

# GSM Based Energy Meter Billing System

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**Abstract** - In present world almost all industrial systems are based on wireless communication, as it has many advantages. The development of a fully Automated Energy Meter which is having capabilities like remote monitoring and controlling of energy meter will lead to transparency in the energy meter reading and billing system. This system avoids the human intervention in power management. If the customer does not pay the bill in time, the user is informed through SMS system using GSM. If still customer does not pay the bill then as per designed late consideration, one alert message will be sent then automatically the power connection is disconnected from the remote server. The purpose of this project is the remote monitoring and control of the domestic energy meter; its aims includes: to design a circuit which continuously monitors the meter reading and sends message to electricity company, programming of the GSM MODEM with AT (Attention)command sequence, interfacing the programmable chip with the personal computer, interfacing the programmable chip with the energy meter, interfacing of GSM MODEM with the programmable chip, sending messages from the remote phone to control device.

**Keywords:** AT-Mega 328 Microcontroller, GSM, domestic energy meter, SMS system.

## I. INTRODUCTION

In India, the revenue collection process is slow and lengthy. Also the billing process is manual and requires a lot of human labor. The process involves taking meter readings manually, then processing that reading for costing and generating the bill for the same. This may cause a lot of errors as it is complex and process is not in a centralized control. The distribution of bill to a mapped location also a lot of time consuming process. Here we can't avoid any mistake or error in this process as manual operation is done. All these problems can have a solution by using the prepaid energy meter system.

To measure the amount of energy consumed by the domestic, commercial and industrial user, an energy meter is being use. As the population of energy consumers is gradually increasing the smart energy meter helps to ease the energy management system. The electricity meter is a contraption that checks the level of electric energy eaten up by a living

methodology, a business, or an electrically controlled device. Electric utilities use electric meters to appear at customers' premises for charging purposes. They are routinely adjusted in charging units; the most all things considered surveyed that one being the kilowatt-hour (kWh).

They are routinely investigated once each charging period. Unequivocally when imperativeness saves assets in the midst of particular periods are required, a few meters may measure ask for, the most absurd use of force in some between times. The SMS has extended their service to content providers to deliver a wide variety of services to mobile phone users. SMS is one of the convenient mean of communication especially for reminder, notification, and a short note when the mobile phone user is not expect to answer or respond immediately.

This system provides an automated way of bill payment. It takes the readings automatically and the information is sent to the authority and the consumer too. This will reduce the human effort and will eliminate the complexity in billing process. It also reduces collection form the consumers living in an isolated area and distanced villages and deployment of human Labour in such cases.

## II. METHODOLOGY

In this system AT-Mega 328 Microcontroller retrieves the data from various sensors and transmits. The controller takes readings from the energy meter and sends it to the GSM module. A SIM card enabled GSM module is used to communicate to the end user.

The scheme has the following components:

- GSM Module (SIM 300)
- Microcontroller (ATMEGA328)
- Voltage sensor
- Current sensor
- LCD display
- Literature review
- Identification of the matter
- Finding solution of the matter

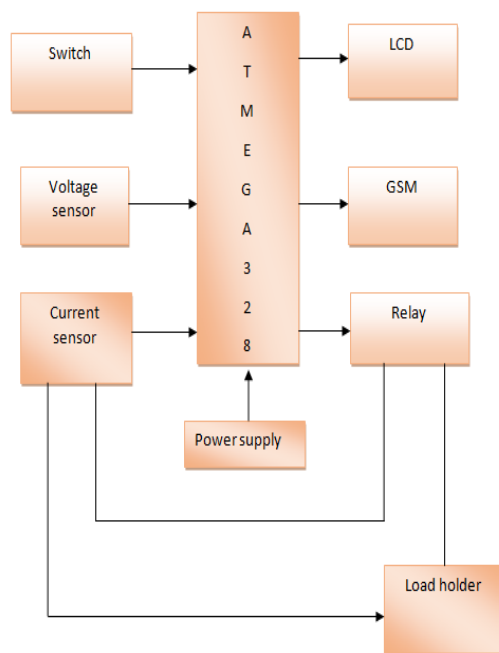


Figure 1: Block Diagram

In this system we used Microcontroller Atmega328, press switch, current sensor, voltage sensor, relay and GSM module. First press switches once the pressed the relay will turn on for 60 sec. Load status checked though voltage and current sensor by adding different bulb for ex, 15 watt, or 60 watt or 100 watt and check Simultaneously one by one. After that calculate the highest voltage and current to determine how many units consumed for the energy meter. Then dependent on power calculation send the SMS to user after 60 second. And get the energy bill using the GSM (Global system of mobile) to the user on the registered number. Then finally display the status of the voltage and current on the LCD display.

### III. RESULTS AND CONCLUSION

It avoids the human intervention reduces the cost, save human power. It works both automatically and manually. This meter sends billing directly to mobile before due date without causing human intervention. It avoids the human intervention reduces the cost, save human power. It works both automatically and manually. The system is mainly intended for smart cities .This computerization diminishes the work costs as well as makes the framework more effective and exact.

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