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Automation with smart meter

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Abstract - *As we can see that the person from the electricity department has to visit each and every house for the meter readings and then they handover the bill to the customers every month. According to that reading customers have to pay the bills. The main drawback of this system is that the person form the electricity department taking the readings may read wrong value, due to which some errors like extra bill payments and notification from electricity department even though the bills are paid may occur. To overcome this issue we have come up with a new idea of eliminating the above errors and making the customers to update the status of the meter anytime. In this paper we will introduce controlling of the appliances ON/OFF and knowing the status of meter anytime anywhere using arduino. The meter reading with the units consumed and amount will be displayed in LCD and GSM module is also used for SMS notification.*
Keywords - *Automation, GSM module, Smart meter, SMS, Status*

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I. INTRODUCTION

Energy is crucial to human sustenance and development. Due to the increasing demand of people necessity, there is a increase in the energy and deficiency in the power generation, the gap between the demand and supply of electric energy is widening day by day. The integration of arduino with the GSM provides the meter reading system. Instead of using Atmel 89S52 microcontroller[1] we will be using Arduino. Arduino has good features than the other controller, it is small in size, it is easy to carry, low cost than the other microcontroller and cover less area. This system provides efficient meter reading avoiding billing errors and avoids the human intervention in power management.

Sometimes in Hurry, people forget to OFF the appliances and go out in work because of which there is wastage of electricity. If the person is out of station then he/she cannot come back to OFF/ON the appliances. Because of the carelessness of the people, wastage of electricity is increasing day by day, so that time our proposed system comes into play, through message we can turn ON/OFF the appliances.

This paper concentrates on two things

1. Power consumed
2. Controlling the home appliances through SMS

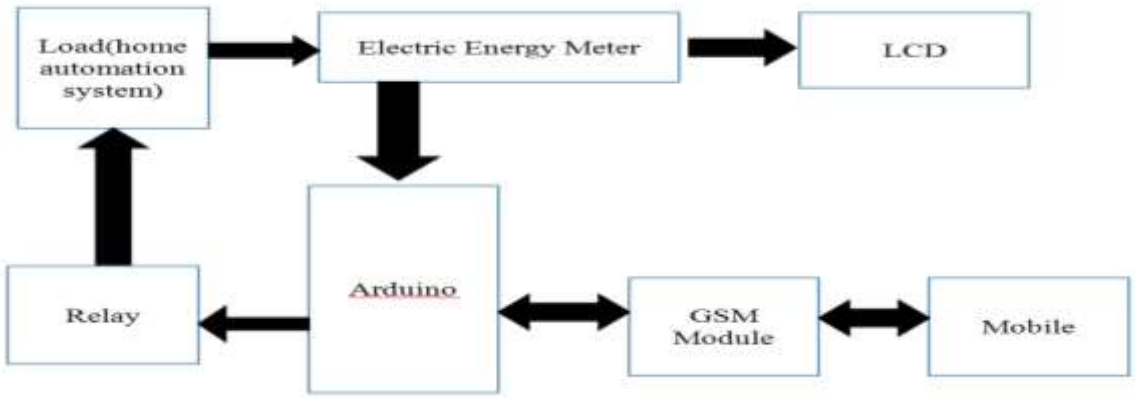
II. PROPOSED SYSTEM

A smart meter works by directly communicating with the GSM module. The proposed system consist of GSM module, Arduino and energy meter. Here energy meter is used for taking the pulse count. Every energy meter has its own constant which is termed as ENERGY METER CONSTANT, that is, 3200 blinks/Kwh. By counting those blinks we can easily calculate the power consumed by any unit [2]. This energy meter is connected with the arduino and arduino is connected with the 16X2 LCD which displays the units consumed and its cost . As soon as the meter starts a message is sent to the customer mobile regarding the status of the smart meter through GSM module. If the customer needs to know the current status of the meter anytime from anywhere he can send the message and can be get updated regarding the status and if the units consumed crosses the threshold value then automatically the SMS will be received in the mobile phone[3].

If the person is out of station then he/she can turn ON/OFF the appliances with just one message from mobile. As soon as the GSM module receives the SMS from the mobile phone it makes the relay low for turning OFF the appliances and makes the relay High for turning ON the appliances .

If the power consumed is more than the threshold value the person can control the appliances. In this manner a person can save the electricity and can reduce the unnecessary wastage of electricity.

III. BLOCK DIAGRAM



LOAD: This can be any home appliances like bulb, fan or else home automation system.
ENERGY METER: It is just used for taking the pulse count.
LCD: LCD stands for liquid crystal display. It is 16X2 display .It is used for displaying the units consumed and the amount. This is also used for displaying which appliance is ON/OFF.
ARDUINO:Arduino is an electronic prototyping platform All the programming is done in the arduino software and then dumped in the Arduino board. This is the very important component of the system.GSM module, energy meter, Relay are connected to the arduino board.
GSM MODULE:GSM stands global system for mobile communication. It accepts SIM and almost works similar to mobile. It is used for sending and receiving the message.
RELAY: A relay is a electrically operated switch. It is used for switching the circuit high or low.

IV. OBSERVATION

Fig.1.1 LCD DISPLAY

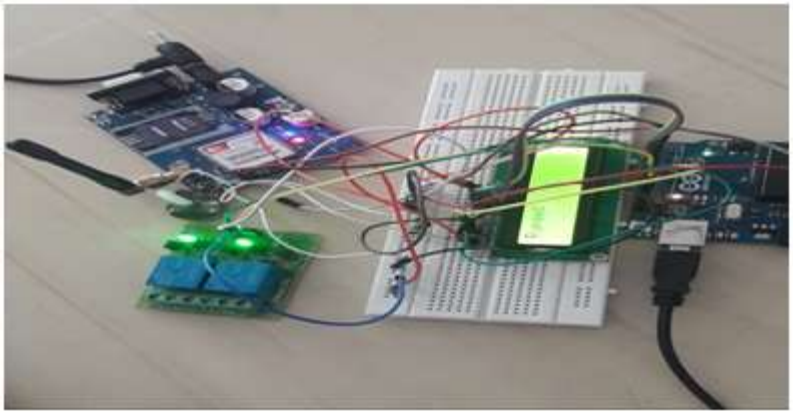


Fig.1.2 INTERFACING ALL THE COMPONENTS

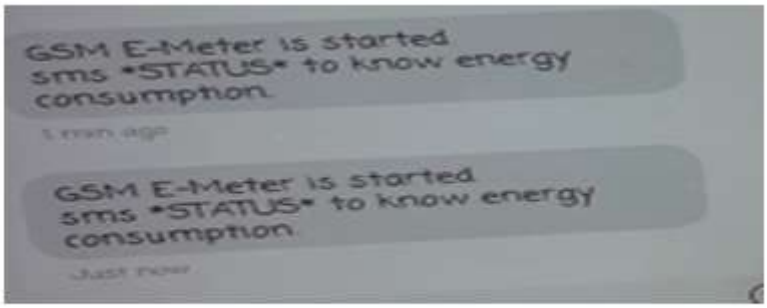


Fig.1.3 SMS FROM THE GSM MODULE WHEN METER GETS

Fig.1.4 SMS FROM MOBILE FOR SWITCHING ON/OFF THE APPLIANCES

Fig.1.5 SMS FOR KNOWING THE STATUS OF THE METER

V. CONCLUSION

The available conventional system in the market is time consuming and may have errors. But the system proposed in this paper is very beneficial. The customer itself can get updated regarding the status of the meter from any place and can control the appliances by sending SMS to the GSM. Also if the energy consumed crosses the threshold then an alert will be sent to the customer and then the customer can send the SMS to operate the appliances. After getting the alert, people can turn of the least usable appliance according to their comfort through SMS.

This system will help the customer to get aware of the daily energy consumption and to be saved from the conventional system errors. Hence the system presented through this paper provides good features for the customers.

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