Bluetooth Energy Meter

The purpose of this project is to remote monitoring of the Digital Energy Meter using Bluetooth technology. This system enables the Electricity Department to read the meter readings regularly without the person entering inside each house. This can be achieved by the use of Microcontroller unit that continuously monitors and records the Energy Meter readings in its permanent (non-volatile) memory location. This system also makes use of a Bluetooth module for transmitting the readings of Energy Meter to Bluetooth enabled Mobile phone.

Bluetooth is an open standard specification for a radio frequency (RF)-based, short-range connectivity technology that promises to change the face of computing and wireless communication. It is designed to be an inexpensive, wireless networking system for all classes of portable devices, such as laptops, PDAs (personal digital assistants), and mobile phones. It also will enable wireless connections for desktop computers, making connections between monitors, printers, keyboards, and the CPU cable-free.

The Microcontroller based system continuously records the readings and the live meter reading can be sent to the Hand held device. Energy meter, Bluetooth module and LCD display are interfaced to the Microcontroller. The Microcontroller continuously gets input from energy meter; this data is processed and displayed on the LCD and also transmitted using Bluetooth module. This data can be received by any Bluetooth enabled mobile phone. The major advantages of this system are making use of Bluetooth technology which helps for a wireless transmission and the readings can be seen on hand held device (Bluetooth enabled Mobile phone). The Microcontroller in the project is programmed using Embedded C language.

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The main features of this project are:

1. Wireless Meter Reading transmission.
2. High accuracy.
3. Instantaneous display on hand held device (Bluetooth enabled Mobile phone).

The device provides learning's on the fallowing advancements:

1. Bluetooth technology.
2. Interfacing of Bluetooth module with Microcontroller.
3. LCD interfacing with Microcontroller.
4. Energy meter interfacing with Microcontroller.
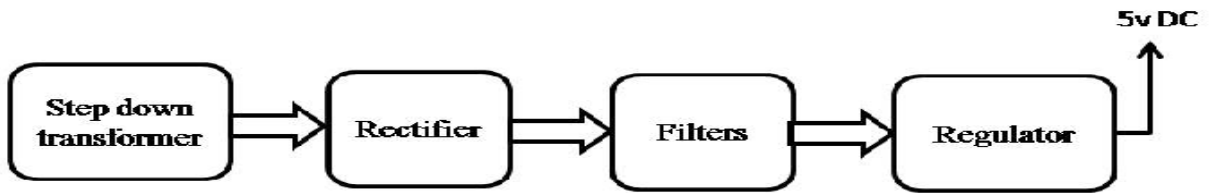5. Embedded C programming.
6. PCB design.

The major building blocks of this project are:

1. Regulated Power supply.
2. Microcontroller.
3. Bluetooth module.
4. Energy meter.
5. Optocoupler.
6. Reset.
7. LCD display with driver.
8. Crystal oscillator.
9. LED indicators.

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Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

Regulated Power Supply:

5v DC

Step down transformer → Rectifier → Filters → Regulator

Block diagram:

Bluetooth Energy Meter

Regulated power supply

Bluetooth Enabled Mobile phone

Energy meter → Optocoupler → Micro controller

Reset → Micro controller

Crystal Oscillator → Micro controller

Micro controller ↔ Bluetooth module

Micro controller → LCD driver → LCD

Micro controller → LED indicators

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