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IoT based smart energy meter

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ABSTRACT

Energy meter reading is a tedious and an expensive affair. The meter reader has to go and take the reading manually to issue the bill, which will later be entered in the software to automate the billing and payment system. This paper proposes a new network communication system for energy meter reading by internet communication technology and software system along with the existing meters. A IOT modem will be integrated with electronic energy meter to read the usage of electricity and uploaded on server or website. Energy meter deliver the reading details and it is uploaded on the website instantly. This communication system is further useful for electricity regional/sub-regional office, who can monitor the power consumption, and they cut the power supply for any specific house, who had not paid the electric bill using the EB Office login. Moreover, this power cut control system is done by using same website which is used for monitoring. In this project each customer is differentiated using address or ID, this ID are used for identification by the consumer and as well as by office to monitor the reading and payment details. The user can also monitor their usage from anywhere using the user login. An additional feature is provided to the user for controlling the power supply during in terms of emergency case.

Keywords: Energy meter, IOT modem, Website, Login id.

1. INTRODUCTION

Energy meter reading is a tedious and an expensive affair. The meter reader has to go and take the reading manually to issue the bill, which will later be entered in the software to automate the billing and payment system. It would have reduced the laborious task and financial wastage if can automate the manual meter reading process and bill data entry process. This paper proposes a new network communication system for energy meter reading by internet communication technology and software system along with the existing meters. An IOT modem will be integrated with electronic energy meter to read the usage of electricity and uploaded on server or website. Energy meter deliver the reading details and it is uploaded on the website instantly. This communication system is further useful for electricity regional/sub-regional office, who can monitor the value and power consumption. And they cut the power supply for any specific house, who had not paid the electric bill. Moreover, this power cut control system is done by using same website which is used for monitoring. In this project each customer is differentiated using address or Id, this ID are used for identification by the consumer and as well as by office to monitor the reading and payment detail. It is secured by any network standards. Energy meter deliver the reading details and it is uploaded on the website instantly. Moreover, this power cut control system is done by using same website which is used for monitoring. In this project each customer is differentiated using address or Id, this ID are used for identification by the consumer and as well as by office to monitor the reading and payment detail.

2. EXISTING SYSTEM

In existing system, human power is used to note the energy meter reading for each house and enter the system of regional office. This system is too complicate and need more human power to read the energy meter of each and every house. In this system human can't now the reading unstill the date of bill payment. Human power again used for controlling the load by cut down the power of customer who had not paid the electric bill. Due to human usage their chance of occurring error.

3. PROPOSED SYSTEM

In this system, the energy meter reading is calculated and uploaded to server through IOT using controller. Thereby, customer and officer can open the website and read the data to know the cost of electric bill. The power to home can be controlled through the website by EB officer like ON/OFF based on payment of electric bill. Current sensor is used to read the current drawn by the load from the power supply. Voltage sensor is used to identify the voltage drop and apply voltage to the load from power supply. Relay is used to control the power ON and OFF to the home. Using the voltage and current sensor the power consumption is identified by the ARDUINO microcontroller and these data are uploaded to the server or website through IOT modem.

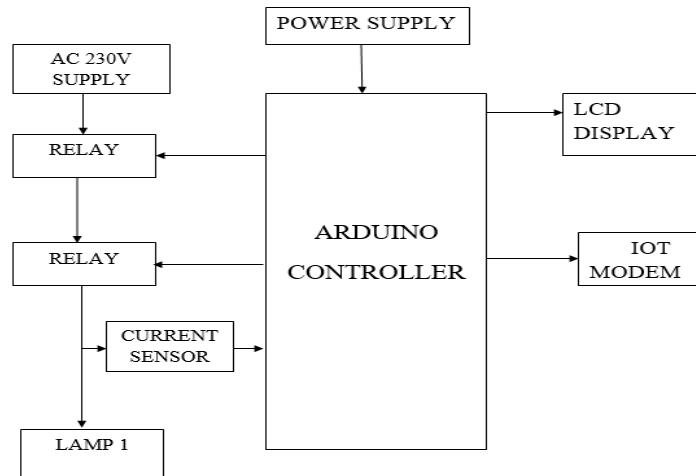


Fig 1: Block Diagram

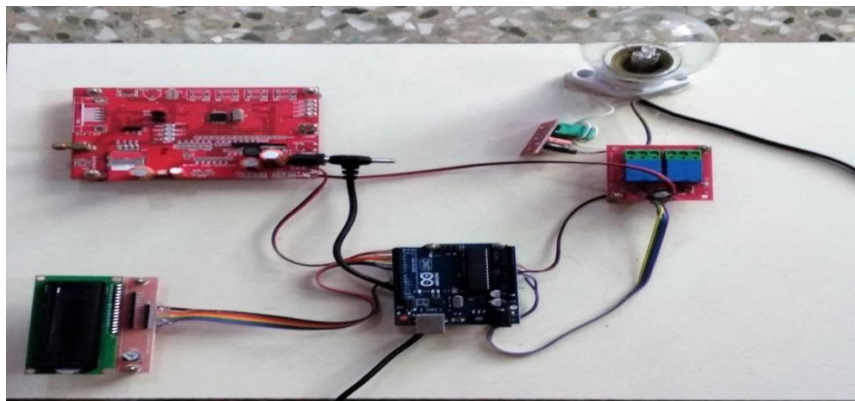


Fig 2: Project Hardware

4. LAYOUT DIAGRAM

The Layout of the diagram comprises of a current sensor, voltage sensor, Arduino UNO, an LCD Display, IOT Modem and a pair of relays which are connected together. A Suitable power supply is given to the primary part of the circuit. A preferable load is given to the circuit.

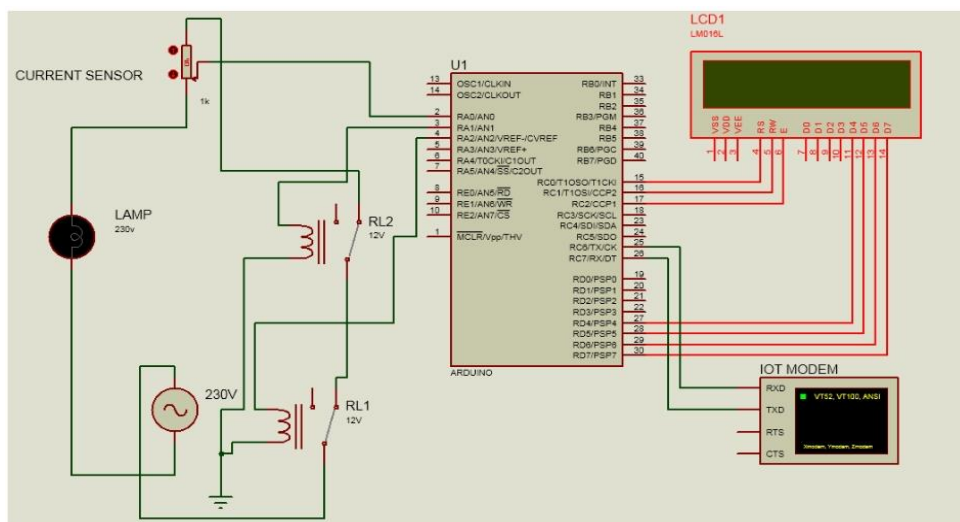


Fig 3: Layout diagram

5. CONCLUSION

Thus by this project we have created the prototype model using which we will be able to monitor the energy meter reading by using IOT modem and also we can control the load using relays via the web page. The IOT based energy meter was developed and extended with the relay controls to disconnect the load from the power supply. Live status about power consumption can be viewed by both consumer as well as electric board. The relay in the energy meter can be controlled by the EB officer using the website created, for turning off the power supply. Another relay is provided to the consumer for turning off the load from the power supply during emergency cases.

6. ACKNOWLEDGEMENT

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