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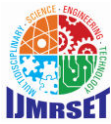
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GSM (SMS)based Prepared Energy Meter with Automatic Light CUT-OFF

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ABSTRACT: The Prepaid Energy Meter with 8051 Microcontroller using GSM for prepaid billing of electricity used in house. Today in India, the present energy billing system is manual which increases processing time and becomes labour consuming. The manual billing system makes data reading and processing errors which may occur at every stage of energy billing. The aim of this system is to minimize the errors by introducing a new system of Prepaid Energy Metering using GSM. Also using this system, it reduces the queue at the electricity billing counters and to restrict the usage of electricity inevitably, if the bill is not paid. The GSM expertise is used so that the consumer would get messages about the consumption of power (in watts) and if it touches the minimum amount, it would automatically alert the consumer to recharge. The GSM module affords a mode of communication among the user and service provider. So, the user can recharge his/her electricity account from phone while sitting at home. The implementation of this system will help in better energy management, conservation of energy and automatic and authentic billing system. The automated billing system will keep track of the real time consumption.

KEYWORDS: Microcontroller, Prepaid Scheme, GSM Modem.

I. INTRODUCTION

This System Works On Prepaid Energy Meter Which Is Utilized For Sensing The Energy Automatically Consumed At Home. Gsm Sim 800 Is The Interface In This System, Which Will Make The Interaction Between The User And The Energy Meter. This System Describes An Approach Of Transmitting The Consumed Electricity Data And Bill Using Gsm Modem. Traditional Meter Reading Is Not Fully Efficient And More Time Consuming For Meter Readings And Further Processing To Generate Bills As Well As The User Has To Pay Bills In Queue At The Counter Which Is Very Much Time-Consuming As Well As Inefficient. So, A System Is Required Which Collects Meter Readings Automatically I.E. Automatic Meter Reading (Amr) Systems. Its Application Lies In The Household, Commercial And Industries. In This Proposed Method, The Consumption Of Energy Will Be Monitored By The Prepaid Energy Meter Automatically. It Records Those Readings Continuously And Transmits To The User Through The Gsm Network. The Gsm Network Sends A Sms (Short Messaging System) For Electricity Used And Amount Paid To The User. The Service Will Be Quick, Fast And In A No Time Costumer Will Get The Updated Bill.

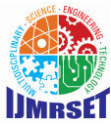
II. RELATED WORK

V. K. Mehta & Rohit Mehta “Principle of Electronics”

Microcontroller - Mazdi.

GSM Based Automated Meter Reading with Bill. Chettri, S., Nath, A.K. and Ahmed, M.A.

Kabwegyere (2004) argues that revenue collection efficiency determines the level of service delivery. The Total Margin measures the percentage of revenues collected from both primary and peripheral activities that is kept as profit, while the Operating Margin measures the percentage of revenues collected from primary activities that is kept as profit (Montaigne, 2010) The prepaid meter payment system is considered efficient with minimal error based on electricity fixed base tariff price during periodic review. This base price is then adjusted on a monthly basis according to an adjustment formula in order to take into account fluctuations that affect the generation costs of electricity. This includes; for example, increases or decreases in the cost of fuels required for electricity generation. Finally, the customer is provided with various tariff options that are classified under a tariff structure depending on customer demand levels. Customer billing processes play a critical role in revenue for a number of private and public sector



organizations, including municipalities. In the delivery of public services, for example, billing drives cash flow and is the key source of information for customers using these services. In many countries, reforming billing processes, coupled with strengthening collection processes, has improved revenue collection efficiency. Most of the evidence about the role of billing in revenue collection efficiency comes from the water sector (Governance and social development report, 2012). Some experts argue that billing systems based on consumption are more likely to be paid by individual users (USAID). In the water sector, this could take the form of universal adoption of water metering or spot billing (Agarwal, 2008). Other measures to improve efficiency in revenue collection include computerizing customer databases and billing systems. Misra and King, (2012) noted that human handling should be eliminated from all billing processes to prevent fraud and billing errors. Other experts have advocated for pre-payment as a means of increasing collections. This means that rather than billing after service consumption/usage, it may be better to use prepayment. This can ensure payments for services, as well as help households monitor and plan their expenditures. According to Blore et al., (2004), this can be more important when providing services for poorer customers who may also benefit from the option of phased payments facilities and/or debt cancellation. Agarwal, (2008) adds that strict enforced disconnection policy for utilities to address those who default in making payments will also help ensure payment compliance.

III. METHODOLOGY

- ▶ Design the hardware circuit for the system.
- ▶ Write the software program for the microcontroller.
- ▶ Integrate the hardware and software components.
- ▶ Test and debug the system.
- ▶ Deploy the system.

IV. EXPERIMENTAL RESULTS

During Test 1 We sent a message containing “read” to retrieve the reading of the meter and we received the reading through SMS some few moments later indicating the reading part was working as expected. In the next test, we sent “disconnect” and the lamps were turned off and we received a text message containing “meter disconnected” as expected. However, on the third test, when we sent “connect” the light bulbs didn’t come on. This was later diagnosed to be a programming error where we were instantly deleting messages that arrived and hence could not read the message to reconnect. This problem was then solved by inserting a delaying to allow the message to settle and be read properly before deleting. We got the expected results for reconnection in test 4 as indicated. During test five. The expected message for confirming disconnection was received at a later time which could be attributed to problems on the network operators’ side, the same thing happened for “read” on test 6.

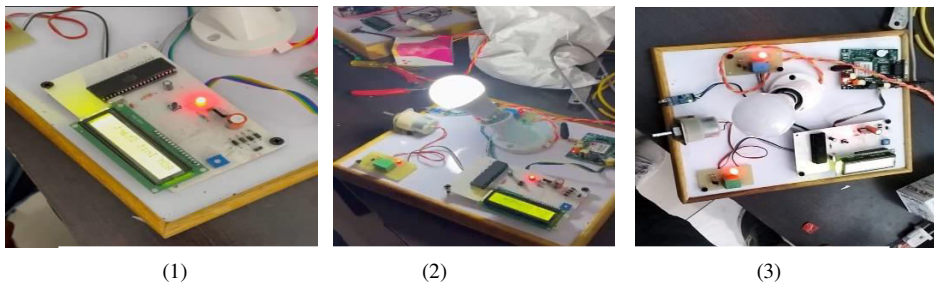


Fig. 1. Firstly, we are start the project reset key pressed to reset microcontroller, microcontroller start the counting the pulse, then recharge Rs 100 amount. dc motor start rotating. IR sensor counting the pulses of dc motor ,we use the dc motor as analog energy meter .

Fig. 2. We use the load as a lamp, so lamp is on & unit consumption show in LCD Display.

Fig. 3. Total amount recharge Rs 100 is consumed by load (lamp), then our load (lamp) is off.

V. CONCLUSION

In this project, a device incorporating a microcontroller and GSM modem has been designed and built in order to take meter reading of the amount of energy used from a consumer’s unit to energy provider’s outlet. The data from the energy consumption is processed and the bill sent via the GSM technology from the energy provider to the consumer.



The design was done in order to make reading and billing more accurate. The system will also help to disconnect customers with outstanding bills from the system until they have paid all arrears.

From the work we have done up to now from the conception of the idea to the development of the final product, we tried as much as possible to keep the design true to those objectives as much as possible.

As a result, the final device is one that is very efficient in obtaining meter reading and data with minimum margin of error, faster means of transmission from the customer to the energy provider and vice-versa and frequent notification to the customer through SMS.

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