

Power line communications for home applications

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Abstract- The main objective of this project is to transmit data or voice or controlling some devices using power line applications with X10 protocol. X10 protocol is meant for data communication over the power line which carries 230V, 50 Hz Ac supply. Here we are going to use the power line in the industry for data acquisition purpose. This is an improvement of data communication over the power line. X10 is an international and open industry standard for communication among electronic devices used for home automation, also known as domotics. It primarily uses power line wiring for signaling and control, where the signals involve brief radio frequency bursts representing digital information.

Keywords- X-10 protocol plc (power line communication), automation, radio frequency.

I. INTRODUCTION

1.1 INTRODUCTION TO X10 PROTOCOLS:

The X10 protocol is an international standard of communication among home devices that use common household wiring to connect to one another. Plug an X10 enabled device into a household outlet and it can automatically exchange information with other plugged-in X10 appliances. A controller manages the machines. One household can contain up to 256 addresses

X10 products are easy to install require no addition wiring and represent a mature, maintenance – free technology. The protocol is commonly used by hundreds of products that are relatively inexpensive. A noise filter can be used to avoid this problem.

The packets transmitted using the X10 protocol consists of 4-bit house code followed by one or more 4-bit unit code, finally followed by a 4-bit command. For the convenient of users configuring a system, the 4- bit house code is selected as a letter from A through P while the 4-bit unit code is a number 1 through 16.

II. SYSTEM ANALYSIS

2.1 EXISTING SYSTEM:

In existing system, if the user want to transfer analog or a digital signal (voice or data) needs a communication protocol either wired or wireless. So we go for the proposed system.

2.2 PROPOSED SYSTEM:

In proposed system ,user going to transfer the data or voice signal without using any of the communication protocol ,instead of that going to transfer the signal through normal household wiring with the use of x10 protocol.

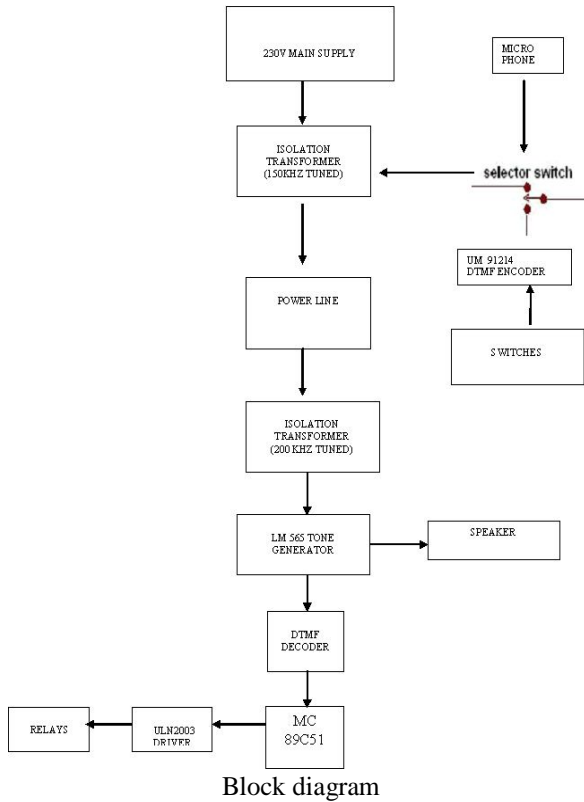
III. OVERVIEW OF THE PROJECT

The device is a hardware interface that allows control data communication over the power line. Its purpose is that of translating the serial output provided by some digital service, like a microcontroller, into a coded pulse train that is suitable for being transmitted over the usual domestic power lines. Conversely, the interface is able to extract such messages from the power line and to convert them into serial streams that the connected digital device can read. The interface therefore acts like a modem, allowing the employment of the common electrical supply network of a building as a local area network.

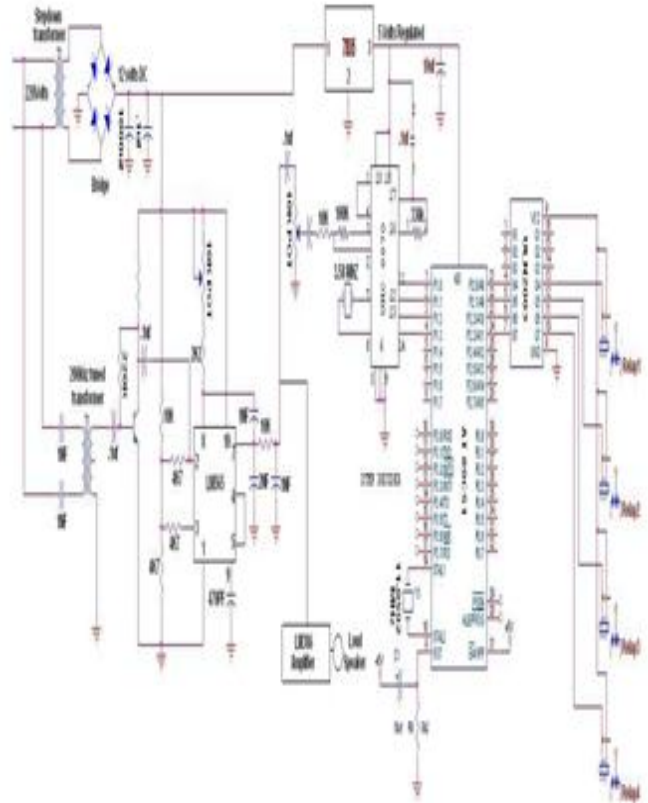
When coupled with a programmable digital device, such as a microprocessor or a microcontroller, the device allows the realization of “intelligent” and “communicative” equipments that can interact with similar objects over a domestic network, without the need of installing a dedicating wiring. Typical applications are in the field of Home and Building Automation (management of surveillance and alarm systems, home appliances automation, AMR (Automatic Meter Reader), Home automation control, Security and surveillance, General-purpose isolated transceiver.

The innovative feature of these devices is that they transmit data on the power line, using the concept of conveyed wave (zero crossing).

V. RECEIVER SECTION



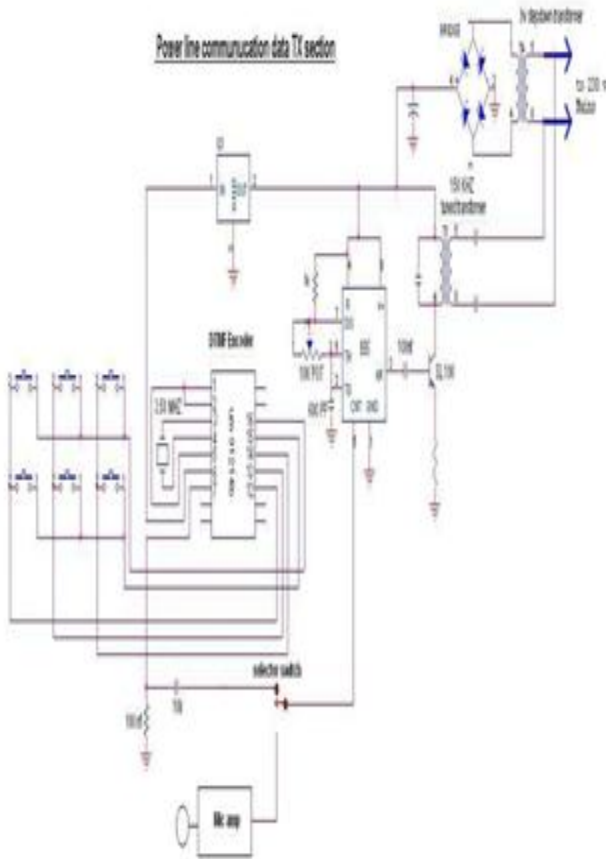
IV. TRANSMITTER SECTION



VI. CONCLUSION

Home Control Systems (HCS) are expected to be increasingly prevalent in future homes. HCS is an integrated system that includes HACS and HSS. HCS is expected to improve quality of life for the people living in the future home by giving them unparalleled ability to remotely control their way of life at home. Performance related measurements of HCS are important to the industry and consumers so that concerned stakeholders may make the appropriate choice of HCS for their homes. We have procured some of the commercial HCS equipments and evaluated their performance aspects.

A commonly used technology in HCS for communicating with household appliances and equipments is the power line infrastructure at home. The X10 protocol is used to communicate between the controller and the appliance over the power line. While this technology is cost effective and relatively easy to use, the performance of this technology has considerable scope for improvement. During our experiments we observed the problem is weakening of X10 signal due to distance from the transmitter, reduction in bandwidth compared to even analog telephone line for data transmission and inability to easily switch from one phase to another.



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