

An Exposure of Automatic Meter Reading Anticipated For Instant Billing and Power Controlling Applications

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Abstract--Electrical power has turn out to be essential to human endurance and advancement. A device measuring the utilization of energy of any industrialized firm is an energy meter. Conventional meter reading by means of human operator is incompetent to assemble the upcoming residential development needs. As a result there is amplified demand intended for systems of Automatic Meter Reading which accumulates meter readings by electronic means, and its application is increasing over industrialized, utility environment and for commercial means. AMR is not merely to resolve the trouble of manual meter reading but also make available added feature such as power disconnect because of exceptional dues, illegal power usage, power reconnect subsequent to pay dues and also gives the information of whole load used in a house on appeal at any moment. Automatic meter reading system also sends the information of power consumption and power cut through SMS. This system is protected and consistent for the reason that it can be accessed merely by an authorized person and also consists of tampering detection unit that controls the illegal power usage.

Key Words: *Automatic Meter Reading, SMS, Electrical Power, Tampering detection.*

1. INTRODUCTION:

Except for efforts to assemble mounting demand, computerization in the energy distribution is also necessary to improve people's life paradigm. The energy provider corporation employs the persons who record the meter reading physically, and attempt to control meter reading by adopting various fraudulent practices in the system of conventional metering measuring electricity utilization. For systems intended for Automatic Meter Reading, there is an amplified demand for them over industrialized, utility environment and for commercial means accumulating meter readings by electronic means [4]. Automatic meter reading system is the novel system of post paid energy metering introduced in this paper. The initial Global System for Mobile Communications network was adopted by the world that is intended for mobile communication. SMS is one of the opportune mean of communication in particular intended for reminder, notification, and a short note when the mobile phone user is not supposed to respond without delay and has unlimited their service to content providers to distribute an extensive variety of services towards mobile phone users [7]. In the place of conventional power meter the proposed system is tested and achieved good results. The examination is performed and power consumption is experiential. The ZigBee devices are tremendously limited in resources together with processing, memory and power, short operating range.

Each meter is provided a meticulous ID number in this system which is provided according to unique service number of SIM card and constantly monitors each meter reading every day or on appeal and forwards to central server of energy Provider Company [1] [9]. Automatic meter reading system also sends the information of power consumption and power cut through SMS. On the way to identifying and retrieving customers detail for billing and identification function, the SIM card service number is used. In the database server the meter reading is stored all the way through SMS gateway. By means of sending the equivalent commands to the modem of Global System for Mobile Communication Network from the mobile phone, the user can get hold of the prominence of the energy utilization and the billed amount [3]. The commands were sending to the microcontroller section throughout Zigbee subsequently and the necessary information is sent to the user mobile all over the modem of Global System for Mobile Communication Network. Global System for Mobile Communication Network based energy meter is trouble-free to installation and valuable for both energy provider and customer [11]. Automatic meter reading is not merely to resolve the trouble of manual meter reading but also make available added feature such as power disconnect because of exceptional dues or any tamper detection, power reconnect subsequent to pay dues and also gives the information of whole load used in a house on appeal at any moment [2] [5]

The Global System for Mobile Communications network was adopted by the world that is intended for mobile communication. When the mobile phone user is not supposed to respond without delay and has unlimited their service to content providers to distribute an extensive variety of services towards mobile phone users, SMS is one of the opportune mean of communication in particular intended for reminder, notification, and a short note. A bill was issued by the company of energy Provider with the assist of Global system intended for communication network of mobile which was sent all the way through SMS following to billing calculation. By means of sending the equivalent commands to the modem of Global System for Mobile Communication Network from the mobile phone, the user can get hold of the prominence of the energy utilization and the billed amount. Automatic meter reading system also sends the information through SMS.

2. METHODOLOGY:

Automatic meter reading is to decide the trouble of manual meter reading but also make available added feature such as power disconnect because of exceptional dues, power reconnect subsequent to pay dues and also gives the information of whole load used in a house on appeal at any moment. The block illustration of the wireless meter reading system is revealed in the Fig1. Fig.2 shows the working model of automatic meter reading. The required Power was supplied to other components by the section of the power supply. The microcontroller module ARM7 LPC2148 at the slave meters receives the data from the energy meter, consisting of LED that blinks in accordance with the power expenditure.

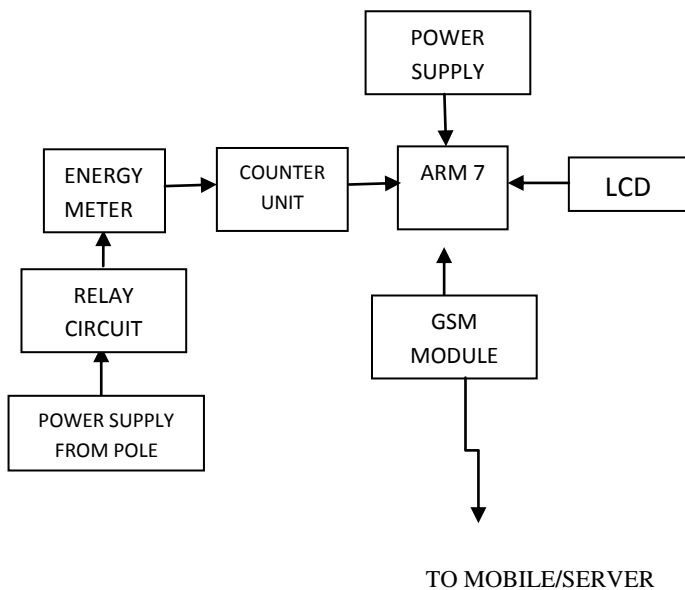


Fig.1 Block diagram of automatic meter reading system



Fig.2 Working model of automatic meter reading

LED will blink by means of a quicker rate if the consumption is extra, however if utilization is less subsequently LED will blink by means of slower rate [12]. The LED receives train of pulses accountable for its blinking and is applied to one of the Automatic meter reading controller interrupt pin by means of a counter unit. The counter is turn on at the interrupt pin, that counts the pulse number received by the Automatic meter reading controller and as a consequence controller calculate the quantity of energy consumed in the domestic and it also carries out the essential control operations resembling breaking the circuit all the way through Relay control unit and the necessary information is given and taken by means of the master meter/ Power line meter [6] [10]. The whole information is occupied from the master meter and ahead to the power station by means of communication module Global System for Mobile Communication Network through the use of equivalent commands. In the ARM7, MAX-232 was inbuilt and is used as a sequential communication interface for the modem of Global System for Mobile Communication Network intended for transmitting the data to the mobile phone from the controller. In the bank section of Load, a 60W incandescent bulb is used as a load intended for the intention of energy utilization of the user [8]. The user can get hold of the prominence of the energy utilization and the billed amount by means of sending the equivalent commands to the modem of Global System for Mobile Communication Network from the mobile phone. Subsequently the commands were sending to the microcontroller section and the necessary information is sent to the user mobile all the way through the modem of Global System for Mobile Communication Network. Fig.3 shows the GSM module used in the working model.



Fig.3 GSM Module

3. RESULTS:

In the place of conventional power meter the proposed system is tested and achieved good results. For display purpose, 60Watt bulb is made used as load in the direction of examining our system. The bulb is attached to load and the Energy meter which is used to calculate



Fig.4 Examining System

the information of average real power, revealed in Fig.4. The examination is performed and power consumption is experiential. For the duration of this period the bulb glows constantly. Fig.5 Shows the initial meter reading and Fig.6 shows the the number of units consumed and the bill amount displayed in the LCD display.



Fig. 5 Initial meter reading in LCD display



Fig.6 Meter reading on LCD display after the consumption of power

. Subsequent to the due date, the LPC2148 controller turned off the bulb all the way through the relay, which proves the accurateness of our system in terms of the power and estimation of remote controlling.

4. CONCLUSION

In the system of conventional metering measuring electricity utilization, persons who record the meter reading physically, and attempt to control meter reading by adopting various fraudulent practices were employed by the energy provider corporation. Global System for Mobile Communications network based energy meter is trouble-free to installation and valuable for both energy provider and customer. AMR is not merely to resolve the trouble of manual meter reading but also make available added feature such as power disconnect because of exceptional dues, power reconnect subsequent to pay dues and also gives the information of whole load used in a house on appeal at any moment. It forwards an SMS alert to energy provider corporation whether a person by means of extra signify border of load. This system is protected and consistent for the reason that it can be accessed merely by an authorized person. If any illegal person tries to contact the system this system transmit an aware towards energy provider and moreover give warning of that illegal person.

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