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Research paper on Smart Energy Meter with Automatic Data Transfer

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Abstract

As per the requirements of market of Energy Meter there is need of Smart Energy Meter. Today's, the system will use ZigBee system for communication protocol. The ZigBee is used when the application need high speed data rate and need to be low powered and minimum cost. In our project presenting the remote wireless Energy Meter Reading System this helps in resolving the shortcomings of the technology of the traditional Energy Meter Reading, by adding the characteristics of the ZigBee technology and IEEE802.15.4 standard with AVR Microcontroller ATMega16. The hardware implementation was designed, and then analyzed the use cases of Energy Meter.

Keywords: *Energy Meter, ZigBee, Microcontroller, ATMega16*

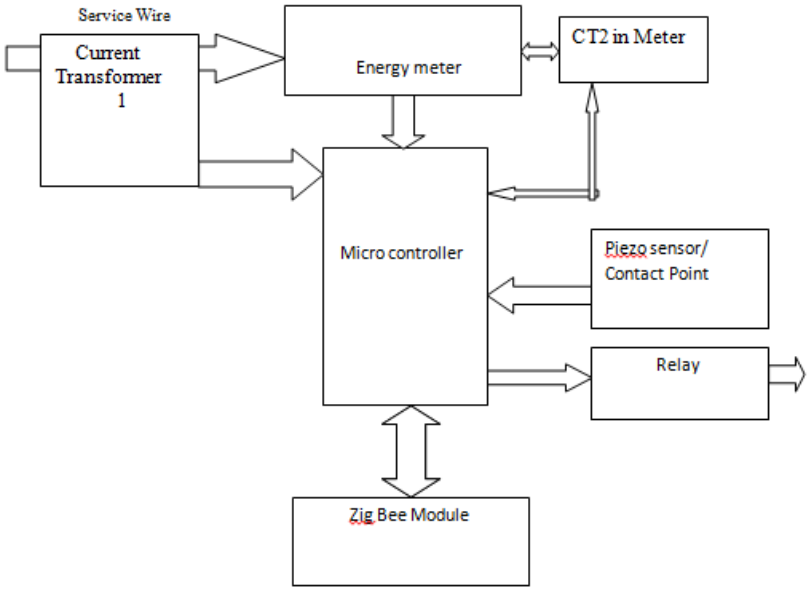
INTRODUCTION

The Smart Energy Meter is a sophisticated communication link directly from the meters to the central office computers that will also speed locating service interruptions, faulty meters and service theft, as well as allowing for expanded services, such as flexible billing dates, time-of-use rates and prepaid accounts. Meters could also be turned on or off directly from the office rather than having to send out an employee to do it manually. The study shows a Smart Energy Meter system would save almost 2-3 crore per year by eliminating meter-reading, automating disconnects and reconnects, reducing bad debts and improving meter accuracy and reducing theft of service

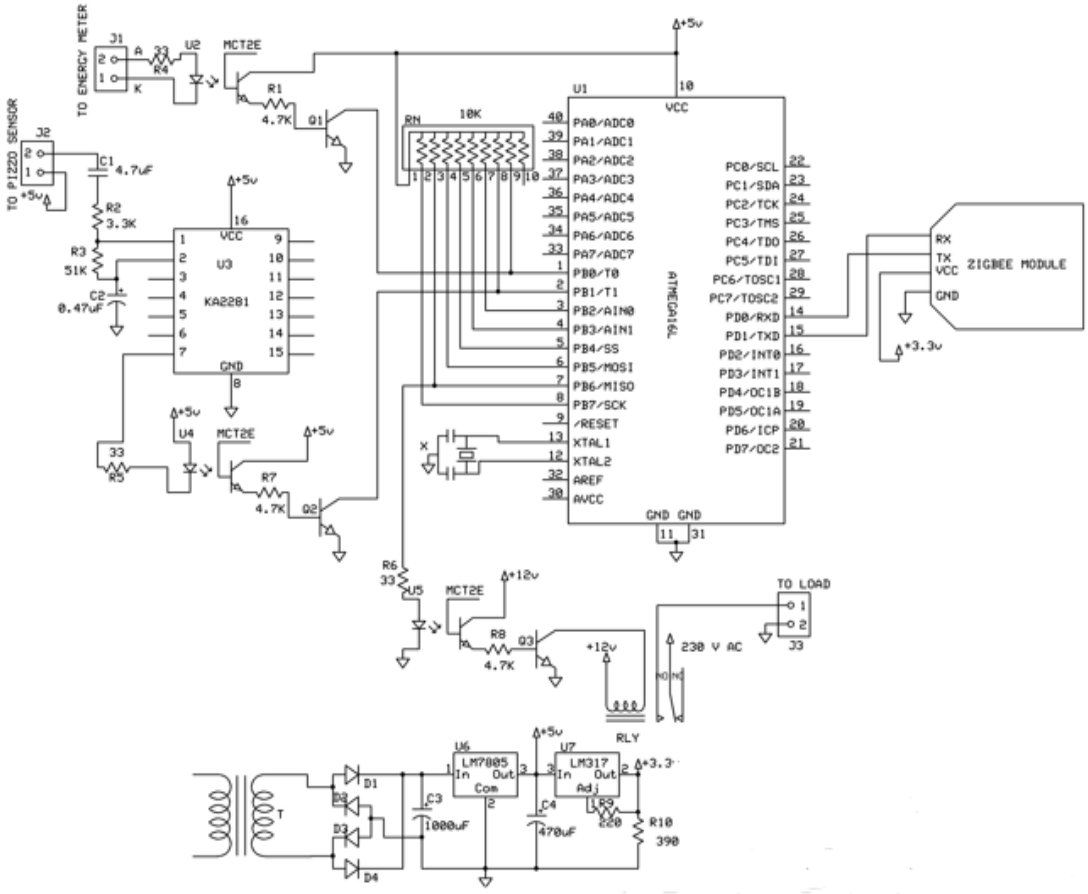
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another positive element of the project would be lower costs for services to the consumer as well.

BLOCK DIAGRAM



CIRCUIT DIAGRAM



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WORKING

- In this project we used energy meter transmitting kit and receiver kit. Tapping with contact point like CT.

- If any subscriber not paying the bill then microcontroller send 1 command to subscriber then automatically switch off

- If any subscriber is trying to open the energy meter then automatically 1 command is send to microcontroller and power is off

- If microcontrollers send command 1 then power is off and if microcontroller send command 0 then power get on.

Components

- Microcontroller Atmega 16
- Zigbee
- Optocoupler
- Energy meter
- Connecting wires
- Switches
- Load

FUTURE SCOPE

Originally Smart Energy Meter devices just collected meter readings electronically and matched them with accounts. As technology has advanced, additional data could then be captured, stored, and transmitted to the main computer, and often the metering devices could be controlled remotely. This can include events alarms such as tamper, leak detection, low battery, or reverse flow. Many AMR devices can also capture interval data, and log meter events.

The logged data can be used to collect or control time of use or rate of use data that can be used for water or energy usage profiling, time of use billing, demand forecasting, demand response, rate of flow recording, leak detection, flow monitoring, water and energy conservation enforcement, remote shutoff, etc.

Advanced Metering Infrastructure, or AMI is the new term coined to represent the networking technology of fixed network meter systems that go beyond AMR into remote utility management. The meters in an AMI system are often referred to as smart meters, since they often can use collected data based on programmed logic.

Application

- Domestic Homes
- Industrial uses

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Advantages

- Smart automated processes instead of manual work.
- Accurate information from the network load to optimize maintenance and investments.
- Customized rates and billing dates.
- Streamlined high bill investigations.
- Detection of tampering of Meters.
- Accurate measurement of transmission losses.
- Better network performance and cost efficiency.
- Demand and distribution management.
- More intelligence to business planning.
- Better company credibility.

RESULT

- Precise consumption information.
- Clear and accurate billing.
- Automatic outage information and faster recovery.
- Labour not required

CONCLUSION

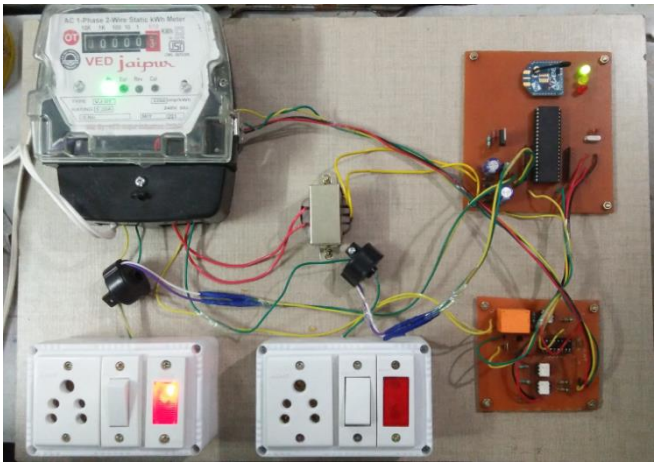
Smart Energy Meter is a unique solution for problems in existing manual system. Automatic Meter Reading is self assured automation system. Implementation of Automatic Meter Reading with the help of standalone system is an innovative idea. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources but with the help of Automatic Meter Reading, we can easily overcome this anomalies.

Standalone Smart Meter system is most suitable to implement transfer of unit. Using prepaid services, we can make proper use or storage of electricity. Economic benefits include increased cash flow, lower labor and equipment cost, increased accuracy and lower costs some customer satisfaction benefits include improved service quality, more customer choices and faster response time.

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Output

Transmitter &Receiver





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