking
- Large number of devices on a network
- Damaged elements are easily removed and easily fixed
- Immediate status updates

VI.SOFTWARE DESIGN

Using android operating system the Z wave wireless protocol is paired with the Smartphone. And also the home appliances easily paired with Z wave controller box by using the operating frequency of home appliances.



Figure 6: Mobile Application

VII. HOME APPLIANCES SYSTEM

In this system mainly consist of Z wave wireless controller box which is working with standard frequency. Using this standard frequency each and every residential appliances paring with the Z wave wireless controller box .also the smart phone paired with Z wave wireless controller box.

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Using the mobile application we can control the every appliances which is paired with Z wave controller box. Using this application we can on and off the every appliances in anywhere. Because most of the people forgot to on and off the home appliances. Using this system we can access our home appliances in everywhere.



Figure7:Home Appliances Control System using Z wave Wireless Protocol with Smartphone

VIII. CONCLUSIONS AND FUTURE WORK

A smart home system based Z wave wireless communication was implemented. This system is target for house hold people, hotel and office managements and industrial persons. This system implement by Z wave by using Z wave controller with the help of smart phone. The system implements the wireless network using Z wave protocol for their high security far communication and low power consumption. In future it will also use for hotel automation, office automation, industrial usage.

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