PREPAID ENERGY METER USING RFID

1Assistant professor, 2,3,4,5Students
Department of Electronics and Communication Engineering
Coimbatore Institute of Engineering and technology

ABSTRACT
The present system of energy billing in India is error prone and also time and labor consuming. Errors get introduced at every stage of energy billing like errors with electro-mechanical meters, human errors while noting down the meter reading and error while processing the paid bills and the due bills. There are many cases where the bill is paid and then is shown as a due amount in the next bill. There is no proper way to know the consumer's maximum demand, usage details, losses in the lines, and power theft. The remedy for this drawback is prepaid energy billing, which could be titled. Pay first and then use it. There are clear results from many countries, where prepaid system have reduced the usage (wastage) by a large amount.

INTRODUCTION
The present traditional billing system have many problems like problem of payment collection, energy thefts etc. due to which the traditional billing system is slow, costly and unreliable. The present billing system has chances of error and it is also time or labor consuming. prepaid energy metering system has also been proposed and developed based on local prepayment and card reader. So it is essential to develop a billing system which solves the problem of billing manually and also reduces the manpower. In this paper we proposed and designed a prepaid energy meter using microcontroller AT89C51 from ATMEL family. The reason for using this microcontroller is its high performance, power efficiency or design flexibility etc. In this paper, a recharge card is used which is available in various ranges (i.e. Rs. 50, Rs. 100, Rs. 20 etc.) and the energy meter to which the no. of recharge units has to be loaded. Suppose a consumer recharges card for Rs. 50 RFID tag is read using RFID reader that the prepaid energy meter will be activated. According to the power consumption the amount will be reduced. An IR circuit is used to count the amount of energy consumed and an LCD is used to display the meter readings. When the recharge card amount is nil the relay will automatically shut down the whole system. In this project we also have provision to give an alarm sound using buzzer to the consumer before the whole amount is depleted.
II. PREPAID ENERGY METER:

Prepaid energy meter is technique which is cost efficient and can reduce problems associated with billing and also reduces deployment of manpower for taking meter readings. Prepaid energy meter has many advantages both from suppliers as well as consumer’s point as follows:-

Why Prepayment?
- No bill production
- No bill distribution
- No need to chase payments
- Load and demand side management
- Limit load
- Load based
- Time based

OPERATION

This project is designed with
- RFID R/W tag
- RFID R/W reader
- Microcontroller
- Driver circuit
- Alarm
- Keypad RFID R/W is the special type wireless card which has inbuilt the embedded chip along with loop antenna. The inbuilt embedded chip represents the 12 digit card number. In the R/W card we can read as well as write the information on the card.

RFID R/W reader is the circuit which generates 125KHZ magnetic signal. This magnetic signal is transmitted by the loop antenna connected along with this circuit which is used to read and write the information on the RFID card. In this project RFID R/W card is used as prepaid card and charged with some amount of money like Rs.100 and Rs.500 etc. This prepaid card is inserting in the Energy meter. The consumed energy is measured by IR transmitter and receiver.
Infrared transmitter is one type of LED which emits infrared rays generally called as IR Transmitter. Similarly IR Receiver is used to receive the IR rays transmitted by the IR transmitter. One important point is both IR transmitter and receiver should be placed straight line to each other. Here the IR transmitter and receiver are placed in between the energy meter.

We put holes in the energy meter disc. Initially the IR transmitter passes the rays to receiver. Whenever the disk is rotating it cuts the IR rays between Transmitter and Receiver. So the corresponding signal is given to microcontroller through signal conditioning unit. So the inside the counter will increment the one value for each rotating. Microcontroller will calculate the amount for each rotating and compare with RFID prepaid card amount.

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**CONCLUSION**

The paper is intended to present an overview of prepaid energy meter, which can control the usage of electricity on consumer side to avoid wastage of power. Prepaid energy meter is a concept to minimize the Electricity theft with a cost efficient manner.

The users are not bound to pay excess amount of money, users have to pay according to their requirement. It can reduce problems associated with billing consumers living in isolated area and reduce deployment of manpower for taking meter readings. Prepaid energy meter is more reliable and user friendly. From all these we can conclude that if we implement this prepaid energy meter then it can become more beneficial.

**REFERENCE**

