**Virtual instrument package for Visual Basic**

Engineers who would like to get the functionality of National Instruments Corp.’s popular LabVIEW graphical programming environment for instrumentation but prefer to work in Visual Basic got a gift this holiday season. National has developed a collection of 32-bit virtual instrumentation add-on controls and libraries for Visual Basic 4.0. Called ComponentWorks, the tool set is compatible with multiple development environments and does not suffer from the array-handling limitations of Visual Basic extensions (VBX).

ComponentWorks comprises four major functional components: drivers for IEEE-488 instruments; data-acquisition (DAQ) controls; analysis libraries; and graphical user interface (GUI) controls for creating meters, knobs, real-time graphs, and so forth [see photo]. For maximum flexibility, the OLE controls and data-linked libraries (DLLs) can be combined with 32-bit OLE controls from other vendors.

The IEEE-488 drivers are standard 32-bit DLLs for more than 70 instruments from Hewlett-Packard, Tektronix, Keithley, Fluke, Wavetek, and others. They are based on National’s LabWindows/CVI driver library, the standard established through the VXI-plugsplay Systems Alliance.

The data-acquisition controls are strictly for controlling National Instruments’ data-acquisition hardware. As might be expected when the hardware and software come from the same vendor, the controls make DAQ programming particularly easy. All that is required is assigning a set of DAQ properties. When the hardware data buffer is full, the control simply passes the data array to a Visual Basic application for processing.

Two different analysis libraries are offered. The standard Analysis Library, which comes with the ComponentWorks Base Package, calculates basic statistical quantities such as the mean, standard deviation, maximum, minimum, and so forth of an array. The advanced Analysis Library comes with the Full Development System. It does signal processing, curve fitting, signal generation, complex algebra, matrix operations, fast Fourier transforms, filtering, and so on.


**peripherals**

**Fax acts as scanner for PCs**

Why waste all that good digital scanning and printing hardware just sitting in a fax machine? With the pocket-sized, quarter-kilogram ProSX-101 from Faxmate Inc., Rolling Hills, Calif., the fax acts as a scanner for any personal computer with a fax modem (phone cables are included). The scanned document, fed into any fax machine to which the unit is affixed, can then be manipulated to your heart’s content—saved, edited, e-mailed, or manipulated with software for optical character recognition.

On the output side, the device can be...
**EEs’ tools & toys**

used to replace a portable printer, say, so that rather than sending documents stored on a portable PC to an often-hoarded printer, they can be sent to a fax machine, which almost everybody has on-line and is easily accessible.

The ProSX101, and all necessary cables, sells for $79.95. Contact: Faxmate Inc., 904 Silver Spur Rd., Suite 425, Rolling Hills, CA 90274; 310-514-8322, toll-free, 800-514-9337; fax, 310-514-1333; or circle 106.

**general interest**

**Invention kit lets kids (and adults) do experiments**

It has been said that what makes engineers tick is a childlike curiosity and enthusiasm for taking things apart. If that is true, Widget Workshop, The Mad Scientist’s Laboratory, will delight the child in all of us. Developed by Maxis, the company behind SimCity 2000, Widget Workshop allows children (and adults) to connect dizzying arrays of scientifically accurate Rube Goldberg devices to make original inventions. It also lets them conduct wacky or realistic experiments and solve pre-built puzzles.

Components such as light switches, logic gates, gravity chambers, and even elephant hearts can be used to teach basic principles of math and science. On an elementary level, experimenters can measure how long it takes for a feather to fall to the moon’s surface from the height of the Empire State building. For those enamored of esoterica, the software can measure the interval between orbital rotations of Jupiter and Mars in hummingbird heartbeats with a mewing cat keeping time in the background.

Although designed as a combination teaching tool and game for children aged eight and up, the package is an excellent aid for science instructors, too. Its puzzles—actually, incomplete machines in need of additional connections and parts—will remind some engineers of their everyday jobs.

Speaking of engineering, our evaluation of Widget Workshop uncovered a flaw in the package: it is not very good at handling circuits with memory states—cross-coupled NAND gates, for example. So while the product is an entertaining instructional aid, we cannot in good conscience recommend it for VLSI logic synthesis.

The kit is available on CD ROM for PCs and on floppy disk for the Macintosh. It lists for $44.95. Contact: Maxis, 2 Theatre Square, Orinda, CA 94563–3346, 510-254-9700, fax, 510-253-3736; or circle 107.

**RF/Analog simulation library**

Users of SystemView, the Microsoft Windows-based visual simulator for signal electronics, now have available a library containing models of analog circuits and components. With it, for example, users can generate Bode and root locus plots with a single mouse click.

The library includes fixed and variable amplifiers, op-amps, several types of power splitters and combiners, couplers, and diodes. It also makes available resistor-capacitor differentiators, resistor-inductors, low-pass and high-pass R-C and L-C filters, PLL filters, LC tank and quad circuits, and coupled resonator pairs.

The host application, SystemView, supports mixed-mode (analog and digital)
multirate systems, parallel simultaneous systems, and internal or external data sources and sinks. Graphical templates can be used for design of analog-digital filter, discrete linear time, and continuous-time Laplace linear systems. Modifications to the design can be displayed in the time, frequency, or phase domain.

SystemView, at $2450, requires a minimum of 4-MB RAM and 3-MB disk-space on a 386 or higher computer running Windows. The RF/Analog library costs $525; other libraries for communications, DSP, and logic are also available. Contact: Elanix Inc., 5655 Lindero Canyon Rd., Suite721, Westlake Village, CA 91362, 818-597-1414, fax, 818-597-1427, e-mail, elanix@elanix.com, http://www.elanix.com, or circle 108.

Package supports chip- and system-level design

As electronic systems get larger, more complex, and more tightly integrated—with the trend toward realizing complete systems on a single chip—the separation of chip-level design and system-level design becomes less and less appropriate. It is usually desirable, and increasingly necessary, to merge the various levels of design and simulation for firmware as well as analog and digital circuitry.

A big step in that direction has been taken by the Alta Group of Cadence Design Systems Inc., which has released version 3.5 of its Signal Processing WorkSystem (SPW). Built around a new Convergence Simulation Architecture, SPW 3.5 supports control and dataflow modeling for both synchronous (fixed-rate) and dynamic (variable-rate) dataflow. It models real-world clocked systems and finite-precision systems and links with Alta's BONEs block-oriented network simulator for modeling the environment in which many new systems will operate.

In addition to the existing SPW block diagram editor, a graphical finite state machine (FSM) editor for modeling control-based designs is also available for version 3.5. For interoperability with high-level design language environments, FSM descriptions can be converted into C, Verilog, or VHDL.

The node-locked version of SPW 3.5 is priced at $25 000 in the United States, with the FSM editor adding an additional $10 000. Software for linking to BONEs is included with both packages. Contact: Alta Group of Cadence Design Systems Inc., 555 Mathilda Ave., Sunnyvale, CA 94086, 408-733-1595, fax, 408-523-1601, url, http://www.altagroup.com, or circle 109.

new & noteworthy

• Burr-Brown Corp., Tucson, Ariz., has a new quad version of its OPA65X Speed Plus voltage-feedback family of op amps. The OPA4650 quad has a 360-MHz bandwidth and 12-bit settling time of 20 ns to 0.01 percent. The price is $5.12 each in thousands. Contact: 800-548-6132; or circle 110.

• The 5B45 and 5B46 frequency-to-voltage signal conditioner modules from Analog Devices Inc., Norwood, Mass., provide 1500-V isolation and have a maximum initial accuracy error of ±0.1 percent span. Inputs, from TTL-compatible sources or zero-crossing signals, produce 0 to +5 V output proportional to the input frequency. Price is $180 each for 1–24 pieces. Contact 800-426-2564, fax, 617-461-3091, or circle 111.

Consultant: Paul A.T. Wolfgang, Boeing Defense & Space Group

MICHAEL J. RIEZENMAN, Editor