

Monthly Electricity Billing System using Microcontroller

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Abstract: The main purpose of this paper is to measure the monthly electricity bill as well as consumed electricity in units using microcontroller. This project is fitted at home so people need not to be worry about bill tampering. The user can get the message of electricity bill as well as consumed units through GSM modem also user can observe these things on LCD display.

Keywords: Microcontroller, SIM900 GSM module, Energy Meter, MAX232, Opto-Coupler, LCD Display, etc.

1. Introduction

The project provides a system that allows for consumed electricity reading in units as well as the amount charged over it to the user. Our system provides the electricity readings on an LCD screen as well as can SMS this reading and cost in rupees to the user. This lets the user know about his exact electricity units consumed and cost directly from his meter so that there is no chance of bill tampering. The project allows a two way reading. One on the LCD display and second on the SMS by using the GSM module.

Our project consists of a GSM modem connected to the microcontroller of 8051 family. The system continuously monitors electrical pulses and calculates the unit consumption. The system then uses the cost of each unit to calculate the electricity cost. It then sends all this data to user and electric company via SMS and also displays it on an LCD screen for viewing. The system further enhanced to receive user messages and control load operations.

2. Block diagram

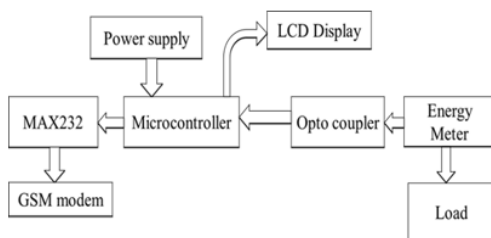


Fig. 1. Block diagram of monthly electricity billing system

1) Microcontroller

In this monthly electricity billing display system, the microcontroller have been used for the intelligent control of this

system. It is 40 pins integrated circuit IC, programmed in c language with the help of mikro/c software. It is powered up with 5 V dc and it interfaced with max 232, LCD display and opto-coupler.

2) MAX 232

In this monthly electricity billing display system, the max 232 is used for serial communication between the microcontroller and GSM modem. It is dual channel 16 pins integrated circuit IC and is only used for communication purposes. It is powered up with 5 V dc and can send or receive the digital signal.

3) Opto-coupler

In this monthly electricity billing display system, the optocoupler is used for giving the on or off pulse to microcontroller. It is 6 pins integrated circuit IC and gives the pulse signal to the energy meter after receiving the on or off signal from microcontroller. Here it is also used for isolation purposes between microcontroller and output load.

4) Energy meter

In this monthly electricity billing display system, the energy meter is used for calculating the consumable units. Two types of energy meter are available in market one is disc type, which works on the principle of mutual induction second one is digital electronic meter, which have been using here.

5) SIM 900 GSM module

In this monthly electricity billing display system, the GSM modem is only used for communication purpose between the mobile phone and this billing display system. It is wireless base modem, works on the principle of mobile phone subscriptions and accepts sim card. Here it is interfaced with microcontroller through max 232.

6) LCD display

In this monthly electricity billing display system, the LCD display is used for displaying the customer's monthly consumable units with their cost in other words it displays totally monthly bill. It is 16 pins LCD display, interfaced with microcontroller and is powered up with 5 V dc.

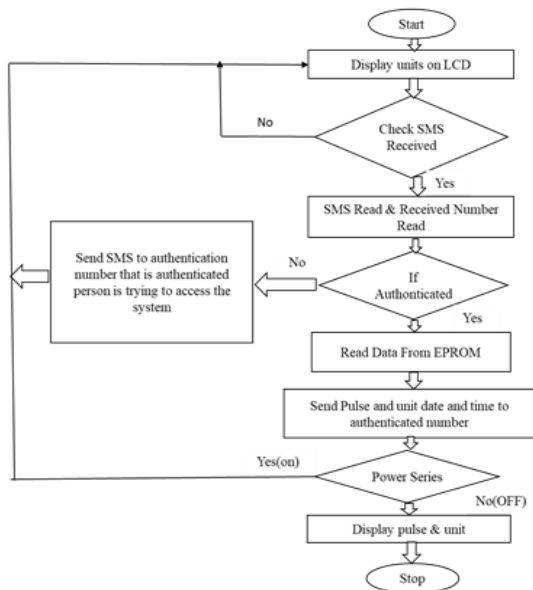


Fig. 2. Flowchart

3. Conclusion

In this proposed system we are going to make the project which calculate the monthly electricity bill and consumed units of electricity with SMS feature as well as these things will display on LCD display. We are going to decrease the man

power as well as tampering of bill.

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