Keeping Up with the Latest in Windows NT and PCI

Our experience in developing 32-bit driver software extends over many years. Since 1994, National Instruments has given you the widest selection of DAQ hardware and software products for use with Windows NT. Last year, we were the first to deliver 32-bit driver software for Windows 95.

Now under development is a revision version of NI-DAQ that will make PCI, PCMCIA, ISA, and SCXI products work with Windows NT 4.0 – the latest NT release from Microsoft. Windows NT 4.0 combines the ease of use of the Windows 95 operating system with the reliability and security that have made Windows NT a success in the demanding workstation marketplace. We anticipate this beta NI-DAQ driver software to be available for testing by the end of the year. Thanks to the current shipping version of NI-DAQ, Version 4.9, our ISA and certain SCXI products already work with Windows NT 4.0.

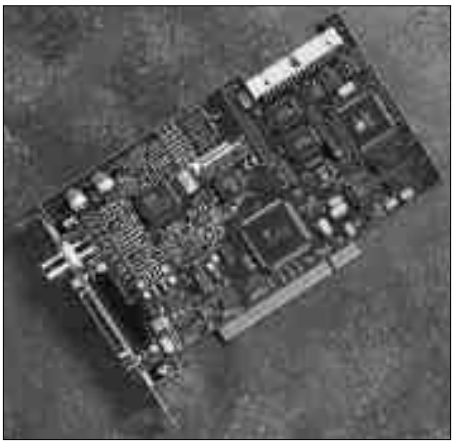
PCI Data Acquisition – "Doing" it the Right Way

PCI is an exciting technology that extends the capabilities of PC-based virtual instruments into newer and higher speed application areas. We have been developing PCI products for more than two years and understand the PCI specification quite well. Because you need a bus-master PCI board to achieve the best performance from PCI, we designed the MITE PCI bus master interface ASIC. By using the MITE, we achieve continuous data transfers of more than 100 Mbytes/s to system memory without the direct involvement of the CPU. By using PCI bus-master boards, you benefit from an increase in overall application performance because the microprocessor processes your data while the MITE chip transfers it into RAM. We are "doing" PCI the right way.

Image acquisition is an ideal application use for PCI. Our new image acquisition board, the IMAQ PCI-1408 (see related story below), uses the MITE to give you optimal performance. We also have three PCI slave boards for use with PowerPC computers running Mac OS. Under development is a series of new PCI bus-master DAQ boards. These boards, which we anticipate will be available in the first quarter of 1997, will work with Windows NT, Windows 95, and Windows 3.1. Applications that you develop today using the ISA bus will be scalable to these new PCI products. Mac OS drivers are scheduled for later.

Turn to pages 20 and 24 to learn about our Windows NT and PCI DAQ Seminar series.

New IMAQ Board Integrates with Data Acquisition



The IMAQ PCI-1408 board features the MITE ASIC for high-performance image acquisition.

Recent developments in computer technologies position image acquisition as the next widely used measurement technique in test and measurement and industrial automation applications. With higher speed microprocessors and the high-throughput PCI bus found on today's computers, you can easily integrate image acquisition into your test systems.

Our new IMAQ PCI-1408 board is an 8-bit, grayscale, image acquisition board for the PCI bus. It digitizes images from four video sources at rates up to 132 Mbytes/s. The IMAQ PCI-1408 uses our MITE ASIC to transfer images directly to PC RAM at 30 frames per second. The MITE ASIC performs bus mastering to transfer data at full PCI bandwidth even to noncontiguous memory.

In addition, the MITE contains three scatter-gather direct memory access (DMA) controllers that make fragmented memory "look" like one large block. This eliminates reprogramming inefficiencies in the data transfer. The MITE also frees the microprocessor from transferring the data. The processor can then devote all of its time to performing image analysis, processing, and other test system tasks, such as processing data from DAQ boards.

The RTSI bus makes the IMAQ PCI-1408 unique among image acquisition products.

The RTSI bus makes the IMAQ PCI-1408 unique among image acquisition products. This bus routes timing and triggering between IMAQ and DAQ boards to synchronize inputs. The DAQ board triggers the IMAQ board to capture images. In this way, images and transducer values correlate precisely.

The IMAQ PCI-1408 also has four trigger/control lines for external control. You can configure each of these lines to start or stop acquisition on a rising or falling edge. You can also use each line as digital I/O, performing external control and monitoring.

The IMAQ PCI-1408 board is shipped with NI-IMAQ driver software, a 32-bit DLL for Windows 95 and Windows NT. This driver feature both high and low-level functions. High-level functions give intuitive control of single and sequential image acquisition. Low-level functions provide customization for specialized systems. NI-IMAQ works with LabVIEW, LabWindows/CVI, and common programming languages such as Visual Basic, C, and C++. Future plans include porting NI-IMAQ to the Macintosh operating system.

For more on IMAQ products, circle IMAQ kit on the reply card.

Temperature Measurement System Is Ready to Run

The SCXI-MS100 is a ready-to-run system for measuring temperature and voltage signals. This measurement system combines DAQ and SCXI products for economical, reliable thermocouple monitoring with 16-bit resolution. The system includes all of the hardware and software you need to quickly start monitoring up to 32 thermocouple or voltage inputs. Because the SCXI-MS100 comes with our VirtualBench™-Logger software, no programming is required.

The main components of the SCXI-MS100 measurement system include:

- SCXI-1102, 32-channel thermocouple amplifier
- SCXI-1000, 4-slot chassis
- AT-MIO-16XE-50 16-bit plug-in DAQ board
- VirtualBench-Logger, data logger software for Windows 95/3.1

The SCXI-MS100 system also includes an SCXI-1303 terminal block (to connect the thermocouples to the SCXI-1102), an SCXI-1349 shielded cable assembly (connects DAQ board to SCXI chassis), and chassis filler panels. In fact, the module and filler panels are installed for you in the chassis for even greater convenience.

No Programming Required

VirtualBench-Logger software is a ready-to-run multichannel data logger for recording and displaying low-frequency signals, such as temperature and DC voltages. Using menus, you configure each channel of the SCXI-MS100 for the type of thermocouple or sensor, range, and display scale. The VirtualBench-Logger software acquires hundreds of channels of data, displays up to 16 channels in a trend (strip) chart, and automatically scales data to engineering units, such as temperature. The VirtualBench-Logger also logs data to disk and replays logged files.

Expandable to 128 Channels

Because the system is based on SCXI, it is easy to expand for more channels. For convenience, the SCXI-MS100 Expansion kit is a bundle of one 32-channel SCXI-1102 module and SCXI-1303 terminal block. You can add up to three expansion kits to the SCXI-MS100 to bring the channel capacity up to 128 channels. Of course, you can also add in different types of SCXI modules for different signal types and capabilities.

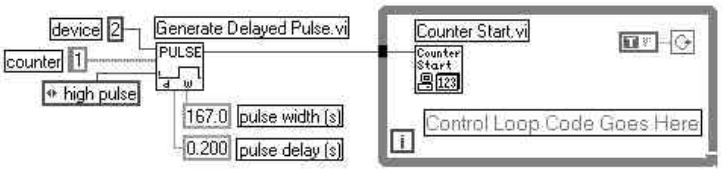
The SCXI-MS100 system includes everything you need to monitor and log data from 32 thermocouples right out of the box.

For an SCXI-MS100 data sheet, circle this option on the reply card.

Data Acquisition

How can I implement a watchdog timer using the DAQ-STC™?

You can implement a simple watchdog timer application using the DAQ-STC on any E Series product. You can set the digital output of the counter to toggle a relay or some other digital device (such as an alarm) to indicate that your software control loop is no longer active. The DAQ-STC is programmed to output a pulse with a specified delay. This delay is the maximum time that is allowed to elapse before the digital output is enabled (the output of the counter will toggle high). Within the application control loop, a refresh function resets the watchdog timer to its initial value. If the control loop does not call the refresh function within the programmed delay time, the watchdog timer output toggles.



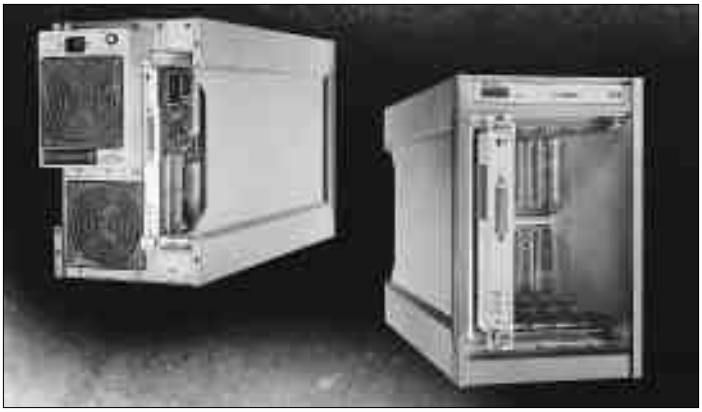
You can quickly build this algorithm with only two LabVIEW data acquisition VIs. Initialize the watchdog timer by calling Generate Delayed Pulse.vi (`Data Acquisition: Counter palette`). Set the pulse delay to the desired watchdog timer countdown time (i.e. 200 ms). Set the pulsewidth to the maximum value allowed for the DAQ-STC (167 s). Inside the control loop, call Counter Start.vi (`Data Acquisition:Counter: Intermediate Counter palette`) to refresh the counter to its initial countdown value. If the control loop does not execute before the countdown value has elapsed for any reason (including a computer lockup), Counter Start.vi will not be called to reset the DAQ-STC to its initial value. This causes the counter output to toggle high.

You can further protect the external system from a computer power failure by pulling the counter output up to 5 V through a resistor using a protected power supply that is isolated from the computer power supply. The DAQ-STC watchdog timer is responsible for keeping the digital output pulled to ground. If the delayed pulse is enabled OR if the computer power fails, the DAQ-STC output no longer pulls the signal low and the digital line pulls up to 5 V, triggering the external device.

New Nine-Slot VXI FlexFrame™ Combines VXI and VME

The new FlexFrame combines both C and B-size VXI/VME resources in a single system to drive down overall costs.

National Instruments recently announced a new combination VXI/VME mainframe – the FlexFrame VXI-1200. The FlexFrame (patent pending) can house six C-size and three B-size VXI modules or VME cards for a total of nine usable slots. Fully compliant with the latest VXI specifications, the FlexFrame combines both C and B-size VXI/VME resources in a single system to drive down overall system costs. With this design, expensive adapter cards are no longer needed for interfacing B-size modules into a C-size chassis. In addition, system developers can use low-cost B-size VXI controllers, freeing all six C-size slots for instruments. With its unique backplane design, users can easily configure the FlexFrame with a Slot 0 controller in the front (C-size) or rear (B-size) of the chassis.



Using a FlexFrame-based VXI system, users can control B or C-size controllers.

About the FlexFrame

The FlexFrame is compact, easily configurable, and delivers the power and cooling required to handle demanding applications in harsh environments. Providing 720 W of usable power, the FlexFrame delivers more power than many full-size 13-slot mainframes, while taking up less than half the space.

The buses serving C and B-size modules are physically connected and appear as a single bus for seamless communication. Users can configure a Slot 0 interface in the rear of the FlexFrame chassis using a B-size VXI controller, such as the VXI-MXI-2/B. Within seconds, users can switch the Slot 0 between C and B-size simply by switching the orientation of a "personality" card located on the inside panel of the FlexFrame. Users insert the card one way and control the VXI system with a B-size controller. Or, users can flip the card 180° and reinsert it to control the VXI chassis with a C-size controller.

For a FlexFrame data sheet, circle this option on the reply card.

New B-Size MXI-2 Interface Lowers VXI System Cost

To complement the new VXI/VME FlexFrame chassis, we are introducing a new B-size version of our standard C-Size MXI-2 interface. The new VXI-MXI-2/B delivers the same capability and performance as the standard C-size interface but at a lower cost. You can use the VXI-MXI-2/B in the back of the FlexFrame so that you can use all six C-size VXI slots located in front of the chassis for instruments.

The smaller size and the absence of EMI shielding reduce the cost of the B-size VXI-MXI-2 versus the C-size module. EMI shielding is required for a C-size instrument or control module but not for B-size. Because of the FlexFrame design, you simply insert the VXI-MXI-2/B module into the leftmost B-size slot located in the rear of the FlexFrame to physically isolate the VXI-MXI-2/B from the C-size instruments, eliminating possible EMI problems that can arise in traditional B-size systems.

Unlike other B-size controllers, the VXI-MXI-2/B uses all of the VXI-defined P2 connector signals, including the MODID lines for slot identification and the TTL and ECL trigger lines for module-to-module timing and synchronization. The VXI-MXI-2/B also offers the same onboard memory expansion (up to 64 MB) found on the C-size version as well as DMA, synchronous MXI, and VME64 transfers for exceptional data throughput. Except for the EMI shielding and the smaller circuit board, the VXI-MXI-2/B is functionally equivalent to the C-size version.

You can use any of the standard computer-based MXI-2 interface boards with the VXI-MXI-2/B, including the record-breaking PCI-MXI-2, to deliver transfer rates up to 23 Mbytes/s. You can also order a special kit that bundles the PCI-MXI-2, the VXI-MXI-2/B, and the FlexFrame chassis to realize a significant cost savings over purchasing these components separately. A system based on the VXI-MXI-2/B, FlexFrame, PCI-MXI-2, and the new VXI-DAQ instrument modules delivers both high performance and low cost that can solve a wide range of test and measurement, industrial automation, and data acquisition applications.

For a VXI-MXI-2/B data sheet, circle this option on the reply card.

Teradyne Creates Test Platform Using VXI and LabWindows/CVI

by Dominic Haigh, Product Manager,
Teradyne, Inc., Assembly Test Division

The Challenge: Creating sophisticated electronic product function tests on a manufacturing test platform quickly and easily.
The Solution: Combining LabWindows/CVI custom software, the open architecture of VXI, and Teradyne's Spectrum 8800-Series to create an efficient, fast, testing system that significantly reduces final test and quality costs.

The Spectrum 8800-Series VXI manufacturing test platform uses LabWindows/CVI for functional test development.

At Teradyne, we needed to develop a way to give our customers the ability to create tests on the manufacturing test platform as easily as possible. LabWindows/CVI and MXI-2 technology from National Instruments helped us achieve this with our Teradyne Spectrum test platform.

The Spectrum 8800-Series Manufacturing Test Platform is designed to meet the circuit board test requirements of complex, leading-edge electronic products, including multimedia desktop and laptop PCs, digital cellular networks, personal digital assistants, broadband personal communications systems, wireless paging, and cable modems.

This system is targeted at electronics manufacturers whose strategy is to integrate some or all of functional board test at the manufacturing process test stage. The system incorporates the ability to integrate VXI, GPIB, IEEE, or custom instrumentation and software into the system. By simplifying the assembly and test process, manufacturers can make significant reductions in final test and quality costs.

Using the open architecture of the Spectrum 8800-Series, which is based on industry standards such as VXI and Windows NT, electronics manufacturers can pursue a flexible test strategy. In addition to performing manufacturing process test, users can change board function tests from custom setups and move assembly steps, such as programming flash and logic devices, to the Spectrum manufacturing test system.

Open System Architecture

Our Spectrum systems are based on an open-systems test head architecture. The channel cards, controllers, switching, and instrumentation modules are VXI-compliant. This makes each Spectrum tester highly configurable. Users can customize their systems by adding any commercially available VXI instrumentation. This high level of flexibility is mirrored in the software architecture, which uses LabWindows/CVI running on Windows NT. With this combination, the system can access hundreds of Windows NT programming utilities and LabWindows/CVI device drivers.

Integration of LabWindows/CVI on the Spectrum test platform means users can take advantage of low-cost, high-speed, modular VXI instruments.

Integrated VXI Architecture

The core of our Spectrum system is the VXI test head cage. The Spectrum card cage and backplane system comply with all VXI specifications, including full trigger bus support for precise timing in multimodule product function test operations. The test head cage houses all analog and digital instrumentation modules, channel cards, system controllers, and optional, user-specific VXI modules.

The system controller communicates with the test head VXIbus directly via the high-speed MXIbus; we used a PCI-MXI-2 controller from National Instruments. This interface makes the external test system PC controller perform as though it were plugged directly into the VXI backplane, providing the capability of an embedded system controller. The Spectrum high-density system interface provides a high-frequency, impedance-controlled, wireless signal path to the test head cage.

LabWindows/CVI Software

With LabWindows/CVI, users have access to a visual test programming environment that streamlines test development and debugging. The virtual instrument panels resemble familiar benchtop and rack-and-stack instrument controls.

Integration of LabWindows/CVI on the Spectrum test platform means users can take advantage of low-cost, high-speed, modular VXI instruments. The large driver library of National Instruments saves our customers time they previously spent developing instrument drivers. With drivers already available for more than 500 GPIB, VXI, and serial (RS-232) instruments, LabWindows/CVI provides excellent access to a wide range of third-party instruments.

The integration of LabWindows/CVI into the Spectrum test system gives users a fast, flexible solution for creating product function tests and moving them to the manufacturing test platform. For many test engineers, this makes the goal of "practical, single-stage test" a reality.

For more information, contact Teradyne, Inc., (510) 932-6900, www.teradyne.com/cbt

VXI DEVELOPMENTS

New 200 MHz Pentium Embedded VXI Controller Sets Standard

National Instruments is introducing a new addition to the VXIpc™-850 family of embedded VXI controllers – the VXIpc-850/200. The VXIpc-850/200 combines the new 200 MHz Pentium microprocessor with the MITE and MANTIS™ custom ASICs to deliver unmatched PC and VXI system performance. With its innovative, microprocessor-independent design, the VXIpc-850 Series can quickly capitalize on the recent 200 MHz Pentium introduction to surpass the VXIpc-850/166, a 166 MHz embedded Pentium controller, as the fastest VXI controller available.

The VXIpc-850/200 delivers unmatched PC and VXI system performance.

About the VXIpc-850/200

The 200 MHz Pentium processor represents a new level in VXI performance for all types of applications, including instrument control, test and measurement, ATE, data acquisition, simulation, and industrial automation. A comparison of the relative processor performance of the VXIpc-850 Series is described in the following table using Intel's ICOMP microprocessor rating:

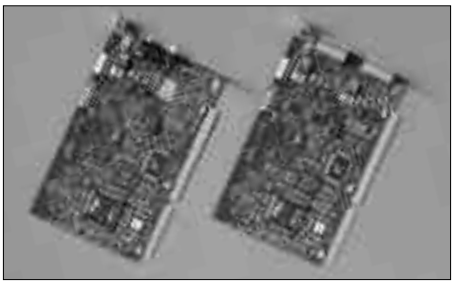
Core Frequency	iCOMP® index 2.0
200 MHz	142
166 MHz	127
133 MHz	111

All VXIpc-850 controllers feature a modular, PCI-based local bus design, so system developers can interchange the microprocessor daughterboards to upgrade their controllers to the latest, most powerful microprocessors – thus protecting their initial investment. A major cost of an embedded VXI controller is the microprocessor. Intel typically lowers pricing on existing Pentium products with each new microprocessor introduction. The innovative VXIpc-850 Series design not only leverages off the latest computer technology, such as the 200 MHz Pentium, but the entire product line realizes significant cost savings as microprocessors prices drop with the introduction of new technology. In conjunction with the VXIpc-850/200 introduction, the prices on the entire VXIpc-850 family have been reduced. Delivery of the VXIpc-850/200 is expected for Q4 of 1996.

For a VXIpc-850/200 data sheet, circle this option on the reply card.

AUTOMOTIVE DEVELOPMENTS

New Interfaces Connect to the CAN Bus



National Instruments CAN interfaces are designed to meet the physical and electrical requirements for in-vehicle (automotive) networks based on CAN.

National Instruments is expanding connectivity into the world of automotive and industrial device networking with new AT-CAN and PCI-CAN interface products. CAN (controller area network) was developed by the Robert Bosch Corporation to address the needs of in-vehicle automotive communications. Automobiles have a variety of control devices for functions such as engine timing, carburetor throttle control, and antilock brake systems. With the increasing demands placed on these systems for safety, performance, and customer needs, CAN was developed to provide a digital serial bus system to connect controllers.

The AT-CAN, the first-available interface for CAN, is an ISA interface for communicating with CAN devices. Available in either 1 or 2-port configuration, the AT-CAN offers full Windows 95 Plug and Play compatibility. The AT-CAN configuration is also fully integrated into the Windows 95 Device Manager.

The PCI-CAN, a PCI interface for communicating with CAN devices, is also available in 1 and 2-port versions. The PCI-CAN is the first-available PCI interface for CAN. The AT-CAN and PCI-CAN physical layers fully conform to the ISO 11898 physical layer specification for CAN and are optically isolated to 500 V. Both CAN boards use an Intel 80386EX microprocessor to directly handle communications on the interface board. CAN interfacing is accomplished using the Intel 82527 CAN controller chip.

Included with the CAN cards is NI-CAN™ driver software (Windows 95 for the AT-CAN, Windows NT and Windows 95 for the PCI-CAN). The NI-CAN software includes device drivers used for application development as well as firmware that runs on the embedded 80386EX microprocessor. The device drivers provide functionality for standard programming environments, such as Visual C/C++ and Borland C/C++, as well as National Instruments application software products, such as LabVIEW and LabWindows/CVI. The CAN kits also include a set of CAN VIs for use with LabVIEW.

By using a CAN interface board and NI-CAN software, you can address a variety of CAN applications, including automotive testing and diagnostics, factory automation, and machine control.

For a CAN Bus Interface data sheet, circle this option on the reply card.

Adtech Uses HS488 and TNT4882™ Chip in ATM Test System

by Mike Gouveia, Adtech Vice President

The Challenge: Developing a test system for ATM networks, equipment, and applications.
The Solution: Using HS488 and the TNT4882 chip from National Instruments, we developed the AX/4000 ATM system to test a variety of equipment and applications.

The telecommunications industry is one of the fastest-growing areas for test and measurement applications today. Asynchronous transfer mode (ATM), the emerging standard for communications, is redefining traditional approaches to network connectivity because of its innate ability to accommodate the simultaneous transmission of data, voice, and video.

Using HS488 and the TNT4882 chip, we developed the AX/4000 ATM system to test ATM networks, equipment, and applications. The AX/4000 can generate ATM cell streams; simulate various ATM traffic conditions; and measure delays, impairments, and errors when ATM cells pass through multiple networks, ATM switches, and other equipment before reaching its final destination.

Because network-sensitive applications demand flexibility in testing, we created a modular test system based on a high-speed HS488 backplane design where users select the physical port interface and the modules to generate and/or analyze ATM traffic. Other applications of the AX/4000 ATM test system include physical layer testing, network load stress testing, traffic conformance testing, and network impairment emulation.

Using the AX/4000 system, our customers can pick and choose test modules and physical interfaces to configure a system that meets their exact needs without spending a lot of money on modules that use more complex and expensive backplane designs. We can provide our customers with a lower cost solution because HS488 delivers high-performance connectivity with inexpensive, off-the-shelf PCs; this helps us keep our system controller prices down.

HS488 provides the performance our customers need for high-speed telecommunications testing.

The AX/4000 ATM system uses the HS488 protocol for high-speed telecommunications testing.

For remote testing, we supply a National Instruments Ethernet GPIB controller with TCP/IP compatibility so users can control the AX/4000 system from any platform via their LAN or the Internet.

HS488 provides the performance our customers need for high-speed telecommunications testing. We use the high-speed HS488 version of GPIB because of the performance required to test high-speed, large-bandwidth network equipment – some of our modules operate at speeds up to 622 Mb/s. With HS488, we can reduce the time needed to perform network tests compared to the time that would be required using standard GPIB.

For more information, contact Adtech, Inc., tel (800) 348-00880 or (808) 734-3300, fax (808) 734-7100, or e-mail contact@adtech-inc.com

HS488 Enhances Overall GPIB System Performance

As HS488 paves the way for a high-speed extension to the IEEE 488.1 standard, GPIB system developers recognize that GPIB performance plays a significant role in enhancing overall system performance.

Over the past decade, we have seen phenomenal advancements in general-purpose computer technology. Today, computer systems can process data using advanced microprocessors that are clocked at 200 MHz. PCI and DMA accelerate transactions between the I/O, memory, and CPU up to 132 Mbytes/s. Even access times to data storage devices, such as RAM and the hard disk, have improved. As overall computer system performance continues to improve, GPIB I/O becomes a larger fraction of the entire measurement system performance. The HS488 high-speed data transfer protocol addresses this issue by creating a standard mechanism for increasing GPIB performance while maintaining compatibility with existing GPIB instrumentation.

HS488 is a high-speed GPIB transfer protocol that scales the maximum data transfer rate of ANSI/IEEE Standard 488.1-1987 up to 8 Mbytes/s by removing delays invoked by the 3-wire IEEE 488.1 handshake. Using the HS488 protocol, a GPIB controller automatically detects compatible devices capable of using the HS488 handshake to transfer data. If the protocol does not detect an HS488-capable device, it automatically defaults to the standard IEEE 488.1 3-wire handshake. In addition, HS488 employs the same proven, high-speed data streaming techniques used with VME, PCI, and fast SCSI.

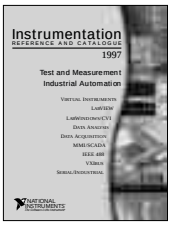
With HS488, the installed base of GPIB users can continue to reap the full benefits of computer technology and begin developing higher performance GPIB-based instrument control systems.

Windows NT and PCI DAQ Seminar Coming Soon

Beginning in February 1997, National Instruments will host a worldwide seminar titled Data Acquisition Solutions with PCI and Windows NT. This four-hour seminar focuses on the latest Windows NT and PCI technologies and shows you how to develop DAQ systems that take advantage of these newest technologies. This seminar describes the use of data acquisition in a variety of application areas, including telecommunications, semiconductor, educational, medical research, and automotive. Learn how to build DAQ solutions that scale a variety of hardware and operating system architectures. The seminar is designed for both developers and users of DAQ systems.

For more information, circle Windows NT and PCI DAQ Seminar – see also page 24.

New 1997 Catalog



Our new, full-color 1997 catalog will be available in December. The catalog, which is also available on our Instrupedia™ CD, describes more than 500 National Instruments hardware and software products that you can use for PC-based test and measurement and industrial automation solutions.

For a 1997 catalog, circle this option on the reply card.

Toronto Area User Group Meets

On September 17, more than 30 LabVIEW users gathered to find out about new LabVIEW features and give feedback for future development. Although this was not the first user group meeting in the area, it was certainly the best. Based on the success of this meeting, the next one is set for January 20 at Humber College in Etobicoke. Contact Gary Proctor at (905) 785-0085 for more details and to RSVP.

Get Set for NIWeek™ 97, August 18-21

National Instruments invites you to join us at NIWeek 97, the worldwide conference for virtual instrumentation. Based on the success and excitement of this year's event, NIWeek 97, slated for August 18-21, promises to be another innovative, information-packed event! NIWeek 97 will once again be held at the scenic Renaissance Hotel in Austin, Texas. End-users, professional developers, and systems integrators who want to get the most out of their instrumentation systems should mark their calendars! The conference features presentations on our strategic directions and new product developments, in-depth technical training on our hardware and software products, and feedback sessions with our management and engineers. The critical information gathered here will help users with their ongoing and future applications. We will also sponsor a contest to identify the best applications of our products (for more details, see related story below).

NIWeek 97 Call for Papers

Share your exciting applications with colleagues from around the world! We encourage you to submit a paper for the NIWeek 97 Best Applications of Virtual Instrumentation Contest and participate in the Poster Session. All acceptable papers will be published in the Conference Proceedings CD. Winners receive free registration to NIWeek 97 and will present their papers during the conference sessions. All contestants receive $100 off their conference registration fee. To enter, just request an Applications Contest Kit on the reply card and turn in your abstract by March 3, 1997. Complete papers will be due May 1, 1997.

Learning BridgeVIEW Basics for Industrial Automation

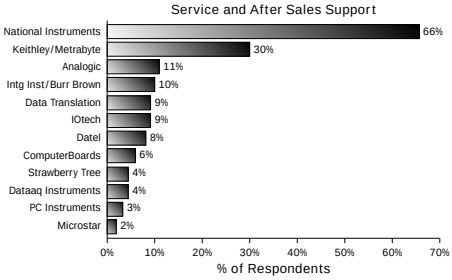
Stay on top of the new release of BridgeVIEW by taking advantage of the BridgeVIEW Basics training course. This 3-day, hands-on course prepares you to unlock the potential of BridgeVIEW so you can create sophisticated MMI/SCADA applications for your industrial automation needs. If you are new to BridgeVIEW, the course guides you in creating a functional MMI application using configurable utilities, such as the MMI G Wizards, as well as advanced features using G, the graphical programming language of BridgeVIEW. Each chapter provides the skills and knowledge in a sequential fashion so you can easily establish a step-by-step procedure to develop MMIs.

Students learn how to configure and acquire data using NI-DAQ software and Modbus hardware. In addition, the course illustrates how to configure tags for monitoring, controlling, and logging. Students also learn how to create an MMI panel without any G programming. The course introduces concepts such as alarming, logging and extracting historical data, and employing security features.

For those who are unfamiliar with G programming, National Instruments is also offering a G Primer course to introduce new users to the G environment. The G Primer is a hands-on course that emphasizes the capabilities of G programming while reinforcing fundamental concepts.

For more information or to register, contact our Customer Education Department at (512) 794-0100 in the U.S. or your local branch office.

New Support Offering! Extended Development Support



Our efforts to serve our customers have not gone unnoticed. In a 1995, PC-Based Test Market Insight Study, Test & Measurement World *readers ranked National Instruments number one in service and after sales support; National Instruments received nearly twice as many responses for excellent service.*

Support ⟷ Consulting

Customer Support				Customer Education	Alliance Program
Electronic Automated Support	Basic Support	Future Support Options	Extended Development Support	Product Training	System Integration

National Instruments Support and Service Continuum.

Our driver software, which includes NI-DAQ, NI-VXI™, and NI-488®, simplifies application development by providing easy-to-use, high-level functions to program our hardware. However, we realize that occasions sometimes arise where you need to program the hardware directly at the register level. To better serve your application development needs, National Instruments is announcing the Extended Development Support (EDS) for assistance with register-level programming support for National Instruments DAQ, SCXI, GPIB, and VXI products. EDS also includes technical assistance with the driver development kit (DDK) software available for some of our hardware products. This level of technical support goes beyond our Basic support, providing you with in-depth technical assistance in programming our hardware products at a very low level.

When you contact National Instruments with EDS-related questions, you will speak directly with senior support engineers who are knowledgeable about register-level application development with our hardware products. EDS is available on a pay per-incident basis or on an annual contract basis to provide support for multiple users and incidents.

In the event your requirements exceed the boundaries of EDS, you can also schedule telephone consultations with senior support engineers. Services include assistance with developing applications using National Instruments hardware and software, implementation assistance, and advice on optimizing your configuration. Before engaging in telephone consulting, you can discuss your needs with the support engineer. Based on this preliminary discussion, we can determine whether we can provide consultation assistance and the amount of consultation time required.

New Articles, User Solutions, Application Notes Available

Use the enclosed information reply card to order these articles and application notes. Order numbers are listed after the literature descriptions.

Hot Off the Press

"LabVIEW-Based Quality Feedback System Monitors Production on Factory Floor," by David Douglas, User Solutions article, July 1996. (A506A)

"Dynamic Simulation Improves Control Module Testing," by Chuck Karam and Dave Wilson, *Evaluation Engineering*, June 1996. (A544A-01)

"Using LabVIEW to Perform Thermal Analysis Test and Temperature Measurement" by Felice Abramo, User Solutions article, July 1996. (A778A)

"Staying In Control With Data Acquisition," by Dave Wilson, *Desktop Engineering*, July 1996. (A862A)

"VXI*plug&play* Software: Understanding and Using VISA 1.0," by Bob Mitchell, *VXI Journal*, July 1996. (A863A)

"PC-Based System Tests Vehicles in Temperature Extremes," by Brian Wright, *Evaluation Engineering*, July 1996. (A865A)

"Choosing the Right Test Platform," by James Kimery, *Evaluation Engineering*, September 1996. (A868A)

"Using LabVIEW in Student Projects for Instrumentation and Control," by David McDonald, User Solutions article, June 1996. (A871A)

"Monitoring Magnetic Resonance Imaging Experiments with LabVIEW," by Bruce Balcom, Derrick Green, User Solutions article, May 1996. (A872A)

"Stimulating Minds with LabVIEW at Boston's Museum of Science" by Asha Ghosh, User Solutions article, May 1996. (A873A)

"Modernizing a High-Volume Production Test System," by G. D. Swanson and Kripa Nidhi, User Solutions article, July 1996. (A874A)

"Upgrading the Jefferson Parish, Louisiana, SCADA System with Lookout," by Dik LeDoux, User Solutions article, July 1996. (A876A)

"Data Acquisition TAKES OFF," by Dave Wilson, *Desktop Engineering*, September 1996. (A877A)

"An exclusive interview with Dr. James Truchard of National Instruments," by Jack Hickey, *I&CS*, June 1996. (A878A)

"LabVIEW Provides a Variety of Solutions for Image Processing Applications Using ETC3000 and IMAQ Vision," by John Vennari, User Solutions article, September 1996. (A889A)

"IMAQ Vision and LabVIEW Automate Seedling Analysis," by Anne Menedez, User Solutions article, September 1996. (A890A)

AED Introduces Virtual Instrumentation for J1850 Connectivity with LabVIEW

Advance Electronic Diagnostics (AED), a new Alliance Program member, is offering a comprehensive, powerful virtual instrument package that communicates with the standard J1850 automotive protocol. The AED Vehicle Communication System (VCS) is a Type III PCMCIA device. When combined with the AED VCS Driver for LabVIEW software, the VCS accesses a vehicle's communication network via the J1850 protocol to obtain vehicle information.

The VCS connects the PC to J1850-compliant vehicles through a standard OBD II connector. OBD II, the regulated standard for vehicle electronic communications, consists of an industry-standard connector that gives users quick and easy access to any vehicle information provided by the vehicle manufacturer. The VCS is field-reprogrammable, making it possible to change or add new firmware protocols such as ISO9141, GM-ALDL, and custom serial. The VCS package also includes C libraries for further custom application development.

The VCS Driver for LabVIEW communicates via the J1850 protocol in both VPW and PWM modes. This

capability is useful for both the manufacturer and the after-market automotive technicians. Manufacturer-specific functions include reprogramming flash ROM controllers, reading diagnostic codes, clearing diagnostic codes, and accessing guided diagnostics. Automotive technicians now have access to data such as RPM, throttle position, and oxygen sensor information.

For more information, contact Advance Electronic Diagnostics, Inc., 10850 North 24th Avenue, Suite 101, Phoenix, AZ 85029, tel (800) 657-0951 or (602) 861-9359, fax (602) 678-4471, or e-mail sales@aed.com

Certification Leads To Training Opportunities

To meet the increasing customer demand for training on our products, National Instruments has started a certification program for third parties, such as Alliance Program members. We now offer two types of certification to teach our Customer Education courses – an individual can become a National Instruments Certified Instructor (NICI) or an organization can become a National Instruments Certified Training Center (NICTC).

The NICI recognizes individual expertise in LabVIEW, LabWindows/CVI, IEEE 488.2 (GPIB), or DAQ. Once you become certified, you can teach our approved courses that fit with your specialty. National Instruments may request that you first teach one of our scheduled courses in your geographic area. In addition to compensation for teaching a course, you also benefit from the use of the NICI logo, a symbol of your expertise.

As an NICTC facility, your organization has the opportunity to provide training on National Instruments products in accordance with specified guidelines. Once you become an approved training facility, National Instruments will market your training center to our local customers. You will also receive an official plaque designating your facility as a certified center.

For more information, contact our Customer Education Department at (512) 794-0100 in the U.S. or your local branch office.

Advisory Committee Helps Chart Course of Alliance Program

Alliance Program members play a vital role to the success of National Instruments. Not only do they use our general-purpose virtual instrumentation hardware and software products to create vertical solutions, they also provide valuable feedback on how we can improve our products and processes. In addition to the existing mechanisms for feedback, such as the Developer Conference portion of NIWeek and Alliance Program Internet mail list, National Instruments has instituted an Advisory Committee to formulate ideas that contribute to the mutual success of National Instruments, the Alliance Program members, and our customers. Topics include:

1. Improving our business practices
2. Improving the Alliance Program service
3. Creating new market opportunities
4. Defining the topics and agenda for NIWeek

Selection of Committee Members

Each year, National Instruments will select five to seven members to the Alliance Program Advisory Committee (APAC). Committee members will be selected based on factors such as company size, seniority, current business level, and location. In addition, Alliance Program members will appoint one additional committee member at large.

APAC Members for 1996-97

B&B Technologies – Timothy Brooks
Brill Engineering (U.K.) – Chris Brill
CIT (Belgium) – Adriaan Brebels
Dateppli – John Date
GTE – Neil Dewitt
Viewpoint Software – Jim Campbell
G Systems – Lynda Gruggett

National Instruments and Graftek Work to Further Imaging Products

As a broad-based supplier of general-purpose instrumentation products, National Instruments relies on our Alliance Program members to use their expertise in providing vertical, application-specific solutions. One example of a symbiotic relationship is the one National Instruments shares with Graftek, makers of Concept V.i and Vinci software.

For years, National Instruments and Graftek have worked closely to ensure that our products are compatible and to educate our customers about the availability of imaging software for LabVIEW. To further imaging as a mainstream measurement technology through our worldwide channels, National Instruments recently acquired this software from Graftek, freeing Graftek to pursue their focus on higher level solutions for mutual customers. This acquisition underscores just one of the many successes of the Alliance Program.

National Instruments President Dr. James Truchard, Vice President of Marketing Tim Dehne, and Graftek President Philippe Sauvan-Magnet celebrate their partnership in imaging software.

Graftek President Philippe Sauvan-Magnet demonstrates some of Graftek's imaging software.

A Long-Term Relationship

In the late 1980s, Graftek was developing turnkey software for vision applications. To address customer demands for tools to customize their applications, Graftek saw the opportunity to leverage off the ease of use and productivity of LabVIEW to offer their customers an easy way to develop these applications. They developed Concept V.i, a VI library implementation of their imaging software that gave their customers icons for use with Macintosh-based LabVIEW.

For the past decade, National Instruments has worked with Graftek to improve the internal architecture of LabVIEW to make it more suitable for imaging applications. When we introduced Windows-based LabVIEW in 1992, Graftek not only ported Concept V.i but developed some of their higher level tools, such as Ultimage, with the LabVIEW Application Builder. More recently, Graftek made the same imaging technology available to C programmers through Vinci, a library for LabWindows/CVI.

A Team Approach to New Products

With the recent advent of the PCI for high-speed transfer of images and powerful processors for high-speed image analysis, Graftek and National Instruments recognized that images could become another real-time measurement parameter, just like temperature value or pressure waveform. Imaging has crossed the threshold from being a vertical niche to a mainstream technology.

Our two companies collaborated on the IMAQ PCI-1408, our first image acquisition board, and NI-IMAQ driver software. With the application expertise of Graftek and our experience in developing PC-based hardware, we created a quality image acquisition board that complements our DAQ hardware.

Obviously, National Instruments needed imaging software, such as Concept V.i and Vinci, to complement the hardware introduction. By transferring software ownership to National Instruments, the products can now take full advantage of our worldwide sales, marketing, and distribution channels. We will continue to work with Graftek to jointly enhance our imaging software technology.

More Imaging Solutions

Several Alliance Program members, including Graftek, have already developed turnkey applications based on this imaging technology. These applications include:

Vision Explorer VS/TC – handles image sequences from video recorders and time-coded devices (Graftek)

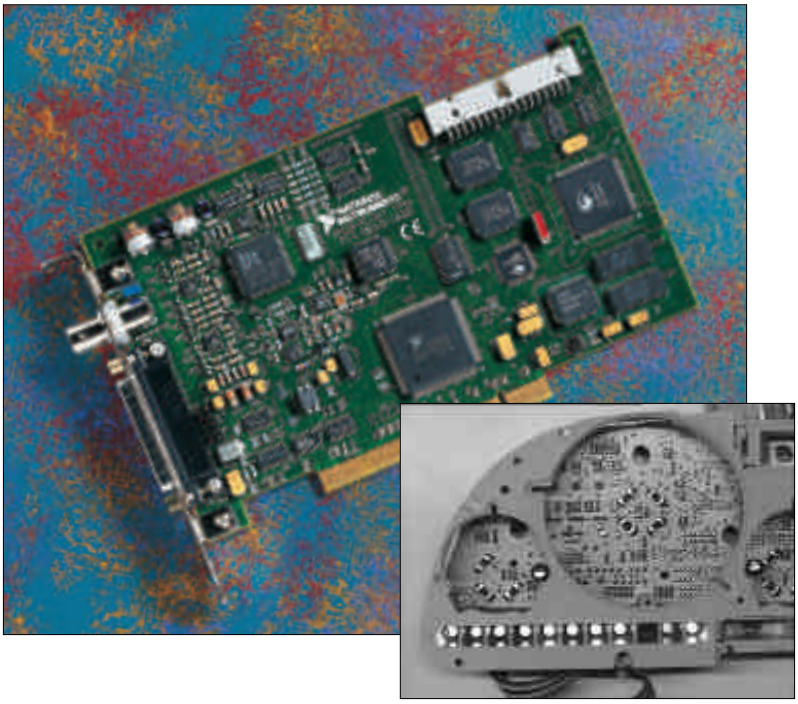
Vision Explorer MA – performs motion analysis on images such as automobile crash test, explosions, or physical/biological phenomena (Graftek)

ETC 3000 – serves as a turnkey application for automating "image-based" laboratory and applications that include robotics control, XY stage control, microscopes, and so on (Engineering Technology Center)

Beam Analysis VI – performs real-time laser beam profiling and diagnostics for the characterization, quality control, and tuning of lasers, diodes, and optical sources (GTFS)

IN THIS ISSUE

IMAQ Products Join Our Virtual Instrumentation Family



Our new imaging products, which include our IMAQ Vision software, NI-IMAQ driver software, and IMAQ PCI-1408 board (formerly Concept V.i and Vinci), form a complete solution that adds imaging to virtual instrumentation. Our imaging suite capitalizes on PCI and is also compatible with our family of DAQ products. Along with test and measurement functions, our IMAQ products also have broad uses in research and development and industrial automation applications.

Windows NT and PCI DAQ Seminar Dates

Look for the Windows NT and PCI DAQ seminar in the following U.S. and Canadian cities (see page 20). To sign up or for more details, call National Instruments at (512) 794-0100.

February	March	April
Anaheim, CA	Albany, NY	Albuquerque, NM
Atlanta, GA	Ames, IA	Andover, MA
Austin, TX	Calgary, AB	Ann Arbor, MI
Berkeley, CA	Columbus, IN	Boise, ID
Charlotte, NC	Columbus, OH	Boulder, CO
Cincinnati, OH	Edmonton, AB	Bozeman, MT
Cleveland, OH	Fort Lauderdale, FL	Braintree, MA
Cocoa Beach, FL	Fort Washington, PA	Burlington, VT
Columbia, MD	Honolulu, HI	Cambridge, MA
Columbus, OH	Huntsville, AL	Cedar Rapids, IA
Dallas, TX	Indianapolis, IN	Danvers, MA
Dayton, OH	Jackson, MS	Dearborn, MI
Fairfax, VA	Kansas City,MO	Denver, CO
Fort Walton Beach, FL	Las Vegas, NV	El Paso, TX
Fort Worth, TX	Long Island, NY	Flint, MI
Foster City, CA	Madison, WI	Grand Rapids, MI
Gainesville, FL	Memphis, TN	Hamilton, ON
Greenville, SC	Milwaukee, WI	Holyoke, MA
Hampton, VA	Minneapolis, MN	Idaho Falls, ID
Hartford, CT	Newburgh, NY	Kitchener, ON
Houston, TX	Northbrook, IL	Las Crueces, NM
Knoxville, TN	Oakbrook, IL	Little Rock, AR
Lexington, KY	Parsippany, NJ	London, ON
Louisville, KY	Pascagula, MS	Los Alamos, NM
Manhattan Beach	Phoenix, AZ	Montreal, PQ
Morgantown, WV	Portland, OR	Nashua, NH
New Orleans, LA	Princeton, NJ	Newport, RI
Norwalk, CT	Richland, WA	Ottawa, ON
Oklahoma City, OK	Rochester, NY	Portland, ME
Orlando, FL	Rockford, IL	Salt Lake City, UT
Paducah, KY	Schaumburg, IL	Saskatoon, SK
Pasadena, CA	Seattle, WA	Scarborough, ON
Pittsburgh, PA	Spokane, WA	Toronto, ON
Pleasanton, CA	St. Louis, MO	Troy, MI
Reno, NV	Syracuse, NY	Winnipeg, MB
RTP, NC	Tucson, AZ	
Sacramento, CA	Vancouver, BC	
San Antonio, TX		
San Diego, CA		
Santa Clara, CA		
Santa Rosa, CA		
Tampa, FL		
Toledo, OH		
Ventura, CA		

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

Trade Shows

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

COMDEX/Fall		Allen Bradley Automation Fair		Automated Manufacturing Expo	
Las Vegas, NV	Nov 18-22	Philadelphia, PA	Dec 11-12	Greenville, SC	Feb 18-20
Photonics		MACWORLD Expo		SAE	
Boston, MA	Nov 19-21	San Francisco, CA	Jan 7-10	Detroit, MI	Feb 24-27
Int'l Mechanical Engineering Expo		Energy Week		Nepcon West	
Atlanta, GA	Nov 19-21	Houston, TX	Jan 28-30	Anaheim, CA	Feb 25-27

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