

PLC Based Meter Reading and Theft Detection

Prof.S.S.Somwanshi¹, Satish N. Avhad², Mukesh B. Wagh³, Aniket S. Gajbhiye⁴.

¹ *M.E (E&TC) Assistant Professor S.V.I.T, Chincholi, Nasik, Maharashtra, India.*

^{2,3,4} *B.E (E&TC) Student, S.V.I.T, Chincholi, Nasik, Maharashtra, India.*

ABSTRACT

An energy calculation through wireless smart meter using PLC is proposed for automatic meter data collection, give intimation through messages displayed on seven segment display and energy auditing. Power consumed by the consumer is monitored by Electricity Board (EB) through wireless. In this project, we discuss different hardware techniques for tripping, indicating, intimating the consumers and power monitoring. It is the ARM7 Processor based system which continuously records the readings and automatically takes the responsibility of calculating the bill with the data received from the energy meter, and the tariff provided by the operator and displays the same.

Keyword: - PLC Modem, LCD Display, ARM7 Processor.

1. INTRODUCTION

In this project we will use to monitor theft in Electricity meter. An electric meter is a device used for measuring the amount of electrical energy supplied to a residential or commercial building. Due to the increasing cost of electricity, tampering and security in electric meters has become a major concern for government agencies across the globe. Especially in populous countries like India and China tampering in electric meter and energy theft have become quite common. Electric meters can be manipulated, thus causing them to stop, under-register or even bypassing the meter. Consumers, who are tamper with electric meter, effectively use power without paying for it. This theft or fraud can be dangerous as well as dishonest. Electric meter security is looked upon as major issue in many countries today.

2. LITERATURE SURVEY

Power-line communication is based on electrical signals, carrying information, propagating over the power-line. A communication channel is defined as the physical path between two communication nodes on which the communication signal is propagated. In a low-voltage grid there is a lot of different channels, in fact the links between the sub-station and each household are all different channels with different characteristics and qualities. If the communication system supports communication between households all these links are also different channels.

3. EXISTING SYSTEM

As we know there are such systems but they can't monitor the theft of the electricity effectively. Although this type of system is present so we are proposed new and improved system for monitoring and alarming the user for limiting the electricity usage.

4. PROPOSED SYSTEM

In our proposed system i.e. PLC based meter reading and theft detection technique we will be able to monitor the electricity usage as prescribed by the particular user, the electricity usage can be monitored. The additional advantage of the system is to avoid the tampering or the theft of the electricity. In this system the intimation to the user is given via alarming if the user over uses the electricity can be tripped i.e. the continued supply can be terminated.

5. SYSTEM ARCHITECTURE

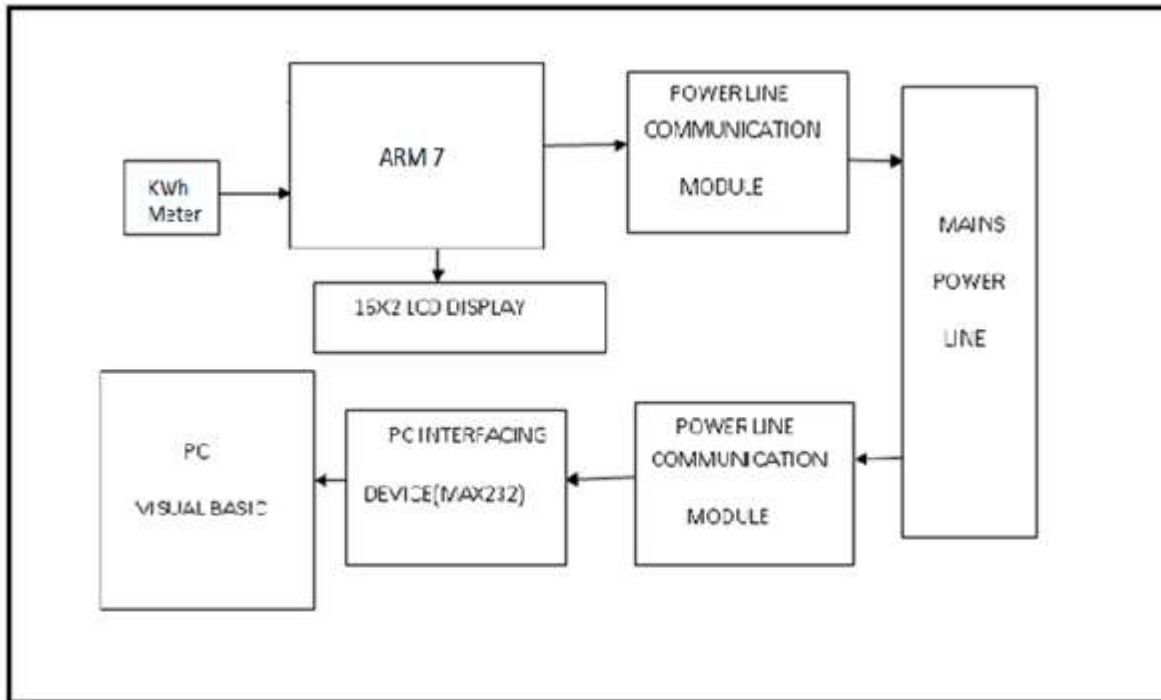


Fig.5.1.Block Diagram

The following different blocks in the system are:-

1. ARM7: In this project we have used one Processor is the heart of the project this monitors analog meter and electronic device that measures the amount of energy supplied.
2. LCD 16X2 display: LCD is used at transmitter side, this is used to display the current status of the system and it has 1/16 duty cycle it is working on +5V.
3. Power supply: It is used to supply the power to processor, LCD display.
4. Series voltage Regulator IC 7805: for regulated power supply.

6. SYSTEM REQUIREMENT SPECIFICATION

6.1 SOFTWARE REQUIREMENTS:

- PCB Designing software Proteus
- Programing software Visual Basics Programming Language
- Keil Software (For writing Code)

6.2 HARDWARE REQUIREMENTS

- ARM7 Processor.
- PLCC Modem (1187)
- LCD 16X2 display.
- Power Supply Module for AC to DC conversion.
- Voltage Regulator 7805.
- Diode, capacitor, resistor, LEDs, Energy Meter.

7. TECHNICAL SPECIFICATIONS

7.1 ADVANTAGES

1. Remotely Connect / Disconnection of Power supply through PLCC Meter.
2. Ability to detect tamper events and outage occurrences.
3. Monitor electrical load in real time.
4. System has no running cost for data acquisition.
5. Reduction in manual meter reading costs.
6. Reduction in late and estimated billing costs.
7. Improved meter accuracy Reduced meter maintenance expenses.
8. Reduction in Revenue Protection losses.

7.2 APPLICATIONS

1. Home automation.
2. Internet Access and Home Networking.
3. PLC used for transmitting radio program.
4. Army stations.
5. This system will be used effectively in rural areas where wire-less communication system fails to work.

8. CONCLUSION

1. In MSEB for meter reading.
2. IN MSEB for detecting theft or tampering.
3. In home for measuring for energy consumption.
4. At the industries where energy is used mostly.
5. Overload protection thus ensuring safety of the consumer and household appliances.

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