SMART PREPAID ENERGY METER USING GSM TECHNOLOGY

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ABSTRACT-*The aim of the project is to minimize the queue at the electricity billing counters and to restrict the usage of electricity automatically, if the bill is not paid. The project also aims at proposing a system that will reduce the loss of power and revenue due to power thefts and other illegal activities. The work system adopts a totally new concept of "Prepaid Electricity". GSM technology is used so that the consumer would receive messages about the consumption of power (in watts) and if it reaches the minimum amount, it would automatically alert the consumer to recharge. This technology holds good for all electricity distribution companies, private communities, IT parks and self-containing housing projects. The implementation of this project will help in better energy management, conservation of energy and in doing away with the unnecessary hassles over incorrect billing. The automated billing system will keep track of the real time consumption and will leave little scope for disagreement on consumption and billing.*

Keywords-Energy meter, GSM technology, Microcontroller ATMEL 89C51

1. INTRODUCTION

This method consumers are expected to reload their mobile account and send SMS to the energy meter using GSM network. Then the meter holds the purchased energy units corresponding to the recharged value and let the consumer to use electricity until the purchased units are exhausted. If the available energy units are exhausted then the electricity supply is cut-off After the next recharge occurs the microcontroller pulls the SMS sent by the mobile, decodes it, recognizes the Mobile no. and then makes the power supply connection again. After successful operation, controller sends back the acknowledgement to the consumer's mobile through sms. This technology holds good for all electricity distribution companies, private communities, IT parks and self containing housing projects. The implementation of this project will help in better energy management, conservation of energy and also in doing away with the unnecessary hassles over incorrect billing.

2. OBJECTIVES

1. To study about the prepaid energy meter with GSM technology.

2. To reduce the loss of power& revenue due to thefts & other illegal activities like the queue at Electricity billing.

3. Reduce the billing delay & give better consumer service.

4. Reduce the unnecessary wastage of power.

3. AIM

To Design a Prepaid Energy Meter for save electricity

4.SCOPE OF PROJECT

Steel industries currently are functioning with different sections where each section generally worked on measuring scheduled time. Hence it is completed the

systems automatically activate and collect the data from energy meter using ARM processor. The collected data send through SMS using GSM modem is discussed and simulated through Keil IDE and ARM processor. Payment for smart prepaid electricity meters can be done offline, which is similar to your mobile recharge or set box payment During summers, an individual will have to ensure to recharge the meters with an additional amount to match with extra power consumption.
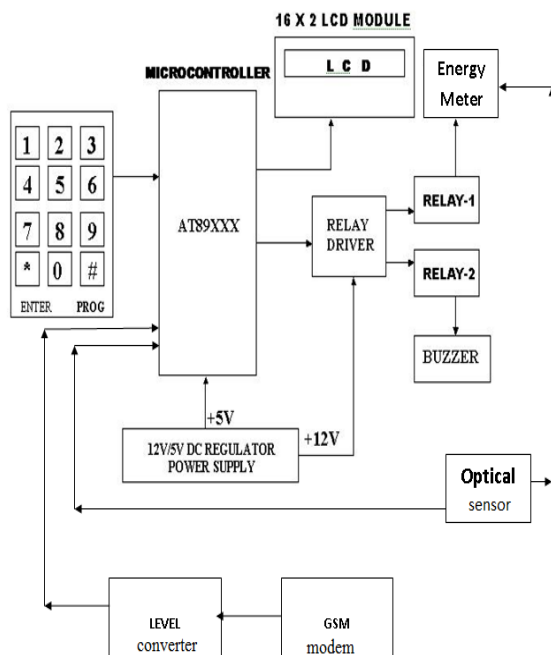
4. BLOCK DIAGRAM

Fig-1: Block Diagram

WORKING

Fig-2: Set Up Of Project

we have to load the 14 digit number, printed on recharging voucher, in to system using keypad also using mobile through the GSM. After loading the 14 digit code, it is compared with code saved in memory, if it is wrong then units will not load, but buzzer will turn ON. And if 14-digit code is right, then units corresponding to that code are loaded into system. After loading the units light supply is given to customer. According to light used the loaded units will decrement. When minimum units, set by program, are remaining then microcontroller gives indication to customer to bring the new recharging voucher, to recharge the energy meter. But if he fails to recharge the energy meter then light is disconnected from the customer's house. GSM technology is used so that the consumer would receive messages about the consumption of power (in watts) and if it reaches the minimum amount, it would automatically alert the consumer to recharge. LCD display is used to display the code, error message and units etc.

6. HARDWARE DESCRIPTION

6.1 GSM Modem

The modem follows plug and play operation with on board RS232 interface for communication and follows standard AT command set. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller. It can be used to send and receive SMS or make/receive voice calls. It can also be used in GPRS mode to connect to internet and do many applications for data logging and control. In GPRS mode you can also connect to any remote FTP server and upload files for data logging.

6.2 Energy Meter

Fig-3: Energy Meter

In this project we are using conventional energy meter. When there is no supply at input terminals of energy meter then the internal disk will not rotate.

When there is supply given at input terminals of energy meter then the internal disk will start to rotate. The speed of rotation depends on power used at output terminal. There is mechanical counter to count the rotation of disk. For four hundred rotations unit will increment by one.

6.3 Microcontroller 89c51

It is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash Programmable and Erasable Read Only Memory PEROM. The device is manufactured using Atmel's high density non-volatile memory technology and is compatible with the MCS-51™ instruction set and pin diagram. The on-chip flash allows the program memory to be reprogrammed in-system or by a conventional non-volatile memory programmer. By combining a versatile 8-bit CPU with flash on a monolithic chip. the Atmel AT89C51 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications.

7. CONCLUSION

The design of Smart Energy meter using GSM technology can make the users to pay for the electricity before its consumption. In this way, consumers hold credit and then use the electricity until the credit is exhausted. If the available credit is exhausted then the electricity supply is cutoff by a relay. An arrangement is also made to intimate the user with the help of GSM communication module when their credit in their balance goes low. This system has been proposed as an innovative solution to the problem of affordability in utilities system. Since a microcontroller based system is being designed, the readings can be continuously recorded. This reduces human labour and at the same time increases the efficiency in calculation of bills for used electricity. Smart energy meters will bring a solution of creating awareness on unnecessary wastage of power and will tend to reduce wastage of power. This module will

reduce the burden of energy providing by establishing the connection easily and no theft of power will take place.

8. REFERANCE

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