

Advanced IOT Based Smart Billing Using GSM Model

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Abstract—This system proposed the automatic reading of energy meter with the help of Arduino. This system provides the reliability at the time of taking reading and billing. This system reduced the human errors which is occurred at the reading also the electromagnetic error. This system is related to automation which is used for smart work. The traditional system of billing will be converted to smart and errorless automatic system. In that system GSM is used for sending and receiving data to mobile phone and Arduino. There is also the modification of to firstly sending the data from energy meter to the MSEB office due to that the record of energy meter of all the commercial customer is also to MSEB office and then MSEB office send the billing or reading of energy meter to all the commercial consumers. Secondly link is provided to pay the billing amount by using internet.

Keywords— Arduino,IOT,GSM,Energy meter,GPRS.

I. INTRODUCTION

In the present situation the manual readings of energy meter is very time consuming and error prone. So that to overcome this problems by using the wireless energy system means GSM Based Energy Meter Using Arduino. This system gives the reliability in billing as well as its not time consuming. With the help of this system hourly, weekly and monthly storage of the data can be possible without any failure. Cost of this project is minimum and it is mainly used in local and urban areas for easy billing system. In that system power of energy meter is stored in Arduino. Arduino is used for storing of data from the energy meter. The data from the energy meter is transfer to the GSM(Global System For Mobile Communication). This data from the GSM is send to the mobile phone and MSEB as a message format. So that reading of the energy meter is also available in MSEB for the record.his document is a template.

II. ENERGY METERING SYSTEM

Energy meter is a device that can measure energy usage by continuously measuring voltage and current. The existing energy meter either electronic or electromechanical was used to record energy consumption in kWh units and the data will be recorded by meter readers from house to house monthly. After taking reading from the energy meter user, the recorded data will be transferred to the energy provider for processing meter reading and then determine the amount energy usage by specification tariff that have been set by energy provider. But this is conventional method.



Fig.1GSM Module

A. GSM for monitoring system

This project will based on the energy meter monitoring by using GSM. The energy meter by using GPRS has been conducted but it can't be implemented easily. The GSM is very useful in communicating because it very easy to use and have good area coverage. In addition, there is no need extra wiring because the data will be transferred wirelessly though the SMS and MMS.

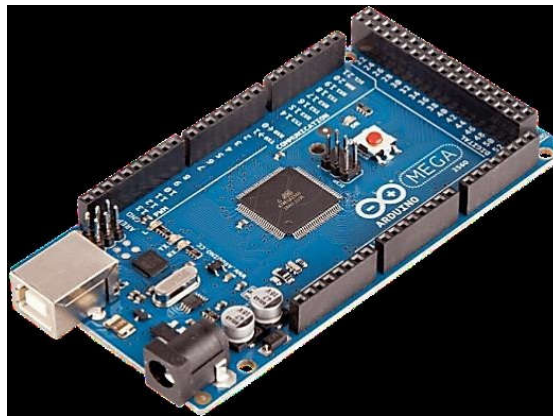


Fig.2 Monitoring system

B. *Arduino used for energy monitoring system*

There are several types of arduino like UNO, MEGA, NANO, MINI. Arduino is one of the microcontrollers that can be used to read the data from the energy meter by using current sensor and it is main component that responsibility with others component such as GSM. The current sensor will give the data to the arduino and arduino program will extract the data into energy consumption and transfer it to the GSM. During the construction of project, the arduino and GSM must be placed at the suitable position because of the high voltage equipment will cause flux leakage that can interrupt communication between arduino and GSM.

III. BLOCK DIAGRAM

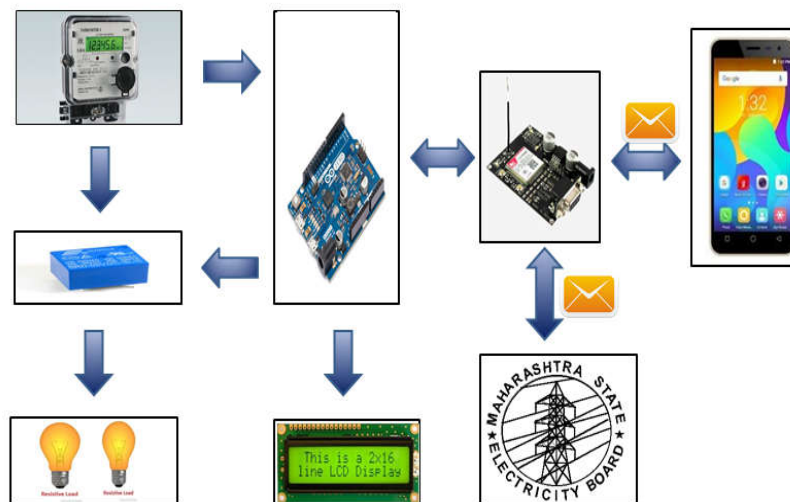


Fig.3 IOT based energy meter

The energy from the energy meter is given to the relay. Relay sense the current from the energy meter and supplies to the load. One pulse from the energy meter is given to the Arduino. The data from the energy meter is stored in the Arduino in EEPROM. If the supply is disturbed but data is stored in energy meter. When the power is continues then reading is start from that time.

The data from Arduino is displayed on the crystal LCD display. Also the reading of the energy meter is sending to the mobile phone using the GSM in the format of message.

A. *SOFTWARE REQUIREMENT*

For working on this project software which required are makes by Keil an ARM Company makes C compilers, macro assemblers, real-time kernels, debuggers, simulators, integrated environments, evaluation boards, and

emulators for ARM7/ARM9/Cortex-M3, XC16x/C16x/ST10, 251, and 8051 MCU families. Compilers are programs used to convert a High Level Language to object code. Desktop compilers produce an output object code for the underlying microprocessor, but not for other microprocessors.

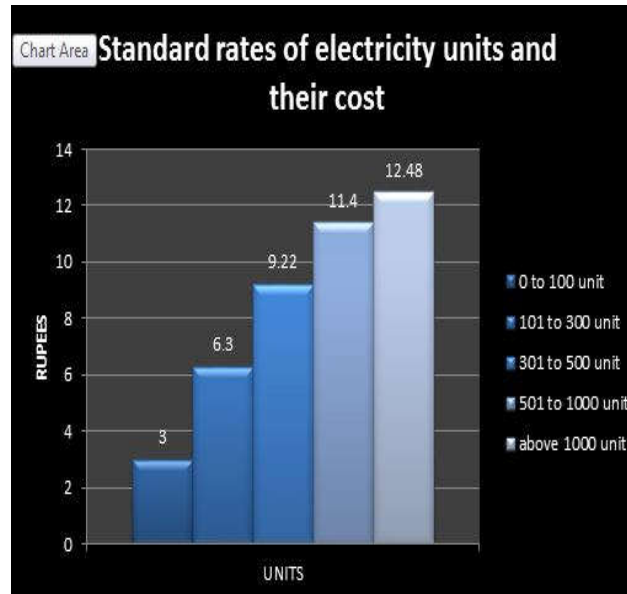


Fig 4 standard rates of electricity units

Calculation of Electricity Bill

1 unit= 1Kwh

Total kwh = 1000 Watts * 24 Hrs * 30 Days = 720000 Watts/Hour

Where is 1 Unit = 1Kwh

Total Consumed units 720000/1000.....(K=Killo=1000)

Total Units= 720

Cost of per unit is 11(approx.)

Total cost or electricity bill is= 720*11= 7920 Rs

Result

Consumer No- XXXXXXXXX8976

Reading Dates: 05/05/2017 to 05/06/2017

Total Unit Consumption: 720 kwh

Calculation: 720*11 Rs

Fix charge: +30

SMS Charge: +2

Total: 7952 Rs

Pay on : www.onlinepay.com

IV. CONCLUSIONS

Using this project we can reduce the manual efforts to take the readings from the energy meter which is cost effective solution Reduces man power it is user friendly and we can enhance this project, in which an electricity department can send message to the consumer about the billing information. Using this project we can reduce the human errors, electromagnetic error and also some errors which cannot be determine It is reliable than convectional energy metering system We can billing the readings hourly, weekly and monthly as our choice.

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