ELE700 / ELE800: Project Design 2004/2005

Topic:

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Estimated cost: \$ 250	Project rating: Average	Date: September 2004

Title: INSTRUMENTATION SYSTEM WITH INTELLIGENT SENSORS, WIREWLESS NETWORK AND INTERNET ACCESS

Preamble:

In many areas of application in laboratory or industrial environment it is necessary to have different types of data acquisition modules distributed in the area. On the other hand it is very beneficial to have Internet access to the data from those instrumentation modules. This allows getting lab experimental results or parameters of manufacturing process from remote location or in the hazardous environment. Thus, the system should be built around wireless network aggregating the host PC and distributed instrumentation modules.

Objective:

Develop built and test the distributed laboratory instrumentation system based on a host PC, wireless network and instrumentation modules based on RISC microcontrollers.

Partial specifications:

This project can be divided in two parts scheduled for two students:

- 1. Development of instrumentation modules based on RISC controllers interfaced via RF-transceivers to the host PC,
- 2. Host PC with RF-transceiver and software (GUI and application software) with the ability for Internet access to data collected from instrumentation modules.
 - Use Microchip PIC16F877 with 10-bit ADC for instrumentation modules,
 - Utilize MODBUS industrial protocol and USART standards for wireless LAN,
 - Apply JAVA for GUI and application software development.

Suggested approach:

- Conduct literature survey on USART and MODBUS protocols
- Design the instrumentation modules based on PIC16F877 embedded RISC-controllers;
- Develop wireless LAN on a base of MODBUS protocol,
- Interface this LAN with IBM-PC via COM-port (RS-232);
- Develop proper GUI for Windows platform as well as application software to provide access to collected data via Internet,
- Integrate and test complete system.