Automatic Energy Meter Reading Using Bluetooth

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Abstract- *Presently electronics energy measurement is continuously replacing existing technology of electro-mechanical meters especially in China and India. By the year 2004, digital meter has start replacing electromechanical meters in Singapore. A wireless digital energy meter would definitely offer greater convenience to the meter reading task. Bluetooth technology is chosen as a possible wireless solution to this issue. In this paper, we present the design and implementation issues of a Bluetooth-enabled energy meter. The energy reader can collect the energy consumption reading from the energy meter wirelessly based on Bluetooth. Two methods, which can retrieve the meter reading with little human intervention, are proposed and implemented in the targeted applications. They are AMR (automatic meter reading) and the APM (automatic polling mechanism). Few commercial applications are suggested to apply for the Bluetooth-enabled energy meter. We have successfully implemented the Bluetooth-enabled energy meter for these suggested commercial applications to demonstrate the advantage of reading the electricity consumption wirelessly via Bluetooth technology.*

Keywords- Bluetooth, IC ,DC Supply, LCD, wireless data, data management, billing and payment

I. INTRODUCTION

It will be of social interest of the society and will also reduce the billing burden of the respective state electricity board one has to educate the society of its importance. There will be awareness of the energy conservation. and the best of all it will avoid the illegal practice that quite often happen in our society. It will create smart society that it need for the Nation Smaftech. Inc is pioneer in producing Bluetooth and smart card technology in India. Electronic energy meter has got numerous advantages over the conventional electromechanical meter and due to this; many countries of the world have switched to electronic metering system. But unfortunately Pakistan is still deprived of such meters. The paper is based on the final year project of the design & implementation of prepaid electronic energy meter which we are designing in order to eliminate the problems being faced by the Pakistani people. By the introduction of prepaid system in Pakistan the problem of overcharging and over billing and the trouble being faced by the customers in paying the bills will be removed all together. Since our meter is electronic in nature, it has got no moving parts and hence the problem of stability & accuracy due to temperature changes are solved. Our meter is also tamper resistant which eradicates the chances of the theft of electricity[1]

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II. LITERATURE REVIEW

This method can eliminate the problems such as manpower requirement for billing and errors during calculation etc., and can provide necessary information such as tariff variation and due date for payment etc. to the consumer through the wireless medium. The wireless technology can be implemented by having a Bluetooth enabled transceiver interfaced with the electricity billing section server as well as in consumer side. .

III. BLOCKDIGRAM

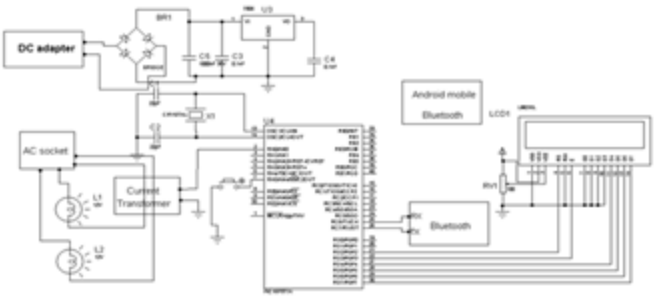

Fig-block diagram of data collection of patient monitoring system

The master card consists of Micro controller, RF/ Bluetooth cards, and LCD etc. The Bluetooth INTERFACE is used for wireless communication between patient card and android phone. The Bluetooth card receives the data from the tablet pc and sends it to the micro controller. The Max 232 is used to provide interface between patient card and PC if necessary. The LCD is used to display the various parameter and their current value read by the micro controller

Power Supply-When working with electronics, you always need one basic thing: Power. In every electronic circuit power supply is required. The proper working of each and every component, the exact amount of voltage and current to be supplied to it. If the power exceed its limit, it can be fatal. Below is the circuit diagram of power supply which gives output of 5V, as only that much is required for microcontroller.

Bluetooth--module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm. Hope it will simplify your overall design/development cycle.

This document contains device specific information .Additional information may be found in the PIC micro TM Mid-Range Reference Manual (DS33023), which may be obtained from your local Microchip Sales.Represent native or downloaded from the Microchip website. The Reference Manual should be considered a complementary document to this data sheet, and is highly recom-mended reading for a better understanding of the device architecture and operation of the peripheral modules.There are four devices (PIC16F873, PIC16F874,PIC16F876 and PIC16F877) covered by this data sheet. The PIC16F876/873 devices come in 28-pin packages and the PIC16F877/874 devices come in40-pin packages. The Parallel Slave Port is not implemented on the 28-pin device The following device block diagrams are sorted by pin number; 28-pin for Figure 1-1 and 40-pin for Figure 1-2.The 28-pin and 40-pin pin outs are listed in Table 1-1 and Table 1-2, respectively

IV. HARDWARE REQUIREMENT

1. ARM platform
2. BLUETOOTH Module
3. Voltage and Current sensors
4. Keypad
5. Monitoring Module

SOFTWARE REQUIREMENT-

Code Composer Studio

ADVANTAGES-

1. Accurate meter reading, no more estimates.
2. Improved billing.
3. Accurate profile classes and measurement classes, true costs applied.
4. Improved security and tamper detection for equipment.
5. Less financial burden correcting mistakes.
6. Less accrued expenditure.
7. Improved procurement power though more accurate data-"de-risking" price.
8. In case of shortages, utility will be able to manage/allocate supply

Future Scope -In future phase of this project, you will be able to view your daily energy usage, at your convenience, by logging in to your account on website. Knowing both how you use energy, and when, will allow you to decide what energy-saving changes you would like to make. You can always check our website for current information, and the Texas power magazine will continue to provide information on when new options are available.

V. CONCLUSION

This paper presents the design and the implementation of an interactive BLUTOOTH based energy meter. As the mobility in the world increases, the need for communicating to remote locations also increases. The use of BLUTOOTH communications technology helps lower the expense of the system and the intrusiveness of the respective system Installation. This system helps to pay our electricity bill in our own place..

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