AUTOMATIC ENERGY METER WITH POWER THEFT DETECTOR USING GSM TECHNOLOGY

R.PRADEEP RAJA[1], Dr.S.M.Ramesh[2], Boobalakumaran S.M[3], Shanmathi .S[4]

PG Scholar, Department of ECE, BannariAmman Institute of Technology, Erode, T.N, India[1, 3,4]

Assistant Professor, Department of ECE, BannariAmman Institute of Technology, Erode, T.N, India[2]

Abstract: In the resent technology development everything became automated .Automatic energy meter (AEM) is one among them. In this automatic energy meter amount of power consumption is calculated on monthly basis and the calculated data (amount of power consumption) is send to the Electricity board for billing and EB again send back the bill amount to the every user. This energy meter also alert the EB in case of any detection of power theft .This system uses ATMEGA microcontroller for collection and manipulation of data and the technology used here for communication is GSM technology.

Keywords: Automatic energy meter (AME);Global System Monitoring

INTRODUCTION

Electronic metering technology greatly reduces the man power and time and also made easy for remote area people for paying the bill[1]. It also reduces the non payment of the bill and avoids the mistake due to manual calculation. Power theft is one of the greatest problems that our country is facing and with the help of this AME power theft can be greatly reduced. This Energy meter always have predefined value of amount of electricity that the user is going to use .If there is any huge difference between the amount of power transmitted (including technical losses) and amount of power being billed then it comes to the conclusion that there exist an power theft .This power theft can be greatly reduced with the help of AME.

EXISTING METHOD

A. WIRELESS ENERGY METER

The Smart automatic energy meter uses blue tooth for sending the recorded to the nearby device may be the personal computer but it is useful only for small distance communication. Some method Energy meters uses zigbee for sending the recorded data and it also covers a small area.

B.WIRED ENERGY METER

Wired   Energy   meter   uses   power   line communication for sending data and some of the Energy meter uses telephone lines for communication .The main disadvantage of this methods is the communication get loss if there is any disconnection in the lines.

PROPOSED METHOD

The proposed method uses GSM(Global System for Mobile communications) for sending and receiving the data from the Energy meter to the Base station. The reason why we are going for GSM technology is since it has a huge coverage area. It can even covers a remote area Where the manual measurement of power by manpower is highly difficult.

OVER VIEW OF GSM

In GSM the data transfer can made the rate up to 9.6kbps .It also have Short message Service(SMS) facilities. It operates in 900MHZ and 1.8GHZ Europe and 1.9 GHZ and 850MHZ in US[3].The GSM capabilities in India is GSM 900 and GSM 1800[4].In India there are about 733 million GSM subscriber[5].The figure shows the number of GSM subscribers on May 2014[5]

The steup consist of Automatic energy meter and the embedded   unit   .The   embedded   unit   consist   of microcontroller .LCD display ,GSM module for sending and receiving the data.
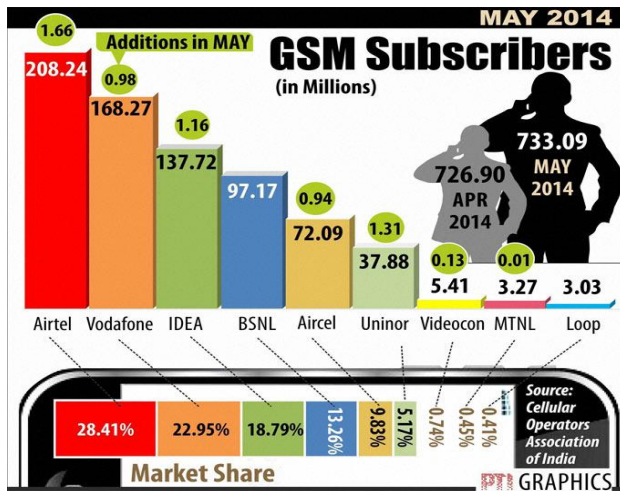
BLOCK DIAGRAM
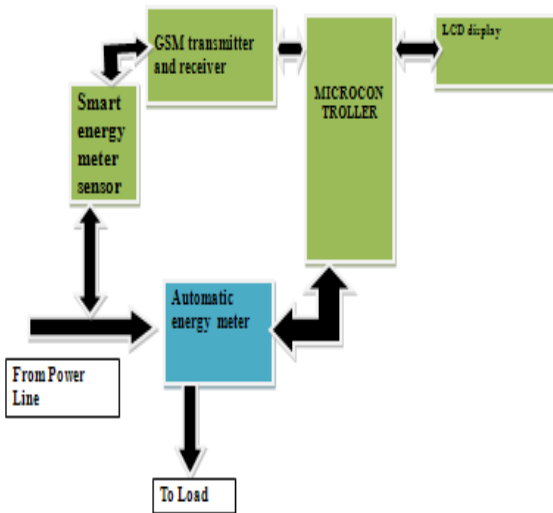
A.MICROCONTROLLER

It uses ATMEGA microcontroller is a low power high –perormance8 –bit microprocessor .and is based on advanced RISC architecture .It has 130 powerful instructions and most of them are single clock cycle execution. It has 32 X 8 general purpose register. It has8kbytes of in-system self programmable flash memory and 512 bytes of EEPROM. It has two 8bit Timer/counter with separate prescaler and one 16bit Timer/Counter with separate prescaler and it has 23 programmable I/O lines .It has the operating voltages from 4.5V-5.5V and speed up to 0-16 Mhz [2].

B.SMART ENERGY METER SENSOR

Smart energy meter sensor is connected between the power lines and automatic energy meter via

Microcontroller and GSM module. This energy meter continuously monitor the amount of power drawn though that power line by the user. And stores the value in the flash memory and compare the value with the energy meter value .If the both the values are same means there is no issues but if there is any change in value means then there is an power theft occurs and it will send the message to Electricity board That there may be the occurrence of power theft in that particular Energy meter.

C.GSM TRANSMITTER AND RECEIVER

This block consist of GSM module for sending the meter data to the electricity board and also it is used to alert the Electricity board in case of any occurrence of power theft. It will send the data which is manipulated by microcontroller. The data may be electricity usage data or it may be notification message about power theft. The user can receive the SMS about the bill amount sent by the electricity board to their mobile number.

SIMULATION

The simulation of the proposed method is done using proteus and the following diagram shows the simulation of automatic energy meter with power theft detector.
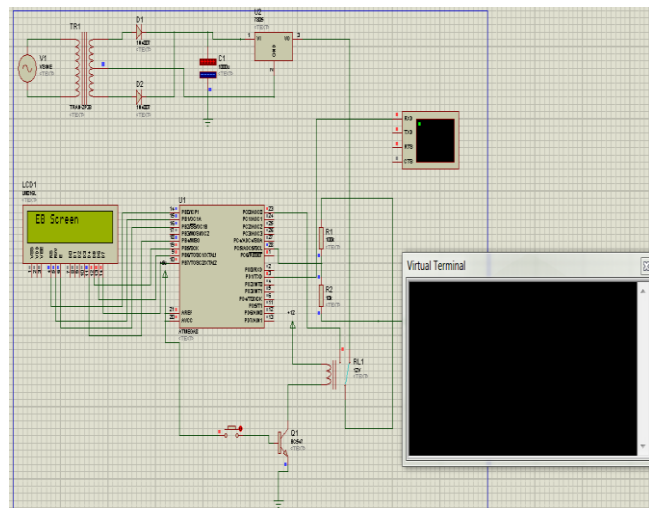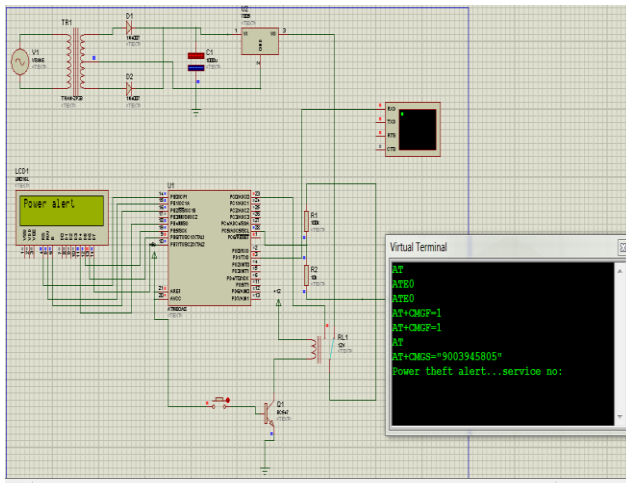
CONCLUSION

This paper deals about the automatic energy meter billing and power theft detection using GSM technology. The drawback of this system is there may be a chance of missing SMS so that user may be in the position of non-payment of electricity bill. The future work may be done to reduce the chance of this missing SMS

REFERENCES

[1] GSM Based Automatic Energy Meter Reading System with Instant Billing

[2] www.atmel.com/devices/atmega8.aspx

[3]http://www.gsma.com/aboutus/gsm-technology/gsm

[4]http://www.gsmarena.com/networkbands.php3?sCountry=INDIA

[5] http://ibnlive.in.com/news/733-million-gsm-subscribers-in-india-airtel-leads-with-2841-market-share/480165-11.html