For more than 30 years, National Instruments has advised companies worldwide on ways to build more effective automated test and measurement systems. While continuing to serve as today’s leading authority in instrument control technologies, NI is driving innovation in test system design with virtual instrumentation. This approach combines the advantages of open, industry-standard PC technologies, modular instrumentation, and proven instrument control options – all powered by the industry’s most comprehensive and widely chosen test system software.
Reduce Your Cost of Test
The NI virtual instrumentation platform has proven essential in helping thousands of companies reduce test costs in both validation and production. Through this approach, companies realize savings in capital equipment, system development, and maintenance costs, as well as greater system efficiency for reducing test costs per unit. Choose NI virtual instrumentation and realize the following benefits today.

Reduced Capital Equipment Costs and System Size
Deploy a complete test system for a lower cost with the same footprint as a single traditional instrument.

Rapid Test Development
Design and deploy test systems faster with graphical software development tools.

Faster Test Execution with Increased Flexibility
Achieve higher performance with PC data buses, multicore processors, and FPGAs.

Increased System Longevity and Success
Add or update functionality as needs evolve and benefit from world-class services and support.
Test Management Software

NI test management software can direct your entire test system execution. Rather than spending time programming your own applications to prioritize and run tests, use ready-to-run software to quickly and easily implement a scalable test software framework. Choose the same software as the world’s top 10 aerospace, defense, and electronics manufacturing companies – NI TestStand.
NI TestStand Software

Accelerate your test and validation software development with NI TestStand, an off-the-shelf solution for organizing, controlling, managing, and executing test sequences written in any programming language. Use NI TestStand software for specifying execution flow, reporting, database logging, switching, and connecting to other enterprise systems.

- Call tests written in any programming language
- Quickly debug sequences with breakpoints and tracing tools
- Run your test sequence UUTs sequentially, in parallel, or as a batch
- Log results to files or databases such as Oracle, Microsoft Access and SQL, and MySQL
- Create reports in your preferred format, such as HTML, ASCII, XML, and ATML
- Develop custom operator interfaces in LabVIEW, ANSI C, C++, and Visual Basic

Ensure System Success

NI offers ongoing support, training, and certification to help you maximize your success with software and hardware. You can also visit ni.com/devzone for the latest community events and resources, including virtual user groups, technical tutorials, code sharing, and discussion forums.
Test Development Software

It is not uncommon for engineers to exceed budgets and time schedules when they are tasked with using application development environments (ADEs) not designed for automated test. NI offers a variety of industry-leading ADEs that help you increase productivity in test development and reduce your overall costs.

Manufacturers achieve FDA compliance using virtual instrumentation.
NI LabVIEW, LabWindows/CVI, and Measurement Studio Software

Engineers worldwide use the block diagram approach of the LabVIEW graphical development environment to create automated test systems. Its graphical dataflow language naturally represents data flow and intuitively maps user interface controls for easy viewing and modification. NI also offers LabWindows/CVI, an ANSI C development environment with built-in measurement and analysis functions, and Measurement Studio for Microsoft Visual Studio, which provides similar test functionality.

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**LabVIEW**

*Acquire* – Quickly capture data from thousands of instruments

*Analyze* – Use more than 500 built-in math and signal processing functions

*Present* – Display results with custom UIs and store data to enterprise systems

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**LabWindows/CVI**

Acquisition, analysis, and presentation in an ANSI C environment

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**Measurement Studio**

Acquisition, analysis, and UI tools for Microsoft Visual Studio

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Reduce Total Software Cost

Take advantage of substantial product discounts by purchasing a bundle of software products, such as NI Developer Suite, or multiple software licenses through a volume license agreement. Subscribe to the NI Standard Service Program to receive automatic upgrades, maintenance releases, on-demand training, and technical support via phone and e-mail.
Industry-Standard Test Platform

PXI is an open, PC-based platform for test, measurement, and control that provides the industry’s highest performance. Modular instrumentation products are available from DC to 26.5 GHz. With more than 1,500 products offered by more than 70 vendors, including Agilent Technologies, Rohde & Schwarz, and National Instruments, it is clear why PXI is the automated test platform of choice for thousands of companies worldwide.
NI PXI Hardware

Choose from a variety of PXI chassis, controllers, and modular instruments from NI to build a test system that best meets your application requirements. NI also offers PXI Express hardware, which extends the rugged PXI platform by integrating PCI Express signaling to deliver the highest bandwidth, lowest latency, and best timing and synchronization of any test platform.

Controller
- Embedded, multicore controllers (Windows, real-time, Linux®)
- Remote PC and laptop control
- Ethernet, USB, GPIB, and ExpressCard connectivity

Chassis
- 4- to 18-slot, rugged enclosures
- High-speed PCI and PCI Express backplane
- Integrated timing and synchronization

NI and Multivendor Modules
- DC to RF measurement modules
- Communications modules CAN, ARINC, IEEE 1588
- Digital I/O, frame grabbers, motion control

The PXI specification is governed by the PXI Systems Alliance (www.pxisa.org), an industry consortium of more than 70 vendors who have released more than 1,500 PXI products since its founding in 1998.

Reduce System Setup Time

NI can help your company save significant setup time and costs through both standard and custom system services. Through standard system services, NI technicians can assemble, configure, test, and document your NI PXI system to meet your exact needs. Through custom system services, NI can work with you to develop a completely custom deployment system, including custom hardware, shipping, application installation, and more.
Modular Instruments

Choose from a variety of software-configurable NI measurement, signal generation, RF, power, and switch modules to address specific measurement tasks. Because these instruments are modular and software-defined, you can quickly interchange and repurpose them as your test needs evolve. NI modular instruments – available for PXI, PXI Express, PCI, PCI Express, and USB – also provide high-speed test execution by leveraging industry-standard PC and advanced timing and synchronization technologies.
**High-Resolution I/O**

- Multimeters: 6½- and 7½-digit performance
- Precision source/measure: 10 nA current resolution
- LCR meters: 0.25 percent basic accuracy for both inductance and capacitance
- Audio and vibration analyzers: 24 bits and 118 dB dynamic range

**High-Speed Mixed-Signal I/O**

- Digitizer/oscilloscopes: 2 GS/s sample rates (300 MHz bandwidth)
- Signal generators: 200 MS/s sample rates (80 MHz bandwidth)
- Digital devices: 400 Mb/s data rates and programmable voltage levels (-2.0 to 5.5 V)
- Multifunction data acquisition: 18 bits, 625 kS/s, 32 channels

**RF and Communications**

- Vector signal generator: Up to 2.7 GHz with 20 MHz real-time bandwidth
- Vector signal analyzer: 9 kHz to 2.7 GHz with 20 MHz real-time bandwidth
- Modulation capability: Support for custom and standard analog and digital modulation

**Switching**

- Topology: More than 150 multiplexer, matrix, general-purpose, and RF configurations
- High density: Up to 256-channel multiplexers and 544-crosspoint matrices
- High power: Up to 600 VDC/300 VAC, 12 A
- Bandwidth: Up to 26.5 GHz
System Integration

The NI Professional Services team consists of NI engineers and the National Instruments Alliance Partner program, which includes more than 600 independent consultants and integrators worldwide. Members have in-depth knowledge of NI products to offer services ranging from basic startup assistance to turnkey system integration and maintenance. NI also provides services for assembling and configuring your system to help you take advantage of your measurement and automation solution right out of the box.
Instrument Control for Any Bus
With a hybrid test system based on NI LabVIEW software and PXI hardware, you can easily integrate instrumentation from a variety of platforms, such as PCI, VXI, USB, GPIB, and LXI, to meet your test needs. You also can visit the NI Instrument Driver Network at ni.com/idnet to access more than 5,000 instrument drivers for LabVIEW, LabWindows/CVI, and Measurement Studio.

Maintain Accuracy with Calibration
All NI measurement hardware is calibrated using internationally accepted standards, such as ISO 9001, to ensure proper traceability. Once your system is installed, take advantage of NI software and hardware built-in calibration features to compensate for measurement errors induced by cables, fixtures, and emissions. Furthermore, maintain your hardware accuracy through on-site calibration or by returning your hardware for recalibration using the ISO 17025 standard.
Case Studies

NI has helped more than 25,000 companies around the world improve their automated test and measurement strategies. NI customers save time and money while ensuring product quality. Read some of their brief stories below or visit ni.com/automatedtest to read full case studies from these companies and more.

**Consumer Electronics Test**

Microsoft Corporation developed a versatile validation and end-of-line production test system for the Xbox and Xbox 360 controllers using LabVIEW and PXI modular instrumentation. With the new test system, Microsoft implemented a test strategy that resulted in a 100 percent increase in test throughput per test station.

![Xbox 360 Controller](#)

**Medical Device Test**

Sanmina-SCI, a leading EMS company, used NI software and PXI modular instrumentation to develop an FDA-approved production tester for medical devices that measure blood glucose levels. The NI test platform exceeded its throughput requirements, testing 83,000 devices per week while maintaining a cycle time of 30 seconds per device, and exceeded its yield requirements with production yields greater than 95 percent.

![Blood Glucose Meter](#)

**Automotive Electronics Test**

Freightliner LLC, the leading heavy-duty truck manufacturer in North America, selected LabVIEW software and PXI modular instrumentation to verify the electrical assembly on its new line of heavy-duty trucks. Using NI tools, Freightliner engineers integrated electrical test, machine vision, and physical measurements into a single system that not only ensures high-quality vehicles but also instructs operators on the correct assembly process.

![Truck Electrical Assembly](#)
Electronics Test
Lexmark deployed an NI PC-based system to test ink cartridges used with its inkjet family of printers. The company recently upgraded to new, higher-performance NI modular instruments, increasing the quality of its products and production yields while improving test performance – all with minimal development expense.

RF and Communications Test
Harris, an international communications and information technology company, tests RF data transmitters and receivers. Using PXI instruments from NI and an external wide area network transceiver integrated circuit on a custom-printed circuit board, Harris implemented a complete serial bit error rate test system that reduces cost per unit approximately 4X and offers customization capability to communication interfaces that have added test requirements.

Audio and Video Test
Thomson Grass Valley designs and manufactures equipment for broadcast, TV and film production, and professional audio, visual, and networking applications. Using the NI test platform for production testing of the new Grass Valley Turbo iDDR (intelligent digital disk recorder), it achieved test time savings of more than 75 percent and reduced time-intensive development by 90 percent.

Military Electronics Test
Lockheed Martin Simulation, Training & Support (LM STS) developed a standard test system for avionics suppliers to the joint strike fighter program. The system uses NI TestStand and LabWindows/CVI software for the core test management and ANSI C test development. LM STS estimates its standardized approach to the F-35 JSF program has already saved the U.S. government millions of dollars and has the potential to save hundreds of millions more over the life of the program.
Visit ni.com/automatedtest for:

- **Test Development Resources**
  Access white papers and other resources covering strategies for test system development and optimization.

- **Case Studies**
  Read in-depth case studies from companies around the world that are saving time and money using the NI test platform.

- **Software Evaluation and System Specification**
  Download software evaluations and start specifying a test system today with interactive advisors.