Grid Mnitoring Using Wireless Communication

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Abstract

By embedding computational capabilities in all kinds of objects and living beings, it will be possible to provide a qualitative and quantitative leap in several sectors: healthcare, logistics, domestics, entertainment, and so on. Due to the drastic changes in technology in the last decade, so many advancements were introduced in electricity departments. The electricity bill can be paid now through E-Seva centers, Net-banking and even through mobile phones.

Introduction

By embedding computational capabilities in all kinds of objects and living beings, it will be possible to provide a qualitative and quantitative leap in several sectors: healthcare, logistics, domestics, entertainment, and so on. Due to the drastic changes in technology in the last decade, so many advancements were introduced in electricity departments. The electricity bill can be paid now through E-Seva centers, Net-banking and even through mobile phones. In this project electricity consumption by the user i.e. Units consumed in that meter will be sent to receiver using ZigBee module and also 16X2 LCD is provided to read units available. Whenever there is a change in count value / units in the meter get changed, these values are displayed on LCD. Here we are using ZigBee for the purpose of communication. Here we are using a current and voltage transformer to identify the changes in power. So when these are known then the load can be controlled by just tripping off i.e. to avoid damage of our appliances. At the receiver we also have a GSM modem interfaced to the controller to send the SMS in abnormal case. At the transmitter we have LPC2148 & AT89S52 at the receiver.

This system uses 5V regulated power supply for the microcontroller unit and 18V supply for the load. This is provided by the 18V, 2Amp transformer. Recharging unit also requires regulated 5V supply, which is provided by a separate 18V and 750mA transformer. Hence this project provides a best solution for the users to know how much amount of power is consumed in their day- to- day life and also the amount of power consumed is also under the user control.

Over View

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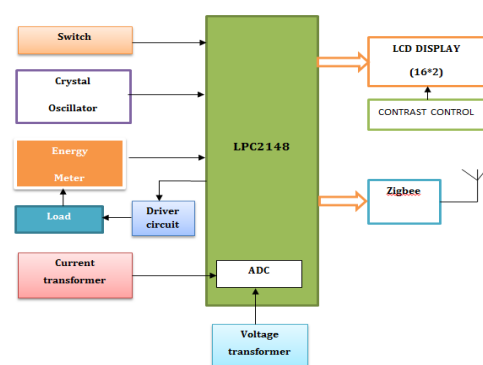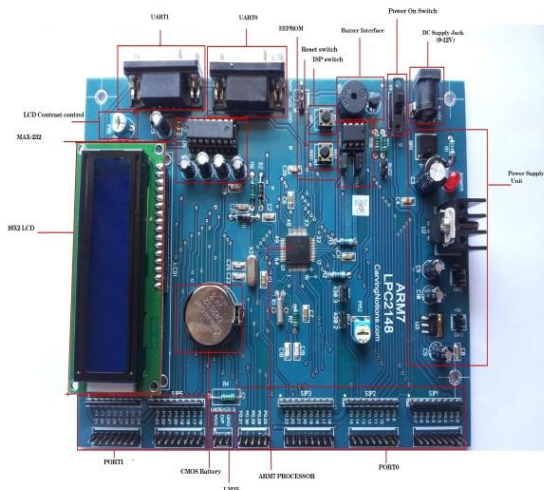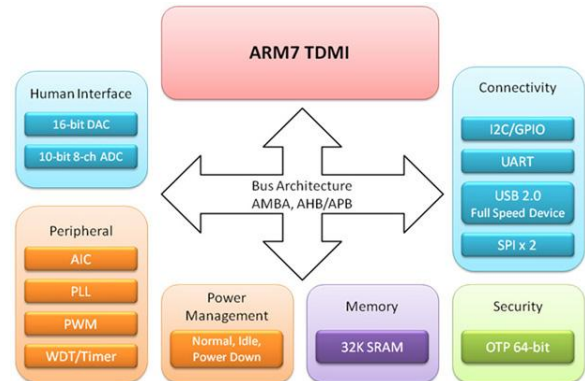
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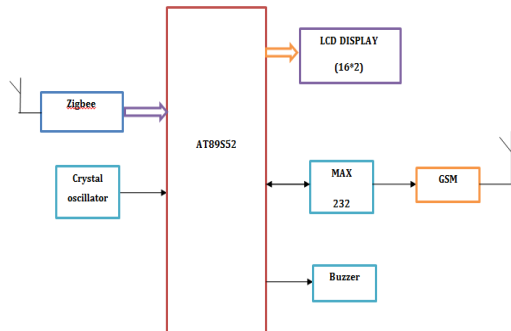
Hardware modules

The **LPC2148** are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory.


A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

ZigBee
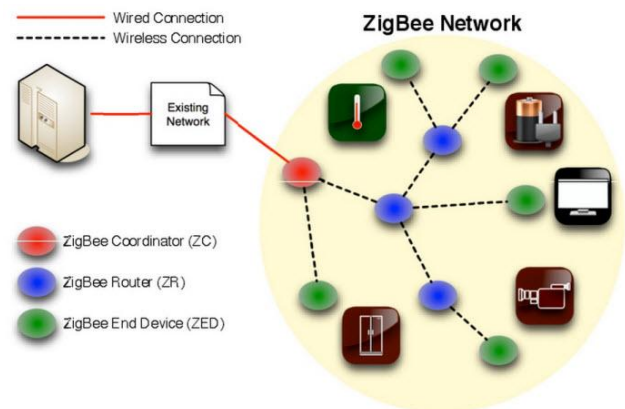
It is the wireless device for transmitting and receiving purpose or simply it called as Transceiver. ZigBee is based on the IEEE802.15.4 protocol. The range of the ZigBee is covered as 100m. It range is 10 times better than Bluetooth device so it can be more preferable one in wireless device. The data rate is very low for transmission while using this device.


ZigBee floor network tree.
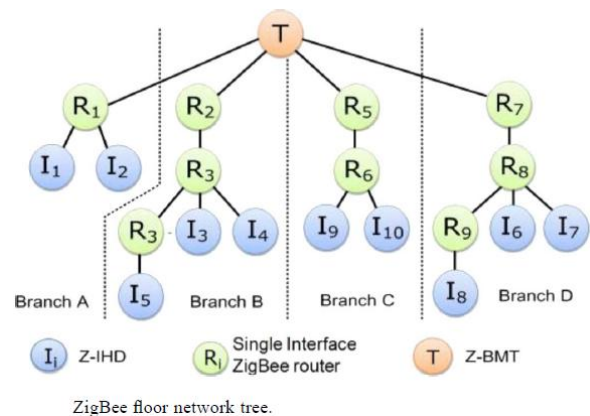
Grid

The term grid usually refers to a network, and should not be taken to imply a particular physical layout or breadth. Grid may also be used to refer to an entire electrical network, a regional transmission network or may be used to describe a sub network such as a local utility's transmission grid or distribution grid.

Global System for Mobile Communication

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.
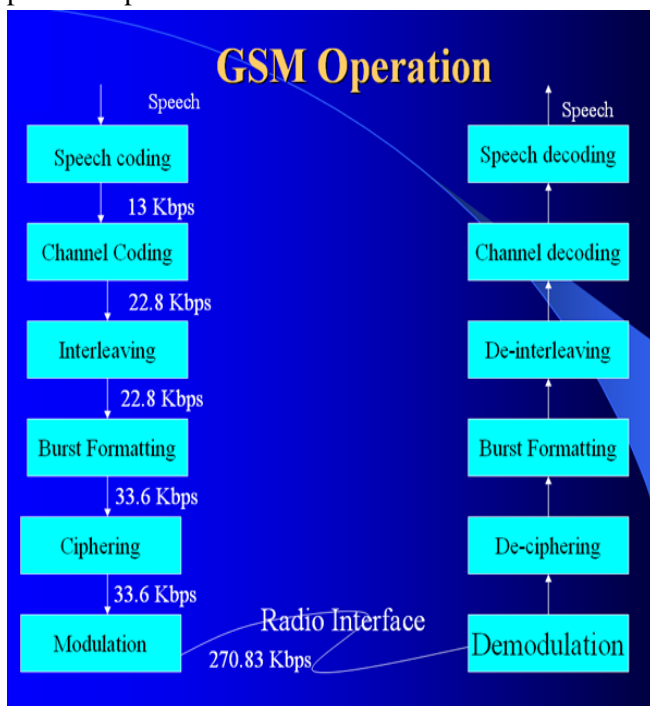
PERFORMANCE EVALUATION

The performance evaluation is divided into two parts: ZigBee mesh floor (horizontal communication) network and BN (vertical communication).
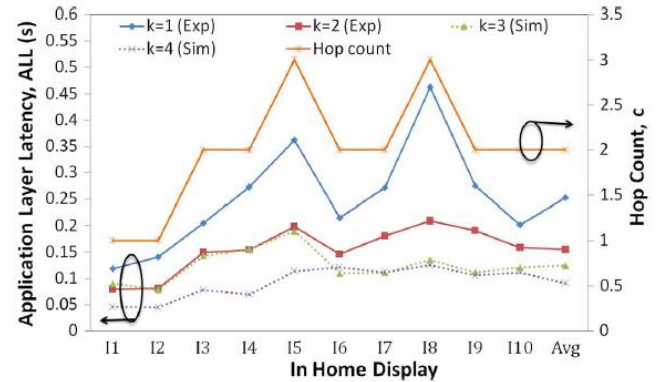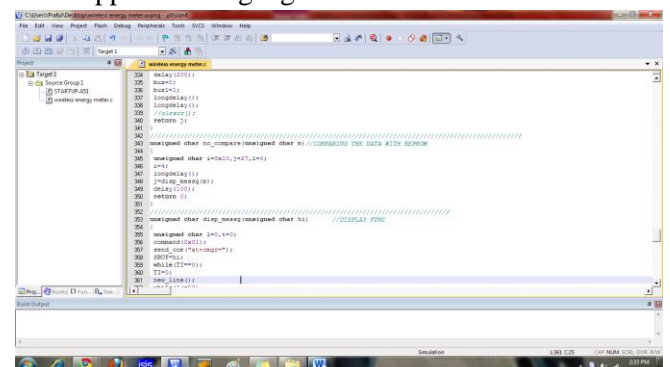

ALL and c of $I_1 - I_{10}$ for $k = 1$–4 and $n = 1$.

SOFTWARE DETAILS

Keil compiler

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

Ease of maintenance accessing the data from other place less power consumption. Very faster communication
Weather stations. Agricultural

Conclusion

To facilitate efficient deployment of metering for existing buildings this concept is very helpful using LPC2148 and ZigBee.

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