

# Wireless Energy Theft Meter using GSM

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**Abstract**--This paper deals with Energy meters are replacing conventional energy meters (electro Postpaid mechanical energy meters) throughout the world power systems. They have outperformed the electromechanical meters in terms of functionality and performance. The manufacturing investment, the measurement accuracy and quality, and fault tolerant billing are each unquestionably superior to the traditional electromechanical meter design. The electronic energy meter have built in microcontroller based technology that makes it accurate, more reliable, tamperproof and with future enhancing prospect the most preferable over electromechanical meter. Electromechanical meters have been the standard for metering electricity since billing began. Today's electricity companies are demanding more information from meters in the residential sector, where metering has typically been limited to kilowatt-hours. New features such as multi-tariff billing, reactive energy measurement and power quality monitoring are desirable to improve generation, distribution, customer service and billing. Postpaid energy meters are mainly uses to restrict the energy theft, especially in urban & rural areas. 8051 microcontroller & Energy Metering IC ADE7751 along with other circuit are used in this project.

**Keyword:** Theft Detection and power saving Energy meters.

## I. INTRODUCTION

Electricity is the modern man's most convenient and useful form of energy without which the present social infrastructure would not be feasible. The increase in per capita production is the reflection of the increase in the living standard of people. When importance of electricity is on the increasing side, then how much should theft of this energy or illegal consumption of power from the transmission lines be averted? Power theft has become a great challenge to the electricity board. The dailies report that electricity board suffers a total loss of 8% in revenue due to power theft every year, which has to be controlled. Our project identifies the power theft and indicates it to the electricity board through power line. We had also dealt about the remote monitoring of an energy meter.

## II. OBJECTIVES

- This system would provide a simple way to detect an electrical power theft without any human interface.
- It would indicate exact zone and distribution line on which unauthorized tapping is done in real time.
- It would be time saving if distribution company personnel take reading by this wireless technique.

## III. MOTIVATION

The motivation for us to take up this project is the current inefficient distribution system of the electricity boards all

over the world. Also the present inability of the authorities in applying the existing laws in a stringent form has encouraged more and more people to involve in such unlawful activities. In case we develop a effective system to remotely monitor the use of power and are able to detect power theft at the exact location in a accurate and cost effective way, such huge losses can be prevented. This kind of money could definitely be used for the development of the quality of electricity board and its service. The severe power shortage can be overcome by the implementation of our simple system. More over this kind of implementation of proper billing to all the customers would reduce the reckless use of power and would surely help us to build a greener and more eco friendly environment for ourselves. As the majority of the power we generated is by burning coal, which adds to the already severe problem of the green house effect. Thus our group has been motivated to bring up this completely unique method of remotely sensing power theft in most of the possible ways.

## IV. EXISTING METHODS

In the existing methods wireless communication system of energy meter used with GSM module.

## V. PROPOSED METHOD

In the proposed method GSM technology used to transmit the meter reading to power suppliers with the required cost. and government. Then the energy theft controlled by 8051 microcontroller and some other technique with high security.

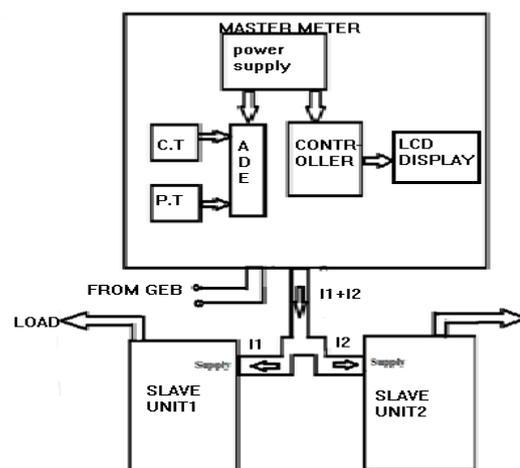
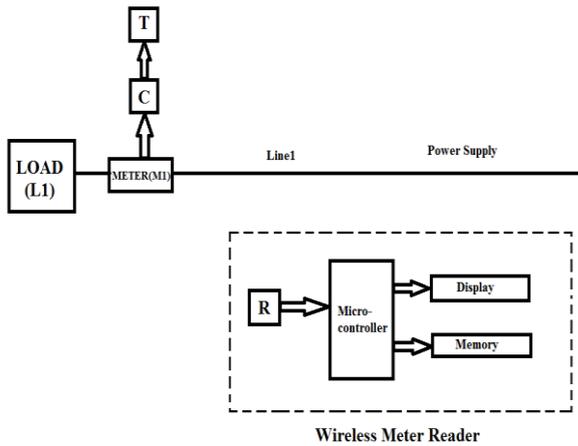


Fig. 1: Schematic diagram.

## VI. ENERGY METER

Energy meter is a device that calculates the cost of electricity consumed by a home, business, or electrically powered device. In this project our meter box made of current transformer, Potential transformer nad micro-

controller .According to the energy meter calculates the reading with the help of the micro-controller . micro-controller is used to detect the theft in energy meter and sending through GSM module.



### VII. WORKING PROCESS OF THE SYSTEM

First of all, 230volts a.c supply is step down to 9 volts First of all as shown from the hardware, 230 volts a.c. supply is step down to 9 volts by means of 230/9 volts step down transformer. This is further rectified and converted to varying dc. The input coming from rectifier unit contains a.c. components which is filter out by means of high capacity (220 0 uf) capacitor connected in parallel. Further it is fed to 7805 regulator which gives the constant 5 volts dc output. Now this constant 5 volt d.c. supply is fed to metering ic ade7751, microcontroller 8051, lcd display unit, eeprom atmel 24c02.the ct and pt are measuring unit which provides 1 va constant power by means of preset which is a requirement of ade7751 i.e. fed tov1a, v1b of ct channel and v2a of pt channel of ade7751 metering ic. Now the output pin cf of ade7751 gives instantaneous real power information in a frequency pulses form. This o/p is intended to be used for calibration purpose.

### VIII. THEFT CONTROL SYSTEM

The theft in energy meter is the major drawback in our country because of theft more than lakes of money loss per state in our country. So our project deals about the theft control in energy meter by using embedded systems. To control the theft we use two types of theft controlling process namely tapering of seal in energy meter, underground power theft control .The first process of theft control by using GSM module. GSm module is fixed in the energy meter screw with 12v rechargeable battery for identifying the tapering of sea.

### IX. MATHEMATICS PROOF

89v51 microcontroller count the pulses which is proportional to kwh o/p. this is done by mathematical equation:

$$1\text{kw} * 1\text{hour} * 1\text{pulse} = \text{No. Of Pulses}$$

$$\text{Watts} * \text{Seconds}$$

$$\text{Ex. } 1000\text{watts} * 3600\text{seconds} * 1\text{pulse} = 2571\text{pulses}$$

$$200\text{watts} * 7\text{seconds}$$

Now these 2571 pulses are proportional to 1 kwh o/p

### X. CONCLUSION

The project model reduces the manual manipulation work and theft .use of gsm in our system provides the numerous advantages of wireless network systems. The government saves money by the control of theft in energy meter and also more beneficial for customer side and the government side. The metering ic ensure the accurate and reliable measurement of power consumed. Cost wise low when compared to other energy meter without automatic meter reading and theft control.

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