Billing of Electric Meter using GSM

Mrs. Arpitha Shankar S I[1], Ms Chaitra T V [2], Ms Meghana S [2], Ms Sadhana Prakash Sharma[2], Ms Shilpa M

[1]Assistant Professor, TE department, GSSSIETW, Mysuru
[2]Student, 8th semester, TE department, GSSSIETW, Mysuru

***Abstract:*-Although there are many technological innovations that are taking place, existing electricity consumption billing process in India is not up to the mark and does not meet the latest technology available. In order to achieve a better and efficient billing system we are introducing a fully automatic billing system i.e., "Billing of electric meter using GSM". Here along with existing unit, a GSM modem will be installed in every consumer's place with a microcontroller which is also connected to the Electric Board office on the other end. This calculates the electricity usage and the amount to be paid based on consumer's power consumption and sends it to the consumer's mobile by SMS. The same details will be displayed on LCD which is attached to user's unit. Whenever the user has not paid bills after the due date the power supply is disconnected and reconnected automatically as soon as they pay bills.**

Keywords: GSM Modem, Digital Power Meter, Short Messaging Service, GSM network.

I INTRODUCTION

From the early days till today meter reading for electricity consumption and billing is done by human operators from houses to houses. This therefore requires a very large number of human operators and long working hours to acquire complete data reading and billing in a particular area.
Moreover human operators are very much likely to make mistake while billing or reading a meter and sometimes the house's electric power meter may be placed in a location where it is not easily accessible. Again printed billing has the tendency of being lost in the mail box or being never delivered. Day by day due to the increasing number of residential housings and commercial buildings, more human operators and longer working hours is needed to complete the meter reading task which eventually increases the energy provider operation costs for meter reading. To achieve efficient meter reading, reduce billing error and operation costs, an Automatic Electric Meter reading system can be introduced with every energy meter in an area. "Billing of electric meter using GSM" implements the emerging applications of the GSM technology. GSM is a Global system for mobile communication (GSM) and is a wide area wireless communications system that uses digital radio transmission to provide voice, data, and multimedia communication services. We have selected a particular GSM modem SIM com 900 for our project. The proposed approach for designing this system is to implement microcontroller based control module that receives its instructions and command from a cellular phone over the GSM network. The microcontroller then will carry out the issued commands and then communicate the status of a given appliance or device back to the cellular phone.

II RELATED WORK

The currently prevailing system involves the user to go up to the EB office to manually pay his bills. The readings are taken using the analogue meter present in the customer's house. The readings are taken using an employee working at the EB office. This system has a set of disadvantages which are given below:

1. Erroneous Readings – This involves errors present in the meter reading which are committed due to human mistakes.
2. Manual Labour – The amount of workforce involved in this prevailing EB system is too large as the EB people have to visit many areas at roughly the same date.
3. Time Consuming – This system takes a lot of time to go personally to the customer's house and take the readings.

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III BLOCK DIAGRAM

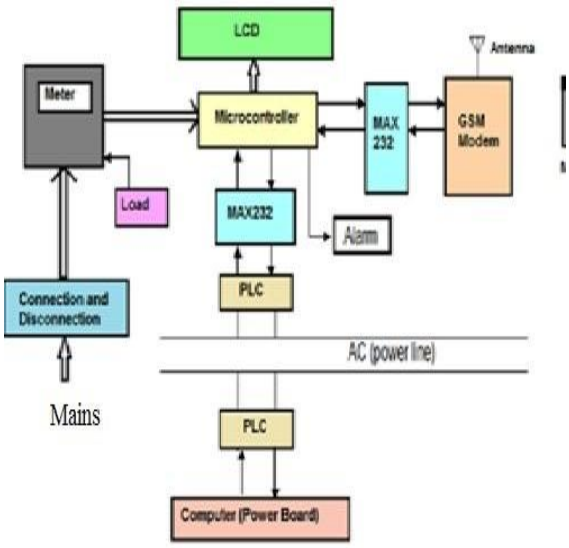

Figure 1 Block Diagram of Billing of electric meter using GSM.

Figure 1 shows the simple block diagram of our project. It consists of the power supply section, the microcontroller, the GSM modem, LCD display, EB Meter, PLC and Max232.

Initially the load is connected to the electric meter, where electric meter reads the number of units consumed by the load, then sends that information to the microcontroller. Microcontroller then sends that information to the EB via PLC modem. In EB, there is a PC to calculate the bill for the power consumed by user, then send it to the microcontroller via PLC modem at the EB side. Microcontroller will send that information to GSM modem where GSM modem will send that to particular customer's SIM number. Same information will display on the LCD also. There will be an alarm to alert user twice a day, if in case message is not seen by the customer. If the customer fails to pay bill then there will be a message to microcontroller from the EB. Then microcontroller will disconnect the power supply and whenever they pay, a message from EB will be sent to the controller saying bill has been paid, then microcontroller will connect power line to the consumer.

IV RESULT

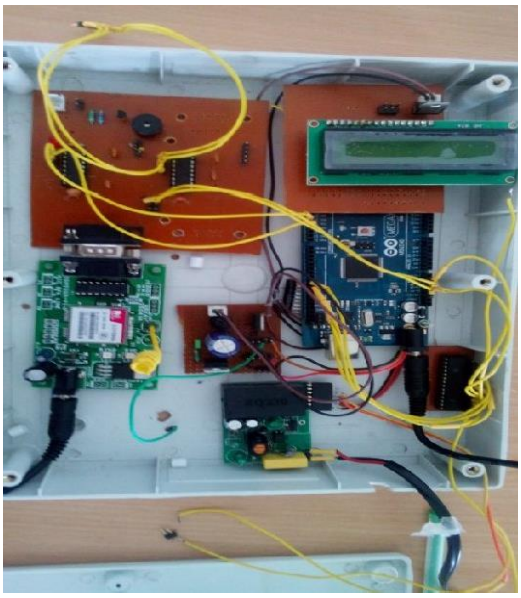

Figure 2 Hardware Setup

Figure 3 Displays NO SIM when SIM is not detected

Figure 4 Displays SIM PRESENT when SIM is detected

Figure 5 It displayed when microcontroller configures GSM modem

Figure 6 Final output

V CONCLUSION

In the present situation all customers are using manual commun ication. To reduce the manual efforts and human errors, we need to have some kind of automated system monitoring of all the parameters and functioning of the connections between the customer and electricity board.

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