



# PREPAID ENERGY METER BY USING GSM TECHNOLOGY

K.Satyalokesh<sup>1</sup>, T.Divyavaralaxmi<sup>2</sup>, M.Vikas<sup>3</sup>, P.Janaki<sup>4\*</sup>, Y.Sumith<sup>5</sup>

\*janaki.pakalapati@gmail.com

<sup>1 2 3</sup> students, <sup>4</sup>Associate Professor, <sup>5</sup> Assistant Professor

<sup>1 2 3 4 5</sup>Department of Electrical And Electronics Engineering,  
Lendi Institute of Engineering And Technology, Vizianagaram, 535005, India

**Abstract:** The smart energy meter system helps how much energy is consumed in real time by the users and also they can be able to make changes to reduce the energy usage. By implementing these meters we can reduce the inconvenience to the employees and by putting an intolerance of sending monthly reading to the users. This paper presents the design of prepaid energy meter by using GSM Technology. This designed automated prepaid energy meter is used to assess the values of voltage, current and the consumption of power by displaying the units on LCD display. The main objective of this paper is to design and implement a Smart Electricity Metering System to control electricity consumption effectively by the consumers. The consumers can buy a specific amount of energy as per their requirement. If once the sim card is out of balance the consumer would receive a message about the consumption of power by giving an alert to recharge by using GSM Technology.

**Keywords:** Arduino, Energy meter, OLED Display, GSM Technology.

## I. INTRODUCTION

The present billing system includes electromechanical principle and to some extent digital energy meters are used. Despite the past electrical consumption and electrical distribution has become more complicated. Because of huge variation in electrical production and electrical consumption. The conventional meters with heavy coils and magnets are used so far for metering and billing system. They consume more time and labour and system is inaccurate. Due to high cost, lack of flexibility and reliability. To reduce all these problems we are going to implement a new technology which helps us in better energy management, conservation of energy, high accuracy and better performance. This automated billing system results in less size, less weight and will keep real time consumption. The GSM Technology is the major technology that we are using for automated billing and metering system helps for the consumers in way that they could receive message about energy consumption and it alert the consumer to recharge if it reaches the minimum amount and we can monitor our own energy meter readings regularly without the person visiting the every house at the end of every month. By this we can reduce man power consumers are also not satisfied with the services of power companies. Most of the time they have complaints regarding statistical errors in their monthly bills. Thus we are trying to present an idea towards the minimization of technical errors and to reduce human dependency at the same time. With the help of this project we are aiming to receive the monthly energy consumption from a remote location directly to a centralized office. In this way we can reduce human efforts needed to record the meter readings which are till now recorded by visiting every home individually. These results in considerable loss of human hours and also provides considerable details regarding the average consumption of a locality so that power supply can be made according to these data.

## II. BLOCK DIAGRAM

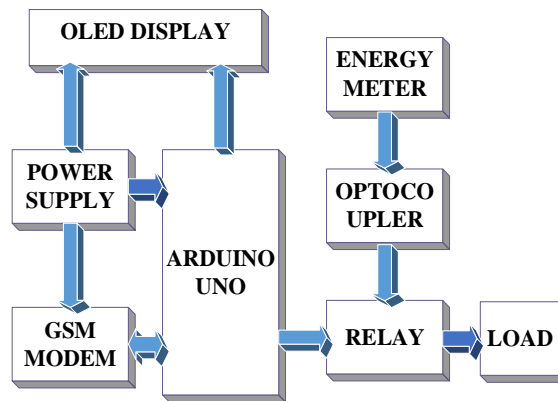


Figure1: Block diagram of prepaid energy meter by using GSM Technology.

## III. DESCRIPTION

When +5 volts supply is given to the Arduino, GSM modem, Oled display, Then Arduino which can be in on condition. After that Arduino will be given signal to the display “SYSTEM READY” on Oled. According to programming of Arduino which display different characters. After that GSM modem send the message to electricity board. Then electricity board can be recharge the energy meter through GSM modem. The load should be connected to the energy meter by using relay module. After some power consumed by the load then energy balance should be reduced to minimum value. Then the alert message sends to the consumer. Due to low balance condition the Arduino will be send the signal to the relay module to disconnect the supply.

## IV. SPECIFICATIONS

- Energy meter – 5 to 30 amps, 240 volts
- GSM – Sim 800A
- Arduino Uno – operating voltage 5 volts, input voltage – 7 to 20 volts.

## V. ABBREVIATIONS

- GSM: “Global System For Mobile Communication”
- UNO: “One In Italian”
- IDE: “Integrated Development Environment”

## VI. FLOW CHART

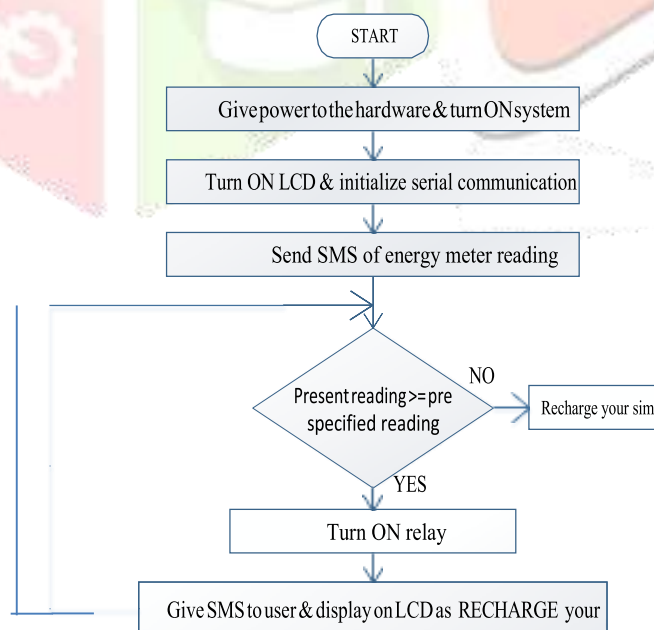


Figure2: Flow chart of prepaid energy meter.

## VII. APPLICATIONS

- Domestic purpose.
- Industries.
- Medical.
- Also in so many general purpose.

## VIII. RESULTS

These results shows how quickly the work is done by reducing man power. When some amount of power should be consumed then it will automatically reads the data until it reaches to its minimum balance and if we consume 100 units it will give us result as that we have consumed 100 units. This meter will bring solution of creating awareness on unnecessary wastage of power will tend to reduce wastage of power.

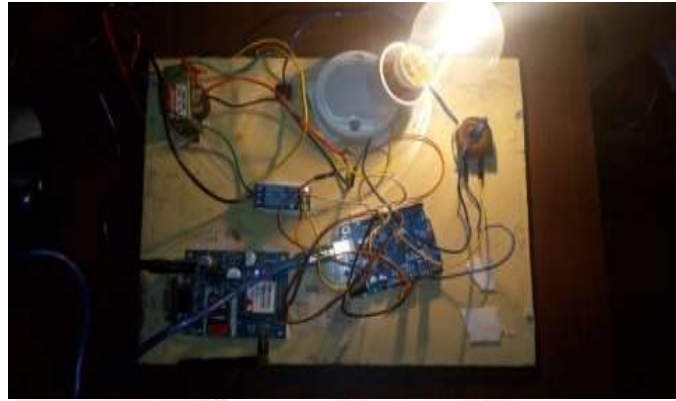


Figure 3: Prepaid energy meter by using GSM Technology with load.



Figure 4: Prepaid energy meter by using GSM Technology without load.

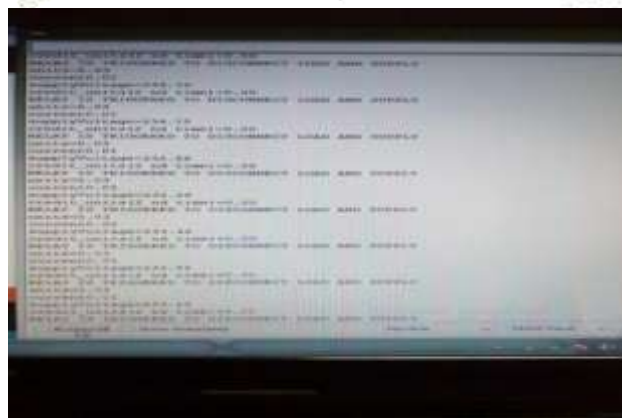


Figure 5: Output of prepaid energy meter by using GSM Technology with & without load.

## IX. CONCLUSION

The design of prepaid energy meter using GSM Technology is used for assessing the power consumption and electricity bill before their use. We hope this energy meter will be used for better energy management, conservation of energy.

## X. FUTURE SCOPE

These type of systems is can be modified for better performance and reliability by introducing new technologies in future work.

## REFERENCES

- [1] Mrs. Akanksha Shukla, et.al, "Embedded system based prepaid electricity metering & billing", IJETEE, Vol. 2, Issue. 4, April-2013.
- [2] "A Review on Prepaid Energy Meter Using Arduino and GSM Technology"International Journal of Research in Advent Technology (IJRAT) (E-ISSN: 2321-9637) Special Issue National Conference "CONVERGENCE 2017", 09th April 2017
- [3] AlokMalviya, "An Approach to Automate Power Meter Reading & Billing System" Global Journal of Management and Business Studies. ISSN 2248-9878 Volume 3, Number 9 (2013), pp. 943-948© Research India Publications.
- [4] G. L. Prashanthi, K. V. Prasad, "Prepaid Energy meter monitoring with power theft detection and intimation system using GSM", Journal of Electronics and Communication Engineering, vol. 9, no. 6, Nov - Dec. 2014.
- [5] K Ashna, Sudhish N George, "GSM Based Automatic Energy Meter Reading System with Instant Billing", This project was supported and financed by National Institute of Technology Calicut IEEE, 2013.
- [6] SaiKiran Ellenki, Srikanth Reddy G and SrikanthChan"Advanced Smart Energy Metering System for Developing Countries" International Journal Of Scientific Research And Education,2014
- [7] Subhasimaitra, "Embedded energy meter" A new concept to measure the energy consumed by consumer and to pay the bill, Power system Technology and IEEE Power India conference 2008.