APPENDIX B

IOT BASED SMART ENERGY MATER IN REAL TIME

Avinash Saroj[1#], Ayush Kumar Singh[2#], Tanishq[3#], Ms. Preeti Jaidka[4*]

[1]sarojavinash1995@gmail.com

[#]Department of Instrumentation and Control Engineering, JSS Academy of Technical Education, Noida, UP, India

[4]preetijaidka@jssaten.ac.in

[*]Assistant Professor, Department of Instrumentation and Control Engineering, JSS Academy of Technical Education, Noida, UP, India

Abstract- The dawn of Internet of things(IoT) has started its journey for new era of smart and portable devices. IoT is regarded as hard-core for integrating various sensors, microcontrollers and all sorts of communication protocols and lays the foundation of futuristic communication standard i.e. Human-Things Interaction. The aim of this research paper is to highlight the concept of Internet of Things(IoT) and addition to this, a Smart Energy Meter capable monitoring and processing the Bill of the Energy Meter.

1. INTRODUCTION

Internet of Things has been a vast field for inventions since it came into the world. The most important part of this technology is the ability to control electrical and mechanical products without physically even handling them. We just need a wireless connection and that's all.

The main objective of this project is to automate the Energy Meters so that they not only keep record of the energy being used but also deliver the information about the units used and the amount generated to the customer.

The main aim of this paper is –

- To create an automated and self billing system
- To solve the problem of energy theft across the country

2. COMPONENTS USED

- GSM Module
- Energy Meter
- Microcontroller
- Power Supply
- Display

3. METHODOLOGY

Microcontroller AT89S52 is the heart of the system. It is used to control the relay so as to enable the switching of the load .it also supplies the power to the GSM module so as to make a wireless connection. It is also accepts the commands from the push buttons so that we can send the details to the user and we can also we can increase the time period for which billing is to be done.

A 2X16 LCD has been provided so as to monitor the readings and the usage of the energy. Reading along with the number of days and the amount generated is

displayed on the display. The brightness of the display can also be adjusted.

Optocoupler has been provided into the system so as to avoid the failure of the system due to overloading or due to the short circuit. Isolation transformer is not used as it adds unnecessary input inductance to the system.

For sharing of the details 2 SIM cards are used where one is used into the GSM Module itself so that the details could be sent and the other is used by the user to read the message.

4. PROCESS DESCRIPTION

A) ENERGY METER

A typical analog type energy meter is used that operates on 230V 6A and the meter constant of the energy meter is around 2300. Since the meter constant is very high so we have used the microcontroller so the it counts the number of blinks that the unit LED makes and operate accordingly. In order to smoothen the process and get the reading as per the users choice we programmed the controller to display 1unit for every blink of the LED.

The supply from mains is given to the meter and the output from the meter is given to the power supply to get a constant DC supply for the microcontroller and the display. And the output from the meter is also given to the relay so as to control the on-off condition of the load.

B) MICROCONTROLLER

Microcontroller AT89S52 is used , the input to the microcontroller is from the voltage regulator and the push button that is used to control the load. The output from the controller is to following parts:

- GSM Module: The power to the module is provided by the controller.

- Display: The power to the display is given by the microcontroller. And the information about the units used , number of days passed and the amount generated is displayed by the microcontroller.
- Relay: A 5V supply is given by the controller through the Darlington pair to the Relay to control the load.

C) GSM MODULE

SIM 900A GSM is used it operates on a bandwidth of 800MHz.A push button gives input to the microcontroller and the microcontroller generates the message to be delivered and the module sends the message to the user in the following format:

M. code: 2314, Address: xyz, Name: 13BEE0123, Unit: XXXX, Balance: XXXX

5. CONCLUSION

In this paper we showed how to implement a Smart Energy Meter. The aim behind this project is to reduce the energy theft and enable the user to track the usage of the energy and to generate the bill by himself. In order to cope up with the problem of energy theft we need to use a SIM to which a Bank Account is connected. And the programming is to be done for auto payment. When the month ends the controller should automatically deduct the balance from the account and in case the payment is not made due to low balance then the controller should put the load down with the help of the Relay.

6. REFRENCES

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