

Review of Power Line Communication Based Automation System

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ABSTRACT

This system is used for controlling and monitoring electrical appliances through power line communication. Every electrical appliances works on power which is of 230V/50Hz. This power line can be used as a communication media for controlling remote location devices. Data is communicated from source to destination via a power line power line communication modem and Differential Code Shift Keying modulation. We can control various parameters as temperature, humidity, switching ON-OFF remote device

Keywords— Power line communication, Frequency shift keying.

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I. INTRODUCTION

Modern society can't leave without automation. Automation is used for achieving safety, comfort and ease of operation. The purpose of the system is to provide convenience to the user and also to reduce power consumption and save energy. This system requires no modification to the appliances, and it works for all appliances using electricity, since electricity to the socket is controlled and not the appliance directly. This paper is taken into consideration because of a need for users to efficiently manage the consumption of power in their homes. Costs will be kept to a minimum by the use of existing home wiring.

II. LITRATURE SURVEY

A Extensively search has been carried out for past and related work in the field of home automation. Internet tool is used as source of information for carrying out this literature survey.

1) "Embedded Web Server for Home Automation, International Journal of Engineering and Applications", by

Mr. Abhishedk Vichare, Ms. Shilpa Verma. Main aim of this paper is to describe how to connect a micro- controller to LAN or Internet and use it as a web server. This paper offers a new approach to control home appliances from a remote terminal, with an option from a local server, using the Internet. This system is accomplished by personal computers, interface cards, microcontroller, along with window-type software and microcontroller control software. The system is designed to control home appliances' on/off, to regulate their output power, and to set their usage timing. The microcontroller which is used in this project is the Philips P89C51RD2BN

2) "Implementation of a home automation system through a central FPGA controller", by. Debono, C.J, Abela. Technology advancements have made possible the implementation of embedded systems within home appliances. This has added new capabilities and features, however, most of the time, the implementations are proprietary and networking is not always possible. Yet there is an increasing demand for smart homes, where appliances react automatically to changing environmental conditions and can be easily controlled through one common device.

This paper presents a possible solution whereby the user controls devices by employing a central Field Programmable Gate Array (FPGA) controller to which the devices and sensors are interfaced. Control is communicated to the FPGA from a mobile phone through its Bluetooth interface. This results in a simple, cost effective, and flexible system, making it a good candidate for future smart home solutions.

3) "A phone-based remote controller for home and office automation" by Wong, E.M.C

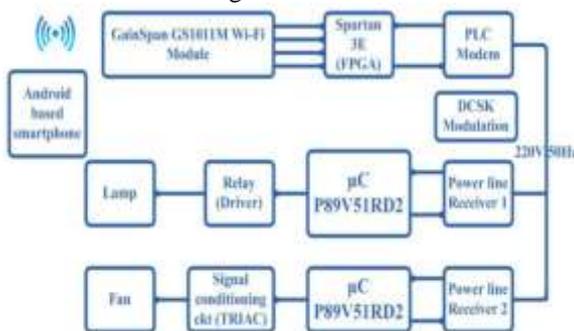
In modern society, home and office automation become increasingly important and interesting. They not only provide better ways to transfer information within homes/offices and between homes/offices, they provide better time management too. These also improve the quality of our lives by automating some of the electrical home appliances such as light source, A/V equipment, computer, security device, etc. The paper describes a hardware-based remote controller for power point control. Users can input the control commands and their own passcodes by using local or external telephones. The paper also discusses the operational sequence of the remote controller

4) "Power Line Communication Based Automation System Using a Handheld Wi-Fi Device" by Karthik Shivaram, Nikhil Rajendra, Kavi Mahesh, Balasubramanya Murthy K.N . Karthik Shivaram and team explained an open source automation system for controlling electrical appliances using power line communication. Control messages are sent over wi-Fi network from a Wi-Fi device to microcontroller which then couples to power line and receiver will receive data and take appropriate action.

5) "An Internet Based Wireless Home Automation System for Multifunctional Devices" by Ali Ziya Alkar . The aim of home automation is to control home devices from a central control point. In this paper, we present the design and implementation of a low cost but yet flexible and secure internet based home automation system. The communication between the devices is wireless. The protocol between the units in the design is enhanced to be suitable for most of the appliances. The system is designed to be low cost and flexible with the increasing variety of devices to be controlled.

III. PRAPOSED SYSTEM

The generalised block diagram of proposed Vehicle system is as shown in figure below



A Wi-Fi enabled device is used as means of input. An Android based Smartphone is used for this purpose, which

provides the user with a touch screen interface facilitating ease of use. A Wi-Fi network is first setup using a wireless router. The microcontroller connects to the wireless router through an Ethernet interface card. The Ethernet interface card and the micro-controller communicate over a Serial Peripheral Interface (SPI) bus. An application on the device consists of 3 buttons and 1 slider and enables us to send messages in Open Sound Control format. OSC (Open Sound Control) protocol is used to communicate between the Android based Smartphone and the micro-controller over a Wi-Fi network. When a user presses a particular button, specific messages are sent over the Wi-Fi network to the micro-controller which decodes the messages. The micro-controller converts these messages into simple control signals. The commands sent by the micro-controller to switch ON/OFF an appliance are not sent directly to the appliance, but rather these commands are broadcasted over the power lines using a Power Line Communication (PLC) transmitter. The micro-controller sends data to the PLC modem using UART protocol. Each end appliance has a PLC receiver plus micro-controller combination to listen to these commands, if the commands are intended to the corresponding appliance; it switches ON/OFF the appliance or controls the appliance.

The FPGA is the Spartan 3E is the main controller (master) of this system; it is the main channel of communication between the slaves and the GainSpan Wi-Fi module. The FPGA uses a two (UART) or four wire (SPI) interface to communicate with the Wi-Fi module and also it uses UART interface to communicate with IT800D/CY8CPLC10. Protocol for communication with GainSpan Wi-Fi module and PLC modem exists as a separate FPGA image and is programmed to the FPGA.

The microcontroller is a P89V51RD2 and it is used in slave module. It was chosen because it has a good set of peripherals that will be useful for adding functionality in the future, it has a set of high level development C++ tools for faster application creation while keeping the ability to program on a low level in C and also it has a SPI, UART for communicating with a PLC modem, PWM to control duty cycle of control signal for fan speed or dimming the light application. Its main function is to receive data/command from master on power line and generate control signal to switch on/off lamp. Also it generated pwm signal as per received data from master that pwm is used for dimming the light or fan speed control. Also this Microcontroller communicates with PLC modem to receive/send data on power line.

IV. CONCLUSION

PLC offers a method of broadband access for those living in isolated areas, which have no other viable means of broadband access. Therefore, it seems plausible that when PLC will become available in rural areas, it will be a moderate success. However, this success is unlikely to be long-term, since telecommunications companies are already contemplating rolling out FTTH (Fiber to the Home) connections to all of their customers sometime in the future.

Therefore, it appears that PLC will be little more than a stopgap solution.

The usage of power line communication over the electrical power supply networks gives an alternative for the telecommunications access area and the same we can use in Building management services.

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REFRANCES

- [1] Karthik Shivaram, Nikhil Rajendra, Kavi Mahesh, Balasubramanya Murthy K.N.,Padmavathy Jawahar, University of Michigan, USA; Stanford University, USA; P.E.S.Institute of Technology, Bangalore, India. Power Line Communication Based Automation System Using a Handheld Wi-Fi Device, 2012 IEEE 16th International Symposium
- [2] Shwehdi, M.H.Khan,"A Power Line Data Communication Interface Using spread spectrum technology in home automation," Power Delivery, IEEE Transaction on Vol.11,no.3, pp.1232,1237, Jul 1996, doi:10.1109/61.517476
- [3] Piyare,R;Tazil,M,"Bluetooth based automation system using cell phone," Consumer Electronics (ISCE), 2011 IEEE 15th International Symposium on, vol.,no.,pp.192,195, 14-17 June 2011, doi: 10.1109/ISCE.2011.5973811
- [4] Wong,E.M.C.,"A phone based remote controller for home automation and office automation,"Consumer Electronics,IEEE Transactions on, vol.40, no.1, pp.28,34, Feb 1994 doi: 10.1109/30.273654