

# PXI Systems Alliance Releases PXI 2.0



The PXI Systems Alliance, a group of more than 50 member companies, released version 2.0 of the PXI Specification in August 2000. It defines extensions to the CompactPCI architecture that meet the needs of measurement and automation system developers. PXI extensions provide a higher level of system functionality and interoperability than CompactPCI. The PXI Systems Alliance distributes and maintains it free of charge.

## Key Updates in PXI 2.0

PXI 2.0 includes updates to the requirements and guidelines in the mechanical, electrical, and

software sections, but maintains complete interoperability with version 1.0. It reflects the latest revision of CompactPCI (PICMG 2.0 R3.0) and includes geographical addressing capability, as well as the option for 66 MHz PCI operation. PXI 2.0 also includes updates to electromagnetic compliance specifications and adds Windows 2000/98 software frameworks. Perhaps most significant are guidelines that better define multisegment PXI operation – how to build PXI chassis with significantly more than eight slots.

“The updated version includes contributions from multiple companies and expands the realm of possible applications for PXI,” said Mark Wetzels, PXI Systems Alliance Technical Sub-Committee

Chairperson. “A key element of this new revision specifies bus bridging beyond two segments, thus defining larger PXI systems more accurately, and revealing the path for higher performance systems.”

*To download a FREE copy of the PXI Specification and for membership information, visit the PXI Systems Alliance Web page at [pxisa.org](http://pxisa.org)*

[ni.com/pxi](http://ni.com/pxi)

# Understanding the Basics of Complex RF Switching

In our technological world, wireless appliances are becoming extremely common and the need for radio frequency test systems is rising quickly.

## Crosstalk, VSWR, and Insertion Loss

Parameters that are extremely important in the radio frequency domain of more than 100 MHz of bandwidth are Insertion Loss, Voltage Standing Wave Ratio (VSWR), and Crosstalk. These parameters are connected to physical phenomena that occur when the radio frequency signal travels within a system. Let us compare this to light traveling through glass with different refraction constants.

When the light (our signal) hits the first surface, part of it is reflected and part continues to travel through the first layer of

glass. The reflection is caused because the glass has a different refraction constant than the air. In our circuits, the characteristic impedance of the cable is equivalent to the refraction constant in the glass – if it is different from the impedance of the source, part of the signal is reflected.

VSWR qualifies the amount of signal that is reflected toward the source. A theoretical switch should have VSWR equal to zero. In reality, the impedance is not perfectly matched, so the VSWR has a value greater than zero.

You do not want signal reflection because the reflected part of the signal travels back toward the source and permanent damage of the signal source could occur if it is not designed to withstand signal reflection.

The light traveling through the first glass layer has some energy loss because the glass is not perfectly transparent and part of the signal is lost along the path. In the same way, a switch is not perfectly “transparent” for the signal and part of the

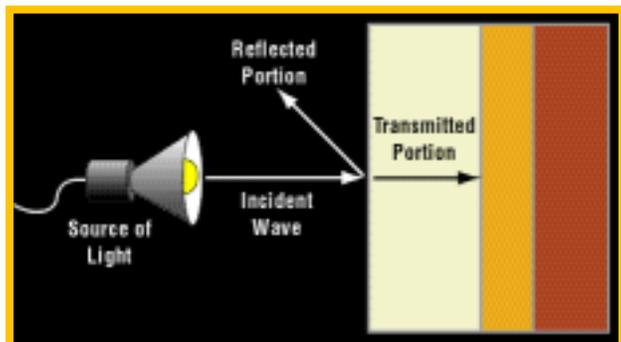
Parameter	Theoretical Value	Desired Level at Frequency of Interest
Insertion loss	0 dB	Less than 1.5 dB Insertion loss
VSWR	1	Less than 1.5
Isolation	-∞	Less than -50.0 dB

signal energy is lost while traveling through the switch, mainly becoming heat. A theoretical switch should have insertion loss equal to zero.

Crosstalk is a measure of how much a signal flowing on one channel can influence the signal on other channels. This parameter is usually expressed in dB. Good crosstalk behavior guarantees that signals on Channel 2 are marginally affected by signals on Channel 1. Crosstalk needs to be associated with a specific value for the frequency. In general, as we would expect, this parameter degrades as the frequency increases, so you need a precise idea of the frequency range of the switched signal.

*For a more in-depth look at this article, read “Complex RF Switching Architectures” at [ni.com/zone](http://ni.com/zone)*

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Compare light traveling through glass with different refraction constants.

# More Measurements with NI-SCOPE™

You can now extract more functionality from National Instruments high-speed digitizers with a FREE upgrade to the latest version of our NI-SCOPE instrument driver software.

NI-SCOPE offers more than 50 measurement functions, including waveform math, time and voltage histogram measurements, and frequency measurement tools, such as spectral leakage windows and digital filters. The IVI-compliant driver software is compatible with Windows 2000/NT/9x and available at [ni.com/idnet](http://ni.com/idnet)

With NI-SCOPE and National Instruments high-speed digitizers, you can customize and define your measurements. NI-SCOPE gives you the choice of several windowing and filter functions for accurate frequency domain measurements. In addition, multi-acquisition voltage and time histogram measurements are

available for statistical amplitude and pulse width jitter analysis. For a complete list of measurements, see the sidebar.

NI-SCOPE offers you programming flexibility by providing an application programming interface (API) in National Instruments LabVIEW 6i and Measurement Studio, and Microsoft Visual Basic and Visual C++. By design, the software specifically works with the NI 5102, NI 5112, and NI 5911 high-speed digitizers. These digitizers offer increased test throughput, deep memory, low costs, and simplified systems integration. ▶

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[ni.com/instruments](http://ni.com/instruments)

# Pentium III-Based VXI Controllers

National Instruments presents a series of VXI controllers powered by a 700 MHz Intel Pentium III processor that deliver unmatched VXI performance. With state-of-the-art packaging, the VXIpc™-870 Series takes advantage of the Intel Pentium III microprocessor family without compromising performance or space. The VXIpc-870 Series is fully *VXIplug&play* compliant and is compatible with all Windows NT/98 software, including National Instruments LabVIEW and Measurement Studio application software, TestStand test executive software, and NI-VXI™/NI-VISA™ bus interface software.

## The VXIpc-870 Series

The VXIpc-870 Series uses an innovative mechanical design to package the Intel high-performance Pentium III microprocessors in a two-slot C-size unit. You can also order a VXIpc-870 complete with a standard floppy drive, CD-ROM, Ultra DMA 33 hard drive, PC Card expansion, and a number of high-performance peripherals in this same small package. The VXIpc-870 Series computers, based on the Intel Pentium III



VXIpc-870/700 Controller Offers Unmatched Performance

architecture, deliver the latest in high-speed bus technology. ▶

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[ni.com/vxi](http://ni.com/vxi)

## Measurements Provided by NI-SCOPE

### Array Measurements and Functions

FFT Amplitude Spectrum (Volts RMS)
FFT Amplitude Spectrum (dB)
FFT Phase Spectrum
Last Acquisition Histogram
Multi-Acquisition Voltage Histogram
Multi-Acquisition Time Histogram
Array Integral
Derivative
Inverse
Hanning Window
Flat Top Window
Hamming Window
Triangle Window
Blackman Window
Polynomial Interpolation
Multiply Channels
Add Channels
Subtract Channels
Divide Channels
Multi-Acquisition Average
Butterworth Filter
Chebyshev Filter
Bessel Filter
Windowed FIR Filter
Array Offset
Array Gain

### Scalar Measurements\*

Rise Time	AC Estimate
Fall Time	DC Estimate
Voltage Max	FFT Frequency
Voltage Min	FFT Amplitude
Voltage Peak to Peak	Low Reference Voltage
Voltage High	Mid Reference Voltage
Voltage Low	High Reference Voltage
Voltage Amplitude	Area
Period	Integral
Frequency	Cycle Area
Voltage Average	Voltage Base
Voltage RMS	Voltage Top
Voltage Cycle Average	Voltage Base to Top
Voltage Cycle RMS	Phase Delay
Positive Width	Time Delay
Negative Width	Rising Slew Rate
Positive Duty Cycle	Falling Slew Rate
Negative Duty Cycle	Average Period
Overshoot	Average Frequency

### Histogram Measurements\*\*

Histogram Hits
Histogram New Hits
Histogram Mean
Histogram Standard Deviation
Histogram Mode
Histogram Min
Histogram Max
Histogram Amplitude
Histogram Median
Histogram Mean Plus Stdev
Histogram Mean Plus 2 Stdev
Histogram Mean Plus 3 Stdev

\*Excluding histogram measurements  
\*\*Voltage and time histograms are available

# Knowles Increases Production with NI PC-Based DSA

by John Witt, Software Manager, and Tom Jalava, Software Engineer, Knowles Electronics

**The Challenge:** Reducing test times in the high-volume manufacturing of receivers and microphones for hearing aids, while maintaining measurement accuracy and integrity.

**The Solution:** Replacing a stand-alone dynamic signal analyzer (DSA) with a National Instruments PC-based DSA controlled with LabVIEW.

Reducing test times is a primary concern for high-volume manufacturers. This concern was the motivation for Knowles Electronics, a leading manufacturer of receivers and microphones used in hearing aids, to redesign their transducer test systems. The redesign involved replacing a stand-alone DSA with a National Instruments NI 4551 PC-based DSA. In doing so, we achieved a lower-cost solution, while maintaining the same measurement accuracy and integrity. The overall redesign resulted in a greater than expected five to one reduction in test time.

In testing the receivers and microphones, we test each transducer twice. Because our

control the equipment, provided us with a familiar, user-friendly environment for software modification. LabVIEW simplified the integration of the new analyzer into our existing program and preserved our software investment.

We modified the system program for quick and easy changes between the stand-alone DSA and the NI 4551, which greatly facilitated comparison of the two devices. We performed measurements on the stand-alone DSA and on the NI 4551 and compared them for accuracy and speed. Key measurements performed were power spectrum, frequency response, and distortion of the devices under test. In all cases, good correlation existed between the data from the stand-alone DSA and the data from the NI 4551.

As a result of the performance on individual tests made with the NI 4551, test times decreased greatly. When performing a FFT to obtain the power spectrum or frequency response, we used the extended resolution feature of the NI 4551 to obtain 950 lines of resolution.

The source of the NI 4551 was configured for a chirp signal with a frequency range of 0.0 to 9.5 kHz, providing 10.0 Hz frequency resolution – a significant improvement over the 32.0 Hz resolution provided by the stand-alone DSA. Consequently, only one sweep was required, which was a significant time saver compared to the 15 sweeps necessary on average previously. The time to acquire and display a frequency response for the stand-alone DSA was 1.80 s. For the NI 4551, the measurement time was only 0.12 s, a 15 to 1 improvement. Also, the increase in resolution improved low-frequency accuracy and interpolation.



Knowles Electronics realized a 5 to 1 reduction in test time.

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**The original estimate for test time reduction was 50 percent. However, a typical receiver test showed a five to one reduction. The total test time went from 5.24 to 1.03 s.**

receiver test ran three to five times longer than our microphone test, we chose the receiver test systems for modification.

National Instruments NI 4551 was ideal for the application. Because it plugged directly into the PCI bus of the controlling PC, it provided speeds 40 to 100 times faster than communication on the GPIB bus. We also significantly reduced the redesign cost of the test system by using the computer-based DSA. The price of the NI 4551 was one-third the original cost of the stand-alone DSA.

National Instruments LabVIEW, already in use as the programming environment to

The greatest improvement in test time reduction came with the distortion measurements. We performed a total harmonic distortion (THD) measurement using the first five harmonics. A single distortion measurement took 1.00 s with the stand-alone DSA, but only 0.12 s with the NI 4551. Because a typical test sequence has at least three distortion tests, the 10 to 1 distortion test improvement resulted in the greatest reduction. The original estimate for test time reduction was 50 percent. However, a typical receiver test showed a five to one reduction. The total test time went from 5.24 to 1.03 s. Because of the magnitude of this unexpected improvement, microphone test systems formerly considered as marginal will now be considered for computer-based DSA replacement. Future system designs will also take full advantage of National Instruments products. ❧

*For more information, contact Knowles Electronics, 1151 Maplewood Drive, Itasca, IL 60143, or tel (630) 250-5100.*

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# Building a Low-Cost Test System for Battery Manufacturer

by G. Abdulla, Sr. Project Engineer, Soliton Automation Pvt. Ltd.

**The Challenge:** Integrating the functionality of numerous independent subsystems of a large-scale battery test system into a single, easy-to-use program (VI), while increasing the capabilities of the earlier system.

**The Solution:** Using a PXI-based system that incorporates National Instruments SCXI, FieldPoint™ I/O, and LabVIEW to develop an integrated test system with the capability to cycle test 1,280 batteries simultaneously.

## Introduction

Exide Industries, one of India's largest manufacturers of automotive and industrial batteries, wanted an automated system to cycle test its batteries during production. In the typical test, batteries connect to a charger in series, and they follow charge/discharge/rest cycles. Meanwhile, data loggers measure the terminal voltage of each battery at specified times to determine how well each battery stores charge. At the end of the test, batteries receive classifications based on these voltages. Because operators test up to 1,280 batteries simultaneously, the task was tedious and time-consuming to perform manually, with a high possibility of errors. Another limitation was the inability to alter the test cycle sequence because the programmable logic controller (PLC) was preprogrammed.

**Through a clever measurement system suggested by the National Instruments ATE (Switch) Group, we saved approximately \$28,000.**

## PXI-Based Automated System

We chose a PXI-based system because of the harsh environmental conditions – temperature and dust – in the factory. Using two fully loaded 12-slot SCXI chassis with SCXI-1127 multiplexer modules and a PXI-based DMM, we constructed a large-channel count measurement system. The batteries connected in series to the charger, so we did the voltage measurements in differential mode. Each SCXI-1127 multiplexer can accept 32 differential inputs, which means we normally

would have needed 40 SCXI-1127 modules. But, through a clever measurement system suggested by the National Instruments ATE (Switch) Group, we reduced the required number of modules to 24. The reduction saved approximately \$28,000 in the process and increased our competitive edge in our bid for this large project.

The wiring arrangement, shown here, describes how to make the voltage measurements by closing the switch. Using an external multiplexer (with relays), we read the voltage across two wires going to different SCXI-1127 multiplexer modules. We created a “virtual” channel in the process, thereby reducing the number of “real” channels used. The common mode voltage in the system could be as high as 300 V, which the SCXI-1127 modules and the PXI-based switch module NI 2565 can handle.

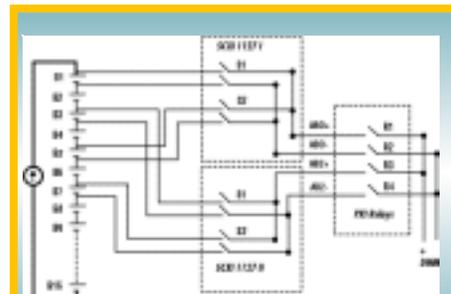
To control the four chargers, we used the NI FieldPoint distributed I/O system. We used relay control modules to switch the charger between charge/discharge mode. Additionally, we used digital input modules to sense for alarm conditions and analog output modules to set the value of the charging/discharging current.

## Flexibility in LabVIEW

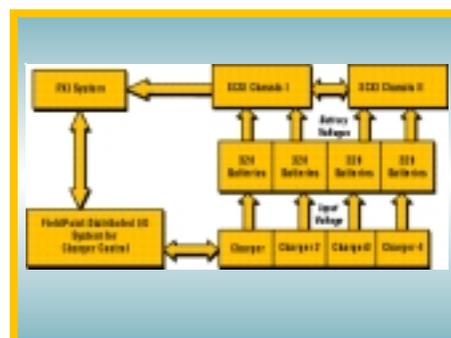
The software, written in LabVIEW, is highly modular, so we can expand the system easily. And, we can apply any test sequence to any charger, irrespective of the state of the other chargers. The test set-up screen for the test sequence offers complete flexibility in the test sequence and number of steps, as shown above. The main time saver was classifying the batteries by terminal voltages recorded at various times during the test. The VI-based system performed analysis in a matter of seconds and gave a printout of the classification (color-coded), eliminating tedious manual classification using the numerous printouts from stand-alone data loggers. These reports are also accessible using a Web browser over the factory network.

## Conclusion

The VI-based system provided value to the



Make voltage measurements by closing the switch.



Schematic of the Effective Battery Test System



Test Set-Up Screen Offers Test Sequence Flexibility

customer by addressing all the shortcomings of the earlier stand-alone system. With LabVIEW, we integrated all the hardware pieces into the application effortlessly and developed a professional-looking application quickly, delighting our customer in the process. ▶

*For more information, contact Classic Towers, 1547 Trichy Road, Coimbatore 641 018, Tamil Nadu, India, tel +91 (422) 302374, fax +91 (422) 302375, e-mail [abdulla@solitonautomation.com](mailto:abdulla@solitonautomation.com) or [ganesh@solitonautomation.com](mailto:ganesh@solitonautomation.com).*

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# NEW! LabVIEW Tools for High-Channel Count Applications

With increasing demand for data sharing, data integrity, and multivendor hardware integration, National Instruments provides the tools to help you develop large-channel count applications efficiently. Now, new tools are available for building your LabVIEW applications. This module plugs into LabVIEW and provides configuration-based tools to get your high-channel count system up and running quickly.

## Flexibility in Distributed Data Logging and Networking

These new LabVIEW tools, shipped as the LabVIEW Datalogging and Supervisory Control Module, make monitoring and historical logging applications easy with extensive historical data logging, trending, and graphing capabilities. Whether you are collecting data from National Instruments DAQ products, FieldPoint I/O modules, or programmable logic controllers (PLCs), you just configure which points you want to collect. The Tag Monitor shows the data in real time, while acquiring and logging in the system. The Historical Trend Viewer is a built-in utility that provides an easy mechanism to view historical data. Because historical logging automatically occurs, you can use LabVIEW to develop a data logging application with no programming. Also, you

can log data into any machine you select on a network. This distributed data logging capability gives you unprecedented flexibility to log data from many applications to one particular computer or to any number of computers on a network.

In addition, sharing data between machines is simple – between LabVIEW systems around your lab, your production floor, or the world. You can connect to any data residing on different computers as easily as you connect to data on a single machine.

## Automated Alarm and Event Management

This new module offers full alarm and event management. You can automatically calculate and log alarm information and events for the

events on one or more server machine(s) and acknowledge them.

## Built-In Security

In addition, with these new tools, you have security in your LabVIEW environment and across the network. You can turn any existing VI into a secured application by defining system-level and operator-interface security in only a few mouse clicks, without any programming. You can limit user access to different utilities, such as Tag Monitor, Historical Trend View, front panels, and even individual graphical objects.

## Enhanced Productivity

While LabVIEW graphical programming provides tremendous power and flexibility, simple HMI functions should be just that – simple. The HMI Wizard and Panel Wizard encapsulate configuration data and graphical programming in

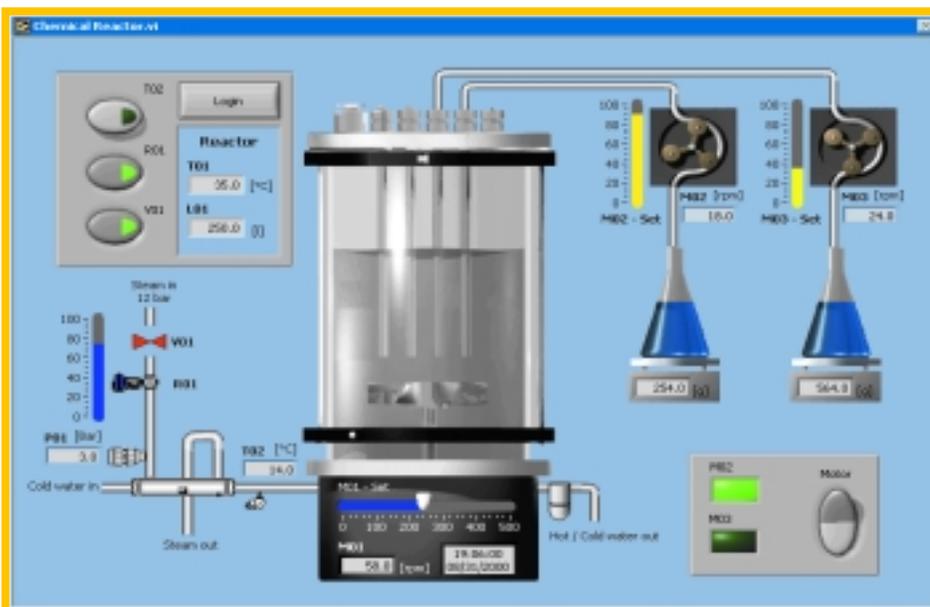
## The new LabVIEW Datalogging and Supervisory Control Module simplifies system configuration and improves your development productivity.

reusable objects you can use to develop HMI, screen navigation, monitoring, and supervisory control functions. These wizards increase productivity and decrease application development time by removing repetitive tasks and giving you the ability to easily reuse user-interface objects. Also, this LabVIEW add-on module adds more than 3,300 new graphics, including valves, motors, PLCs, sensors, and mixers, for developing professional-looking front panels for your measurement and automation systems.

Whether you need full-scale industrial automation and control tools or simply need to monitor and log a few dozen I/O points for historical collection, the new LabVIEW Datalogging and Supervisory Control Module simplifies system configuration and improves your development productivity. ✎

Whether you need full-scale industrial automation and control tools or simply need to monitor and log a few dozen I/O points for historical collection, the new LabVIEW Datalogging and Supervisory Control Module simplifies system configuration and improves your development productivity. ✎

*For more information on the LabVIEW add-on module, visit [ni.com/info](http://ni.com/info) and enter newsletter.*



Chemical Reactor Application Using LabVIEW Datalogging and Supervisory Control Module

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# Use LabVIEW 6i Alternative for Spectral Noise Reduction

LabVIEW 6i includes more than 30 Digital Signal Processing (DSP)-based measurement tools. These tools are standard LabVIEW functions (VIs) that input a waveform data type – a time-domain signal that includes sampling rate and other acquisition information – and output a measurement with appropriate scaling.

While you can certainly use these VIs one at a time, you are also free to combine them for even more extensive measurement capability. Here we discuss how you can combine two new measurement analysis VIs to reduce noise in your spectral analysis.

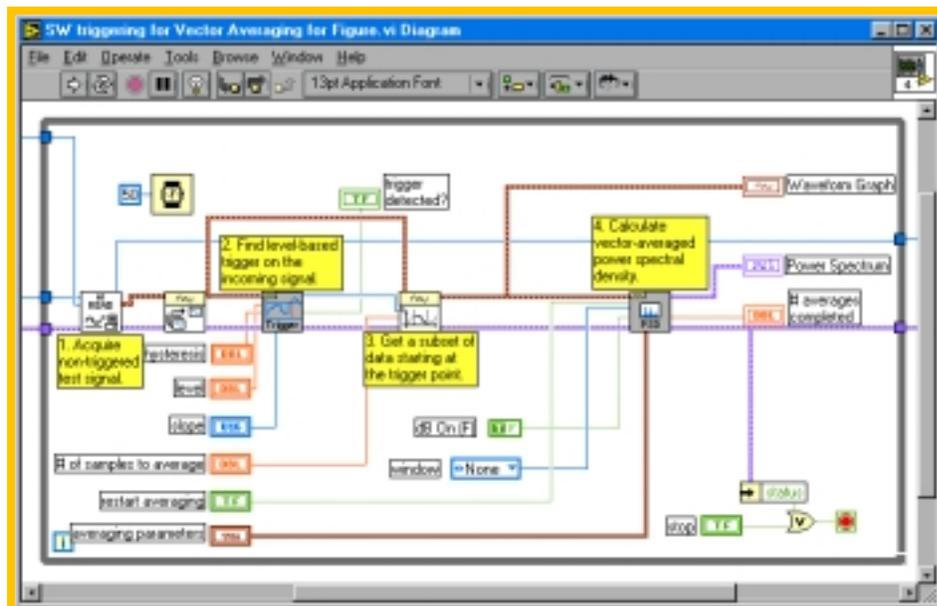
For our example, we reduce broadband noise by applying vector averaging, as depicted to the right. Such averaging is a built-in feature of FFT Power Spectrum, one of the new LabVIEW 6i frequency analysis tools.

Because it requires a synchronously acquired time record as an input, vector averaging calls for a triggered input signal. There are several means of supplying such a trigger. You can apply an analog or digital trigger prior to acquisition. For many National Instruments multipurpose I/O (MIO) data acquisition boards and computer-based instruments, enabling such triggering capabilities is as easy as setting a simple parameter.

**An alternative to hardware-based triggering is the software-based triggering you can apply with basic level trigger detection, another new measurement analysis VI.**

## A Software Alternative

In some circumstances, a hardware-based analog or digital trigger is not available. For instance, some acquisition hardware and instruments lack the capability. Or, you might require vector-averaged spectral analysis for blocks of previously acquired data. An alternative to hardware-based triggering is the software-based triggering you can apply with basic-level trigger detection, another new measurement analysis VI. This VI requires a waveform data type time record and outputs whether or



This LabVIEW 6i diagram shows how to use software-based triggering for spectral analysis with vector averaging-based noise reduction.

not it detected a trigger. If it detects a trigger, it also returns the location of the trigger.

Using basic-level trigger detection for vector averaging with FFT Power Spectrum is straightforward. First, select a synchronous time input by using the trigger location to select a synchronous starting point from your asynchronous samples. By adjusting basic-level trigger detection and hysteresis input parameters, you can optimize the triggering to fit your input signal.

To actually select the subset, you apply another VI, Select Waveform Subset. This VI requires a starting point and a length (number of samples) and outputs the selection, which you can then input into FFT Power Spectrum. It is important to set the length input to a value that, when added to the starting point, does not exceed the number of samples in your data block. In doing so, you ensure the averaged block maintains a fixed length (a requirement for vector averaging) and the selection does not exceed the length of your data block.

## Why Apply Vector Averaging to a Power Spectrum?

By applying vector averaging, you can actually reduce the noise energy of your spectrum. It does so by averaging the real and complex components of the spectra separately, canceling random phase components. The result is an average over both phase and magnitude and is equivalent to time-domain averaging. Because you want to reduce only noise, you must make sure the non-noise portion of your signal does not vary in phase relative to your other sample spectra. This requirement means the input spectra must share a common non-noise trigger. The cover article describes a method of providing a software-based trigger for the job. 🐦

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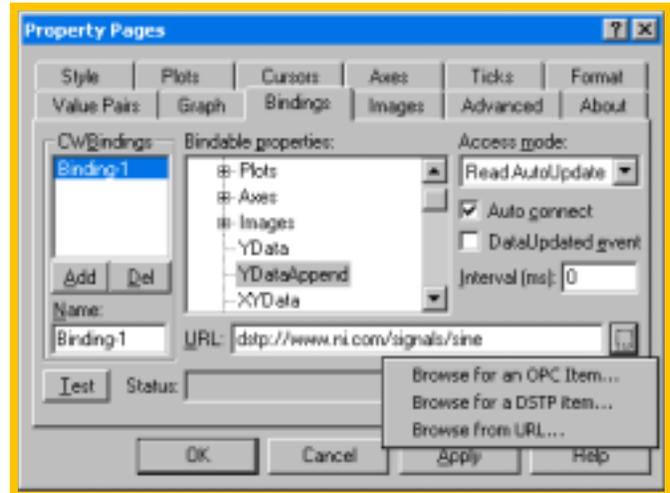
## Measurement Studio UI Components for Visual Basic

When creating a measurement system, you want to give your software applications a professional look. For designers creating applications with Visual Basic, or any ActiveX control container, you can now easily create measurement and automation user interfaces with National Instruments Measurement Studio User Interface Components for Visual Basic.

Measurement Studio User Interface Components are a subset of the functionality that come in the complete Measurement Studio package. With these components, you can quickly and easily create professional user interfaces, using knobs, switches, sliders, LEDs, tanks, thermometers, and real-time 2D graphs. Therefore, your application can mimic stand-alone hardware to be more intuitive for you to understand. Because the controls come

in a standard interface, ActiveX, you can use the controls with any data acquisition or GPIB product from any vendor.

The controls also provide a simple means of transferring data and connecting your application through the Web. With the built-in DataSocket™ binding features, you can connect the value of a slider, or any user interface control, to the real-life measured value on a measurement system. This is possible through OPC, HTTP, FTP, and DSTP (DataSocket transfer protocol – optimized for transferring measurements) without writing any code. You can also send data by write binding the control to the input on a remote measurement system, so your application controls your networked system, rather than just monitoring for values or errors. Finally, Visual Basic can create ActiveX controls and embed them into a Web page using Internet Explorer. With these capabilities, you can



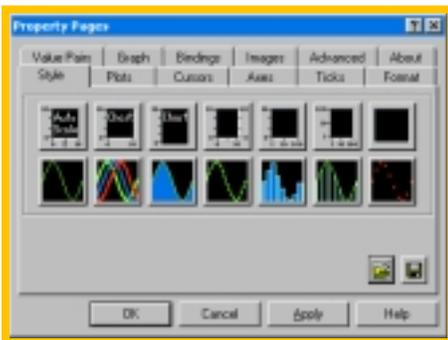
Built-In DataSocket Binding Features

easily create truly interactive Web applications that can monitor and control a measurement system from anywhere in the world.

National Instruments offers these tools for immediate purchase and download from the Web. 🐘

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Professional Measurement Studio Graph Styles

## Use LabVIEW 6i Alternative for Spectral Noise Reduction



A Comparison of the Instantaneous and Averaged Power Spectral Densities (The lower right shows a noise floor drop possible through vector averaging.)

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Next, you must activate vector averaging on FFT Power Spectrum. To do so, create a control for the Averaging Parameters input on that VI. Set the parameters in that cluster as follows:

- **Averaging Mode** – Vector
- **Weighting Mode** – Choose Linear if you want all averaged blocks to receive equal weighting during the average. This returns measurements less biased by transient signal components, but is not conducive to live monitoring of the running average. If you intend to examine the average as it develops, choose Exponential. This mode weights the average, so more recent samples have more influence on the result.

- **Number of Averages** – Choose a value to set the number of linear averages to perform. (The parameter has no effect with exponential averaging.) Higher values mean reduced measurement noise, but increased measurement time. 🐘

Sam Shearman,  
Signal Processing and Analysis Software  
Product Manager  
E-mail [sam.shearman@ni.com](mailto:sam.shearman@ni.com)

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In August 2000, we unveiled *Developer Insights* at [ni.com/insights](http://ni.com/insights), an online magazine with a decidedly technical focus. *Insights* features monthly columns from the technical experts at NI. We also have columns from third-party publishers, including *LabVIEW Technical Resource (LTR)*.

In *Developer Insights*, you can find in-depth articles on technical concepts focusing on DAQ, automated test, general software, and LabVIEW techniques. In addition to rich content, with *Insights* articles you find:

- Source code and examples
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- The opportunity to share your own thoughts on the subject

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- **Complex RF Switching Architectures** – Explore the need for new switching solutions in the GHz domain with this two-part series
- **Integrating with Motion Using RTSI** – Learn how you can use the RTSI bus to integrate motion, vision, and data acquisition in your applications
- **Tone Detection Fits Waveform Frequency in LabVIEW 6i** – Discover how you can use LabVIEW 6i and its measurement analysis VI waveform data type to locate and characterize frequency components in a signal

With new articles being posted every week, keep visiting *Developer Insights* in the NI Developer Zone, and let us know if there is a topic you would like an expert from NI to cover in the future. ✎

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## Share VIs with LabVIEW Player™



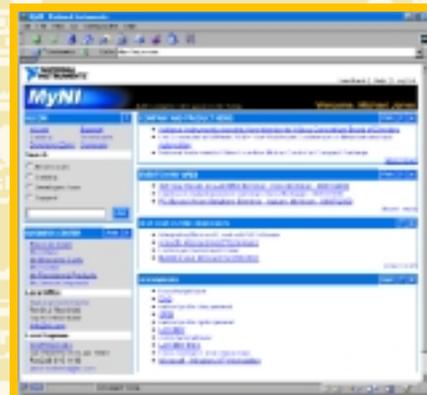
The new LabVIEW Player is a compact, Web-enabled version of LabVIEW designed for sharing LabVIEW VIs over the Internet. By downloading and installing the LabVIEW Player, which is available for FREE from [ni.com](http://ni.com), anyone can open and run secure LabVIEW Player-enabled VIs. With the LabVIEW Player, you can easily distribute applications over the Web that

illustrate measurement and automation concepts, analysis techniques, or data manipulation approaches. You can also use the LabVIEW Player to run light-weight clients for distributed applications.

You can try the LabVIEW Player today. The NI Developer Zone on [ni.com](http://ni.com) now features the LabVIEW Player VI Gallery, a collection of VIs designed to illustrate the powerful measurement and analysis capabilities of LabVIEW. ✎

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OverVIEW from MNovation is the first project-centric environment for creating,



Organize, design, and control with OverVIEW.

managing, and controlling applications developed with LabVIEW. With OverVIEW, you can organize, design, and control your project from the top down. You can apply many utilities to the project as a whole or to an individual VI, resulting in higher confidence, more reusable code, and less time spent on activities not related to development.

OverVIEW improves quality and increases productivity by automating tasks associated with formal software development and by providing consistent status information on several key development categories. OverVIEW includes at-a-glance project status reporting,

automated unit testing, metrics visualization, and issue tracking.

You can also use OverVIEW to control the project once it has been released to production. The run-time loader from MNovation Inc., LaunchPad, serves to verify that all the links are accurate and that you use the correct version of software each time you load the application for execution. ❧

*For more information on OverVIEW, contact MNovation Inc. at 5012 Upton Ave. S, Suite 200, Minneapolis, MN 55410, tel (651) 283 5803, e-mail info@mnovation.com, or Web mnovation.com*

## Toolkit Provides Statistical Process Control for TestStand

Vidaq introduces SPCStand, a statistical process control add-on for National Instruments TestStand. Developed using National Instruments Measurement Studio and TestStand, SPCStand provides a statistical engine and stand-alone front-ends for connecting to test stations in the network.

With minimal impact on the operating performance of TestStand, you can use SPCStand to analyze and monitor processes both in real time and using historical data. The component architecture of SPCStand is

configurable to give statistics for any custom step type developed for TestStand applications. You can also configure warning and alarm messages to stay informed when an event occurs. In addition, you can customize the user interface.

SPCStand provides a tool to assess the reproducibility, repeatability, stability, and bias of the measurement system before introduction into manufacturing. Using wizards to generate macros, you can easily generate measurement systems analysis reports. On the manufacturing floor, you can

use SPCStand to monitor the test station and give alarms when critical measurements are drifting or displaying nonrandom behavior. Managers can get an overview of the situation on the production floor and generate reports without leaving their offices. ❧

*For more information about SPCStand, contact Vidaq NV, Diepenbekerweg 10, 3500 Hasselt, Belgium, tel +32 11 265 999, fax +32 11 265 990, e-mail info@vidaq.com, or Web vidaq.com*

## Vehicle Network Technology Monitors Bus Information



Instrument Cluster Text Fixture Demonstration

Dearborn Group Technology and VI Engineering have partnered to offer new technology and application services for communication with invehicle networks. With the GRYPHON interface from Dearborn Group and the

GRYPHON Toolkit for LabVIEW from VI Engineering, you can monitor vehicle bus information from various manufacturers without purchasing separate tools for each bus – especially in the automotive, off-highway, and aerospace industries.

GRYPHON is a hardware interface that provides remote

connectivity for multiplexed automation and automotive communication networks. The interface provides a high-speed Ethernet connection to a host PC for applications such as testing, network monitoring, diagnostics, and

troubleshooting. The embedded Linux operating system and standard TCP/IP services of GRYPHON ensure interconnectivity with a large number of existing PCs, workstations, and network hardware systems.

The toolkit is based on TCP/IP functions, for easy use with high throughput. With its powerful bus monitoring tools, you can easily connect and receive, transmit, filter, and schedule messages. ❧

*For more information about GRYPHON, contact VI Engineering at 37800 Hills Tech Dr., Farmington Hills, MI 48331, tel (800) 884-8950, fax (248) 489-1904, e-mail sales@vieng.com, or Web vieng.com*

## Quick and Easy LCD Display Inspection

With TestPro™ Vision, a visual test solution from Workstation Source, you can quickly incorporate LCD testing into your test system without advanced machine vision knowledge.

TestPro Vision tests display features, such as display optical character recognition (OCR), backlight checks, contrast checks, display skew and icon presence, absence, or damage. You can also check the pixel array, check display lens damage, and inspect the keypad.

Each TestPro Vision can use up to four monochrome cameras connected to National Instruments IMAQ-1408 framegrabbers. The wizard then configures the cameras for use either on a single fixture or on up to four independently controlled test fixtures via four serial lines.

The Display and Test Definition Wizard guides you through the process of defining the features of the LCD display and the tests the display requires. With the Vision Test Manager, you can perform a series of vision tests on a single acquired image to minimize test time.

TestPro Vision is available either as a stand-alone compact unit with control via simple serial commands or as a software and



Test display features with TestPro Vision.

hardware bundle to install in an existing PC or PXI-based system. With the serial option, you can add TestPro Vision to any existing system or platform that has a serial port. ✎

*For more information, contact the sales team at, Workstation Source Ltd. Unit 1 Danehill, Lower Earley, Berkshire, RG6 4UT England, tel +44 (0)118 922 7888, fax +44 (0)118 922 7880, e-mail sales@workstation-source.co.uk, or Web workstation-source.co.uk*

## Ultrasonics Used in Nondestructive Material Testing

t.e.s.t introduces the Ultrasonic Material Analyzer (UMA), a nondestructive test system that uses ultrasonics to test an object's material composition and continuity. You can use the system for analysis and research of material composition in the laboratory or for monitoring the composition during the production process. UMA is based on an ultrasonic waveform, test and production environment conditions, and analysis algorithms to characterize the material under test. The system characterizes the standard material composition and detects any differences from the standard. You can also implement control algorithms to maintain the desired composition.

The UMA uses National Instruments data acquisition boards and a custom LabVIEW program to give you functionality ranging from test configuration to analysis and report generation. You improve

productivity with the flexibility to create and use configuration programs, as well as extensive analysis capabilities. The overall system performance provides accurate understanding of the material composition during research and manufacturing.

With the UMA, you can test the continuity of the material and inspect for cracks, chips, or defects, either during the manufacturing process or after a fatigue test. The UMA also ensures that the material thickness is maintained during production by monitoring and adjusting the material to required specifications. ✎

*For more information or a demonstration, please contact the t.e.s.t. sales department at 65 Bellwoods Ave, Suite 106, Toronto, ON M6J 3N4, tel (416) 363-0404 x224, fax (416) 363-0971, or e-mail test@lukas.org*

## Also in the News

Stress Engineering Services, Inc. (SES) has incorporated National Instruments SCXI-1520 into StrainDAQ – the powerful strain gauge data acquisition system from SES. With the addition of SCXI-1520, StrainDAQ gains distributed architecture, so you can configure multiple data acquisition devices, each with multiple chassis, through one central console across a local area network. You can also immediately post data to the Internet or to your company intranet. The new StrainDAQ also includes 512 channels per data acquisition station for those who need high-channel count systems. ✎

*For more information about StrainDAQ, contact Danny Pitts with Stress Engineering Services, Inc., 13800 Westfair East Dr., Houston, Texas 77041, tel (281) 955-2900, fax (281) 955-2638, or Web stress.com*

DVP Inc. announces new features and technologies for its OmniMeter line of handheld instrumentation platforms. A new software driver for National Instruments DAQCard™-6062E widens the range of data acquisition applications the OmniMeter can serve. In addition to the new software driver, OmniMeter now includes new techniques for managing signal connectivity and strain relief. You can also create customized instrumentation applications faster with new application software. ✎

*For more information about OmniMeter, contact DVP Inc., 2401 Research Blvd., Ste. 200, Rockville, Maryland 20850, tel (301) 670-9282, e-mail info@dvpinc.com, or Web omnimeter.com*



photo courtesy of LightPath Technologies.

Learn how LightPath Technologies used NI PXI, motion, and vision to develop a flexible fiber optics system on page 3.

## NI and Philips Global Purchasing Agreement

Royal Philips Electronics named National Instruments as its preferred supplier of computer-based measurement and automation tools for its research, engineering, and manufacturing plants around the world. The agreement is intended to decrease operational costs for both parties by improving the processes for ordering products and tracking product deliveries.

Philips uses NI computer-based tools, including PXI, LabVIEW, and IMAQ Vision, across the globe to develop, manufacture, and test many of their products, such as cellular phones, television sets, lighting products, and electronics for home and industrial settings.

“Through the agreement with NI, our global operations further extend a world-class performance level in manufacturing, research, and development that exceeds the standard in the electronics industry,” said Mark Strubbe, Senior Manager of Process Engineering and Technology for Philips Consumer Electronics. ▶

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

Fieldcomms – London, U.K.	Dec 5-6	Photonics – San Jose, CA	Jan 23-25
MT Berlin – Berlin, Germany	Dec 6-7	NI Days – France	Feb 7
International Tech. Exhibition on Image Tech. and Equip. – Yokohama, Japan	Dec 6-8	IPOT Exhibition – NEC Birmingham, U.K.	Feb 14-15
ELEC – France	Dec 11-15	MTEC – NEC Birmingham, U.K.	Feb 14-15
MD&M Expo – Anaheim, CA	Jan 8-10	Nepcon West – Anaheim, CA	Feb 27-Mar 1
Electrotest Japan 2001 – Tokyo, Japan	Jan 17-19		



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