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E1-511: Microcontroller embedded web server with flash support

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In atmospheric and meteorology research, constant monitoring and recording of weather parameters are often required. Especially, in today's society, the demand is there not only to automate the monitoring and recording of physical parameters but also to provide online access to data. To satisfy these requirements a general purpose data acquisition system (DAQ) which collects and stores data was designed and built. Since the data such as weather information could be useful for the general public, special attention was given to publishing the data directly on the Internet.

To minimize the complexity and the cost of the system, the DAQ system was constructed with an embedded web server by interfacing high performance microcontrollers with other architectural platforms (PIC18F452 microcontroller and TCP/IP firmware). The firmware used for the network interface was developed on TCP/IP Lean. The server supports Ethernet and RS-232 interfaces. A standard web browser such as Microsoft® Internet Explorer, Netscape™ Navigator or Opera can be used to view HTML web pages that are generated by the PICmicro® microcontroller itself. Several status indicators and user interface devices are provided, including a 16 x 2 LCD indicator. The web server has 5, 10 bit, Analog inputs, one digital 8 bit input and a one Serial input (*max 33.6 kbps*) port.

The total power consumption of this unit is less than 250 mA / 5V at its full load. The network interface (RTL 8019AS) can send and receive data at a rate greater than 33.6 kbps (*Mainly depends on network traffic*) and its parallel interface can transfer data at a rate more than 500 kbps. However the Maximum number of simultaneous connections from the clients is restricted to 100, to maintain the Web Server's speed.