E1-223: Development of low cost network based virtual instruments

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With the rapid expansion in IT, especially in the communication and networking areas, new products and instruments are being introduced into the market frequently. These instruments help researchers to explore their problems in ways that are far superior to those that were available a few years ago. Today, many researchers require automated setups that can collect data without their presence. Often large amounts of data are required to overcome the noise and other interference on the signals that they study.

A simple DAQ system was developed with most of the general options available in the commercial DAQ systems. This device is composed of several sub units, all of which can be controlled via software written exclusively for the device. The device contains a two channel 8-bit ADC, a two channel 8-bit DAC, a reference voltage selector which is common to both DAC and ADC, an 8-bit digital output, an 8-bit digital input, one 8-bit register and an 8 step digital gain controller for the analog inputs. All inputs are protected from over voltages up to 50 V. The ADC has a sampling speed of 600 ksps and hence the device can be operated at the speed of the parallel port (around 800 ksps max). The control software for the device was written in Delphi and Assembler languages. The control software allows the device to be operated over the Internet or Intranet (Local Area Network) where the TCP/IP network protocol is used.