# GSM Based Energy Meter Billing

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**Abstract-** *The project is designed for reading electrical energy consumed in units and in rupees to display on an LCD screen to the user. This data is also provided to the electrical department using GSM technology for billing purposes. Owing to high electricity cost these days it becomes necessary for the consumer to know as to how much electricity is consumed to control electricity bill within his budget. In this proposed system, the consumer will get his energy consumption data on real time basis on a LCD display. The same data is sent through GSM modem to the electricity department via SMS. A microcontroller of MSP430 family is interfaced to the energy meter to get the Watt Hour pulses. The microcontroller then processes these pulses according the program written in it, to calculate the units consumed and cost involved. Further it gives command to the SIM loaded GSM modem for sending the data to the electricity department via SMS. Further this project can be enhanced by to control the electrical appliances remotely via SMS. Also, the electricity department can send the monthly bill amount over SMS to the receiving unit for consumer information.*

*Keywords-* Automatic Meter Reading(AMR), Short Messaging Service(SMS), Global System for Mobile(GSM)

## I. INTRODUCTION

Nowaday's it has a very difficult job for people to take electric readings from homes, corporate companies because the person who takes the reading must be on-site to take the reading. It is a tedious work to visit each and every house to take reading. It is a waste of human power. For this problem the demand for AMR system has increased. AMR is a system in which the reading is taken automatically and the consumer directly comes to know how much electricity has been used by him. The service provider for energy still uses conventional methods for getting the energy consumed by individual customer. The proposed system automatically reads the energy consumed and sends it to the service provider using the existing short messaging services (SMS).

## II. EXISTING SYSTEM

In the current scenario EB employees are coming to each house, corporate buildings with a device to calculate the amount of cost spent on consumed electricity by the user.

After this according to the users wish the individual can pay through online gateway or individual can pay directly in the EB office.

## III. PROPOSED SYSTEM

In the proposed system the consumer will get his energy consumption data on real time basis on a LCD display . Same data is sent to gsm modem to the electricity department via SMS. A micro controller of 8051 family is interfaced to the energy meter to get watt hour pulses. The micro controller process this pulses according to the program written in it to calculate the units consumed and cost involved . Further it gives command to the sim loaded gsm modem for sending the data to the electricity department via SMS. Further this project can be enhanced to control the electrical appliances remotely via SMS. Also the electricity department can send the monthly bill amount over SMS to the receiving unit for consumer information.

## IV. LITERATURE SURVEY

| S.NO | Paper name | Year | Technique |
|------|------------|------|-----------|
| 1. | Zigbee based energy meter monitoring system | 2014 | Zigbee,GSM |
| 2. | Automatic energy meter reading using ARM | 2012 | ARM, GSM |

## V. PROPOSED TECHNIQUE

**MSP430:**

The MSP-EXP430G2 LaunchPad Development Kit is an easy-to-use microcontroller development board for the low-power and low-cost MSP430G2x MCUs. It has on-board emulation for programming and debugging and features a 14/20-pin DIP socket, on-board buttons and LEDs & BoosterPack Plug-in Module pinouts that support a wide range of modules for added functionality such as wireless, displays & more.

The MSP-EXP430G2 LaunchPad also comes with 2 MSP430 devices, with up to 16kB Flash, 512B RAM, 16MHz CPU speed and integrated peripherals such as 8ch 10-bit ADC, timers, serial communication (UART, I2C & SPI) & more
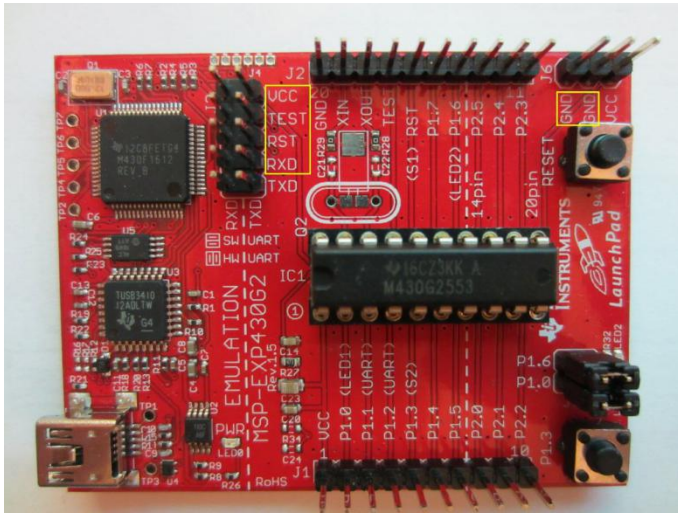


### GSM:

The SIM908 module which counts with both GPRS and GSM technologies what allows to easily perform realtime tracking applications. This module is connected with Arduino board and accessed using AT commands



### LCD:

The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580 Most LCDs with 1 controller has 14 Pins and LCDs with 2 controller has 16 Pins (two pins are extra in both for back-light LED connections).

The most commonly used LCDs found in the market today are 1 Line, 2 Line or 4 Line LCDs which have only 1 controller and support at most of 80 charachers, whereas

LCDs supporting more than 80 characters make use of 2 HD44780 controllers.
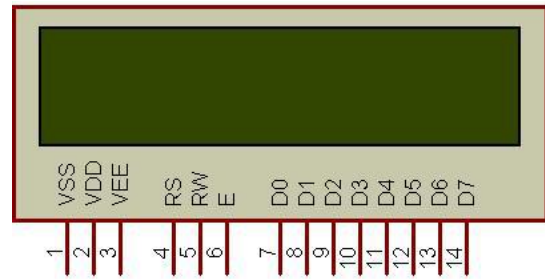


### POWER SUPPLY:

The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.
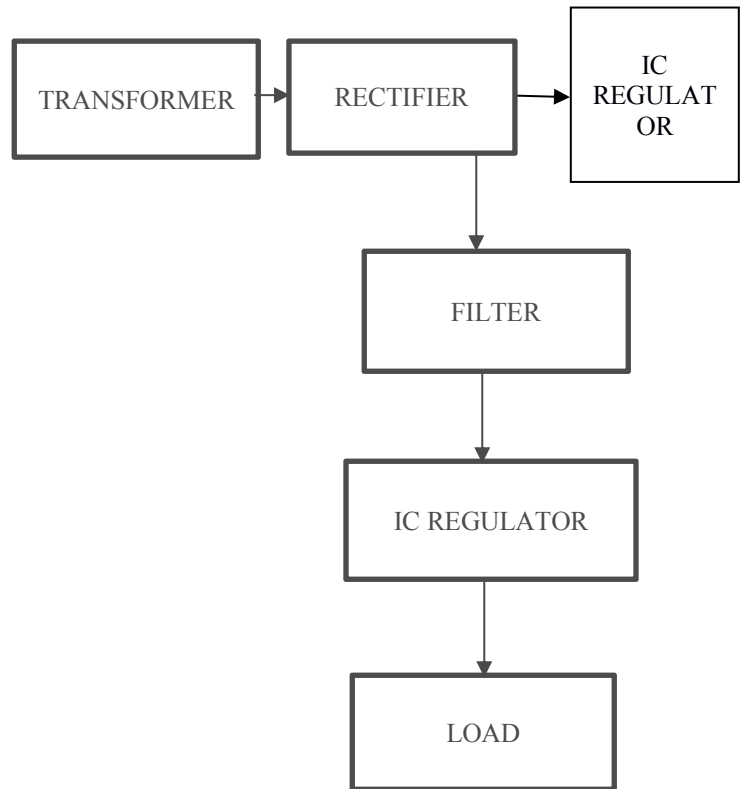
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