

HARDWARE IMPLEMENTATION OF GPRS BASED ON EMBEDDED SERVER USING REMOTE ACCESS TERMINAL

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ABSTRACT

Wireless Packet Data Networks, such as GPRS, hold great promise for applications that rely on machine to machine (M2M) communication. The rapidly advancing mobile communication technology and the decrease in costs make it possible to incorporate mobile technology into home automation systems. Based on an SMS/GPRS (Short Message Service/General Packet Radio Service) mobile cell module and a microcontroller, a home automation server can be established. Powerful microcontrollers are used as parts of most home and office appliances of today. Integrating web servers to these intelligent devices will aid in controlling them over the Internet and also in creating effective user interfaces in the form of web pages. This paper presents the development of AT modem driver, text based command processing software, output for an Atmel micro-controller to facilitate in sending and receiving data via the cell module. The proposed design is implemented using SMS (commonly known as text messages) and GPRS (Internet based protocol) as the main communication protocol.

Key words: LPC2148 development board, GPRS Modem, Cell Phone which can support JAVA Application, Intelligent appliances

INTRODUCTION

Remote control via the Internet is not a new feature and used in home automation systems. However, providing a mechanism for interaction between devices in this environment is quite challenging. The internet has been mostly used to connect personal computers so far, but shortly all kinds of appliances with embedded computers

will exchange information over the Internet. A massive number of microcontrollers are available in today's devices which can be linked to the Internet. If these intelligent appliances could be connected to the Internet at low cost, the way we control and manage their functions would change entirely. An embedded web server should use the HTTP protocol to transmit Web pages from the embedded system to the attached to the appliance. The embedded system requires a network interface, such as Ethernet, a TCP/IP protocol stack, embedded web server software and static and dynamic web pages that form the user interface for that specific device.

I. THE HARDWARE SYSTEM

Micro controller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

ARM7TDMI: ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

Liquid-crystal display (LCD) is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or

fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

THERMISTOR: Thermistors are a temperature sensing device. It is used to sense the temperature. In this project by depends on the value of temperature the exhaust fan will run.

I. DESIGN OF PROPOSED HARDWARE SYSTEM

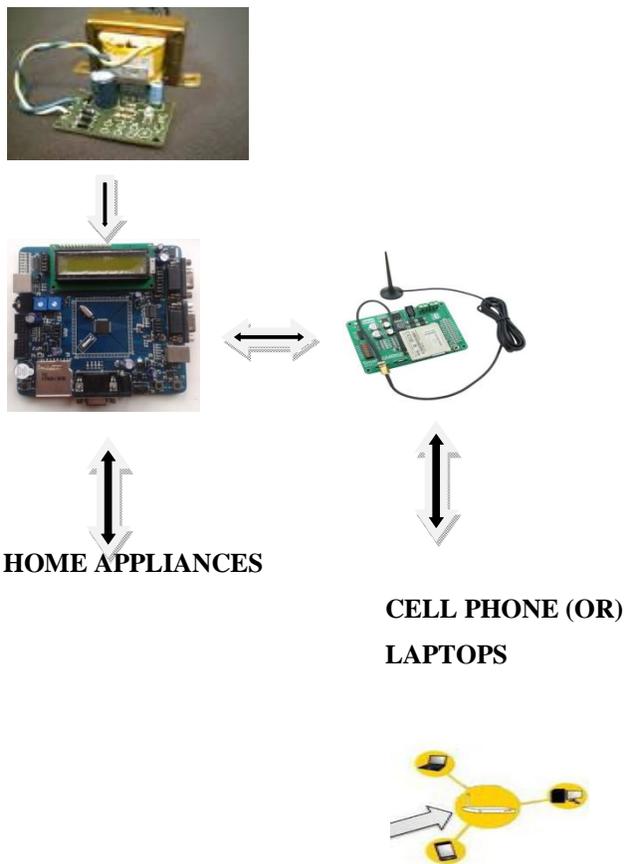


Fig.1.Block diagram

We can overcome the disadvantage of the existing method by Remote control via the Internet and it's a new feature and used in home automation systems. However, providing a mechanism for interaction between devices in this environment is quite challenging. The internet has been mostly used to connect personal computers so far, but shortly all kinds of appliances with embedded computers

will exchange information over the Internet. A massive no of microcontrollers are available in today's devices which can be linked to the Internet. If these intelligent appliances could be connected to the Internet at low cost, the way we control and manage their functions would change entirely. The embedded system. requires a network interface such as Ethernet, a TCP/IP protocol stack, embedded web server software and static and dynamic web pages that form the user interface for that specific device. The system uses a compact circuitry built around LPC2148 (ARM7) microcontroller programs are developed in Embedded C. Flash magic is used for loading programs into Microcontroller.

IV.BOARD HARDWARE RESOURCES FEATURES

Gprs

GPRS (General Packet Radio Service) is a packet based communication service for mobile devices that allows data to be sent and received across a mobile telephone network. GPRS is a step towards 3G and is often referred to as 2.5G. Here are some key benefits of GPRS .GPRS usage is typically charged based on volume of data transferred, contrasting with circuit switched data, which is usually billed per minute of connection time. Usage above the bundle cap is either charged per megabyte or disallowed.

GPRS is a best-effort service, implying variable throughput and latency that depend on the number of other users sharing the service concurrently, as opposed to circuit switching, where a certain quality of service (QoS) is guaranteed during the connection. In 2G systems, GPRS provides data rates of 56–114 kbit/second.^[3] 2G cellular technology combined with GPRS is sometimes described as 2.5G, that is, a technology between the second (2G) and third (3G) generations of mobile telephony.^[4] It provides moderate-speed data transfer, by using unused time division multiple access (TDMA) channels in, for example, the GSM system. GPRS is integrated into GSM Release 97 and newer releases. As mentioned earlier GPRS is not a completely separate network to GSM. Many of the devices such as the base transceiver stations and base transceiver station



controllers are still used. Often devices need to be upgraded be it software, hardware or both. When deploying GPRS many of the software changes can be made remotely. There are however two new functional elements which play a major role in how GPRS works. The Serving GPRS Support Node (SGSN) and the Gateway GPRS support node (GGSN).

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