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Electricity Billing Through PLM

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Abstract: This paper manages the execution of power line system in the field of power billing. In the present situation Power Line Communication (PLC) is one of the temperate methods for correspondence of information. Despite the fact that there are new strategies for remote communication Design of Narrowband PLC for Power Distribution System with Automated Billing Generation through GSM Network techniques, basically it is especially tedious to introduce such a system, and furthermore it is exceptionally taken a toll devouring strategy .But the electrical lines which as of now exist and interface each household device in a specific territory is more invaluable as it doesn't require any new establishment or erection for communication channels, and thus is not a time consuming one . One greatest favorable position of this system is that it can be promptly actualized, not at all like the other present day techniques. This system takes out the requirement for utilizing EB meter reader and this arrangement of representatives can be utilized somewhere else. The long lines in the charging counter can be maintained a strategic distance from by executing this model. Additionally the control of the system is completely automated by this method. The most essential component in this system is the utilization of advanced meters comprising of microcontrollers and constant clock, therefore disposing of the loss of meter information during power failure.

Keywords: Energy meter, Arduino UNO, Power Meter.

I. INTRODUCTION

In spite of the fact that numerous mechanical developments are occurring in this world, existing power consumption billing process appears in India to be extremely outdated and does not meet the most recent innovation accessible. In this paper, the above said process is completely automated and the correspondence is made conceivable altogether through the electrical line. Not just the billing, even the control of system is completely automated i.e. at the point when a purchaser neglects to pay his utilization charge inside a given timeframe the supply consequently gets slice off to his home and the rebuilding is done just when the bill is cleared. The present winning system includes the client to go up to the EB office to physically pay his bills. The readings are taken utilizing the simple meter show in the client's home. The readings are taken utilizing a representative working at the EB office. This system has a few impediments like mistaken readings, simple control, difficult work and tedious. In the proposed system, the simple analog meters are supplanted by digital meters. The meter readings as advanced information are exchanged from the client end to the EB office through electrical power line. The meter readings are gathered at the general time and the bill is made prepared according to the section for the expended units by the client. At the EB end a PC keeps up an information base of its whole client. Once the bill is created, the clients are furnished with some elegance period for the instalment of bill. In the event that a client neglects to pay his/her bill, a trek flag is sent to the outing circuit associated with the meter, through a similar system. Once when the bill is paid, the supply is re-established back. Accordingly the above system does not require any individual from the earliest starting point of recording the meter perusing to, till the supply control when he/neglects to pay the bill. The upsides of this system are less work, no more lines, fast updates, and no control and financially savvy. Henceforth no more an EB work force is required to go to the shopper house to expel the circuit to remove the supply which is the most established EB convention took after, even at the present stage.

II. LITERATURE SURVEY

1. Design of Narrowband PLC for Power Distribution System with Automated Billing Generation through GSM Network

The progression of the Electricity Boards in the Metropolitan territory, Such as executing energy meter, current spillage detecting parameters and achieved accomplishment in it, yet at the same time now a noteworthy headway have not accomplished in this office. However, the month to month bill and use of current units are noted by a man and later it went into the Electricity Board. This paper proposes the most solid and viable computerized Bill age utilizing PLC Modem through GSM Network for every individual home or individual, and to give the office to screen and control the every last family from the Electricity office Board.

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2. Automatic Electric Billing System using Digital Wattmeter and Power line Carrier System.

The Existing local Energy meter perusing systems all around exist numerous issues, for example, trouble in development, excessively limit data transfer capacity, too low rate, poor ongoing, not two way correspondence rapidly and so on. To take care of above issues, this paper utilizes the remote innovation for Automatic Meter Reading system. A proposed technique gives the correspondence between the Electricity Board segment and the shopper segment utilizing Internet of things (IOT) for transmitting the client's power utilization and bill data that is figured utilizing ARM7 microcontroller. The power changes are checked utilizing the voltage sensor and current sensor are encouraged to the microcontroller which demonstrates it to the Electricity Board. Contingent upon the power age, the house hold gadgets are controlled consequently. From Electricity Board area the data with respect to the bill sum and installment are conveyed to the purchaser by means of Global System for Mobile correspondence. The power and charging data is constantly transmitted by the utilization of Internet of Things and observed by the Electricity Board area. At whatever point there is control robbery recognized can be sent from the Electricity Board area to slice the supply to the client.

III. PROPOSED SYSTEM

This system gives data of the energy devoured by the client to the power office. The perusing of the meter is perused by the beats of the utilization of energy which are given to microcontroller. These readings are changed over into the advanced frame and send to the MSEB through electrical lines. The charging of the perusing is computed at MSEB side and that bill is transmitted to client. On the off chance that client crosses the limit esteems the MSEB cuts the power supply of the client till he/she doesn't clears the past bill.

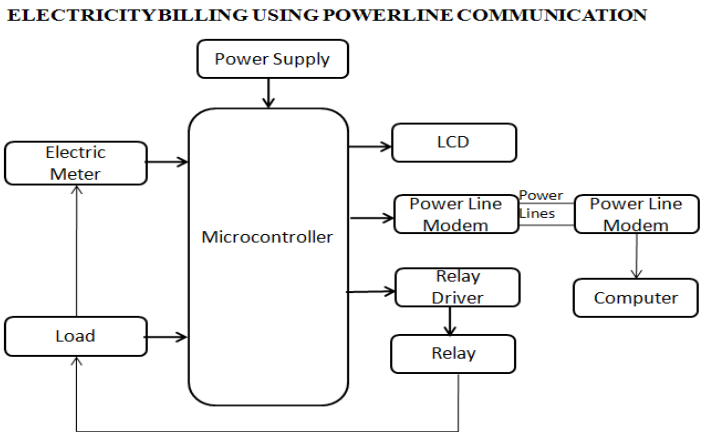

Figure 1: Block diagram of proposed system

1. Microcontroller

AVR: 5V, 8-bit, 16 MHz

Arduino/Genuine Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. Connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Figure 2: Arduino Board

2. Energy Meter

Energy meter or watt-hour meter or is an electrical instrument that measures the measure of electrical vitality utilized by the buyers. Utilities is one of the electrical divisions, which introduce these instruments at each place like homes, ventures, associations, business structures to charge for the power utilization by burdens, for example, lights, fans, cooler and other home apparatuses.

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Figure 3: Energy Meter

- Signal phase, 2 wire
- 240 V, 50 Hz
- Operating Current: 5-30 A, 3200imp/kwh
- Frequency range (30—370 MHz

3. PLM

Power Line modem is helpful to send and get serial data over existing AC mains electrical lines of the building. It has high resistance to electrical commotion perseverance in the electrical cable and implicit mistake checking so it never gives out degenerate information. The modem is in type of a prepared to utilize circuit module, which is fit for giving 9600 baud rate low rate bi-directional data correspondence. Because of its little size it can be coordinated into and progressed toward becoming piece of the client's electrical power lines information correspondence system.

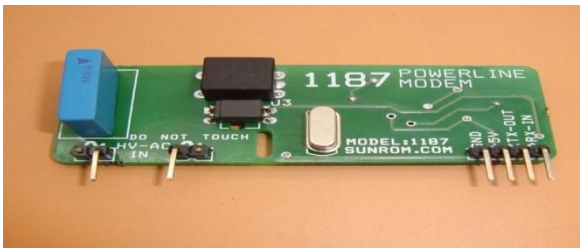

Figure 4: Power Line Modem

- Transmit and Receive serial data at 9600 bps
- Data Tx/Rx LEDs
- Powered from 5V
- Low Cost & Simple to use
- Built in Error Checking
- Direct interface with microcontroller uart txd, rxd pins

IV. RESULTS

Figure 5: Power OFF condition

Figure 5: Power ON condition

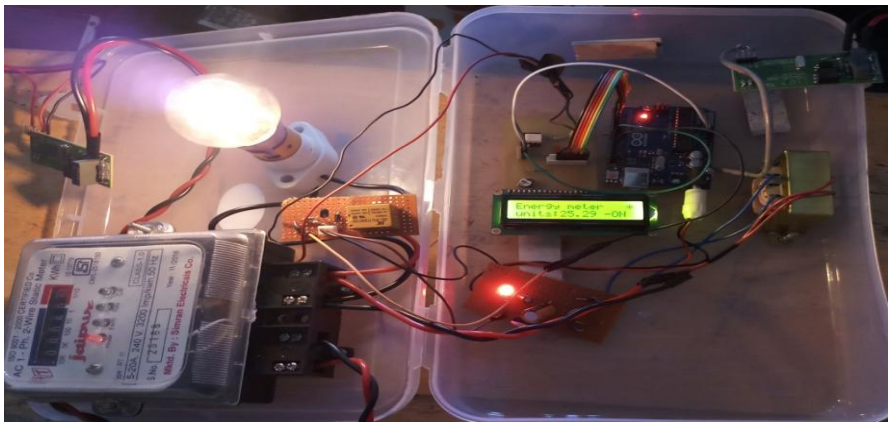

Figure 6: Implemented Embedded System

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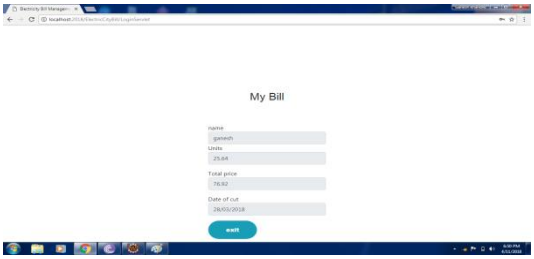

Figure 7: User Login

Figure 8: Bill Generation at MSEB

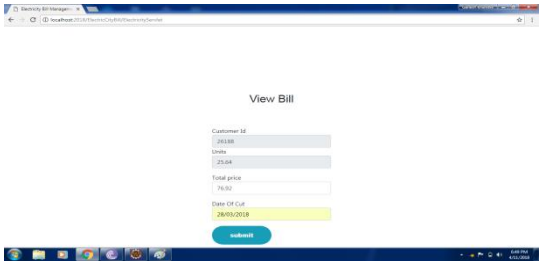

Figure 8: MSEB power cut

V. ADVANTAGES

- Low cost and expandable allowing a variety of devices to be controlled.
- Saves money and energy.
- User friendly system.
- This system contains Arduino Board as a controller so the system contains all the advantages of it.
- Noise free system.

VI. APPLICATIONS

- Home Automation
- Automatic Meter Reading
- Process Control
- Heating & Ventilation, Air conditioning Control
- Lighting Control
- Status Monitoring and Control

VII. CONCLUSION

The proposed system will give simple access the bill from anyplace utilizing PLM. The project will used to give an unmistakable photo of a home's present utilization, and through this information give an estimate to power. The devices will be associated through wifi and get the bill through the application on android telephone or PC.

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