

LabWindows/CVI 5.0 Enhances C for Measurement and Automation

With the advent of LabWindows/CVI Version 5.0 comes a variety of new tools and capabilities that focus on productivity for the engineer and scientist developing applications in C. LabWindows/CVI 5.0 both accelerates development cycles and reduces test times – a compelling combination!

LabWindows/CVI has always excelled at rapid code generation. This strength continues to grow in LabWindows/CVI 5.0 with the addition of two new code wizards. The Instrument Driver Development Wizard takes you through the steps needed to create a state-caching instrument driver, accelerating the development process and ensuring that high-quality, high-performance drivers are created in the minimum time. The ActiveX Automation Wizard provides a simple-to-use tool for controlling other applications via ActiveX automation. With this wizard, you can build an intuitive instrument driver for ActiveX and automation servers like Microsoft Word and Excel. In addition,

the new dynamic link library (DLL) debugging capabilities mean you can get the wrinkles out of your application quicker than ever!

The new instrument driver architecture in LabWindows/CVI 5.0 improves run-time performance with state-caching. This built-in intelligence helps reduce unnecessary bus traffic without the need for optimizing driver source code. Status checking and parameter range checking in these drivers help test developers with their debugging, and can be switched off to beef up run-time performance for production tests.

The built-in simulation mode means that test program development can continue, even without an instrument present. Those using plug-in data acquisition can now configure their system with the DAQ Channel Wizard for simplified programming without tedious transducer algorithms.

For super sophisticated GUIs, LabWindows/CVI 5.0 offers 3D visualization with the new OpenGL



LabWindows/CVI comes with tools and capabilities that include 3D visualization, multithread-safe libraries, and more.

library. What's more, you can automatically rescale GUI panels for differing screen resolutions – perfect if you are developing applications for installation on multiple machines. ▶

For a LabWindows/CVI 5.0 kit, check this option on the reply card.

Visit www.natinst.com/cvi

Upgrade Now to LabVIEW 5.0!

You have probably read about it on the web, seen it in a magazine, or even heard your colleagues talking about it. Certainly many of you saw it at the LabVIEW 5.0 Worldwide Event in March. Already, thousands of users are successfully taking advantage of the numerous new technologies and features in LabVIEW 5.0 for Windows NT/95/3.1, Mac OS, Sun, HP-UX, and concurrent PowerMAX. If you have not started using LabVIEW 5.0 yet, you will want to get started with this exciting new version soon.

For enhanced reliability and performance, you can automatically take advantage of the built-in multithreading of LabVIEW 5.0 for Windows NT/95, Solaris 2, and Concurrent PowerMAX. Without any modifications to your code, you can immediately take full advantage of multithreaded operating systems and/or multiprocessor computers.

ActiveX connectivity is also easy in LabVIEW 5.0 on Windows NT/95. You can now easily embed ActiveX controls

and documents in a LabVIEW front panel, including Excel charts, web browsers, and more. Or, if you need to reuse LabVIEW code in other development environments such as C or Visual Basic, you can use the ActiveX automation server to call LabVIEW code from other environments.

Develop projects faster with tools that get you up and running, such as the new Instrument Wizard, as well as tools that automate tasks throughout project development, including documentation generation and translation utilities. Generate VI documentation in web format complete with graphics, or print complete documentation in rich text format (RTF) for use with on-line help compilers. With the LabVIEW 5.0 Professional Development System, which includes source code control and other large application development tools, you can track version changes between two VIs with the innovative graphical differencing utility. In addition, some of your most



highly requested features, including programmatic menu bars and multistep undo, are now available in LabVIEW 5.0.

LabVIEW 5.0 can impact your project by saving you an enormous amount of development time on applications of any scale. Start reaping the benefits of these new technologies today! ▶

For a LabVIEW 5.0 kit, check this option on the reply card.

Visit www.natinst.com/labview

Bringing ActiveX Benefits to Image Acquisition and Processing

From aligning paint robots with car chassis to counting and qualifying shattered glass fragments in destructive product testing, computer-based image acquisition and processing is occupying a growing role in the world of measurement and automation. These systems, more commonly known as machine vision applications, are enhancing or replacing traditional measurement applications with more efficient, non-invasive techniques and automating processes with computer-based tools.

ComponentWorks IMAQ™ Vision – Machine Vision ActiveX ComponentWorks IMAQ Vision, a suite of machine vision ActiveX controls, makes National Instruments image acquisition and processing solutions available to

Combining the machine vision ActiveX controls with other ComponentWorks tools users can develop applications using a complete array of tools based on one standard architecture.

developers using ActiveX tools in their development work. By combining National Instruments machine vision expertise with the proven ActiveX framework of ComponentWorks, these tools deliver a new level of ease of use and performance. With a free run-time license for applications integrating IMAQ hardware and software tools, ComponentWorks IMAQ Vision offers the ideal development solution for OEM and turnkey systems in machine vision.

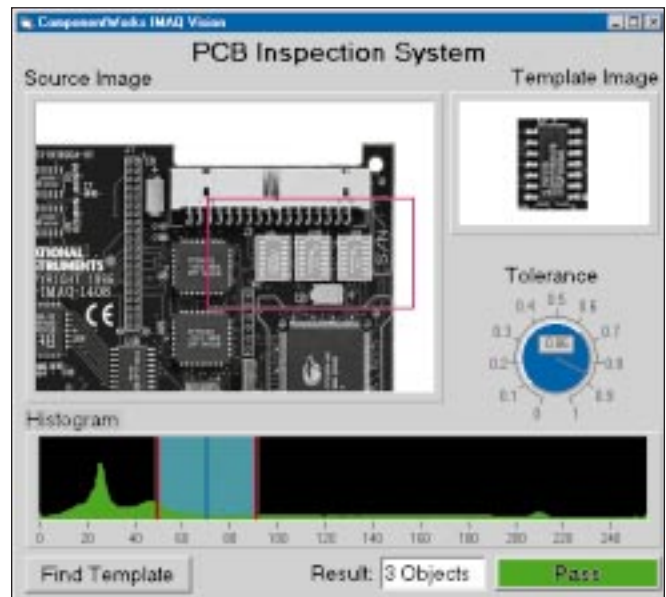
Open Development Solution
Using a standard programming tool, ActiveX controls, users can apply the new machine vision software in a wide range of popular application development tools, including Visual Basic and Visual C++. Users familiar with ActiveX controls in these environments can quickly apply their skills to machine vision applications. Furthermore, they can use the same tools

in other “non-programming” tools, such as Microsoft Excel and Internet Explorer. The range of possible applications expands past traditional turnkey/stand-alone systems to distributed network and web-based solutions.

The machine vision ActiveX control software consists of three controls: an acquisition control for acquiring images using the NI-IMAQ™ driver software; an image display (viewer) control; and an IMAQ Vision control that provides hundreds of image processing functions from the IMAQ Vision library, including pattern matching, caliper tools, filtering and more. Using the controls is a simple matter of configuring the controls using intuitive property pages and calling a few high-level functions. Applications that required pages of code in the past are now realized in a few simple lines.

Optimized Performance
We have developed the machine vision controls to optimize application performance by efficiently sharing image information between the different controls. Rather than acquiring an image in one control and passing it to the viewer and analysis functions, the same image is shared in memory by all three controls. This eliminates the need for memory-intensive and slow copy operations. It also facilitates an event-driven update of the viewer from the acquisition control that is independent of your programming environment and application. Users can easily implement update rates of live acquisitions at 30 frames/s or greater.

The IMAQ Vision image analysis functions take advantage of an MMX processor in a user's system. Originally designed to improve integer (fixed point)



The PCB (printed circuit board) inspection system verifies placement of components by comparing a finished product image to a template image and identifying the number and location of matching components.

calculations for a variety of applications, MMX can increase processing of images up to 400 percent over non-MMX systems. With this capability, many applications can perform in-line image analysis without the need for adding specialized processors to a system or storing images for offline analysis.

Combining the machine vision ActiveX controls with other ComponentWorks tools, including data acquisition, instrument control, and data analysis, users can develop applications using a complete array of tools based on one standard architecture. In addition, the IMAQ hardware and software can also synchronize image and traditional data acquisition processes to develop more powerful test and automation applications using machine vision and control. ♣

For an IMAQ Vision data sheet and a ComponentWorks brochure, check these options on the reply card.

Visit www.natinst.com/cworks

Engineers Monitor Isolated Well Drilling Systems with LabVIEW 5.0

By Richard Brueggman,
Data Science Automation

The Challenge: Monitoring well drilling sites, which are typically complex and difficult to access.

The Solution: Using PXI hardware controlled by LabVIEW 5.0 software to monitor important parameters across several computers.

Engineers at Data Science Automation are making the most of the multithreading and ActiveX capabilities of LabVIEW 5.0 by using the software to monitor several aspects of the drilling process, such as pressures, temperatures, status of the pumping system, motor status, and flow rates of pump discharges.

The system benefits from the multithreading features of LabVIEW 5.0 because it is a distributed application, sharing information between several computers at the drilling site. The system uses PXI modular instrumentation

because of the harsh, remote environment.

Customers with offshore wells can use this application, particularly those drilling for oil. One customer with previous LabVIEW experience improved his system with alarming, ActiveX, and SCADA features. Before LabVIEW, he used a custom-made, DOS-based PC system to monitor the wells. This old system, which had limited functionality, was difficult to change or enhance.

In a future system upgrade, Data Science Automation engineers will electronically link monitors of well drilling systems across the Internet and over satellite uplinks. LabVIEW 5.0 will monitor the well drilling pump systems, some of which are in such remote



Using LabVIEW 5.0 and PXI, scientists at Data Science Automation monitor several parameters of the drilling process.

locations that only select engineers can observe them onsite. ▶

For more information, contact Jay Grassel or Richard Brueggman at Data Science Automation, tel (412) 745-8400, fax (412) 745-8461, e-mail dsa@dsautomation.com, web <http://www.dsautomation.com>

Chrysler Maintains Emissions Standards with LabVIEW 5.0

By Chris Megdanoff, Quantum Controls

The Challenge: Performing emissions test efficiently.

The Solution: Using LabVIEW 5.0 and DAQ hardware to control and monitor system processes.

With LabVIEW 5.0, Detroit-based Alliance Program member Quantum Controls is helping Chrysler guarantee that their vehicles meet federal standards for emissions. Quantum engineers are developing new emission test benches for Chrysler using LabVIEW and DAQ hardware to control the bench hardware, communicate to the gas analyzers, communicate to a host computer, and collect and process concentration data.

Because the Environmental Protection Agency (EPA) requires certification for all new vehicles, automobile manufacturers check emissions standards using a required EPA test. An EPA certification bench certifies automobiles by collecting “bags” of

emissions and analyzing their content. Real-time benches monitor the emissions of the vehicle at particular points in the process to assist engineers in finding ways to reduce automotive emissions.

With LabVIEW 5.0 multithreading capabilities, Quantum can optimize the application by assigning a thread for each major activity or communication stream.

In this application, DAQ hardware controls the flow of gases through solenoids and start/stop blowers. The hardware also monitors system processes, including pressure and temperature sensors. Quantum uses an AT-MIO-64E DAQ board to communicate to a 12-slot SCXI chassis.

With LabVIEW 5.0 multithreading capabilities, Quantum can optimize the

application by assigning a thread for each major activity or communication stream. The host communication, the analyzer communication, the DAQ subsystem, and the user interface all have separate, dedicated threads. This prevents some of the slower routines – serial, TCP/IP, DAQ – from interfering with the time-critical routines and collection of data relative to time.

In addition, Quantum developed some of the dynamic loading routines using the VI server feature to optimize how the VIs are used.

LabVIEW helps Quantum develop applications that Chrysler personnel can later maintain. The collection of LabVIEW subroutines for communications (DDE, TCP/IP, UPD, Serial, DAQ) also greatly reduces development time and end-user cost. ▶

For more information, contact Chris Megdanoff at Quantum Controls, tel (313) 414-1900, fax (313) 414-1911, e-mail megdanoff@mail.quantumone.com

High-Speed GPIB Instrument Boosts Data Rates for Inspection Tasks

By Mike Kaiser, Panametrics

The Challenge: Efficiently performing ultrasonic measurements on industrial materials for detailed inspection purposes.

The Solution: Using an HS488-capable instrument with a GPIB interface to take up to 10,000 measurements per second and send them to a host computer.

Using a high-speed GPIB instrument powered by HS488, companies can perform tasks that include scanning or on-line ultrasonic measurements.

The Panametrics Model 9100 high-speed ultrasonic flaw detector can make up to 10,000 measurements per second and send measurement data to a host computer via GPIB. Measurement packets can include results, such as amplitude or depth, or they can contain a portion of the ultrasonic waveform sampled at 100 MS/s.

In many applications, we sustain data rates of 300-400 kbytes/s with peak rates of 2-3 Mbytes/s. We also use multi-instrument configurations. HS488 provides us with the familiarity of the GPIB bus along with the enhanced data transfer rates and performance that are an absolute necessity.

Rotor Blade Detection

One of our customers uses the Model 9100 and a National Instruments AT-GPIB/TNT

card with HS488 capability for helicopter rotor blade inspection. During production, these blades, which vary in length from 20 to 40 ft, need checking for porosity, delamination, and cracking. A similar inspection is sometimes necessary after regulated hours of use to ensure that blades do not fail.

The application involves ultrasonic immersion type transducers positioned on either side of the helicopter blade. Ultrasound pulses from one transducer are transmitted through the material and received by the transducer on the other side. If delamination has occurred, the sound waves will not reach the receiving ultrasonic transducer.

The Model 9100 receives the signal amplitude information from the receiving transducer. As the propeller blade is scanned, signal amplitude variances are logged in relation to transducer position along the blade to create a color map of the internal structure of the material. These amplitude variations transferred across the GPIB line at a rate of 500 kbytes/s as the part is scanned at 20 in. per second, with data points taken every 0.04 in.

How Fast Is the Model 9100?

Another application example is the production of a metal tube with a wall thickness of 3 mm. In an immersion setting, the tube is inspected for flaws as small as 0.5 mm. Data points are required every 0.25 mm to size the flaw. Because



The Panametrics Model 9100 high-speed ultrasonic flaw detector can make up to 10,000 measurements per second and send measurement data to a host computer via high-speed HS488 and GPIB.

the Model 9100 can make up to 10,000 measurements per second (10 kHz measurement rate) scientists can inspect and thus produce the metal tube at a maximum speed of 10,000 x 0.25 mm (.010 in.), or 2,500 mm per second (almost 100 in.).

For more information, contact Dan Kass, Panametrics, tel (781) 899-2719, fax (781) 899-1552, e-mail kassd@panametrics.com, web www.panametrics.com

Visit www.natinst.com/hs488

TECH NOTE

Tips and Tools to Speed GPIB Development and Troubleshoot Problems

One of the greatest frustrations when getting started with GPIB is verifying that you can actually communicate with your GPIB instruments. You may spend hours sifting through lengthy manuals and layers of menus on the instrument trying to find information about the GPIB address and whether GPIB is enabled or not. Sometimes, just trying to find GPIB instruments on the bus and

getting them to respond to queries becomes an adventure.

To alleviate this frustration, the National Instruments GPIB Interactive Control Utility and the new LabVIEW 5.0 Instrument Wizard help you speed through this important startup process so you can begin focusing on the most important aspect of your application – building your test solutions. The control

utility and instrument wizard also assist you in identifying the basic problems, such as powered down instruments, disconnected cables, and potentially malfunctioning instruments.

For examples and information on these GPIB technologies, go to www.natinst.com/gpib to view the complete application note.

Fifteen Companies Endorse PXI at NEPCON

The growing momentum behind PXI was clearly evident at the NEPCON West show in March, when 15 vendors, including Dolch Computer Systems and GenRad, announced support for PXI. Several of these companies announced new PXI products and participated in interoperability demonstrations.

National Instruments originally developed PXI, an open specification that defines instrumentation extensions to the CompactPCI specification (PICMG 2.0 R 2.1), with support from Vero Electronics, specialists in electronic packaging; and Ziatech, originators of the CompactPCI specification. Now, less than six months after unveiling PXI, numerous companies have endorsed the specification with a variety of products and services:

- **ALPHI Technology** – a variety of I/O modules
- **Analogic** – data acquisition modules
- **ASCOR** – switching and multiplexer modules
- **BittWare Research Systems** – SHARC DSP modules and I/O solutions
- **Dolch Computer Systems** – portable instrumentation platforms and LCD monitors
- **GenRad** – complete automated test systems
- **Gespac** – a variety of I/O modules and systems



Jon Titus, Editorial Director for *Test & Measurement World*, presents a “Best in Test” award for PXI to National Instruments representatives Tim Dehne and Carsten Puls at the NEPCON West show.

- **GTE-ERS** – test integration services
- **Innovative Integration** – DSP modules
- **PX Instrument Technology** – switching and multiplexer modules
- **SBS GreenSpring** – IndustryPack modules and carriers
- **Integrated Test Solutions** – PXI-based custom test systems for automotive and defense
- **Vero Electronics** – backplanes, chassis, and electronic packaging

- **Virginia Panel Corporation** – receiver interconnect devices and connectivity solutions
- **Ziatech** – Intel-based CPUs, systems and peripherals

James Ficaro, General Manager Geneva Product Line, states “PXI provides GenRad’s customers with a cost-effective solution, based on CompactPCI standards, which can satisfy the industries’ requirements for low-cost integrated products. GenRad is fully committed to supporting this instrumentation standard in current and future product offerings.”

Because PXI is 100 percent interoperable with CompactPCI, users can choose from more than 100 available CompactPCI products from multiple vendors. National Instruments is consistently adding to the list of PXI compatible products. In March alone, National Instruments announced 12 new PXI products including instruments, bus interfaces, switches, and motion controllers. ➤

For a PXI brochure, check this option on the reply card.

Visit www.natinst.com/pxi

PXI Recognized with Numerous Awards

Since the PXI announcement last year, PXI has already won several prestigious awards within the high-tech industry. In November, KPMG Peat Marwick LLP awarded National Instruments and PXI with its ICE High Tech Award for Product of the Year. *Test & Measurement World* selected PXI as one of the “Best in Test” products for 1998. Other awards include:

- *Instrumentation and Automation News* Editor’s Choice
- *Instrumentation and Control Systems* Editor’s Choice
- Finalist in annual Product Design and Development Engineering Awards
- *Control Engineering* Product Recognition Award
- Finalist for *EDN’s* Innovation of the Year



Automated Jet Engine Test System Uses VXI, LabVIEW Control

by David Johnston, CACI-ASG,
and Fred Shows, SA-ALC/LDAD,
ETTAS II Program Manager

The Challenge: Incorporating the capabilities of three aging automated test systems for jet engines into one system using commercial off-the-shelf (COTS) products.

The Solution: Building a multiprocessor PC-based virtual instrumentation system using VXI instruments controlled by LabVIEW.

The United States Air Force (USAF) has decided to use COTS products, if possible, to build a single test system to replace the three jet engine test systems currently in use. We began by using COTS products to build the Engine Test/Trim Automated System II (ETTAS II), designed to replace an aging custom test system, ETTAS. Among the COTS products used are the VXIpc-860/200 controller, VXI-AO-48XDC data acquisition module, a VXI-PCI8015

System integration is greatly simplified by the availability of VXI instrument drivers and the ease of use of LabVIEW.

interface, a VXI-MXI-2 extender, and LabVIEW software, all from National Instruments. With today's technology, ETTAS II exceeds ETTAS performance by a significant margin. Plus the modularity and scalability of ETTAS II give us the flexibility to incorporate the capabilities of the other two test sets in the future.

ETTAS II includes two 13-slot VXI chassis, configured in a single 19-in. rack, and connected with a MXI-2 extender. The two chassis contain 14 VXI instruments from eight manufacturers, the three MXI-2 interface modules, and the VXIpc-860/200 Pentium Pro embedded controller. A rack-mounted Pentium II 233 MHz PC is connected with a MXI-2 interface. Other standard peripherals complete the ETTAS II system.

We searched for COTS OS and application software products with



LabVIEW software coupled with VXI hardware makes jet engine test more efficient for the United States Air Force.



sufficient market share to warrant confidence for the future. We chose Windows NT and LabVIEW because of the strength of the Intel platform and the commitment to it from Microsoft and National Instruments.

System Capabilities

ETTAS II measures analog, discrete, frequency, synchro, phase difference, pulse-encoded signals, and vibration. It also provides current and voltage sources as well as digital I/O (low-level discrete I/O).

ETTAS II directs the operator through each test required by the engine-specific technical order; the TO test requirements are embedded in the test program software (TPS). ETTAS II informs the user of an anomaly with visual alarms and text-based information, and then guides the user through the appropriate troubleshooting.

ETTAS II system software resides on the embedded computer and the TPS software, on the rack-mounted PC. An advantage of this segmented configuration is that we can upgrade or replace instrumentation hardware or software without affecting TPS software. However, fast, reliable data transfer between the machines is crucial. Communication is handled through "dual-ported" shared memory, via a MXI-2 interface. The shared memory is configured so that one computer reads data from memory while the other computer is writing data to memory, without conflicts.

Thanks to this efficient architecture, ETTAS II is a "soft-real-time" system. The TPS processor cycle times are at least twice the speed of the embedded computer. ETTAS II can identify and process alarm conditions within 15 ms of occurrence.

To make ETTAS II the generic USAF engine test system, we will incorporate the specialized capabilities of the other two test systems in COTS, such as automatic closed-loop engine control. We predict that this future system will still outperform all existing USAF engine test systems, including "real-time" systems.

We have successfully integrated a COTS test system, but it required innovation and research to minimize risk of obsolescence. System integration was greatly simplified by the availability of VXI instrument drivers and the ease of use of LabVIEW. COTS systems such as ETTAS II, which can be updated without substantial impact to functionality, have the adaptability to survive in our changing environment. ▶

For more information contact David Johnston, 4318 Woodcock Suite 200, San Antonio, TX, tel (210) 735-1903, fax (210) 734-8872, e-mail djohnston@hq.caci.com, or Fred Shows, 308 Avionics Circle, Kelly AFB, TX 78241-5000 tel (210) 925-6271 x515, fax (210) 925-1336, e-mail fshows@ldgate1.kelly.af.mil

New Courses Include Vision and Motion

We have announced several new courses that range from vision, to motion, to courses that discuss features of our latest 5.0 releases of LabVIEW and LabWindows/CVI.

Our new IMAQ course covers the basics of image acquisition, lighting, and processing. The hands-on exercises guide you through these fundamentals by building mini-applications, including: performing automatic gauging to verify if a spray tip is present on an aerosol can; using 2D Fourier transforms to remove 60 Hz noise from an image; building an interactive histogram tool for a region of interest (ROI); and finding the center of mass of cells.

Hot Off the Press

“Maximizing GPIB Performance with HS488,” by Amar Patel, ECN, September 1997. **A1141**

“Improved Performance with MMX Technology,” by John Hanks, Image Processing, November 1997. **A1143**

“A Road Map to Successful DAQ Board Selection,” by Chad Chesney, I&CS, October 1997. **A1144**

“Windows 98 Refines Data Acquisition,” by Dave Madden, R&D Magazine, January 1998. **A1170**

“Instrument for Success: Merging Laboratory Machines with Computers Proves a Winning Combination for NI,” by Julie Anne Schofield, Design News, December 1997. **A1176**

“Users Adapt Quickly to New Technologies,” by Paul Schreier, and “Users Embrace New Technologies in Maturing Test and Measurement Market,” by Sam Shearman, Personal Engineering & Instrumentation News, January 1998 and February 1998, respectively. (Annual PE&IN Readers Surveys on DAQ and T&M, combined.) **A1177A-03**

The new LabVIEW Advanced I course discusses many of the hot subjects of LabVIEW 5.0. Topics include multithreading, ActiveX, memory management, VI Control, CINs, and DLLs.

We have rewritten the LabWindows/CVI course for the release of LabWindows/CVI 5.0. Topics include creating a GUI application, data acquisition, and instrument communication through the use of instrument drivers and IVI. In this course, you develop a GUI application where you acquire a signal from a GPIB device, plot it, and analyze it. If you are a new LabWindows/CVI user, this course gives you valuable knowledge about the LabWindows/CVI environment, thus shortening the time you would need to spend on the initial learning curve. If you are an experienced LabWindows/CVI user, this course reinforces the basics of LabWindows/CVI and teaches many time-saving tips and techniques.

Also new is the Motion Control course. This course studies the fundamentals of feedback and motor types (stepper and servo). The hands-on exercises use the Motion Control Trainer Box to illustrate these concepts by guiding you through applications of increasing sophistication.



Perhaps you do not have the opportunity to join us for an instructor-led, hands-on course. We now proudly offer another training tool, the LabVIEW Basics I Interactive CD. This multimedia CD covers the LabVIEW Basics I course and is available in English and Spanish. There is still no better way to improve your productivity with LabVIEW than the LabVIEW Basics I and II courses.✦

To begin any of these Certification Programs, contact the Customer Education Department.

Visit www.natinst.com/custed

Download the Latest Instrument Drivers

The instrument driver request form located at www.natinst.com/idnet plays a major role in determining the drivers that are developed in-house. Recent drivers we have developed based on customer demand include Hewlett-Packard's new Infinium series oscilloscope, as well as their 3245A universal source.

Instrument manufacturers also play a role in submitting many of our instrument drivers. Yokogawa has submitted drivers ranging from function generators to power meters. Other manufacturers that have made recent contributions include: Advantest, American Reliance, Good Will, Lake Shore Cryotronics, Pressure Systems Inc., and Sun Electronic Systems.

Alliance Program members also have submitted several of our recent instrument drivers. VI Technologies, for instance, submitted an instrument driver for the popular HP34970A. In addition, Wentworth Industries has provided the TTC 1402S LabVIEW driver. Alliance Program members become Certified Instrument Driver Developers when their instrument drivers are accepted into our Instrument Driver Library.

Go to the recent additions section of www.natinst.com/idnet to see the latest additions to the Instrument Driver Network (IDNet).✦

Visit www.natinst.com/idnet

Check the Web for Order Status!

National Instruments now brings you real-time status on your current orders via our web site. Visit www.natinst.com/status to check on the latest information about your order.

Your order status information is available directly from our production systems. For security, we ask that you provide two pieces of information for each order. Along with verification data about the order, you can check your status either with the National Instruments Order Number or the Purchase Order from your company.

This system is available for orders placed by U.S. and Canada customers who take delivery in the U.S. or Canada. If you have additional questions about your order, contact a National Instruments Customer Service Representative for assistance. ▶

Check your order at www.natinst.com/status

LabVIEW 5.0 Announced Worldwide

Following the announcement of LabVIEW 5.0, more than 10,000 engineers and scientists, LabVIEW users or prospects, attended the exciting LabVIEW 5.0 Worldwide Event in March. The event, held in more than 130 cities around the world, demonstrated new LabVIEW 5.0 features and technologies. In many areas, LabVIEW developers and other members from our corporate office were on hand at packed houses to present the new version and directly answer questions. The event was a tremendous success for both users and our LabVIEW staff. The LabVIEW team took back valuable feedback and comments while attendees had the opportunity to see firsthand how they could immediately apply new technologies to their applications and use LabVIEW 5.0 to gain the power to make it simple. ▶

New Book Examines LabVIEW

National Instruments and McGraw-Hill have announced a new text by LabVIEW Graphical Programming author and LabVIEW expert, Gary Johnson. The new text, *LabVIEW Power Programming*, is a compilation of advanced graphical programming techniques used by leading programmers in industry and education. The text details the power and flexibility of graphical programming as embodied in LabVIEW and offers its readers insight into new and innovative ways of leveraging this powerful software. Scientists and engineers will enjoy reading about LabVIEW applications in space, uses of LabVIEW in computer science, LabVIEW-based cryptography, and more. ▶



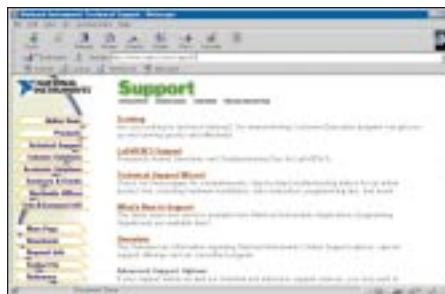
To order *LabVIEW Power Programming*, contact McGraw-Hill at (800) 722-4726 and reference ISBN# 0-07-913666-4. Readers can also access the McGraw-Hill web site at www.ee.mcgraw-hill.com

Web Wizards Make Support Easier

In an effort to make our technical support even more convenient, we recently unveiled the NI Technical Support Wizard on our customer support web page. This

wizard gives you instant 24-hour access to technical support for your most common questions; it also includes screen shots and example programs.

We have also recently added a new LabVIEW 5.0 Support Page where you can find answers to the hottest LabVIEW 5.0 questions. This is operated from our KnowledgeBase, a database of support articles used by our applications engineers to answer questions on all of our products. Look for these and other new automated support tools at www.natinst.com/support ▶



New LabVIEW Signal Processing Text Released

Prentice Hall Professional Technical Reference, an official publisher of the National Instruments Series in Virtual Instrumentation, is announcing an exciting new title – *LabVIEW Signal Processing* by Mahesh Chugani, Abhay Samant and Michael Cerna.

LabVIEW Signal Processing provides information on how to make the most of the powerful signal processing analysis tools in LabVIEW. Using easy-to-understand language that links digital signal processing (DSP) theory with practical applications, this real-world guide to the LabVIEW signal processing

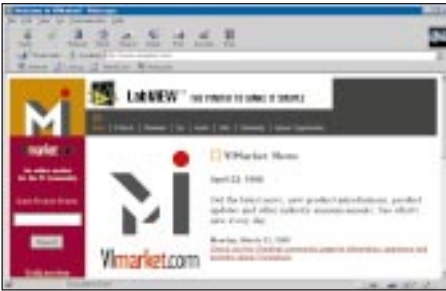
and control system helps engineers/scientists and students alike get results fast.

The text helps readers understand the unique analysis capabilities of the software and which LabVIEW tools are best suited for their needs. A CD included with the book contains demo versions of LabVIEW analysis toolkits. ▶

For more information on *LabVIEW Signal Processing*, visit the Prentice Hall web site at www.phptr.com. The ISBN number for the text is 0-13-972449-4.

VI Market Expands Access to Third-Party Products

The virtual instrumentation community now has a new resource on the world wide web, VImarket.com. Serving as both a comprehensive list of virtual instrumentation add-on products and a purchasing channel for engineers and



scientists, VImarket.com combines the broad assortment of established LabVIEW and LabWindows/CVI add-on products into a single integrated Internet site. Both commercial and shareware add-on software products are available on the site. VImarket.com also features a powerful search engine that customers can use to quickly find specific products, software requirements, or system solutions. VImarket.com is sponsored by VI Technology, G Systems, LTR Publishing, and Viewpoint Software Solutions.

VImarket.com offers a one-stop Internet destination for engineers and scientists seeking the latest news,

information, and add-on products pertaining to the world of virtual instrumentation. As a comprehensive resource, engineers and scientists can come to the site, find the add-on product that best suits their application, read about it, and if they choose, even purchase it with a credit card. Many of the products at the site have been around for quite some time but have been very difficult to find until now.✶

For more information about VImarket.com, contact VImarket.com Inc., 1715 West 35th St. Suite 211, Austin, Texas 78703, tel (512) 474-5486, fax (512) 474-2931. Visit VImarket.com at www.vimarket.com

Web Site Offers Resource for LabVIEW Information

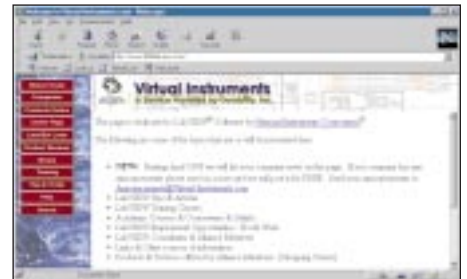
Durability, an Alliance Program member, has announced a new web site (www.888labview.com) designed to bring together the LabVIEW community and that serves as a platform for locating products, services, employment, as well as technical information.

The site is a wealth of technical information and resources. The LabVIEW Tips & Articles section, sponsored and provided by LTR Publications, answers many technical questions and provides insights on programming techniques. The Training Classes section offers information about locations around the world where you can receive training on LabVIEW.

In addition, the web site provides links to other sources of information.

The site is also a centralized location for information about LabVIEW-related services. In addition, a shopping center provides information about LabVIEW add-on products as well as products that support LabVIEW development. This page is a collaborative effort among the following parties – Durability, Inc., Viewpoint Software Solutions, VI Technology, Inc. and Socratis Kalogrianitis.

Other information at the site includes a list for LabVIEW Employment Opportunities worldwide. For educators interested in integrating LabVIEW



into their curriculum, a list of Academic Courses, Courseware, and Syllabi.✶

For more information, contact Kami Razvan, Ph.D. at Durability, Inc. by phone at (540) 231-7760, fax at (540) 231-3327, or e-mail at Kami@durability.com

Visit the Instrument Driver Net Web Site

For the latest instrument driver news, check out our new Instrument Driver Net (ID Net) web page at www.natinst.com/drivers. This page includes instrument drivers you can download and links to other sites for instrument drivers as well as development tools, such as templates, wizards, and application notes for developing drivers.

The ID Net includes the official Instrument Driver Library (IDL), which contains drivers that have met our quality requirements as well as the Contributed

Driver Library (CDL), which contains drivers that have not but that have not yet met all requirements but are still available for your convenience. For instance, we will post beta drivers on our CDL to make new drivers available as soon as possible. Once the beta drivers have completed our review process for the IDL, we will move them to the IDL.

We encourage our Alliance Program members and customers to submit instrument drivers to the ID Net. The ID Net includes a page on development tools,

making it easier to develop quality instrument drivers. Furthermore, the ID Net features a web form for submitting instrument drivers. Plus, as an added incentive, you will become a Certified Instrument Driver Developer once your driver has been accepted into the IDL.✶

If you have questions about submitting instrument drivers, driver corrections, or problems with an existing driver, e-mail us at instrument.driver@natinst.com

New Battery Test Module Conforms to SCXI Standard

Alliance Technologies Group, an Alliance Program member, has developed a battery test module conforming to the National Instruments SCXI standard. Using this module, you can measure UUT voltage, charge current, and load current at sampling rates exceeding 1.0 MHz. Additional channels are available for scanning external signals, such as thermistors.

The ATG-3947 module consists of an independent power supply, electronic load, scanning circuitry, SCXI interface, and pulse control. The supply can source up to 1.0 A at 10.0 V and is voltage and current limited with a response time less than 10.0 μ s; the electronic load can sink up to 10.0 A and achieves a current slew rate exceeding 5.0 A/ μ s for pulsing loads. The scanning circuitry multiplexes sense signals over the SCXI backplane and interfaces to the resident DAQ board on the controlling computer.

Also available for use with the ATG-3947 is EnerTest software, which is used for configuring, monitoring, and analyzing data from the modules. You can configure a module by specifying charge current,



Alliance Technologies Group has developed a test module that works with the SCXI standard.

supply voltage, loading profile, data sampling, and exit conditions. EnerTest monitors the performance of all configured modules for a defined period of time in round-robin fashion. The software then applies standard analysis routines. It can also easily apply custom analysis routines that you create, so that it collects data while monitoring the channel. Standard analysis routines include ESR, capacitance, impedance, and many more.

Upon execution, you can chart the UUT voltage, charge current, and load current; in addition, you can analyze the data and store the results in a binary or ASCII file. ▶

For more information, contact Alliance Technologies Group at Mundelein, Illinois, by phone at (847) 247-9284, fax at (847) 247-9724, via the web at www.atgroupinc.com, or e-mail at 3947info@atgroupinc.com

Graftek Imaging Introduces Optical Character Recognition Toolkit

Graftek, an Alliance Program member, announced pcREAD, a high-level optical character recognition (OCR) toolkit for adding text recognition capability to automated inspection and document conversion systems.

This third-generation algorithm, which combines pattern and feature matching, is font independent, accurate, and fast. Unlike first and second-generation techniques, which were typically only 95 percent accurate and required extensive human correction, pcREAD can accurately convert printed text to computer form. Because pcREAD is fully integrated with LabVIEW, BridgeVIEW™, or LabWindows/CVI, you can now rapidly and economically implement completely automated industrial and laboratory OCR-based systems.

You can use pcREAD in a number of industries. For medical, pharmaceutical,

and food applications, you can use pcREAD for product label and content description verification. In automotive and

Because pcREAD is fully integrated with LabVIEW, BridgeVIEW, or LabWindows/CVI, you can now rapidly and economically implement completely automated industrial and laboratory OCR-based systems.

aerospace industries, you can use pcREAD for instrument cluster quality inspection. With the electronic and telecom disciplines, you can use pcREAD for inspection of printed circuit boards, components, and displays (LCD, LED, and FED). You can even use pcREAD for

automated document conversion systems. In addition to pcREAD, a complete OCR system typically requires either a scanner or a camera, lens, lighting, an image acquisition board, a computer, and National Instruments software (or a stand-alone application). National Instruments revolutionary PXI, a CompactPCI computer chassis, along with the IMAQ PXI-1408 image acquisition module, is a perfect choice for industrial applications. ▶

For more information, contact Steve McCool, Graftek Imaging, Inc., 1825 Fortview Road, Suite 109, Austin, TX 78704-7655, tel (512) 416-1099, fax (512) 416-1014, e-mail graftek@gtk.com, or web www.gtk.com

Automating Engine Test with LabVIEW and VXI




National Instruments VXI hardware and LabVIEW software are helping the United States Air Force build a single, WindowsNT-based test system to replace the three jet engine test systems currently in use. **Read more on page 19.**

Trade Show Winners

Butch Kittle, Chamber Division Manager of Environmental Systems, Inc. in Santa Clara California is the luck winner of either a LabVIEW or LabWindows/CVI Full Development System. Kittle participated in a software drawing held at the National Instruments booth during the recent Nepcon West trade show in Anaheim, California.

Johnny Lau, Product Design Manager for Ford Motor Company, also won his choice of LabVIEW or LabWindows/CVI as a result of a drawing – Lau won his prize at the National Instruments booth during the recent SAE trade show in Detroit, Michigan. ▽

 This newsletter represents a commitment from National Instruments to the environment.

Trade Shows

Look for the National Instruments booth at these upcoming trade shows:

Offshore Technology Conference Houston, TX	May 4-7	IEEE MTT-S Baltimore, MD AWWA Dallas, TX	June 9-11 June 21-24	NIWeek Alliance Day Austin, TX	Aug 24
International Automotive Manufacturing Detroit, MI	May 12-14	ISA Instrument Expo Toronto, ON	June 26-27	NIWeek 98 Austin, TX	Aug 25-27
Sensors Expo San Jose, CA	May 19-21	ASEE Seattle, WA	June 28-July 1	High Technology Toronto, ON	Sept 15-16
PC Developers Expo San Jose, CA	May 20-22	Semicon West San Jose, CA	July 15-18	Wescon Anaheim, CA	Sept 15-17
SuperComm Atlanta, GA	June 7-11	AutoTestCon Salt Lake City, UT	Aug 24-26	Diskcon San Jose, CA	Sept 22-24
Nepcon East Boston, MA	June 9-11	Summer Sales Conference Austin, TX	Aug 19-23	Canadian Plant Maintenance Design Toronto, ON	Sept 29-Oct 1

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Using today's computer technology, the performance of the new system exceeds the original by a significant margin. The modularity and scalability of the new system also give flexibility to incorporate other test parameters in the future.

Overall, system integration is greatly simplified by the availability of VXI instrument drivers and the ease of use of LabVIEW. **Read more on page 19.**

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Pulpaper Helsinki, Finland	June 2-4	EPAC 98 (European Particle Accelerator Conference)	
Acquisition Expo Paris, France	June 2-5	Stockholm, Sweden	June 22-26
Messtechnik München		Mittaus & Testaus	
München, Germany	June 17-18	Helsinki, Finland	Aug 25-26

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Electrical Engineering Show

Hong Kong June 2-5
EE Show Hong Kong June 2-5

Hitech Hamamatsu

Hamamatsu, Japan June 4-6
Jemima Kansai Osaka, Japan June 10-12
Tohoku FA Sendai, Japan June 17-19

Design/Manufacturing

Tokyo, Japan June 17-19
International Exhibition of Automation
Taipei, Taiwan July 24-27



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