

DATA TRANSMISSION THROUGH POWER LINE COMMUNICATION(PLC) TO THE ROBOT

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Abstract: PLC solutions are developed to reduce weight and cost by using existing infrastructures. This paper focuses on small-scale applications equipped with a modular energy storage system which can be adapted to suit the application's energy needs. The proposed solution is adapted to small-scale radial distribution system. In order to remove the costly extra cable used for management, an innovative solution is presented to communicate the robot through the AC power lines. PLC is proposed to achieve high throughput suited to different applications such as multi-media or safety. The Robot is handled through the PLC. The data or commands transfer through power line cable to the robot. The monitoring unit will give commands to the Robot through the power line.

Keywords: Reduce cable effect, Power line transmission and economically reasonable.

I. INTRODUCTION

The data has been transferred through power line communication cable which is used for industrial purpose, home applications and many others., The data can be transferred through power line communication cable is impossible. But now it is possible by power line communication modem. The data can be easily transferred through power line using power line communication modem. Using the various wires, extra cables cannot be used. Nowadays we need extra cables for communication in wired medium, fiber optic cable, ethernet cable have been used. In wireless medium, antennas and satellites are used, but it creates more radiation effect. It affects human, animals, and plants. To avoid this side effects in environment power line communication is used. In our project we are transferring the data to the industrial robot. In industry Environment separate communication cable maintenance is difficult and economically high cost. The data transfer in power line communication cable battery management system is not required and it economically reasonable. It eliminates battery hazards.

II. PROJECT AIM

This Paper focus on the challenges in data transfer through power line communication to the industrial robot. It overcomes the battery management system, and it challenges the power line communication by reducing the harmful effects. This paper the data can transfer through computer to control the industrial robot in power line communication.

III. EFFECTS OF POWER LINE

In communication signals the accurate propagation is difficult. The noise level and cable attenuation of frequencies takes place in large quantity. There are various types of noise and disturbances are provided such as voltage, frequency variations etc., These different types of noise can be occurred at the communication channel. This various types of noise occur at undeterminable times and different frequencies, certain parts of bandwidth are used for the system that simply Eliminated.

IV. BLOCK DIAGRAM

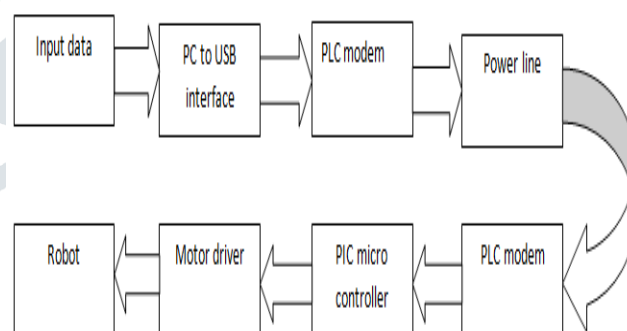


Fig 1. Power line communication

Fig 1 shows the power line communication and it contains two sides namely transmitter side and receiver side. In the transmitter side the sending signal is from PC to power line. Likewise the receiving side receives the signal from power line to robot. This project done by three stages are signal amplification, Modulation and interfacing of signal. In data transfer through power line data or command has been transferred from PC to power line communication

modem. Then it transfers the data from power line to receiving system. The receiving system checks the data and performs the robot based on given command from transmitter side. In power line communication there are various types of modulation techniques are performed. The modulation techniques are Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Quadrature Phase Shift Keying (QPSK) and Amplitude Modulation (AM). By using this modulation techniques the data can be easily modulated through power line and transfer data from PC to robot.

V. WORKING

This paper Focus about the data can be send to PC by using hypertrm software. The hypertrm software is used for converting the given information to machine language. Then it transfers the data to PLC modem. The Power line communication modem can be send and receive the serial data over existing AC mains power lines of the building. It has high immunity noise persistence. The modem is capable of providing 9600 baud rate. It builds in error checking, so it never gives corrupt data. This module provides bi-directional half duplex over AC mains at any voltages. This PLC modem has KQ330F module is used.

The advantages of using KQ330F modules are widely available and the range of devices that are provided on variety of applications that can be achieved using simple plug - in or wire-in Modules. Then it transmits the signal through power line to receiver. The receiver receives the incoming data in PLC modem and computes the signal to PIC microcontroller. The PIC microcontroller is a group of microcontrollers that interfaces one or more devices simultaneously. In this process the various modulation technique has been done. The Frequency Shift Keying (FSK) is a modulation of frequency that the digital information is transmitted through discrete form of frequency changes of carrier signal. This modulation is used for communication systems like amateur radio, caller ID and energy broadcast. It transfer the data in digital BFSK. In this pair of discrete frequencies to transmit binary 0's and 1's. The Frequency modulation (FM) is the encoding of information in carrier wave. This can be varied instantaneous frequency of the wave. FM is used at intermediate frequencies by analog VCR systems to record the luminance of video signal. The Quadrature Phase Shift Keying (QPSK) is a form of phase Shift Keying in which two bits are modulated once, selecting one of four possible carrier phase shifts. QPSK allows the signal to carry twice information as ordinary PSK using same bandwidth. It can encode two bits per symbol to minimize the bit error rate.

The binary data stream is split into the in-phase and quadrature-phase components. It can be separately modulated two orthogonal basis functions. In this implementation, two sinusoids are used. It is used for polar non-return-to-zero encoding. This encoder can be placed for binary data source, but have been placed after to illustrate the conceptual difference between digital and analog signal involved with digital modulation. The receiver of QPSK matched filters can be replaced with correlators. Using these modulation methods the data can be transferred through power line by varying the frequency range in recover signal.

These signal can be received by the controller and gives the information to the motor driver. The motor driver is a little current amplifier, the function of motor drivers is to take a low-current control signal and then turn it into a higher-current signal that can drive a motor. It can be used for any device that usually draws more than 50-100 mA.

Maximum current of microcontroller output is not enough to drive the devices. It requires another supply which can handle the current requirement. A separate thyristor or diode rectifier is used to supply the field of the motor, the power is much less than the armature power. So the supply is often single-phase and provides for closed-loop speed control.

The received signal can be demodulated to robotic arm. A robotic arm is a one type of mechanical arm with similar function to the sum total of the mechanism of pair of a more complex robot. Manipulator links are connected by joints allowing either rotational motion or translational displacement.

The link of the manipulator can be considered to form a kinematic chain. The terminus of the kinematic chain of the manipulator is called the end effector and it is analogous. By using this robotic arm the information data from the transmitter command has been performed.

VI. APPLICATION

1. Home Automation:

It is used to control the equipments in home through power line. The automation technology can be used for new smart homes and offices.

2. Automatic Meter Reading:

This can be used for automatically collecting consumption and transferring that data to a central database for billing, troubleshooting and analyzing.

3. Intercom System:

It functions independently and generally mounted permanently in buildings.

4. Lighting Control:

The lighting control incorporates communication between various system inputs and outputs with the use of one or more central computing devices.

5. Load Control:

Various types of loads can be connected to output. These loads can be switches controlling and it relays different types of security system.

6. Accessibility:

Due to accessibility the communication can be implemented in areas where telephone signal cannot be reach.

7. Industrial control system:

The industrial systems can be easily controlled by the power line to transfer data or command without any extra cables.

8. PC to PC transfer:

It can easily transfer the information from one system to another system through power line.

9. Power Grid:

It can be transferred the information from line-to-line communication.

VII. RESULT AND DISCUSSION

In our project we transfer the data through power line communication in small industrial robotic arm. And it performs based on command from PC. Fig 2 shows the data transferring process using personal computer.



Fig 2.Data transfer using PC

VIII. CONCLUSION

The power line communication the data transfer is to reduce the extra cable and economically reasonable and it used for multiple applications. If the power line had a phase angle is changed the transferring the data is impossible. This power line communication is most advanced in the wired communication.

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