

# Prepaid Energy Meter with GSM Module and Theft Detection

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**Abstract**— The GSM technology is used so that the consumer would receive messages about the consumption of power (in watts) and if it reaches the minimum amount, it would automatically alert the consumer to recharge. This technology holds good for all electricity distribution companies, private communities, IT parks and self-containing housing projects. The implementation of this paper will help in better energy management, conservation of energy and also in doing away with the unnecessary hassles over incorrect billing. The automated billing system will keep track of the real time consumption and will leave little scope for disagreement on consumption and billing. A scheme of electricity billing system called "prepaid energy meter with tariff indicator" can facilitate in improved cash flow management in energy utilities and can reduce problem associated with billing consumer living in isolated area and reduces deployment of manpower for taking meter readings.

**Key words:** ARM 7, GSM, RFID READER

## I. INTRODUCTION

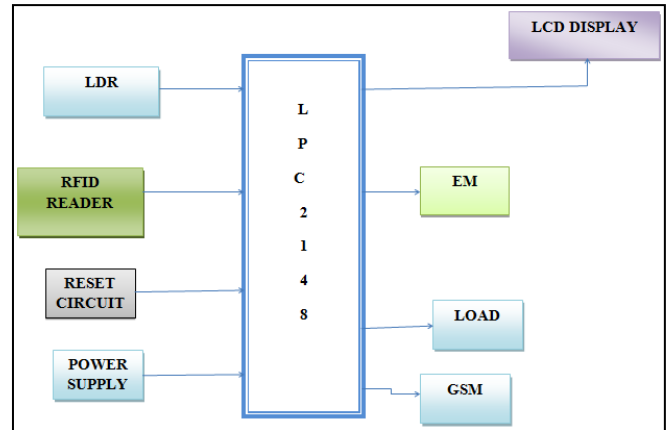
In recent years many attempts have been made to design the energy meter with instant billing technique but till now the designed energy meters are not efficient and do not provide replacement. Now-a-days the numbers of Electricity consumers are increasing in great extent. It is hard to handle and maintain the power due to growing requirements. Maintenance of the power is an important task as the human operator goes to consumer's house and produces the bill as per the meter reading. The billing process takes much time if the consumers are not in the house while taking readings on energy consumption. It requires a lot of time and more labor to analyze energy consumption and generating the bill. If the consumer did not pay the bill, the Foreman needs to go to their houses to disconnect the power supply. These consumes time and difficult to handle. The manual operator cannot find the Un-authorized connections or malpractices carried out by the consumer to reduce or stop the meter reading/power supply. Some of the energy meters which had been implemented are prepaid but it needs internet to recharge it. The major disadvantage of that method is that it needs internet and the computer interface. In this paper we propose a method which uses GSM Network which eliminates the need of internet.

## II. EXISTING SYSTEM

Previous system was not capable to give any indication about power theft detection. Also no message send to the user or MSEB. When theft gets detected no power disconnect to load. To overcome all these drawbacks , a prototype system is implemented called as Power theft detection system.

## III. SYSTEM DESCRIPTION

### A. Working diagram



### 1) Proposed work

The prepaid energy meter is advanced technology so that it is usable to save consumer as well as Electricity board timing also theft detection can be used to detect theft and wastage of electricity

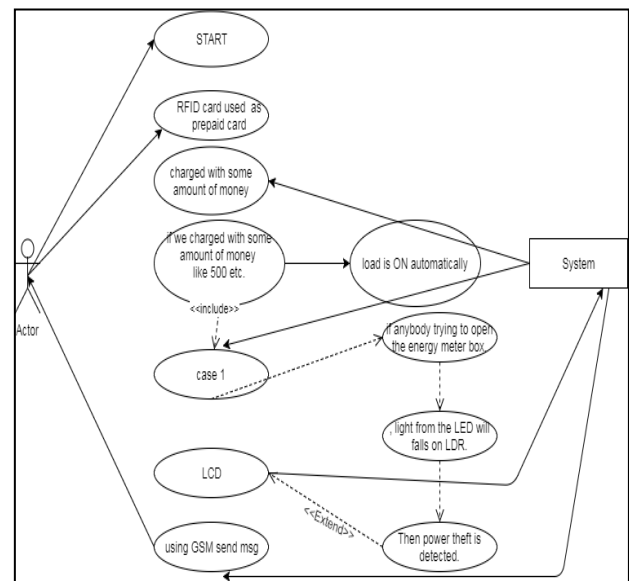
### B. GOALS AND OBJECTIVES

This system would provide a simple way to detect an electrical power theft without any human interface

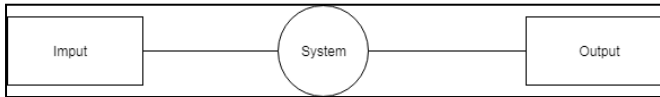
- It will determine transmission line faults.
- To maximize revenue generation by the power utility companies.
- Its cost is less as compare to other present system .

## IV. UML DIAGRAMS

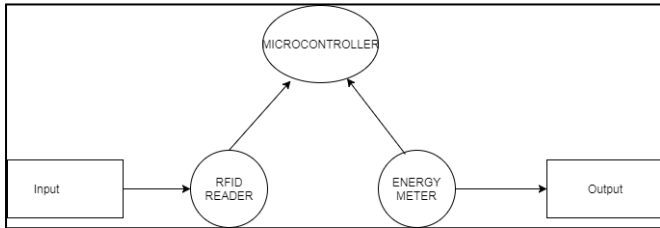
### A. Use Case



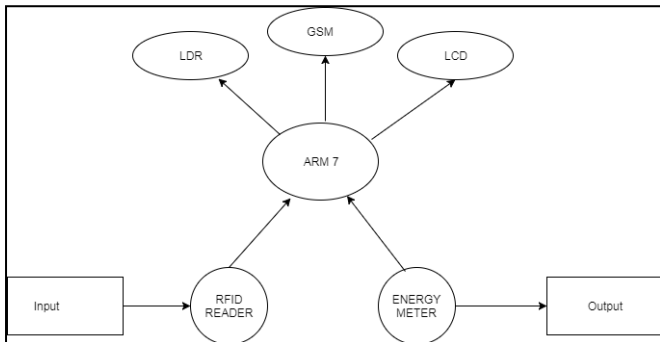
### B. DFD0



### C. DFD1



### D. DFD2



## V. SCOPE OF PROJECT

The scope of this project is to reduce billing, manpower, time of electricity board & detect the power theft. Electricity theft is at the center of focus all over the world but electricity theft in India has a significant effect on the Indian economy, as this figure is considerably high. Ineffective and inefficient present methods of detecting and preventing Power theft cause a revenue loss along with damage to personal and public property. Large amount of power shortage is caused due to power theft. One of the challenges in stopping power theft is the difficulty in detecting power theft. In particular it is difficult to find the exact location where power theft is occurring.

Measurement of parameters like power line current and power line voltage has not been available in a satisfactory way to optimize power network management. But due to advancement in present technologies we can give better solution to detect the power theft.

## VI. APPLICATIONS & FUTURE SCOPE

### A. Applications

This smart energy meter can be used in anywhere e.g. Banks, Offices, Industries, jeweler Shops and Home Applications.

### B. Future Scope & 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 excesses amount of money, users have to pay according to their requirement. It can reduce problems associated with

billing consumers living in isolated areas 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.

Energy theft detection is very required, as population and energy requirement is increasing day by day so that we can implement more advance technology to detect energy theft on grid lines also.

### ACKNOWLEDGMENT

Authors want to acknowledge Principal, Head of department and guide of their project for all the support and help rendered. To express profound feeling of appreciation to their regarded guardians for giving the motivation required to the finishing of paper.

### REFERENCES

- [1] A.Vijayarajet al "Automated EB Billing system using Ad-Hoc wireless routing" published at International Journal of Engineering and Technology Vol.2 (5), 2010, 343-347
- [2] Muhammad Ali Mazidi; Janice Gillispie Mazidi; Rolin D. McKinlay; edition 2007, "The 8051 Microcontroller And Embedded System"
- [3] Datasheet of LPC2148.
- [4] B.P. Singh & Renu Singh, "Advanced Microprocessors and Microcontrollers".
- [5] Irfan Quazi et al "Prepaid Energy meter based on AVR Microcontroller" published at International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622, Vol.1, Issue 4, pp.1879-1884.
- [6] Md. Mejbahul Haque et al "Microcontroller Based Single Phase Digital Prepaid Energy meter for Improved Metering and Billing system" Published at International Journal of Power Electronics and Drive System (IJPEDS) Vol.1, No.2, December 2011, pp.139-147 ISSN: 2088-8694.
- [7] I. H. Cavdar, "Performance analysis of FSK power line communications systems over the time-varying channels: Measurements and modeling," IEEE Trans. Power Delivery, vol. 19, pp. 111-117, Jan. 2004.