NI Product Guide

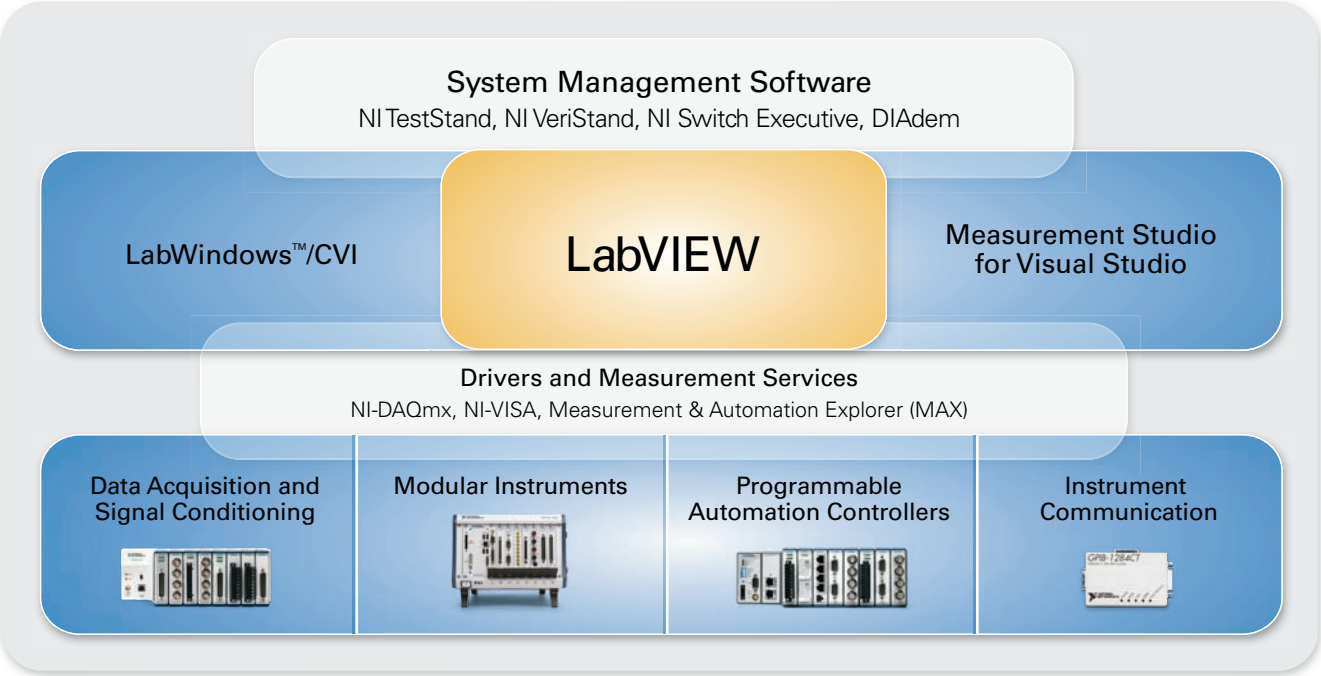
NATIONAL INSTRUMENTS™

Discover how the National Instruments approach to graphical system design can change your business.

National Instruments is a technology pioneer and industry leader, delivering today's most advanced technologies for test, control, and design. Engineers and scientists in hundreds of industries use flexible, high-performance NI products to create reliable, user-defined systems. With graphical programming software and modular, open hardware, NI has redefined how engineers work throughout the entire product design cycle, resulting in reduced time to market and lower development costs.

Measurement and Automation Software Overview

For more than 20 years, National Instruments has pioneered measurement and automation software for virtual instrumentation. The NI vision of virtual instrumentation is advancing into graphical system design, giving you a single development platform to rapidly design, prototype, and deploy your systems. Today, NI delivers application development environments (ADEs), analysis and test management software, and device and instrument drivers to meet your test, control, and design needs.



NI offers system management software such as NI TestStand for test management and DIAdem for offline data analysis and presentation. For graphical, interactive, and text-based programming solutions, use ADEs such as NI LabVIEW, LabWindows™/CVI, and Measurement Studio for Microsoft Visual Studio. NI provides hardware drivers, flexible high-level APIs, and a configuration manager.

NI Software Services and Support

National Instruments software services programs complete and complement the NI software product offering so you can increase your development productivity and achieve long-term success.

- Reduce development time and maintenance costs for your applications
- Keep your software products up-to-date with the latest features and capabilities
- Maximize your ability to develop efficient, powerful applications using your available resources

Learn more at **ni.com/services**

Additional Services

Software Maintenance and Support

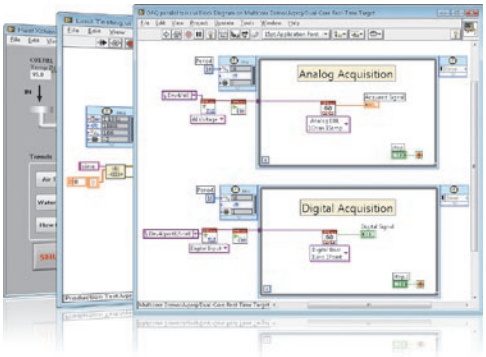
Provides automatic upgrades, maintenance releases, on-demand training, and technical support via phone and e-mail.

Training and Certification

Offers the fastest, most effective way to increase application development productivity with NI software and hardware.

Volume License Program

Simplifies your software license management and provides NI software at a discounted rate.



NI Developer Suite

NI Developer Suite offers substantial savings and provides regular quarterly software updates with the latest versions of your application software. The modular NI Developer Suite is configurable for your application needs.

- Offers up to 72 percent savings on software
- Provides regular updates to keep your software current
- Reduces development downtime with technical support

Learn more at **ni.com/suite**

Related Products

NI Developer Suite with Automated Test Option

Adds NI TestStand for test execution management, sequencing, data collection, and report generation and adds NI Switch Executive for intelligent switch routing and management.

NI Developer Suite with Real-Time Deployment Option

Adds the LabVIEW Real-Time Module and Real-Time Execution Trace Toolkit to deploy LabVIEW code to dedicated real-time hardware.

NI Developer Suite with Image Acquisition and Machine Vision Option

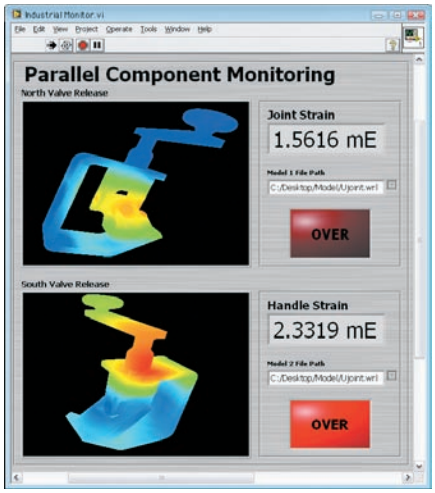
Adds support for thousands of cameras, including IEEE 1394 cameras, and libraries for image processing and machine vision.

What is NI LabVIEW?

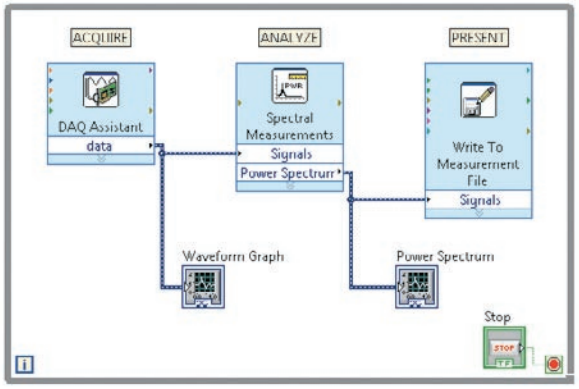
For more than 20 years, engineers and scientists worldwide have depended on LabVIEW software to build cost-effective design, control, and test systems. The unique LabVIEW graphical development environment features interactive assistants, code generation, and connectivity to thousands of devices for easily gathering data. Because LabVIEW connects to virtually any measurement device and design tool, you can incorporate new LabVIEW applications seamlessly into existing systems without risking your application investment.

> *"With the new functional test system [based on LabVIEW] for the Xbox 360 controller, we implemented a test strategy that resulted in a 50 percent increase in our test throughput per test station."*
>
> – D.J. Mathias, **Microsoft**

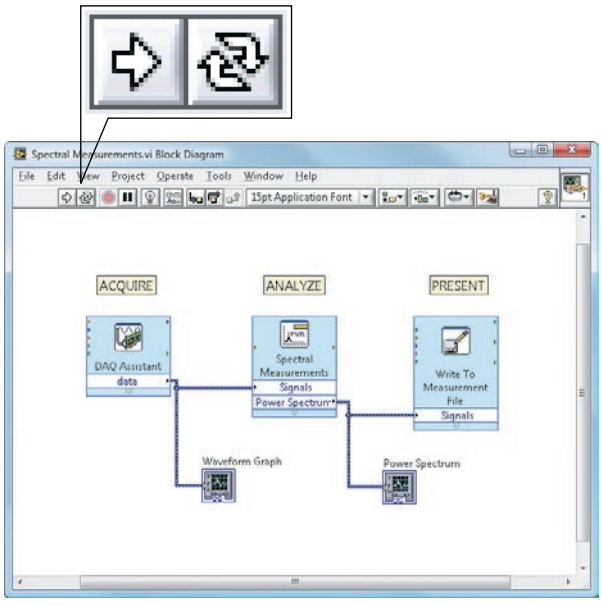
3 Easy Steps to Create Your Application



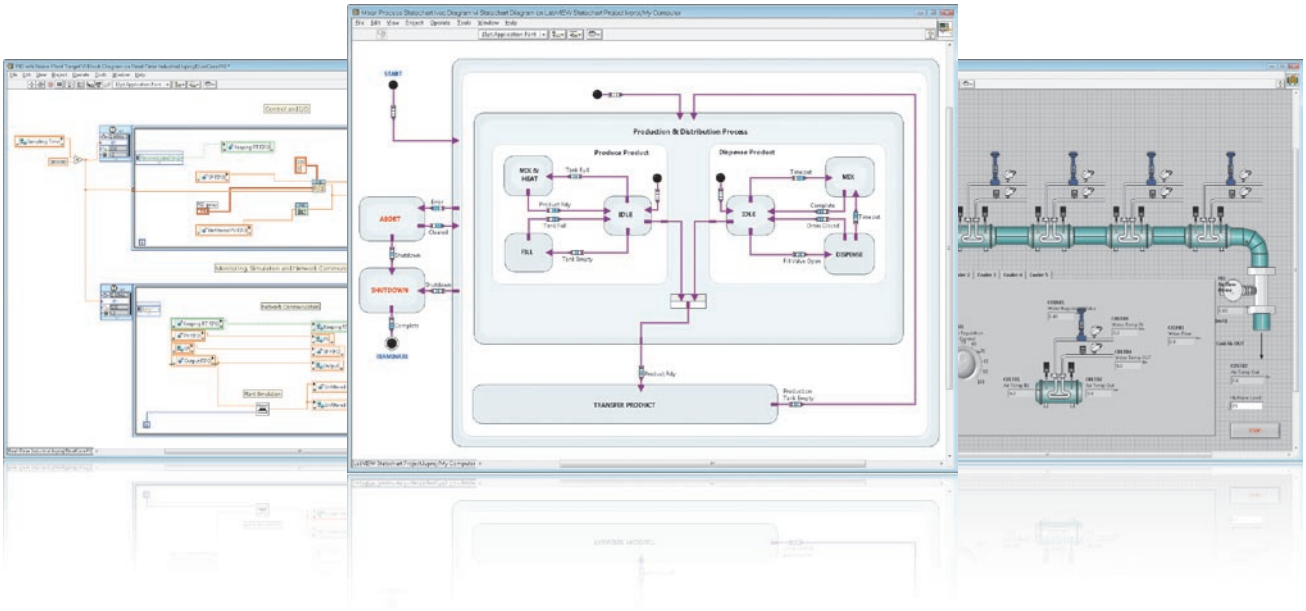
1 Design a User Interface



2 Draw Your Graphical Code



3 Debug and Deploy



LabVIEW Modules

In addition to the LabVIEW development environment, National Instruments offers a variety of add-on modules that provide additional functionality or deployment to computing targets ranging from industrial real-time devices to field-programmable gate arrays (FPGAs) and microprocessors.

LabVIEW Real-Time Module

- Develop real-time systems with LabVIEW graphical programming
- Download to a dedicated real-time target for reliable, deterministic performance
- Deploy as a distributed, stand-alone, autonomous, or embedded system

LabVIEW FPGA Module

- Program FPGAs without knowledge of VHDL using LabVIEW graphical programming
- Create custom logic to implement advanced timing and triggering, onboard decision making, and digital I/O
- Execute tasks deterministically and simultaneously in hardware

LabVIEW Datalogging and Supervisory Control Module

- Create industrial HMIs and program application logic in a single software environment
- Quickly develop high-channel-count logging and alarming applications without any programming
- Efficiently communicate with networked LabVIEW Real-Time targets and OPC devices

LabVIEW Statechart Module

- Develop state diagrams in LabVIEW with hierarchy, concurrency, and comprehensive actions
- Design LabVIEW applications at a higher level
- Deploy statechart applications to targets such as desktop PCs, real-time systems, and FPGAs

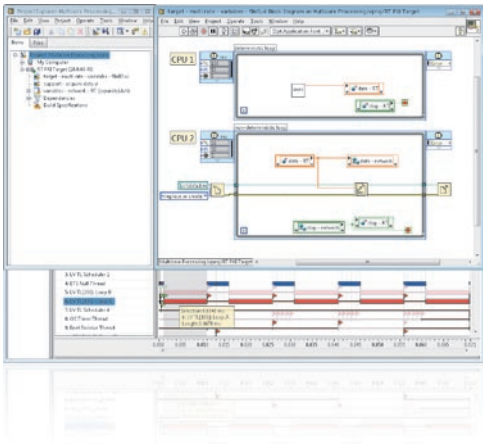
Learn more at **ni.com/labview/family**

More LabVIEW Add-Ons

Other LabVIEW add-ons are available for programming 32-bit microprocessors, industrial touch panel computers, handheld devices, and more. These include:

- LabVIEW Mobile Module
- LabVIEW Embedded Module for ARM Microcontrollers
- LabVIEW Wireless Sensor Network Module
- LabVIEW Control Design and Simulation Module
- LabVIEW Touch Panel Module
- LabVIEW for Machine Vision
- LabVIEW MathScript RT Module

Learn more at **ni.com/labview/family**



LabVIEW Toolkits

LabVIEW toolkits provide additional functionality for report generation, advanced analysis, database communication, vibration analysis, and more.

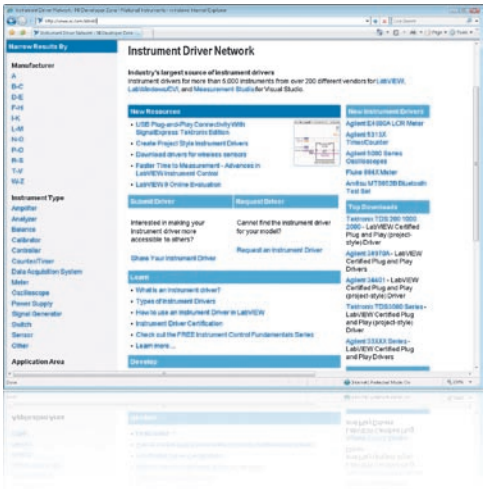
- Report Generation Toolkit for Microsoft Office, Database Connectivity Toolkit
- Sound and Vibration Measurement Suite, PID and Fuzzy Logic Toolkit
- Advanced Signal Processing Toolkit, Modulation Toolkit
- Unit Test Framework Toolkit, Desktop Execution Trace Toolkit, VI Analyzer Toolkit

Learn more at **ni.com/labview/family**

More LabVIEW Toolkits

- Real-Time Execution Trace Toolkit
- Internet Toolkit
- Digital Filter Design Toolkit
- Math Interface Toolkit
- NI Motion Assistant
- System Identification Toolkit
- GPS Simulation Toolkit
- DataFinder Toolkit
- Adaptive Filter Toolkit

Learn more at **ni.com/labview/family**



Instrument Driver Network

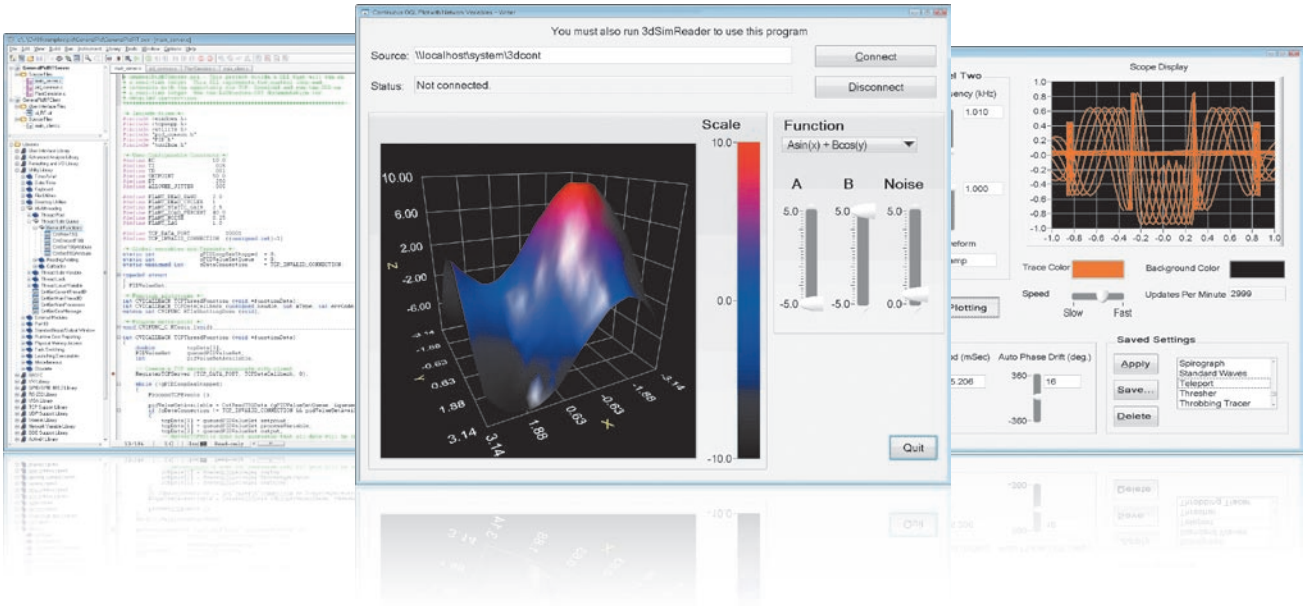
Instrument drivers offer a high-level programming interface, which eliminates the need to learn an instrument's low-level messaging. This can often save you days or even weeks of programming time. Whether you use NI LabVIEW, NI LabWindows™/CVI, or Microsoft Visual Studio, the NI Instrument Driver Network has you covered with drivers for more than 8,000 instruments from more than 275 vendors.

- Take advantage of the industry's largest source for instrument drivers
- Choose from LabVIEW Plug and Play and Interchangeable Virtual Instrument (IVI) drivers

Learn more at **ni.com/idnet**

10 of the Most Downloaded Drivers

- Tektronix TDS 200, 1000, and 2000 series oscilloscopes
- Tektronix TDS 3000 series oscilloscopes
- Agilent 34401A digital multimeter
- Agilent 33000 series function generators
- National Instruments NI-SCOPE driver
- Keithley 2000 series digital multimeters
- Stanford Research SR830 lock-in amplifier
- LeCroy Wave series oscilloscopes
- Fluke 45 digital multimeter
- Eurotherm 2400 series temperature controllers



NI LabWindows™/CVI

LabWindows/CVI is a proven ANSI C integrated development environment that provides engineers and scientists with a comprehensive set of programming tools for creating test and control applications. Specifically designed for building instrumentation systems based on PXI, plug-in data acquisition devices, GPIB, and more, LabWindows/CVI combines an interactive, easy-to-use development approach with the programming power and flexibility of compiled ANSI C code. In addition, LabWindows/CVI delivers many usability features that improve productivity without sacrificing speed or source code manageability.

- Built-in libraries for acquisition, analysis, and visualization
- Simplified drag-and-drop user interface editor
- Automated code generation tools and hardware assistants
- Interactive execution of individual functions without changing the source code
- More than 300 analysis and math functions including signal processing
- IVI Instrument Driver wizards for fast creation of IVI-C drivers
- Ability to integrate DLLs, ActiveX, and .NET components
- High-level multithreading library and optimized data structures for building multithreaded applications
- Simplified API to transfer live measurement data between applications over the network
- Quick access to the Windows SDK
- Support for advanced PC technologies such as 64-bit operating systems and Windows 7
- Memory Management and resource tracking tools

Learn more at **ni.com/lwcvi**

LabWindows/CVI Add-Ons

- LabWindows/CVI Real-Time Module
- Vision Development Module
- Enterprise Connectivity Toolkit
- Execution Profiler Toolkit
- LabWindows/CVI Run-Time Module for Linux
- Database Connectivity (SQL) Toolkit
- Advanced Signal Processing Toolkit
- PID Control Toolkit

Learn more at **ni.com/lwcvi**

NI Measurement Studio

Measurement Studio is an integrated suite of measurement and automation controls, tools, and class libraries for Microsoft Visual Studio. It dramatically reduces application development time by providing Windows Forms, Web Forms, and ActiveX user interface components designed for engineers, advanced scientific analysis, and data acquisition and instrument control assistants optimized for test.

- Complete object-oriented APIs for data acquisition and instrument control
- .NET instrument driver generation for IVI, VXIplug&play, and legacy drivers
- More than 20 scientific user interface controls including graphs, thermometers, gauges, dials, and LEDs
- Extensible components and classes for the customization of user interface controls and I/O libraries
- Automated code generation tools and hardware assistants
- Simplified network communication and user interface data binding
- More than 110 analysis and math functions for curve fitting, signal processing, windowing, filtering, linear algebra, statistics, and measurements
- Support for C#, Visual Basic .NET, Visual Basic 6.0, C++ 6.0, and unmanaged C++ .NET
- Support for advanced PC technologies such as 64-bit OSs and Windows 7

Learn more at **ni.com/mstudio**

Related Products

Vision Development Module

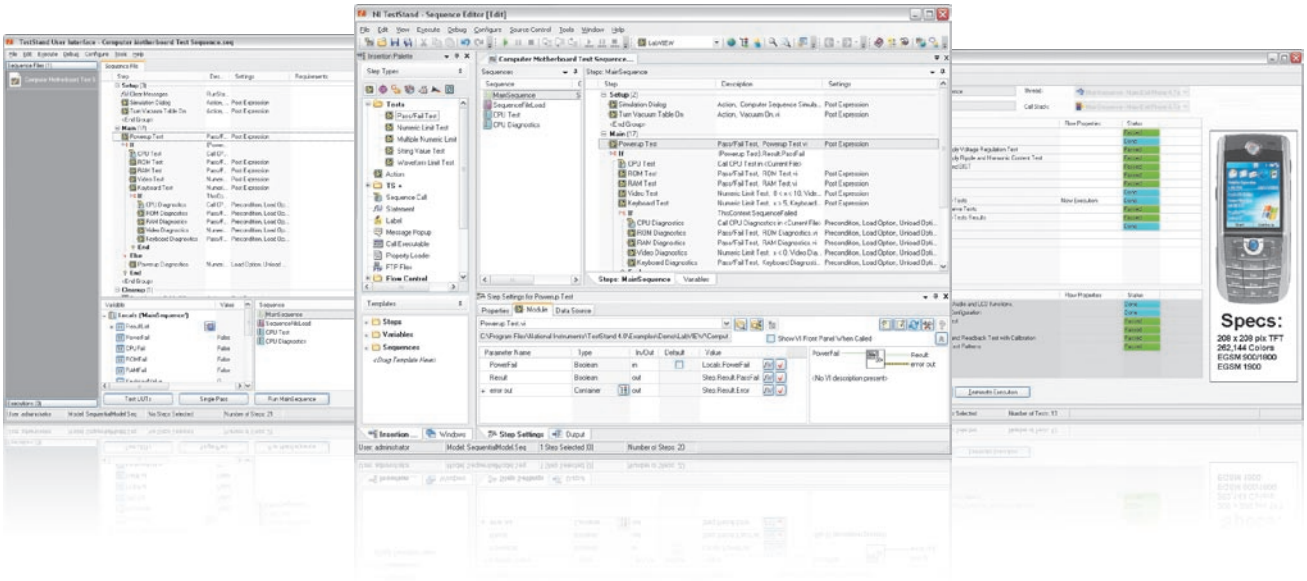
Interactively develop applications using image processing, machine vision, blob analysis, and pattern matching functions.

Motion Control Module for Measurement Studio

Use interactive property pages to control the motors, drives, and encoders that make up your motion system.

Measurement Studio Toolkits

For sophisticated control applications, use autotuning wizard and control algorithms in the PID Control Toolkit, as well as automation symbols, such as pumps and valves, for building human machine interface displays.



NI TestStand

NI TestStand is a ready-to-run test management environment for organizing, controlling, and executing your automated prototype, validation, and manufacturing test systems. Quickly build your test sequences with NI TestStand by incorporating tests written in your preferred programming language. Built on a high-speed, multithreaded execution engine, NI TestStand delivers the performance to meet your most rigorous test throughput requirements. NI TestStand is also completely customizable, so you can modify and enhance it to match your specific needs, including customizing the operator interface, generating custom reports, and modifying sequence execution requirements. Using NI TestStand, you can focus your engineering efforts on testing a particular product while NI TestStand manages the sequencing, execution, and reporting tasks for you.

- Sequence development environment
- Parallel multithreaded testing
- Customizable reporting
- Source code control integration
- Debugging
- User management
- Customizable operator interfaces
- Database logging

Learn more at **ni.com/teststand**

Related Products

NI Developer Suite Automated Test

Boost your productivity with a complete set of software tools for automated test, phone, and e-mail support as well as quarterly updates for all software tools.

NI Requirements Gateway

Integrate with requirements written in Microsoft Excel, Microsoft Word, or Adobe Acrobat as well as Telelogic DOORS and IBM Rational RequisitePro.

NI Switch Executive

Increase your development productivity by interactively configuring and naming switch modules, external connections, and signal routes.

NI VeriStand

NI VeriStand is an open, configuration-based software tool for creating real-time testing applications more efficiently. It provides the common functionality required to implement real-time testing applications in a ready-to-use format, which reduces development cost and risk. No programming knowledge is necessary; however, with the open environment, you can add custom functionality using LabVIEW; the LabVIEW FPGA Module; LabWindows™/CVI; NI TestStand; NI DIAdem; The MathWorks, Inc. Simulink® software; C/C++; .NET; Python; and other environments, ensuring the software meets application requirements.

- Real-time stimulus generation
- Triggered, multirate data logging
- Real-time hardware I/O interfaces
- Event detection and response routines
- Calculated channels
- Closed-loop control implementation
- Simulation model execution
- Run-time editable user interface

Learn more at **ni.com/veristand**

Related Products

NI Developer Suite Real-Time Testing and HIL Simulation

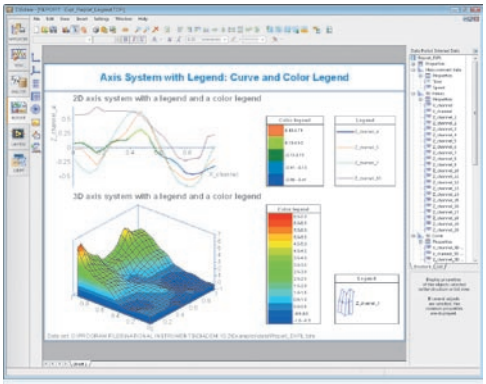
Get NI VeriStand with additional tools for customizing the environment.

NI TestStand and NI Requirements Gateway

Add automation requirements traceability to your NI VeriStand applications.

LabVIEW FPGA

Graphically define FPGA-based interfaces to implement control, signal processing, or model simulation tasks.



NI DIAdem

DIAdem offers configuration-based technical data management, analysis, and report generation tools to help you mine and analyze your data interactively.

- Quickly search and mine your data to find trends and correlations
- Load and analyze data sets containing more than 100 billion data points
- Inspect data, compare test runs, and identify anomalies using interactive visualization tools
- Create professional reusable reports to share your results

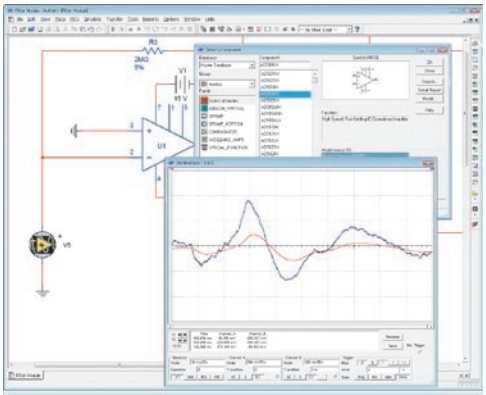
Learn more at **ni.com/diadem**

Related Products

NI DataFinder Server Edition
Manage test data across multiple groups and departments regardless of format.

LabVIEW DataFinder Toolkit
Create custom, deployable data management applications.

DIAdem Crash Analysis Toolkit
Automate crash data analysis and reporting in compliance with international standards.



NI Multisim

Multisim from the NI Electronics Workbench Group equips professional PCB designers with world-class tools for schematic capture, interactive simulation, and board layout. Multisim combines the power of SPICE simulation with LabVIEW graphical development software to create a streamlined and integrated design flow for easily comparing simulation to real-world results.

- Capture, simulate, and design in an intuitive and interactive design environment
- Reduce design iterations with sophisticated SPICE analysis and validation tools

Learn more at **ni.com/multisim**

Related Products

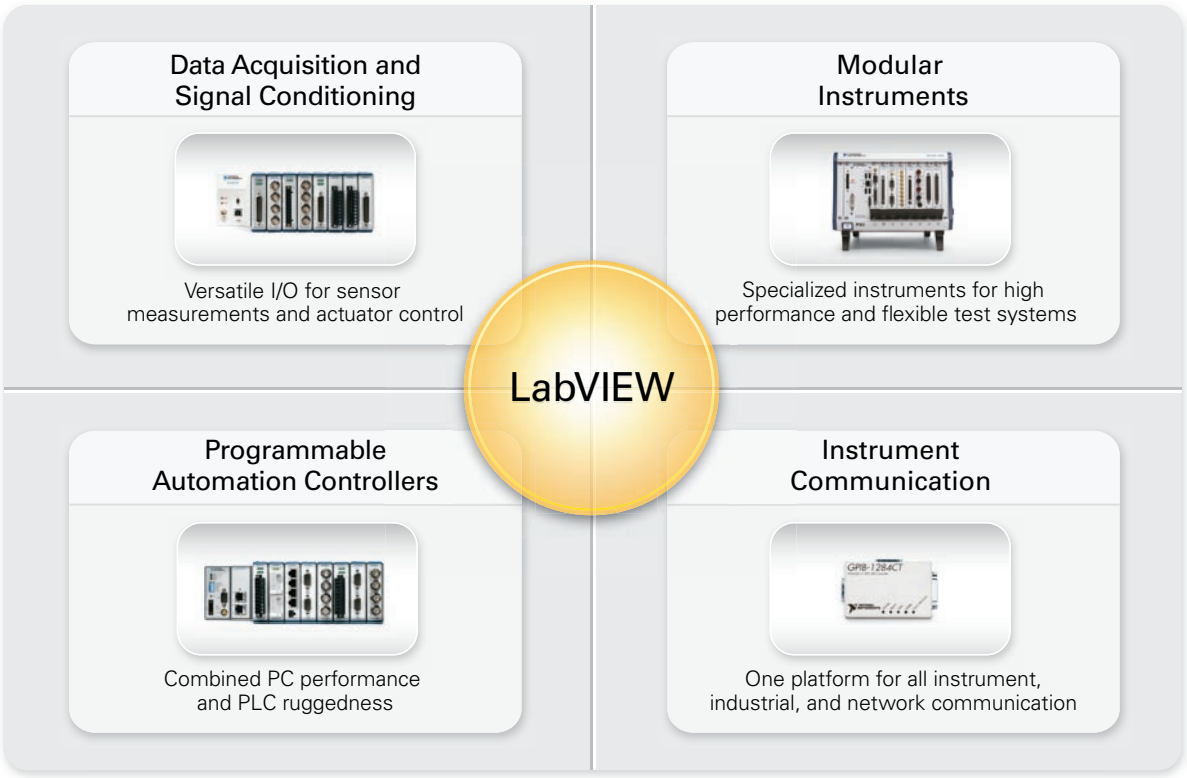
NI Ultiboard
Lay out, route, and prepare your PCB designs for manufacture with a flexible environment that is seamlessly integrated with Multisim.

NI Multisim MCU Module
Interface the simulation of a microcontroller with analog and digital SPICE models.

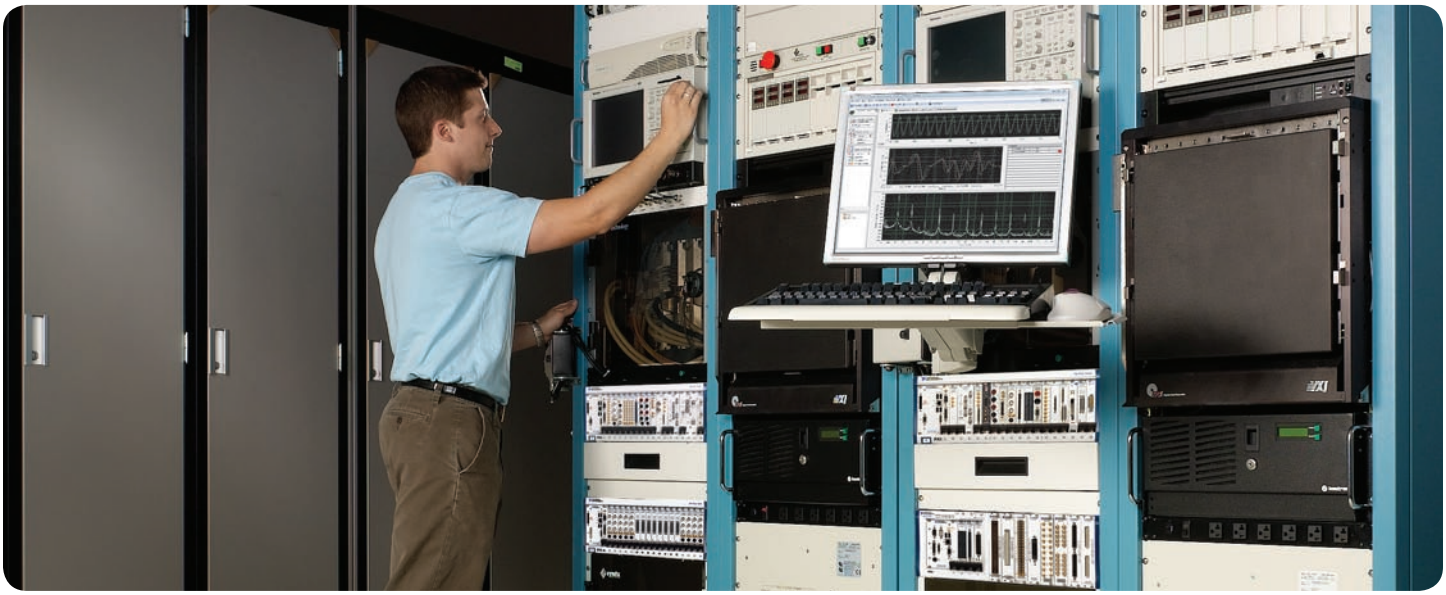
NI Electronics Education Platform
Help students translate theory into practice with the integrated academic platform of Multisim, LabVIEW, and the NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS).

Measurement and Automation Hardware Overview

National Instruments offers engineers and scientists a tightly integrated suite of hardware and software tools to measure and automate the world around them. By using cutting-edge commercial technology, such as the latest ADCs, FPGAs, and PC buses, NI hardware delivers modular and easy-to-use solutions for a wide range of applications from automated test and data logging to industrial control and embedded design.



National Instruments data acquisition (DAQ) devices measure electrical or physical signals from a variety of sensors. NI modular instruments synchronize measurement, signal generation, RF, and switching components for automated test systems. NI programmable automation controllers (PACs) combine the ruggedness of a PLC and the performance of a PC for industrial measurement and control applications. For instrument control and communication, NI provides numerous GPIB, USB, Ethernet, and serial interfaces.



NI Hardware Services and Support

Whether you own a single NI data acquisition device, a state-of-the-art PXI system, or hundreds of CompactRIO systems deployed in critical applications around the world, NI hardware services protect your investment and save you money.

Product Services

Extended Warranty – NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project.

Repair – Highly trained technicians perform NI repair services as quickly as possible. In addition, NI offers advanced replacement and next-on-bench services.

Calibration – NI calibration helps make sure that every measurement is as good as the first measurement by verifying the accuracy of your measurements and adjusting them back to specification when necessary. In addition, NI calibration helps you maintain traceability to national and international standards.

System Services

Standard – During standard system configuration, NI technicians assemble, configure, test, and document your NI PXI, CompactRIO, or Compact FieldPoint system to give you the ultimate out-of-box experience.

Custom – Custom system configuration helps you successfully deploy a large number of systems at a lower price. Featured services include system assembly and configuration, custom test, custom application installation, and custom documentation.

Learn more at **ni.com/services**

Additional Services

OEM Support

NI offers design-in consulting and product integration assistance if you want to use NI products for OEM applications. Visit **ni.com/oem** for more information.

Technical Support

NI delivers industry-leading technical support through online knowledge bases, applications engineers, and discussion forums. Visit **ni.com/support** for more information.

Upgrades

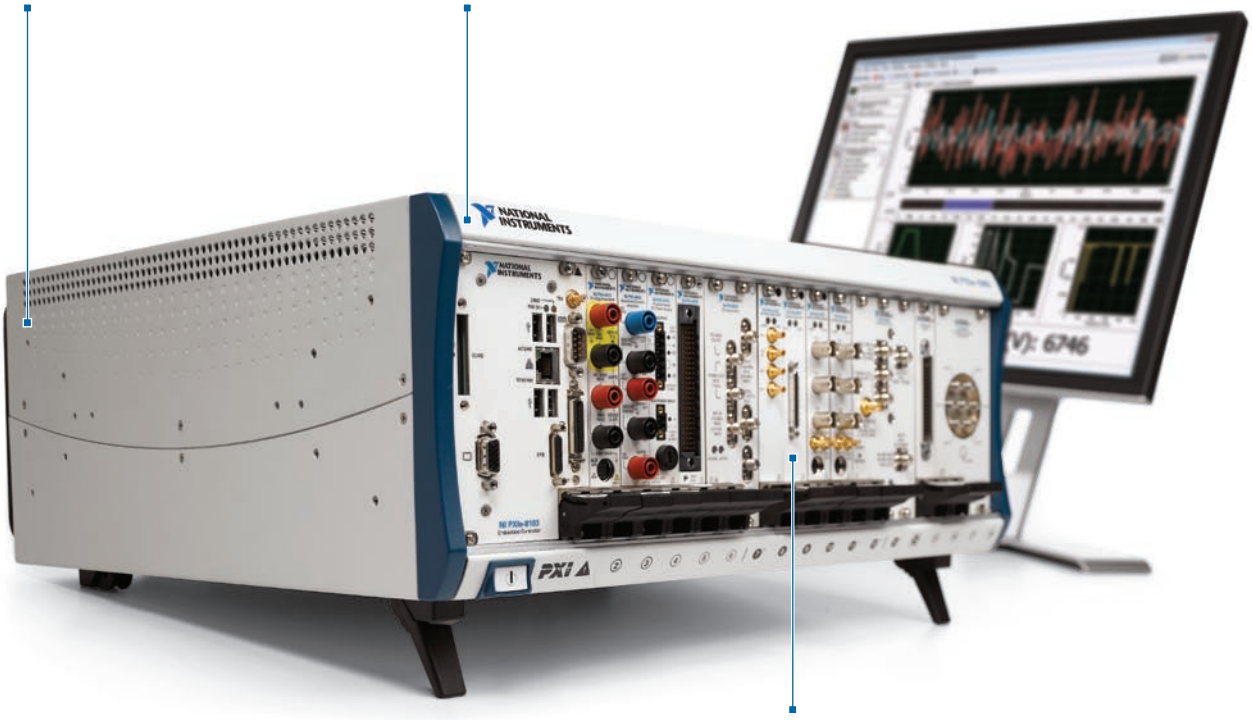
NI service programs include automatic upgrades to your application development environment and higher levels of technical support. Visit **ni.com/ssp** for more information.

NI PXI

PXI is the open, PC-based platform for test, measurement, and control that provides the industry's highest bandwidth and lowest latency with modular I/O for high-resolution DC to 6 GHz RF. With more than 10 years of industry adoption and over 1,500 products from more than 70 members of the PXI Systems Alliance (pxisa.org), it is clear why PXI is the automated test platform of choice for thousands of companies worldwide.

Chassis
High-throughput backplane with triggering and tight synchronization

Controllers
Embedded controllers with Windows or real-time OS and remote controllers



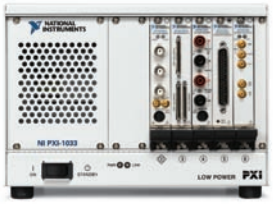
Modules
More than 1,500 products from more than 70 vendors

Platform Advantages

Modular — Build custom test systems using a hardware architecture that can scale with your changing needs.

High Performance — Take advantage of the latest commercial technologies offering the test and measurement industry's highest throughput and lowest latency.

Rugged — Develop and deploy industrial applications using hardware with small, rugged packaging and high temperature tolerances.



High-Value Chassis

With NI high-value chassis, you can control up to five PXI/CompactPCI or PXI Express/CompactPCI Express modules across a remote link that offers up to 250 MB/s of sustained throughput. These high-value chassis are ideal for remote, real-time, and data acquisition applications.

- Quiet acoustic noise emissions as low as 38 dBA
- AC and AC/DC power options
- Options for integrated MXI-Express controller, remote controllers, or embedded controllers

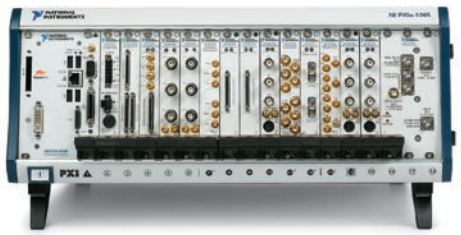
Learn more at **ni.com/pxi**

High-Performance Chassis

NI provides high-performance chassis designed to meet a wide range of test and measurement application needs. The large operating temperature range is ideal for extended temperature environments. Available with up to 18 slots, these chassis feature a low-jitter 10 MHz reference clock for device synchronization.

- As low as 43 dBA acoustic emissions
- Removable high-performance AC power supply up to 600 W
- Extended 0 to 55 °C operating temperature range
- PXI and PXI Express as well as CompactPCI and CompactPCI Express module compatibility
- Options for both 3U and 6U modules

Learn more at **ni.com/pxi**



High-Performance and High-Bandwidth PXI Express Chassis

PXI Express chassis from NI increase bandwidth by up to 45 times, incorporate the industry's best timing and synchronization, and preserve compatibility with software and the more than 1,500 available PXI modules.

- Chassis contain PXI slots, PXI Express hybrid slots, PXI Express slots, and one PXI Express system timing slot
- Up to 700 W total power
- Compatibility with PXI, PXI Express, CompactPCI, and CompactPCI Express modules
- Use with PXI Express embedded, real-time, and remote controllers from NI

Learn more at **ni.com/pxi**

Low-Cost Integrated Chassis and Controller

PXI now meets more low-cost, high-performance application needs by applying the cost benefits of commercial technologies such as cabled PCI Express. The new integrated chassis and controller device offers five peripheral slots and an integrated MXI-Express remote controller with host card to connect to the host PC. This chassis is available in two host interface versions – a PCI Express interface to connect to a desktop PC and an ExpressCard interface to connect to a laptop. The chassis is also available for PXI or PXI Express modules.

Embedded Controllers

PXI embedded controllers from National Instruments use the latest advancements in computing technology to provide high performance and the best value in a compact form factor, making them ideal for test and measurement systems.

- Up to 4 GB/s system bandwidth
- Integrated hard drive, memory, Ethernet, video, USB, GPIB, and other peripherals
- Preinstalled Microsoft Windows OS

Features

High Performance

NI embedded controllers use the latest multicore processors from Intel and AMD to provide high computing performance.

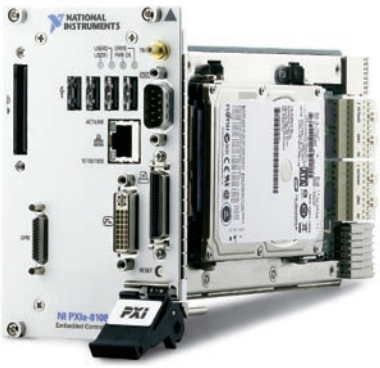
High I/O Bandwidth and Lowest Latency

PXI embedded controllers harness the advantages of PCI/PCI Express to offer the industry's highest I/O throughput and lowest latency.

NI System Assurance Program

You receive a preconfigured controller with all software and drivers applicable for your system.

Learn more at **ni.com/pxi**



Real-Time Controllers

National Instruments RT series PXI embedded controllers deliver a flexible, rugged platform for your deterministic, real-time measurement and control applications.

- Up to 137 kHz PID control loop rate
- Deployment platform for LabVIEW Real-Time and LabWindows™/CVI Real-Time applications
- Submicrosecond loop rates with only 3 to 4 ns of system jitter
- Integrated hard drive, USB, GPIB, serial, and other peripheral I/O

Features

Deterministic Performance

Run your application on dedicated PXI real-time hardware for real-time responses, fast loop rates, and extremely low system jitter.

Multicore Processor Benefits

Exclusively control processor affinity for executing certain sections of your code.

Extended Temperature and 24/7 Operation Option

Deploy your PXI-based systems in more demanding conditions.

Learn more at **ni.com/pxi**

Remote Controllers

With PXI remote controllers from National Instruments, you can control PXI systems directly from your PC or laptop computer with a transparent, high-speed serial link that requires no programming. Using PXI remote controllers, you can take advantage of the latest high-performance, low-cost PCs for control of your PXI system.

- Direct PC/laptop control of PXI/CompactPCI and PXI Express/CompactPCI Express systems
- Fiber-optic cabling options for distributed applications up to 200 m
- More than 800 MB/s of sustained throughput with low-latency cabled PCI Express link

Features

High Performance

PXI remote controllers use high-performance computers to stream live measurement or control data quickly.

Low Cost

These controllers offer the lowest entry cost into the PXI platform, with kits starting at $999 USD.

Control of Multiple PXI Chassis

You can build multichassis PXI systems by daisy chaining individual PXI chassis up to 200 m apart.

Learn more at **ni.com/pxi**

Timing and Synchronization Modules

PXI timing and synchronization modules use the trigger bus, star trigger, and system reference clock features of PXI to implement advanced multimodule and multisystem synchronization. Through shared clocks, triggers, and time references, you can vastly improve the accuracy of measurements and implement advanced clocking and triggering schemes.

- Control PXI trigger bus and PXI star trigger lines
- Synchronize multiple PXI chassis
- Synchronize hybrid systems with GPIB, VXI, and other instruments

Learn more at **ni.com/pxi**

Features

Synchronization

With PXI timing and synchronization modules, you can tightly synchronize multiple PXI systems with chassis-to-chassis skew below 100 ps.

Clock Generation

You can generate clocks from DC to 1 GHz with 1 µHz resolution.

References

High-stability OCXO and TCXO reference clocks are available with a maximum stability of 50 ppb. With the NI PXI-6682 and PXI-6682H, you can reference GPS, IEEE 1588, and IRIG-B time sources.

Data Record and Playback

Because it is based on the high-bandwidth PCI and PCI Express buses, the PXI platform enables instruments and data acquisition modules to continuously stream data to and from high-speed RAID hard drive arrays.

- External RAID hard drive enclosures or in-chassis storage options
- Up to 600 MB/s sustained reading and writing to disk
- Up to 12 hard drives with 3 TB total storage capacity

Learn more at **ni.com/pxi**

Features

High-Bandwidth Interface

PXI systems interface to the RAID hard drive arrays using cabled PCI Express.

Standard File I/O

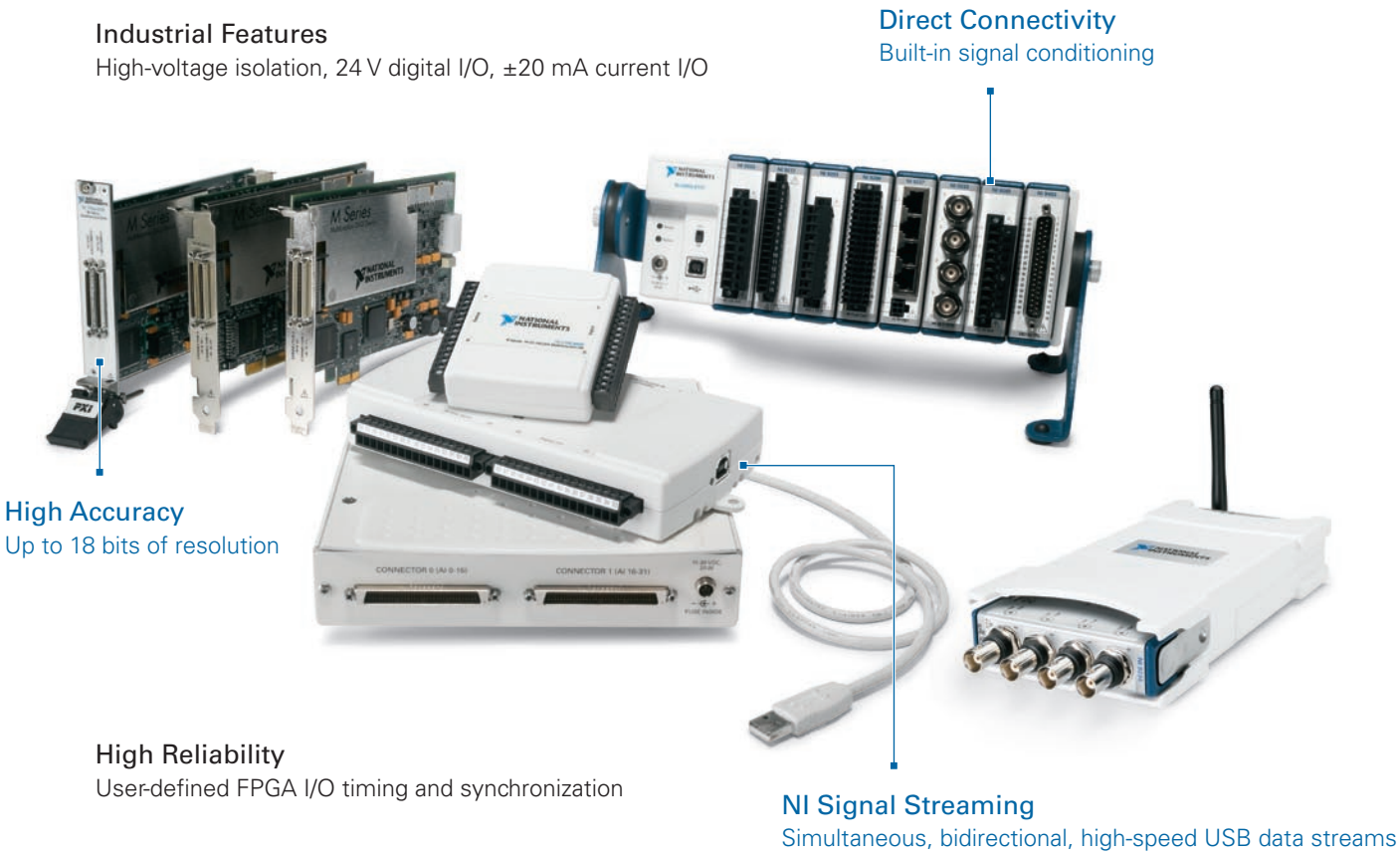
NI data streaming systems support standard file I/O application programming interfaces.

RAID

The external RAID hard drive enclosures support multiple RAID levels, including 0, 1, and 5.

NI Data Acquisition and Signal Conditioning

The purpose of data acquisition is to measure a physical or electrical phenomenon such as voltage, current, temperature, pressure, or sound. PC-based data acquisition uses a combination of measurement hardware and software to provide a flexible, user-defined system for automating measurements and making data available for analysis. While each data acquisition system is uniquely defined by its application requirements, every system is designed to acquire, analyze, and present information. Use NI data acquisition (DAQ) to meet application challenges for any signal on any bus with easy, powerful software.

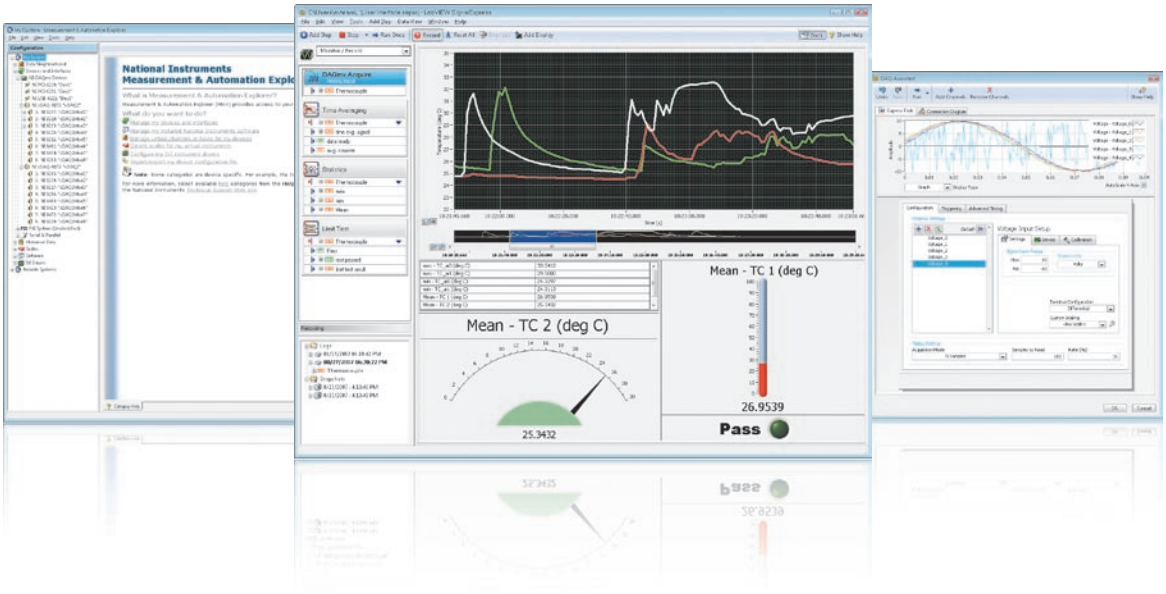


The NI Measurement Difference

NI data acquisition devices are optimized for absolute accuracy, high-speed performance, ease of use, and safety.

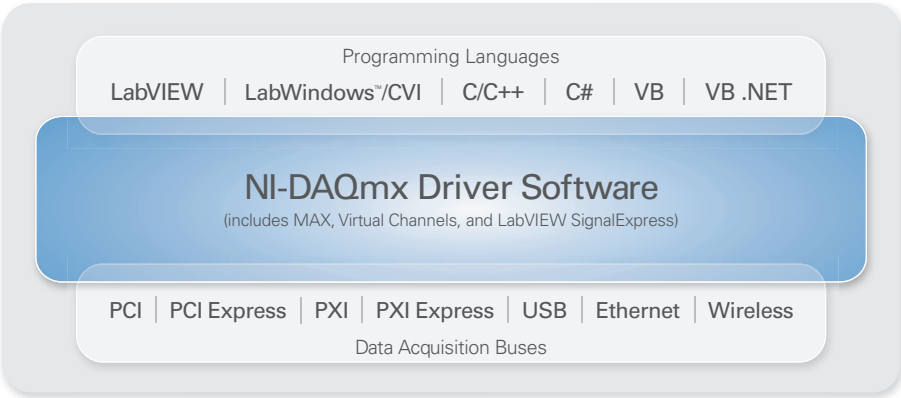
Any Bus — The most complete family of data acquisition devices for PCI, PCI Express, PXI, PXI Express, PCMCIA, USB, CompactFlash, Ethernet, and IEEE 802.11 wireless.

Any Sensor — Signal conditioning for high- or low-channel-count systems and a wide range of sensors, including strain, temperature, high-voltage, and pressure.



NI Data Acquisition Software

When building a data acquisition (DAQ) system, selecting the right driver software is just as important as choosing the instrumentation. NI-DAQmx, a high-performance, multithreaded driver, abstracts data acquisition bus technology and provides a consistent API across multiple programming languages. So no matter which language you use, NI-DAQmx software can simplify any application.



Learn more at **ni.com/dataacquisition/software**

NI-DAQmx Driver Software

NI Measurement & Automation Explorer (MAX)

Configure, test, and simulate NI-DAQmx hardware. Easily access wiring diagrams and other documentation.

NI-DAQmx Virtual Channels

Create virtual channels through wizards that map configuration information to specified physical channels.

LabVIEW SignalExpress

Visualize and log data with free software that is included with all NI-DAQmx devices.

NI X Series Multifunction DAQ

X Series devices for PCI Express and PXI Express – the most advanced data acquisition devices ever designed by National Instruments – are optimized for use with multicore PCs. They integrate high-performance analog, digital, and counter/timer functionality into a single device, making them well-suited for applications ranging from basic data logging to control and test automation.

NI-PGIA 2 Amplifier Technology

- Custom instrumentation class amplifier
- True 16-bit resolution at 1 MS/s scan rate
- Low settling times to ±1 LSB at 1 µs

NI-MCal Calibration Methodology

- 4X more accurate self-calibration
- Third-order correction for nonlinearity, offset, and gain
- Calibration for each input range in a scan list
- Ultrastable, low-drift precision voltage reference

NI-STC3 Timing and Synchronization Technology

- Four 32-bit counters for PWM, encoder, frequency, and more
- 100 MHz timebase for precise sample clock generation
- Independent analog and digital timing engines
- Retriggerable analog I/O, digital I/O, and counter I/O

Native x1 PCI Express Interface

- Dedicated bandwidth of up to 250 MB/s in each direction
- 8 DMA channels for analog I/O, digital I/O, and all four counters

Learn more at **ni.com/xseries**

Simultaneous Sampling X Series on PXI Express

- Take advantage of up to 16 ADCs per device for higher sampling rates per channel and reduced phase offset
- Synchronize up to 272 analog input channels in a PXI Express chassis
- Easily acquire from multiple devices with NI-DAQmx multidevice tasks
- Log data to TDMS files at up to 1.2 GB/s with new Configure Logging VI

NI M Series Data Acquisition for PCI/PXI

M Series multifunction data acquisition (DAQ) combines analog input, analog output, digital I/O, and two counter/timers on a single PCI or PXI device. The M Series integrates NI-MCal technology to ensure accurate analog measurements at all signal ranges by compensating for nonlinearity error during self-calibration. The NI-PGIA 2 custom instrumentation class amplifier provides true 16-bit resolution at 1 MS/s scan rates and low settling times.

- Up to 80 analog inputs, 48 digital I/O lines, four analog outputs
- Two 80 MHz, 32-bit counter/timers
- 10 MHz clocked (correlated) digital I/O lines
- 5 V TTL/CMOS or 24 V digital logic levels

Learn more at **ni.com/daq/mseries**

NI M Series Product Families

	Input Resolution	Max Input Sampling Rate	Output Sampling Rate	Digital I/O	Signal Conditioning
High-accuracy	18 bits	625 kS/s	2.8 M	5 V, 10 MHz	Lowpass filter
High-speed	16 bits	1.25 MS/s	2.8 M	5 V, 10 MHz	—
Industrial	16 bits	250 kS/s	500 k	24 V, 60 VDC	Bank isolated
Low-cost	16 bits	250 kS/s	833 k	5 V, 1 MHz	—

NI S Series Simultaneous Sampling DAQ

With a dedicated analog-to-digital converter (ADC) per channel, high-performing S Series DAQ devices are ideal for applications such as transient analysis; ultrasonic, radar, and sonar measurements; 42 V automotive applications; and industrial measurement and control.

- Up to 64 MS onboard memory
- Channel-to-channel isolation
- Dynamic signal measurement up to 5 MHz

Learn more at **ni.com/dataacquisition**

Benefits

Eliminate Crosstalk

Obtain higher absolute accuracy by avoiding the channel crosstalk caused by multiplexer charge injection.

Preserve Phase Relationship

With up to eight ADCs per device, simultaneous sampling DAQ preserves the phase relationship between input channels.

Increase Data Throughput

Expand your overall device data throughput by sampling at the maximum rate on every channel – stream up to 80 MB/s.

M Series DAQ for USB

M Series devices for USB deliver high-performance data acquisition in an easy-to-use and portable package. Bus-powered devices provide up to 32 analog input channels and sampling rates of up to 400 kS/s; wall-powered devices offer up to 80 analog input channels at up to 1.25 MS/s along with screw, mass, and BNC termination options. All USB M Series devices integrate industry-leading M Series technologies and patent-pending NI signal streaming for sustained bidirectional high-speed data streams over USB.

Wall-Powered

- Up to 80 analog inputs (16-bit, up to 1.25 MS/s)
- Up to four analog outputs (16-bit, up to 2.8 MS/s)
- Up to 48 digital I/O lines (32 clocked)
- Two 32-bit counters
- Screw- and mass-termination available
- Integration with SCC signal conditioning
- Driver support for LabVIEW, LabWindows™/CVI, ANSI C/C++, C#, Visual Basic .NET, and Visual Basic 6.0

Bus-Powered

- Up to 32 analog inputs (16-bit, up to 400 kS/s)
- Up to two analog outputs (16-bit, up to 250 kS/s)
- Up to 24 digital I/O lines with optional external power
- Two 32-bit counters
- 60 V, CAT I isolation available
- Screw termination
- Driver support for LabVIEW, LabWindows/CVI, ANSI C/C++, C#, Visual Basic .NET, and Visual Basic 6.0

Learn more at **ni.com/daq/usb**

OEM USB M Series DAQ

Board-only versions of USB devices are ideal for OEM integration with various computing platforms including laptops and single-board computers. Recognizing that OEMs have different needs from end-user customers, NI offers product customization, quantity pricing, and free 30-day evaluation kits for qualified customers.

Learn more at **ni.com/oem**

Low-Cost USB-6000 Series

Low-cost NI USB DAQ devices provide basic functionality for applications such as simple data logging, portable measurements, and academic lab experiments. They are affordable for student use yet powerful enough for more sophisticated measurement applications. All low-cost USB DAQ devices include free NI LabVIEW SignalExpress LE data-logging software.

Learn more at **ni.com/daq/usb**

NI CompactDAQ USB Data Acquisition

NI CompactDAQ is a rugged, portable, USB data acquisition system designed for high-performance mixed-signal measurement systems. With more than 50 C Series modules and module channel counts ranging from four to 32 channels, you can create a test system that is customized for your measurement needs and expandable for future projects. Four- and eight-slot chassis are available so you can build smaller or larger systems with up to 256 channels.

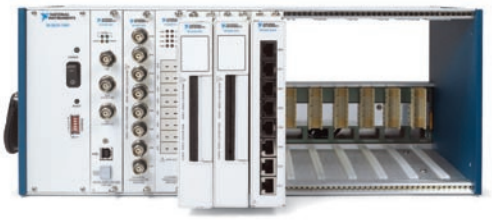
- More than 50 measurement modules
- Ability to stream data at rates ranging from low-speed DC to more than 5 MS/s
- Most modules feature up to 2300 V_{rms} withstand isolation for system and operator safety
- Operational temperature range of -20 to 55 °C
- Built-in signal conditioning and connectivity for a system with fewer components
- Run analog input modules at different rates with multiple timing engines
- Support for LabVIEW, LabWindows™/CVI, ANSI C/C++, C#, Visual Basic .NET, and Visual Basic 6.0
- Included data-logging software to acquire and save data to ASCII text, binary, or Microsoft Excel file
- Windows 7/Vista/XP compatibility

Learn more at **ni.com/compactdaq**

NI C Series Integrated USB Carriers

C Series USB carriers offer the same integrated signal conditioning as NI CompactDAQ in a smaller, more portable form factor. Select C Series modules are available in the single-sleeve carrier for low-cost, low-channel-count applications.

Learn more at **ni.com/daq/usb**



NI SCXI – High-Channel-Count Signal Conditioning

SCXI is a high-performance signal conditioning and switching platform for measurement and automation systems.

- Customize your system with a wide variety of modules
- Link chassis to expand to up to 3,072 channels
- Protect your system with isolation up to 300 V
- Save costs by choosing a four- or 12-slot chassis
- Use driver support for LabVIEW, LabWindows™/CVI, ANSI C/C++, C#, Visual Basic .NET, and Visual Basic 6.0

Learn more at **ni.com/signalconditioning**

Featured Products

Four-Slot SCXI Chassis
A rugged, low-noise chassis with a compact design that can hold up to four SCXI modules.

USB Data Acquisition for SCXI
Full-featured 16-bit USB data acquisition and control module for SCXI analog input, analog output, digital I/O, and switching modules.

RTD Module
16-channel analog input module for three-wire and four-wire RTD measurements.

NI R Series Multifunction RIO

R Series multifunction RIO devices feature user-defined, onboard processing for flexible system timing and triggering. An FPGA-based system timing controller makes all analog and digital I/O configurable for application-specific operation with embedded custom logic. R Series devices offer up to eight analog inputs, up to eight analog outputs, and up to 160 digital I/O lines.

- LabVIEW FPGA-configured hardware for custom onboard decision making
- Digital lines individually configurable as inputs, outputs, counter/timers, PWM, flexible encoder inputs, or specialized communication protocols

Learn more at **ni.com/rseries**

Applications

High-Speed Control Loops
With LabVIEW code that executes in silicon, you can implement multiple analog PID control systems at loop rates exceeding 100 kHz and digital decision making at 40 MHz.

Custom Digital Protocols
Implement both standard and custom digital communication protocols with commercial off-the-shelf (COTS) hardware.

Sensor Simulation
Simulate complex analog and digital sensors for test system validation and hardware-in-the-loop (HIL) test.

Digital I/O

Industrial digital I/O (DIO) devices are suitable for a wide range of automation applications including controlling switches, relays, actuators, fans, lights, and motors. These devices offer the following specialized industrial features for high reliability:

- Programmable power-up states ensure actuators and relays begin in a known state
- Watchdog timers detect and respond to fault conditions
- Change detection triggers applications with minimal processor usage
- Programmable input filters remove glitches and spikes
- Isolation provides safety and prevents ground loops

Features

Low-Cost Digital I/O
Up to 96 5 V TTL/CMOS lines for PCI, PXI, PCMCIA, and USB.

30 V Bank-Isolated Digital I/O
Up to 64 sourcing or sinking digital I/O lines with 24 V logic levels.

Up to 150 V Digital Relays
Mechanical or solid-state relay devices with up to 150 VDC channel-to-channel isolation.

Learn more at **ni.com/digitalio**

Counter/Timers

Counter/timer devices, which feature up to eight 32-bit counters, provide a variety of time-related measurements and fulfill critical timing functions as components of complex measurement systems. Use counter/timers for:

- Frequency measurements
- Edge/event counting
- Pulse-width measurements
- Event timestamps
- Quadrature encoders
- Frequency generation
- Frequency division
- Pulse-train generation
- Pulse-width modulation

Features

High Voltage
Up to 48 VDC channel-to-channel isolation for industrial applications.

High Precision
High-stability (75 ppb) timebase and GPS-based synchronization for high-precision measurements.

Learn more at **ni.com/digitalio**

Analog Output

Analog voltage and current output devices cover a full spectrum of test and control applications from basic software-timed output to complex high-speed waveform generation. Analog output devices feature:

- Up to 1 MS/s per-channel arbitrary waveform generation
- 12-, 13-, or 16-bit resolution
- ±10 V voltage or 0 to 20 mA current outputs
- High-channel density
- Multidevice synchronization
- Digital triggering and external clocking
- Simultaneous updates
- Eight digital I/O lines
- Two 24-bit counter/timers

Features

Software-Timed Outputs
Simultaneous software-timed single-point updates across many channels for control applications.

Waveform Generation
Onboard FIFOs and high-speed update rates for simple sine, square, and triangle waves or more complex user-defined waveforms.

Learn more at **ni.com/daq**

NI Wi-Fi Data Acquisition

National Instruments Wi-Fi data acquisition (DAQ) devices combine IEEE 802.11 wireless or Ethernet communication, direct sensor connectivity, and the flexibility of NI-DAQmx software for remote monitoring and control of electrical, physical, mechanical, and acoustical signals. These devices stream data in real time for easy-to-use, high-performance remote wireless sensor measurements.

- C Series signal conditioning for thermocouples, RTDs, accelerometers, microphones, strain gages, 4 to 20 mA current, and more
- Streaming waveform measurements at up to 250 kS/s
- Advanced security with IEEE 802.11i (WPA2 Enterprise) support

Learn more at **ni.com/wifi**

Benefits

Simple
NI-DAQmx driver software provides a single interface for all NI USB, Ethernet, and wireless DAQ devices in multiple programming languages.

Secure
WPA2 Enterprise security, including 128-bit AES encryption and 802.1X authentication, ensures the integrity of your wireless network.

Wi-Fi
You can use high-bandwidth IEEE 802.11g Wi-Fi DAQ devices to stream dynamic waveform measurements over existing network infrastructure.

NI Wireless Sensor Networks

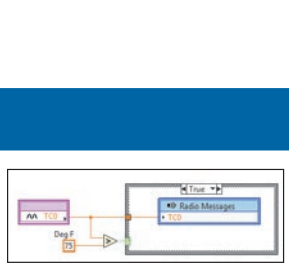
The NI wireless sensor network (WSN) platform delivers NI measurement quality and LabVIEW ease of use to remote monitoring applications. NI WSN combines battery-powered measurement nodes, industrial ratings, and a reliable mesh networking protocol to offer a complete monitoring solution for low-power, long-range, and long-term applications.

- Wireless communication range up to 300m
- Three-year node battery power with a one-minute sample interval
- Powered mesh routing to increase range and reliability

Learn more at **ni.com/wsn**

LabVIEW WSN Module

The LabVIEW WSN Module delivers a graphical development environment to create and wirelessly deploy embedded applications to WSN measurement nodes. Use LabVIEW WSN to interface with custom sensors, improve battery life, and perform local decision making.



NI Modular Instruments

NI modular instruments combine world-class measurement hardware with optimized measurement and analysis software. With modular instruments, you specify the essential functionality you require and choose from a wide variety of measurement, signal generation, RF, power, and switch modules. Then configure those instruments in software for your specific measurement tasks. Because these instruments are modular and software-defined, you can quickly interchange and easily repurpose them to meet your evolving test needs. With reconfigurable I/O (RIO) instruments, software configuration extends to powerful, open FPGAs for even greater instrument customization. NI modular instruments provide high-speed test on a variety of platforms including PXI, PXI Express, PCI, PCI Express, and USB.

RF Instruments
Acquisition and generation up to 6.6 GHz

Mixed-Signal Instruments
Digitizers, arbitrary waveform generators, dynamic signal acquisition, and high-speed digital I/O

Precision DC Instruments
Digital multimeters, power supplies, and source measure units

Switching
Complete switch offering including multiplexer, matrix, RF, and general purpose

Platform Advantages

Performance – Specialized instruments for high-resolution, high-speed, and high-channel-count applications.

Flexibility – Software-defined measurement capability for automated test and customization, including RIO technology for FPGA-enabled test.

Integration – Ability to tightly synchronize modular instruments and integrate the measurements with test software to achieve solutions from design to manufacturing test.

NI Digitizers/Oscilloscopes

Digitizers offer several advantages over traditional stand-alone oscilloscopes by delivering an open architecture and flexible software. With a National Instruments digitizer, you can not only perform standard oscilloscope measurements but also easily build other instruments such as spectrum analyzers, transient recorders, and ultrasonic receivers. In addition, you can synchronize multiple NI digitizers with other instruments with picosecond-level accuracy for high-channel-count and mixed-signal applications.

Features

- Real-time sampling up to 2 GS/s, equivalent-time sampling up to 20 GS/s
- Up to 24 bits of resolution for high dynamic range, low-distortion measurements
- Simultaneous sampling on up to eight channels per board or multiple instrument synchronization for higher-channel counts
- Deep onboard memory up to 512 MB per channel for long waveform captures
- USB, PCI, PXI, and PXI Express models

High Speed

- Up to 2 GS/s real-time sampling and 1 GHz bandwidth
- Deep onboard memory up to 512 MB per channel for long waveform captures

High Channel Count

- 60 MS/s sampling rate on eight simultaneously sampled channels for up to 136 phase-coherent channels

High Resolution

- Highest dynamic range and highest resolution of any digitizer on the market
- Flexible resolution from 16 to 24 bits

Learn more at **ni.com/digitizers**

High-Speed Data Streaming

Using PXI Express digitizers from National Instruments, you can stream data at the full data rate of 400 MB/s to the PC memory or RAID 0 array of disks. This streaming capability makes NI PXI Express digitizers ideal for applications such as signal intelligence, radar, and IF/RF data streaming.

Learn more at **ni.com/streaming**

NI FlexRIO

NI FlexRIO integrates high-performance and user-customizable I/O with NI reconfigurable I/O (RIO) and LabVIEW FPGA technology. With the standard interface, you can interchange NI FlexRIO adapter modules and FPGA modules for the exact combination of I/O and FPGA processing power your application demands. NI FlexRIO enhances the capability of the PXI platform by providing easier access to new semiconductor technology, custom hardware designs, and high-performance FPGA-based algorithms.

Learn more at **ni.com/flexrio**

Adapter Module Options

NI Adapter Modules

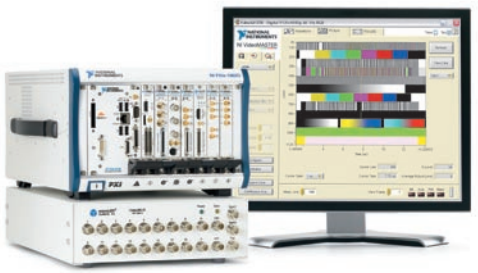
NI FlexRIO adapter modules from National Instruments bring high-performance, instrument-class I/O to LabVIEW FPGA.

Third-Party Adapter Modules

National Instruments Alliance Partners provide application-specific and custom NI FlexRIO adapter modules.

Custom Adapter Modules

Build your own NI FlexRIO adapter module with the NI FlexRIO Adapter Module Development Kit.



NI VideoMASTER

NI VideoMASTER, a versatile video analysis and generation test suite for validation and production test, works with a wide variety of video standards and formats for both analog and digital video. Combining PXI-based, software-defined modular instruments with configurable NI TestStand test steps, VideoMASTER shortens development time and increases throughput of video test applications.

- Composite, S-video, and component analog video analysis
- HDMI/DVI video signal analysis including HDCP encryption, deep color, and Full HD video (1080p/60 Hz)
- Hundreds of built-in video measurements for rapid test development

Learn more at **ni.com/videomaster**

Features

Set-Top Box Testing

Combine analog and digital video testing in a single, high-performance solution optimized for automated measurements.

HDTV Testing

Generate custom video patterns to automate HDTV testing including colorbars and multiburst.

NI Signal Generators

National Instruments PXI and PCI signal generators include versatile arbitrary waveform generators, function generators, and clock generators. By combining these instruments with the NI Analog Waveform Editor, you can produce completely user-defined signals in minutes. Whether generating simple sine and clock signals or complex modulated communications waveforms, the broad offering of NI signal generators can improve your prototyping and test systems by delivering world-class performance and higher system throughput.

Features

- Up to 16-bit resolution at a 400 MS/s sampling rate for high dynamic range and bandwidth
- Deep waveform and instruction memory for long play times
- Download rates up to 600 MB/s using PXI Express
- Continuous streaming rates up to 200 MS/s (400 MB/s) with PXI Express
- Powerful waveform linking, looping, scripting, and triggering
- Onboard signal processing for interpolation upconversion to intermediate frequencies

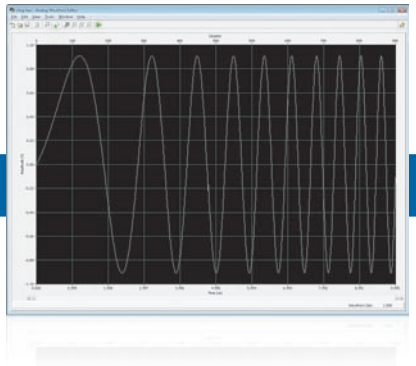
Function Generators

- DC to 100 MHz
- 1.07 µHz frequency resolution

Arbitrary Waveform Generators

- Up to 512 MB shared waveform data and sequence instruction memory
- Multimodule/multichannel synchronization with <20 ps skew
- PCI, PXI, and PXI Express models

Learn more at **ni.com/signalgenerators**



NI Analog Waveform Editor

Create and edit analog waveforms with this tool. To view or edit waveforms, you can open and resample data files saved in binary or ASCII file formats. After importing your waveforms, you can view and edit them. You can also create new waveforms by selecting from a library of more than 20 waveform primitives or by entering a mathematical expression.

High-Speed Digital I/O

With a software-defined platform for generation or acquisition of digital vectors, you can design high-channel-count digital test systems with subnanosecond multimodule synchronization. Use deep onboard memory to create complex digital test patterns for semiconductor test, complex communication/protocol schemes, and multimedia test.

- Data delay – Shift acquisition or generation data with up to 40 ps resolution
- Hardware compare – Compare expected data with acquired information
- Scripting – Link and loop waveforms from onboard memory to create infinite test vectors
- DDR – Double instrument data rate by transferring data on both the rising and falling clock edges

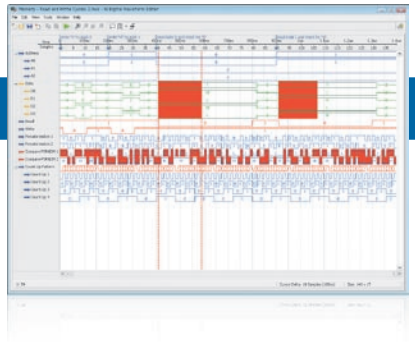
Product Family	Maximum Clock Rate	Voltage Levels	DIO Channels	Direction Control	Form Factor
5 V TTL/CMOS, low-cost	2/20 MHz	5 V	32	By 8-bit ports	PCI/PXI/PCMCIA
Selectable voltage, low-cost	25/50 MHz	2.5, 3.3, 5 V	32	Per-channel	PCI Express/PXI Express
Selectable voltage, high-speed	50/100/200 MHz	1.8, 2.5, 3.3, 5 V	32	Per-channel	PCI/PXI
Programmable voltage, bidirectional	50/100 MHz	-2 to 5.5 V (10 mV steps)	20	Per-channel, per-cycle (tri-state)	PCI/PXI
Differential voltage, high-speed	100/200 MHz	LVDS, LVTTL	16	Per-channel (SDR), dedicated I/O (DDR)	PCI/PXI

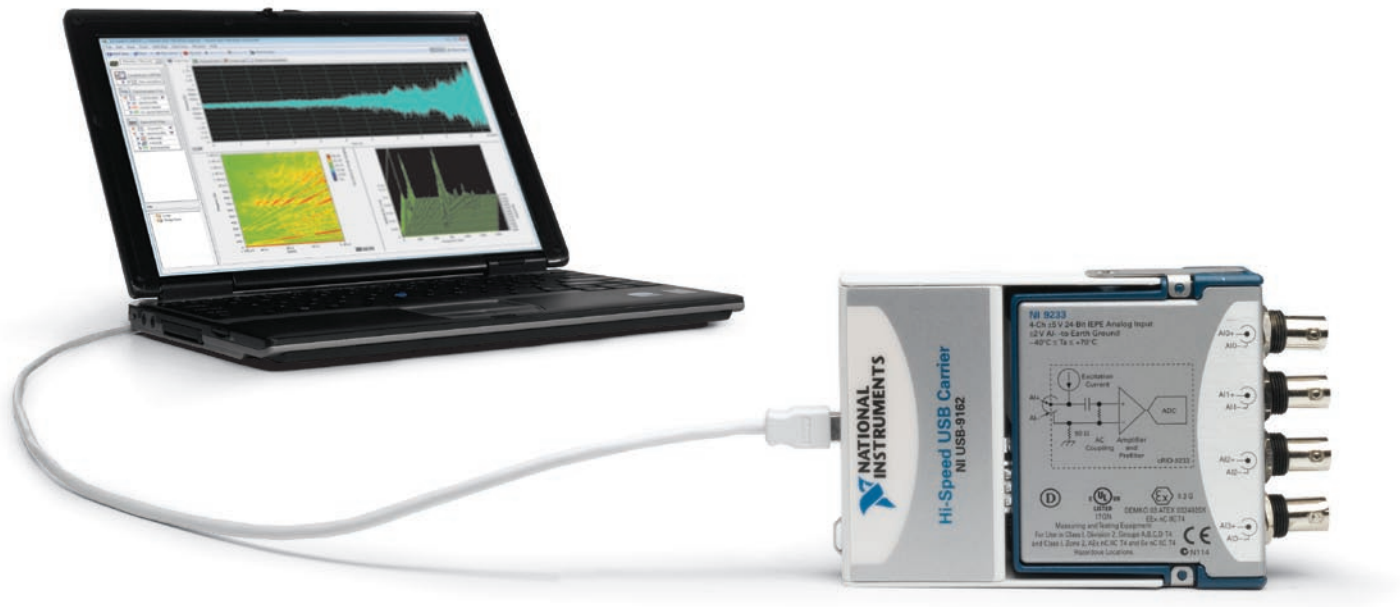
Learn more at **ni.com/hsdio**

NI Digital Waveform Editor

Use this interactive software tool to create digital signals/buses as well as import existing test vectors from VCD or ASCII files for interfacing and communications applications.

- Design digital vectors with six drive and compare states (0, 1, Z, H, L, and X)
- Use built-in patterns for count up/down, PRBS data, and more
- Highlight bit errors in designs and "play" signals with LabVIEW SignalExpress





NI Dynamic Signal Acquisition Hardware and Software

National Instruments sound and vibration measurement hardware provides the flexibility and performance required by applications such as acoustic test and noise mapping, vibration analysis, dynamic structural test, machinery monitoring and diagnostics, and audio performance validation. NI dynamic signal acquisition (DSA) devices for USB, PCI, PXI, PXI Express, and NI CompactRIO are ideal for precision measurements with microphones, accelerometers, and other transducers that have very large dynamic ranges.

Features

- 24-bit ADCs and DACs with up to 118 dB dynamic range and multiple gains
- Up to 204.8 kS/s sampling rate (AI) and 204.8 kS/s update rate (AO)
- 2-, 4-, 8-, and 16-channel options with AC/DC coupling, IEPE conditioning, antialiasing filters, and TEDS
- NIST-traceable calibration certificates included

High-Density PXI Modules

- 16 simultaneous analog inputs offer the highest channel density
- 24-bit ADCs with sampling rates up to 204.8 kS/s
- Four gain settings from ±316 mV to 10 V
- Ability to synchronize up to 272 channels in a single PXI chassis or more than 13,000 channels in a distributed system with <0.1 deg mismatch

Learn more at **ni.com/soundandvibration**

NI Sound and Vibration Measurement Suite

NI sound and vibration analysis software includes both a configuration-based, ready-to-run acquisition and processing package and comprehensive LabVIEW analysis VIs for acoustic, vibration, structural test, and machine monitoring applications.

- Interactive viewing, processing, and logging of live data
- Flexible audio, octave, and frequency response analysis
- More than 30 LabVIEW Express VIs and more than 50 example code bases
- Vibration trending and order analysis to define machine vibration

NI AudioMASTER

NI AudioMASTER is an audio generation and analysis test solution for analog and digital audio validation and production test. With it, you can use the same tool from validation and verification through production test. This tool provides a full-featured audio analyzer inside the NI TestStand environment. You can perform swept sine test and define single tone production test values all in NI TestStand.

- View data in NI TestStand to determine appropriate limits
- Perform any audio test

RF Instruments

Testing today's complex RF and microwave devices requires a fast, flexible, and accurate RF instrumentation platform. NI modular RF instruments incorporate technologies such as multicore processors and the PCI Express data bus to achieve measurement speeds that are three to 10 times faster than traditional instruments in automated test applications. In addition, with the inherent flexibility of a software-defined platform, you can test multiple wireless standards from GPS to wireless LAN to WiMAX with the same RF instrumentation.

RF Signal Generators

- Continuous wave generation up to 6.6 GHz
- Vector or continuous wave signal generation up to 6.6 GHz with 100 MHz of instantaneous bandwidth
- Up to 512 MB of onboard memory
- -145 to +10 dBm output power
- Typical phase noise (10 kHz offset) at 1 GHz is -110 dBc
- Tuning times less than 300 µs in cellular and PCS bands
- Capable of streaming signals from disk at full bandwidth

RF Signal Analyzers

- Vector signal analyzers up to 6.6 GHz with 50 MHz of instantaneous bandwidth
- Up to 80 dB spurious-free dynamic range
- Up to +30 dBm input range
- Typical phase noise (10 kHz offset) at 1 GHz is -110 dBc
- Tuning times less than 400 µs in cellular and PCS bands
- Capable of streaming signals from disk at full bandwidth
- Typical noise floor as low as -158 dBm/Hz at 1 GHz

Learn more at **ni.com/rf**

RF Accessory Modules

RF accessory modules include a 6.6 GHz USB true RMS power meter with typical linearity of ±0.13 dB, a programmable 8 GHz attenuator with up to 60 dB attenuation, and a programmable 8 GHz amplifier with up to 30 dB of gain and 1 dB compression point at +20 dBm.

RF and Communications Software

With software-defined measurement systems from NI, you can keep pace with rapidly evolving wireless standards. National Instruments RF tools deliver a highly flexible software selection to help you stay ahead of the latest developments.

NI LabVIEW Modulation Toolkit

- Signal generation, analysis, and visualization
- Processing of standard and custom digital and analog modulated signals

NI Spectral Measurements Toolkit

- Provides functions for power spectrum, peak power, and power in band

NI WLAN Measurement Suite

- LabVIEW and C-style API
- Example programs for generation and analysis of IEEE 802.11a/b/g signals

NI Measurement Suites for Fixed and Mobile WiMAX

- LabVIEW and C-style APIs
- Example programs and demo panels for the generation and analysis of IEEE 802.16-2004 and IEEE 802.16e-2005 signals

NI GPS Simulation Toolkit

- Use with PXI RF vector signal generators as a GPS constellation simulator
- Provides simulation for up to 24 hours
- On-the-fly signal creation
- Simulates custom motion trajectories

Learn more at **ni.com/rf**

NI RIO IF Transceivers

National Instruments PXI and PCI reconfigurable I/O (RIO) intermediate frequency (IF) transceivers bring the flexibility and performance of LabVIEW FPGA to RF test and measurement applications. They feature high-performance, dual-channel inputs and outputs coupled to Xilinx FPGAs and interface with NI and third-party upconverters and downconverters.

Learn more at **ni.com/transceivers**

NI Digital Multimeters

National Instruments digital multimeters (DMMs) achieve remarkable throughput rates while maintaining precise and stable measurements. NI DMMs accurately measure voltage, resistance, current, capacitance, inductance, and temperature. Build high-channel-count systems by integrating these DMMs with NI switch modules.

- Up to 7½ digits of resolution (26 bits) and up to 1.8 MS/s sample rate
- Voltage from 10 nV to 1000 V, current from 1 pA to 3 A, resistance from 10 µΩ to 5 GΩ
- Low-cost and high-performance devices for PXI, PCI, PCI Express, and USB

Learn more at **ni.com/digitalmultimeters**

Features

Intuitive Software

The NI-DMM instrument driver makes configuration quick and easy and helps you tightly synchronize DMMs and NI switches.

Superior Accuracy

The NI 7½-digit DMM offers the best DC accuracy of any instrument in its class with 12.5 ppm accuracy over a two-year calibration cycle.

Guarding and Current Amplification

Combine NI DMMs with the six-wire guard and current amplifier module to guard signals for in-circuit test or to measure current with subpicoamp resolution.

NI Programmable Power Supplies and SMUs

National Instruments precision DC sources combine high-resolution, high-speed outputs with accurate voltage and current measurements. These instruments provide constant current or voltage, sweep IV curves, and measure leakages in automated test systems or lab environments.

- High-precision, four-quadrant outputs with down to 10 pA measurement sensitivity or up to 40 W sourcing and 2 A current
- Fast, accurate, multichannel power supplies with integrated voltage and current readback capability on low-noise outputs

Learn more at **ni.com/powersupplies**

Features

Fast Sweeping

These products offer sourcing and measurement speeds up to 3 kHz along with hardware triggering for automated measurements.

Configurable Current and Voltage

Stack outputs for up to 46 V or connect the channels in parallel for up to 2 A on a single power supply module.

Intuitive Software

With an easy-to-use soft front panel and intuitive driver software for programmatic control, NI precision sources help get applications up and running quickly.

NI Switches

Whether you are performing high-accuracy, low-speed measurements on a dozen test points or high-channel, high-frequency characterizations of integrated circuits, National Instruments delivers a flexible, modular switching solution based on PXI or SCXI to help you maximize equipment reuse, test throughput, and system scalability. You can use the four types of NI switches in applications ranging from automobile ECU test, to in-circuit test, to even RF stimulus/response test. NI provides IVI-compliant NI-SWITCH driver software as well as a variety of connectivity options and accessories that make multimodule expansion easy.

Multiplexer

- Deterministic scanning with onboard memory
- Bandwidth from DC to RF
- Ideal for high-channel-count applications

Matrix

- Bandwidth from DC to 500 MHz
- Ideal for flexible, high-channel-count applications
- Matrix configurations determined by terminal blocks

General Purpose

- Turn on/off high-power devices such as motors, fans, and lights with SPDT and SPST relays
- Switch up to 300 VDC/300 V_{rms}, 12 A, or 26.5 GHz

RF

- Minimal insertion loss (less than 2 dB typical), reflection, and crosstalk
- Multiplexer, matrix, and general-purpose relay configurations
- Bandwidth up to 26.5 GHz; deterministic scanning with onboard memory

Learn more at **ni.com/switches**

NI Switch Executive

NI Switch Executive is an intelligent switch management and routing application that simplifies switch system configuration, increases test performance, and facilitates code reuse to help you reduce test system cost.

- Development system – Configure switch modules and control switches from any application software
- Deployment system – Import switch configuration from a file or network and validate deployment setup
- NI Developer Suite – Take advantage of a complete set of test tools and receive quarterly updates

Learn more at **ni.com/switchexecutive**

NI Programmable Automation Controllers

NI programmable automation controllers (PACs), programmed with LabVIEW software, combine the reliability and ruggedness of a programmable logic controller (PLC), the performance of a PC, and the flexibility of custom hardware. NI has incorporated these features into single-box solutions, so you can design, prototype, and deploy industrial systems and machines much faster and at a lower cost. Most NI PACs feature reconfigurable FPGA chips you can use to define your own custom hardware circuitry with LabVIEW graphical development tools. With LabVIEW FPGA, you can filter and process signals on the fly, run extremely precise and high-speed control loops, and protect your IP all on a single chip.

Industrial Controller
Fanless deterministic real-time processing and a rich user interface

CompactRIO
Embedded controller with reliable, high-speed FPGA-based I/O

NI Single-Board RIO
Lower-cost embedded deployment solution based on CompactRIO architecture

NI Smart Camera
Image sensor and a real-time embedded processor in a small, rugged package

Platform Advantages

Measurement-Quality I/O – Acquire and log high-speed and high-precision measurements from thousands of industrial sensors.

Open – Connect and communicate with PLCs, human machine interfaces (HMIs), enterprise software, and the Internet.

Performance – Analyze and control high-speed systems with PID, image processing, and other advanced algorithms.

NI CompactRIO

CompactRIO is a rugged, reconfigurable control and acquisition system designed for high performance and reliability. It combines an embedded real-time controller, a reconfigurable FPGA chassis, and NI C Series I/O modules. CompactRIO is powered by LabVIEW FPGA and LabVIEW Real-Time technologies.

Real-Time Controllers

- Stand-alone, real-time analysis, control, and logging
- Ethernet/serial ports for communication and connection to peripherals/displays

Reconfigurable Chassis

- 1M or 3M gate FPGAs for high-speed and precise timing, control, and triggering
- Onboard FPGA for high-speed and precise timing, control, and triggering

C Series I/O Modules

- Direct connection to analog and digital sensors, actuators; ability to create your own custom modules

Industrial and Machine Control

- Custom multiaxis motion control

Embedded Data Logging, Industrial Monitoring

- Automotive and industrial data logging
- Machine condition monitoring and protection

Learn more at **ni.com/compactrio**

Deterministic Ethernet Expansion

Expand your CompactRIO system with deterministic, distributed I/O to maintain the tight timing and synchronization needed for time-critical systems. Using real-time Ethernet, this eight-slot rugged chassis for C Series modules communicates deterministically with any CompactRIO, real-time industrial controller, or real-time PXI system that has two Ethernet ports. You can daisy chain multiple slave chassis from the controller to expand time-critical applications to high-channel counts while maintaining hard determinism. Plus, you can embed FPGA code on your expansion I/O to offload processing from the controller and reduce response time.

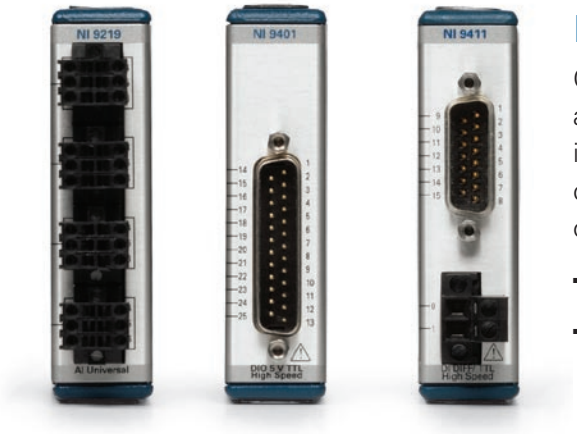
Learn more at **ni.com/distributedio/expand**

NI Single-Board RIO

National Instruments Single-Board RIO is a board-level embedded control and acquisition device for OEM applications. It combines the real-time processor, reconfigurable FPGA, and NI C Series analog and digital I/O components of the reconfigurable I/O (RIO) architecture onto a single-board computer (SBC).

- Real-time processor onboard for stand-alone, reliable control and monitoring
- Reconfigurable FPGA for deploying custom logic in software-defined hardware with LabVIEW FPGA
- Onboard analog and digital I/O with modular expansion to C Series I/O modules

Learn more at **ni.com/singleboardrio**



NI C Series for Industrial Applications

C Series modules provide I/O for hardware targets including NI CompactDAQ and CompactRIO. Each I/O module contains built-in signal conditioning and isolation for extended voltage ranges and industrial signal types, so you can connect wires directly from the modules to your sensors and actuators. Check online for an up-to-date list of supported modules.

- Modules are available for many signal types
- NI CompactDAQ supports most modules, and CompactRIO supports all C Series modules including custom modules

Learn more at **ni.com/compactrio**

Module Development Kit

With the CompactRIO Module Development Kit, you can build a module with your own custom circuitry and software driver for use with CompactRIO systems.

More Than 100 C Series Modules

- Voltage
- Current
- Temperature
- Accelerometer
- Strain
- Digital (12, 24, 48 V TTL)
- Counter/timer
- CAN communication
- Motion drive
- More than 50 specialty modules available from third-party developers

Industrial Controller with Windows or LabVIEW Real-Time OS

The NI industrial controller provides a flexible platform with broad software support and several options for expansion to a wide range of NI and third-party measurement I/O. Select an Intel Core Duo for parallel processing with LabVIEW and add the NI Real-Time Hypervisor to run LabVIEW Real-Time applications and Windows XP simultaneously on one controller.

- Rugged, high-performance, fanless industrial controllers with LabVIEW Real-Time OS
- Options for 1.66 GHz Intel Core Duo processor or 1.06 GHz Intel Celeron M
- Two Gigabit Ethernet ports for network connectivity to LabVIEW Real-Time platforms
- One PCI or PCI Express slot for expansion to PCI and PCI Express boards
- One MXI-Express connector for remote connectivity to PXI systems

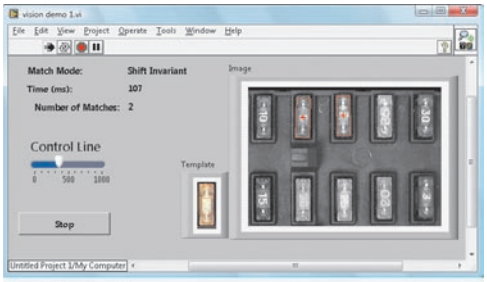
Learn more at **ni.com/pac**

NI Compact FieldPoint

Compact FieldPoint is a mature platform of programmable automation controllers that include a small I/O package with built-in signal conditioning and direct connectivity to a variety of industrial sensors.

- Class I, Division 2 industrial certification and -40 to 70 °C operating temperature
- Embedded data logger functionality with up to 4 GB of removable storage
- Ethernet and serial network interfaces to provide expansion I/O from any PC or LabVIEW Real-Time PAC

Learn more at **ni.com/compactfieldpoint**



NI Vision Development Module

Build highly customized machine vision applications with the Vision Development Module. Using the LabVIEW graphical programming environment, you have the option to develop your own custom image processing algorithms, optimize your inspection for speed, and integrate data acquisition and motion. The Vision Development Module includes:

- A large selection of add-ons, such as the LabVIEW FPGA Module, that complement the LabVIEW environment
- The NI Vision Assistant interactive prototyping environment that generates ready-to-run code

Learn more at **ni.com/vision/vdm**

Key Applications

Measure Features

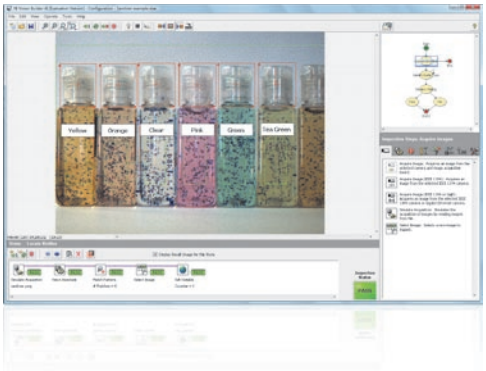
Verify widths and shapes with caliper and geometry tools, perform color or grayscale measurements, and count objects from cells to pistons.

Locate Objects

Detect edges even in fuzzy images; match patterns regardless of scale, position, or location; and check for presence and alignment of objects.

Identify Parts

Read 1D and 2D codes, read and verify text on packaging, and classify parts for sorting.



NI Vision Builder AI

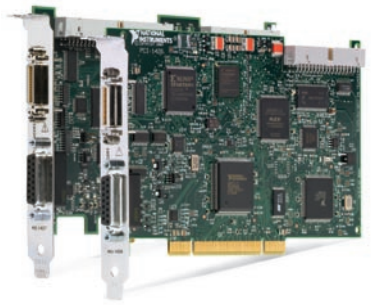
National Instruments Vision Builder for Automated Inspection (AI) is a configurable environment for machine vision that you can use to develop full machine vision applications with little or no programming.

- Work with all NI vision hardware for acquisition from thousands of cameras
- Rapidly develop with innovative state diagram tool
- Communicate triggering and inspection results directly to industrial devices over digital I/O, serial, and Ethernet protocols
- Build, benchmark, and deploy complete machine vision applications

Learn more at **ni.com/vision/vbai**

NI Vision Acquisition Software

NI Vision Acquisition Software provides an API to acquire, save, and display images from thousands of cameras, including area-scan, line-scan, color, monochrome, and infrared. The software acquires images using many standards, such as Camera Link, GigE Vision, IEEE 1394, USB, analog, and parallel digital, and works for all NI image acquisition hardware as well as third-party Gigabit Ethernet and IEEE 1394 devices. The software is included with all NI vision hardware and software.



NI Frame Grabbers

NI frame grabbers work with a wide range of camera buses and their modularity provides unequalled synchronization with data acquisition and motion products.

- Acquire from Camera Link, GigE Vision, IEEE 1394, analog, and parallel digital cameras
- Program vision applications using LabVIEW, C, C++, C#, Visual Basic, or Visual Basic .NET
- Choose from PXI, PXI Express, PCI, and PCI Express form factors
- Works in real-time and Windows OSs

Learn more at **ni.com/framegrabber**

NI Vision Automation Systems

NI vision automation systems combine industrial camera connectivity, open communication, and rugged, fanless designs.

- Acquire images from multiple GigE Vision, IEEE 1394, Camera Link, and/or USB devices
- Select high-performance options with multicore processors
- Choose between the NI Embedded Vision System and Compact Vision System form factors
- Take advantage of up to 29 digital I/O lines including TTL and optoisolated
- View images and inspection results in real time through video output
- Interface with other devices using RS232 serial, Modbus serial, Modbus/TCP, EtherNet IP, and TCP/IP

Learn more at **ni.com/vision/evs**

NI Smart Cameras

NI Smart Cameras combine an image sensor with a real-time embedded processor to achieve image acquisition and processing in one small, rugged package.

- Ideal for packaging inspection, assembly verification, 1D and 2D code reading, and robot guidance
- Includes integrated lighting control, isolated digital I/O, and industrial communication
- Increases algorithm performance with DSP coprocessor
- Features Vision Builder for Automated Inspection

Learn more at **ni.com/vision/smartcameras**

Develop Flexible HMI/SCADA Systems with NI LabVIEW

With LabVIEW graphical system design software, you can program your human machine interface (HMI) and NI programmable automation controllers (PACs) in the same environment, which minimizes development cost and training time. You can use the LabVIEW Touch Panel Module to target Windows XP Embedded HMIs for local operator interfaces or the LabVIEW Datalogging and Supervisory Control (DSC) Module to develop a local HMI/SCADA application.

LabVIEW DSC Module

- Networked, SQL-compliant database for distributed data logging
- Configuration-based alarms and events
- OPC and Modbus connectivity to PLCs and sensors
- Real-time and historical trending
- User-level application security
- Unlimited tags and open connectivity through custom I/O servers
- More than 4,000 user interface graphics

Learn more at **ni.com/dsc**

LabVIEW Touch Panel Module

- Support for Windows CE and XP Embedded-based HMI targets
- Ethernet download of application to remote touch panel hardware
- Communication to NI PACs through shared variable, TCP/IP, and other protocols
- Suite of built-in management examples to build intuitive operator interfaces
- Built-in tools for data analysis and communication

Learn more at **ni.com/hmi**

Related Products

5.6 in. Touch Panel Computer
Includes LCD transflective display, 64 MB onboard SDRAM with CompactFlash 2.0 expansion slot, and Windows CE Embedded OS.

12 and 15 in. Touch Panel Computers
This option comes with an SVGA TFT LCD touch screen display, 256 MB DDR SDRAM with 128 MB CompactFlash, and 500 MHz or 1 GHz processors running Windows XP Embedded.

15 in. Panel PC
Features an XGA/TFT color LCD touch screen, 1 GHz Celeron M fanless cooling, and 1 GB Ethernet.

NI Motion Control

By integrating flexible software with high-performance hardware, National Instruments motion control products offer a powerful solution for motion system design. From automating test equipment and research labs to controlling biomedical, packaging, and manufacturing machines, engineers and scientists use NI motion to meet a diverse set of application challenges faster and at a lower cost.

Motion Control Software

- Motion control software for PC-based, custom, and distributed motion control
- NI Motion Assistant intuitive, configuration-based software for fast motion application prototyping
- LabVIEW NI SoftMotion Module for custom motion control application graphical development

Motion Control Hardware

- Support for hundreds of servo, stepper, or piezo motors
- Motion control on PCI, PXI/CompactPCI, and CompactRIO platforms
- Synchronization with NI data acquisition and machine vision
- Stepper and servo power drives

Learn more at **ni.com/motion**

LabVIEW NI SoftMotion Module

- Design custom motion control applications using graphical development tools
- Benefit from functions for trajectory generation, spline interpolation, position, or velocity control
- Use the high-level function block API for simplified motion profile development
- Define custom axes that include standard I/O, custom control algorithms, or communication interfaces
- Create virtual prototypes using NI SoftMotion for SolidWorks

Stepper Drives and Motors

- High-power stepper drives with easy connectivity to NI motion controllers
- Advanced features for smooth motion
- Matched stepper motors for high performance

Controller Area Network (CAN), FlexRay, and Local Interconnect Network (LIN)

NI CAN, FlexRay, and LIN interfaces provide connectivity to automotive and embedded networks for sending, receiving, monitoring, logging, and simulating frame and signal data. Integration with the NI hardware and software platform enables a wide variety of automotive applications.

- New high-performance NI-XNET CAN and FlexRay interfaces for PCI and PXI
- Low-cost and portable CAN and LIN interfaces for USB
- Embedded CAN interfaces for the CompactRIO platform

Learn more at **ni.com/flexray** or **ni.com/lin**

Diagnostic and Calibration Toolkits for NI CAN Interfaces

Ideal for automotive OEMs and suppliers, NI CAN toolkits add functionality to NI CAN interfaces. The NI Automotive Diagnostic Command Set for KWP2000 (ISO 14230) and Diagnostics on CAN (ISO 15765) protocols help you access diagnostic trouble codes, flash electronic control unit (ECU) firmware, initiate diagnostics tests, and more. The NI ECU Measurement and Calibration Toolkit for XCP and CCP calibration protocols offers access to internal ECU characteristics for calibration applications. Both toolkits work with LabVIEW, LabWindows™/CVI, and Visual C/C++ 6.0.

Serial Interfaces for RS232, RS485, and RS422

NI serial interfaces are ideal for connecting a wide variety of devices to PC and PXI systems ranging from consumer electronics and PC peripherals to specialized military, industrial, and laboratory devices. You can add up to 16 standard COM ports per interface to a Windows or LabVIEW Real-Time system.

- Interfaces for PCI, PCI Express, PXI, USB, ExpressCard, and CompactRIO
- Standard and flexible baud rates up to 3 Mbits/s
- High-speed DMA transfer technology to reduce CPU usage and improve system performance
- Available 2000 V port-to-port isolation for industrial and harsh electrical environments

Learn more at **ni.com/serial**

PROFIBUS

NI PROFIBUS interfaces connect LabVIEW systems to any PROFIBUS network and device. Interfaces for CompactRIO, PCI, and PXI/CompactPCI can operate as master or slave nodes.

- LabVIEW Real-Time support for deterministic systems
- Configurator utility to easily set up PROFIBUS networks

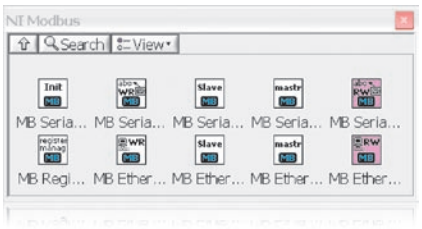
Learn more at **ni.com/profibus**

FOUNDATION Fieldbus

NI FOUNDATION Fieldbus interfaces connect H1 FOUNDATION Fieldbus devices to standard desktop, industrial, and notebook PCs.

- Link master or basic device available
- Configurator and monitor software for system setup and diagnostics

Learn more at **ni.com/fieldbus**



Modbus, EtherNet/IP, and DNP 3.0

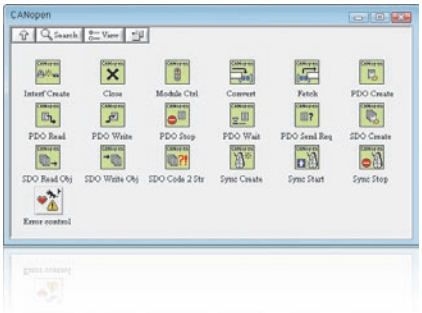
LabVIEW provides protocol connectivity to standard PCs and NI PAC platforms using several software-only drivers. These protocols use the controller's Ethernet and/or serial ports without requiring additional hardware interfaces.

Learn more at **ni.com/support**

EtherCAT

NI PAC platforms, such as CompactRIO, real-time PXI, and industrial controllers, support EtherCAT master functionality. For deterministic distributed I/O, daisy chain multiple NI 9144 chassis and an NI modular EtherCAT slave with FPGA capabilities.

Learn more at **ni.com/distributedio/expand**



NI CANopen Library

The NI CANopen LabVIEW Library is a set of VIs you can use to create CANopen master applications.

- Supports all high-speed NI Series 2 CAN interfaces
- Transmit and receive Service Data Objects (SDO) and Process Data Objects (PDO)

Learn more at **ni.com/canopen**

DeviceNet

Interface LabVIEW applications to DeviceNet networks.

- DeviceNet for control products have master functionality to easily manage other devices
- DeviceNet for test products have master and slave support for testing other DeviceNet products

Learn more at **ni.com/devicenet**

GPIB Instrument Control

For more than 30 years, National Instruments has provided a variety of instrument control solutions so you can get the most from your GPIB hardware and software investment while benefiting from advancements in computer technology.

- Compatibility with more than 20 computer platforms/OSs
- NI-488.2 – the de facto industry-standard API for GPIB
- Up to 8.0 MB/s with HS488

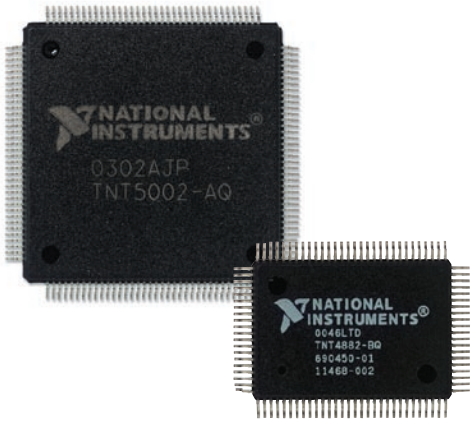
Learn more at **ni.com/gpib**

Features

Performance
NI GPIB performance includes sustained data transfer rates up to 1.8 MB/s (IEEE 488.1) and 8.0 MB/s (HS488).

OS Support
NI provides support for Windows including Windows 7 (32- and 64-bit), Mac, Solaris, real-time, and Linux OSs as well as a driver development kit for compatibility with any other OS.

Premier NI-488.2 API
This de facto industry-standard API has increased in performance and efficiency and remained unchanged in user experience for 20 years.



NI GPIB Application-Specific Integrated Circuits (ASICs)

National Instruments offers single-chip TNT GPIB Talker/Listener chips and drop-in replacement controller chips to help you upgrade your designs to IEEE 488.2 standards. NI GPIB ASICs are also RoHS-compliant (sometimes referred to as "lead free"). With GPIB ASICs, you can increase performance through faster clock inputs and enhanced functionality.

- TNT5002 high-performance, low-cost GPIB Talker/Listener ASIC for PCI
- NAT7210 drop-in replacement chip for NEC µPD7210 controller
- NAT9914 drop-in replacement chip for TI TMS9914A controller

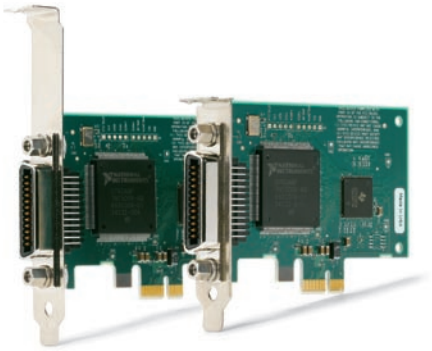
Learn more at **ni.com/gpib**

Features

Performance
Take advantage of 1.8 MB/s maximum transfer rates using IEEE 488.1 handshaking and up to 8 MB/s using HS488.

OEM Supplier
Contact National Instruments for your custom GPIB needs.

Legacy Support
Obtain drop-in replacements for legacy GPIB controllers/ASICs.



GPIB Controller for PCI Express and PCI

PCI Express and PCI controllers combine reliable, high-performance hardware with a complete suite of development tools to get your applications up and running fast.

- Support for Windows including Windows 7 (32- and 64-bit), Mac, Solaris, real-time, and Linux OSs
- Driver development kit for compatibility with any OS

GPIB Analyzer

National Instruments offers a complete GPIB analyzer and controller on a single device for both PCI and PCI Express. GPIB analyzer software features tools for interpreting captured GPIB information.

- Capture, analyze, and monitor the real-time state of each of the 16 GPIB data and control lines
- Take advantage of easy-to-use analyzer software with online help

GPIB Controller for Hi-Speed USB

The compact NI GPIB-USB-HS transforms any computer with a USB port into a full-function GPIB controller.

- Connect directly from a USB port to a GPIB instrument
- Reuse code for other NI GPIB controllers without modification
- Take advantage of support for Windows including Windows 7 (32- and 64-bit), Mac, and Linux OSs

GPIB Controllers for Ethernet and Serial

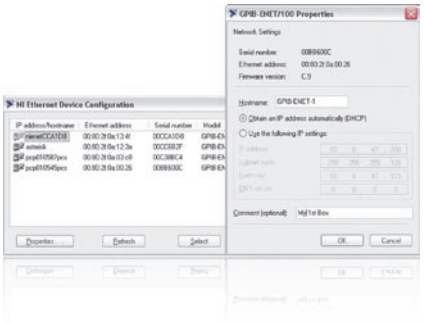
Connect to GPIB instruments and other common industry interfaces.

- Remote connection to any GPIB instrument connected with Ethernet
- Bidirectional serial controllers for conversion of serial and GPIB instruments via RS232 and RS485/RS422

Cables and Accessories

Choose from the following NI accessories:

- Adapters, cables, fixtures, and rack-mount kits
- Electrical isolation up to 2,500 VDC
- Direct cable length up to 2,000 m



GPIB Software

NI-488.2 software provides:

- High-performance, portable, and distributed GPIB applications using LabVIEW, LabWindows™/CVI, ANSI C/C++, C#, Visual Basic .NET, or Visual Basic 6.0
- Better system configurability and ease of use

Learn more at **ni.com/gpib**

VXI

As a VXI hardware and software leader, National Instruments offers VXI controllers that take advantage of off-the-shelf PC technologies to deliver state-of-the-art VXI control solutions. Comprehensive NI software – from NI-VXI and NI-VISA I/O software to LabVIEW, LabWindows™/CVI, and Measurement Studio for Microsoft Visual Studio application development tools – is vital to successful VXI development. This combination of hardware and software sets NI VXI controllers apart from the competition.

- Embedded one- or two-slot, C-size controllers or remote controllers for a PXI system, desktop PC, laptop, or workstation via PCI, PCI Express, or Hi-Speed USB
- VXIplug&play compliance and compatibility with software available for general-market computers
- High-performance, custom ASICs – the MITE and MANTIS – or VXI backplane resource access
- Ability to perform block-mode transfers, giving the processor time to perform application-specific tasks
- Full VXI Slot 0 capabilities, including slot identification and bus management responsibilities
- External VXI CLK10 synchronization for multiple mainframe configuration
- Advanced trigger/timing capabilities and full software and hardware control of the VXI trigger lines
- Ability to function as an interrupter and an interrupt handler for any or all of the VXIbus interrupt lines

Learn more at **ni.com/vxi**

Features

Intuitive Software

The NI-VXI/NI-VISA bus interface software features high-performance routines for industry-standard programming languages.

High Throughput

With the NI VXI-MXI-Express remote controller, you can achieve up to 29 MB/s sustained throughput across PCI Express and VXI.

Hybrid Systems

With NI VXI controller interfaces to PXI, PCI, PCI Express, and USB and intuitive software packages, NI makes it easy to build optimized, integrated test systems across multiple platforms.

NI Training and Certification

The National Instruments training and certification program is the fastest, most effective way to increase productivity with NI software and hardware. Courses designed by NI engineers help you learn the skills to develop robust, maintainable applications, and you can earn continuing education units and professional development hours with most courses. For greater flexibility, the NI Training and Certification Membership Program offers one year of unlimited access to regional training courses and certification exams. With training credits, organizations can purchase training for employees to take when needed within a one-year period.

Benefits of NI Training

- Shorten your learning curve
- Increase performance and reuse of your code
- Save development time and reduce maintenance costs

Benefits of NI Certification

- Gain recognition from the industry, employers, clients, and peers
- Differentiate technical competency for career advancement
- Distinguish expertise with professional credentials

Learn more at **ni.com/training**

Flexible Options for Improving Productivity

Local Classroom Training

NI engineers and certified instructors present hands-on training courses that include comprehensive reference guides. Limited class size ensures personal attention.

On-Site Training

Optimize training cost per employee and avoid travel expenses by bringing an instructor on-site. Combine course topics for more focused instruction tailored to your employees.

Individual Online Training

Attend a virtual class with live, instructor-led courses featuring slides, application sharing, quizzes, and two-way voice communication. Also try self-paced online courses.

Academic Discounts

NI provides substantial discounts to students, educators, and researchers at qualifying academic institutions. The highest discounts are available in special packages designed for academia, including site licenses, starter kits, and product bundles, or you can receive standard academic discounts on any other NI products and services.

Learn more at **ni.com/academic**

GSA Contract Holder
FSS Contract GS-24F-0007K

OEM Discounts

In addition to supplying free 30-day evaluation kits and world-class technical support, NI offers pricing discounts for qualified OEM applications. Discounts may apply to the company's industry-leading data acquisition and GPIB products or to a variety of other measurement and automation tools found in this product guide. NI also offers both hardware and software customization for qualified customers. Take advantage of the company's OEM Elite Program.

Learn more at **ni.com/oem**

GSA Pricing

With the General Services Administration Federal Supply Schedule (GSA FSS), approved vendors can offer products to U.S. Government agencies and authorized contractors at "prenegotiated" discount rates. This alleviates delays in the procurement process caused by price negotiation for government accounts. In 1999, NI was awarded the GSA Federal Supply Schedule Contract GS-24F-0007K.

Learn more at **ni.com/gsa**

Corporate and International Branch Offices

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