An Efficient Integrated Industrial or Home Device Status Monitoring And Controlling System Using Power Line Carrier Communication

B.Suresh Kumar[1], M.Abirami[2], S.Aswini[3], M.Nivethitha[4], J.Priya[5]
[1]Assistant Professor, Dept of Electronics and Communication Engineering
[2, 3, 4, 5]Dept of Electronics and Communication Engineering
[1, 2, 3, 4, 5] The Kavery Engineering College

Abstract- *In this system, we use the power line (already exist in home, industrial etc.,) for data communication. This system deals with the use of this technology over pulse width-modulation (PWM) networks in communication applications such as computer data communication and home/industrial device control. The originality stands on the frontier of two distinct domains communication and energy The PLCC modem is in the form of a ready-to-go-circuit module, which is capable of transferring data over the power cable at the low voltage end of the power transformer of a 3-phase/ 4-wire distribution network. A pair of embedded PLCC modems connected on the power line can provide low speed bi-directional data communication at a baud rate of 9600 bps. Operating limits and main difficulties encountered are underlined. Based on the requirements of the PWM network, new PLC modems are developed and tested. Experimental results presented in this system show the capacity of these modems to overcome the hostile environment due to the inverter and to guarantee reliable communication over the PWM network. The method used by X-10 is based on a simple data frame with eight data bits (one byte) proceeded by a predetermined start code. The complicated part of this technology was not the system of binary data, but the method in which it was transmitted from one device (the transmitter) to another device (the receiver).*

Keywords- PLCC MODE KQ330,NUVOTON microcontroller and power line network etc.

I. INTRODUCTION

A. POWER LINE COMMUNICATION:

Power-line communication (PLC) carries data on a conductor that is also used simultaneously for AC electric power transmission or electric power distribution to consumers. It is also known as power-line carrier, power-line digital subscriber line (PDSL), mains communication, power-line telecommunications, or power-line networking (PLN).A wide range of power-line communication technologies are needed for different applications, ranging from home automation to Internet access which is often called broadband over power lines (BPL). Most PLC technologies limit themselves to one type of wires (such as premises wiring within a single building), but some can cross between two levels (for example, both the distribution network and premises wiring). Typically transformers prevent propagating the signal, which requires multiple technologies to form very large networks. Various data rates and frequencies are used in different situations. A number of difficult technical problems are common between wireless and power-line communication, notably those of spread spectrum radio signals operating in a crowded environment. Radio interference, for example, has long been a concern of amateur radio groups.

B. BASICS:

Power-line communications systems operate by adding a modulated carrier signal to the wiring system. Different types of power-line communications use different frequency bands. Since the power distribution system was originally intended for transmission of AC power at typical frequencies of 50 or 60 Hz, powerwire circuits have only a

limited ability to carry higher frequencies. The propagation problem is a limiting factor for each type of power-line communications. The main issue determining the frequencies of power-line communication is laws to limit interference with radio services. Many nations regulate unshielded wired emissions as if they were radio transmitters. These jurisdictions usually require unlicensed uses to be below 500 kHz or in unlicensed radio bands. Some jurisdictions (such as the EU), regulate wire-line transmissions further. The U.S. is a notable exception, permitting limited-power wide-band signals to be injected into unshielded wiring, as long as the wiring is not designed to propagate radio waves in free space. Data rates and distance limits vary widely over many power-line communication standards. Low-frequency (about 100–200 kHz) carriers impressed on high-voltage transmission lines may carry one or two analog voice circuits, or telemetry and control circuits with an equivalent data rate of a few hundred bits per second; however, these circuits may be many miles long. Higher data rates generally imply shorter ranges; a local area network operating at millions of bits per second may only cover one floor of an office building, but eliminates the need for installation of dedicated network cabling.

C. LONG HAUL, LOW FREQUENCY

Utility companies use these special coupling capacitors to connect radio transmitters to the power-frequency AC conductors. Frequencies used are in the range of 24 to 500 KHz, with transmitter power levels up to hundreds of watts. These signals may be impressed on one conductor, on two conductors or on all three conductors of a high-voltage AC transmission line. Several PLC channels may be coupled onto one HV line. Filtering devices are applied at substations to prevent the carrier frequency current from being bypassed through the station apparatus and to ensure that distant faults do not affect the isolated segments of the PLC system.Our system designed to control the different home appliances through power line network using PLCC MODEM (KQ330)

II. LITERATURE SURVEY

a. Navish Lallbeeharry IEMN/TELICE University of Lille Villeneuve d'Ascq, FranceReal Time Fault Detection on In-Vehicle Power Line Networks Based on Power Line Communication IEEE-2019

Real time detection of intermittent or permanent faults which could appear on wired networks becomes a critical issue. Fault detection and localization methods are often based on reflectometry techniques but they need the implementation of dedicated devices. Furthermore, since they often use a wide frequency band, problems related to their electromagnetic compatibility with the environment may occur. If a power line communication is already implemented in the network, the objective of this paper is to study the proof of concept of a fault detection only based on the statistical properties of the received signals. Even without precise information on fault location, results of this approach could be interesting to decide to carry out a maintenance operation.

b. Bhoyar Nilesh I Department of Electrical Engineering Visvesvaraya National Institute of Technology Nagpur,India Review on Implementation of Power Line Carrier Communication Technique in Smart Grid IEEE-2018

Based on the available infrastructure of power grid and bidirectional integrated communication network, Smart Grid (SG) apply advanced measurement and sensing technology, decision and analysis support to build safe technology, economic, reliable, and efficient and environment friendly modern grid. In this paper, emphasize given on brief discussion of various communication technique in SG. Later, out of which Power Line Carrier Communication (PLCC) techniques are explained in detail. Paper discusses benefit; problem arises while implementing technique and various solutions to overcome the problems. A model of 3 Phase High Frequency Power Distribution Transformer which is used for PLCC technique at distribution level is presented.

c. Marc Anthony Mannah, Christophe Batard, Nicolas Ginot, and Mohamed Machmoum A PLC-Based Method for Data Transmission Over a Pulsewidth-Modulated Network IEEE -2011

The use of power networks as a communication medium is currently under development. Power line communication (PLC) is a recent technology that allows interconnecting high-speed multimedia equipment while using the conventional domestic electric network. This paper deals with the use of this technology over pulse width-modulation (PWM) networks in motor-drive applications. The originality stands on the frontier of two distinct domains—communication and energy. First, the performance of the PLC technology conceived for domestic applications is evaluated when used over a PWM network. Operating limits and main difficulties encountered are underlined. Based on the requirements of the PWM network, new PLC modems are developed and tested. Experimental results presented in this paper show the capacity of these modems to overcome the hostile environment due to the inverter and to guarantee reliable communication over the PWM network.

III. EXISTING SYSTEM

Real time detection of intermittent or permanent faults which could appear on wired networks becomes a critical issue. Fault detection and localization methods are often based on reflectometry techniques but they need the implementation of dedicated devices. Furthermore, since they often use a wide frequency band, problems related to their electromagnetic compatibility with the environment may occur.

If a power line communication is already implemented in the network, the objective of this paper is to study the proof of concept of a fault detection only based on the statistical properties of the received signals. Even without precise information on fault location, results of this approach could be interesting to decide to carry out a maintenance operation.

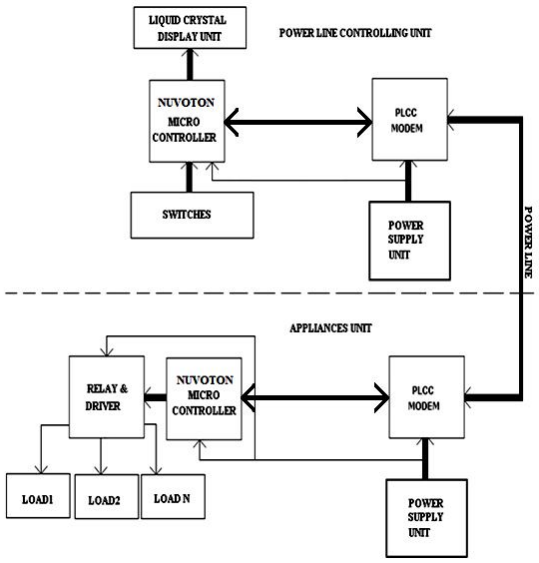
Drawbacks of Existing System

1. PLCC is used only for communication
2. Fault detection only based on the statistical properties of the received signals.

IV. PROPOSED METHOD

In this system, we use the power line (already exist in home, industrial etc.,) for data communication. This system deals with the use of this technology over pulse width-modulation (PWM) networks in communication applications such as computer data communication and home/industrial device control. The originality stands on the frontier of two distinct domains communication and energy. First, the performance of the PLC technology conceived for domestic applications is evaluated when used over a PWM network. Operating limits and main difficulties encountered are underlined. Based on the requirements of the PWM network, new PLC modems are developed and tested for controlling the different home devices. Experimental results presented in this system show the capacity of these modems to overcome the hostile environment due to the inverter and to guarantee reliable communication over the PWM network.

V. BLOCK DIAGRAM



VI. CONCLUSION

In this system, the efficiency of the PLC technology for device control over an embedded network is underlined. First, the feasibility of communication using the domestic PLC modems is studied. These modems seem inefficient, and the communication is interrupted. Causes of their operating limits are revealed, and the influence of the power converter is analyzed. Based on a detailed study, new PLC modems dedicated for the networks and taking into account their specific requirements are conceived and developed. Experimental results clearly show the feasibility of the communication over an embedded network.Our system successfully completed and it can control the home or any other industrial devices through power line network.

REFERENCES

[1] NavishLallbeeharry IEMN/TELICE University of Lille Villeneuve d'Ascq, FranceReal Time Fault Detection on In-Vehicle Power Line Networks Based on Power Line Communication IEEE-2019

[2] Bhoyar Nilesh I Department of Electrical Engineering Visvesvaraya National Institute of Technology Nagpur,India Review on Implementation of Power Line Carrier Communication Technique in Smart Grid IEEE-2018

[3] Marc Anthony Mannah, Christophe Batard, Nicolas Ginot, and Mohamed Machmoum A PLC-Based Method for Data Transmission Over a Pulsewidth-Modulated Network IEEE -2011