International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 9 Issue 8 ǁ 2021 ǁ PP. 11-13

Three in one meter: A System for smart billing and power quantification

Brunda S*[1], Parijatha K V*[2], Shivani K S*[3], Srija K M *[4] Sridhar C S*[5]
[1*2*3*4]*Student, Department of Electronics and Communication Engineering, SJC Institute of Technology, Chikkaballapur, Karnataka, India.*
[5]**Assistant Professor, Department of Electronics and Communication Engineering, SJC Institute of Technology, Chikkaballapur, Karnataka, India.*

ABSTRACT
This paper talks about one of the upgraded meter reading where the smart meter reads the three sources the gas, water and energy or electricity in one single meter. This meter provides a smart billing system. It has automatic source or supply turn on and off condition on the basis of bill payment. It also comes with an additional feature of power quantification, where the user can know the amount of power that is consumed by each appliance connected. Briefly this can be a meter that supports home automation and has wide range of future scope.

KEYWORDS—*LCD- Liquid crystal display, LED-Light emitting diode, LDR-Light dependent resistor , PLCC-Power line carry communication, VNC –Virtual network computing, EB-Equipment branch, CDR-Current divider rule.*

Date of Submission: 18-07-2021 Date of acceptance: 03-08-2021

I. INTRODUCTION

IoT is a major part in our daily life. With systems embedded and along with cloud connections one can make life easier. One such application is this smart three in one meter. Electricity plays a dominant role in our daily life. From the start of the day to the end we spend most of the time with electronic gadgets and appliances for example phones, laptop, computers, TV, fan, AC, lights etc. when in home the interaction increases. As the current technology is moving towards home automation, smart meters are replacing the current traditional meters used by the electric board. As talking about smart homes other main aspects of home that are vital are water and gas, as there are also meters for this and bills are also paid for this, so it is smart to combine all three sources to a single meter instead of there and obtain the bill and become smart. In the day-to-day life, a common meter reading and bill generation, involves two to three people from the electric board to come and visit house to house to check their meter reading and then generate the bill. Their task also involves to check if the bill of the previous month is paid if not the source is until the bill is paid. However, there are many drawbacks to these traditional systems them being whenever the owner of the house isn't available and the house is locked then the meter reading cannot be possible resulting in the officials to come back the next day. Human sources consumption is exceeded and for some extent made waste. Hence, the paper aims in creating a real time monitoring system where all the bills will be shown in a single meter. Based on consumption the bill is generated automatically without any human aid. For the efficient reduction of the amount of electricity gas and water consumed in the residential area, the demand response of the consumers is important.

II. RELATED WORK

1. Smart meter systems are being deployed to improve grid reliability and promote energy,water and gas efficiency while providing improved services to their customers. Smart metering which is installed millions of households worldwide provides utility for companies .
2. In recent years, smart devices are increasingly. These devices allow making cities smart, enabling communication not only among people but also among things, creating a new system nowadays known by the term IoT .
3. Energy,water and gas theft is a very common problem in countries like India where consumers of energy,water and gas are increasing consistently as the population increases. Utilities in electricity system are destroying the amounts of revenue each year due to energy,water and gas theft.
4. At present, power theft ways become increasingly subtle and intelligent. Power theft not only has caused a great lossto the nation and the power sector, but also has brought serious security risks to the equipment and personal health.

III.METHODOLOGY

The proposed system introduces a new method of meter reading electronically and transmitting to headquarters for further processing. This helps in reducing the manual errors that occur in the present meter reading systems. Meter reading system can be used to take readings for different utilities such as Electricity, Water, Gasoline etc. Let us consider an example of Electricity; here it is connecting the Energy Meter between main supply and load, by which Microcontroller will be able to measure the energy units consumed by the consumer. When the various appliances ofthe household consume energy the energy meter reads the reading continuously and this consumed load can be seen on meter. It can be seen that the LED on meter continuously blinks which counts the meter reading. Based on the blinking, the units are counted. Normally, 3200 blinks are one unit. In our project we are trying to develop, a system in which Arduino Uno act as main controller, which continuously monitor energy meter. As per the blinking of LED on energy meter the Arduino will measure the unit consumption. The measured reading with the calculation of the cost will be continuously displayed on web that we have designed requirement. When the consumers reading will be near about to the set threshold value it will send a notification value to the consumer. This threshold value notification will increase the awareness amongst the consumer about the energy. The Microcontroller computes the amount of energy consumed. Then the calculated values are transmitted instantaneously via Wi-Fi to the MAIN STATION and the necessary updatesare performed in the DATA BASE of the consumer.

IV. RESULTS AND DISCUSSION

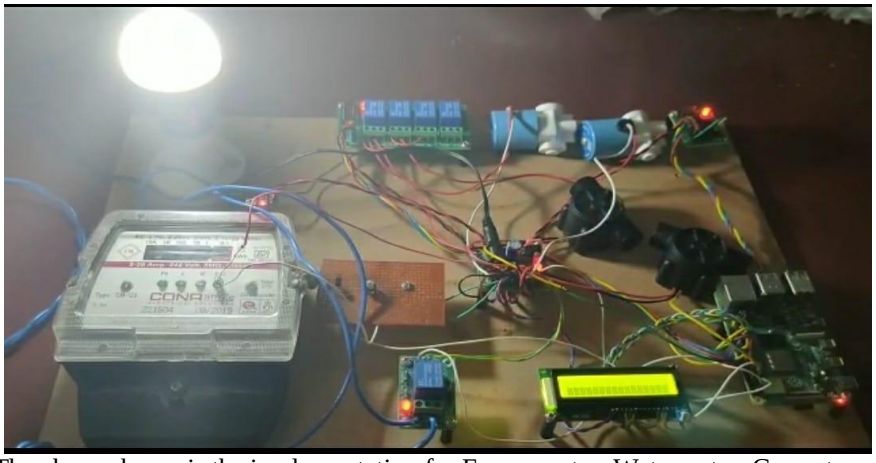

Fig 1: The above shown is the implementation for Energymeter, Watermeter, Gasmeter.

Fig 2: Above snapshot shows the final output of the energy meter ,bill is generated after 4unitsmeans 16 counts. For a sample here 30rs generating. Amount is generated as per usage of consumer.

The above shown snapshot is the message sent by raspberry pi through the third party app, thenuser pay the bill through online now Energy, water, gas bill is payed.

V. CONCLUSION

The project proposes automation for existing manual power billing system. This involves the automation process of taking a meter reading and computing the billing by examining the number of units consumed by the user of that particular registered energy meter and sending a computed bill to the registered mobile number of a user. Thus Automated wireless power billing involves total authentication over accessing a data from energy meter and provides accurate and timely billing.

REFERNCES

[1]. M. Ferro, A. Pietrosanto and V. Paciello, Smart power meter for the IOT, IEEE, 2020.
[2]. GrzegorzDudek, Anna Gawlak, MiroslawKornatka and Jerzy Szkutnik, Analysis of smart meterdata for electricity consumers, IEEE, 2020.
[3]. Shiva Poudel, Anamika Dubey and Anjan Bose, Risk- based probabilistic quantification of power distribution system operational resilience, IEEE IOT journal, Vol-3, Issue: 3, PP: 9-15, 2020.
[4]. Sushi Suguira, Ayaka Miwa and Tomoko Uno, Analysis of household energy consumption oflighting and electric appliances and predictions, IEA, Vol-3, PP-17-21, 2020.
[5]. Xiahngyu Kong, Shijian Zhu, and Siqiong Zhang, A household energy efficiency index assessment method based on non – intrusive load monitoring data, Applied sciences journal, Vol- 10, Issue -11, PP- 380-411, 2020.