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Prepaid and Postpaid Energy Meter for Billing System Using Microcontroller and GSM

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Abstract – ***In this paper smart energy meter with GSM model for prepaid and postpaid system is proposed. Due to this system the user has ability to select prepaid or postpaid mode as per his/her requirement. In prepaid mode balance is reduced as per energy is consumed. When the balance is low user gets a "Balance is low" message. If balance reaches to zero then with the help of relay power automatically gets cut off. If the account is recharged then the user gets uninterrupted power supply. In postpaid system with the help of GSM module MSEB gets the message of how much units a particular user is used and according to that data MSEB sends bill by post.***

Key Words: AT89C52, GSM module, energy meter.

1. INTODUCTION

Now a days traditional meter reading is used in which a person is sent to record reading which MSEB collects and bill is send to user. This system has many flaws such as labor work, time consuming. In order to eliminate these errors this project proposes prepaid and postpaid meter system. If the bill is not filled in time power supply is switched off remotely.

2. EXISTING SYSTEM AND ERRORS

In existing system an energy meter is installed at every house which records energy consumed by user. Then a person hired by MSEB goes to each and every house and collects the data which he gives to MSEB. Then MSEB calculates the bill. According to that data bill is send to user by post to user.

If a user doesn't pay the bill then after a lot of time period MSEB sends workers to cut off that particular power supply. When that person pays the bill then MSEB sends a man to connect the power supply.

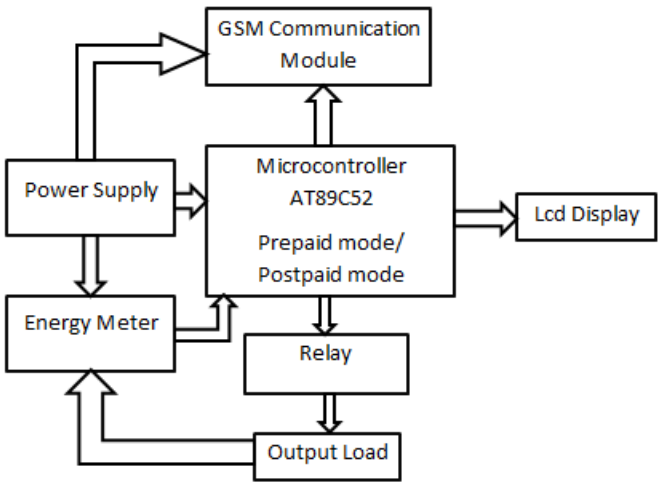
This system has some major drawbacks such as going to remote areas is not easy. The person sends MSEB may or may not know the area. While going to remote area a lot of time is wasted. That person may not take reading from all users. There are possibilities of error in taking the reading. Then he comes back to submit data to MSEB. Then MSEB is able to calculate the result. In this process a lot of time is wasted. in this system a lot of labor work is needed. MSEB have to pay these people extra money to do work. If MSEB have to cut power supply then a person goes manually cut supply. At first a power supply is disconnected and again have to reconnect a person has to go that place and connect.

PROPOSED SYSTEM

In this system atmel microcontroller is used for selecting prepaid and postpaid mode. In prepaid mode balance can be filled by user as per requirement. For postpaid monthly statement is send by post.

This proposed system operates with high speed. For prepaid mode it sends "Balance low" message to user when the balance is low with the help of GSM module. For postpaid mode units used are send to MSEB in form of message.

BLOCK DIAGRAM



WORKING

In our project there is combination of two types energy meter, we can select first mode which is prepaid mode. When this mode is active relay 1 is used to cut off or continue the power supply.EEPROM1 stores amount of energy remaining. When this count reaches near to zero "balance is low" SMS is send to that particular user. If the user fills the balance then uninterrupted power supply is provided. If the user do not fills balance then when counter reaches to zero with the help of relay1 power supply to the user is switched off.

When mode 2 is selected which is postpaid mode relay2 is used to cut off or continue the power supply.EEPROM2 stores amount of energy used by consumer.at the month end the units used by consumer are sent to MSEB with the help of GSM module. Then MSEB calculates bill by using this data. Each user have a special SIM number, Which helps MSEB to identify that particular user.

If user have compliant about energy meter then a button is provided which if user presses it sends "GSM BASED ENERGY METER SERVICE REQUIRED" to MSEB office then MSEB can send the person to give service.

RESULT

When power supply is given to controller and postpaid mode is selected then after every thirty days the units consumed by user are send by SMS to MSEB and user. MSEB calculates amount according to that data. If bill is not paid in time then power supply is shut down remotely.

When prepaid mode is selected by the consumer, the units are reduced as per consumption. When balance is low "Balance low" message is sent to user. If the counter reaches to zero power is automatically shut down. But if balance is filled power is continued.

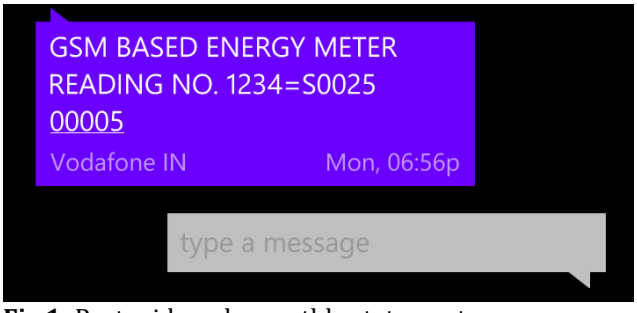


Fig 1: Postpaid mode monthly statement

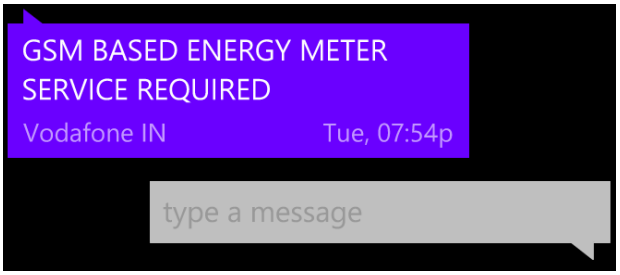


Fig 2: Service requirement SMS send by GSM unit at user's house

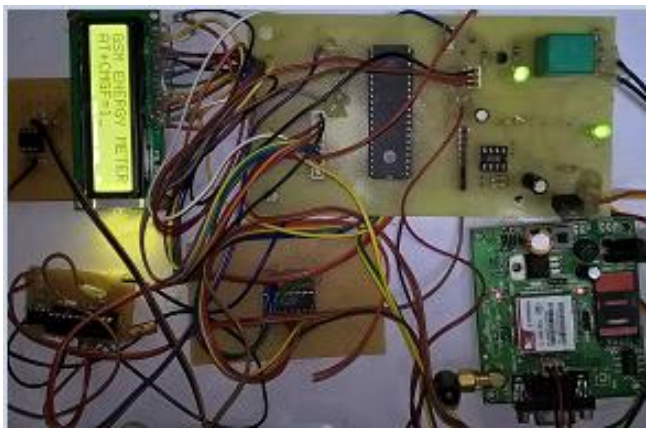


Fig 3: When load is on.

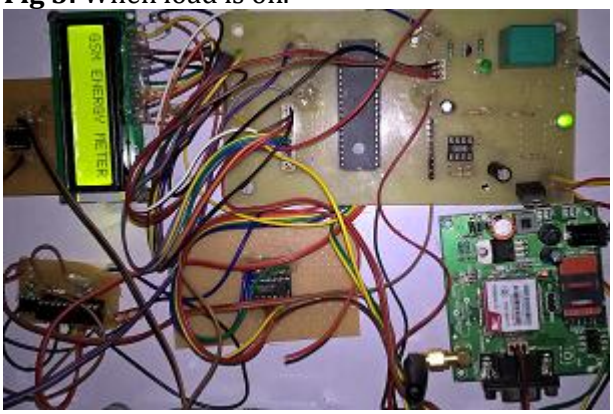


Fig 4: When load is off.

ADVANTAGES

1. By designing this project we reduce the human efforts and time.

2. We increase the accuracy of system.

3. Hard copies can be eliminated completely.

4. Speed of service is increased.

CONCLUSION

Due to this system a user gets to choose prepaid or postpaid mode as per requirement. The problem of maintaining bills is reduced. Mass production of meters is possible and there is no need to create prepaid or postpaid meters separately.

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