DAQ Instruments Extend the Capabilities of Virtual Instrumentation

The DAQCard-4050 and VirtualBench-DMM software turn your computer into a digital multimeter.

The DAQ Instruments line of products from National Instruments includes plug-in oscilloscopes, arbitrary waveform generators, and a digital multimeter that work with Windows NT, 95, and 3.1. Because of NI-DAQ and instrument drivers, using DAQ Instruments with LabVIEW and LabWindows/CVI is easy.

DAQScope Family

The DAQScope family, consisting of the PCI-5102, AT-5102, and DAQCard-5102, delivers oscilloscope performance to the PCI, AT, and PCMCIA bus. The DAQScope product features include:

- 2 input channels simultaneously sampled
- ±5 V, ±1 V, ±0.25 V, ±5 mV input ranges
- 20 MS/s real-time maximum sampling rate per channel
- 1 GS/s random interleaved sampling (RIS)
- 15 MHz input bandwidth
- 8 bits vertical resolution
- 662 ksamples memory depth
- 1 analog and 2 digital triggers
- Software-selectable AC/DC coupling
- Asynchronous pulse-train generation
- VirtualBench-Scope software

The DAQScope PCI-5102 and AT-5102 use the RTSI bus to send timing and triggering signals between other RTSI-capable boards, resulting in powerful, multifunction DAQ solutions. For instance, the asynchronous pulse-train generation capability of the DAQScope is useful for cable fault testing and classification.

The DAQScope DAQCard-5102 makes computer-based portable field test a reality. You can use the DAQScope products for high-speed waveform capture, electronic testing, transmission line testing, power supply testing, and more. The DAQScopes are shipped with NI-DAQ driver software, instrument drivers, and VirtualBench-Scope, so that you can quickly and easily turn your computer in to a digitizing oscilloscope.

DAQMeter

For portable field testing applications, the DAQMeter excels. The DAQMeter PCMCIA DAQCard, a 5½ digit digital multimeter (DMM), measures voltage, current, and resistance. For current measurements, a shunt module is available separately. The DAQCard-4050 includes NI-DAQ for Windows NT, 95, and 3.1, an instrument driver, and VirtualBench-DMM software. DAQCard-4050 features include:

- 5½ digit DMM with AC/DC coupling
- DC input ranges of ±20 mV to ±250 V
- AC input ranges of 20 mVrms to 250 Vrms
- Resistance measurements of 200 Ω to 20 MΩ
- Up to 60 readings per second
- True AC RMS voltage measurements, 20 Hz to 25 kHz
- 250 V isolation
- Compliant with international safety standards, UL and CE
- Low power consumption – operational 45 mA; power down 15 mA
- VirtualBench-DMM software

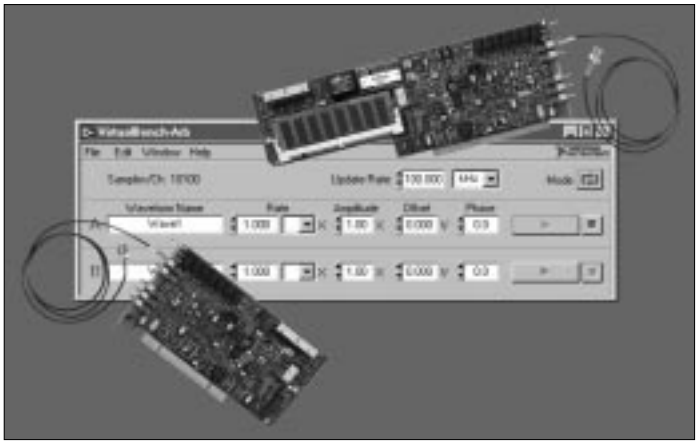
DAQArb Family

The DAQArb PCI-5411 and AT-5411 are high-speed, arbitrary waveform-generating boards that perform at stand-alone instrument levels. DAQArb features include:

- 1 output channel
- 40 MS/s sustained update rate
- 32-bit direct digital synthesis (DDS) for up to 16 MHz frequency
- 12-bit vertical resolution
- 16-bit digital pattern output
- 2 Msamples (expandable to 8) of waveform memory
- ±5, ±10 V output
- Waveform linking and looping
- 50 Ω and 75 Ω selectable-output impedance
- VirtualBench-Arb software

The DAQArb, combined with the VirtualBench-Arb software, generates PAL and NTSC signals for video and HDTV testing, analog stimulus for network analysis, automotive test waveforms, serial signals for diagnostics of communication links, and waveforms.

DAQ Instruments will be available by the end of Q2,1997. For a DAQ Instruments kit, circle this option on the reply card.



By using DAQArb hardware combined with VirtualBench-Arb software, you can design and generate arbitrary waveforms.

National Instruments • Tel: (512) 794-0100 • Fax: (512) 794-8411 • info@natinst.com • www.natinst.com

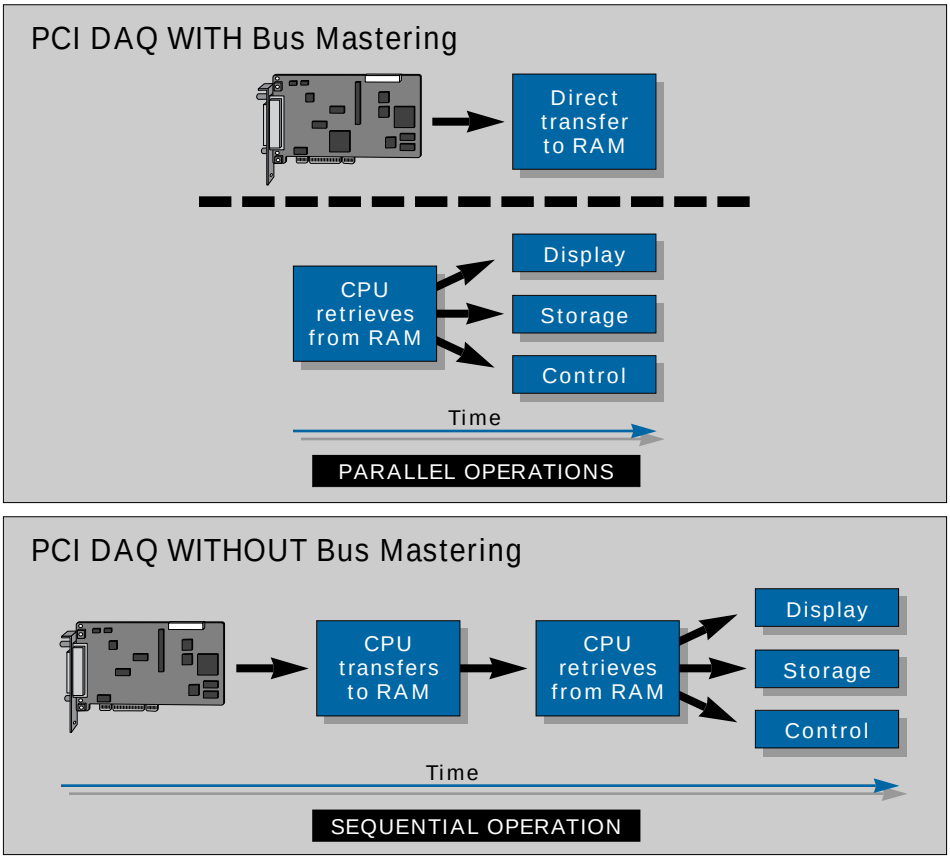
Get the Most Out of PCI with the MITE ASIC

With a PCI-based computer, you can build powerful virtual instrumentation solutions – the 132 Mbytes/s PCI bus greatly increases the rate at which you can transfer data to system memory. Just having a PCI board, however, does not guarantee good system performance.

For top PCI performance, you need a bus-mastering board with advanced data transfer features. To achieve this performance, National Instruments developed the MITE data transfer ASIC, which is used on all of our new PCI DAQ products.

The MITE provides intelligent bus cycle logic that relinquishes the PCI bus during potentially long transfers (such as acquiring data at slow rates) while continuing internal data transfers, operating as a "good citizen" on PCI. This is important for your solutions because it gives you the ability to acquire data without reducing system performance of other parts, such as graphics and analysis.

In addition, the MITE uses sophisticated PCI bus-mastering techniques that optimize data transfers in virtual memory operating systems, such as Windows NT, Windows 95, and the Mac OS. Virtual memory systems partition



The MITE uses a transfer scheme called scatter-gather direct memory access (DMA) to increase PCI system performance.

The MITE ASIC, developed by National Instruments, is used on all our PCI products to give you maximum and consistent PCI performance.

memory into small blocks that are strung together to make large memory buffers. You can allocate a block of memory for acquiring data; however, this seemingly contiguous memory buffer actually exists as a series of memory blocks scattered throughout memory. A simple PCI bus master transfers data to virtual memory inefficiently because the CPU must repeatedly instruct the PCI master to move data to each of the scattered memory blocks.

The MITE, however, uses a transfer scheme called scatter-gather direct memory access (DMA) to operate smoothly with virtual memory operating systems. Instead of relying on continual service from the CPU, the MITE executes a linked list of memory transfer instructions stored in system memory. The CPU only has to direct the MITE to the first instruction in the list; the MITE handles the transfer with no further CPU intervention. Because the MITE frees the microprocessor, it can perform other tasks, such as data display and analysis.

Another feature of the MITE are its three independent DMA controllers. Typically, one is used for analog input, one for analog output, and one for counter/timers, providing simultaneous operation of each of these functions.

By providing maximum performance while minimizing microprocessor burden, the MITE is a critical component in PCI-based data acquisition. You will find the MITE on all new National Instruments PCI DAQ products, delivering the next generation of DAQ solutions.

Products that Use the MITE ASIC

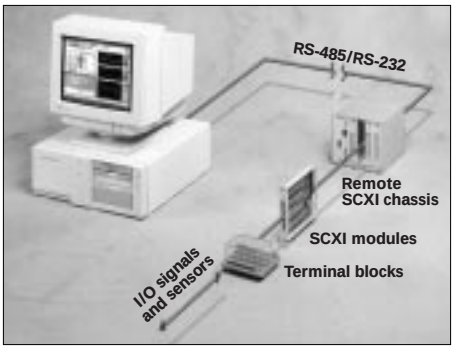
DAQ
- PCI-MIO-16E-1
- PCI-MIO-16E-4
- PCI-MIO-16XE-10
- PCI-MIO-16XE-50
- PCI-1200
- PCI-DIO-96
- IMAQ PCI-1408

GPIB
- CPCI-GPIB
- PMC-GPIB
- PCI-GPIB

VXI
- VXIpc™-850 Series
- VXIpc-740 Series
- VXI-MIO-64E-1
- VXI-MIO-64XE-10
- VXI-MXI-2
- VME-MXI-2
- PCI-MXI-2
- AT-MXI

Industrial
- PCI-CAN

Data Acquisition Goes the Distance with SCXI



To address remote and distributed DAQ applications, SCXI now includes the capability to communicate over a long-distance RS-232/RS-485 network.

For all of the obvious benefits of PC-based data acquisition, one limitation has been the adaptability of these systems to applications with remotely located sensors and I/O.

For example, suppose you want to use your PC to collect temperature and pressure data from several engine test cells located in a large production facility. With the PC located in the control room, one solution is to run long signal wires from each sensor back to the PC. Installation of such wiring, however, can prove expensive, labor intensive, and very susceptible to noise problems. A better approach is to physically locate the signal conditioning and data acquisition instrumentation out in the test cells. Then, you can condition and digitize the signals in the test cells and transmit them back to the PC using a high-speed serial network connection.

SCXI Goes Remote

SCXI is a versatile signal conditioning and data acquisition platform with modules for many types of analog and digital I/O. The multiplexing architecture of SCXI, which delivers a compact, low-cost per channel for larger applications, has been used as front-end signal conditioning for PC plug-in DAQ boards in all types of applications.

To address remote and distributed DAQ applications, SCXI now includes the capability to communicate over a long-distance RS-232/RS-485 network. You can locate several SCXI chassis, equipped with any combination of signal conditioning and data acquisition modules, up to 4,000 ft from the PC using only an inexpensive RS-485 cable.

Unlike other traditional data loggers and remote I/O devices, a remote SCXI system retains the inherent flexibility of PC-based DAQ systems.

Versatility of PC-Based DAQ, Including Waveform Captures

Unlike other traditional data loggers and remote I/O devices, a remote SCXI system retains the inherent flexibility of PC-based DAQ systems. For example, in addition to monitoring low-bandwidth parameters, such as temperature and pressure, you can use a remote SCXI system to capture a high-speed waveform record.

Returning to our engine test cell example, you can locate a remote SCXI chassis in each test cell, connecting each chassis to a single RS-485 cable that is fed back to a PC outfitted with an AT-485 interface board. Each chassis can condition and digitize the temperature and pressure signals. In addition, you could even expand your system to periodically monitor dynamic parameters, such as vibration of the engine. Because the SCXI DAQ module can perform high-speed A/D conversions, you can acquire a waveform into local memory at up to 100 kS/s, transmitting the data back to the PC at serial rates.

Compatible with Existing SCXI

At both the hardware and software level, a remote SCXI system is compatible with a standard benchtop or portable SCXI system. All existing SCXI modules and chassis work in a remote configuration. To convert an existing system, you simply add an SCXI-2400 communications module and an SCXI-1200 DAQ module. More importantly, the programming API for a remote SCXI system is exactly the same as for a standard benchtop or portable SCXI system. In effect, NI-DAQ makes the communications link, whether it be RS-232/485, parallel port, or via a DAQ board, transparent to the user. Therefore, your programs port extremely easily, and you do not have to learn a new interface. In addition, NI-DAQ works with Windows 95, Windows 3.1, and now Windows NT.

For an SCXI kit, circle this option on the reply card.

New BNC Connectors Available for SCXI

The SCXI-1305 provides convenient BNC connectors and AC/DC coupling for several SCXI modules.

You can now use BNC connections with your 8 and 4-channel SCXI modules. The SCXI-1305 is a front-mounting terminal block with eight BNC connectors and selectable AC/DC signal coupling. You can use the SCXI-1305 with the following modules:

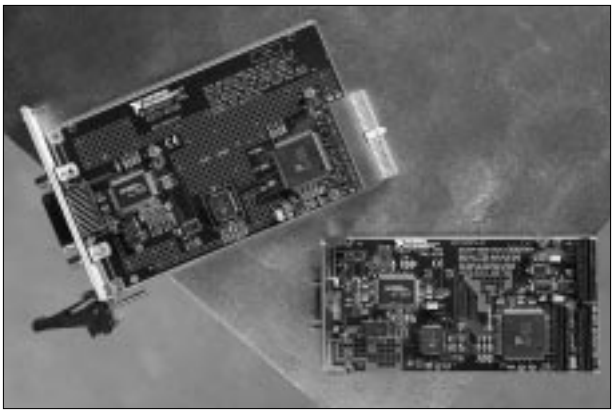
- SCXI-1140 sample and hold module
- SCXI-1141 programmable lowpass filter module
- SCXI-1120 isolated analog input module
- SCXI-1121 isolated analog input with excitation

The SCXI-1305 terminal blocks also includes AC coupling and bias resistors, which you can enable or disable with switches on a per channel basis. Note that when you use the SCXI-1305 with the SCXI-1120 or SCXI-1121 isolation modules, the working common-mode voltage is reduced to 42 V.

For an SCXI kit, circle this option on the reply card.

New Industrial PCI Products Available for GPIB

PC technology continues to make inroads into industrial computing environments, delivering performance and reducing system development costs. Two new derivatives of the PCI bus, the CompactPCI and the PCI Mezzanine Card (PMC), now deliver new and exciting opportunities for you to take advantage of the PCI bus in industrial application areas.



Using the new CPCI-GPIB and PMC-GPIB interfaces, you can take advantage of the latest industrial computing environments, CompactPCI and PMC.

With our new CPCI-GPIB and PMC-GPIB interfaces for CompactPCI and PMC, respectively, you can take full advantage these new bus standards and continue to leverage off your existing investments in GPIB instrumentation and application software. The CPCI-GPIB and PMC-GPIB will be available in Q1 1997.

The CPCI-GPIB, a 3U HS488-compatible CompactPCI GPIB interface, comes with NI-488.2M™ GPIB software for Windows NT or Windows 95. The PMC-GPIB, a single-size PMC interface for GPIB, offers VME users a low-cost GPIB interface solution that resides in the same slot as the VME CPU. Users can also use the NI-488 DDK for developing their applications for other operating systems.

CompactPCI, an adaptation of the peripheral component interconnect (PCI) specification for industrial and/or embedded applications, combines standard, high-volume, PC technology with the more robust VME or Eurocard 3U and 6U packaging standards to deliver the benefits of PCI in a mechanical form factor suited for more rugged applications.

PMC is emerging as the *de facto* standard mezzanine bus for many VME CPU boards.

For data sheets on industrial PCI products for GPIB, circle this option on the reply card.

HS488 News

Formal IEEE standardization of HS488, the new standard for high-speed GPIB, continues to move forward. The most recent development is submission of the HS488 Draft Standard 1.3 to the Working Group for Higher Performance IEEE std. 488.1.

The working group consists of more than 30 members, including leading suppliers such as Capital Equipment Corporation (CEC), IOtech, Hewlett-Packard, Ines, National Instruments, and Tektronix, as well as others. Draft Standard 1.3 incorporates minor refinements that clarify the Extended Acceptor Handshake Interface function and HS488 Configuration. The goal of the working group is to complete standardization of HS488 by the summer of 1997.

In addition to the HS488 specification, GPIB users and suppliers can contact National Instruments or visit www.natinst.com/gpib for a free copy of the HS488 White Paper.

For copies of the HS488 White Paper and GPIB Application Note, circle these options on the reply card.

GPIB Info Source Comes to the Web!

GPIB on the World Wide Web (www.natinst.com/gpib) delivers a comprehensive online reference that GPIB users and instrument vendors can use to find the latest technologies for building instruments and GPIB-based instrument control applications.

The GPIB web page delivers a variety of information for both new and veteran GPIB users. In addition to a complete GPIB overview and tutorial for new users just beginning to take advantage of GPIB for instrument control, the GPIB web page delivers information on the latest developments in GPIB interfacing technology; easy access to instrument drivers; easy access to application notes for learning about development techniques; an online KnowledgeBase for finding solutions to your development problems; and an online catalog for quickly finding the GPIB products and accessories.

Currently, the GPIB web page features new information on HS488, a high-speed data transfer standard for GPIB that is currently undergoing formal IEEE standardization. Over the next few months, you will also find a variety of application notes that discuss how to take full advantage of new mainstream technologies such as HS488, Windows NT, Windows 95, and the intranet, as well as new features of our 32-bit NI-488.2™ development software. Keep appraised of the latest in GPIB by staying tuned to National Instruments and GPIB on the World Wide Web.

Visit our GPIB web page at www.natinst.com/gpib

New C-Size 13-Slot VXI Mainframe Available

We have expanded our line of VXI mainframes by introducing a new C-size, 13-slot mainframe – the VXI-1500. The VXI-1500 mainframe combines a high-performance, 13-slot backplane with a high-output power supply. Its rugged, modular design makes the VXI-1500 an ideal choice for a wide range of applications – the modular power supply and fan assemblies simplify maintenance and reduce repair time. The VXI-1500 complies with VXIbus Specification Revision 1.4 and VXI*plug&play* Systems Alliance Specification VPP-8, the standard for VXI Module/Mainframe to Receiver Interconnection.

Its rugged, modular design makes the VXI-1500 an ideal choice for a wide range of applications.

With a rugged, modular design, the VXI-1500 is an ideal choice for a wide range of applications.

About the VXI-1500

The VXI-1500 can supply a maximum of 1420 watts with 220 VAC or 1100 watts with 110 VAC – delivering more than 80 amps at 5.0 V. Over-current protection is managed by a push-reset circuit breaker rather than fuses, making it easy to maintain. The power supply is housed in a single case that users can remove quickly. Four screws connect the power supply to the mainframe, so that users can service the power supply assembly in less than five minutes. Users can remotely monitor the power supply voltages through a 25-pin connector located on the back of the mainframe. Users can also remotely power-on or off the mainframe using this same connector.

The VXI-1500 meets FCC Class B requirements for radiated emissions, surpassing many available mainframes. With a 12-layer stripline construction and employing differential tracking and line length equalization techniques, the VXI-1500 backplane minimizes random noise and signal skew to ensure consistent and error-free operation.

Users can use the VXI-1500 for benchtop applications or they can mount the VXI-1500 in a standard 19 in. instrument cabinet with an optional rack-mount kit. The VXI-1500 will be available in Q1 of 1997.

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

MXI-2 Upgrade Program Expanded

We have expanded the MXI-2 trade-in/upgrade program to include the VXIpc-486 Model 500 Series. Now, VXIpc-486 Model 500 Series users can trade in their embedded controller to receive a 30 percent discount off the purchase price of a new MXI-2-based VXI-PCI8000 Series kit. Trade-in customers can choose from a variety of operating systems for the VXI-PCI8000 Series controller, including Windows NT/95/3.1 and Mac OS.

Anyone who has previously purchased a VXIpc-486 Model 500, 566, or 599 is eligible to trade up to MXI-2. Previously, VXIpc-486 Model 500 Series customers could trade in their controller for a discount on a new Pentium-based VXIpc-850 Series. This new offer provides another controller option for VXIpc-486 Model 500 Series users who want to upgrade their systems.

All software written using the VXIpc-486 Model 500 Series and the NI-VXI™/VISA software runs on the VXI-PCI8000 Series kits as is because the software is source-code compatible. In fact, software written under Windows using NI-VXI/VISA, including LabVIEW and LabWindows/CVI programs, is binary compatible and executes unmodified.

For a trade-in response form, circle this item on the reply card.

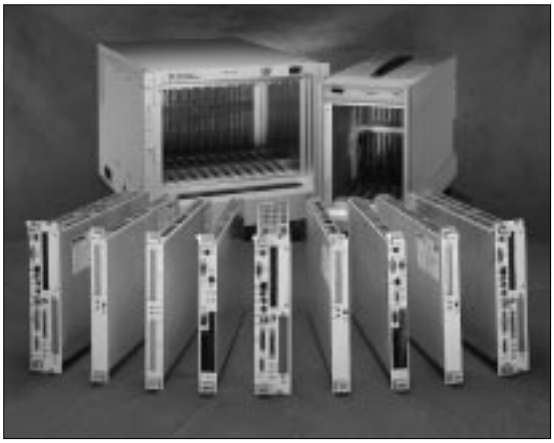
Complete VXI Solutions for Windows NT

When Windows NT began shipping more than two years ago, its impact on instrumentation systems was expected to be dramatic. On the surface, Windows NT provides all of the attributes necessary to make it a top choice for VXI developers – enhanced security, 32/64-bit addressing, a robust development environment with separate memory spaces for each process, a wealth of software development environments such as LabVIEW and LabWindows/CVI to speed development, and multithreading for faster performance.

However, as many users discovered, Windows NT uses a different device driver architecture than DOS and Windows 3.1, meaning that hardware vendors had to rewrite their drivers to work under Windows NT. Thus, engineers wanting to migrate to Windows NT found surprisingly few hardware components from which to choose. This has changed, as today engineers have a wide selection of VXI controller and instrument choices.

Windows NT Compatibility from the Start

Because National Instruments recognized the importance of Windows NT from the start, we provide the most comprehensive Windows NT capability for VXI today. Our entire VXI-DAQ product line, including our new VXI signal conditioning modules, are shipped with NI-DAQ for Windows NT as well as WINNT and GWINNT framework VXI*plug&play* instrument drivers to get users up and running quickly. The VXI*plug&play*-compliant VXI-DAQ instrument modules include the VXI-MIO Series – the VXI-MIO-64E-1 and VXI-MIO-64XE-10 multifunction analog, digital, and counter/timer modules; the VXI-DIO-128 digital I/O module; the VXI-AO-48XDC analog output and digital I/O module; and our complete line of VXI signal conditioning.



National Instruments offers complete Windows NT solutions for VXI.

Complete Driver Software

In addition to the VXI-DAQ product line, our Pentium-based VXIpc-850 Series and low-cost VXIpc-740 Series embedded controllers come with NI-VXI/VISA and NI-488.2M for VXI and GPIB control. Users can also order these computers from the factory with Windows NT installed and configured. For users wanting to control their VXI systems with MXI-2, the VXI-PCI8015 interface kit boasts the highest block transfer rate of any Windows NT VXI controller available today.

The combination of controllers and instruments is important because both are necessary to build a complete system. Customers who have used our VXI controllers and instruments in the past will find the migration to Windows NT simple. The NI-VXI/VISA and NI-DAQ software have the same APIs for all operating systems, giving users the ability to run their applications on Windows NT without modification.

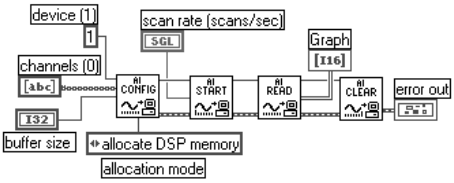
For a VXI catalog, circle this option on the reply card.

TECH NOTE

How do I program the onboard DRAM option on the VXI-MIO-64E-1 and the VXI-MIO-64XE-10 modules for waveform acquisition using LabVIEW?

Using the onboard DRAM option on the VXI-MIO Series modules, you can increase your overall system performance and capability by providing an alternative destination to store acquired data. You can configure each VXI-MIO Series module with up to 64 MB of onboard memory. By acquiring 12 or 16-bit samples, you can acquire up to 32 MSamples of error-free data on each VXI-MIO in the system. Because the memory resides on your VXI-MIO module, valuable VXI bandwidth is conserved and the overall system performance is optimized.

To use the onboard DRAM, you must first acquire the data and then move it to system memory on your controlling computer. You cannot use the onboard DRAM for continuous acquisition. Once you have configured the onboard DRAM for one of the VXI-MIO modules using the NI-DAQ configuration tool, you program the analog acquisition just like a typical single shot acquisition. To tell the NI-DAQ driver to place the acquired data in the onboard memory, change the "allocation mode" parameter in the AI Config.vi



(Data Acquisition: AI palette) from "no-change," which defaults to system memory, to "allocate on-board DSP memory." Although this is not strictly DSP memory, the operation and programming model are the same. Next, initiate the acquisition using AI Start.vi. You read the data from the onboard memory using AI Read.vi. AI Read.vi does not return until all of the samples have been captured.

National Instruments Expands Technical Support Offerings

National Instruments is committed to your success with our products and quality technical assistance worldwide. We have expanded and improved our services to better meet your individual technical support needs, while continuing our free, high-quality technical support.

Support ◄——————————————► Consulting

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

The National Instruments Support and Service Continuum.

Electronic Automated Support

You can access a variety of information at no cost 24 hours a day, 365 days a year using our automated information services. For your support needs, our InstrumentationWeb® web site at www.natinst.com has links to our extensive Software Library and Document Library and KnowledgeBase as well as information on user solutions, seminars, and new products. Through the web link to the Software Library and Document Library, you can download instrument drivers, hardware drivers, application updates, example programs, and support notes. You can also access these libraries directly via FTP or BBS. We also offer an automated fax-on-demand service for technical support documents.

SSP Services

The Software Subscription Program (SSP) provides you with the following services for one year:

- Free and automatic upgrades of your application software
- Regular distributions of the NI eSupport News via e-mail
- A 10 percent discount on our Customer Education courses and materials

With this proactive approach to software maintenance, you are ensured that your application and driver software are always the most current and correct versions. Furthermore, NI eSupport News keep you on top of all the latest developments.

You can purchase SSP for LabVIEW, LabWindows/CVI, BridgeVIEW, Lookout™, and ComponentWorks. Current maintenance and support members who renew their annual membership will be transferred into the SSP. SSP is identical to MSP with the additional benefit of NI eSupport News.

Basic Support

To handle questions that an automated system cannot answer, National Instruments provides no-charge, Basic support via phone, fax, or e-mail for all of our products. Basic support provides you with the assistance necessary to get you up and running on your hardware and/or software as well as assistance in using your National Instruments products. Basic support includes guidance in installing hardware and hardware drivers; assistance in making signal connections, wiring, and configuration; answers to questions about your National Instruments application environment; explanations of application operations or driver functions; assistance with provided software examples; assistance with the use of instrument drivers; and assistance with reproducible problems, bugs, and incompatibilities.

EXD Support

Extended Development (EXD) support provides fee-based, register-level programming assistance with National Instruments DAQ, SCXI, GPIB, and VXI products. EXD support also includes technical assistance for the driver development kit (DDK) software available for some National Instruments hardware products. You can purchase EXD support on a per-incident basis.

Get Up to Speed with Startup Assistance

New users of National Instruments products can receive one-on-one assistance on a variety of hardware and software products through our new Startup Assistance program. Software assistance is available for LabVIEW, LabWindows/CVI, VirtualBench, Component Works, HiQ, Measure, BridgeVIEW, and Lookout. Hardware assistance is available for DAQ, GPIB, VXI, and industrial communications products.

With Startup Assistance, you can select from three types of assistance based on your needs. Product installation assistance includes installation of the specified hardware/software and basic diagnostics to ensure that the products are functioning properly. When you select hardware assistance, we install the associated driver software. With basic user tutoring assistance, you can select from a variety of topics for one-on-one tutoring with an NICI or AE. User tutoring includes informal training of four people or fewer. Application assistance includes configuration of National Instruments hardware and software products for your specific application. Application areas include any necessary calibration of devices, verifying field wiring to National Instruments products, and checking interfacing between system controllers and instruments. You can also consult with a NICI or AE on how to achieve your development objectives.

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

New LabVIEW, Vision, PCI/NT for DAQ Seminars Offered

National Instruments offers three new free seminars designed to teach you the benefits of new technologies in PC-based instrumentation.

LabVIEW – Join the G Revolution gives you a hands-on opportunity to explore LabVIEW, the industry standard in instrumentation programming. Come learn about the G environment and how to accomplish data acquisition, instrumentation control, analysis, and data presentation better, faster, and cheaper.

How Windows NT and PCI Deliver New Data Acquisition Solutions explains the advantages of a preemptive, multitasking, robust, 32-bit environment combined with the high-speed throughput of the PCI bus to open up new data acquisition possibilities in PC-based instrumentation.

PC-Based Vision Solutions shows how you can improve your company's efficiency and profitability in inspection, manufacturing, laboratory automation, and test and measurement applications. This seminar covers image acquisition and processing fundamentals and their use with LabVIEW, BridgeVIEW, and LabWindows/CVI.

Best of all, these seminars are free! Visit our web site at www.natinst.com or call us at (512) 794-0100 to find out when these seminars will be near you.

For seminar flyers, circle this option on the reply card.

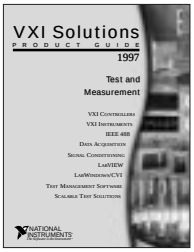
Alliance Member Wins "Test Innovator of the Year"

At Test 96 (U.K, October 1996), Miller Audio Research was awarded "Test Innovator of the Year" for development of the LabVIEW-based Jitter Analyzer, the first instrument, virtual or otherwise, to use interpretive spectrum analysis (see the Alliance News section on page 23 for more information). A typical application of the Jitter Analyzer, which also uses National Instruments audio-quality DAQ boards, is evaluating CD player performance.

Paul Miller, developer and founder of Miller Audio Research, has combined the power of LabVIEW with his vast knowledge of audio testing to create an instrument that adds enormous value to the measurement process – all in just eight months. Miller Audio Research joined the Alliance Program in early 1996.

Paul Miller of Miller Audio Research

New Catalog Available for VXI Products



The 1997 *VXI Solutions Product Guide* is a catalog and technical reference featuring product information on controllers, software, and our new VXI-DAQ instruments. The catalog includes a directory of more than 20 VXI systems experts from our Alliance Program. Whether you develop systems internally or partner with a systems integrator, the 1997 *VXI Solutions Product Guide* gives you the information you need to build complete VXI systems.

VI UserNet Groups Growing Fast Worldwide

The VI UserNet now has more than 40 new registered user groups around the world! Last year, VI UserNet™ meetings covered topics such as printing in LabVIEW, creating DLLs in LabWindows/CVI, and a Windows 95 style guide. For the upcoming quarter, we are planning meetings to discuss the new Internet capabilities of LabVIEW as well as the Professional G Developers Toolkit.

The VI UserNet program is designed to provide a central point of contact and structure for worldwide user group meetings. Eventually, we want to network these groups so that VI UserNet groups in different parts of the world can communicate what is happening in their local meetings to the rest of the VI UserNet program.

You can be a part of the VI UserNet simply by attending ongoing user group meetings in your area or by registering over the Internet at www.natinst.com/viusernet. You can also find a list of upcoming VI UserNet user group meetings at this site. If you need information on meetings in your area, please e-mail v.usernet@natinst.com with your request and specify your area.

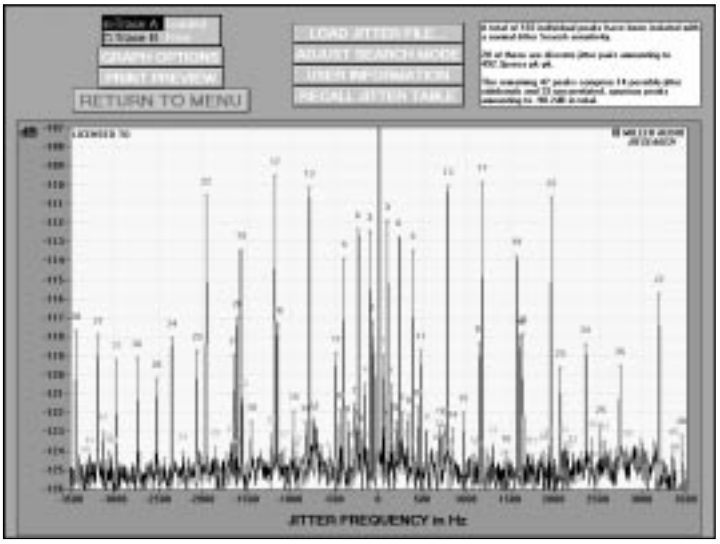
If you are interested in organizing and running user group meetings in your company, university, or region, you can join the VI UserNet as a VIexpert. Please contact us for more information on the benefits and requirements of becoming a VIexpert.

Visit the VI UserNet web site at www.natinst.com/viusernet

Trade Show Winners

The most recent prize winners from our trade show drawings include Sean M. Judd of Atlas Electric Devices (ISA/Chicago) and Brian Croissant of Aerojet (Wescon/Anaheim). Judd won a copy of BridgeVIEW, while Croissant won a LabVIEW software package.

LabVIEW-Based Jitter Analyzer Evaluates Performance of Audio Players



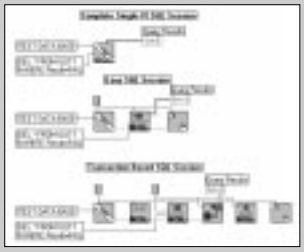
Alliance Program member Miller Audio Research (U.K) has announced the Jitter Analyzer (Version 3.0), the first program to infer and isolate all types of jitter from the final analog signal output by a CD player, DAC, DCC/MD or DAT player. Jitter is any variation in the timing of a periodic event, including those correlated with a fixed frequency and random variations. The Jitter Analyzer uses LabVIEW and National Instruments audio-quality DAQ boards.

The Jitter Analyzer is the first instrument, virtual or otherwise, to use interpretive spectrum analysis. This technique eliminates the drudgery of manual spectral analysis to identify salient peak information. It takes all known forms of jitter into account, including the effect of the data pattern itself on levels of jitter during D/A conversion. Other key features include high-speed, 16K point FFT data acquisition with advanced multiterm windowing and complete color-coded spectral information, both graphically and in text format.

The Jitter Analyzer makes measurements at the final output stage, ensuring very accurate results. The Jitter Analyzer is already being used in R&D and production by leading audio manufacturers. The product can reduce test costs by helping engineers diagnose phenomena that have a direct correlation on sound quality.

For more information, contact Miller Audio Research at Unit 4, Springfield Rd., Ash Vale, SURREY, GU12 5EN, U.K., tel 0044 (0) 1252 334274, or e-mail 100576.3021@compuserve.com

National Instruments Acquires SQL Toolkit



National Instruments has acquired the SQL Toolkit for LabVIEW from Ellipsis Products Inc. (Boston, MA) in response to the growing demand for database connectivity. In automated test equipment (ATE) systems, engineers use databases to organize and retrieve complex test regimens and store vast amounts of data and summary results. In manufacturing applications, SCADA systems use databases for storing and analyzing data for statistical process control (SPC).

For years, National Instruments and Ellipsis have worked closely to ensure that our products are compatible and to educate our customers about the availability of database connectivity software for LabVIEW. By acquiring the SQL Toolkit software, National Instruments can ensure its availability and support through our worldwide channels. This acquisition underscores one of the many Alliance Program successes.

GDE Systems Joins the Alliance Program

National Instruments is pleased to announce that GDE Systems, a major developer of test equipment for advanced electronic systems for more than 35 years, has joined the Alliance Program. GDE Systems is the largest supplier of automatic test systems to the US Air Force. They have also developed commercial test systems for the Motorola Iridium program, the Japanese F-2 fighter program, and the Lockheed Martin's Atlas and Titan launch vehicles. By joining the Alliance Program, GDE Systems, a total systems integrator, can offer modular solutions that combine the optimum mix of commercial-off-the-shelf and custom-designed hardware and software products.

GDE Systems, a subsidiary of Tracor, Inc., has more than 1,600 employees. The company consists of three main business units:

- Automatic Test Systems (ATS) designs, develops, and produces automatic test equipment (ATE), test program sets (TPSs), maintenance and diagnostic systems (M&DS), and performs systems integration.
- Imagery and Information Systems (IIS) designs, develops, and supports systems that exploit digital imagery, signals, and collateral data to satisfy information collection, processing, and integration requirements.
- Mission Planning Systems (MPS) business unit is a full-spectrum supplier of mission planning products and services for weapon systems.

For more information, contact Robert G. Dixon, Program Manager, Advanced Engineering Development, tel (619) 675-2851, fax (619) 675-1901, or e-mail rob.dixon@GDEsystems.com.

CharmWorks Combines New Process Analysis Tools for LabVIEW

Alliance Program member Process Analysis and Automation has released CharmWorks, a chemometric data analysis toolkit for LabVIEW. Using this software package, you can develop powerful real-time process analysis applications. CharmWorks combines the previously released CharmPLS with two additional multivariate data analysis techniques, including CharmCLASS, a SIMCA-based qualitative pattern recognition tool, and CharmPCA, an exploratory data analysis technique.

These tools are particularly useful at chemical, petrochemical, and pharmaceutical companies that want to improve control of their processes using on-line data acquired in real time. Instrument manufacturers can also use these tools to satisfy customers requiring complete analytical solutions.

In a typical process analysis application, you need to control a sampling system, measure a process variable (such as temperature), access analytical data (from a spectrometer or chromatograph), analyze that data, and communicate the results to the process control system or an operator. LabVIEW is the only current programming environment that can satisfy all of these needs and provide a low-cost route to generating a fully integrated system.

For more information, contact Process Analysis and Automation at Falcon House, Fernhill Road, Farnborough, Hants GU14 9RX, U.K., tel +44 1252 373 000, fax +44 1252 371 922, or e-mail 100272.1202@compuserve.com

New Analytical Instrumentation Planned for PittCon

At PittCon 97, Alliance Program member Analytical Instrument Systems will introduce several new PC-based products based on LabVIEW and National Instruments DAQ hardware. These products include:

Low-Cost Chromatographic Integrator – The new Revision 1.2 of the Model LCC-100 adds auto-peak detection to this low-cost chromatographic integrator for LC, GC, and HPLC instruments. The four-channel integrator can vary acquisition rates and send event signals to concentrate data densities during peak detection.

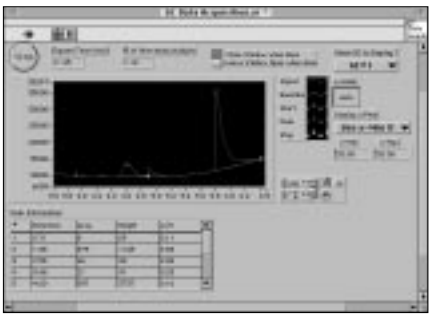
Electrochemical Analyzers – The new Model DLK-50 is a low-cost potentiostat targeted at the educational market and the new Model DLK-150 is a high-end potentiostat offering greater sensitivity for element detection. These instruments perform all necessary voltammetric techniques, including: linear sweep, cyclic, differential pulse, square wave, chronamperometry, and all stripping techniques.

Potentiostat Software – with the new AIS-273 software interface for the Model 273 and Model 273a potentiostats, users can integrate data into AIS advanced analysis for electrochemistry.

Spectrophotometer Software – The new Model AIS-1001 software adds control of the AIS UV-2 deteutrium power supply and visible source to the interface of the Ocean Optics spectrometer. These instruments work in the visible wavelengths from 360 to 850 mm and UV range down to 200 nm, as well as perform fluorescence analysis.

For more information, contact Analytical Instrument Systems at P.O. Box 458 Flemmington, NJ 08822-0458, tel (908) 788-7022, fax (908) 788-5617, e-mail ais@aishome.com

New Chromatography Toolkit Offered for LabVIEW 4.0



WillStein Software, Inc., an Alliance Program member, is offering the Chromatography Toolkit, a flexible, high-performance chromatography engine for LabVIEW 4.0. This toolkit includes a turnkey chromatography system, the GC WorkMate, and a peak detection library. With LabVIEW, you can modify the turnkey system to provide functions specific for your lab or pilot plant. For example, you can use the information from the Peak Detection VI to provide real-time feedback control for a distillation column.

You can use GC WorkMate right out of the box as a complete chromatography system. The system controls data acquisition using National Instruments DAQ boards, real-time graphs, peak information, and data storage and retrieval. You can simultaneously acquire data from up to four channels. In addition, instructions are included on how to write your own DAQ modules. Add-on modules will soon be available for data acquisition from the HP 5890 and HP 6890 chromatographs.

You can use the Peak Detection VI independently of GC WorkMate in your own custom application. This algorithm can deal with curved baselines, fused peaks, and shoulders typical in chromatographic applications. You can send to the VI in "chunks," providing real-time processing or in one large batch for post analysis.

For more information, contact WillStein Software, Inc. at 1723 Elmwood Avenue, Wilmette, Il 60091, tel (847) 302-0339, fax (847) 256-5220, e-mail willstn@mcs.net, or www.mcs.net/~willstn

IN THIS ISSUE

DAQ Instruments and Windows NT/PCI-Based DAQ Products

National Instruments announces some exciting new developments in data acquisition – DAQ Instruments, a product line that combines the performance of stand-alone instruments with the flexibility of plug-in DAQ boards; and new DAQ hardware and software that take advantage of two of the latest computer technologies, Windows NT and the PCI bus. Both of these exciting new DAQ families are featured on the cover of this Instrumentation Newsletter *edition.*

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For Customer Education schedule, see insert.

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

Trade Shows

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

VBITS	
San Francisco, CA	March 10-12
Industrial Automation	
Chicago, IL	March 10-13
Petrochem & Technochem Expo	
Houston, TX	March 11-13
Pittcon	
Atlanta, GA	March 17-20
Eptech	
Calgary, AB	March 18
Edmonton, AB	March 20
Toronto/Mississauga	April 1
Ottawa, ON	April 3
Vancouver, BC	May 21
Mississauga, ON	May 29
BODE	
Minneapolis, MN	April 1
Milwaukee, WI	April 3
Detroit, MI	April 8
Cleveland, OH	April 10
Santa Clara, CA	May 20
Irvine, CA	May 22
ISA Calgary	
Calgary, AB	April 2-3
Experimental Biology	
New Orleans, LA	April 7-9
CETS	
Markham, ON	April 10
London, ON	April 30
AWWA Computer Expo	
Austin, TX	April 14-16
PCI Plus	
Santa Clara, CA	April 14-18
UTECA	
Cromwell, CT	April 15-17
Technologie Electronique au Quebec	
Montreal, QB	April 16-17
Quality Expo	
Chicago, IL	April 22-24
Rocky Mountian Expo	
Denver, CO	April 23-24
Control System Integrators Association	
West Palm Beach, FL	April 23-26
Offshore Technology Conference	
Houston, TX	May 5-8
ISE	
Albuquerque, NM	May 6-8
ISA Instrument Expo	
Toronto, ON	May 6-7
Electronics Industries Forum	
Boston, MA	May 6-8
Int'l Automotive Manufacturing	
Detroit, MI	May 13-15
Sensors Expo	
Boston, MA	May 13-15
SAE Noise & Vibration	
Traverse City, MI	May 20-22

Corporate Headquarters: 6504 Bridge Point Parkway, Austin, TX 78730-5039 USA • Tel (512) 794-0100 • Fax (512) 794-8411 • info@natinst.com • www.natinst.com
Canadian Sales Offices: P.O. Box 42252 • 128 Queen St. S. • Mississauga, ON L5M 4Z0 • Tel: (905) 785-0085 • Fax (905) 785-0086
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