

# Data Transfer Through Power Line

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*Abstract: "Data transfer through power line is a technology that sends data through Electric line along with electric current. In this we study data transmission applicability over power lines for home automation. This study concluded after the problem defined by previous research. Two major problems such as cable attenuation and excessive noise level are eliminated by our project. We designed this technology in two phases, in first phase, run the performance analysis of this technology. And secondly, build system that represents the real life applications with security issues. In data transfer through power line we transmit the eight bit command through 230volt and 50Hz supply. This project provides large coverage, since the power lines are already installed everywhere."*

## I. Introduction

Power line communication is user friendly method used for installing a network within a building. In this technology we transmit the data as well as electric current through single power line. We use the pre installed wired network for transmitting and receiving the data which is economically reasonable. In this we convert data in coded form and then transmit it through 230v and 50Hz supply and at receiver side it decoded in original form. In data transfer through power line we generally send command to any process or plant or corporate buildings. This technology used for various process controls, domestic purposes.

The advantages of power line over other communication are:

- Bit rate speed is high.
- It is less expensive.
- Time saving method and less physical work.

But power line communication consists of disadvantages also. The main disadvantage of power line communication is the power modem used in power line communication can send only 8bit data. Hence we cannot send data but we only send commands.

## II. Aim of Project:

Data transfer through Power line technique is economical as well as user friendly method. In this project we investigate, identify and overcome the challenges of using the power line for communication purpose. We designed this project to transmit eight bit data which we called as command from one place to another by the use of power line. We can implement this project in pre installed single wiring supply. For transmission of command through power line we need power modem at transmitter and receiver side. In this command is send from one pc using a software terminal to a transmitter kit and then this data is transfer on power line and then this data is received on receiver side and decoded in original form.

## III. Block diagram:

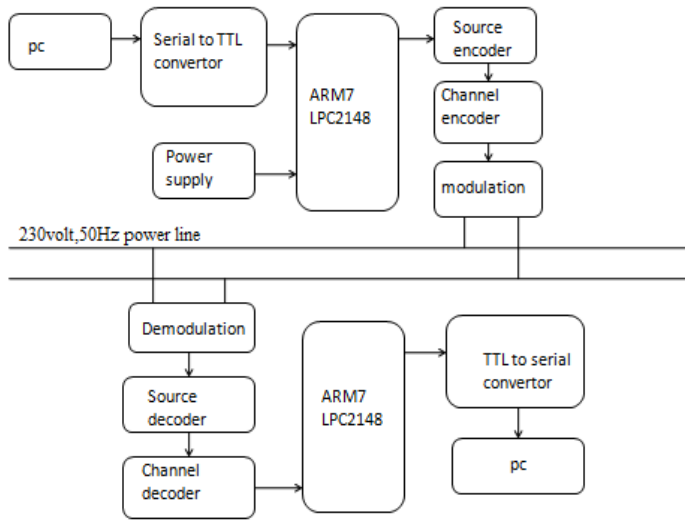


Fig1. Block diagram of power line communication

Power line communication contains mainly two parts that are transmitter and receiver. The transmitter is responsible for sending signal from one pc to power line and the receiver receive signal from power line and given to another pc. This project basically done in three stages that are signal amplification, modulation and interfacing of signal. In data transfer through power line we give command from pc to serial to TTL converter because ARM7 understand TTL language and then this command is transfer to power modem. Power modem converts this command in the form so that we can send this data on power line with the power supply. And then we modulate and encode the signal using channel encoder, source encoder and modulation block. Then this data is received at receiver side and received data decoded in original form by using channel decoder, source decoder and demodulation block. Then this data is converted into TTL to serial form using converter in this way we received command on another pc.

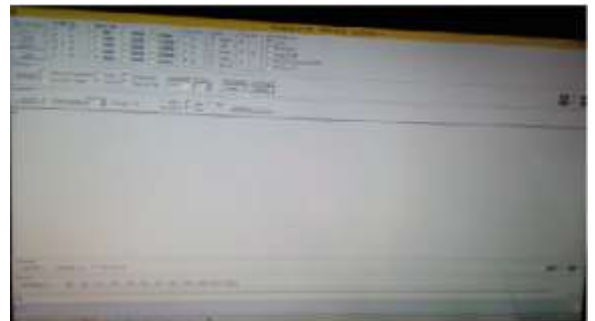
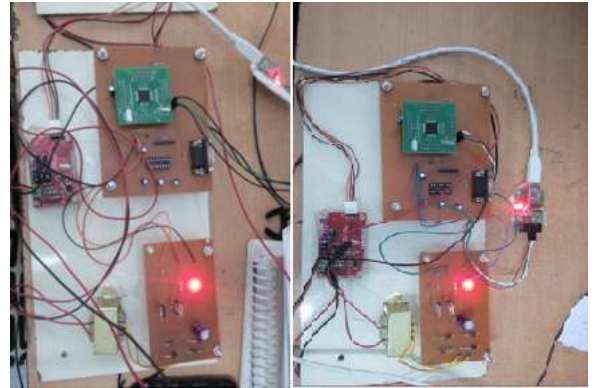
#### IV. Algorithm:

- Step1: start.
- Step2: initialization the microcontroller input and output, serial port.
- Step3: declare variable.
- Step4: read data from pc.
- Step5: receive data through serial port and store in serial register.
- Step6: transmit data through serial port using tx.
- Step7: receive data through serial port receiver.
- Step8: store data in serial register.
- Step9: Transmit data using serial port to pc.

Step10: end.

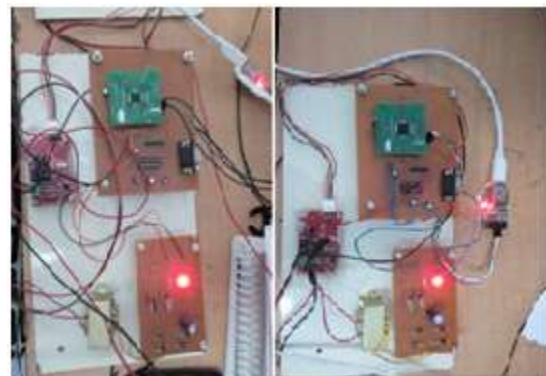
#### V. Practical implementation:

##### a. At transmitter side



- A command given through the pc and put it in a form that can be readable by the plc transmitter module.
- Encrypt the command through the RSA algorithm in order to ensure that the data that will be transmitted via power lines can't be read by any other module than the system.
- Send the encrypted command to the receiver RS-232 transmitter module which is linked to the computer through the RS-232 serial port.

##### b. At receiver side:





The receiver RS-232 transmitter module receives the data and modulates it in order to transmit it over the power lines at the 120 KHz-150KHz frequency.

- The receiver RS-232 receiver module receives the data from the power line and demodulates it in order to send it to the ARM7 microcontroller.
- The arm7 analyses the command, decrypts it through the c language and then sends it respectively to the corresponding pc. This project have following advantages:
- From economic point of view, it is less expensive because we use pre installed wired network instead of using new wires.
- The main advantage of this is this is time saving technology.
  - Easy to install a network within a building.

## VI. Application:

- This technology has been to facilitate meter reading i.e electricity meter, gas meter, temperature meter etc.
- Control of air conditioning
- Home automation
- In corporate building

## VII. Conclusion:

By this technology we overcome to major issues that are cable attenuation and excessive noise caused in power line. The PLCC system we designed is a primary stage of a home networking system in which we tried to send a data from one computer to another which are installed in the same building. The system has some drawbacks they are as follow:

- The power line modem used in this technology is transmitting only 8bit data. This is the biggest disadvantage of this project.
- We used this technology in case of single wiring only.

## 8. References:

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