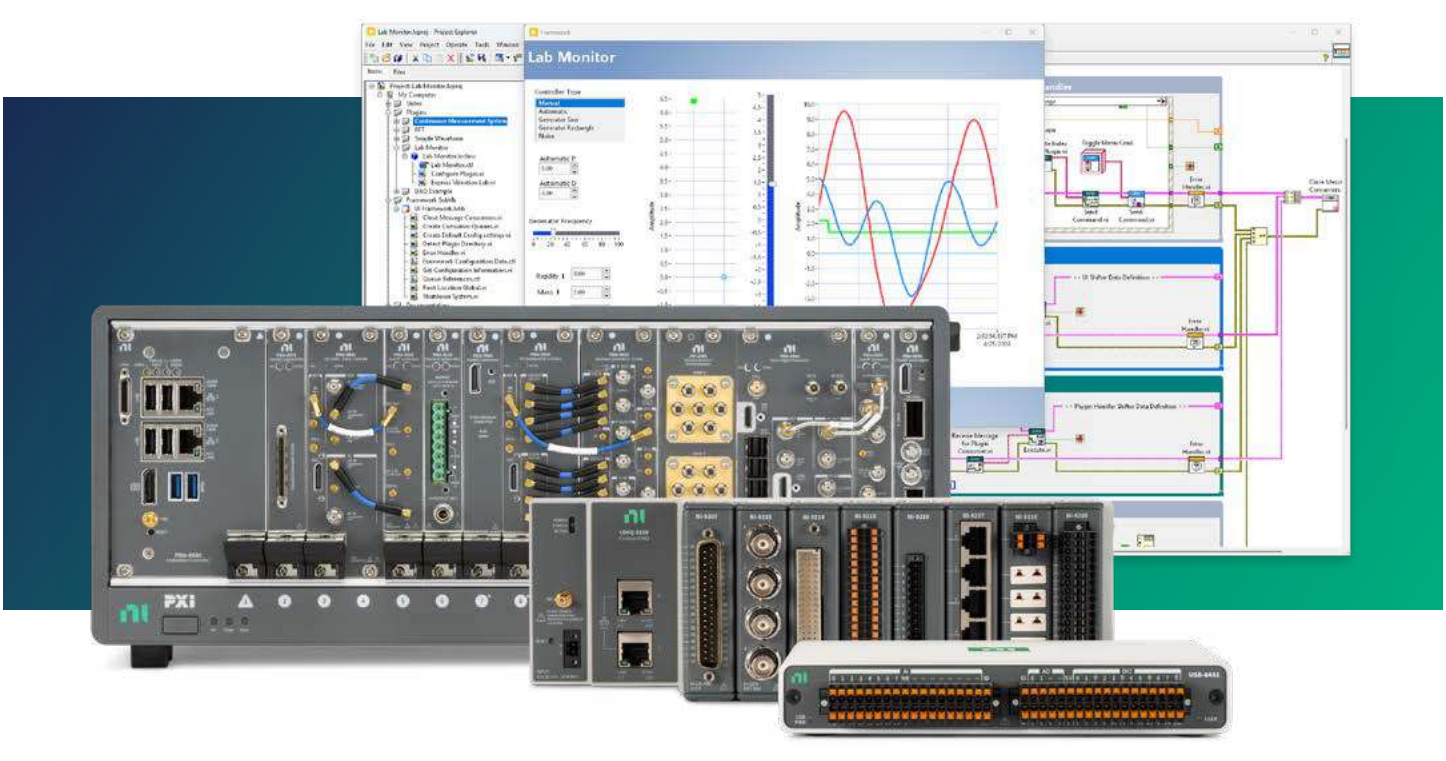
NI Product Catalog



September 2025

dataTec

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>>> www.datatec.eu

Authorized Distributor

Contents

What Makes NI Different for Test and Measurement

At our core, we're passionate about test technology and improving product performance. We know your research or latest product design will move markets and improve the world we live in. We're here to help you.

We Are Software-Obsessed

NI products are designed for software. From simple USB devices to advanced RF testbeds, engineers working with NI systems see software as a defining element of test.

Our Hardware Is Modular

You may be used to purpose-built boxed instruments; when you need a new measurement or more channels, you buy a whole new box. With NI hardware, you change or add measurements by adding new modules. Just like you upgrade your PC with a new graphics card, you can upgrade your NI test system with a new oscilloscope module.

The NI Ecosystem Is Open

Test engineers benefit most when they combine NI software with NI hardware, but NI hardware works with other (non-LabVIEW) popular programming languages and NI software connects to non-NI hardware. Choose the tools that work for you.

Why NI for Test

Every company says they save you time and money. Here are the challenges NI solves to do it.

Flexibility

Changing designs, market needs, and supply chains challenge product development. Use NI tools to adapt and stay on schedule.

Standardization

Don't spend time and money repeating work. Lower your cost of test by sharing code libraries and hardware architectures amongst all of your test teams.

Quality

NI is known for data throughput, acquisition rates, synchronization, and measurement quality. Better products need better test.

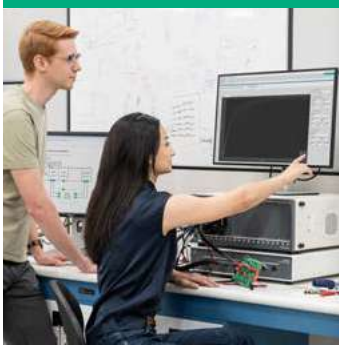
Productivity

You are a critical part of test. NI improves your productivity, so you focus more on what matters to you, your team, and your business.

Find NI Anywhere There Is Test

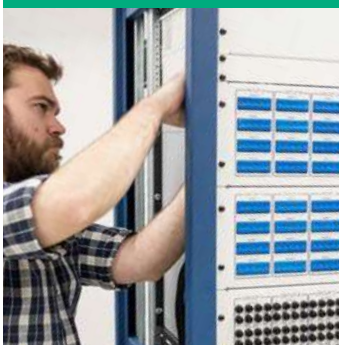
NI works with more than 40,000 customers each year to deliver the test and measurement technology engineers use to create better products, on time, while driving down the cost of test. Find NI anywhere there is test, including:

Quick desktop measurements to test design assumptions



Mechanical and sensor-based tests to validate specifications

Automated software (HIL) test racks to cover the whole test envelope in less time



Manufacturing test systems to improve test quality and throughput

Industries Served

- Semiconductor
- Electronics (consumer and industrial)
- Electrical components (motors, switches)
- White goods and appliances
- Automotive
- Aerospace
- Military and defense
- Life sciences
- Academic (teaching and research)
- Heavy equipment, industrial, and off-highway
- Commercial and government research labs
- Energy: Smart grid
- Energy: Renewables research
- Energy: O&G mid/downstream and well-servicing

Companies and Engineers Seeing Success with NI Today

Qorvo

2x

test throughout and prepared for 5G

Hyundai

83%

lower development time for new test systems per variant

Honeywell

40%

reduction in cost of each test station

Philips

$2M+

reduction in OpEx per project

Philips Rethinks Functional Test, Shortening Time to Market

"The move to a COTS approach using PXI and LabVIEW was critical to this production-test success at Philips. The combination of best-in-class modular hardware along with industry-standard software was pivotal to millions of dollars and hundreds of hours saved in production test engineering."

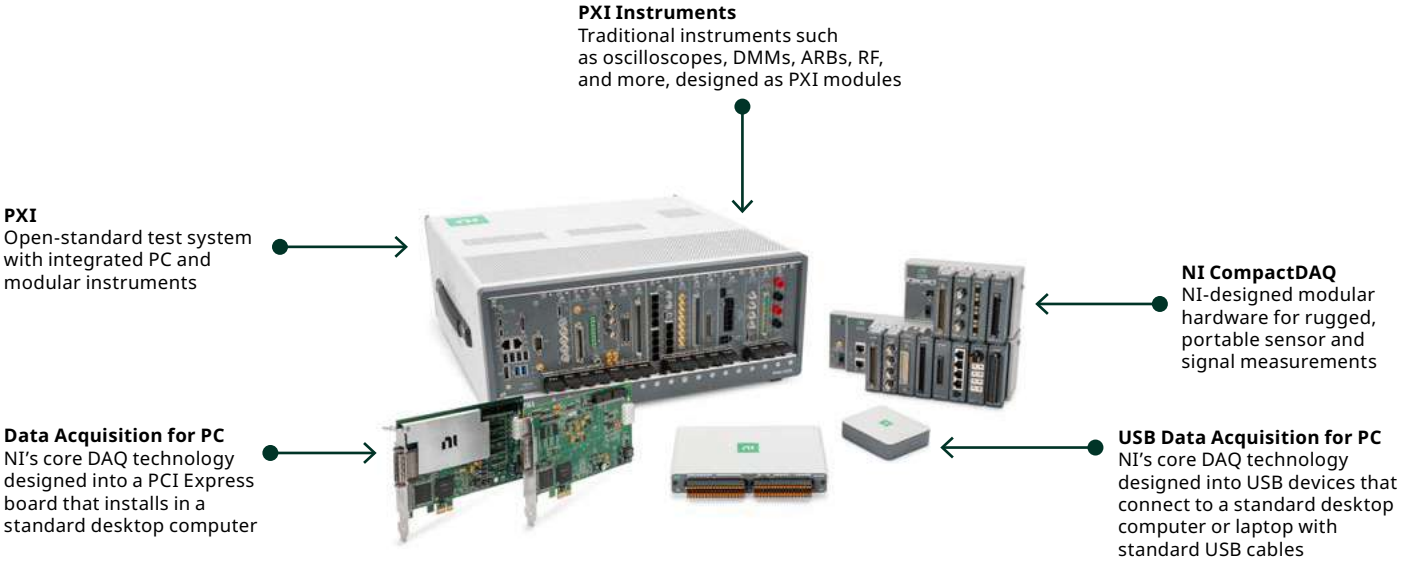
Neil Evans
Senior Manager, Philips

Productivity Boost in Postsilicon Validation

"It was never easier to configure the PXI instruments and run automated measurement without much coding in a few minutes of setup time. I believe the powerful combination between InstrumentStudio™ software and TestStand with the sweep loop is an incredible feature that (will) boost our productivity for debugging activities in postsilicon validation."

Wolfgang Rominger
NXP

NI Hardware Is Modular



Mix and match NI's modular hardware with a PC to build a custom test and measurement solution for the desktop, lab bench, or production floor.

NI Software

Our comprehensive software portfolio scales from the instrument to the enterprise, allowing us to serve a complete range of needs, from performing a simple measurement to managing test systems across the globe.

Why Choose NI Software?

Test and measurement applications are different. While general-purpose tools are great, they aren't built for test and measurement engineers, like NI software is. At NI, we recognize that the needs of test and measurement applications are unique because they must measure and interact with the real world. This presents challenges that a developer in other application areas will never encounter. Using an NI solution, you can:

Work with Speed and Efficiency—With a tightly connected toolchain of specialized tools, you can work in the most productive environment for any given task, with minimal time lost when switching between them.

Engineer with Confidence in an Evolving World—You need software that harnesses the latest commercial technologies such as AI, GPUs, and IT security standards in a way that allows you to leverage them without distraction.

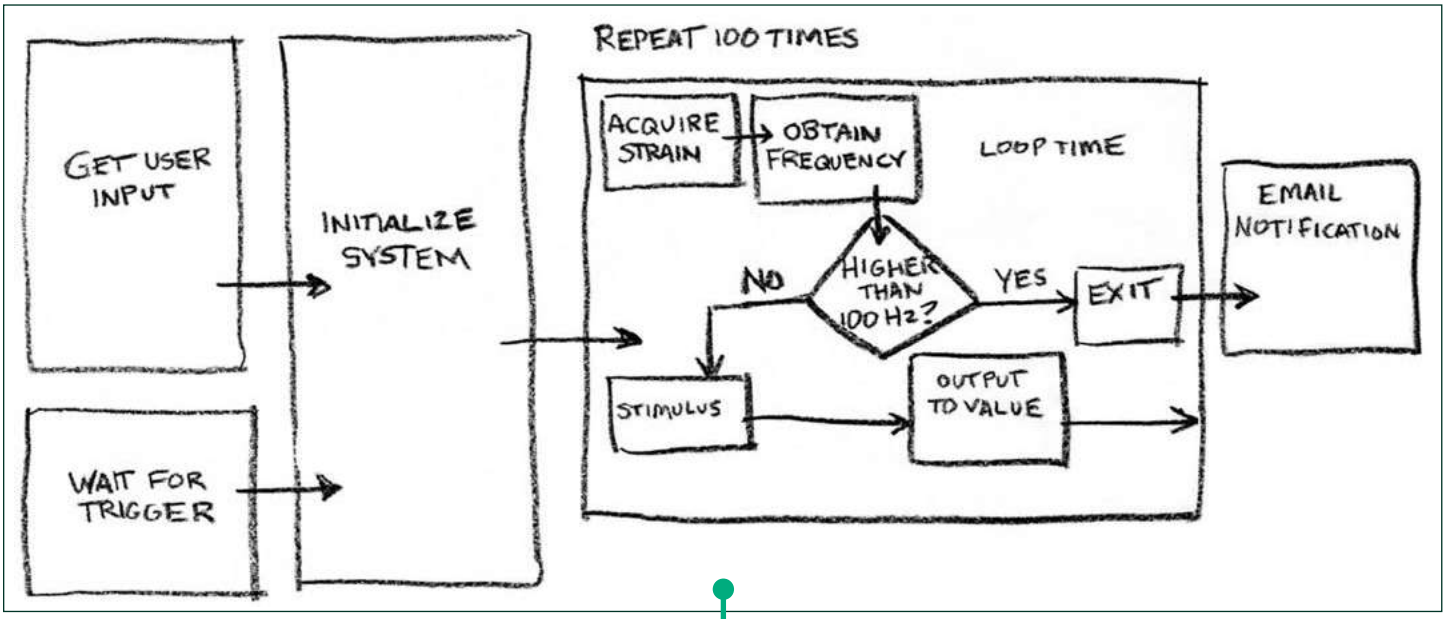
Work as Part of a Community—Gain insight from an active, global test-and-measurement-specific community with forums, user groups, and events.

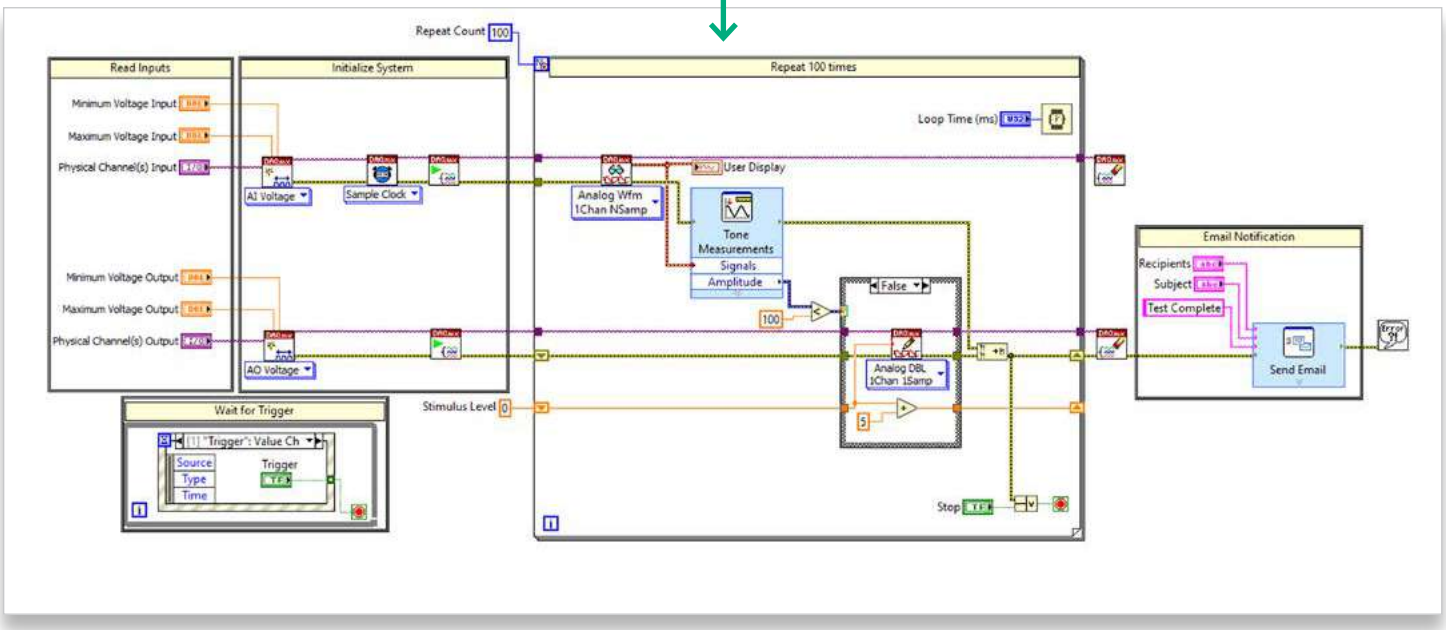
Why Choose LabVIEW for Test

In 1986, we released LabVIEW, and have been the leaders in automated test since. From performing a simple voltage measurement to advancing space missions, LabVIEW has been engineers' tool of choice. Let's take a look at why engineers choose LabVIEW:

Program Like You Think

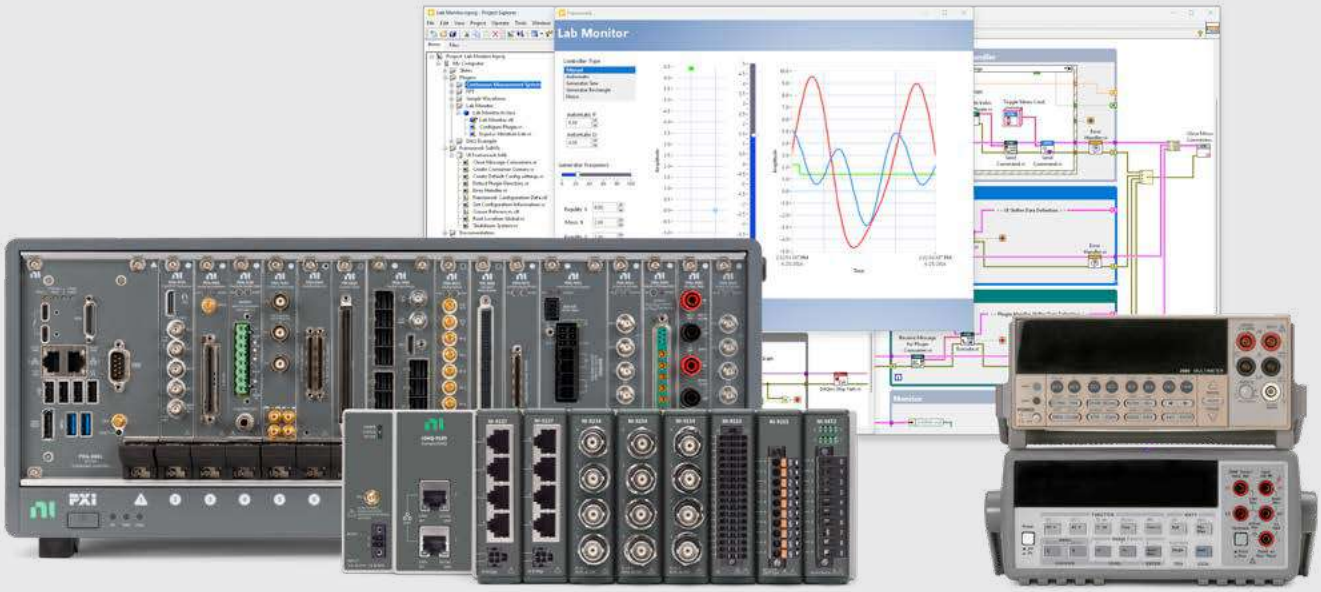
Graphical data flow in LabVIEW (bottom) is like flowchart logic (top) and considered easier by many to interpret and debug.





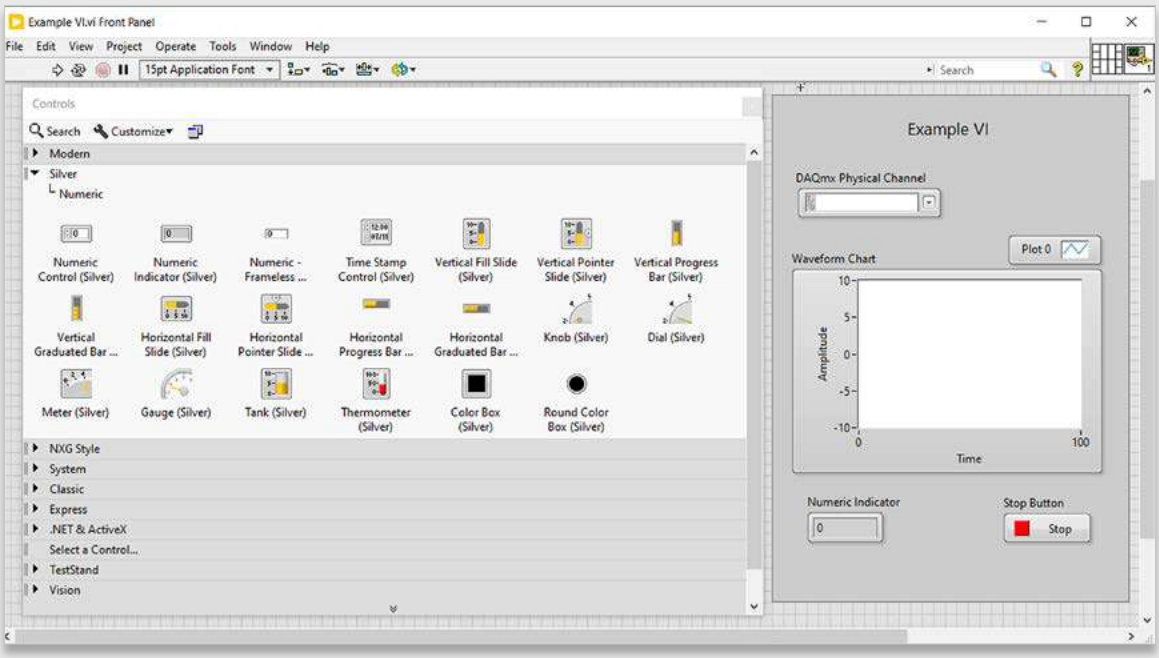
LabVIEW Connects to Everything in Your Test System

Get unparalleled instrument connectivity with LabVIEW–automate NI and non-NI hardware. Any device is accessible and programmable with thousands of available instrument drivers.



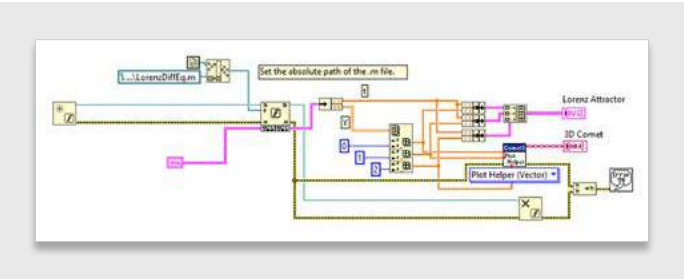
Build a Custom User Interface in Minutes

Use drag-and-drop UI elements to build a custom professional test panel. The UI elements in LabVIEW are designed specifically for engineers building test and measurement systems.

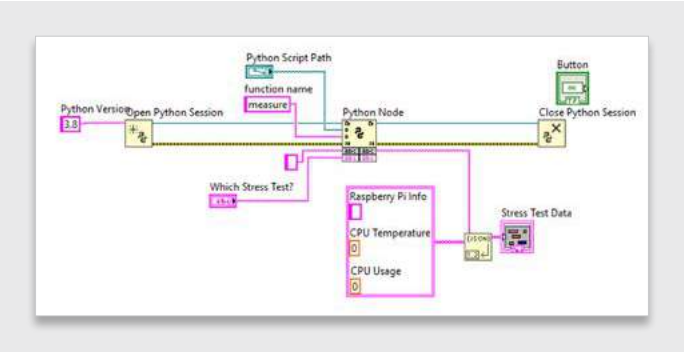


Integrate Code from Other Programming Languages

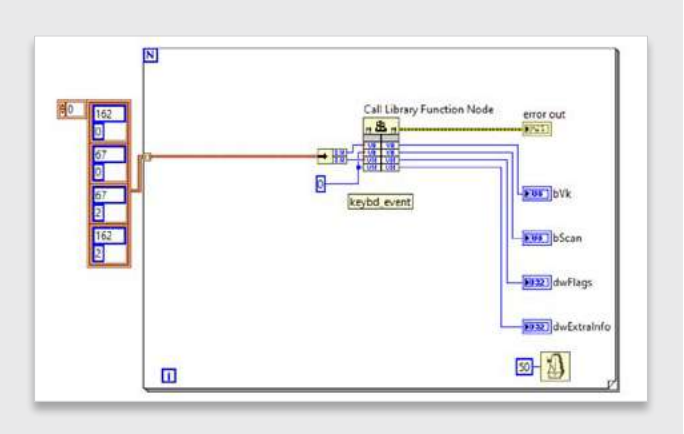
Add new algorithms and data analysis routines, and connect to other systems with code written in Python, C, and .NET. Language flexibility and integration save time.



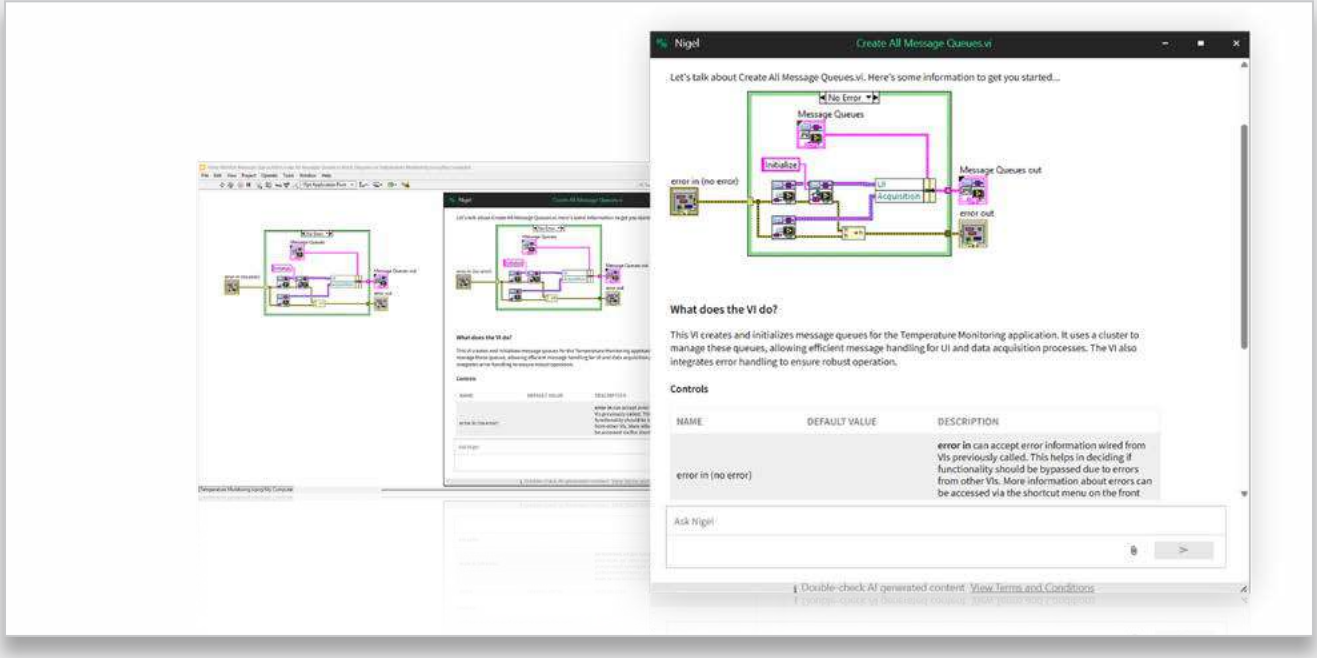
MATLAB® Software



Python



C/C++, C#



NI Nigel™ AI Advisor

Your Trusted Test and Measurement Companion

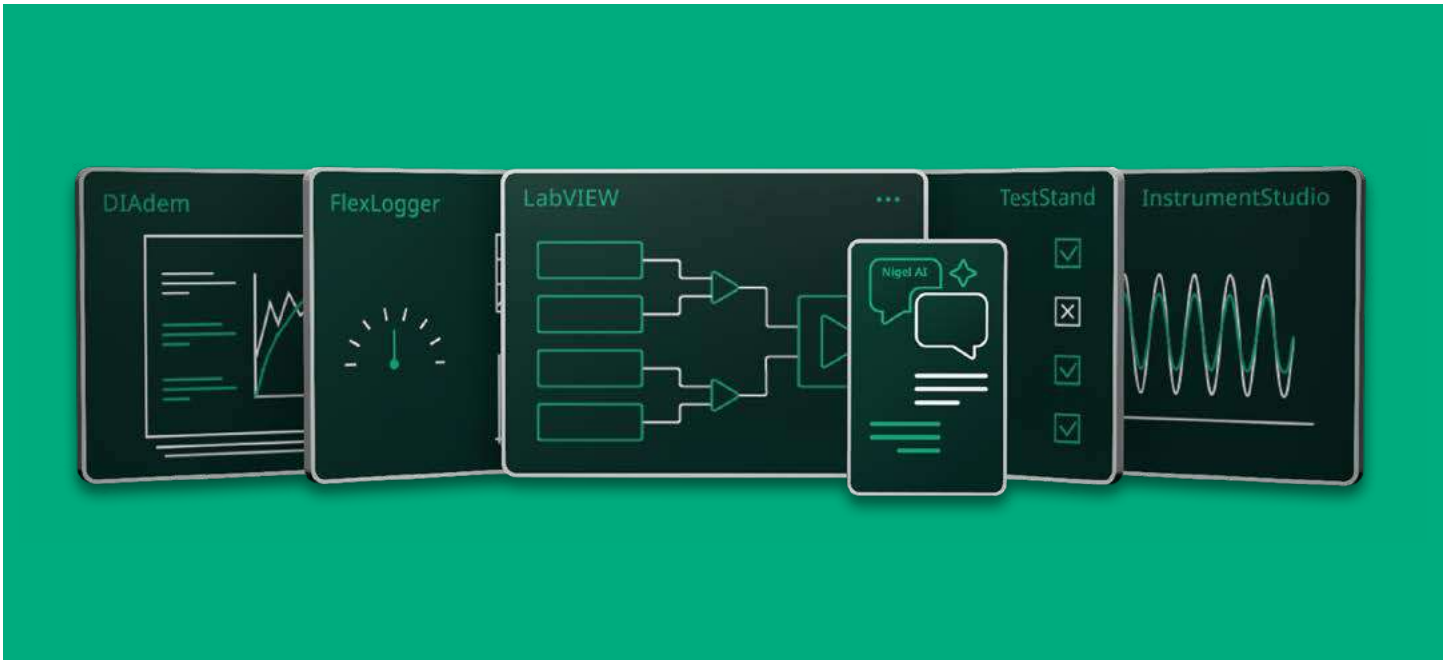
Nigel is an AI advisor purpose-built for test and measurement workflows. Nigel's contextual guidance, automation, and insights work with NI software to help eliminate time-consuming development tasks, boosting your productivity and impact. Nigel is now available to help you be even more productive while developing in NI LabVIEW and NI TestStand. Let's look at what makes Nigel special:

Optimized for Test—Nigel is built for test applications. It leverages our extensive domain expertise and trusted data to deliver smarter, more relevant answers so you can make faster, more informed decisions.

Fully Integrated—Nigel is integrated into LabVIEW, offering relevant suggestions based on what you're working on without the need to switch between software applications. Even better, it's included at no extra cost with existing LabVIEW+ Suite and LabVIEW Professional subscriptions or an active service agreement.

Just the Beginning—As Nigel expands across the NI platform and grows more capable, you'll gain deeper, more holistic insights into your test system. More tasks that consume valuable time will become automated, freeing you to focus on more impactful engineering work. As Nigel becomes better, so will you.

Get Access to All the Software You Need in the LabVIEW+ Suite



788509-35

It's LabVIEW, plus whole lot more. The LabVIEW+ Suite brings together the best of NI test software that saves engineers time by optimizing every part of their workflow. Each software includes features and capabilities designed to accelerate test:

- NI LabVIEW is the industry-leading environment for automated test system development.
- NI TestStand is used in validation labs and on manufacturing floors across the world to automate and sequence tests.
- NI DIAdem saves engineers hundreds of hours of manual data analysis and report creation with automation.
- NI FlexLogger and InstrumentStudio software make measurement and instrument configuration a quicker and interactive process.

The suite provides purpose-built tools for automating measurement, analysis, and test that work together to save you time.

Measure

Take a Quick Measurement

Configure NI hardware channels for sensor, analog, and digital signals

Interactively set up PXI instruments and debug unexpected behavior

Powered by:

Test

Optimize Test for Validation and Production

Create test sequences with code from LabVIEW, Python, C/C++, and .NET

Track units and automatically store test results to your database

Powered by:

Analyze

Interactively Analyze Data

Use built-in engineering analysis functions for calculations

View any type of data, quickly and all at once, with segmented displays

Powered by:

Create and Share Reports

Drag-and-drop to graphics to create shareable reports for your team or organization

Automate your postprocessing routine with VBS or Python

Powered by:

NI LabVIEW™

NI DIAdem™

NI TestStand™

NI FlexLogger™

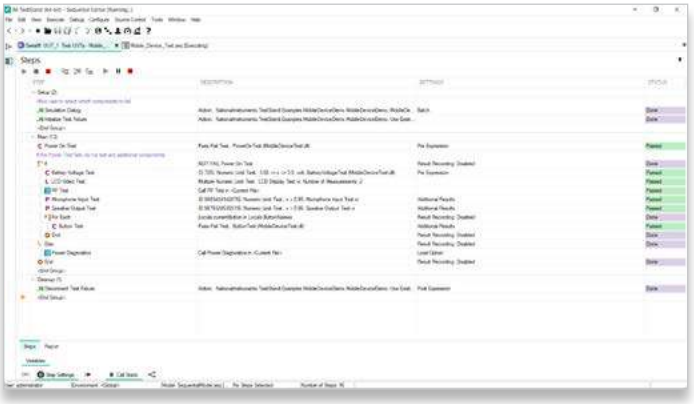
NI InstrumentStudio™

NI Test Software Overview

NI software can be purchased individually or as part of LabVIEW+ Suite; short descriptions of the software follow. More information on applications and key features can be found in this section.

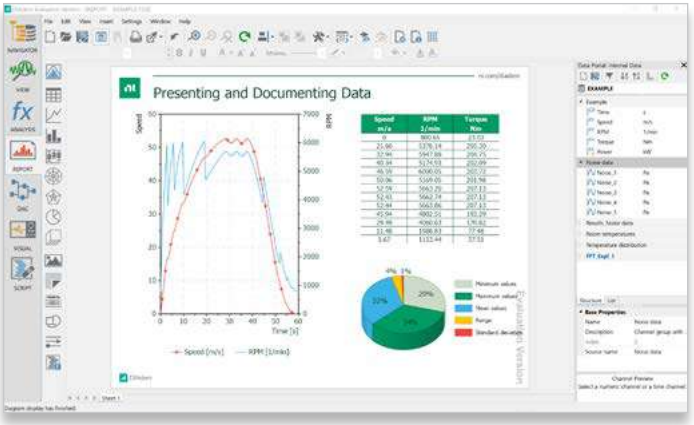
NI LabVIEW

LabVIEW is a graphical programming environment that provides unique productivity accelerators for test system development, such as an intuitive approach to programming, connectivity to any instrument, fully integrated user interfaces, and the test-optimized NI Nigel™ AI Advisor.



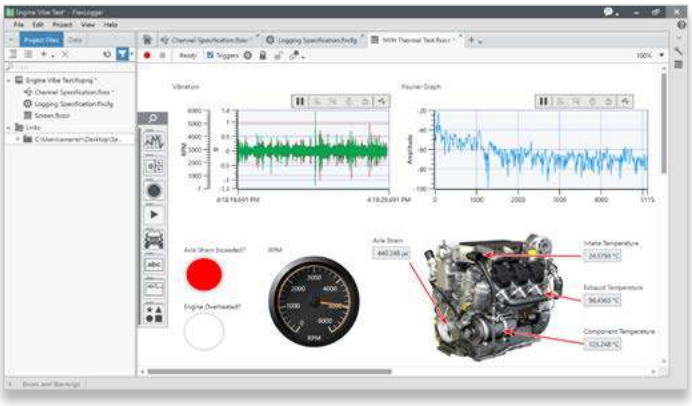
NI TestStand

Test management software for validation and production test that eliminates the need for time-intensive in-house sequencer development and maintenance. TestStand is equipped with the NI Nigel™ AI Advisor for accelerated development.



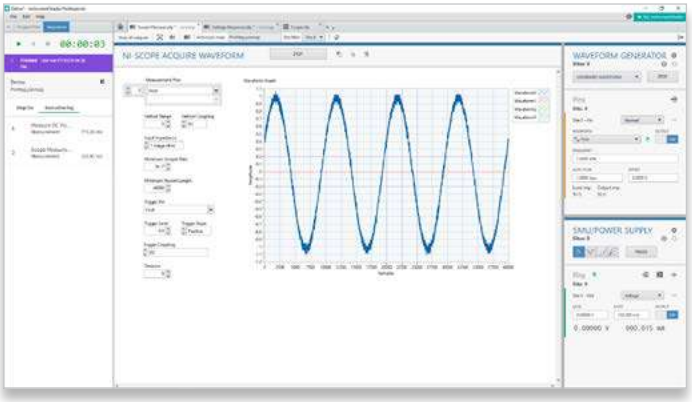
NI DIAdem

Data-analytics software for measurement data search, inspection, analysis, and automated reporting.



NI FlexLogger Software

No-code software that accelerates measurement configuration and logging with NI DAQ hardware.



NI InstrumentStudio Software

Instrument configuration software for automating and sequencing measurements.

LabVIEW Base
784503-35
Recommended for simple test and measurement applications.

LabVIEW Full
784522-35
Recommended for applications needing advanced analysis or signal processing.

LabVIEW Professional
784584-35
Recommended for engineers who need tools for software engineering, code deployment, distribution, and reporting.

NI LabVIEW

LabVIEW is a graphical programming environment that provides unique productivity accelerators for test system development, such as an intuitive approach to programming, connectivity to any instrument, fully integrated user interfaces, and the test-optimized NI Nigel™ AI Advisor.

Engineers use LabVIEW to:

Accelerate the development of flexible test systems
Automate and control any instrument
Perform data acquisition, analysis, and report generation

Key Features:

Maximize Productivity

Customizable User Interfaces—Create custom, interactive UIs with prebuilt objects for real-time data display and user input.

Active Debugging—LabVIEW recompiles code after every action. Identify and resolve issues with no last-minute surprises.

Graphical Programming—Visualize your test system with a natural flowchart-like data flow.

Nigel AI Advisor—Get expert help while developing in LabVIEW—from onboarding, to programming advice, and beyond!

Integrate Everything

Hardware Access—Connect to any device with thousands of drivers for third-party instrumentation.

Code Reuse—Call Python, C, MATLAB, and .NET code.

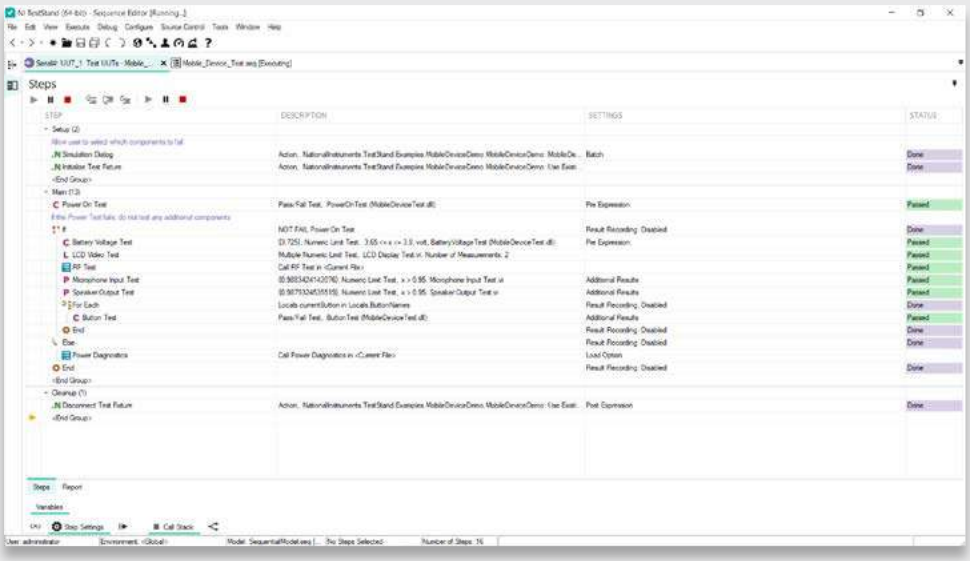
Protocol Support—Exchange data between applications using TCP/IP, UDP, serial, IrDA, Bluetooth, Modbus, SMTP, and many more.

Increase Capabilities

Real-Time and FPGA Modules—Use add-ons for applications that require embedded hardware and FPGA systems.

Automated Reporting—Share test results by generating reports for Microsoft Office or writing to a database, such as MongoDB.

Application Builder—Create and deploy your code as stand-alone applications for others to use in just a few clicks.



TestStand Development

788372-35

Recommended for engineers developing test sequences.

TestStand Deployment Engine

777774-35

Required for deploying test sequences to additional test systems.

NI TestStand

TestStand is off-the-shelf test management software for validation and production test that eliminates the need for time-intensive in-house sequencer development and maintenance. TestStand is equipped with the NI Nigel™ AI Advisor for accelerated development.

Engineers use TestStand to:

- Rapidly develop, deploy, and manage automated test systems
- Test products in parallel to optimize instrument use and test times with built-in autoscheduling intelligence
- Integrate and sequence tests written in various programming languages
- Log and share test results to local and network databases

Key Features:

Develop Systems Faster

Code Adapters—Take advantage of investment in existing code by integrating LabVIEW, C#, C++, Microsoft Visual Basic .NET, and more. Use multiple languages in the same sequence.

Drag-and-Drop Development Environment—Use the TestStand Sequence Editor to quickly sequence, configure, and execute test code modules.

TestStand Deployment Utility—Easily package all required DLLs, source code, drivers, and configuration information into a single installer.

Nigel AI Advisor—Get expert help while developing in TestStand, including onboarding, configuring settings, and automation.

Increase Test Throughput

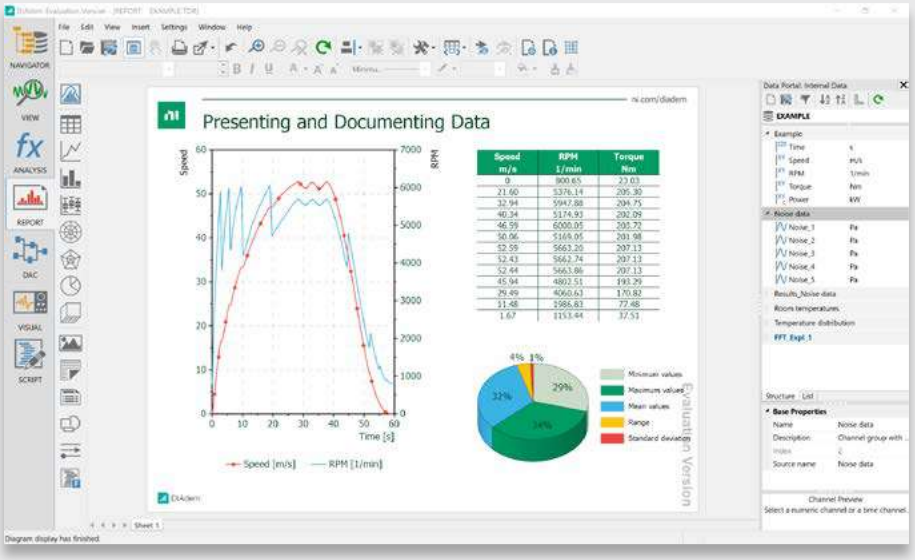
Parallel Test—Scale from single-unit test to multiunit parallel tests. Save hundreds of development hours with this built-in architecture.

Autoschedule Hardware Resources—Maximize utilization by sharing hardware among multiple execution threads.

Record and Publish Test Results

Enterprise Connectivity—Log test results using standard database connectivity or plug-ins for specialized data management systems, such as NI SystemLink™.

Built-In Reporting—Log critical results to several industry-standard report formats, such as ATML, XML, HTML, and ASCII.



DIAdem Base
784270-35

Recommended for standard analysis and reporting.

DIAdem Advanced
784271-35

Recommended for advanced analysis and calculation requirements.

DIAdem Professional
784272-35

Recommended for comprehensive and complex analysis and reporting tasks.

NI DIAdem

DIAdem is data-analytics software for measurement data search, inspection, analysis, and automated reporting.

Engineers use DIAdem to:

- Search for and find specific data
- Visualize multiple types of test data
- Save time by automating analysis routines and report generation

Key Features:

DataPlugins—DIAdem can import more than 1,000 file types through a technology called DataPlugins. Utilize the 200+ existing DataPlugins or create your own using an interactive Wizard or API.

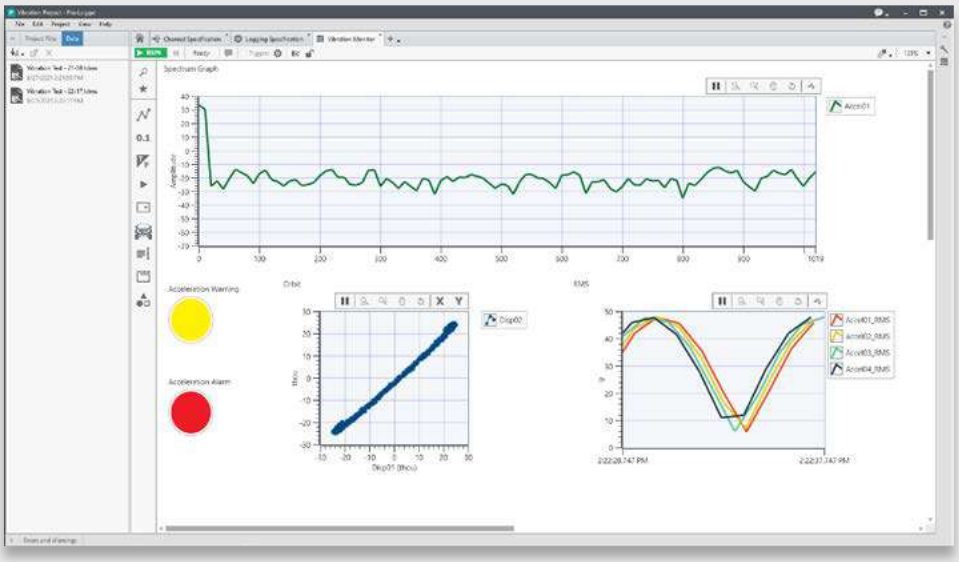
Data Display—Instantly display data in multiple 2D-axis systems and tables; play audio and video data; and view map data. Use a paneled display to view multiple datasets with different layouts in one window.

Built-In Functions—Transform your data with a simple point-and-click interface to perform analysis.

Script—Automate your measurement data analysis workflow, from import to analysis to report, by writing scripts in Python and VBS.

"We have reduced our reporting and analysis time by 95 percent and achieved our goal of replacing the current multistep process with a one-button DIAdem solution."

Jim Knuff
Raytheon Missile Systems



FlexLogger
785748-3501

NI FlexLogger™ Software

FlexLogger is out-of-the-box data acquisition software that lets you quickly configure hardware, visualize signals, and log sensor data–no coding required.

Engineers use FlexLogger software to:

- Acquire and log data quickly to validate designs and drive confident, data-informed decisions.
- Visualize live measurements with customizable dashboards to monitor system behavior and detect issues in real time.
- Automate test execution using triggers, alarms, and plug-ins to streamline workflows and increase test coverage.

Key Features:

Simplified Hardware and Channel Configuration—Set up NI hardware and define measurement channels effortlessly through a no-code interface, enabling rapid deployment and real-time visibility into system performance.

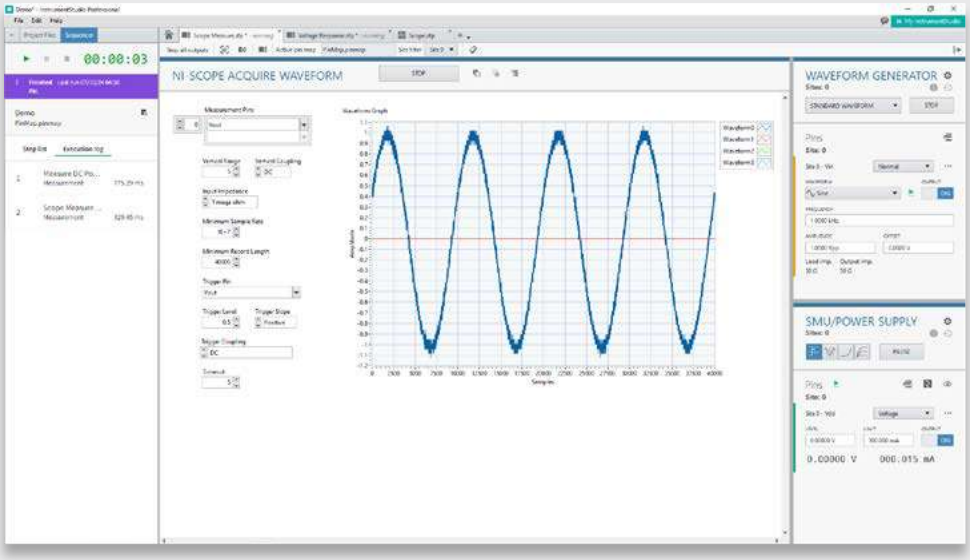
Reliable Data Management and Storage—Store test data in TDMS or CSV formats with support for metadata tagging, file segmentation, and multi-location saving—**ideal for long-duration tests and data integrity.**

Automated and Scalable Test Execution—Automate test sequences using alarms, triggers, events, and APIs to reduce manual effort, improve consistency, and support scalable test operations.

Customizable and Intelligent System Behavior—Perform real-time calculations, configure advanced alarms, and integrate plug-ins to extend functionality and adapt to complex or evolving test requirements.

FlexLogger Lite

FlexLogger Lite comes free with NI DAQ hardware! It includes standard capabilities such as configuring measurements and saving data. For additional automation and integration of custom measurements, choose the complete version of FlexLogger.



InstrumentStudio Professional
789987-35

NI InstrumentStudio™ Software

InstrumentStudio is an interactive, configuration-based software for engineers to control and configure instruments, run measurements, and develop and debug test sequences within a single environment.

Engineers use InstrumentStudio software to:

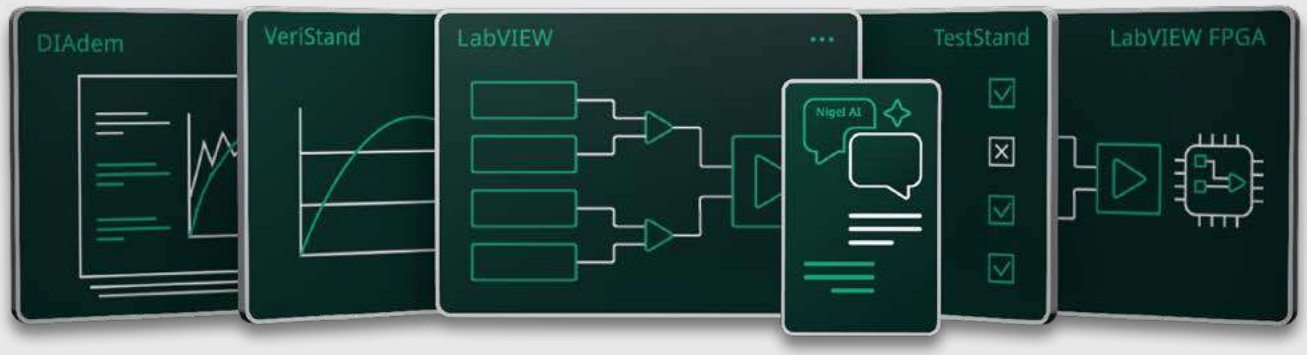
- Validate hardware functionality through instrument bring-up, measurement automation, and debugging
- Simultaneously interact with multiple instruments, non-NI hardware, and custom measurement logic
- Integrate measurements developed in various programming languages with a common user interface

Key Features:

- **Interactive, Multi-Instrument environment**—Start getting work done immediately with out-of-the-box interfaces for PXI modular instruments and interfaces for third-party instruments. Automate in seconds—after interactively configuring your instruments in InstrumentStudio, export the confi guration to LabVIEW or TestStand for automating.
- **Test-System Debugging**—Keep your automated workflows up and running with full visibility into instrument configurations and measurements in InstrumentStudio. Pause the execution of any software (TestStand, LabVIEW, Python, or other) that is using the instrument to change settings, then resume without restarting.
- **Open and Extensible**—InstrumentStudio grows with your needs, enabling you to control your DUT or build a library of custom measurements using plug-ins built in the programming language of your choice (LabVIEW, Python, .NET).

InstrumentStudio

InstrumentStudio is included with NI PXI instruments, including oscilloscopes, digital multimeters, waveform generators, VSTs, and more. It includes standard capabilities such as configuring instruments, saving data, and exporting instrument configurations. For third-party hardware integration, additional automation capabilities, and integration of custom measurements, choose InstrumentStudio Professional (included in the LabVIEW+ Suite).



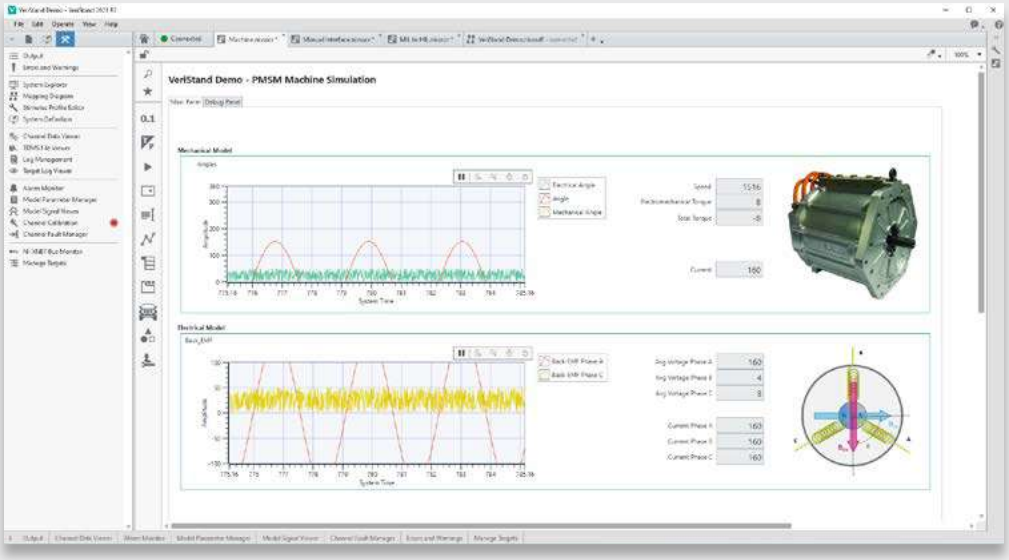
LabVIEW+ for HIL 790387-35

LabVIEW+ Suite for HIL

The LabVIEW+ Suite for HIL combines NI VeriStand with LabVIEW plus additional NI software. The collection provides a complete suite for embedded software development, and the software works together to get your product to market quicker.

LabVIEW+ for HIL integrates NI's software portfolio to accelerate embedded software development:

- NI VeriStand validates hardware and performs embedded software tests for HIL applications, offering model integration, real-time stimulus generation, and extensibility.
- NI LabVIEW is the industry-leading environment for automated test system development.
- The LabVIEW Real-Time Module is a software add-on for LabVIEW that you can use to create and deploy real-time, distributed system applications for test, monitoring, and control.
- The LabVIEW FPGA Module simplifies complex system design with integrated tools, IP libraries, and custom FPGA logic for HIL simulation and rapid prototyping.
- NI TestStand automates and sequences tests in labs and manufacturing.
- NI DIAdem automates data analysis and report creation.



VeriStand Full Development

788367-35

Recommended for configuring test systems.

VeriStand Operator

781067-35

Required for deployments.

NI VeriStand

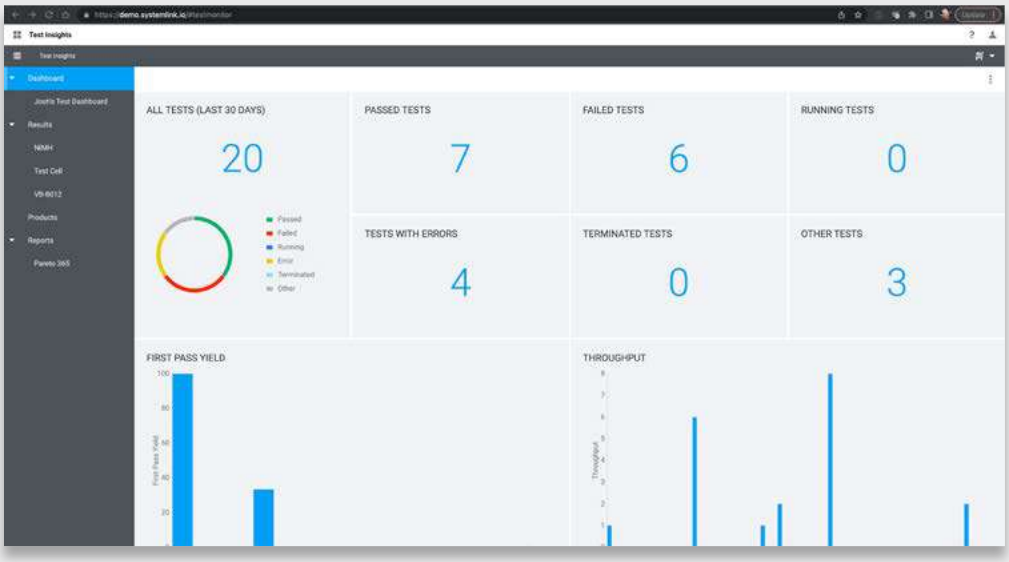
VeriStand is ready-to-run software with which you can create, deploy, and leverage closed-loop control on an NI Linux Real-Time target. Develop hardware-in-the-loop applications that accelerate the product development lifecycle with model integration, real-time stimulus generation, and an extensible software environment.

Use VeriStand to:

- Configure real-time I/O interfaces for high-speed data acquisition, vehicle networks, and FPGA-based reconfigurable I/O
- Configure alarms, respond to events, and automate your testing
- Gain full sight of your HIL system with graphical elements that allow you to control configurations and display runtime results

Key Features

- **Quick System Configuration**—Set up I/O channels, alarming, data logging, stimulus generation, fault insertion, user interfaces and bus communications
- **Model Integration**—Integrate plant and controller models from MathWorks® Simulink® software and other third-party modeling environments adhering to the Functional Mock-up Interface standard
- **Customizability**—Adapt to changing requirements with an extensible software environment. Build plug-ins for third-party hardware and additional measurement types
- **Test Automation**—Use test sequences and scripting to configure, orchestrate systems through .NET APIs, Python, and ASAM XIL, and integrate with CI/CD workflows



SystemLink Small
790508-35

Connect 2-10 systems, with a maximum of five users

SystemLink Medium
790509-35

Connect 11-25 systems, with a maximum of 10 users

For large-scale and enterprise deployments, find more information online or through your distributor.

NI SystemLink™

SystemLink™ software is a trusted, centralized platform for engineering and test teams of all sizes to plan, manage, and optimize tests.

Use SystemLink to:

- Manage software deployments, configurations, and test assets
- Automate data analysis and reporting
- Reduce downtime through real-time monitoring

Key Features

Remotely Manage Test Systems—Monitor and control NI PXI, NI CompactRIO, and Windows PCs from anywhere. Maximize uptime and ensure system health across distributed labs.

Deploy Software with Confidence—Push updates, drivers, and configurations to multiple systems—centrally and consistently. Save time and reduce deployment errors.

Track and Optimize Test Machines—Stay on top of usage, calibration, and location for NI and third-party instruments. Maintain compliance and improve test asset utilization.

Centralize Test Data—Store and analyze TDMS files in one place. Ensure traceability and streamline data access across teams.

Meet IT Standards with Simple, Secure Deployment—Deploy SystemLink in the cloud or on premises quickly and securely, no external services required. Fast and secure setup fits your IT policies.

Per-System Deployment Time

"Using SystemLink and NI package pre/postactions to achieve a graceful shutdown, install, and restart process, we were able to reduce deployment time from 30 minutes per system to three minutes for an entire production line."

Chase Fearing, Senior Lead Engineer
Sub-Zero

Part Number Extended Edition

Software	Edition	Subscription Part Number	Perpetual Part Number
LabVIEW	Base	784503-35	776671-35
	Base, with media	784503-35WM	776671-35WM
	Full	784522-35	776670-35
	Full, with media	784522-35WM	776670-35WM
	Professional	784584-35	776678-35
	Professional, with media	784584-35WM	776678-35WM
LabVIEW+ Suite	LabVIEW+ Suite	788509-35	790058-35
	LabVIEW+ Suite, with media	788509-35WM	790058-35WM
DIAdem	Base	784270-35	778806-35
	Advanced	784271-35	778807-35
	Professional	784272-35	778810-35
FlexLogger	Professional	785748-3501	785748-35
InstrumentStudio	Professional	789987-35	789988-35
TestStand	TestStand Development System	788372-35	777777-35
	TestStand Debug Deployment	—	779851-35
	TestStand Deployment Engine	—	777774-35
VeriStand	Full Development	788367-35	780590-35
	PC	788373-35	781066-35
	Operator	—	781067-35
LabVIEW+ for HIL Suite	LabVIEW+ for HIL Suite	790387-35	790386-35
SystemLink	For 2-10 systems	790508-35	—
	For 11-25 systems	790509-35	—

NI DAQ Hardware

With NI DAQ devices, you can measure any voltage, current, physical sensor, or digital signal for your test or research need. NI's industry-leading catalog of premium hardware makes it easier to say "yes" to that good idea you have for your test system or research testbed—and adding sensors or measurements wherever necessary.

Why Choose NI DAQ Hardware?

NI DAQ hardware is designed and tested to deliver high-quality data from sensors and electrical signals. Only NI combines quality measurement hardware with a complete selection of test and measurement software so that engineers can dominate their measurement tasks. NI hardware is:

Software-Defined—From free logging software to development support using LabVIEW, Python, or C/C++, with NI DAQ hardware, you decide which method is best for obtaining the data you need.

Quality—Don't worry about repeating expensive tests or slowing manufacturing. With NI quality inherent in every device, you can have complete confidence in datasheets, calibration cycles, and measurement accuracy.

Leading DAQ Technology—Complex designs need high-speed measurements, synchronization, streaming data, and more to ensure product quality while innovating.

Future-Proof and Flexible—Support thousands of measurement combinations and incorporate more than 100 PXI instruments to solve your test challenges. NI helps you scale your test to keep up with change and growth.

What Can You Do with NI DAQ Products?

Measure

- Voltage input ranges from ±0.25 VDC up to 480 VAC
  - 12-bit, 16-bit, and 24-bit options
  - High-speed transient capture at up to 1 MS/s/ch
  - Dynamic voltage (waveform) signals with 24-bit resolution
- Current inputs (0–20 mA, 5 A_{RMS} direct or from CT secondaries)
- Temperature (thermocouples and RTDs)
- Load, pressure, and torque sensors
- Strain gages (¼-, ½-, and full-bridge)
- Accelerometers (IEPE)
- Microphones (IEPE)
- Pulse and event counting
- Galvanically isolated measurements
- Digital (TTL, 24 VDC, sinking/sourcing)
- Quadrature encoder
- Resolvers LVDTs
- Proximity probes
- Tachometers (analog/digital pulse)
- String pots, line pots, and rotary potentiometers

Generate and Control

- Voltage output (±10 V)
- Current output (0-20 mA)
- Digital output (TTL/24 VDC)
- Relay module (250 VRMS @ 2 A, 60 VDC @ 1 A)
- External relay (control with digital lines)
- Generate pulse-width modulated (PWM) signals
- Simulate sensors/signals

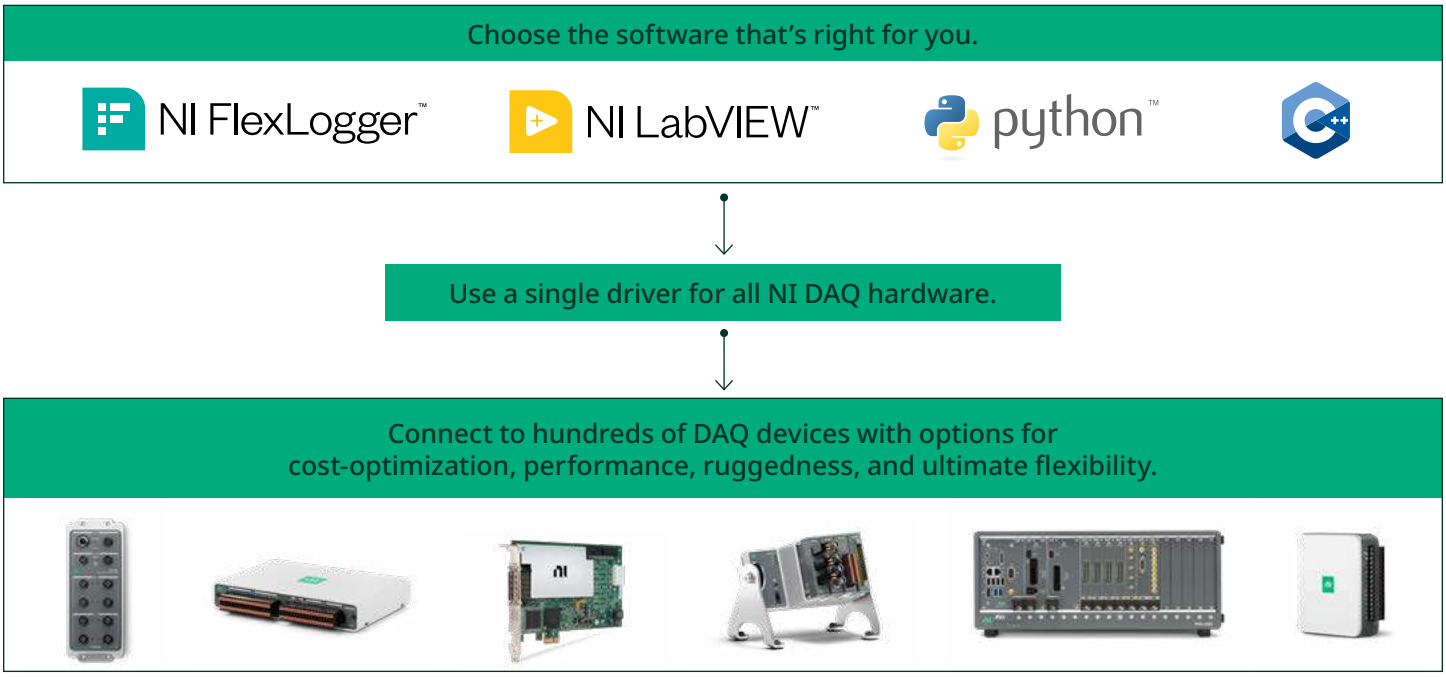
How to Choose NI DAQ Hardware

	Cost-Optimized Performance	Ultimate Flexibility	Ultimate Performance	Ultimate Ruggedness
	Take measurements with your PC	Handle whatever change comes your way with modular DAQ hardware	Measure the impossible and turn test into a business advantage	Achieve quality measurements in the harshest environments
	Multifunction DAQ devices	**NI CompactDAQ systems**	**DAQ for PXI**	**NI FieldDAQ™ hardware**
Measure	 +/- 200 mV to +/- 10 V	 +/- 200 mV to 480 VAC, A/O, DIO, sensors	 +/- 200 mV to +/- 600 V, A/O, DIO, sensors, instruments	 +/-10.5 V, sensors
Deploy to	Desktop, workbench, manufacturing PCs	Desktop, workbench, panel-mount, enclosure, manufacturing line	Desktop, workbench, 19 in. rack, manufacturing floor	Outdoors, test chambers, panel-mount
Operating specs	0-55 °C	-40 °C to 70 °C. 50 g shock	0-55 °C	-40 °C to 85 °C. 100 g shock. Waterproof (IP67)

One Powerful Software Driver for All NI DAQ Hardware

Connect NI's entire catalog of hardware with some of the best documented software support in the industry so you can be confident that you can measure what you want using the software you want.

NI knows how much you invest in software, whether it's learning how to use application software or developing custom test software. Use the NI-DAQmx driver to keep your software investment as you move between various hardware in the catalog. The API call for a 10 V measurement on a pocket-sized USB device is the same API call for a high-resolution, high-speed measurement in a PXI system.



Keep your software investment as your measurement requirements change and expand.

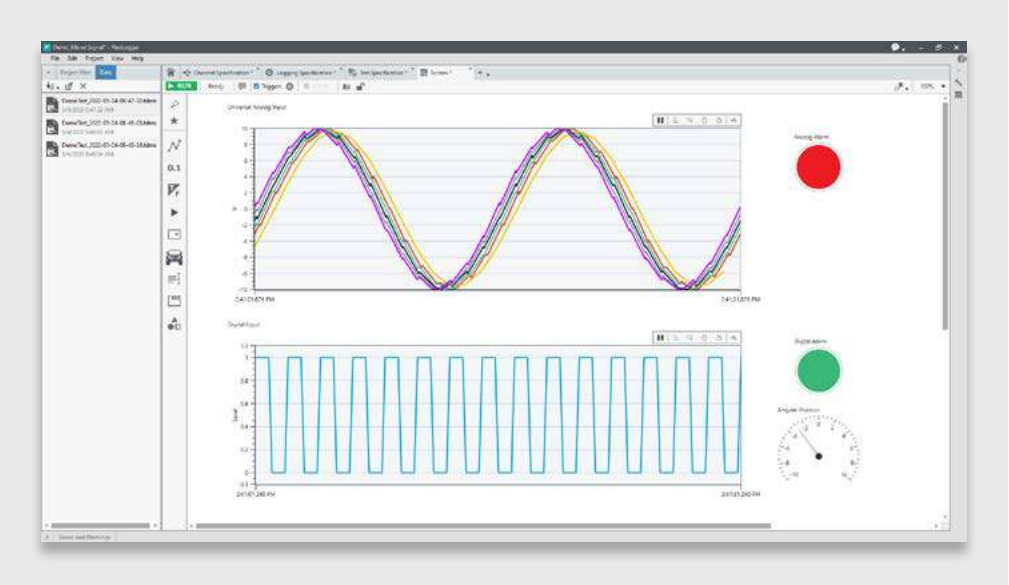
NI DAQ for Linux

See the NI Platform on Linux Desktop User Manual and NI Hardware and Software Operating System Compatibility for information regarding hardware support and Linux OS compatibility.

Application Software Included

Use FlexLogger Lite with your NI DAQ hardware to configure measurements, build a custom real-time display, and log data in minutes. Upgrade FlexLogger to unlock the plug-in repository, triggering, test operator mode, redundant log files, and more. FlexLogger works with high-speed, low-speed, voltage, digital, and sensor signals.

Need something custom? Use LabVIEW or Python to develop a custom plug-in for FlexLogger to get the special analysis, third-party hardware data, or file formatting options you need for your logging or test application.



Customize real-time displays in FlexLogger with live data editing so you can interact with and explore your measurements.

NI Multifunction DAQ

Overview of NI Multifunction DAQ Devices

As an industry leader in PCI/PCI Express, PXI, and USB DAQ devices for decades, NI gives you the hardware and software you need for quality measurement. Use our selection of premium hardware to say “yes” to that good idea you have to make a better product or drive your research forward.

The following product families are featured in this section of the catalog:

Multifunction I/O devices include a combination of ±10 V input/output, digital input/output, and counters on the same device. These are great multipurpose measurement devices with a ton of flexibility.

Analog output devices have several channels that generate ±10 V signals at up to 1 MS/s for waveform generation and signal simulation.

Counter/timer devices include multiple counters on a single device for more PWM signals, quadrature encoders, or frequency counters.

Digital I/O devices offer more industrial features such as higher voltage-level support, more current drive, channel-channel isolation, programmable start-up states, and filtering.

Why Choose NI DAQ Hardware?

NI DAQ hardware is designed and tested to deliver high-quality data from sensors and electrical signals. Only NI combines quality measurement hardware with a complete selection of test and measurement software so that engineers can dominate their measurement tasks. NI hardware is:

Software-Defined—From free logging software to development support using LabVIEW, Python, or C/C++, with NI DAQ hardware, you decide which method is best for obtaining the data you need.

Quality—Don't worry about repeating expensive tests or slowing manufacturing. With NI quality inherent in every device, you can have complete confidence in datasheets, calibration cycles, and measurement accuracy.

Leading DAQ Technology—Complex designs need high-speed measurements, synchronization, streaming data, and more to ensure product quality while innovating.

Future-Proof and Flexible—Support thousands of measurement combinations and incorporate more than 100 PXI instruments to solve your test challenges. NI helps you scale your test to keep up with change and growth.

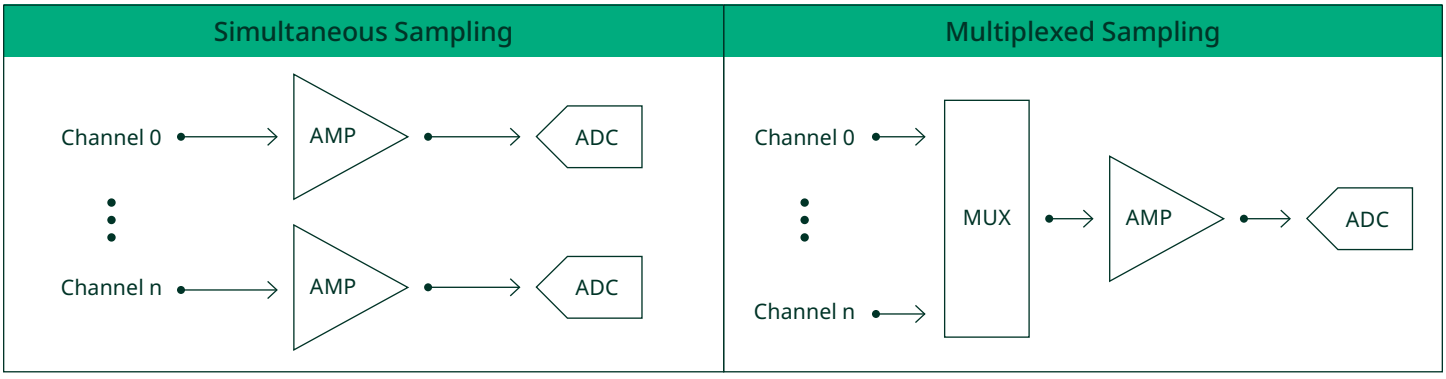
NI DAQ Device Key Features

High-speed measurement with options for simultaneous measurement paths

Engineers select NI devices because of the quality required for high-speed measurements. NI DAQ devices have input rates up to 3.8 MS/s (million samples per second).

Many NI DAQ devices have simultaneous ADC architectures, meaning that each channel (signal path) has its own analog-to-digital converter. This design improves measurement quality and provides synchronized data for time correlation, important for tests like stimulus/response, modal analysis, impact, electronics power characterization, beam forming, and more.

A simultaneous vs. multiplexed architecture is a cost vs. quality decision. Learn more from the KnowledgeBase article, **"How Do I Eliminate Ghosting from My Measurements?"**. For high-channel systems with synchronized, simultaneous channels, NI recommends Ethernet CompactDAQ systems or PXI systems.



Synchronize with Advanced Timing Controllers and Counters

Several NI DAQ devices include a system timing controller for precise, hardware-timed operations across analog and digital subsystems. Internal clocks are derived from a 100 MHz timebase and drive counters, pulse generation, event counting, quadrature encoder input, PWM output, triggering, and more.

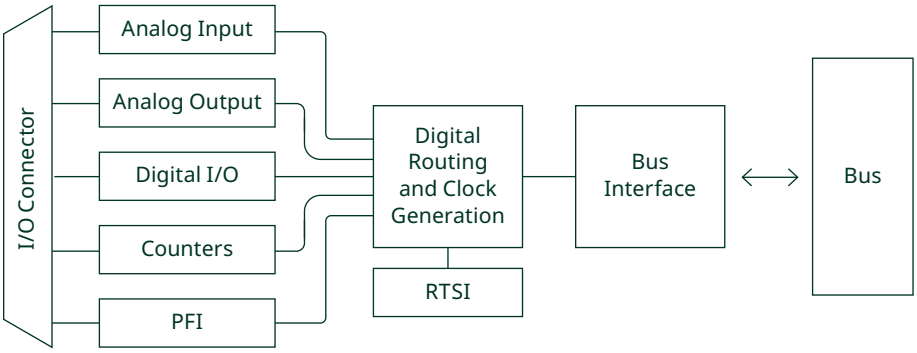
NI Counter Functions and Benefits

Function	Benefit
100 MHz Timebase	Improved timing precision on derived clocks and triggers
Event Counting	Buffered event counting and timestamping for high-speed digital signal analysis
Pulse Generation	Hardware-timed single-point and waveform generation for real-time control loops
Quadrature Encoder Input	Supports quadrature encoder input for motion control applications
PWM Output	Pulse-width modulation output for precise control of actuators and other devices
Synchronization Support	Multidevice synchronization using NI-TClk and PXI trigger lines
Triggering	Start, pause, and reference triggers
Digital Waveforms	High-speed digital waveform generation and acquisition
Clock Routing	Route many internal clocks to external pins to synchronize/ coordinate with other instruments or DAQ devices

Note: Not all features are available on all devices; see user manual and specifications documents to confirm feature inclusion.

Dedicated Timing Engines for Measurement Tasks

Use the DAQmx API to address analog, digital, and counter subsystems separately for simplified programming, or synchronize them together for more complicated test systems. This flexibility scales development effort with the complexity of the system so you can start small, simple, and fast, and keep the option to add complexity when needed. NI FlexLogger™ DAQ software manages this complexity under the hood.



NI multifunction DAQ devices have advanced timing and clock routing so software development can scale from simple to complex.

Do More with Digital

NI's family of digital I/O devices include features such as:

- Programmable power-up states
- I/O watchdogs
- Software-selectable filtering
- Higher current drives for solid-state relays
- High-speed frequency measurement
- Bank and channel-channel isolation options
- Port-selectable input/output functionality
- Up to 60 V, 2 A digital output lines

Confidence in Your Measurements with Built-In Calibration

Whether you're deploying in a lab or a field environment, NI's calibration architecture ensures your data remains trustworthy and traceable. NI multifunction DAQ devices are engineered for long-term measurement accuracy with robust calibration support, including onboard calibration technology, sometimes referred to as "M-CAL," for self-calibration. Key benefits include:

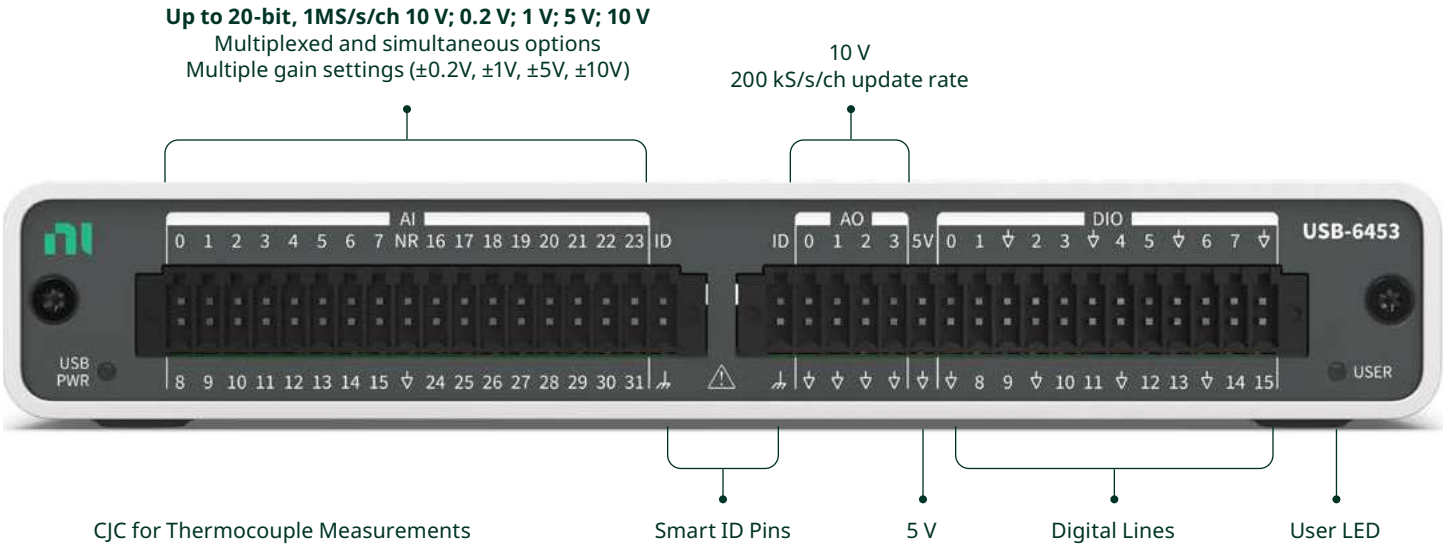
On-Device Self-Calibration: Maintain measurement accuracy over time with automated, software-triggered calibration routines.

Temperature-Aware Compensation: Many NI DAQ devices continuously monitor internal temperature and adjust calibration coefficients in real time.

Longer Calibration Cycles: Reduce maintenance costs by calibrating less often. NI's latest DAQ hardware releases have accuracy calculations for two- and 10-year calibration intervals. See the accuracy table in device specifications for calibration interval.

Factory and External Calibration Support: Many devices ship with NIST-traceable factory calibration and support external calibration for compliance with ISO 17025 and other standards.

mioDAQ Features (Models USB-6421, -6423, -6451, -6453)



NI mioDAQ multifunction I/O devices have features not found in other NI DAQ devices:

- Flexible DIO lines—Independently set each pin to input or output, or route to one of the four counters. Set the threshold for all pins to values of 5 V, 3.3 V, 2.5 V, or 1.8 V
- Smart ID pin—Use mioDAQ to read/write from an EEPROM in your cable/connector to store configuration information, operator instructions, or DUT information
- Programmable user LED

What You Can Do with Multifunction DAQ Devices

The ±10 V input/output and TTL digital signal ranges cover a large variety of data acquisition needs. Many of the ±10 V input channels have gain/amplification capability so you can set the measurement range to ±0.200 V for more accurate low-voltage signal measurements.

Measure

- ±10 V signals at up to 20-bit resolution
- Sensors that output ±10 V
- High-speed voltage signals up to 4,000,000 samples/s/ch.
- Voltage drops across a shunt resistor for current measurement
- Battery cell voltages (±10 V peak cell measurement)
- Power rails on USB/battery-powered electronic boards (PCBs)
- Pulse and event counting
- Digital
- Quadrature encoder
- String pots, line pots
- Rotary potentiometers
- Low-voltage current sensors
- Low-voltage potential transformers

Generate and Control

- Voltage output (±10 V) at up to 1MS/s
- Digital output (TTL) at up to 60 V, 2 A
- External relay (control with digital lines)
- Generate pulse-width modulated signals
- Simulate sensors/signals
- Connect to LEDs

Other Needs

- For higher-input-range options, choose CompactDAQ module NI-9225, NI-9242/44, or PXIe-4310
- For higher-resolution measurements of low-voltage signals, check out PXIe-4309 or NI's catalog of PXI-based DMMs for precision voltage measurements
- For a more rugged system, direct sensor coverage, and more input resolution options, consider a CompactDAQ system
- For waterproof, ultrarugged DAQ hardware, choose NI FieldDAQ™ hardware

One Powerful Software Driver for All NI DAQ Hardware

Connect NI's entire catalog of hardware with some of the best documented software support in the industry so you can be confident that you can measure what you want using the software you want.

NI knows how much you invest in software, whether it's learning how to use application software or developing custom test software. Use the NI-DAQmx driver to keep your software investment as you move between various hardware in the catalog. The API call for a 10 V measurement on a pocket-sized USB device is the same API call for a high-resolution, high-speed measurement in a PXI system.

Choose the software that's right for you.

NI FlexLogger™ NI LabVIEW™ python™

↓

Use a single driver for all NI DAQ hardware.

↓

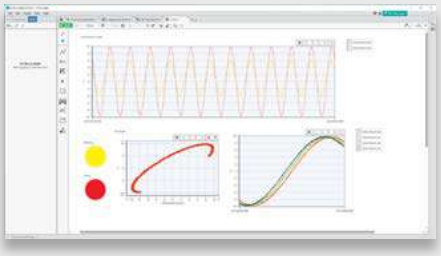
Connect to hundreds of DAQ devices with options for cost-optimization, performance, ruggedness, and ultimate flexibility.

Keep your software investment as your measurement requirements change and expand.

Compare NI DAQ Software Options

	FlexLogger Lite	LabVIEW	LabVIEW+ Suite
OS Support	Windows	Windows, Linux[1]	Windows, Linux
Hardware Compatibility			
NI DAQ hardware	✓[2]	✓	✓
Other NI hardware	—	✓	✓
Other vendor devices	—	✓	✓
Development			
Native graphical programming	—	✓	✓
Multithreaded code execution	—	✓	✓
Code debugging	—	✓	✓
Analog output waveform generation	—	✓	✓
Create user interfaces with prebuilt data display elements	✓	✓	✓
Analysis and Signal Processing			
Standard math functions, probability, and statistics	—	✓	✓
Additional analysis and signal processing functions, including linear algebra, curve fitting, signal conditioning, wavelet analysis, and more	—	✓	✓
Advanced analysis functions, including regression, order analysis, and more	—	—	✓
Software Interoperability			
Integrate Python, C/C++, .NET, or MathWorks® MATLAB® software code	—	✓	✓
Test System Development			
Create and edit test sequences and create deployable test systems	—	—	✓
Configure and capture data from NI PXI instruments	—	✓	✓
Accelerate and automate measurement data insights with ready-to-use test data visualization, processing, and reporting tools	—	—	✓
Create web applications	—	—	✓

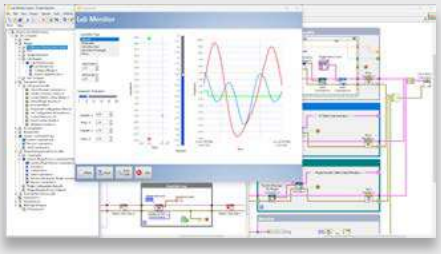
[1] Linux is not FlexLogger-supported on LabVIEW Base edition.
[2] FlexLogger-supported hardware (subset of NI-DAQmx supported hardware).



NI FlexLogger

FlexLogger enables quick sensor configuration and mixed signal data logging—no programming required. FlexLogger comes in a full-featured and a free Lite edition.

Learn more about FlexLogger



NI LabVIEW

LabVIEW is a graphical programming environment with unique productivity accelerators for developing test and measurement systems. With graphical programming, engineering-specific analysis functions, and an integrated user interface, LabVIEW has what you need to build automated test systems, fast.

Learn more about LabVIEW

NI LabVIEW+ Suite

The LabVIEW+ Suite is a collection of powerful tools for test professionals involved in electronic and electromechanical testing. Comprehensive and versatile, LabVIEW+ helps engineers optimize every part of their workflow. The LabVIEW+ Suite includes LabVIEW, FlexLogger, and the following software:

- NI TestStand for creating and editing test sequences and building deployable test systems
- NI InstrumentStudio™ software for interactive PXI measurements
- NI DIAdem for instant data visualization plus automated analysis and reporting

Learn more about LabVIEW+ Suite

NI DAQ for Linux

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Application Software Included

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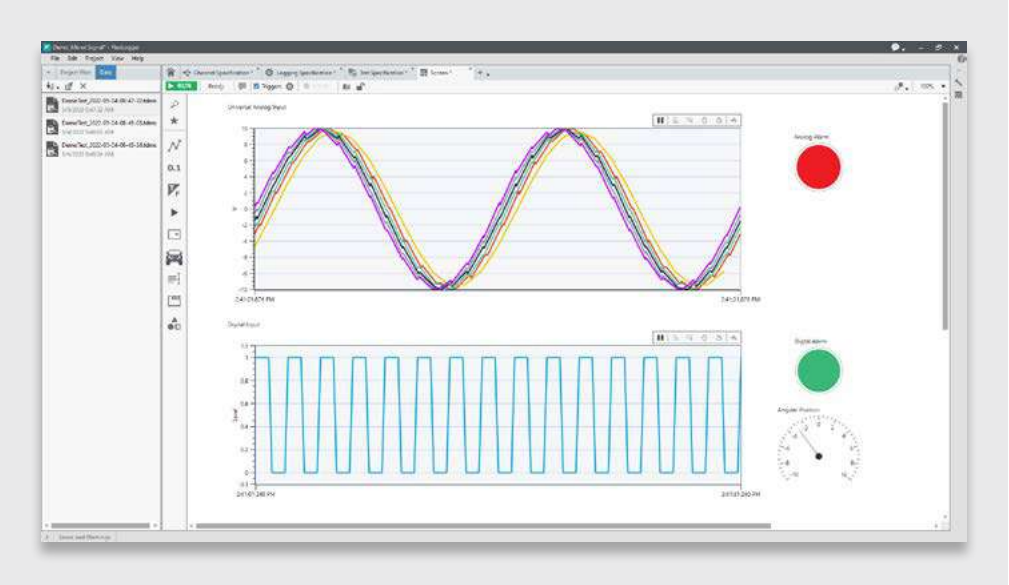


Customize real-time displays in FlexLogger with live data editing so you can interact with and explore your measurements.

NI DAQ for OEM Applications

NI empowers OEMs with cutting-edge hardware and software solutions. Several NI DAQ devices are available in OEM board-only kits with IDC connectors. Available models include:

- USB-6501 (Digital I/O)
- USB-6001 (Entry-level multifunction)
- USB-6002 (Entry-level multifunction)
- USB-6421 (NI mioDAQ)
- USB-6423 (NI mioDAQ)
- USB-6451 (NI mioDAQ)
- USB-6453 (NI mioDAQ)

Multifunction DAQ Device Product Selection

NI DAQ devices for ±10 V input, output, and digital I/O are sorted by how they connect to a computer: USB, PCI Express, and PXI, and by product family.

The table below lists common abbreviations used throughout the product selection tables.

Abbreviation	Meaning
A/I or A/O	Analog input or analog output.
DI/SE	An analog input channel configuration setting. DI is differential mode, with two pins per measurement—a positive and a negative. SE is single-ended, with one pin used for the signal and a shared reference pin (or ground) for the other.
Sample Rate	How many times per second a measurement point is taken.
Update Rate	For analog output channels, how many times per second the device can update the channel with a new value.
DIO	Digital input/output. Devices typically contain 5 V/TTL logic pins.
Absolute Accuracy	Maximum uncertainty based on value of signal measurement, noise, and time/temp deviation from last calibration. See specifications for more.
Counters	Number of counter subsystems on a device; for example, four counters to measure four quadrature encoders at once.
PCI/PCI Express	Peripheral Component Interconnect (PCI) is a communication bus used for communication between computer components on a motherboard. PCI Express is the latest version in modern systems. PCI should be considered legacy and is harder to find in new systems.

USB Devices

This section includes DAQ devices that connect to a computer via a USB cable. All of the USB devices featured in this catalog are powered by the USB connection to the computer, making them the simplest and most portable choice for a test system. But don't let "simple" fool you: The latest USB-6453 device can measure 16 channels of ±10 V inputs at 1,000,000 samples/s/ch.

USB Multifunction I/O Devices

USB multifunction I/O devices are simple, portable, and flexible. The software you use with the lowest-cost entry-level device is the same as you use with the latest bus-powered data streaming powerhouse, the USB-6453 mioDAQ device.

Category	Model	Part Number	DI/SE	AI Sample Rate	A/O and DIO Channels	A/O Update Rate	Counters	A/I Absolute Accuracy	A/I Resolution
Entry-Level (USB 2.0)	**USB-6000**	782602-01	0/8	10 kS/s	A/O: 0 DIO:	—	1	26 mV	16 b
	USB-6001	782604-01	4/8	20 kS/s	A/O: 2 DIO: 13	5 kS/s	1	26 mV	16 b
	USB-6002	782606-01	4/8	50 kS/s	A/O: 2 DIO: 13	5 kS/s	1	26 mV	16 b
	USB-6003	782608-01	4/8	100 kS/s	A/O: 2 DIO: 13	5 kS/s	1	26 mV	16 b
General-Purpose (USB-C)	**USB-6421**	789887-01	8/16	250 kS/s	A/O: 2 DIO: 16	250 kS/s/ch	4	2.61 mV	16 b
	USB-6423	789882-01	16/32	250 kS/s	A/O: 4 DIO: 16	250 kS/s/ch	4	2.61 mV	16 b
Simultaneous-Sampling (USB-C)	**USB-6451**	789888-01	8/16	1 MS/s/ch	A/O: 2 DIO: 16	250 kS/s/ch	4	1.3 mV	20 b
	USB-6453	789884-01	16/32	1 MS/s/ch	A/O: 4 DIO: 16	250 kS/s/ch	4	1.3 mV	20 b

mioDAQ (USB-6453) is a high-quality device with metal housing.

USB 2.0 Digital I/O Devices

Use NI USB digital I/O devices for simple, portable digital systems.

The USB-6501/25 on the left has built-in screw terminals. The USB-6509 on the right has a mass-termination connector and needs accessories. See the Cables for PCIe-6509/12/13/14/15/28 below, and the **USB-6509 (SCSI Connector) table on page 48** for accessory selection.

Cables for PCIe-6509/12/13/14/15/28 and USB-6509

Category	Model	Part Number	Logic Level	D/I Voltage Range	DIO Channels	D/I Only Channels	D/O Only Chanels	Output Voltage	Output Current
5 V TTL/ CMOS	USB-6501	779205-01	5 V	0 V—5 V	24	—	—	0 V—5 V	8.5 mA
	USB-6509	779975-01	5 V	0 V—5 V	96	—	—	0 V—5 V	1.5 mA
Ch-Ch Isolated	USB-6525	779640-01	60 V	+/-60 V	0	8	8	0 V—60 V	500 mA

USB mioDAQ Accessories

NI mioDAQ devices (models USB-6421, -6423, -6451, and -6453) ship with a USB-C-to-USB-C cable and all connector accessories needed to connect a signal wire and begin taking measurements. This section is for extra or replacement parts and mounting accessories specific to mioDAQ.

Description	Part Number	
USB-C to USB-C with top screw lock, 2 m Included with mioDAQ. Purchase as spare/ replacement.	789956-02	
USB-C to USB-C right-angle, 2 m (optional accessory)	789957-02	
Screwdriver sized for spring terminals (quantity: 15)	781015-01	
Backshell for 36-position spring terminal connector with mioDAQ. Purchase as spare/ replacement. (quantity: 1)	785080-01	
Mounting kit: DIN only for horizontal DIN mount	789986-01	

Description	Part Number	
Mounting kit: vertical DIN, panel, or keyhole Includes USB-C cable with right-angle connector (PN 789957-02).	789955-01	
Mounting kit for 19” rack (1U) (mount up to two mioDAQ devices) Includes two USB-C cables with right-angle connector (PN 789957-02).	789953-01	
36-position front mount spring terminal connector with mioDAQ. Purchase as spare/ replacement (0.13 mm^2 to 1.5 mm^2) (26 AWG to 16 AWG) (quantity: 1)	785502-01	

PCI/PCI Express Devices

PCI/PCI Express devices are installed on the motherboard inside a desktop or industrial computer, similar to installing a new graphics card. Choose a PCI/PCI Express device for better streaming and single-point read/write performance vs. USB at a generally lower cost per channel. PCI/PCI Express systems are more common for lab test benches and manufacturing test systems.

Multifunction I/O Devices for PCI Express | Multiplexed

Multifunction devices combine ±10 V inputs with ±10 V outputs and digital/TTL signals. They are the most popular style of DAQ device for their wide coverage of signal types and general flexibility. Engineers across the world have been using NI's multifunction I/O devices for research, validation, and manufacturing test for decades.

PCI Express devices, like the PCIe-6341 shown, install in a PCIe x1 slot on a PC motherboard.

PCIe-6341

Model	Part Number	16-bit A/I Channels (DI/SE)	Sample Rate	DIO Channels	A/O Channels	A/O Update Rate	Counters	A/I Absolute Accuracy
PCIe-6320	781043-01	8/16	250 kS/s	24	0	—	4	2,200 µV
PCIe-6321	781044-01	8/16	250 kS/s	24	2	900 kS/s	4	2,200 µV
PCIe-6323	781045-01	16/32	250 kS/s	48	4	900 kS/s	4	2,200 µV
PCIe-6340	790586-01	8/16	500 kS/s	24	0	—	4	2,190 µV
PCIe-6341	781046-01	8/16	500 kS/s	24	2	900 kS/s	4	2,190 µV
PCIe-6342	790587-01	16/32	500 kS/s	48	0	900 kS/s	4	2,190 µV
PCIe-6343	781047-01	16/32	500 kS/s	48	4	900 kS/s	4	2,190 µV
PCIe-6350	790588-01	8/16	1 MS/s	24	0	—	4	1,520 µV
PCIe-6351	781048-01	8/16	1.25 MS/s	24	2	2.86 MS/s	4	1,520 µV
PCIe-6352	790589-01	16/32	1 MS/s	48	0	900 kS/s	4	1,520 µV
PCIe-6363	781051-01	16/32	2 MS/s (1-ch) 500 kS/s (all)	48	4	2.86 MS/s	4	1,660 µV

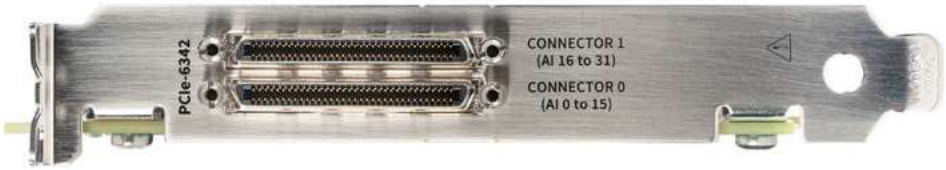
All devices shown in the table are multiplexed and share a single analog-to-digital converter for all channels. The sample rate shown is shared by all channels in the software task.

Multifunction DAQ Device Accessories

Every PCI/PCI Express DAQ device needs accessories for signal connection. Use the tables below to select the accessories that are compatible with your selected device.

Example configuration of a PCI Express MIO device with cable and connector block.
The PCI Express MIO device would be installed in a desktop computer.

How Many Cables Does Your PCI Express DAQ Device Need?



PCI Express DAQ devices have between one and four VHDCI connectors, each with 68 pins. Purchase a cable and connector block for each VHDCI connector to connect signal wires.
Note: Not all cables are compatible with all connectors. Use the tables below to match the correct number and type of cable to your device.

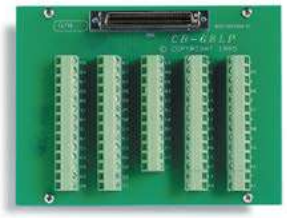
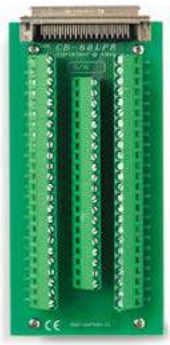
SHC68-68-EPM Cable Compatibility

Model	Part Number	Cable for Connector 0	Cable for Connector 1	Cable for Connector 2	Cable for Connector 3
PCIe-6320	781043-01	SHC68-68-EPM	—	—	—
PCIe-6321	781044-01	SHC68-68-EPM	—	—	—
PCIe-6323	781045-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PCIe-6340	790586-01	SHC68-68-EPM	—	—	—
PCIe-6341	781046-01	SHC68-68-EPM	—	—	—
PCIe-6342	790587-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PCIe-6343	781047-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PCIe-6350	790588-01	SHC68-68-EPM	—	—	—
PCIe-6351	781048-01	SHC68-68-EPM	—	—	—
PCIe-6352	790589-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PCIe-6363	781051-01	SHC68-68-EPM	SHC68-68-EPM	—	—

Cables to Connect Multifunction PCI Express DAQ Devices to Terminal Blocks

Recommendation	Part Number	Length	
Best performance if compatible with your device. **SHC68-68-EPM** Separates DIO from A/I signals in cable to reduce crosstalk.	192061-0R5	0.5 m	
	192061-01	1 m	
	192061-02	2 m	
	192061-05	5 m	
	192061-10	10 m	
Any device connection not supported by the EPM cable. Works on any multifunction I/O device and connector. Basic Shielded **SHC68-68**	191945-0R5	0.5 m	
	191945-01	1 m	
	191945-02	2 m	
Ribbon cable for low-cost systems. Not recommended for noisy environments. Works on any multifunction I/O device and connector. **RC68-68**	187252-0R25	0.25 m	
	187252-0R5	0.5 m	
	187252-01	1 m	

Screw Terminal Accessories for Multifunction I/O PCI Express Devices

Description	Model	Part Number	Shielded	
Most common desktop accessory for NI DAQ devices. Metal breakout box with removable magnetic lid covering screw terminals. **SCB-68A**	SCB-68A	782536-01	✓	
Low-Cost Terminal Block (Wide Layout) **CB-68LP**	CB-68LP	777145-01	—	
Low-Cost Terminal Block (Narrow Layout) **CB-68LPR**	CB-68LPR	777145-02	—	
DIN Rail-Mountable Terminal Connector Block **TBX-68**	TBX-68	777141-01	—	

BNC Accessories for Multifunction PCI Express DAQ Devices

Description and Model	Part Number	
Shielded BNC Connector Block **BNC-2110**	777643-01	
Single-Ended Shielded BNC Connector Block **BNC-2111**[1]	779347-01	
Shielded BNC Connector Block with Onboard Function Generator and Quadrature Encoder **BNC-2120**	777960-01	
Rack-Mountable Accessory for 68-Pin Multifunction DAQ **BNC-2090A**	779556-01	

[1]BNC-2111 cannot be used with NI 6356/6358/6366/6368/6374/6376/6378/6386/6396 simultaneous I/O X Series devices.

For more accessory compatibility information, see the following online KnowledgeBase articles.

DAQ Multifunction I/O Accessory Guide

DAQ Multifunction I/O Cable Guide

NI Cable and Accessory Guides

Digital Input/Output Devices for PCI/PCI Express

These devices are great to add more digital lines to systems in manufacturing test or other industrial environments—and with the higher current output, you can directly drive solid-state relays. Many devices (PCIe-6509, for example) include features such as configuring each port for input or output, programmable power-up states, I/O watchdogs, and software-selectable programmable input filters.

PCIe-6509

Category	Model	Part Number	Logic Levels	D/I Voltage Range	DIO Channels	D/I-Only Channels	D/O-Only Channels	Output Voltage	Output Current1
5 V TTL/ CMOS	PCI-6503	777690-01	5 V TTL/ CMOS	0 V—5 V	24	—	—	0 V—5 V	2.4 mA
5 V TTL/ CMOS	PCIe-6509	778966-01	5 V TTL/ CMOS	0 V—5 V	96	0	0	0 V—5.5 V	24 mA
Industrial	PCI-6512	778970-01	—	-30 V—30 V	—	—	64	0 V—30 V	350 (75) source mA
	PCI-6513	778836-01	—	—	—	—	64	0 V—30 V	500 (120) sink mA
	PCI-6514	778835-01	24 V	-30 V—30 V	—	32	32	+/-30 V	350 (75) source mA
	PCI-6515	779082-01	24 V	-30 V—30 V	—	32	32	+/-30 V	500 (120) sink mA
	PCI-6516	779083-01	—	—	—	—	32	0 V—30 V	350 (75) mA
	PCI-6518	779085-01	24 V	-30 V—30 V	—	16	16	+/-30 V	350 (75) mA
Ch-Ch Isolated	PCI-6520	778833-01	60 V	+/-30 V	—	8	8	+/-60 V	2 A
	PCI-6528	777690-01	60 V	+/-60 V	—	24	24	+/-60 V	150 mA

See user manuals for min/max voltage levels for low/high digital values.

1When using all lines at a 100% duty cycle, the maximum drive current for the -6512, -6514, -6516, and -6518 is 75 mA. It is 120 mA for the -6513, -6515, and -6519. When using only one output line in each bank at a 100% duty cycle, the maximum drive current for the -6512, -6514, -6516, and -6518 is 350 mA. It is 500 mA for the -6513, -6515, and -6519.

Digital I/O Device Accessory Compatibility

The digital I/O devices in the table above need a cable and connector block to connect any signal wires. Please use the tables below to find yours based on device model number.

Cable for PCI-6503 (IDC Connector)

Description	Model	Part Number	
Low-Cost Ribbon Cable	NB1	180524-05	

Terminal Block Options for PCI-6503 (IDC Connector)

Description	Model	Part Number	
Screw Terminal Block for DIN Rail Mount	CB-50	776164-90	
Screw Terminal Block – Standoffs	CB-50LP	777101-01	

Cables for PCIe-6509/12/13/14/15/28 and USB-6509 (SCSI Connector)

Description	Model	Part Number	Length	
Shielded Cable (Recommended)	SH100M-100M Flex	185095-01	1 m	
		185095-02	2 m	
Unshielded split cable that converts device connection to 2x 50-pin connectors. Purchase 2x 50pin terminal blocks.	R1005050	182762-02	2 m	

Terminal Block Options for PCIe-6509/12/13/14/15/28 and USB-6509 (SCSI Connector)

Description	Model	Part Number	
Shielded Screw Terminal Block	SCB-100A	785024-01	
Unshielded Screw Terminal Block, DIN Rail Mount	CB-50	776164-90	
Unshielded Screw Terminal Block	CB-50LP	777101-01	

Cables for PCI-6516/18/20 (D-SUB Connector)

Description	Model	Part Number	Length	
Shielded Cable (Recommended)	SH37F-37M	778621-02	2 m	
Unshielded Ribbon Cable	R37F-37M	779195-0R25	0.25 m	
		779195-0R5	0.5 m	
		779195-01	1 m	

Connector Blocks for PCI-6516/18/20 (D-SUB Connector)

Description	Model	Part Number	Shielded	
Horizontal DIN-Rail-Mount Terminal Block	CB-37FH	778676-01	—	
Vertical DIN-Rail-Mount Terminal Block	CB-37FV	778672-01	—	
DIN-Rail-Mount for High-Voltage Signals up to 150 V. UL-Recognized.	CB-37F-HVD	779491-01	—	
D-SUB-to-Screw Terminal Conversion. Connects to D-SUB Connector on Device. No Cable Needed.	CB-37F-LP	779353-01	—	

High-Speed Digital I/O Devices for PCI Express

High-speed digital devices are designed for interfacing and testing image sensors, display panels, and applications such as pattern I/O, change detection, protocol emulation, or other custom digital tasks. These devices feature selectable voltage levels and per-channel directional control of the digital lines.

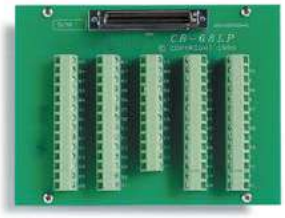
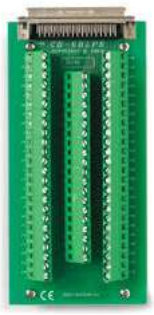
PCIe-6535B Device

Model	Part Number	Logic	Maximum Clock Rate	Voltage Range	DIO Channels	Output Range	Output Current
PCIe-6535B	782629-01	5 V	10 MHz	0 V—5 V	32	0 V—5 V	32 mA
PCIe-6536B	782630-01	5 V	25 MHz	0 V—5 V	32	0 V—5 V	32 mA
PCIe-6537B	782631-01	5 V	50 MHz	0 V—5 V	32	0 V—5 V	32 mA

PCI Express High-Speed Digital I/O Accessory Compatibility (VHDCI connector)

Description	Model	Part Number	Length	
Shielded Cable	SHC68-C68-D4	781013-01	0.5 m	
		196275-01	1 m	
		781293-01	2 m	
		132625-03	3 m (Lower DC Resistance)	
Unshielded Cable	C68-C68-D4	195949-01	1 m	

Connector Blocks for High-Speed Digital I/O Devices

Description	Model	Part Number	Shielded	
Connector block designed for high-speed DIO devices (recommended)	SCB-68 HSDIO	782914-01	✓	
Low-cost terminal block (wide layout) **CB-68LP**	CB-68LP	777145-01	—	
Low-cost terminal block (narrow layout) **CB-68LPR**	CB-68LPR	777145-02	—	
DIN-rail-mountable terminal connector block **TBX-68**	TBX-68	777141-01	—	

±10 V Analog Output Devices for PCI Express

A/O devices for PCI Express are high-speed, high-density devices designed for simultaneous multichannel updates for control and waveform output applications such as simple function generation, and stimulus-response tests including acoustic distortion testing and three-phase power simulations. Each device includes digital I/O lines and four counters for digital triggering and external clocking.

PCIe-6738 Devices

Model	Part Number	A/O Channels	A/O Resolution	A/O Voltage	Max. Update Rate	DIO	Counters
PCIe-6738	783800-01	32	16 b	-10 V—10 V	1 MS/s	8	4
PCIe-6739	783801-01	64	16 b	-10 V—10 V	1 MS/s	20	4

Analog Output Device Accessories

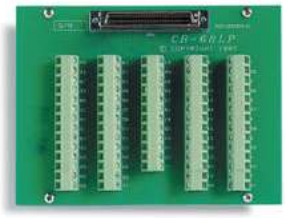
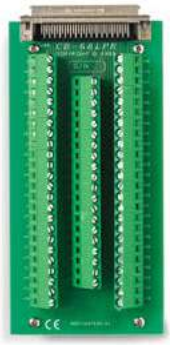
Analog output devices require a cable and terminal block for each connector as follows:

- PCIe-6738 has two connectors on the front and requires two each of cables and connector blocks
- PCIe-6738 has four connectors on the front and requires four each of cables and connector blocks

Cables for PCIe-6739/6738 Analog Output Devices

Description	Model	Part Number	Length	
Shielded 68-pin VHDCI to 68-pin SCSI cable for use with the PXIe-6738 and PXIe-6739.	SHC68-68-A2	157599-0R5	0.5 m	
		157599-01	1 m	
		157599-05	2 m	

Connector Blocks for PCIe-6739/6738 Analog Output Devices

Description	Model	Part Number	Shielded	
Most common desktop accessory for NI DAQ devices. Metal breakout box with removable magnetic lid covering screw terminals. **SCB-68A**	SCB-68A	782536-01	✓	
Low-cost terminal block (wide layout) **CB-68LP**	CB-68LP	777145-01	—	
Low-cost terminal block (narrow layout) **CB-68LPR**	CB-68LPR	777145-02	—	
DIN-rail-mountable terminal connector block **TBX-68**	TBX-68	777141-01	—	
BNC connector block for PCIe-6612 with built-in quadrature encoders, square wave generator, button for digital trigger	BNC-2121	778289-01	—	

Counter/Timer Device for PCI Express

Use the PCIe-6612 for encoder position measurement, event counting, period measurement, pulse-width measurement, pulse generation, pulse-train generation, and frequency measurement. It features eight counter/timers, digital debouncing filters, and TTL/CMOS-compatible digital I/O.

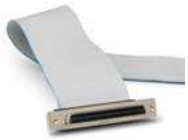
PCIe-6612 Device

Model	Part Number	Logic Level	Counters	DIO Channels	Measure Frequency
PCIe-6612	782352-01	5 V TTL	8	40	80 MHz

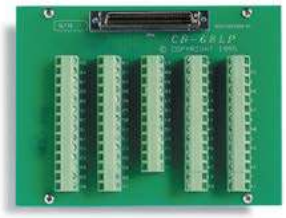
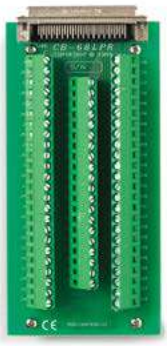
Counter Device Accessories for PCIe-6612

Select one cable and one connector block accessory for each PCIe-6612.

Cables for PCIe-6612

Description	Model	Part Number	Length	
Shielded cable to connect PCIe-6612 to terminal block. (SCSI to SCSI)	SH68-68-D1	183432-0R4	0.4 m	
		183432-01	1 m	
		183432-10	2 m	
Unshielded Ribbon Cable	R68-R68	182482-OR25	0.25 m	
		182482-01	1 m	

Connector Block Accessories for PCIe-6612

Description	Model	Part Number	Shielded	
Most common desktop accessory for NI DAQ devices. Metal breakout box with removable magnetic lid covering screw terminals. **SCB-68A**	SCB-68A	782536-01	✓	
Low-cost terminal block (wide layout) **CB-68LP**	CB-68LP	777145-01	—	
Low-cost terminal block (narrow layout) **CB-68LPR**	CB-68LPR	777145-02	—	
DIN-rail-mountable terminal connector block **TBX-68**	TBX-68	777141-01	—	
BNC connector block for PCIe-6612 with built-in quadrature encoders, square wave generator, button for digital trigger	BNC-2121	778289-01	—	

PXI/PXI Express Devices for Multifunction DAQ

Choose PXI systems for DAQ when you need:

- Large datasets from high-speed or high-channel-count systems
- High-channel system synchronization, or advanced synchronization with external devices
- Clock sharing
- More channels in less space (save rack or workbench space)
- Measurement accuracy (PXI typically has the most accurate measurements for a specific signal type)
- Systems that combine ±V DAQ and sensor measurements with instrumentation including DMMs, SMUs, and scopes.

PXI Multifunction I/O Devices

Multifunction devices combine ±10 V inputs with ±10 V outputs and digital/TTL signals. They are the most popular style of DAQ device for their wide signal type coverage and general flexibility. Engineers across the world have been using NI's multifunction I/O devices for research, validation, and manufacturing test for decades.

Multifunction I/O | Multiplexed

In multiplexed measurement devices, all voltage input channels share a single analog-to-digital converter through a mux/switch. For high-speed signals (~10 kS/s) that require synchronous measurement, NI recommends devices with a simultaneous architecture, as shown in the next section.

Category	Model	Part Number	A/I Channels (DI/SE)	Sample Rate	A/O and DIO Channels	Update Rate (All Channels Combined)	Counters	Absolute Accuracy	Resolution (Input/ Output)
Lowest Cost	PXIe-6321	790590-01	8/16	250 kS/s	A/O: 2 DIO: 24	900 kS/s	4	2,200 µV	16 b/16 b
	PXIe-6323	790591-01	16/32	250 kS/s	A/O: 4 DIO: 48	900 kS/s	4	2,200 µV	16 b/16 b
	PXIe-6341	781052-01	8/16	500 kS/s	A/O: 2 DIO: 24	900 kS/s	4	2,190 µV	16 b/16 b
	PXIe-6343	790592-01	16/32	500 kS/s	A/O: 4 DIO: 48	900 kS/s	4	2,190 µV	16 b/16 b
	PXIe-6345	783631-01	40/80	500 kS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,520 µV	16 b/16 b
Highest Speed	PXIe-6351	790593-01	8/16	1.25 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,660 µV	16 b/16 b
	PXIe-6353	790594-01	16/32	1.25 MS/s	A/O: 4 DIO: 48	2.86 MS/s	4	1,660 µV	16 b/16 b
	PXIe-6355	783632-01	40/80	1.25 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,520 µV	16 b/16 b
	PXIe-6357	790595-01	104/208	1.25 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,660 µV	16 b/16 b
	PXIe-6361	781055-01	8/16	2.0 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,660 µV	16 b/16 b
	PXIe-6363	781056-01	16/32	2.0 MS/s	A/O: 4 DIO: 48	2.86 MS/s	4	1,660 µV	16 b/16 b
	PXIe-6365	783633-01	72/144	2.0 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,520 µV	16 b/16 b
	PXIe-6375	783634-01	104/208	3.8 MS/s	A/O: 2 DIO: 24	2.86 MS/s	4	1,660 µV	16 b/16 b
Best Resolution	PXI-6289	779639-01	16/32	625 kS/s	A/O: 4 DIO: 48	2.86 MS/s	2	980 µV	18 b/16 b

Multifunction I/O | Simultaneous

In simultaneous measurement devices, each voltage input channel has a dedicated analog-to-digital converter for a parallel signal path. This design is recommended for best possible measurement quality and when high-speed signals need data acquired at the same time.

Sample Rate	Model	Part Number	A/I Channels (DI Only)	DIO Channels	A/O Channels	Update Rate (per Channel)	Counters	Absolute Accuracy	Resolution (Input/ Output)
500 kS/s	**PXIe-6349**	785808-01	32	24	2	900 kS/s	4	3,225 µV	16 b/16 b
1.25 MS/s	**PXIe-6356**	781053-01	8	24	2	3.3 MS/s/ch	4	2,688 µV	16 b/16 b
	PXIe-6358	781054-01	16	48	4	3.3 MS/s/ch	4	2688 µV	16 b/16 b
2MS/s	**PXIe-6366**	781057-01	8	24	2	3.3 MS/s/ch	4	2,688 µV	16 b/16 b
	PXIe-6368	781058-01	16	48	4	3.3 MS/s/ch	4	2,688 µV	16 b/16 b
3.3 MS/s	**PXIe-6376**	781475-01	8	24	2	3.3 MS/s/ch	4	2,688 µV	16 b/16 b
	PXIe-6378	781476-01	16	48	4	3.3 MS/s/ch	4	2,688 µV	16 b/16 b
4 MS/s	**PXIe-6124**	780536-01	4	24	2	4 MS/s/ch	2	3,147 µV	16 b/16 b
14 MS/s	**PXIe-6386**	785926-01	8	24	2	3.3 MS/s/ch	4	1,769 µV	16 b/16 b
	PXIe-6396	785927-01	8	24	2	3.3 MS/s/ch	4	1,769 µV	18 b/16 b

Accessories for Multifunction DAQ Devices

How Many Cables Does Your PXI Express DAQ Device Need?

PXI Express DAQ devices offer between one and four VHDCI connectors, each with 68 pins. Purchase a cable and connector block for each VHDCI connector to connect signal wires. Note: Not all cables are compatible with all connectors. Use the tables below to match the correct number and type of cable to your device.

For the cables in the table below, both "Shielded (EPM)" and the "SHC68-68" cables are shielded. The difference between the two is that the EPM cable accounts for the specific mix of analog and digital signal types by separating/twisting some of the pairs. NI recommends using shielded EPM cables wherever possible for the best measurement quality.

SHC68-68-EPM Cable Compatibility

Model	Part Number	Cable for Connector 0	Cable for Connector 1	Cable for Connector 2	Cable for Connector 3
PXI-6289	779639-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6124	780536-01	SHC68-68-EPM	—	—	—
PXIe-6321	790590-01	SHC68-68-EPM	—	—	—
PXIe-6323	790591-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6341	781052-01	SHC68-68-EPM	—	—	—
PXIe-6343	790592-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6345	783631-01	SHC68-68-EPM	SHC68-68	—	—
PXIe-6349	785808-01	SHC68-68-EPM	SHC68-68	—	—
PXIe-6351	790593-01	SHC68-68-EPM	—	—	—
PXIe-6353	790594-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6355	783632-01	SHC68-68-EPM	SHC68-68	—	—
PXIe-6356	781053-01	SHC68-68-EPM	—	—	—
PXIe-6357	790595-01	SHC68-68-EPM	SHC68-68	SHC68-68	SHC68-68
PXIe-6358	781054-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6361	781055-01	SHC68-68-EPM	—	—	—
PXIe-6363	781056-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6365	783633-01	SHC68-68-EPM	SHC68-68	SHC68-68	—
PXIe-6366	781057-01	SHC68-68-EPM	—	—	—
PXIe-6368	781058-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6375	783634-01	SHC68-68-EPM	SHC68-68	SHC68-68	SHC68-68
PXIe-6376	781475-01	SHC68-68-EPM	—	—	—
PXIe-6378	781476-01	SHC68-68-EPM	SHC68-68-EPM	—	—
PXIe-6386	785926-01	SHC68-68-EPM	—	—	—
PXIe-6396	785927-01	SHC68-68-EPM	—	—	—

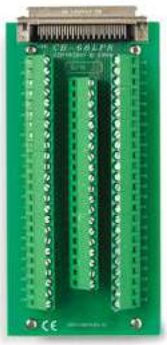
Cables to Connect Multifunction PXI Express DAQ Devices to Terminal Blocks

Recommendation	Part Number	Length	
Best performance if compatible with your device. **SHC68-68-EPM**[1] Separates DIO from A/I signals in cable to reduce crosstalk.	192061-0R5	0.5 m	
	192061-01	1 m	
	192061-02	2 m	
	192061-05	5 m	
	192061-10	10 m	
Any device connection not supported by the EPM cable. Works on any multifunction I/O device and connector. Shielded **SHC68-68**	191945-0R5	0.5 m	
	191945-01	1 m	
	191945-02	2 m	
Ribbon cable for low-cost systems. Not recommended for noisy environments. Works on any multifunction I/O device and connector. **RC68-68**[2]	187252-0R25	0.25 m	
	187252-0R5	0.5 m	
	187252-01	1 m	

[1] Compatible with Connector 0 of all devices and Connector 1 of 6289/6323/6343/6353/6363/6358/6368/6378. Does not work on 6345/6349/6355/6357/6365/6375 Connectors 1, 2, or 3.

[2] RC68-68 is not compatible with the PXIe-6345/6349/6355/6357/6365/6375 due to mechanical constraints (i.e., the larger backshell may interfere with neighboring cables where there are multiple connectors or the ejector handle where the connectors are situated directly above it). Shielded cables such as the SHC68-68-EPM1 or SHC68-68 may be used in place of the RC68-68 when connecting to unshielded connector blocks.

Screw Terminal Accessories for Multifunction I/O PCI Express/PXI Express Devices

Description	Model	Part Number	Shielded	
Mounts to the front of a PXI Express device installed in a PXI chassis. No cable is required. Note: This will block Connector 1, rendering it unusable, even on compatible devices. See the note below for compatibility. **TB-2706**[1]	TB-2706	779183-01	✓	
Most common desktop accessory for NI DAQ devices. Metal breakout box with removable magnetic lid covering screw terminals. **SCB-68A**	SCB-68A	782536-01	✓	
Low-cost terminal block (wide layout) **CB-68LP**	CB-68LP	777145-01	—	
Low-cost terminal block (narrow layout) **CB-68LPR**	CB-68LPR	777145-02	—	
DIN-rail-mountable terminal connector block **TBX-68**	TBX-68	777141-01	—	

[1]Not for use with NI 6345/6346/6349/6355/6365/6375. Connects to Connector 0 of the compatible PXI Express module. After installation, Connector 1 cannot be used.

BNC Accessories for Multifunction PXI Express DAQ Devices

Description and Model	Part Number	
Shielded BNC Connector Block **BNC-2110**	777643-01	
Single-Ended Shielded BNC Connector Block **BNC-2111**[1]	779347-01	
Shielded BNC Connector Block with Onboard Function Generator and Quadrature Encoder **BNC-2120**	777960-01	
Rack-Mountable Accessory for 68-Pin Multifunction DAQ **BNC-2090A**	779556-01	

[1] BNC-2111 cannot be used with NI 6356/6358/6366/6368/6374/6376/6378/6386/6396 simultaneous I/O X Series devices.

For more accessory compatibility information, see the following online KnowledgeBase articles.

DAQ Multifunction I/O Accessory Guide

DAQ Multifunction I/O Cable Guide

NI Cable and Accessory Guides

PXI Digital I/O Devices

These devices are great to add more digital lines to systems in manufacturing test or other industrial environments—and with the higher current output, you can directly drive solid-state relays. Many devices (PXIe-6509, for example) include features such as configuring each port for input or output, programmable power-up states, I/O watchdogs, and software-selectable programmable input filters.

PXIe-6509

Category	Model	Part Number	Bus Connector	Digital I/O Logic Levels	Digital Input Voltage Range	Max Clock Rate	Bidirectional Digital Channels	Digital Input-Only Channels	Digital Output-Only Channels	Output Voltage Range	Signaling Type	Single-Ended Digital I/O Channel
30 V High-Channel D/I	**PXI-6511**	778967-01	PXI Hybrid	24 V	-30 V to 30 V	—	—	64	—	—	Single-Ended	—
30 V High-Channel D/O	**PXI-6512**	778969-01	PXI Hybrid	24 V	—	—	—	—	64	0 V to 30 V	Single-Ended	350 mA
30 V Sink/Source D/I, Source D/O	**PXI-6514**	778965-01	PXI Hybrid	24 V	-30 V to 30 V	—	—	32	32	-30 V to 30 V	Single-Ended	350 mA
Highest-Channel Current Drive (475 mA), 32 D/I, 32 D/O	**PXI-6515**	778964-01	PXI Hybrid	24 V	-30 V to 30 V	—	—	32	32	-30 V to 30 V	Single-Ended	475 mA
60 V Sink/Source D/I, D/O; Channel-Channel Isolated	**PXI-6528**	778543-01	PXI Hybrid	60 V	-60 V to 60 V	—	—	24	24	-60 V to 60 V	Single-Ended	150 mA
Lowest Cost	**PXIe-6509**	787358-01	PXI Express	5 V	0 V to 5 V	—	96	0	0	0 V to 5.5 V	Single-Ended	24 mA
Programmable Logic Level	**PXIe-6535**	780695-0	PXI Express	2.5 V 3.3 V 5 V TTL	-1 V to 6 V	10 MHz	32	—	—	0 V to 5 V	Single-Ended	32 mA

PXI Digital I/O Accessories

Step 1: Locate the model number of your selected device.

Step 2: Use the Digital I/O Accessory Compatibility table below to select compatible accessories. You will need one cable and terminal block for each connector unless you select a front mounting terminal block.

Step 3: Use the Digital I/O Cable and Connector Block Accessories table for images and part numbers of compatible accessories.

Digital I/O Accessory Compatibility

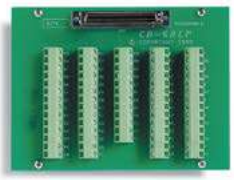
Digital I/O Model	Description	Cable Compatibility	Cable Adapter	Connector Block Compatibility
PXI-6511/6512/6514/6515/6528 PXIe-6509	Shielded	SH100M-100M FLEX	—	SCB-100A
	Unshielded	R1005050	—	CB-50 CB-50LP
		CB-100		
PXIe-6535	Shielded	SHC68-C68-D4 SHC68-C68-D4, Low Leakage SHC68-C68-D4, Lower DC Resistance	—	SCB-68HSDIO SMB-2163
			653x Cable Adapter1	SCB-68A[2]
	Shielded cable backshell to unshielded flying leads	SHC68-H1x38	—	—
	Unshielded—to connector block	C68-C68-D4	—	CB-2162
			653x Cable Adapter[1]	CB-68LP CB-68LPR TBX-68

[1]The cable adapter is only required when connecting to accessories with a 68-pin SCSI connector. It is not required for accessories with 68-pin VHDCI connectors.

[2]SCB-68A must be configured in direct feedthrough mode.

Digital I/O Cable and Connector Block Accessories

Accessory Type	Accessory (Part Number)	Description	
Cable	C68-C68-D4 (195949-01) 1 m	Unshielded cable for high-speed digital I/O, 2x 68-pin male VHDCI cable	
	R1005050 Cable[1] (182762-01) 1 m (182762-02) 2 m (182762-0R5) 0.5 m	Unshielded ribbon cable with 100-pin SCSI to two 5-pin IDC connectors	
	SHC68-C68-D4 (196275-01) 1 m (781293-01) 2 m SHC68-C68-D4, Low Leakage (152870-01) 1 m SHC68-68-D4, Lower DC Resistance (132625-03) 3 m	Shielded cable for high-speed digital I/O, 2x 68-pin male VHDCI	
	SHC68-H1x38 (192681-1R5) 1.5 m	Shielded cable for high-speed digital I/O, 68-pin male VHDCI to 76-pin female flying leads	
	SH37F-37M (778621-01) 1 m (778621-02) 2 m	Shielded 37-Pin D-SUB cable, high-voltage-rated for CAT II, 150 VDC/VAC	

Cable	SH100M-100M FLEX (185095-01) 1 m (185095-02) 2 m	Shielded 100-pin SCSI cable	
	635x Cable Adapter (195846-01)	Cable adapter for high-speed digital I/O, 68-pin VHDCI to 68-pin SCSI	
Connector Block	CB-2162[2] (778592-01)	Single-Ended I/O connector block for high-speed digital I/O, 68-pin VHDCI to genderless solder cup terminal	
	CB-50 (776164-90)	Unshielded I/O connector block with 50 screw terminals and one 50-pin IDC connector, DIN rail mount	
	CB-50LP (777101-01)	Unshielded I/O connector block with 50 screw terminals and one 50-pin IDC connector, panel mount	
	CB-68LP (77714 5-01)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical mounted SCSI connector	
	CB-68LPR (777145-02)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical mounted SCSI connector	

Connector Block	SCB-68A (782536-01)	Shielded I/O connector block with 68 screw terminals and 68-pin SCSI connector	
	SCB-68 HSDIO (782914-01)	Shielded I/O connector block with 72 screw terminals and 68-pin VHDCI connector	
	SCB-100A (785024-01)	Noise-rejecting, shielded I/O connector block with 100 screw terminals and 100-pin SCSI connector	
	TBX-68 (777141-01)	Unshielded DIN-rail-mountable I/O connector block with 68 screw terminals and one 68-pin SCSI connector	

[1]Requires two 50-pin connector blocks to enable connection to all lines.

[2]You must supply 20-24 AWG stranded conductor wire to complete accessory construction.

PXI Analog Output Devices

A/O devices for PXI are high-speed, high-density devices designed for simultaneous multichannel updates. Use them in control and waveform output applications such as simple function generation, and stimulus-response tests including acoustic distortion and three-phase power simulations. Each device includes digital I/O lines and four counters for digital triggering and external clocking.

PXI-6739

Category	Model	Part Number	Analog Output Resolution	Analog Output Voltage Range	Bus Connector	Max Update Rate	Analog Output Channels	Output Current Range
General Purpose	**PXI-6704**	777796-01	16 Bits	-10.1 V to 10.1 V	PXI Hybrid	Static	32	0.1 mA to 20.2 mA
Lowest Cost	**PXI-6723**	778998-01	13 Bits	-10 V to 10 V	PXI Hybrid	800 kS/s	32	—
Fastest Update Rate	**PXI-6733**	778512-01	16 Bits	-10 V to 10 V	PXI Hybrid	1 MS/s	8	—
	PXIe-6738	783800-01	16 Bits	-10 V to 10 V	PXI Express	1 MS/s	32	—
Highest Channel Count and Fastest Update Rate	**PXIe-6739**	783801-01	16 Bits	-10 V to 10 V	PXI Express	1 MS/s	64	—

PXI Analog Output Accessories

Step 1: Locate the model number of your selected device.

Step 2: Use the A/O Accessory Compatibility table below to select compatible accessories. You will need one cable and terminal block for each connector, unless you select a front mounting terminal block. Note: The PXI-6723 has different accessory compatibility for each connector on the device.

Step 3: Use the A/O Cable and Connector Block Accessories table for images and part numbers of compatible accessories.

A/O Accessory Compatibility

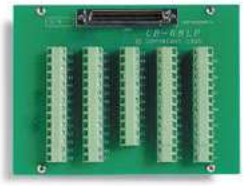
A/O Device Model	Shielded/ Unshielded	Cable Model Number	Connector Block/Accessory Model Number
PXI-6704	Shielded	SH68F-68F-D1	SCB-68A
	Unshielded	R68-68	TBX-68 CB-LP CB-LPR
PXI-6723 (A/O 0-7 and Digital Connector)	Shielded	SH68-C68-S	BNC-2110 SCB-68A
	Unshielded	RC68-68	CB-68LP CB-68LPR TBX-68
PXI-6723 (A/O 8-31 Connector)	Shielded	SH68-C68-S	SCB-68A
	Unshielded	RC68-68	CB-68LP CB-68LPR TBX-68
PXI-6733	Shielded, Noise-Reducing	SH68-68-EPM	BNC-2110 SCB-68A
		No cable required. Front-mounted to PXI chassis.	TB-2705
	Unshielded	R68-68	CB-68LP CB-68LPR TBX-68
PXIe-6738/6739	Shielded	Shielded, basic: SHC68-68-A2 SH68-C68-S1	SCB-68A (Shielded)
	Unshielded	RC68-68	CB-68LP (Unshielded) CB-68LPR (Unshielded) TBX-68 (Unshielded)

[1]Only for use integrating/migrating the 6738/6739 into a 6723 system. Refer to Connecting the NI 6738/6739 in a NI 6723 System section of the PXIe-6738/39 user manual for more information.

A/O Cable and Connector Block Accessories

	Accessory (Part Number)	Description	
Cables	R68-68 Cable (182482-0R25) 0.25 m (182482-01) 1 m	Low-cost, unshielded 68-68 pin SCSI ribbon cable	
	RC68-68 Cable (187252-0R25) 0.25 m (187252-0R5) 0.5 m (187252-01) 1 m	Low-cost, unshielded 68-pin SCSI to 68-pin VHDCI ribbon cable	
	SHC68-68-A2 Cable (157599-0R5) 0.5 m (157599-01) 1 m (157599-02) 2 m	Shielded 68-pin VHDCI to 68-pin SCSI cable for use with the PXIe-6738 and PXIe-6739	
	SH68F-68F-D1 Cable (183432-02) 2 m	Shielded 68-68 pin SCSI cable for use with the PXI-6704 or other counter/timer I/O modules	
	SH68-68-EPM Cable (199006-01) 1 m (199006-02) 2 m (199006-05) 5 m	Noise-reducing, shielded 68-68 pin SCSI cable	
	SH68-C68-S Cable (186381-01) 1 m (186381-02) 2 m	Shielded 68-pin VHDCI to 68-pin SCSI cable for use with the PXI-6723	

A/O Cable and Connector Block Accessories

	Accessory (Part Number)	Description	
Connector Blocks	BNC-2110 (777643-01)	Provides BNC connectivity to all analog signals, some digital signals, and spring terminals for other digital signals	
	CB-68LP (77714 5-01)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical mounted SCSI connector	
	CB-68LPR (777145-02)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical mounted SCSI connector	
	SCB-68A (782536-01)	Shielded I/O connector block with 68 screw terminals and 68-pin SCSI connector	
	TBX-68 (777141-01)	Unshielded DIN rail-mountable I/O connector block with 68 screw terminals and one 68-pin SCSI connector	
PXI Terminal Block	TB-2705 (778241-01)	Shielded front mount terminal block with 62 screw terminals and one 68-pin SCSI connector. Does not require a cable.	

PXI Counter/Timer Devices

Use the counter/timer devices for encoder position measurement, event counting, period measurement, pulse-width measurement, pulse generation, pulse-train generation, and frequency measurement. Devices feature eight counter/timers, digital debouncing filters, and TTL/CMOS-compatible digital I/O.

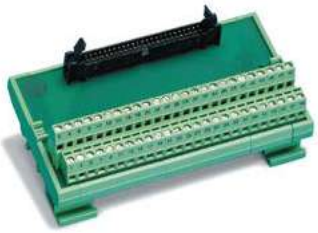
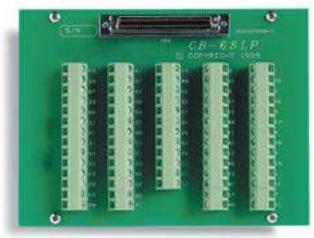
PXIe-6614

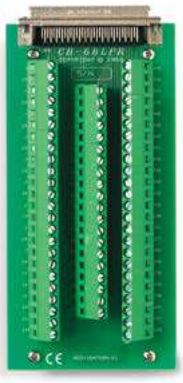
Category	Model	Part Number	Counters/ Timers	Measure Frequency	Onboard High-Precision Oscillator
High-Voltage Option	**PXI-6624**	778975-01	8	400 MHz	—
Lowest Cost	**PXIe-6612**	782352-01	8	80 MHz	—
Onboard High-Precision Oscillator	**PXIe-6614**	782353-01	8	80 MHz	✓

PXI Counter/Timer Device Accessories

Counter/Timer I/O Cable and Connector Block Accessories

Accessory Type	Accessory (Part Number)	Description	
Cable	R68-68 (182482-0R25) 0.25 m (182482-01) 1 m	Low-cost, unshielded 68-pin SCSI ribbon cable	
	R1005050 (182762-01) 1 m (182762-02) 2 m (182762-0R5) 0.5 m	Unshielded ribbon cable with 100-pin SCSI to two 5-pin IDC connectors	
	SH68F-68F-D1 (183432-02) 2 m	Shielded 68-pin SCSI cable for use with the PXI-6704 other counter/timer I/O modules	
	SH100M-100M-FLEX (185095-01) 1 m (185095-02) 2 m	Shielded 100-pin SCSI cable	
	BNC-2121 (778289-01)	Shielded female SCSI to female BNC connector block with eight dedicated and six user-defined BNC connectors and spring terminals, function generator, and encoder	

Accessory Type	Accessory (Part Number)	Description	
Connector Block	CB-50 (776164-90)	Unshielded I/O connector block with 50 screw terminals and one 50-pin IDC connector, DIN rail mount	
	CB-50LP (777101-01)	Unshielded I/O connector block with 50 screw terminals and one 50-pin IDC connector, panel mount	
	SCB-68A (782536-01)	Shielded I/O connector block with 68 screw terminals and 68-pin SCSI connector	
	SCB-100A (785024-01)	Noise-rejecting, shielded I/O connector block with 100 screw terminals and 100-pin SCSI connector	
	CB-68LP (77714 5-01)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical-mounted SCSI connector	

Accessory Type	Accessory (Part Number)	Description	
	CB-68LPR (777145-02)	Unshielded I/O connector block with 68 screw terminals and one 68-pin vertical-mounted SCSI connector	
	TBX-68 (777141-01)	Unshielded DIN-rail-mountable I/O connector block with 68 screw terminals and one 68-pin SCSI connector	
Connector Block Kit	CB-100 (777812-01)	I/O connector block kit, two CB-50 I/O connector blocks and a 1 m R1005050 ribbon cable included	
PXI Terminal Block	TB-2715 (778242-01)	PXI front-mount terminal block, screw terminal	

CompactDAQ

What Is NI CompactDAQ?

CompactDAQ is rugged, modular hardware that connects sensors and electrical signals to a PC over Ethernet or USB. Its available measurement modules, expandability, and software support make CompactDAQ an ideal “universal test instrument” for teams trying to do more with less. Use CompactDAQ for vibration analysis, motor and bearing tests, thermal tests, power quality measurements, reading industrial digital lines, impact/strain tests, and many more test applications.

- High-speed sensor measurements
- Portable or benchtop validation systems
- Combining sensors and electrical measurements

Why Choose CompactDAQ?

CompactDAQ offers a versatile and robust solution for various data acquisition needs. Whether you’re measuring precise sensor data, scaling a system, or working in harsh environments, CompactDAQ adapts to your requirements with ease.

Closeup on Features

Modular I/O (Future Expansion)

The CompactDAQ system provides exceptional flexibility and scalability by allowing you to choose from 17 different types of C Series modules, with more than 60 variants within these types. Each module type adds specific circuitry that enables CompactDAQ to handle various measurement tasks, from analog and digital signals to specialized sensor inputs. This modular approach allows you to customize the system based on your unique application needs, selecting specifications and connectors that fit your requirements. You can select modules based on your immediate needs while easily adding or swapping modules as your testing requirements evolve.

Synchronization

CompactDAQ supports network-based synchronization through time sensitive networking (TSN). TSN allows you to synchronize multiple CompactDAQ systems with precision, ensuring that you accurately correlate measurements from different locations. The CompactDAQ Ethernet chassis with TSN support makes network synchronization easier by abstracting much of the complexity within the NI-DAQmx driver. You can achieve sub-microsecond synchronization accuracy between multiple chassis, enabling consistent and reliable data collection for large-scale, distributed tests.

Connector Options

CompactDAQ systems provide a range of connector options to suit different preferences and application needs. There are more than eight signal connector options for CompactDAQ systems. This range of connector options ensures that Compact DAQ can meet the specific requirements of different testing environments, providing customization where it's needed most.

This range of connector options ensures that CompactDAQ can meet the specific requirements of different testing environments, providing customization where it's needed most.

Mounting Options

CompactDAQ offers several mounting options, making it adaptable to various working environments. You can mount it on desktops, DIN rails, panels, or racks, offering maximum flexibility in setup. Whether in a laboratory, production line, or in the field, you can mount CompactDAQ securely to meet the specific needs of each application. This flexibility ensures efficient use in any setting without the need for custom mounting solutions, allowing you to integrate the DAQ system seamlessly into your existing setup and save on installation time and costs.

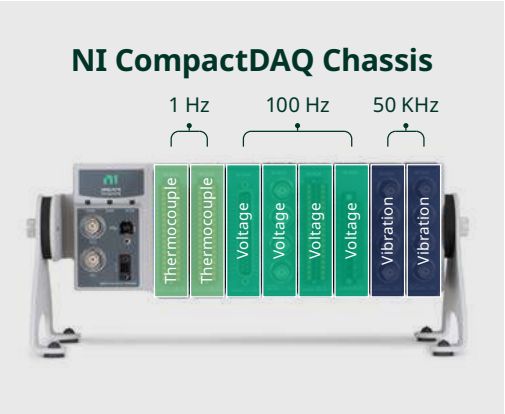
Connect to your PC over USB or Ethernet

CompactDAQ connects via USB or Ethernet, offering flexible options to fit different environments and applications. USB provides a simple, plug-and-play experience ideal for portable, desktop, or stand-alone setups. Ethernet connectivity supports distributed measurements by connecting CompactDAQ to local or enterprise networks, enabling multiple systems to run from a single PC with extended reach up to 200 meters. With both options available, you can integrate CompactDAQ in a way that best suits your needs.

Counter/Timer Capability

CompactDAQ offers advanced counter/timer capabilities, powered by NI System Timing Controller Technology (NI-STC), which is based on 30 years of timing expertise. All CompactDAQ chassis come with four independent 32-bit advanced counters, providing the following features:

- **PWM generation and measurement–**Generate and measure pulse-width modulation signals for motor control and other applications.
- **Event counting–**Accurately count digital events, providing detailed analysis for applications such as frequency detection.
- **Frequency measurement and generation–**Measure or generate frequency signals for precise analysis and synchronization.
- **Train generation and pulse counting–**Generate pulse trains or count pulses for applications that require precise timing and control.
- **Quadrature encoder measurement–**Perform encoder measurements for position tracking and motion applications.



Timing Engines

CompactDAQ features three independent analog input timing engines, providing flexibility to create up to three separate analog input tasks, each with its own unique sample rate and configuration. This allows you to efficiently combine slow measurements like temperature with high-speed signals like vibration or sound, optimizing your test setup for a wide range of sensors. By running multiple sets of measurements concurrently from separate loops or threads in a program, you gain precise timing control. When needed, you can synchronize all channels using a single timing engine, ensuring coherent data collection across all modules.

Output and Control Signals

Using CompactDAQ, you can integrate nondeterministic control with data acquisition, supporting more flexible and automated testing workflows. Use analog, digital, and PWM signal outputs to set control setpoints, simulate voltage and current signals, communicate with PLCs, or control high-current relays. With this functionality, you can automate test processes, reduce manual intervention, and implement sophisticated test setups that require both data collection and active control. Program high-speed A/O modules (up to 100 kS/s output) for sensor simulation and test stimulus.

Rugged and Portable Design

CompactDAQ systems are designed to be rugged yet portable, making them suitable for both lab and field environments. With shock ratings of up to 50 g and an operational temperature range of -40 to 70 °C, CompactDAQ is ideal for challenging environments, such as oil and gas fields or heavy machinery sites.

The compact form factor makes it easy to transport, whether used in a vehicle as a data logger or taken onsite for troubleshooting purposes. Additionally, CompactDAQ can be placed closer to test subjects, reducing the need for long sensor wires and minimizing signal degradation. This combination of portability and durability ensures CompactDAQ can handle a variety of tasks, wherever you need to go, while reducing the risk of equipment failure and ensuring uninterrupted data collection.

What Can You Do with CompactDAQ?

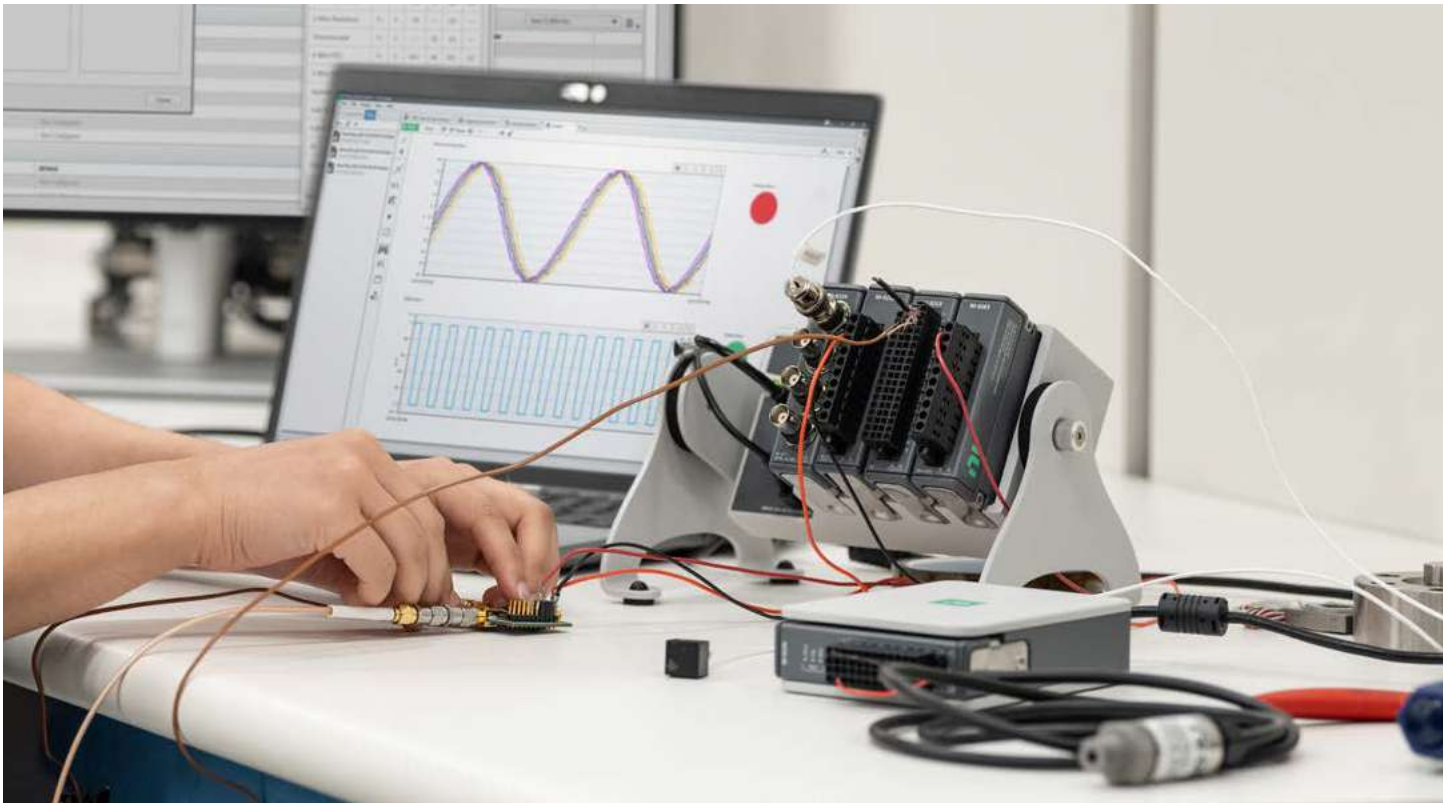
With a wide variety of analog and digital modules, a rugged design, and advanced counter/timer capabilities, powered by NI System Timing Controller Technology (NI-STC), CompactDAQ empowers research and test professionals to tackle a vast array of tasks for data acquisition, automation, and testing.

Measure

- Temperature, pressure, and flow sensors
- Voltage signals (from millivolts to 480 volts AC)
- Current measurements, including 4-20 mA loops
- Vibration and sound with dynamic signal inputs
- Strain gages and bridge-based sensors for structural testing
- Frequency, pulse counting, and encoder signals
- CAN and LIN bus communication for automotive testing
- Power measurements across electrical circuits and machinery
- Voltage drops for current measurements through shunt resistors
- Battery and power supply voltages
- Position and displacement with potentiometers and LVDTs
- And many more

Automate and Generate

- Generate analog signals for simulation or control (voltage, current)
- Read/write digital signals for switching, monitoring, and relay control
- Drive high-current relays and solenoids
- Create pulse-width-modulated (PWM) signals for motor control
- Output control signals to communicate with other systems, including PLCs
- Synchronize analog, digital, and counter outputs
- Control and monitor signals for automated test setups
- Interface with LEDs, alarms, and indicators for user feedback
- Stimulus response test



Module Selection and Considerations

Analog C Series modules are, for the most part, measurement-specific modules with front-end circuitry, analog conversion technology, and signal connectivity designed to create the best digital representation of a signal as possible. Use this section to decide on an approach to wiring, understand different module connector options, and select the right measurement modules for your test system.

FIGURE 1
There are more than 70 measurement modules for CompactDAQ systems

Connectivity Options and Considerations

Some modules will have multiple connection options for the same measurement type. For example, the NI-9205 is available with a spring terminal option and a 37-pin D-SUB option. Here are some methodologies you should consider as you review module connectivity options.

1. NI-9205 spring terminal module
2. Connect to cDAQ chassis
3. Spring terminal connections
4. Plastic backshell around the spring terminal connectors
5. NI-9205 D-SUB module
6. 37-pin D-SUB terminal block
7. NI 37-pin D-SUB cable

FIGURE 2
Several modules are available with different connectivity options, such as the NI-9205.

Standardize on Common Connectors for Efficiency

Team members building the system will develop a familiarity with the connector and be more efficient with their work if fewer (or a single) connector option is selected. Standard connections also make stocking accessories more convenient. Spring/screw terminal and D-SUB connection variants are the most common connector types across the family of C Series modules.

FIGURE 3

Standardize on a few module connectors (screw terminals shown) for efficient system assembly and support.

Quick Connections Reduce Setup Time

Use modules with a quick connection option for systems that are more portable or for systems that will be subject to frequent setups and changeover. The tradeoff is you will manage multiple types of accessories, need to crimp and terminate sensor wires, and have fewer channels per module (quick connects are less channel-dense). The payback comes from time saved during repetitive test setup. BNC (several modules), RJ50 (strain/load), LEMO (dynamic universal), and 10-32 coaxial jack (or “Microdot” as seen on the NI-9231 IEPE module) are all quick connect style modules.

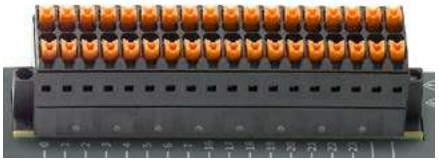
NI C Series Module Connector Types

NI-9205

D-SUB connections—named for the D-shaped metal shell—are a mass termination option that use a pin and socket connection. There are multiple ways to connect to a D-SUB connector including the off-the-shelf cables and terminal blocks, module-mounted terminal blocks with screw terminals, and soldering custom cables using off-the-shelf D-SUB kits with solder cups. All these options are available from NI as well as most global electronics component distributors.

NI-9239

Screw terminal connection options require a flat-bladed screwdriver to close a metal gate that clamps down on exposed signal wire.



NI-9213

Spring terminal connections use a spring mechanism inside the connector to clamp down on exposed signal wires. Use a small, flat-bladed precision screwdriver to open the cage clamp. Remove the screwdriver after inserting the exposed signal wire.

NI-9222

Snap-in connections are quick and easy; open the terminal by pulling the small lever with a finger. Once the signal wire is inserted, the spring-loaded terminal latches closed for a secure connection.

NI-9234

BNC connectors have two signal pins and secure the cable to the module with a quarter-turn coupling nut. They are ideal for single-ended measurements. Because the BNC connector has two pins, it doesn't provide a true differential measurement, which requires three pins.

NI-9237

RJ50 is a variant of the ubiquitous RJ45 that is used for copper Ethernet connections, but the connector and tools are not compatible. The RJ50 has 10 pins. Purchase RJ50 cables and dongles that convert to screw terminals from NI or purchase a crimping tool and use RJ50 connectors to connect sensor wires directly into the module.

NI-9231

The 10-32 coaxial jack, or "Microdot," uses two pins for the connection with a threaded collar to screw the cable in place. This is a common connector for accelerometers and microphones when there are space constraints.

NI-9218

LEMO is a multi-pin push/pull connector that works with several connector standards to offer high-quality connections with a variety of options.

How to Build a CompactDAQ System

1. Modules

Use the **Measurement Modules (C Series Modules) section on page 85** to select your modules.

2. Chassis

Use the **CompactDAQ Chassis Table on page 93** to select your chassis.

Measurement Modules (C Series Modules)

Install C Series modules in a CompactDAQ or NI CompactRIO chassis for a custom measurement system that meets your needs. The following table is an overview of all C Series module specifications. See the **Module Selection Table on page 86** for module specifications.

C Series Module Specification Overview

Analog Input

Signal Type	Channel Count	Measurement Types	Max Sample Rate	Special Features
Voltage	Up to 32	Options for ±200 mV, ±500 mV, ±1 V, ±5 V, ±10 V, ±60 V, 3 V_{rms}, 400 V_{rms}, 800 V_{rms}, 300 V_{rms}	1 MS/s/ch	Up to channel-channel isolation, antialiasing, and configurable filtering
Current	Up to 16	Options for ±20 mA, 0–5 A_{rms}, 0–20 A_{rms}, 0–50 A_{rms}	200 kS/s	Up to channel-channel isolation, built-in channel diagnostics
Voltage and Current	16	Options for ±20 mA and ±10 V	500 S/s	Channel-earth isolation, built-in noise rejection
Universal	Up to 4	V, mA, TC, RTD, Strain, Ω, IEPE	51.2 kS/s/ch	Up to channel-channel isolation, bridge completion, antialiasing filters, built-in shunt resistors, amplification
Thermocouple	Up to 16	J, K, T, E, N, B, R, and S types	95 S/s/ch	Up to channel-channel isolation, amplification, filtering, CJC
RTD	Up to 8	100 Ω, 1000 Ω	400 S/s	50/60 Hz filtering, bank isolation
Strain-/Bridge-Based	Up to 8	¼, ½, full bridge (120 or 350 Ω)	50 kS/s/ch	External excitation, bridge completion, antialiasing filters
Sound and Vibration	Up to 8	±5 V, ±30 V	102.4 kS/s/ch	IEPE, antialiasing filters

Analog Output

Signal Type	Channel Count	Measurement Types	Max Sample Rate	Special Features
Voltage	Up to 16	Options for 3 V_{rms}, ±10 V, ±40 V (stacked)	1 MS/s/ch	Up to bank-isolation
Current	Up to 8	±20 mA	100 kS/s/ch	Channel-earth isolation, built-in open-loop detection

Digital I/O

Signal Type	Channel Count	Measurement Types	Max Sample Rate	Special Features
Input/Output	Up to 32	Options for TTL (3.3 V or 5 V) RS422, 5 V, 12 V, 24 V, 48 V, 72 V, 96 V, 120 V AC, 120 V DC, 240 V AC, 240 V DC	55 ns	Up to channel-channel isolation, sinking or sourcing input, bidirectional channel options
Relay Output	Up to 8	Options for 60 V DC, 30 V_{rms}, 250 V_{rms}	1 operation/s	Up to channel-channel isolation, SPST, or SSR relays

Communication Buses

Signal Type	Channel Count	Measurement Types	Max Sample Rate	Special Features
CAN	1	HS/FD, LS/FT CAN	1 Mb/s	—
LIN	1	LIN	20 kb/s	—
Serial Interface	4 ports	RS232, RS485/RS422	921.6 kb/s	—

Module Selection

The following table lists C Series modules by category. Use the individual tables to match your need to a part number. Can't find exactly what you're looking for? There are more than 70 C Series modules; contact your NI Product Expert or authorized reseller for help.

Module Selection Tables

Module accessories are grouped by connector type. Use the **Front Connector Type** column in the module tables to find the matching accessory table in the accessories section starting on **page 94**.

Voltage Input Modules

Selection Criteria	Model	Part Number	Front Connector Type	Analog Input Resolution	Max Sample Rate	Differential Channels	Single-Ended Channels	Analog Input Voltage Range	Simultaneous Sampling
General Purpose	NI-9204	789114-01	D-SUB	16 Bits	250 kS/s	8	16	±10 V, ±5 V, ±1 V, ±200 mV	—
		789113-01	Spring Terminal						
Higher Channel Count	NI-9205	779357-01	D-SUB*			16	32		
		785184-01	Spring-Terminal						
Faster Rate, High Density	NI-9220	782615-01	D-SUB*		100 kS/s/ch			±10 V	✓
		785188-01	Spring-Terminal						
24-Bit Resolution, 250 V Channel-Channel Isolation	NI-9239	779593-01	Screw-Terminal*	24 Bits	50 kS/s/ch	4	0		
		780181-01	BNC						
		789154-01	Snap-In						
60 V Input Range	NI-9229	779785-01	Screw-Terminal*					±60 V	
		780180-01	BNC						
		789153-01	Snap-In						
Lowest Cost, Simultaneous Sampling	NI-9215	779011-01	Screw-Terminal	16 Bits	100 kS/s/ch			±10 V	
		779138-01	BNC						
		783739-01	Spring-Terminal						
Highest Speed, Simultaneous Sampling	NI-9223	781398-01	Screw-Terminal		1 MS/s/ch				
		783284-01	BNC						
		789125-01	Snap-in						
Medium Speed, Medium Cost	NI-9222	781397-01	Screw-Terminal		500 kS/s/ch				
		783283-01	BNC						
		789124-01	Snap-In						
Selectable Filter, Noise Rejection	NI-9202	784399-01	D-SUB*	24 Bits	10 kS/s/ch	16			
		784400-01	Spring-Terminal						
Digitizer Functionality	NI-9775	784539-01	BNC	14 Bits	20 MS/s/ch	0	4		
Low Cost, High-Speed, 12-Bit	NI-9201	779013-01	Screw-Terminal	12 Bits	500 kS/s		8		—
		779372-01	D-SUB						
		783730-01	Spring-Terminal						

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Voltage Output Modules

Selection Criteria	Model	Part Number	Front Connector Type	Analog Output Resolution	Max Update Rate	Analog Output Channels	Analog Output Voltage Range	Max Current Drive	Analog Output Isolation
General Purpose	NI-9264	780927-01	D-SUB*	16 Bits	25 kS/s/ch	16	±10 V	4 mA	60 VDC Channel-Earth Ground Isolation
		785190-01	Spring-Terminal*						250 V_{rms} Bank Isolation
Lower Cost, Fewer Channels, Faster	NI-9263	779012-01	Screw-Terminal		100 kS/s/ch	4		1 mA	250 V_{rms} Channel-Earth Ground Isolation
		783740-01	Spring-Terminal						250 V_{rms} Channel-Earth Ground Isolation
Channel-Channel Isolated Output, 40 V Range	NI-9269	789131-01	Snap-In					10 mA	250 V_{rms} Channel-Channel Isolation
		781098-01	Screw-Terminal*						

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Thermocouple Modules

Selection Criteria	Model	Part Number	Front Connector Type	Channel Count	Input Range	Max Sample Rate
General Purpose	NI-9213	785185-01	Spring-Terminal*	16	±78 mV	75 S/s
More Accuracy (0.37 °C Benchmark)	NI-9214	781510-01	Screw-Terminal			68 S/s
Channel-Channel Isolation or TC Minijack Connectors	NI-9212	782975-01	Screw-Terminal	8		95 S/s/ch
		785259-01	Miniature Thermocouple (mini-TC)			

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Accelerometer and Microphone Modules

Selection Criteria	Model	Part Number	Front Connector Type	Channel Count	Input Voltage Range	IEPE Excitation	Max Sample Rate
General Purpose	NI-9234	779680-01	BNC*	4	±5 V	2 mA	51.2 kS/s/ch
2X Faster Sample Rate, 30 V Range	NI-9232	782000-01	Screw-Terminal*	3	±30 V	4 mA	102.4 kS/s/ch
		784397-01	BNC				
		789129-01	Snap-In				
More Channels per Module	NI-9231	783610-01	10-32 Coaxial	8	±5 V	2 mA	51.2 kS/s/ch
Lower Cost	NI-9230	783824-01	Screw-Terminal*	3	±30 V	4 mA	12.8 kS/s/ch
		789128-01	Snap-In				
		784396-01	BNC				

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Bridge, Strain, Load, Pressure, and Torque Modules

Selection Criteria	Model	Part Number	Front Connector Type	Channel Count	Analog Input Voltage Range	Bridge Configurations	Max Sample Rate
General Purpose	NI-9237	779521-01	RJ50	4	±25 mV/V	Quarter-Bridge, Half-Bridge, Full-Bridge	50 kS/s/ch
		780264-01	D-SUB*			Full-Bridge Quarter-Bridge Half-Bridge	
More than 2X 120 Ω Quarter-Bridge Sensors	NI-9235	785995-01	Spring-Terminal*	8	±29.4 mV/V	Quarter-Bridge	10 kS/s/ch

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

RTD Temperature Modules

Selection Criteria	Model	Part Number	Front Connector Type	Channel Count	Input Range	Max Sample Rate
General Purpose	NI-9216	783863-01	D-SUB*	8	0–400 mΩ	400 S/s
		785186-01	Spring-Terminal			

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Universal Input Modules

Selection Criteria	Model	Part Number	Front Connector Type	Max Sample Rate	Channel Count	Analog Input Isolation	Electrical Signal Measured	Supported Sensor Type
General Purpose	NI-9219	785994-01	Spring-Terminal*	100 S/s/ch	4	250 V_{rms} Channel-Channel Isolation	Voltage, Current, Temperature, Strain (V, mA, TC, RTD, Strain, Ω, IEPE)	Bridge, RTD, Thermocouple

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Current Input Modules

Selection Criteria	Model	Part Number	Front Connector Type	Channel Count	Analog Input Resolution	Input Current	Max Sample Rate	Analog Input Isolation
General Purpose	NI-9203	779516-01	Screw-Terminal*	8	16 Bits	±20 mA	200 kS/s	250 V_{rms} Channel-Earth Ground Isolation
		783731-01	Spring-Terminal					
More Channels per Module, 24-Bit, 50/60 Hz Rejection	NI-9208	780968-01	D-SUB*	16	24 Bits		500 S/s	60 VDC Channel-Earth Ground Isolation
		785041-01	Spring-Terminal					250 V_{rms} Channel-Earth Ground Isolation

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Digital Input and Output Modules

Selection Criteria	Model	Part Number	Front Connector Type	DIO Isolation	DIO Logic Levels	Max Update Rate	Bidirectional Digital Channels	Digital Input-Only Channels	Digital Input-Only Channels
Industrial DIO	NI-9375	781030-01	D-SUB*	60 VDC Channel-Earth Ground Isolation	12 V 24 V	7 µs	0	16	16
		785192-01	Spring-Terminal	250 V_{rms} Channel-Earth Ground Isolation					
General Purpose TTL	NI-9401	779351-01	D-SUB*	60 VDC Channel-Earth Ground Isolation	5 V TTL	100 ns	8	0	0
High-Channel-Count TTL	NI-9403	779787-01				7 µs	32		
Industrial DI	NI-9421	779002-01	Screw-Terminal	250 V_{rms} Channel-Earth Ground Isolation	12 V 24 V	100 µs	0	8	
		779136-01	D-SUB*	60 VDC Channel-Earth Ground Isolation					
		783734-01	Spring-Terminal	25 V_{rms} Channel-Earth Ground Isolation					
High-Channel-Count 24 V DI	NI-9425	779139-01	D-SUB*	60 VDC Channel-Earth Ground Isolation		7 µs		32	
		785044-01	Spring-Terminal	250 V_{rms} Channel-Earth Ground Isolation					
Industrial DO	NI-9472	779004-01	Screw-Terminal*	250 V_{rms} Channel-Earth Ground Isolation		100 µs		0	8
		779137-01	D-SUB	60 VDC Channel-Earth Ground Isolation					
		783907-01	Spring-Terminal	250 V_{rms} Channel-Earth Ground Isolation					
High-Channel-Count 24 V DO	NI-9476	779140-01	D-SUB*	60 VDC Channel-Earth Ground Isolation		500 µs			32
		785045-01	Spring-Terminal	250 V_{rms} Channel-Earth Ground Isolation					

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Power (Current and 120+ VAC) Modules

Power (Voltage Input) Modules

Selection Criteria	Model	Part Number	Front Connector Type	Analog Input Isolation	Analog Input Resolution	Analog Input Voltage Range	Max Differential Analog	Max Single-Ended Analog	Max Sample Rate	Simul-taneous Sampling
240 VAC	NI-9242	783107-01	Screw-Terminal	250 V_{rms} Channel-Earth Ground Isolation	24 Bits	400 V_{rms}	0	3	50 kS/s/ch	✓
480 VAC	NI-9244	783106-01		400 V_{rms} Channel-Earth Ground Isolation						
Channel-Channel ISO Voltage	NI-9225	789126-01	Snap-In							
		780159-01	Screw Terminal*	600 V_{rms} Channel-Channel Isolation		300 V_{rms}	3	0		
Connects to 0.33 V CTs	NI-9238	789130-01	Snap-In							
		783311-01	Screw Terminal	250 V_{rms} Channel-Channel Isolation		-500 mV to 500 mV	4			

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Power (Current Input) Modules

Selection Criteria	Model	Part Number	Front Connector Type	Analog Input Isolation	Analog Input Resolution	Measure Current	Max Differential Analog	Max Single-Ended Analog	Max Sample Rate
Connects to 5 A CTs (20 A Range)	NI-9246	783920-01	Ring-Terminal	250 V_{rms} Channel-Channel Isolation	24 Bits	0 A_{rms} to 5 A_{rms}	4	0	50 kS/s/ch
High Accuracy, Low Range	NI-9227	789127-01	Snap-In						
		781099-01	Screw-Terminal						

CompactDAQ Chassis and Power Cords

CompactDAQ Chassis

Model	Part Number	Connection to PC	Number of Modules Chassis Can Hold	Synchronized Measurements Between Chassis	Built-In Digital Trigger	Operating Temperature
cDAQ-9170	789116-01	USB-C	1	—	—	-20 °C to 55 °C
cDAQ-9173	789115-01		4			-40 °C to 70 °C
cDAQ-9177	789117-01		8		✓	
cDAQ-9179	783597-01	USB 3.0	14			-20 °C to 55 °C
cDAQ-9181	781496-01	Ethernet	1		—	0 °C to 55 °C
cDAQ-9183	789996-01		4	✓	—	-40 °C to 70 °C
cDAQ-9185	785064-01				✓	
cDAQ-9187	789997-01		8		—	
cDAQ-9189	785065-01				✓	

CompactDAQ Chassis Power Cords[1]

Power Cord	Length (m)	Max Current (A)	Part Number
United States 120 VAC	2.3	10	763000-01
United Kingdom 240 VAC	2.5		763064-01
Swiss 220 VAC			763065-01
Australia 240 VAC			763066-01
European 240 VAC, Right Angle			763067-01
North America 240 VAC	3		763068-01
Japan 125 VAC	2.3	12	786377-01
India 250 VAC	2.5	10	763072-01
Korea 220 VAC, Right Angle			784685-01
China 220 VAC			784686-01
Brazil 250 VAC			785626-01
Taiwan 125 VAC		15	787642-01

[1]Power cords are required if you're using a desktop power supply. If using an industrial power supply, the CompactDAQ chassis does not need a power cord. Instead, wire it directly to the power supply.

C Series Module Accessories

This table provides general descriptions and images of accessories for C Series modules.

Accessories

Term	Definition	
Backshell	This component surrounds the male or female cable connector to protect the cable connections and provide cable strain relief.	
EMI Suppression Ferrite	This passive electrical component clamps around a cable to reduce electromagnetic interference on the line.	
DIN-Rail-Mount Terminal Block	This mounts a connector block to a DIN rail.	
Front-Mount Terminal Block	This connector block connects to the front of the module.	
Screw-Terminal Block	This type of connector block uses screw terminals as the method for connecting wires to a sensor. (included with module)	
Spring-Terminal Block	This connector block uses spring terminals to connect wires to a sensor (included with module).	

D-SUB Accessories

D-SUB connectors are an industry-standard connector with cables and accessories readily available from a variety of distributors. NI C Series modules use 37-, 25-, and 15-pin versions of the D-SUB connector. All D-SUB module accessories are sold separately. You must purchase accessories to connect to a module.

37-Pin D-SUB Connector on C Series Module NI-9205 (Male Connection)

C Series Modules with D-SUB Connectivity

25-Pin D-SUB	
Model	Part Number
NI-9421	779136-01
NI-9472	779137-01
NI-9401	779351-01
NI-9201	779372-01
NI-9221	779373-01

37-Pin D-SUB	
Model	Part Number
NI-9425	779139-01
NI-9205	779357-01
NI-9403	779787-01
NI-9264	780927-01
NI-9208	780968-01
NI-9375	781030-01
NI-9220	782615-01
NI-9216	783863-01
NI-9202	784399-01

25-Pin D-SUB Accessories

D-SUB modules require purchase of either a front mount terminal block or a cable and terminal block for signal connections.

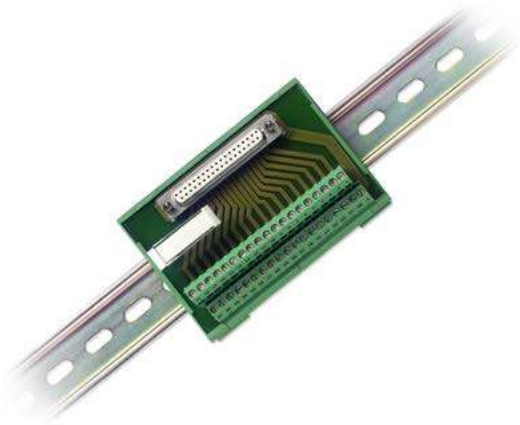
Description	Part Number	Selection Criteria	
Front-Mount Terminal Block	781922-01	Disconnect multiple wires at once (recommended)	
Cable	192568-01	1 m	
	192568-02	2 m	
Mounting	781081-01	DIN rail-mount terminal block	

37-Pin D-SUB Accessories

D-SUB modules require purchase of either a front mount terminal block or a cable and terminal block for signal connections.

Description	Part Number	Selection Criteria	
Front-Mount Terminal Block	781503-01	Disconnect multiple wires at once (recommended)	
Cable	778621-01	1 m	
	778621-02	2 m	
	782316-04	Shielded, low-profile D-SUB-to-pigtail, 4 m	
	778620-04	D-SUB-to-pigtail, 12 ft.	
	154302-01	Low-profile, 1 m	

37-Pin D-SUB Accessories (continued)

Description	Part Number	Selection Criteria	
Mounting	778673-01	Screw-terminal block with horizontal DIN rail mount	
	778676-01	Spring-terminal block with horizontal DIN rail mount	

Screw-Terminal Accessories

C Series Modules with Screw-Terminal Connectivity

Modules with screw-terminal connectivity ship with everything needed to connect a signal wire. Purchase terminals as spares or replacements. Purchase the backshell as an optional accessory for strain relief.

Two-Position	
Model	Part Number
NI-9239	779593-01
NI-9229	779785-01
NI-9225	780159-01
NI-9269	781098-01
NI-9227	781099-01
NI-9222	781397-01
NI-9223	781398-01
NI-9232	782000-01
NI-9238	783311-01
NI-9230	783824-01

Four-Position	
Model	Part Number
NI-9244	783106-01
NI-9242	783107-01

10-Position	
Model	Part Number
NI-9421	779002-01
NI-9472	779004-01
NI-9215	779011-01
NI-9263	779012-01
NI-9201	779013-01
NI-9203	779516-01

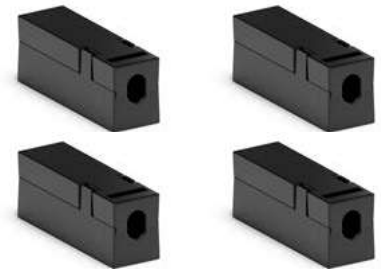
Two-Position Screw-Terminal Accessories

Part Number	Selection Criteria	
196375-01	Backshell for strain relief (Quantity 4)	
196739-01	Extra connectors (Quantity 10)	

Accessories for NI-9242/44 High-Voltage Modules

Part Number	Selection Criteria	
783094-01	Backshell ships with the NI-9242, purchase as spare or replacement (included in shipping kit)	
783154-01	Backshell ships with the NI-9244, purchase as spare or replacement (included in shipping kit)	

Two-Position Snap-in Terminal Accessories

Part Number	Selection Criteria	
790063-01	Backshell for strain relief (Quantity 4)	
790062-01	Extra connectors (Quantity 10)	

10-Position Screw-Terminal Accessories

Part Number	Selection Criteria	
782715-01	Backshell for strain relief (Quantity 1)	
779105-01	Extra connectors (Quantity 10)	

Spring-Terminal Accessories

C Series Modules with Spring-Terminal Connectivity

Modules with screw-terminal connectivity ship with everything needed to connect a signal wire. Purchase terminals as spares or replacements. Purchase the backshell as an optional accessory for strain relief.

Six-Position	
Model	Part Number
NI-9219	785994-01

10-Position	
Model	Part Number
NI-9201	783730-01
NI-9203	783731-01
NI-9421	783734-01
NI-9215	783739-01
NI-9263	783740-01
NI-9482	783906-01
NI-9472	783907-01

24-Position	
Model	Part Number
NI-9235	785995-01

36-Position	
Model	Part Number
NI-9202	784400-01
NI-9208	785041-01
NI-9425	785044-01
NI-9476	785045-01
NI-9205	785184-01
NI-9213	785185-01
NI-9216	785186-01
NI-9220	785188-01
NI-9264	785190-01
NI-9375	785192-01

Six-Position Spring-Terminal Accessories

(NI-9219 Universal Module only)

Part Number	Selection Criteria	
786162-01	Backshell for strain relief (Quantity 4)	
785993-01	Extra connectors (Quantity 4)	

10-Position Spring-Terminal Accessories

Part Number	Selection Criteria	
783787-01	Backshell for strain relief and operator protection (Quantity 1)	
197991-01	Extra connectors (Quantity 10)	

Recommended 24-Position Spring-Terminal Accessories

(NI-9235 strain gage module only)

Part Number	Selection Criteria	
786217-01	Backshell for strain relief (recommended)	
785992-01	Extra connectors (Quantity 1)	

36-Position Spring-Terminal Accessories

Part Number	Selection Criteria	
785080-01	Backshell for strain relief (Quantity 1)	
785502-01	Extra connectors (Quantity 1)	

BNC Accessories

C Series Modules with BNC Connectivity

Model	Part Number
NI-9234	779680-01
NI-9229	780180-01
NI-9239	780181-01
NI-9222	783283-01
NI-9223	783284-01
NI-9215	779138-01
NI-9230	784396-01
NI-9232	784397-01
NI-9775	784539-01

BNC Accessories

Part Number	Selection Criteria	
159103-02	50 Ω BNC-BNC Cable, 2 m	
779697-02	75 Ω BNC-BNC Cable, 2 m	
782802-01	Ferrite For EMI Suppression[1]	

[1]This accessory is required for the NI-9230/9232.

Specialty Connector Accessories—Mini-TC, DIN, Ring, RJ50

C Series Modules with Specialty Connectors

Mini-TC	Part Number
NI-9212	785259-01

DIN	Part Number
NI-9214	781510-01

RJ50	Part Number
NI-9237	779521-01

Ring	Part Number
NI-9246	783920-01

Accessories for NI-9212 Thermocouple Module

Part Number	Selection Criteria	
784486-01	Extra mini-TC front-mount terminal block for NI-9212	
783643-01	Extra screw-terminal front mount terminal block for NI-9212	

Accessories for NI-9214 Thermocouple Module with Screw Terminals

Part Number	Selection Criteria	
781511-01	Purchase terminal block for NI-9214 as spare/ replacement	

RJ50 Accessories

Note: The RJ50 connector is NOT compatible with standard Ethernet cables.

Part Number	Selection Criteria	
196809-01	RJ50 (female)-to screw-terminal adaptor (Quantity 4)	
194738-01	120 Ω quarter-bridge completion terminal block (Quantity 4)	
194739-01	350 Ω quarter-bridge completion terminal block (Quantity 4)	
194611-01	Connector and terminal kit for four-position micro-fit plug that you can use with the NI-9237	
194612-02	RJ50 cable, 2 m (Quantity 4)	
194612-10	RJ50 cable, 10 m (Quantity 1)	

Accessories for NI-9246/47 Current Transformer Modules

Part Number	Selection Criteria	
784300-01	Backshell for strain relief and operator protection for NI-9246/9247 (Quantity 1). Included in shipping kit. Purchase as replacement.	

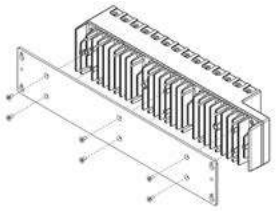
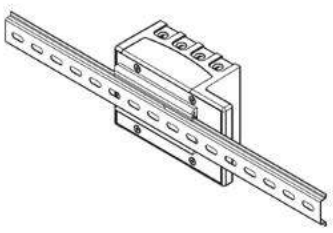
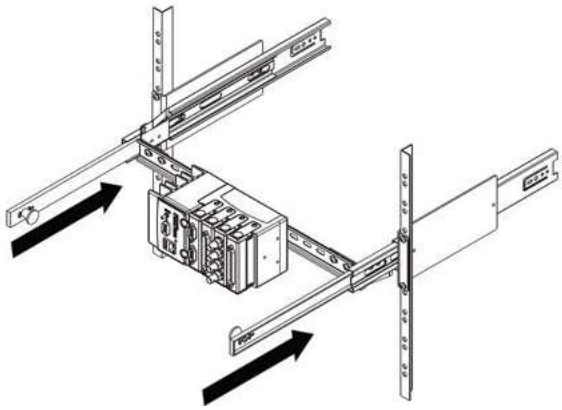
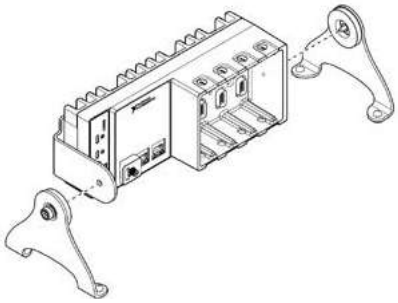
[1]Power cords are required if you're using a desktop power supply. If using an industrial power supply, the CompactDAQ chassis does not need a power cord. Instead, wire it directly to the power supply.

CompactDAQ Chassis Accessories

Mechanical mounting and fixturing is a critical element of a design validation test system. Use the following tables to select a mounting kit as you work through the physical design of your system.

Mounting Kits

Types of Mounting Kits

Type	Selection Criteria and Considerations	
Panel	Use to mount CompactDAQ chassis on flat surfaces Recommended for high shock and vibration applications	
DIN Rail	Mount CompactDAQ chassis and controllers to any standard 35 mm DIN rail Industrial power supplies have DIN mounting options Don't ship systems on DIN rail without considering shock impacts of traditional shipping methods	
Rack-Mount	Use to mount a CompactDAQ chassis on a standard 19-inch rack I/O cables for CompactDAQ systems all come out the same direction Consider space for terminal blocks, power supplies, and cable management	
Desktop	Use for easier access to I/O terminals when working on a desk or benchtop	

Mounting Kits for CompactDAQ Chassis

Type	Part Number	Selection Criteria
Horizontal Panel Mount	781722-01	Horizontal Panel Mounting Kit for 9181/91 Chassis
	779097-01	For any 4-Slot Chassis
	779558-01	For any 8-Slot Chassis
	784303-01	For any 14-Slot Chassis
DIN Rail	779019-01	For 4-Slot cRIO-910x/911x/906x/907x and cDAQ-917x/918x
	781740-01	For NI-9181/9191 Chassis
	779018-01	For 8-Slot cRIO-910x/911x/906x/907x and cDAQ-917x/918x
	157254-01	For 4-Slot cRIO-903x/904x/905x and cDAQ-9132/34/36
Rack	786411-01	Industrial Rack-Mount Kit for CompactRIO and CompactDAQ
Desktop	779473-01	For any CompactDAQ Chassis

Power Supplies

CompactDAQ chassis must be purchased with a 9–30 VDC output power supply (refer to **page 93**). This section contains alternate power supplies.

Power Supplies for CompactDAQ Chassis

Type	Part Number	Selection Criteria
Industrial	783167-01	24 VDC, 3.3 A, 100–240 VAC/110–300 VDC Input
	781094-01	24 VDC, 10 A, 100–120/200–240 VAC Input
Desktop	782698-01	24 VDC, 5 A, 100–240 VAC Input

See the white paper **CompactDAQ Controller and Chassis Mounting Accessories** for more information and images related to mounting CompactDAQ systems.

Use the CompactDAQ advisor to match the right mounting accessories to your chassis. See the **Configuring and Buying a System Online** section.

2D Drawings and 2D CAD Files

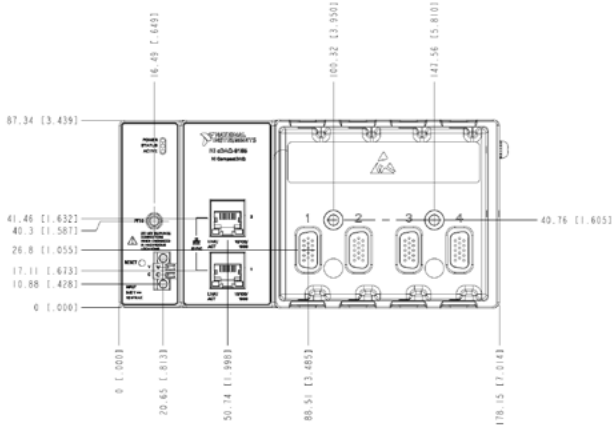


FIGURE 4

2D dimensional drawings and 3D models are available on ni.com. Available file formats for the cDAQ-9185 (2D drawing shown in image) include PDF, DXF, PRT, STP, and IGS.

See the **Dimensional Drawings** support page and enter the product model number, for example, “cDAQ-9185,” to access 2D drawings and CAD model files.

Grounding and Isolation

Safety and Instrument Protection

CompactDAQ modules are independently certified to be safe when used within specifications. Most modules feature hazardous location certifications and/or isolation. Each module is categorized into the following NI-defined isolation levels:

- 60 VDC continuous / 1000 V_{RMS} withstand
- 250 V_{RMS} continuous / 2300 V_{RMS} withstand
- 300 V_{RMS} continuous / 2300 V_{RMS} withstand

Field Wiring and Grounding

Knowing the nature of the signal source and relevant grounding configurations is required to produce accurate and noise-free measurements. Signal sources are broadly classified into two types:

- Grounded or ground-referenced signal source
- Ungrounded or nonreferenced (floating) signal source

A grounded signal source is best measured with a differential or nonreferenced measurement system. In a differential architecture, neither of the inputs is tied to a fixed reference such as earth or building ground. This is useful in rejecting noise, including the unwanted noise often introduced in the circuit that makes up the cabling system as common-mode voltage. One drawback to this approach is that you need twice the number of input channels as signals in your DAQ system. Alternatively, you can use a nonreferenced single-ended (NRSE) architecture that uses one channel per signal and measures each to the same pin usually labeled as AI Sense.

Grounding Resources

For more information, see the following resources:

Understanding and Trusting Isolation Specifications

Grounding Considerations—Intermediate Analog Concepts

Isolation from the Chassis Ground for NI DAQ Hardware

Different Types of Isolation

Helpful Tools for Your Toolbox

Consider these tools when planning systems based on CompactDAQ. These tools are not available from NI.

Tool	Use For	Search For
Precision screwdriver with 2.3 mm blade	Connecting wires to spring terminal modules such as the NI-9213	Screwdriver with 2.3 mm x 1 mm blade
Ferrule crimper and ferrules	Crimping the ends of stranded wires for screw terminal modules. Needed for high vibration environments and for connecting dual wires into a single terminal for some applications.	Ferrule crimper
Rivet nuts and rivet nut tool	Mounting the chassis to a metal panel that's in an enclosure. Thru-hole mounting with nut/bolt combination also works, but rivet nuts make it easier to service an installed panel. Use in combination with a chassis panel mount kit.	Rivet nuts
Hand crimp tool	Crimping 4-terminal connector on external excitation plug for NI-9237 module	Molex part number: 0638190000
RJ50 crimp tool and RJ50 connectors	Crimping sensor cables to turn wire leads into an RJ50 connection. (RJ50-RJ50 cable available as an accessory from NI)	RJ50 crimp tool
Standard Phillips head screwdriver	Ground lug on chassis and some of the strain-relief mounts on the modules	Phillips head screwdriver
Small-blade screwdriver	Connecting to module screw-terminals	Small-blade screwdriver
Wire cutting, splicing tools. Needle-nose pliers	Working with signal wires (typically gage 14–26)	Wire strippers and pliers
Electrical heat-shrink tubing	Creating clean wire connections. Available for a variety of conditions and environments.	Heat-shrink tubing
Soldering station (iron, solder, flux)	Creating custom mass-term connectors and cables for D-SUB or LEMO modules	Soldering equipment
Small plastic zip ties	Strain relief on wiring and cable clean-up	Zip ties
Wire nuts or other form of temporary connectors	Testing connections or creating removable wire junctions to multiple wires without a terminal block	WAGO Lever-Nuts or generic wire nuts

TABLE 1

Helpful Tools

NI FieldDAQ™ Hardware

NI FieldDAQ is a high-performance DAQ device rated for the most extreme environments. Take measurements as close to the sensor as possible in a wide range of environmental and system conditions without settling for lower-quality data.

Pair FieldDAQ with your favorite NI software including FlexLogger™ Lite, NI's free logging software, or APIs and example programs for NI LabVIEW, Python, and C/C++.

Choose FieldDAQ for:

- Environmental test
- HALT test
- Structural test
- NVH analysis
- Rocket engine test
- In-flight structural test
- Off-road vehicle test
- Academic research (wind tunnels, temperature chambers)

Specifications

Measurement	Voltage (±10 V) with Sensor Power	Temperature	Sound/Vibration	Strain/Bridge
FieldDAQ model	FD-11601	FD-11614	FD-11634	FD-11637
Part Number	790065-01	790064-01	790066-01	785641-01
Channel Count	8	16	8	8
Supported Sensors	±10 V analog input with sensor power	Thermocouple type: J, K, T, E, N, B, R, S	IEPE accelerometers and microphones	Strain gage: quarter-, half-, and full-bridge
Input Connector Type	5-pin A-coded M12 connectors	Universal miniature thermocouple jack	8-pin A-coded M12 connectors	8-pin A-coded M12 connectors
Resolution	24 bits	24 bits	24 bits	24 bits
Sample Rate (Simultaneous)	Up to 102.4 kS/s/ch	Up to 85 S/s/ch	Up to 102.4 kS/s/ch	Up to 102.4 kS/s/ch
Sensor Power or Excitation Output	5 V–24 V, 600 mW per channel	N/A	4 mA	3 V, 5 V, or 10 V
Filtering	Anti-alias, Butterworth, comb filtering	50–60 Hz rejection	Anti-alias, Butterworth, comb filtering	Anti-alias, Butterworth, comb filtering
Isolation	Ch-Ch isolation 60 VDC working, 1,000 VRMS withstand			

Detailed Views

Devices with M12 Signal Connections

FD-11601, FD-11634, FD-11637

1. Power input/output (L-Code M12 5-pin)
2. 10/100/1000 Ethernet ports TSN-enabled network switch (X-Code M12 8-pin)
3. Eight analog input channels: voltage, IEPE, quarter-, half-, and full-bridge, and more
4. Channel status LEDs
5. Fanless design, operating temperature -40 °C to 85 °C
6. A-Code M12 standard connectors IP65/67 rated ingress protection: water and dust resistant
7. Mounting holes

Devices with Mini-TC Signal Connections

FD-11614

1. Power input/output (L-Code M12 5-pin)
2. 10/100/1000 Ethernet ports TSN-enabled network switch (X-Code M12 8-pin)
3. 16 thermocouple channels: 24-bit resolution Mini-TC connections for J, K, T, E, N, B, R, and S thermocouple types
4. Channel status LEDs
5. Fanless design, operating temperature -40 °C to 85 °C
6. M12 standard connectors IP65-rated ingress protection: water and dust resistant
7. Mounting holes

Why FieldDAQ?

You can connect FieldDAQ devices to NI's PXI, CompactDAQ, and CompactRIO test hardware to expand your system in any direction your test or research needs, while using the most open software options on the market.

Key Features

FieldDAQ devices provide precision performance in extreme conditions.

- 24-bit resolution and sample rates up to 100 kS/s for fast, accurate measurements
- Sensor-specific signal conditioning and filtering for voltage, strain/bridge, accelerometer, microphone, and thermocouple measurements
- Built-in switch for easy daisy-chained distribution

Ruggedness

Take high-quality measurements as close to the sensor as possible in all-weather conditions like rain, sleet, snow, or mud.

- Rugged, IP65/67 rated waterproof and dust-tight design with shock and vibration resistance over 100 g/10 grms conditions
- Wide range of operating temperatures from -40 °C to 85 °C
- Standard industrial M12 connectors prevent cables from detaching during operation
- Channel-channel isolation (60 V DC continuous/1,000 VRMS transient) reduces noise from ground loops and protects instrumentation circuitry from high transient voltages

High-Performance Measurements

FieldDAQ delivers stable measurements across a wide temperature range, with an impressively low noise floor.

- Thermally stable design allows for minimal accuracy drift over -40 °C to 85 °C range
- 24-bit resolution and simultaneous sample rates up to 100 kS/s detects and acquires full-range signals with varying amplitudes and bandwidths
- Premium signal conditioning and diagnostic features—built-in filtering, open thermocouple detection, and shunt calibration reduce the effect of external interference and increase measurement accuracy
- Shortened sensor cables to minimize noise by digitizing as close as possible to the sensor

Tight Synchronization

FieldDAQ synchronizes measurement data between devices over long distances using Time Sensitive Networking (TSN), which is a set of standards in the IEEE 802.1 Ethernet group.

- Distributed TSN architecture reduces cabling cost, installation time, and enclosure requirements with synchronization accuracy <1 µs
- Connect FieldDAQ devices and other TSN devices together, such as NI CompactDAQ or NI CompactRIO
- Daisy-chain devices without the need for external switches or multiple power supplies since each device has an integrated network switch and built-in power circuitry

Software

NI has decades of experience as an industry leader for test and measurement software. Options for FieldDAQ software include:

Developing custom software with drivers and example programs for:

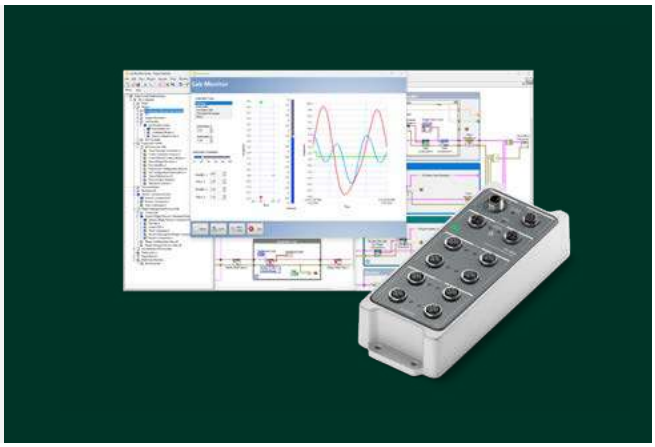
- LabVIEW
- Python, C/C++, VB.NET, and C#

Logging data with a real-time display using NI FlexLogger™ lite, free data acquisition software.

Modernizing your lab and standardizing your test frameworks with the NI LabVIEW+ Suite.

Get the Most Out of Your Test

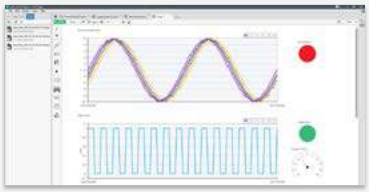
NI recommends LabVIEW for an automated test system that combines data acquisition with analysis, logic, logging, and a professional real-time display.



Keep Your Software. Upgrade Your Hardware.

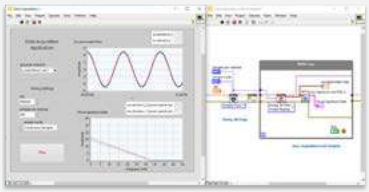
Software developed for your existing NI DAQ device using the NI-DAQmx driver should be generally compatible with NI FieldDAQ.

NI Data Acquisition Software



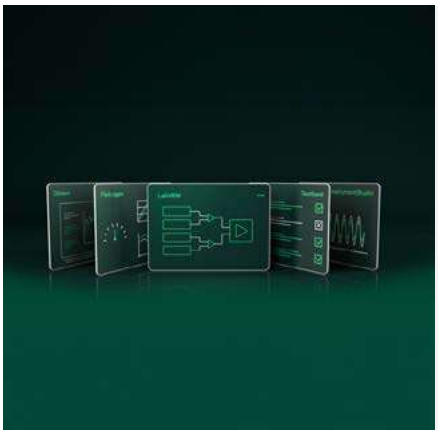
NI FlexLogger Lite (free download)

- Configure measurements
- Create real-time displays
- Log results



NI LabVIEW

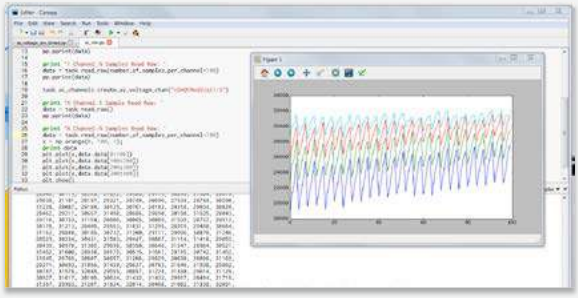
- Create a professional UI
- Integrate all your instruments
- Program like you think
- Integrate code from Python, C, or MathWorks® MATLAB® software



LabVIEW+ Suite for Test Professionals

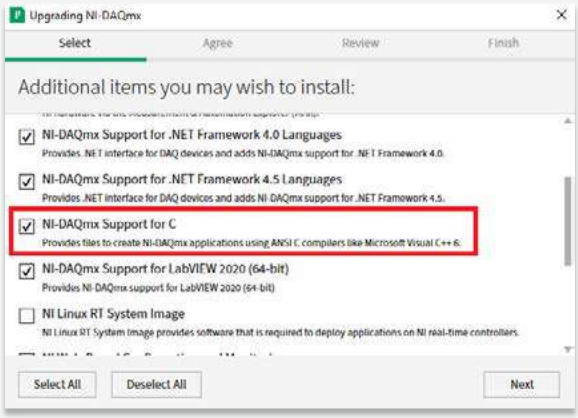
The LabVIEW+ Suite is built for test professionals in electronics and electromechanical test. It provides software solutions to reduce development time, increase data usage, and prevent rework.

Programming Language Support



Python

- nidaqmx package available on GitHub
- Support for Cpython 3.8 and PyPy3
- Example programs included



C/C++, VB 6.0, VB.NET, and C#

- API installs with the NI-DAQmx driver
- Libraries of functions for all DAQ operations
- Example programs included

Accessories

A single FieldDAQ device requires the following accessories:

- External power supply
- Power cable
- Ethernet cable
- I/O cable(s)

All unused M12 ports or mini-TC terminals must have caps or mini-TC plugs with protective boot, respectively, to meet IP65/IP67 requirements.

Power

Power your FieldDAQ device with an external power supply and power cable.

Power Supply

Power your FieldDAQ device with an IP67-rated power supply.

Description	Part Number	
IP67 Power Supply, 24 VDC, 6 A[1]	147464-01	

[1] 100-240 VAC input cable not included

Cables

Choose a cable to connect your power supply to the FieldDAQ power input.

Description	Part Number	Length	
L-code M12 5-Pin Female-Pigtail	786172-01	1 m	
	786172-02	2 m	
	786172-03	3 m	

Power additional FieldDAQ devices by connecting them daisy-chain style, with one of these cables per additional module.

Description	Part Number	Length	
L-code M12 5-Pin Female-Male	786173-01	1 m	
	786173-03	3 m	
	786173-0R3	0.3 m	

Tools for Securing the Connection

Use a torque wrench to tighten the power cable connection and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Power	786182-01

Ethernet

Connect your FieldDAQ to Ethernet and secure the connection with the following accessories.

Cables

Connect your first FieldDAQ device to Ethernet using one of these IP67 shielded cables.

Description	Part Number	Length	
X-Code M12 8-Pin Male to RJ45	785944-01	1 m	
	785944-02	2 m	
	785944-03	3 m	
	785944-10	10 m	
X-Code M12 8-Pin Male to RJ45, Right-angle	786171-01	1 m	
	786171-02	2 m	
	786171-03	3 m	

Connect subsequent FieldDAQ devices to Ethernet by daisy-chaining them together, using one of these IP67 shielded cables per additional module.

Description	Part Number	Length	
X-Code M12 8-pin Male-Male	785946-01	1 m	
	785946-03	3 m	
	785946-0R3	0.3 m	
X-Code M12 8-Pin Male-Male, Right-angle	785945-0R3	0.3 m	

Tools for Securing the Connections

Use a torque wrench to tighten the Ethernet cable connections and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Ethernet and I/O	786181-01

Signal Cables

Select the right IP67 shielded I/O cable to match your specific measurement needs.

Voltage Input (FD-11601, 790065-01)

Choose from the following cables to measure voltage.

Description	Part Number	Length	
A-Code M12 5-Pin Male-Pigtail	785950-01	1 m	
	785950-03	3 m	
	785950-0R3	0.3 m	
A-Code M12 5-Pin Male-Pigtail, Right-angle	785949-01	1 m	
	785949-03	3 m	

IEPE/Sound and Vibration (FD-11634, 790066-01)

Choose from the following cables to measure signals from IEPE and non-IEPE sensors such as accelerometers, tachometers, proximity probes, and even TEDS sensors.

Description	Part Number	Length	
A-Code M12 5-Pin Male-Pigtail	785950-01	1 m	
	785950-03	3 m	
	785950-0R3	0.3 m	
A-Code M12 5-Pin Male-Pigtail, Right-angle	785949-01	1 m	
	785949-03	3 m	
A-Code M12 5-Pin Male-BNC Female	787037-01	1 m	
	787037-03	3 m	
	787037-0R3	0.3 m	
A-Code M12 5-Pin Male-BNC Female, Right-angle	787038-01	1 m	
	787038-03	3 m	
	787038-0R3	0.3 m	

Strain/Bridge Input (FD-11637, 785641-01)

Choose from the following cables to measure strain from quarter-, half-, and full-bridge sensors.

Description	Part Number	Length	
A-Code M12 8-Pin Male-Pigtail	786325-01	1 m	
	786325-03	3 m	
	786325-0R3	0.3 m	
A-Code M12 8-Pin Male-Pigtail, Right-angle	786326-03	3 m	
	786326-0R3	0.3 m	

Connectors

Use a field wirable connector to adapt the pigtail end of a sensor wire to an M12 connector and ensure an IP67-rated connection when completed correctly.

Description		Part Number	
Housing: A-Code M12 Male straight Connection: Screw termination (use end splice)	5-Pin	785941-01	
	5-Pin, Right-angle	785942-01	
	8-Pin	785940-01	
	8-Pin, Right-angle	785943-01	

Tools for Securing I/O Connections

Use a torque wrench to tighten the I/O cable connections and ensure a good seal.

Description	Part Number
M12 Torque Wrench, Ethernet and I/O	786181-01

I/O Caps/Covers for Sealing Out Dust and Water

Protect your equipment from the elements with the following caps.

M12 (FD-11601, -11634, -11637)

M12 connectors must be mated to cables or have caps installed on them to meet IP65/IP67 requirements. Cover the unused connectors with either plastic or metal caps whenever water, dust, or dirt are present.

Metal caps have the highest durability.

Both (Plastic and Metal)	Metal
✓ Dustproof ✓ Waterproof	✓ Highest durability

Select caps to cover unused ports.

Description		Part Number	
Universal M12 Plastic	Ethernet, I/O (Male) Qty. 10	786177-01	
	Power (Female) Qty. 1	786180-01	
Universal M12 Metal	Ethernet, I/O (Male) Qty. 1	786178-01	
	Power (Female) Qty. 1	786179-01	

Mini-TC (FD-11614)

To protect against ESD, water, and dirt, install unconnected mini-TC plugs into all unused terminals, and install a Mini-TC Connector Protection Boot on all mini-TC plugs.

Description	Part Number	
Mini-TC Connector Protection Boot	786394-01	

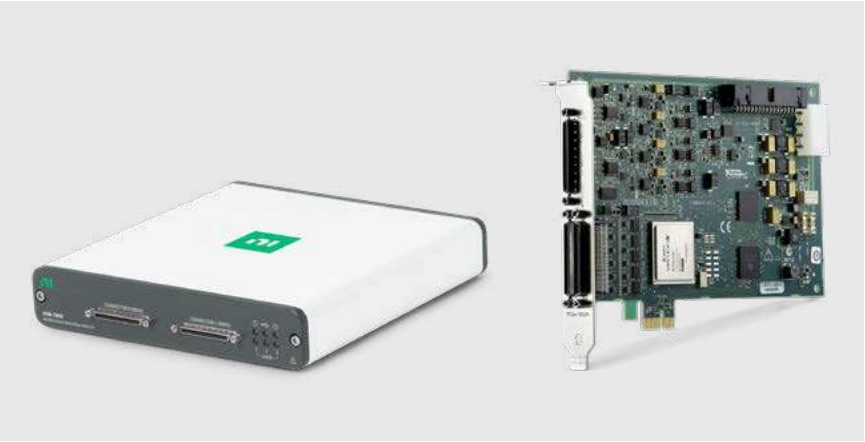
Mounting

Install a FieldDAQ device onto a DIN rail using the DIN rail mounting kit.

Description	Part Number	
DIN Rail Mounting Kit	786443-01	

Reconfigurable I/O Systems

Select a reconfigurable I/O (RIO) system if you are controlling lasers or galvo mirrors; want to offload processing for real-time data analysis; or are running HIL simulations, developing custom digital protocols, prototyping control systems, or other input/output applications where timing is critical. These systems are more advanced. There are two types of reconfigurable devices—RIO and CompactRIO (cRIO).



Recommended software (sold separately):

NI LabVIEW

Additional resources for software development:

C/C++, Python

LabWindows/CVI

Reconfigurable I/O Devices—PCI Express, USB

Reconfigurable I/O devices have an onboard coprocessor (FPGA) that's directly connected to the measurement pins. Unlike a multifunction I/O board on which the data takes time to move through the PCI Express bus or USB to the processor, RIO boards connect data from the measurement pins directly to the FPGA running your code. This direct connection takes less time and is great for low-latency applications where timing is critical. Purchase the LabVIEW FPGA Module, a LabVIEW add-on, to develop code for RIO devices:

- 8 analog input channels, 8 analog output channels, and up to 128 bidirectional channels
- 16-bit analog input resolution, up to 1 MS/s/ch sampling rate
- 16-bit analog output resolution, up to 1 MS/s/ch update rate

Key Features:

Flexible Functionality

Match requirements and mimic the functionality of fixed I/O devices with software in timing and triggering applications, such as control and hardware-in-the-loop (HIL) simulations.

Embed Logic and Processing

Implement LabVIEW logic and processing in the FPGA including basics such as Boolean operations, comparisons, and basic mathematical operations or complex algorithms such as control loops.

Define I/O Resources

Create custom measurements using the fixed I/O resources.

RIO Devices

Model	Part Number	LabVIEW Programmable FPGA	Analog Input Channels	Analog Input Sample Rate	Analog Input Ranges	Analog Output Channels	Analog Output Update Rate	Bidirectional Digital Channels	Digital I/O Logic Levels	Maximum Digital I/O Rate
PCIe-7820	785361-01	Kintex-7 160T	—					128	1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V	80 MHz
PCIe-7841	781100-01	Virtex-5 LX30	8	200 kS/s/ch	±10 V ±10 V	8	1 MS/s/ch	96	3.3 V, 5 V	40 MHz
PCIe-7842	781101-01	Virtex-5 LX50								
PCIe-7846	786456-01	Kintex-7 160T		500 kS/s/ch	±10 V, ±5 V, ±2 V, ±1 V			48	1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V	80 MHz
PCIe-7852	781103-01	Virtex-5 LX50		750 kS/s/ch	±10 V			96	3.3 V, 5 V	40 MHz
USB-7845[1]	783200-01	Kintex-7 70T		500 kS/s/ch	±10 V, ±5 V, ±2 V, ±1 V			48	1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V	80 MHz
USB-7856[1]	782916-01	Kintex-7 160T		1 MS/s/ch	±10 V, ±5 V, ±2 V, ±1 V					

[1]Requires power cord.

Required Power Cords for USB RIO Devices

Region / Voltage	Length (m)	Max Current (A)	Part Number
United States 120 VAC	2.3	10	763000-01
United Kingdom 240 VAC	2.5		763064-01
Swiss 220 VAC			763065-01
Australia 240 VAC			763066-01
European 240 VAC, Right Angle			763067-01
North America 240 VAC	3		763068-01
Japan 125 VAC	2.3	12	786377-01
India 250 VAC	2.5	10	763072-01
Korea 220 VAC, Right Angle			784685-01
China 220 VAC			784686-01
Brazil 250VAC			785626-01
Taiwan 125 VAC		15	787642-01

Shielded accessories improve measurement quality by reducing crosstalk between channels and electromagnetic interference. NI recommends shielded accessories for the best quality measurement. The RMIO cable is specifically shielded for the analog I/O connector and the RDIO cable is for a digital I/O connector.

Reconfigurable I/O Shielded Accessories

Shielded RIO Cables[1]

Description	Length	Part Number	
RMIO Shielded Cables	0.5 M	189588-0R5	
	1 M	189588-01	
	2 M	189588-02	
RDIO Shielded Cables	0.5 M	191667-0R5	
	1 M	191667-01	
RDIO2 High-Speed 80 MHz Shielded Cables	1 M	156166-01	
	2 M	156166-02	

[1]See the table below for compatibility by model.

RIO Cable Compatibility Guide

Model	RMIO	RDIO	RDIO (High-Speed, 80 MHz)
PCIe-7820	—	—	✓
PCIe-7841	✓	✓	—
PCIe-7842	✓	✓	—
PCIe-7846	✓	—	✓
PCIe-7852	✓	✓	—
USB-7845	✓	—	✓
USB-7856	✓	—	✓

Shielded RIO Connector Blocks[1]

Description	Part Number	Selection Criteria	
Shielded Connector Block	782536-01	MIO screw termination connector block	
	782914-01	High-speed DIO screw termination connector block	

[1]See the table below for connector block compatibility by model.

RIO Connector Block Compatibility

Model	MIO Screw Termination Connector Block	High-Speed DIO Screw Termination Connector Block
PCIe-7820	—	✓
PCIe-7841	✓	—
PCIe-7842	✓	—
PCIe-7846	✓	✓
PCIe-7852	✓	—
USB-7845	✓	✓
USB-7856	✓	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Real-Time Module
- LabVIEW FPGA

Additional resources for software development:

C/C++, C#, Python

NI CompactRIO

CompactRIO is a rugged, modular data acquisition and control system that includes a built-in computer and programmable FPGA. The FPGA connects to the measurement modules for a shorter data processing path and better control over I/O timing. Additionally, CompactRIO is TSN-enabled, providing deterministic communication and synchronization capabilities. CompactRIO is great for rapid control prototyping, high-speed data-logging applications in rugged environments, and advanced control where a PLC doesn't have the required performance capability.

Key Features:

Program with LabVIEW

Use one software environment—LabVIEW—to build and deploy time-critical applications. Program both the processor and user-programmable FPGA without having to program in HDL/VHDL.

Combined Control and Instrumentation-Grade Measurements

Integrate high-speed waveform measurements for voltage, vibration, strain, and more with analog and digital control signals for a fully custom test and control system.

Linux Real-Time Operating System

Harness the openness and reliability of the NI Linux Real-Time OS through thousands of open-source applications, IP, and examples, while collaborating with an active community of users and developers.

Rugged Specifications

Deploy in harsh environments with confidence. CompactRIO operates in temperatures from -40 °C to 70 °C and withstands shocks/vibration of 50 g/5 g.

How to Build a CompactRIO System

1. Modules

Use the **Measurement Modules (C Series Modules) section on page 85** to select your modules.

2. Controller

Choose your controller from the **CompactRIO Controller Selection Table on page 130**.

CompactRIO Controllers

Model	Part Number	Slots	Processor	FPGA Coprocessor
cRIO-9040	785624-01	4	1.30 GHz Dual-Core Intel Atom	Good
cRIO-9045	785623-01	8		
cRIO-9047*	785621-01		1.60 GHz Quad-Core Intel Atom	
cRIO-9048*	785619-01		1.30 GHz Dual-Core Intel Atom	Better
cRIO-9049	785618-01		1.60 GHz Quad-Core Intel Atom	Best
cRIO-9053	786424-01	4	1.33 GHz Dual-Core Intel Atom	Good
cRIO-9056	786426-01	8		

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

The CompactRIO Expansion I/O chassis extends the capabilities of CompactRIO systems by providing additional slots for C Series I/O modules for flexible, high-performance data acquisition and control in rugged, industrial environments. It seamlessly integrates with existing CompactRIO controllers for synchronized, distributed measurement and control applications.

CompactRIO Expansion I/O Chassis

Model	Part Number	Slots	Processor	FPGA	Operating Temperature
NI-9145	784756-01	8	EtherCAT	Good	-40 °C to 70 °C
NI-9147*	783496-01	4	Ethernet		
NI-9149*	783376-01	8			

*Available with conformal coating—a protective layer that enhances resistance to moisture, dust, and chemicals. Coated versions have different part numbers; visit ni.com for accurate ordering information.

Power Cords for CompactRIO Controllers (Required)[1]

Region / Voltage	Length (m)	Max Current (A)	Part Number
United States 120 VAC	2.3	10	763000-01
United Kingdom 240 VAC	2.5		763064-01
Swiss 220 VAC			763065-01
Australia 240 VAC			763066-01
European 240 VAC, Right Angle			763067-01
North America 240 VAC	3		763068-01
Japan 125 VAC	2.3	12	786377-01
India 250 VAC	2.5	10	763072-01
Korea 220 VAC, Right Angle			784685-01
China 220 VAC			784686-01
Brazil 250VAC			785626-01
Taiwan 125 VAC		15	787642-01

[1]Power cords are required with a desktop power supply. If using an industrial power supply, the CompactRIO controllers do not need a power cord. Instead, wire them directly to the power supply.

Recommended software (sold separately):

NI LabVIEW

LabVIEW FPGA

Additional resources for software development:

C/C++, C#, Python

LabWindows/CVI

Single-Board RIO (sbRIO)

Single-Board RIO is designed for high-volume and OEM embedded control and analysis applications that require high performance and reliability. Featuring an open embedded architecture and compact size, this flexible, customizable, commercial off-the-shelf (COTS) hardware device is part of an accelerated custom design platform that can help you get your custom embedded control system to market quickly. Built on the CompactRIO platform, you can take advantage of FPGA performance, real-time determinism, and reliability with relatively low nonrecurring engineering compared with custom hardware design. To learn more about sbRIO and explore its full range of capabilities, visit **ni.com/OEM**.

Single-Board RIO:

- Combines a real-time processor, FPGA, and I/O on a single board.
- Is designed for high performance and reliable operation.
- Is ideal for industrial control, monitoring, and embedded applications.

Key Features:

Real-Time Processor

Provides deterministic performance for embedded applications, ensuring reliable and timely execution of high-level code

Integrated FPGA

Offers high-speed processing for time-critical tasks, giving precise control over I/O timing and rapid prototyping

Rugged Design

Built to withstand harsh environments and support extended temperature ranges, vibration, and shock, making it suitable for industrial and critical settings

Reduce Development Time

With its all-programmable SoC, integrated I/O, and high-density connector paired with efficient development software, it accelerates time to market

sbRIO Hardware

		sbRIO-9603	sbRIO-9609	sbRIO-9628	sbRIO-9629	sbRIO-9638	sbRIO-9651
Description		Digital I/O		Multifunction I/O			SOM
Part Number	Dev Kit	787287-01	787289-01	787296-01	787298-01	787297-01	783525-01
	OEM Kit	787287-02	787289-02	787296-02	787298-02	787297-02	783525-02
Performance	Processor	"Intel 1.33 GHz Dual-Core"	"Intel 1.91 GHz Quad-Core"	"Intel 1.33 GHz Dual-Core"	"Intel 1.91 GHz Quad-Core"	"Intel 1.33 GHz Dual-Core"	"667 MHz Dual-Core ARM Cortex A9"
	RAM (DDR3L)	1 GB	2 GB	1 GB	2GB	1 GB	512 MB
	Disk (eMMC)	4 GB					512 MB
	FPGA	XC7A75T	XC7A200T	XC7A100T	XC7A200T	XC7A100T	XC7Z020
Onboard Peripherals	TSN Enabled	✓		—	✓		—
	Ethernet	2x IEEE 802.1AS-2011IEEE 1588-2008 (default end-to-end profile)					
	USB Type-C port	USB 2.0 device					—
	USB Type-C port	1x USB 3.1 Gen1 Host					—
	DisplayPort Alt Mode	—	✓			—	—
	USB Type-A port	—		2x USB 2.0 host			1x USB 2.0 Host or Device
	SD port	—		microSDHC			
	CAN port	1x CAN FD					2x CAN
	RS-232 port	1x		2x			1x
	RS-485 port	—		1x			2x
Onboard IO	Analog I/O	—		16 SE/8 Differential, 233 kS/s, 16-bit, ±10 V to ±1 V			—
				4x AO 100 kS/s/ch, 16-bit, ±10 V			—
	"Digital I/O (5 V tolerant)"	—		4x DIO		28x DIO	—
RMC Connector	C Series	2x C Series interfaces				—	—
	USB	USB 2.0 host				—	—
	DIO	96x DIO, 3.3 V/2.5 V SE/Differential				—	160x DIO, 3.3 V/ 2.5 V/1.8 V/ 1.5 V/1.2 V SE
	PCIe	1x PCIe x1 Gen 2.0				—	—
	SATA	1x SATA Gen 2.0				—	—
	Power	"Optional Input Power from RMC (9 V to 30 V), Output power to RMC (3.3 V and 5 V, FPGA VIO)"				—	—

Note: sbRIO-9651 uses a J1 Connector and not RMC

sbRIO Accessories

Model	Part Number	Description
sbRIO-9684	785257-01	RIO mezzanine card with GPIC I/O board, including 16-BIT 180 KS/S SSAI, D/I, D/O, LVTLL, HB D/O, RELAY CONTROL D/O, SCAN A/I, A/O
Thermal Kit for sbRIO-9603/08/09/28/29/38	787331-01	Thermal kit for sbRIO-9603/08/09/28/29/38, heat spreader, thermal pads, mounting hardware
Standoff	154752-01	9.65 mm standoff for RIO mezzanine cards (4X STANDOFF: 4-40 X 0.380 IN, 8X SCREWS: 4-40 X 1/4 IN)
sbRIO Breakout Box	784507-01	Onboard I/O breakout for 50-pos 2 mm IDC header (includes qty. 2, 6 in. 2 mm IDC ribbon cables)
sbRIO I/O Ribbon Cable	154041-12	50-pin ribbon cable with IDC headers
sbRIO Power Cable	152834-01	Power cable for sbRIO controllers, two-position mini-fit JR to pigtail

NI PXI Systems

Built for automated test, NI PXI is a rugged, PC-based platform for measurement and automation systems that uses modular instrumentation and software to ensure unparalleled accuracy, timing, and synchronization for high-channel, mixed-measurement applications from the lab to the manufacturing line. Developed in 1997 and launched in 1998, PXI is an open industry standard governed by the PXI Systems Alliance (PXISA), a group of more than 70 companies chartered to promote the PXI standard, ensure interoperability, and maintain the PXI specification across its mechanical, electrical, and software architectures.

Why PXI for Automated Test?

Modularity and Scalability—Use PXI's modular architecture to customize and scale test systems with multiple instruments from DC to the mmWave spectrum. Continuously evolve test systems by integrating new modular instruments, ensuring adaptability to changing requirements.

Designed for Advanced Applications—NI PXI offers unparalleled instrument performance, data throughput, latency, and synchronization for advanced test and measurement applications.

Software-Defined—NI PXI's open architecture helps you develop application-specific measurement and analysis programs to enhance automated test productivity. With a comprehensive and connected set of software tools, it offers a seamless development experience with a consistent software interface across multiple instruments.

Vibrant Ecosystem—With NI's global vendor, integrator, and consultant network, achieve unsurpassed customization and support. Connect with a global community of solution providers, systems integrators, consultants, and product developers ready to guide you to your next innovation.

How to Build a PXI Test and Measurement System

1. Chassis

Select a PXI chassis based on your system size and performance. Some chassis include a built-in controller.

2. Controller

- For systems with a built-in computer, choose a PXI embedded controller like you would a desktop PC.
- For laptop or remote control, select a remote Thunderbolt™ chassis from the Chassis Selection Table or explore PXI modules from the PXI Remote Control Module Selection Table.

3. Instruments (Modules)

Choose your instruments and measurement modules from the PXI Instrumentation section.

PXI Chassis

NI PXI chassis offer:

- Up to 24 GB/s system bandwidth and 8 GB/s per-slot of dedicated bandwidth
- Size options ranging from 2 to 18 slots
- Hybrid slots for instrumentation flexibility; compatibility with PXI, PXI Express, CompactPCI, and CompactPCI Express modules
- Up to 82 W per slot of power and cooling for more advanced I/O modules

Key Features:

Timing and Synchronization

NI PXI Express chassis incorporate a dedicated 10 MHz system reference clock, PXI trigger bus, star trigger bus, and slot-to-slot local bus, as well as a 100 MHz differential system clock, differential signaling, and differential star triggers for advanced timing and synchronization.

Peer-to-Peer Streaming

Use NI PXI Express chassis and software for peer-to-peer communication from a modular instrument to an FPGA module for inline signal processing that bypasses the PXI embedded controller.

Cooling

All NI PXI Express chassis exceed PXI Express requirements by providing at least 38.25 W of power and cooling to every peripheral slot; some chassis push slot cooling capacity even further by providing 58 W or 82 W of cooling to a single slot.

PXI Chassis

Selection Guide	Model	Part Number	Chassis Power-Supply Type	Max System Bandwidth	Slot Cooling Capacity	Onboard Clock Type	Slot Count	External Clocking	External Trigger Access
Entry-Level, Low Slot Count	PXIe-1071	781368-01	AC	3 GB/s	38 W	VCXO	Total: 4 Controller: 1 Hybrid: 3 PXI Express: 0 System Timing: 0	—	—
	PXIe-1073	781163-01	AC	250 MB/s	38 W	VCXO	Total: 5 Controller: 0 Hybrid: 3 PXI Express: 2 System Timing: 0	—	—
	PXIe-1090	787040-01	AC	2 GB/s	58 W	VCXO	Total: 2 Controller: 0 Hybrid: 1 PXI Express: 1 System Timing: 0	✓	—
	PXIe-1083	787026-01	AC	2 GB/s	58 W	VCXO	Total: 5 Controller: 0 Hybrid: 5 PXI Express: 0 System Timing: 0	—	—
Entry-Level or Prior Generation, Medium and High Slot Count	PXIe-1081	790631-01	AC	2 GB/s	58W	VCXO	Total: 18 Controller: 1 Hybrid: 17 PXI Express: 0 System Timing: 0	—	—
	PXIe-1084	784058-01	AC	4 GB/s	58 W	VCXO	Total: 18 Controller: 1 Hybrid: 17 PXI Express: 0 System Timing: 0	—	—
		786397-01						✓	✓
	PXIe-1085	783588-01	AC	24 GB/s	38 W	VCXO	Total: 18 Controller: 1 Hybrid: 16 PXI Express: 0 System Timing: 1	✓	—
	PXIe-1086	781720-01	AC	12 GB/s	38 W	VCXO	Total: 18 Controller: 1 Hybrid: 16 PXI Express: 0 System Timing: 1	✓	—
	PXIe-1086DC	787137-01	DC	12 GB/s	38 W	VCXO	Total: 18 Controller: 1 Hybrid: 16 PXI Express: 0 System Timing: 1	✓	—
	PXIe-1088	784782-01	AC	8 GB/s	58 W	VCXO	Total: 9 Controller: 1 Hybrid: 8 PXI Express: 0 System Timing: 0	—	—
Highest Performance, Newest-Generation, Highest Cooling Capacity	PXIe-1092	784781-01	AC	24 GB/s	82 W	VCXO	Total: 10 Controller: 1 Hybrid: 7 PXI Express: 0 System Timing: 1 Expansion: 1	—	—
		786991-01				OCXO		✓	✓
	PXIe-1095	783882-01	AC	24 GB/s	82 W	VCXO	Total: 18 Controller: 1 Hybrid: 5 PXI Express: 11 System Timing: 1	—	—
		785971-01				OCXO		✓	✓

PXI Chassis Accessories

PXI Chassis Power Cords

Region / Voltage	Length (m)	Max Current (A)	Part Number
United States 120 VAC	2.3	10	763000-01
United Kingdom 240 VAC	2.5		763064-01
Swiss 220 VAC			763065-01
Australia 240 VAC			763066-01
European 240 VAC, Right Angle			763067-01
North America 240 VAC	3		763068-01
Japan 125 VAC	2.3	12	786377-01
India 250 VAC	2.5	10	763072-01
Korea 220 VAC, Right Angle			784685-01
China 220 VAC			784686-01
Brazil 250VAC			785626-01
Taiwan 125 VAC		15	787642-01

MXI-Express Cable

Part Number	779500-01	779500-03	779500-07
Description	MXI-Express Cable, Gen 1 X1, Copper, 1 m	MXI-Express Cable, Gen 1 X1, Copper, 3 m	MXI-Express Cable, Gen 1 X1, Copper, 7 m
PXIe-1073	✓	✓	✓

PXI Chassis Trigger Cable

Part Number	149055-0R2
Description	Chassis D-SUB Trigger Breakout Cable To 6 BNC For PFI 0-3, Remote Inhibit and Fault, 20 cm
PXIe-1084	✓
PXIe-1092 Timing and Synchronization (786991-01)	✓
PXIe-1095 Timing and Synchronization (785971-01)	✓

PXI Rack-Mount Kit

Part Number	788347-01	778948-01	778644-01	778644-02	787525-01	781634-01	786371-01	786372-01	786969-01	786970-01
Description	PXIe-1090 Chassis Rack-Mount Kit	PXI-103X and 107x Rack-Mount Kit	PXI 18-Slot Front Rack-Mount Kit	PXI 18-Slot Rear Rack-Mount Kit	Rack-Mount Kit For PXIe-1088	Rack-Mount Kit For PXIe-1078 and PXIe-1088 (Legacy)	PXI 18-Slot Front Rack-Mount Kit, Extended Recess	PXI 18-Slot Rear Rack-Mount Kit, Extended Recess	PXIe-1092 Chassis Front Rack-Mount Kit, Extended Recess	PXIe-1092 Chassis Rear Rack-Mount Kit, Extended Recess
PXIe-1090	✓	—	—	—	—	—	—	—	—	—
PXIe-1071	—	✓	—	—	—	—	—	—	—	—
PXIe-1083	—	✓	—	—	—	—	—	—	—	—
PXIe-1073	—	✓	—	—	—	—	—	—	—	—
PXIe-1086DC	—	—	✓	✓	—	—	—	—	—	—
PXIe-1086	—	—	✓	✓	—	—	—	—	—	—
PXIe-1088	—	—	—	—	✓	✓	—	—	—	—
PXIe-1081	—	—	—	—	—	—	✓	✓	—	—
PXIe-1084 Timing and Synchronization (786397-01)	—	—	—	—	—	—	✓	✓	—	—
PXIe-1084	—	—	—	—	—	—	✓	✓	—	—
PXIe-1085	—	—	✓	✓	—	—	—	—	—	—
PXIe-1092 Timing and Synchronization (786991-01)	—	—	—	—	—	—	—	—	✓	✓
PXIe-1095	—	—	—	—	—	—	✓	✓	—	—
PXIe-1095 Timing and Synchronization (785971-01)	—	—	—	—	—	—	✓	✓	—	—

Thunderbolt 3 Male-to-Male Cable

Part Number	785607-02	785608-02	787580-0R8
Description	Thunderbolt 3 Type-C Cable, Active 40 Gb/S, 3A, 2 m	Thunderbolt 3 Type-C Cable, Passive 20 Gb/S, 5A, 2 m	Thunderbolt 3 Type-C Cable, Passive 40 Gb/S, 5A, 0.8 m
PXIe-1090	✓	✓	✓
PXIe-1083	✓	✓	✓

HDMI Trigger Cable

Part Number	148864-01	148864-02	149055-0R2
Description	HDMI Cable for Trigger Routing (1 m)	HDMI Cable for Trigger Routing (2 m)	Chassis Trigger Breakout Cable (0.2 m)
PXIe-1084 Timing and Synchronization (786397-01)	✓	✓	✓
PXIe-1092 Timing and Synchronization (786991-01)	✓	✓	✓
PXIe-1092	✓	✓	✓
PXIe-1095	✓	✓	✓
PXIe-1095 Timing and Synchronization (785971-01)	✓	✓	✓

Power Supply Replacement

Part Number	782106-01	782107-01	784057-01	781719-01	786300-01
Description	Replacement Power Supply for NI PXIe-1066DC and PXIe-1086DC	Replacement Power Supply for NI PXIe-1066DC and PXIe-1086DC —for EU	Power Supply Filler Panel for PXIe-1066DC and PXIe-1086DC	Replacement Power Supply for PXIe-1085	Upgrade/ Replacement Power Supply for PXIe-1092 or PXIe-1095
PXIe-1086DC	✓	✓	✓	—	—
PXIe-1086	✓	✓	✓	—	—
PXIe-1085	—	—	—	✓	—
PXIe-1092 Timing and Synchronization (786991-01)	—	—	—	—	✓
PXIe-1092	—	—	—	—	✓
PXIe-1095	—	—	—	—	✓
PXIe-1095 Timing and Synchronization (785971-01)	—	—	—	—	✓

Fan Replacement Kits

Part Number	784854-01	786324-02	786972-01	786324-01
Description	Chassis Fan Replacement Kit for PXIe-1078 and PXIe-1088	Replacement Fan Assembly for NI PXIe-1081 and PXIe-1084	Fan Replacement Kit for PXIe-1092 Chassis	Replacement Fan Assembly for NI PXIe-1095
PXIe-1088	✓	—	—	—
PXIe-1081	—	✓	—	—
PXIe-1084 Timing and Synchronization (786397-01)	—	✓	—	—
PXIe-1084	—	✓	—	—
PXIe-1092	—	—	✓	—
PXIe-1092 Timing and Synchronization (786991-01	—	—	✓	—
PXIe-1095	—	—	—	✓
PXIe-1095 Timing and Synchronization (785971-01)	—	—	—	✓

NI PXI Carrying Case

Part Number	780398-01
Description	PXI Carrying Case for Midsize Chassis (10 Slots or Fewer)
PXIe-1083	✓
PXIe-1073	✓
PXIe-1071	✓
PXIe-1088	✓
PXIe-1092 Timing and Synchronization (786991-01)	✓
PXIe-1092	✓

PXI Controllers

With NI PXI controllers, take advantage of:

- The latest high-performance Intel processors, with up to 18 cores available
- OSs: Windows 11, Windows 10, Windows 7, Linux Desktop (RHEL, OpenSUSE, Ubuntu), NI Linux Real-Time Memory and storage up to 512 GB and 64 GB, respectively
- Solid-state drives, Thunderbolt 3, USB 3.0, Gigabit Ethernet, and other peripheral ports

Key Features:

High Performance

NI maintains close partnerships with key processor manufacturers, including Intel and Advanced Micro Devices, so NI controllers feature the latest processors, such as the Intel Atom, Core i7, and Xeon.

Durability

NI offers PXI controllers with solid-state drives (SSDs) so that you can test under a wide range of conditions. Controllers with SSDs are designed to operate in extreme shock, high altitude, and random vibration environments.

Data Security

The Trusted Platform Module, a secure cryptoprocessor, is a component on select embedded controllers specifically designed to elevate platform security above the capabilities of today's software by providing a protected space for key operations and other security-critical tasks.

PXI Controller Modules

Selection Guide	Model	Part Number	Controller OS	Processors and Cores	Max Controller Bandwidth	Hard Drive Memory Size	HDD Removable	TPM Version*
Good, Intel Core i3	PXIe-8822	787881-00	No OS	11th Gen Intel® Core™ i3-11100HE, 4 Core	4 GB/s	512 GB	—	—
		787881-01	Windows 10 64-bit					2.0 (Infineon/ST, Global Market)
		787881-0118						2.0 (Nations Tech, China Market)
		787881-33	LabVIEW Real-Time (NI Linux Real-Time)					—
		788815-01	Windows 11					2.0 (Infineon/ST, Global Market)
		788815-0118						2.0 (Nations Tech, China Market)
Better, Intel Core i5	PXIe-8842	787882-00	No OS	11th Gen Intel® Core™ i5-11500HE, 6 Core	8 GB/s	512 GB	—	2.0 (Infineon/ST, Global Market)
		790657-01**	Windows 10 64-bit					2.0 (Infineon/ST, Global Market)
		787882-01						2.0 (Infineon/ST, Global Market)
		790657-0118**						2.0 (Nations Tech, China Market)
		787882-0118						2.0 (Nations Tech, China Market)
		790657-33**	LabVIEW Real-Time (NI Linux Real-Time)					—
		787882-33						—
		790658-01**	Windows 11					2.0 (Infineon/ST, Global Market)
		788816-01						2.0 (Infineon/ST, Global Market)
		790658-0118**						2.0 (Nations Tech, China Market)
		788816-0118						2.0 (Nations Tech, China Market)
Best, Intel Core i7	PXIe-8862	787987-00	No OS	11th Gen Intel® Core™ i7-11850HE, 8 Core	16 GB/s	512 GB	—	2.0 (Infineon/ST, Global Market)
		790662-01**	Windows 10 64-bit			512 GB	—	2.0 (Infineon/ST, Global Market)
		787987-01				512 GB	—	2.0 (Infineon/ST, Global Market)
		790663-0118**				512 GB	—	2.0 (Infineon/ST, Global Market)
		787987-0118				512 GB	—	2.0 (Nations Tech, China Market)
		789857-01				512 GB	—	2.0 (Infineon/ST, Global Market)
		788167-01				960 GB	U.2, Removable	2.0 (Infineon/ST, Global Market)
		789546-01				512 GB	—	—
		790659-33**	LabVIEW Real-Time (NI Linux Real-Time)			512 GB	—	—
		787987-33				512 GB	—	—
		788167-33				960 GB	U.2, Removable	—
		790660-01**	Windows 11			512 GB	—	2.0 (Infineon/ST, Global Market)
		788817-01				512 GB	—	2.0 (Infineon/ST, Global Market)
		790660-0118**				512 GB	—	2.0 (Nations Tech, China Market)
		788817-0118				512 GB	—	2.0 (Nations Tech, China Market)
		790661-01**				960 GB	U.2, Removable	2.0 (Infineon/ST, Global Market)
		788818-01				960 GB	U.2, Removable	2.0 (Infineon/ST, Global Market)

(continued on next page)

PXI Controller Modules (continued)

Selection Guide	Model	Part Number	Controller OS	Processors and Cores	Max Controller Bandwidth	Hard Drive Memory Size	HDD Removable	TPM Version*
Extreme, Server-Grade	PXIe-8881	787807-01	Windows 10 64-bit	Intel® Xeon W-2225, Xeon Quad-Core	24 GB/s	512 GB	—	2.0 (Infineon/ST, Global Market)
		787807-0118						—
		786636-01		Intel® Xeon W-2245, Xeon 8-Core				2.0 (Infineon/ST, Global Market)
		786636-0118						—
		787805-01						—
		786636-00	No OS					2.0 (Infineon/ST, Global Market)
		787805-33	LabVIEW Real-Time (NI Linux Real-Time)					—
		789431-01	Windows 11					2.0 (Infineon/ST, Global Market)
		789431-0118						2.0 (Nations Tech, China Market)
		787806-01	Windows 10 64-bit	Intel® Xeon W-2295, Xeon 18-Core				2.0 (Infineon/ST, Global Market)
		787806-0118						—

* TPM Versions: In order to run Windows 11 on your PC, it must be installed with Trusted Platform Module (TPM) 2.0. The latest NI controllers offer TPM support. Please see the table above for regional TPM types and restrictions; currently, Global Market and China Market. Please contact NI support with questions.

**NI Controllers I/O: This part number does not include a GPIB port. Please check the model page for full I/O specs. NI controllers typically offer RS-232 Serial, DisplayPort 1.4, Ethernet, Thunderbolt 4, USB 2.0, USB 3.2, Trigger, Reset Button, and LEDs. GPIB ports are not included on all part numbers.

PXI Rack-Mount Controller Modules

Model	Part Number	Processor	Controller OS	RAM	Storage	PCI Express	Video	Ports
NI RMC-8356 for PXI Express Control (Windows)	785321-01	Intel Xeon E5620 (2.4G Hz Quad Core)	Windows 10 64-bit	16 GB–64 GB DDR4	1 TB HDD + 3 Additional Bays	3.0 x 16, 1 Slot (for Remote Control)	2 Display Ports, 1 DVI, 1 VGA	2 USB 3.0, 4 USB 2.0, 2 Gigabit Ethernet RJ-45
NI RMC-8354 1U Controller, Core I7-860, 1X 500 GB, Real-Time Software	781650-33	Intel Core i7-860 (2.8 GHz)	LabVIEW Real-Time OS	1 GB (Included)	500 GB	Gen 1 MXI	—	—

Controller Accessories

Hard Drives

Hard Drive	1 TB NVMe Solid-State Drive Upgrade For PXIe-8822/8842/8862, M.2, 80 mm	Spare 512 GB NVMe Solid-State Drive for PXIe-8822/8842/8862, M.2, 80 mm	Spare 512 GB NVMe Solid-State Drive, M.2, 80 mm
Part Number	788898-01	788897-01	786775-01
PXIe-8822	✓	✓	—
PXIe-8842	✓	✓	—
PXIe-8862	✓	✓	—
PXIe-8881	—	—	✓

RAM

RAM	16 GB DDR4 3200 SO-DIMM RAM for PXIe-8822/8842/8862	16 GB DDR4 2666 SO-DIMM RAM, ECC for PXIe-8881
Part Number	788899-01	787659-01
PXIe-8822 [787881-01]	✓	—
PXIe-8822 [787881-0118]	✓	—
PXIe-8822 [787881-33]	✓	—
PXIe-8822 [788815-01]	✓	—
PXIe-8822 [788815-0118]	✓	—
PXIe-8842 [790657-01]		
PXIe-8842 [787882-01]	✓	—
PXIe-8842 [790657-0118]		
PXIe-8842 [787882-0118]	✓	—
PXIe-8842 [790657-33]		
PXIe-8842 [787882-33]	✓	—
PXIe-8842 [790658-01]		
PXIe-8842 [788816-01]	✓	—
PXIe-8842 [790658-0118]		
PXIe-8842 [788816-0118]	✓	—
PXIe-8862 [790662-01]		
PXIe-8862 [787987-01]	✓	—
PXIe-8862 [790663-0118]		
PXIe-8862 [787987-0118]	✓	—
PXIe-8862 [790659-33]		
PXIe-8862 [787987-33]	✓	—
PXIe-8862 [790660-01]		
PXIe-8862 [788817-01]	✓	—
PXIe-8862 [790660-0118]		
PXIe-8862 [788817-0118]	✓	—
PXIe-8862 [790661-01]		
PXIe-8862 [788818-01]	✓	—
PXIe-8862 [789546-01]	✓	—
PXIe-8881 [786636-01]	—	✓
PXIe-8881 [786636-0118]	—	✓
PXIe-8881 [787805-01]	—	✓
PXIe-8881 [787805-33]	—	✓
PXIe-8881 [787807-01]	—	✓
PXIe-8881 [787807-0118]	—	✓
PXIe-8881 [789431-01]	—	✓
PXIe-8881 [789431-0118]	—	✓

PXI Remote Controllers and System Expansion

Achieve the ultimate flexibility with PXI remote controllers:

- Control a PXI chassis from a desktop PC, laptop, or rack-mount controller
- Create synchronized, data-connected, multichassis PXI systems
- Choose from copper and fiber-optic cable options
- Take advantage of a software-transparent link requiring no programming

Key Features:

Desktop or Rack-Mount PC Control

With a PXI remote control module, a host computer can establish a PCI Express connection to the chassis using a compatible MXI-Express cable.

Multichassis Synchronization

PXI remote control modules can leverage the architecture of the PXI platform to achieve high-accuracy synchronization between modular instruments in separate chassis. By combining NI's timing and synchronization modules with MXI-Express, you can synchronize instruments across multiple chassis with NI-TClk technology deskewing.

Flexible Topologies

While a daisy-chaining topology is the most common approach to building multichassis systems, some host interface cards support star topologies so that each chassis can communicate directly with the host.

PXI Remote Control Modules

Selection Guide	Model	Part Number	Type	MXI Bandwidth	MXI Communication Level	MXI Ports	Supported Cable Type	Supports Daisy-Chaining
Entry	PXIe-8361	779700-02	PXI Remote Control Module	250 MB/s	MXI-Express x1	1	Copper	—
	PCIe-8363	788814-01	Host Interface	—	MXI-Express x1	1	Copper	—
	PXIe-8364	781819-01	Bus Extension Module	250 MB/s	MXI-Express x1	—	Copper	—
	PXIe-8374	781820-04	Bus Extension Module	1 GB/s	MXI-Express x4	—	Copper	—
Performance	PXIe-8398	784178-01	PXI Remote Control Module	16 GB/s	MXI-Express Gen3 x16	4	Copper and Fiber-Optic	✓
	PXIe-8399	784180-01	PXI Remote Control Module	16 GB/s	MXI-Express Gen3 x16	8	Copper and Fiber-Optic	✓
	PCIe-8398	784179-01	Host Interface	—	MXI-Express Gen3 x16	1	Copper and Fiber-Optic	—
	PXIe-8394	785157-01	See Below*	7.9 GB/s	MXI-Express Gen3 x8	—	Copper and Fiber-Optic	—
Thunderbolt	PXIe-8301	785679-01	PXI Remote Control Module	2.3 GB/s	Thunderbolt 3.0	2	Copper	—

*PXIe-839X Gen 3: Through modular cabling and/or the PXIe-8394 Gen 3 x8 bus extension module, several multichassis system configurations are possible.

PXI Remote Control Module Accessories

PXI Remote Control Module Cables

Cable Type	Thunderbolt 3 Type-C Cable, Active 40 GB/S, 3A, 2 m	Thunderbolt 3 Type-C Cable, Passive 20 GB/S, 5A, 2 m	Thunderbolt 3 Type-C Cable, Passive 40 GB/S, 5A, 0.8 m	MXI-Express Cable, Gen 1 x1, Copper, 1 m	MXI-Express Cable, Gen 1 x1, Copper, 3 m
Part Number	785607-02	785608-02	787580-0R8	779500-01	779500-03
PXIe-8301	✓	✓	✓	—	—
PXIe-8361	—	—	—	✓	✓
PCIe-8368	—	—	—	—	✓
PCIe-8398	—	—	—	—	—
PXIe-8398	—	—	—	—	—
PXIe-8399	—	—	—	—	—
PXIe-8374	—	—	—	✓	✓
PXIe-8394	—	—	—	—	—
PXIe-8364	—	—	—	✓	✓

PXI Remote Control Module Cables (continued)

Cable Type	MXI-Express Cable, Gen 1 x1, Copper, 7 m	MXI-Express Cable, Gen 2 x8, Copper, 1 m	MXI-Express Cable, Gen 2 x8, Copper, 2 m	MXI-Express Cable, Gen 2 x8, Copper, 3 m	MXI-Express Cable, Gen 2 x8, Copper, 5 m
Part Number	779500-07	782317-01	782317-02	782317-03	782317-05
PXIe-8301	—	—	—	—	—
PXIe-8361	✓	—	—	—	—
PCIe-8368	—	—	—	—	—
PCIe-8398	—	—	—	—	—
PXIe-8398	—	—	—	—	—
PXIe-8399	—	—	—	—	—
PXIe-8374	✓	—	—	—	—
PXIe-8394	—	—	—	—	—
PXIe-8364	✓	—	—	—	—

PXI Remote Control Module Cables (continued)

Cable Type	MXI-Express Cable, Gen 3 x4, Copper, 3 m	MXI-Express Cable, Gen 3 x8, Copper, 1 m	MXI-Express Cable, Gen 3 x8, Copper, 3 m	MXI-Express Cable, Gen 3 x4, Fiber-Optic, 10 m	MXI-Express Cable, Gen 3 x4, Fiber-Optic, 100 m	MXI-Express Cable, Gen 3 x4, Fiber-Optic, 30 m
Part Number	785549-03	785550-01	785550-03	788302-10	788302-100	788302-30
PXIe-8301	—	—	—	—	—	—
PXIe-8361	—	—	—	—	—	—
PCIe-8368	—	—	—	—	—	—
PCIe-8398	✓	✓	✓	✓	✓	✓
PXIe-8398	✓	✓	✓	✓	✓	✓
PXIe-8399	✓	✓	✓	✓	✓	✓
PXIe-8374	—	—	—	—	—	—
PXIe-8394	✓	✓	✓	✓	✓	✓
PXIe-8364	—	—	—	—	—	—

PXI Instrument Overview

PXI Oscilloscopes Page 149

- Sample at speeds of up to 5 GS/s
- 1.5 GHz of analog bandwidth
- Numerous triggering modes
- Up to 24-bit resolution

PXI Digital Multimeters Page 154

- Voltage measurements up to 1,000 VDC
- Current measurements up to 3 A
- Resistance measurements up to 5 GΩ
- Isolated digitizer mode up to 1.8 MS/s

PXI Waveform Generators Page 156

- Up to two 16-bit channels per module
- 800 MS/s with 20, 40, and 80 MHz bandwidth
- Up to 34 channels to build parallel
- Max ±12 V and min ±7.75 mV output ranges

PXI Counter/Timers Page 72

- Up to eight 32-bit counter/timers
- TTL/CMOS-compatible digital I/O
- Up to 80 MHz measure frequency
- Onboard high-precision oscillators

PXI Power Supplies Page 158

- Two isolated, 60 W channels per module
- Hardware timing and triggering
- Output disconnect relays
- Four-wire remote sense

PXI Switches Page 160

- Electromechanical, reed, solid-state, FET
- Up to 150 V or 2 A
- Up to 544 crosspoints in a single PXI slot
- 1- and 2-wire options

PXI Source Measure Units (SMUs) Page 177

- Up to 24 channels (408 per chassis)
- Up to 200 V and 3 A (10 A pulse)
- Current sensitivity down to 10 fA
- Max power per channel of 40 W (500 W pulse)

PXI LCR Meters and SMUs Page 181

- AC stimulus frequency up to 2 MHz
- AC stimulus amplitude up to 7.07 V_{rms}
- DC bias up to ± 40 V
- Basic impedance accuracy of 0.05%

PXI Digital Pattern Instruments Page 183

- 32-channel module (up to 512 per chassis)
- 100 MHz vector rate, 39 ps displacement
- Digital voltage of -2 V to 6 V
- Up to 200 Mb/s data rate

PXI Digital Waveform Instruments Page 185

- Standard TTL/CMOS interface voltages and programmable voltage levels
- 32 bidirectional digital channels
- Advanced waveform sequencing and streaming features

PXI Electronic Loads Page 188

- Ability to sink up to 300 W of DC power
- Voltage and current measurements with sample rates up to 1.8 MS/s and update rates up to 100 kS/s
- Hardware timing and triggering
- Four-wire remote sense

PXI High-Speed Serial Page 189

- Up to 48 Xilinx MGT (Multigigabit Transceivers) with line rates up to 28.2 Gb/s
- Various high-speed serial protocols on the user-programmable Xilinx Kintex UltraScale + or 7 series FPGAs
- High-speed P2P backplane data streaming up to 7 GB/s to host, disk, or other PXI Express modules
- Up to 20 GB onboard DDR3 DRAM

PXI Timing and Synchronization Page 192

- Generate high-stability PXI system reference clocks and high-resolution sample clocks
- Achieve synchronization over long distance through GPS, IEEE 1588, IRIG-B, or PPS
- Develop advanced timing and sync applications with NI-Sync and NI-TClk software
- Import and export system reference clocks for synchronization between multiple chassis or external devices

PXI Sound and Vibration Page 194

- Built-in high-pass filtering
- Reliable dynamic signal characterization
- Per-channel, software-selectable AC input coupling
- Per-channel, software-selectable input gain settings

PXI Reconfigurable I/O (FPGA) Page 197

- Variety of onboard FPGA options
- 12-bit to 18-bit analog input resolution
- Up to 16 analog channels and 96 bidirectional channels
- Up to 1 MS/s analog sample rate

PXI FlexRIO Page 200

- Analog I/O up to 6.4 GS/s, digital I/O up to 1.25 Gb/s, RF I/O up to 4.4 GHz
- High-performance Xilinx FPGAs with up to 20 GB of onboard DRAM
- Program with LabVIEW FPGA or Xilinx Vivado
- Develop application-specific I/O with FlexRIO Module Development Kit

PXI Signal Conditioning Modules Page 212

- High channel density for conditioned and sensor measurements
- Flexible, synchronized, and accurate measurements
- Isolated measurement options
- Swappable front mount terminal block

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Oscilloscopes

- Sample at speeds up to 5 GS/s
- 1.5 GHz of analog bandwidth
- Numerous triggering modes
- Up to 24-bit resolution

Key Features:

Effortlessly Build High-Channel-Count Systems.
With channel-expansion capabilities, you can automatically synchronize multiple PXI oscilloscopes of the same model with InstrumentStudio™ software, LabVIEW, Python, or any other API using the NI-SCOPE driver.

Store and Process Extensive Data.
PXI Oscilloscopes feature deep onboard memory for high-resolution, long-duration signal capture, and multiple acquisitions from single or parallel channels.

Avoid System Downtime
CableSense technology can reduce risk of faulty electrical connection by detecting changes from a known, golden setup without having to alter the connections themselves.

PXI Oscilloscope Modules

Selection Guide	Model	Part Number	Resolution	Bandwidth	Sample Rate	Channels	Memory Size	CableSense	Reconfigurable FPGA
General-Purpose	PXIe-5114	783591-01	8 bits	125 MHz	250 MS/s	2	8 MB	—	—
		783591-02					64 MB/ch	—	—
		783591-03					256 MB/ch	—	—
	PXIe-5105	783590-01	12 bits	60 MHz	60 MS/s	8	16 MB	—	—
		783590-02					128 MB	—	—
		783590-03					512 MB	—	—
	PXIe-5108	790584-01	14 bits	100 MHz	250 MS/s	4	256 MB	—	—
		790585-01	14 bits	100 MHz	250 MS/s	8	512 MB	—	—
	PXIe-5122	779967-01	14 bits	100 MHz	100 MS/s	2	8 MB/ch	—	—
		779967-02					64 MB/ch	—	—
		779967-03					256 MB/ch	—	—
	PXIe-5163	785182-01	14 bits	200 MHz	1 GS/s	2	512 MB	—	—
	PXI-5922	779153-01	24 bits (Flexible Resolution)	6 MHz	15 MS/s	2	8 MB/ch	—	—
		779153-02					32 MB/ch	—	—
		779153-03					256 MB/ch	—	—
General-Purpose with Downtime Prevention (CableSense Technology)	PXIe-5110	785767-01	8 bits	100 MHz	1 GS/s	2	64 MB	—	—
		785767-11					64 MB	✓	—
		785768-01					512 MB	—	—
		785768-11					512 MB	✓	—
	PXIe-5111	785769-01	8 bits	350 MHz	3 GS/s	2	64 MB	—	—
		785769-11					64 MB	✓	—
		785770-01					512 MB	—	—
		785770-11					512 MB	✓	—
	PXIe-5113	786375-01	8 bits	500 MHz	3 GS/s	2	64 MB	—	—
		786375-11					64 MB	✓	—
		786405-01					512 MB	—	—
		786405-11					512 MB	✓	—
	PXIe-5160	782621-01	10 bits	500 MHz	2.5 GS/s	2	64 MB	—	—
		782621-02				2	2 GB	—	—
		782621-03				4	2 GB	—	—
		782621-11				2	64 MB		—
		782621-12				2	2 GB		—
		782621-13				4	2 GB		—
	PXIe-5162	782622-01	10 bits	1.5 GHz	5 GS/s	2	64 MB	—	—
		782622-05				2	2 GB	—	—
		782622-06				4	2 GB	—	—
		782622-11				2	64 MB	✓	—
		782622-15				2	2 GB	✓	—
		782622-16				4	2 GB	✓	—
High-Speed Real-Time Processing with Programmable FPGA	PXIe-5164	784183-01	14 bits	400 MHz	1 GS/s	2	1.5 GB	—	Kintex-7 410T
	PXIe-5170	783690-01	14 bits	100 MHz	250 MS/s	4	0.75 GB	—	Kintex-7 325T
		783691-01				8	1.5 GB	—	Kintex-7 325T
	PXIe-5171	783692-01	14 bits	250 MHz	250 MS/s	8	1.5 GB	—	Kintex-7 410T
	PXIe-5172	784224-01	14 bits	100 MHz	250 MS/s	4	0.75 GB	—	Kintex-7 325T
		784225-01				8	1.5 GB	—	Kintex-7 325T
		784226-01				8	1.5 GB	—	Kintex-7 410T

PXI Oscilloscope Accessories

Single-Ended Passive Probes

Single-Ended Passive Probes	SP500X Single-Ended Passive Probe, 500 MHz, 300 VDC, 10:1 Attenuation	SP500C Single-Ended Passive Probe, 500 MHz, 300 VDC, 100:1 Attenuation	CP500X Single-Ended Coaxial Passive Probe, 500 MHz, 60 VDC, 10:1 Attenuation	CP400X Single-Ended Coaxial Passive Probe, 400 MHz, 60 VDC, 10:1 Attenuation	SP200B 10:1 and 1:1 Switchable Passive Oscilloscope Probe, 60 V
Part Number	783629-01	783630-01	784253-01	784254-01	780284-01
PXIe-5105	—	—	—	—	✓*
PXIe-5108	✓*	✓*	—	—	✓*
PXIe-5110	✓	✓	✓	✓	✓
PXIe-5111	✓	✓	✓	✓	✓
PXIe-5113	✓	✓	✓	✓	✓
PXIe-5114	—	—	—	✓	✓
PXIe-5122	—	—	—	—	✓
PXIe-5160	✓	✓	✓	✓	✓
PXIe-5162	✓	✓	✓	✓	✓
PXIe-5163	✓	✓	✓	✓	✓
PXIe-5164	✓	✓	✓	✓	✓
PXIe-5170	—	—	—	—	—
PXIe-5171	—	—	—	—	—
PXIe-5172	✓*	✓*	—	—	✓*
PXI-5922	—	—	—	—	✓

*Requires SMB-to-BNC Adapter

Active Probes

Active Probes	SA1000X Single-Ended Active Probe, 1 GHz, 20 VDC, 10:1 Attenuation	SA1500X Single-Ended Active Probe, 1.5 GHz, 20 VDC, 10:1 Attenuation	SA2500X Single-Ended Active Oscilloscope Probe, 2.5 GHZ	DA200025X Active Differential Probe, 2GHZ, 25:1 Attenuation
Part Number	784255-01	784256-01	784257-01	789810-01
PXIe-5105	✓	✓	✓	✓
PXIe-5108	✓	✓	✓	✓
PXIe-5110	✓	✓	✓	✓
PXIe-5111	✓	✓	✓	✓
PXIe-5113	✓	✓	✓	✓
PXIe-5114	✓	✓	✓	✓
PXIe-5122	✓	✓	✓	✓
PXIe-5160	✓	✓	✓	✓
PXIe-5162	✓	✓	✓	✓
PXIe-5163	✓	✓	✓	✓
PXIe-5164	✓	✓	✓	✓
PXIe-5170	✓	✓	✓	✓
PXIe-5171	✓	✓	✓	✓
PXIe-5172	✓	✓	✓	✓
PXI-5922	✓	✓	✓	✓

Current Probes

Current Probes	CC0550X Hioki Current Probe, 5 Arms, 50 MHz	CC05120X Hioki Current Probe, 5 Arms, 120 MHz	CC3050X Hioki Current Probe, 30 Arms, 50 MHZ	CC30100X Hioki Current Probe, 30 Arms, 100 MHz	CC15010X Hioki Current Probe, 150 A, 10 MHz	CC5002X Hioki Current Probe, 500 A, 2 MHz
Part Number	786846-01	786847-01	785561-01	785562-01	786849-01	786848-01
PXIe-5105	✓	✓	✓	✓	✓	✓
PXIe-5108	✓	✓	✓	✓	✓	✓
PXIe-5110	✓	✓	✓	✓	✓	✓
PXIe-5111	✓	✓	✓	✓	✓	✓
PXIe-5113	✓	✓	✓	✓	✓	✓
PXIe-5114	✓	✓	✓	✓	✓	✓
PXIe-5122	✓	✓	✓	✓	✓	✓
PXIe-5160	✓	✓	✓	✓	✓	✓
PXIe-5162	✓	✓	✓	✓	✓	✓
PXIe-5163	✓	✓	✓	✓	✓	✓
PXIe-5164	✓	✓	✓	✓	✓	✓
PXIe-5170	—	—	—	—	—	—
PXIe-5171	—	—	—	—	—	—
PXIe-5172	✓	✓	✓	✓	✓	✓
PXI-5922	✓	✓	✓	✓	✓	✓

Cables

Description	BNC TO BNC Cable, 50 Ω, 0.9 m	HD BNC Male to BNC Female Cable, 50 Ω, 20 cm	SMA Male Plug X SMA Male Plug (Maxi-Flex) 5 in.	SMA Male to SMA Male Cable, 50 Ω, 38.1 cm
Part Number	781887-01	787230-0R2	763443-01	763444-01
PXIe-5105	—	—	—	—
PXIe-5108	✓*	✓*	—	—
PXIe-5110	✓	✓	—	—
PXIe-5111	✓	✓	—	—
PXIe-5113	✓	✓	—	—
PXIe-5114	✓	✓	—	—
PXIe-5122	✓	✓	—	—
PXIe-5160	✓	✓	—	—
PXIe-5162	✓	✓	—	—
PXIe-5163	✓	✓	—	—
PXIe-5164	✓	✓	—	—
PXIe-5170	—	—	✓	✓
PXIe-5171	—	—	✓	✓
PXIe-5172	✓*	✓*	—	—
PXI-5922	✓	✓	—	—

*Requires SMB-to-BNC Adapter

Cables (continued)

Description	Cable Assy, SMA to SMA, Coax, RG-402, 50 Ω, 1 m	1-Pin BNC (Male or Female) to 1-Pin SMB Female, 50 Ω Coaxial Cable	1-Pin SMB (Female) to 1-Pin BNC (Male or Female), 50 Ω Coaxial Cable, 2 ft.	1-Pin SMB (Female) to 1-Pin BNC (Male or Female),50 Ω Coaxial Cable, 1 m	SMB Female to BNC Female, 50 Ω, 0.08 m
Part Number	781845-01	189425-0R6	763389-01	763405-01	781449-01
PXIe-5105	—	—	—	—	—
PXIe-5108	—	—	✓	✓	✓
PXIe-5110	—	—	✓	✓	—
PXIe-5111	—	—	✓	✓	—
PXIe-5113	—	—	✓	✓	—
PXIe-5114	—	—	✓	✓	—
PXIe-5122	—	—	✓	✓	—
PXIe-5160	—	—	✓	✓	—
PXIe-5162	—	—	✓	✓	—
PXIe-5163	—	—	✓	✓	—
PXIe-5164	—	—	✓	✓	—
PXIe-5170	✓	✓	—	—	—
PXIe-5171	✓	✓	—	—	—
PXIe-5172	—	—	✓	✓	✓
PXI-5922	—	—	✓	✓	—

Probe Compensation Tabs

Probe Compensation Tabs	SMB Female to Probe Compensation Tabs, 8 cm
Part Number	786983-01
PXIe-5105	✓
PXIe-5108	—
PXIe-5110	—
PXIe-5111	—
PXIe-5113	—
PXIe-5114	—
PXIe-5122	—
PXIe-5160	✓
PXIe-5162	✓
PXIe-5163	✓
PXIe-5164	✓
PXIe-5170	—
PXIe-5171	—
PXIe-5172	—
PXI-5922	—

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Digital Multimeters

- Voltage measurements up to 1,000 VDC
- Current measurements up to 3 A
- Resistance measurements up to 5 GΩ
- Isolated digitizer mode up to 1.8 MS/s

Key Features:

Most Accurate 7.5-Digit DMM

With 26 bits of resolution and high stability, NI digital multimeters (DMMs) outperform traditional box DMMs.

Customizable Settings

With NI DMMs, you programmatically can customize measurement settings to prioritize speed or accuracy.

Isolated Digitizer Mode

Isolated, high-voltage digitizer mode means sample rates up to 1.8 MS/s—36X faster than traditional DMMs.

PXI Digital Multimeter Modules

Selection Guide	Model	Part Number	Basic DC Voltage Accuracy	Bus Connector	DC Current Range	DC Voltage Range	Digits of Resolution	L&C Measurements	Max Sample Rate
LCR Meter Functionality	PXIe-4082	783131-01	25 ppm	PXI Express	-1 A to 1 A	-300 V to 300 V	6.5	✓	1.8 MS/s
Highest Resolution and Voltage Range	PXIe-4081	783130-01	12 ppm	PXI Express	-3 A to 3 A	-1000 V to 1000 V	7.5	—	1.8 MS/s
General Purpose	PXIe-4080	783129-01	25 ppm	PXI Express	-1 A to 1 A	-300 V to 300 V	6.5	—	1.8 MS/s
Lowest Cost	PXI-4065	780011-01	90 ppm	PXI Hybrid	-3 A to 3 A	-300 V to 300 V	6.5	—	3 kS/s

PXI Digital Multimeter Accessories

Probes

Probe	P-1 DMM Test Probes	P-2 Probe Set	P-3 Probe Set, Banana Plug to Bare Wire DMM Cable, 1 m	Low-Leakage, Low-Thermal-EMF Cable Set (60 V Max)	Low-Leakage, Low-Thermal-EMF Connectivity Kit for Custom Cables (60 V Max)	Digital Multimeter Trigger Cable, 9-Pin DIN to 2 BNC, 0.5 m
Part Number	761000-01	184698-01	185692-01	779410-01	779499-01	184931-0R5
PXIe-4082	✓	✓	✓	✓	✓	—
PXIe-4081	✓	✓	✓	✓	✓	—
PXIe-4080	✓	✓	✓	✓	✓	—
PXI-4065	✓	✓	✓	✓	✓	✓

Connector Blocks

Connector Block	200 mA Current Shunt	10 A Current Shunt
Part Number	777488-01	777488-02
PXIe-4082	✓	✓
PXIe-4081	✓	✓
PXIe-4080	✓	✓
PXI-4065	✓	✓

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Waveform Generators

- Up to two 16-bit channels
- 800 MS/s update rate with 20, 40, and 80 MHz bandwidth options
- Up to 34 channels in parallel per chassis
- Maximum ±12 V and minimum ±7.75 mV output ranges

Key Features:

Waveform Streaming

A PXI waveform generator can stream hundreds of megasamples per second to instrument memory.

Digital Filtering

PXI waveform generators feature digital filtering designed to remove unwanted frequency images from the generated signal in arbitrary generation mode.

Waveform Scripting

Define standard and arbitrary waveforms that can be looped and burst using scripts.

PXI Waveform Generator Modules

Selection Guide	Model	Part Number	Resolution	Bandwidth	Upload Rate	Memory Size	Channels
Lowest Bandwidth	PXIe-5413	784181-01	16	20 MHz	800 MS/s	512 MB	1
		785114-01				1 GB	2
Medium Bandwidth	PXIe-5423	785115-01	16	40 MHz	800 MS/s	512 MB	1
		785116-01				1 GB	2
Highest Bandwidth	PXIe-5433	785117-01	16	80 MHz	800 MS/s	512 MB	1
		785118-01				1 GB	2
Clock Generator	PXI-5404	778577-02	12	100 MHz	300 MS/s	8 MB	1

PXI Waveform Generator Accessories

Cables

Description	Double-Shielded SMB to BNC Male Coax Cable, 50 Ω, 1 m	SMB Plug to SMB Plug Coax Cable, 50 Ω, 1 m, Qty 1	SMB Female to BNC Male Coax Cable, 1 m, Qty 1	SMA Male to SMA Male Cable, 50 Ω, 1 m	SMA Male to SMA Male Cable, 50 Ω, 30 cm	SMA Male to SMA Male Cable, 50 Ω, 38.1 cm
Part Number	778827-01	188859-01	763405-01	781845-01	781846-01	763444-01
PXIe-5413	—	—	—	✓	✓	✓
PXIe-5423	—	—	—	✓	✓	✓
PXIe-5433	—	—	—	✓	✓	✓
PXI-5404	✓	✓	✓	—	—	—

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Power Supplies

- Ability to source up to 300 W of DC power
- Voltage and current measurements with sample rates up to 1.8 MS/s and update rates up to 100 kS/s
- 4-wire remote-sense hardware timing and triggering

Key Features:

Source and Measure Faster

You can power your device under test with up to 300 W of DC power, all while taking current and voltage measurements up to 1.8 MS/s to capture the dynamic signal performance. Additionally, high-speed data converters offer update rates up to 100 kS/s for creating dynamic sequences.

Increase Measurement Accuracy

You can use multiple measurement ranges in certain PXI power supplies for both voltage and current to enhance measurement accuracy and reduce quantization noise. With this feature, you can achieve higher accuracy for both large and small signals, surpassing what you could do with one range.

Tune the Transient Response

You can use NI SourceAdapt technology to optimize system stability and minimize transient response times for a given load with your PXI programmable power supply. With NI SourceAdapt technology, you can test faster without potentially damaging your device.

PXI Power Supply Modules

Selection Guide	Model	Part Number	Channels	Maximum Voltage (V)	Maximum Current (A)	Maximum Power Per Channel (W)	Maximum Voltage Measurement Resolution	Maximum Current Measurement Resolution	SourceAdapt	Auxiliary Power Supply
Most Channels	PXI-4110	779647-11	3	±20	1	20	0.06 mV	0.20 µA	—	Included with Kit
Highest Voltage	PXIe-4112	782857-01	2	+60	1	60	17 mV	274 µA	—	Included with Kit
General Purpose	PXIe-4113	782857-02	2	+10	6	60	3 mV	2 mA	—	Included with Kit
High Power	PXIe-4151	788176-02	1	+20	25*	300	1 µV	10 nA	✓	Not Included
Highest Power	PXIe-4150	788176-01	1	+60	10*	300	1 µV	10 nA	✓	Not Included

*Requires a 58 W or greater chassis to source full-scale current

PXI Power Supply Accessories

Auxiliary Power Supplies and Cables

Auxiliary Power Supply or Cable	APS-4100 Auxiliary Power Source for NI DC Power Supplies*	Replacement Auxiliary Power Supply Module for NI PXIe-4112/13*	APS-4157, 48 V Auxiliary Power Supply for NI PXIe-4150/1	APS-4158, 8-Channel Auxiliary Power Supply, 1,200 W, 48 V	APS-4159, 8-Channel Auxiliary Power Supply, 2,400 W, 48 V	Auxiliary Power Cable for APS-415x, 0.5 m	Auxiliary Power Cable for APS-415x, 1 m
Part Number	779671-01	782888-01	789776-01	788201-01	788201-02	788199-0R5	788199-01
PXI-4110	✓	—	—	—	—	—	—
PXIe-4112	—	✓	—	—	—	—	—
PXIe-4113	—	✓	—	—	—	—	—
PXIe-4151	—	—	✓	✓	✓	✓ **	✓ **
PXIe-4150	—	—	✓	✓	✓	✓**	✓**

*Replacement/extra

**Must purchase 1x auxiliary cable option per PXIe-4151 and PXIe-4150

Connectors and Connector Kits

Connectors and Connector Kits	Screw Terminal Connector Kit for PXI-4130 SMU***	Screw Terminal Connector Kit for PXIe-4112/3 Power Supplies***	Connector Kit for PXIe-4150/1 Power Supplies and PXIe-4051 Electronic Load***
Part Number	780557-01	782887-01	788197-01
PXI-4110	✓	—	—
PXIe-4112	—	✓	—
PXIe-4113	—	✓	—
PXIe-4151	—	—	✓
PXIe-4150	—	—	✓

***Replacement/extra

Mounting Kits

Mounting Kit	Rack-Mount Kit for APS-4158/9 Auxiliary Power Supplies
Part Number	786340-01
APS-4158	✓
APS-4159	✓

Recommended software (sold separately):

- Switch Executive
- NI LabVIEW
- NI TestStand

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Switches

- 100+ different switching topologies
- Up to 600 V and 40 A
- Bandwidth up to 40 GHz
- Up to 544 matrix crosspoints
- 1- wire, 2- wire, and 4-wire options
- Software selectable topologies offer flexibility

Key Features:

PXI Switch Expansion

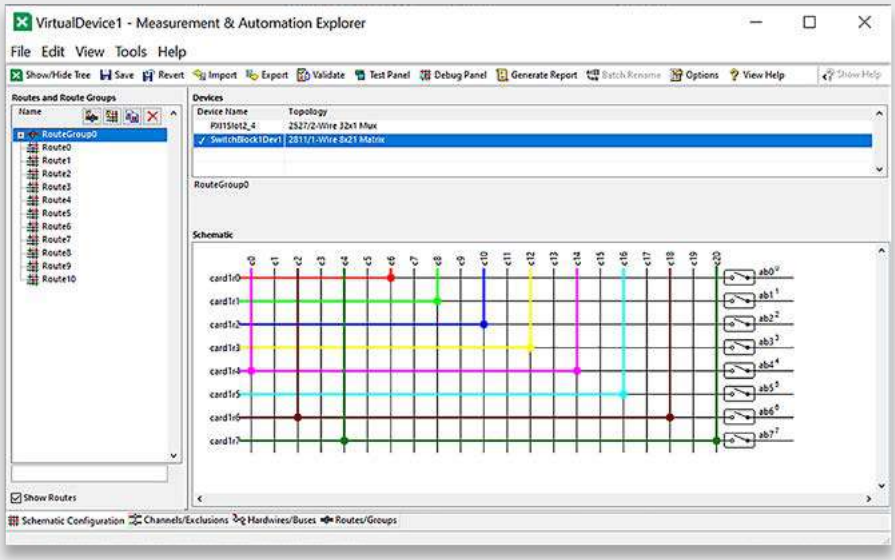
Physically combine multiple PXI switches to create a single, larger switch by either joining the rows/columns of PXI matrices or by joining the COMs of PXI multiplexers.

Synchronize with Instruments

Perform hardware handshaking to synchronize a PXI switch with another PXI instrument, removing the software overhead and bus latency.

Switch Executive Software

Utilize this application software for intelligent switch management and routing that accelerates development and simplifies maintenance of complex switch systems.



NI Switch Executive Software

While the NI-SWITCH driver provides all the low-level functionality required to program switch actions, Switch Executive is application software for intelligent switch management and routing that accelerates development and simplifies maintenance of complex switch systems. The point-and-click graphical configuration and automatic routing capabilities make it easy to design your switch system. Using intuitive channel aliases and route names keeps your system documented for future modifications. Save time and increase test code reuse by integrating your system with NI TestStand, LabVIEW, LabWindows/CVI, and NI Measurement Studio™ software.

With Switch Executive, you can:

- Graphically configure routes and route groups
- Develop reusable switching code and integrate it into NI TestStand or NI LabVIEW
- Automatically route signals between switch endpoints
- Scale switch configuration using Microsoft Excel
- Maintain switch configuration using route validation, reporting, and debugging features

PXI Switch Modules

General-Purpose Switches

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth	Topology
Low Power (1A)	PXI-2569	778572-69	100	100	1	1	EMR	20 MHz	100-Channel, SPST
	PXIe-2569	780587-69	100	100	1	1	EMR	20 MHz	100-Channel, SPST
	PXI-2571	778572-71	100	100	1	1	EMR	35 MHz	66-Channel, SPDT
Medium Power (2A to 5A)	PXI-2520	778572-20	150	150	2	2	EMR	35 MHz	80-Channel, SPST
	PXI-2521	778572-21	150	150	2	2	EMR	25 MHz	40-Channel, DPST
	PXI-2522	778572-22	100	100	2	2	EMR	51 MHz	53-Channel, SPDT
	PXI-2523	778572-23	150	150	2	2	EMR	36 MHz	26-Channel, DPF
	PXI-2564	778572-64	150	150	5	5	EMR	10 MHz	16-Channel, SPST
	PXI-2566	778573-66	150	125	2	5	EMR	70 MHz	16-Channel, SPDT
	PXI-2568	778572-68	100	100	2	2	EMR	40 MHz	31-Channel, SPST
High Power (5A)	PXI-2586	778572-86	300	300	12	12	EMR	20 MHz	10-Channel, SPST

Multiplexer Switches

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth	Channels/Crosspoints
Low Density	PXI-2503	777697-01	60	30	1	1	EMR	10 MHz	48-channel Mux
	PXI-2575	778572-75	100	100	1	1	EMR	20 MHz	196-channel Mux
	PXI-2576	778572-76	100	100	1	1	EMR	30 MHz	64-channel Mux
	PXI-2584	778572-84	600	600	0.5	0.5	Reed	900 kHz	12-Channel Mux
	PXI-2585	778572-85	300	300	12	12	EMR	10 MHz	10-Channel Mux
	PXIe-2525	780587-25	150	150	2	2	EMR	10 MHz	64-channel Mux
	PXIe-2527	780587-27	300	300	2	2	EMR	30 MHz	32-channel Mux
High Density	PXI-2530B	778572-30	60	30	0.4	0.4	Reed	12 MHz	128-channel Mux
	PXIe-2575	780587-75	100	100	1	1	EMR	20 MHz	196-channel Mux
	PXIe-2524	780587-24	150	150	2	2	EMR	10 MHz	64-channel Mux
	PXIe-2526	780587-26	150	150	2	2	EMR	10 MHz	158-Channel Mux
	PXIe-2575	780587-75	100	100	1	1	EMR	20 MHz	196-channel Mux

Matrix Switches

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth
128-Crosspoints	PXI-2529	778739-01	150	150	1	2	EMR	10 Mhz
	PXIe-2529	780587-29	150	150	1	2	EMR	10 MHz
256-Crosspoints	PXI-2533	778572-33	55	30	1	1	Solid State	1.5 MHz
	PXI-2534	778572-34	55	30	1	1	Solid State	2 MHz
	PXIe-2737	782835-37	100	100	2	2	EMR	10 MHz
	PXIe-2738	782835-38	100	100	2	2	EMR	10 MHz
	PXIe-2739	782835-39	100	100	2	2	EMR	10 MHz
512-Crosspoints	PXIe-2531	780587-31	60	30	0.5	0.5	Reed	10 MHz
	PXI-2532B	782383-01	100	100	0.5	0.5	Reed	30 MHz
	PXIe-2532B	782384-01	100	100	0.5	0.5	Reed	30 MHz
544-Crosspoints	PXI-2535	778572-35	12	8	0.1	0.1	FET	1 MHz
	PXI-2536	778572-36	12	8	0.1	0.1	FET	1 MHz

RF Switches

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth	Topology
General Purpose	PXI-2599	778572-99	—	90	—	1.73	EMR	26.5 GHz	Dual SPDT
Multiplexer	PXI-2545	778572-45	30	30	0.5	0.5	EMR	2.7 GHz	4x1 Mux
	PXI-2546	778572-46	30	30	0.5	0.5	EMR	2.7 GHz	Dual 4x1 Mux
	PXI-2547	778572-47	30	30	0.5	0.5	EMR	2.7 GHz	8x1 Mux
	PXI-2594	778572-94	30	30	0.5	0.5	EMR	2.5 GHz	4x1 Mux
	PXI-2596	778572-96	—	90	—	1.73	EMR	26.5 GHz	Dual 6x1 Mux
	PXI-2597	778572-97	—	90	—	1.73	EMR	26.5 GHz	6x1 Mux
	PXI-2796	782356-01	—	30	—	0.6	EMR	40 GHz	Dual 6x1 Mux
	PXI-2797	782357-01	—	30	—	0.6	EMR	40 GHz	6x1 Mux
	PXIe-2542	780587-42	8	8	1	1	FET	6.6 GHz	Quad SPDT
	PXIe-2543	780587-43	8	8	1	1	FET	6.6 GHz	Dual 4x1 Mux
	PXIe-2544	780587-44	8	8	—	—	FET	6.6 GHz	8x1 Mux
	PXIe-2593	780587-93	150	150	0.5	0.5	EMR	750 MHz	16x1 Mux
	PXIe-2746	780587-46	30	30	0.5	0.5	EMR	2.7 GHz	Quad 4x1 Mux
	PXIe-2747	780587-47	30	30	0.5	0.5	EMR	2.7 GHz	Dual 8x1 Mux
	PXIe-2748	780587-48	30	30	0.5	0.5	EMR	3 GHz	Quad SPDT
Matrix	PXIe-2540	780587-40	60	42	0.5	0.5	Reed	350 MHz	8x9 Matrix
	PXIe-2541	780587-41	60	42	0.5	0.5	Reed	300 MHz	8x12 Matrix
Transfer	PXI-2598	778572-98	—	60	—	1.25	EMR	26.5 GHz	Dual Transfer
	PXI-2798	782358-01	—	30	—	0.6	EMR	40 GHz	Dual Transfer

Switch Expansion

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth	Type A/B Module
SwitchBlock PXI Carrier Module	**PXI-2800**	781420-00	150	150	2	2	—	—	—
SwitchBlock Modules	**SWB-2834**	781420-34	100	0	2	2	EMR	10 MHz	Type A
	SWB-2834	781421-34	100	0	2	2	EMR	10 MHz	Type B
	SWB-2833	781420-33	100	100	2	2	EMR	10 MHz	Type A
	SWB-2833	781421-33	100	100	2	2	EMR	10 MHz	Type B
	SWB-2816	781420-16	100	70	0.25	0.3	Reed	8 MHz	Type A
	SWB-2816	781421-16	100	70	0.25	0.3	Reed	8 MHz	Type B
	SWB-2815	781420-15	100	70	0.25	0.3	Reed	6 MHz	Type A
	SWB-2815	781421-15	100	70	0.25	0.3	Reed	6 MHz	Type B
	SWB-2810	781420-10	150	0	1	1	Reed	10 MHz	Type A
	SWB-2810	781421-10	150	0	1	1	Reed	10 MHz	Type B

Type A: Row-to-column signal routing
Type A and B: Column-to-column signal routing

Specialty Modules

Selection Guide	Model	Part Number	Max Voltage (DC V)	Max Voltage (AC V)	Max Current (Switching)	Max Current (Carry)	Relay Type	Bandwidth
Programmable Resistor	**PXIe-2725**	781986-25	60	30	0.3	0.3	Reed	—
	PXIe-2727	781986-27	60	30	0.3	0.3	Reed	—
Relay Driver	**PXI-2567**	778572-67	50	N/A	25	25	FET	—
Fault Insertion	**PXI-2510**	778572-10	150	150	2	2	EMR	6.5 MHz
	PXIe-2512	780587-12	50	30	10	10	FET	800 kHz
	PXIe-2514	780587-14	28	19.8	40	40	FET	801 kHz
	PXIe-2515	780587-15	30	30	0.25	0.3	Reed	50 MHz

General-Purpose Switch Accessories

Accessory Type	Topology	Cables							
Description		160 Pin DIN to Bare Wire Cable for PXI Switches, 1 m	160 Pin DIN to 160 Pin DIN Cable for PXI Switches, 1 m	160 Pin DIN to 4 D-SUB Cable for PXI Switches, 1 m	160-Pin DIN to Bare Wire	37-Pin Female-to-Female DSUB Cable for PXI-2564 1 m	62-Pin Female-to-Female Shielded DSUB Cable for PXI-2568	Cable for PXI-2585 and PXI-2586 (GMCT20-GMCT20)	Cable for PXI-2585 and PXI-2586 (GMCT20-Bare Wire)
Part Number		782417-01	782417-02	782417-03	781090-03	779955-01	779956-01	781256-01	781257-01
PXI-2569	50x DPST 100x SPST	—	—	—	—	—	—	—	—
PXIe-2569	50x DPST 100x SPST	—	—	—	—	—	—	—	—
PXI-2571	66x SPDT	—	—	—	—	—	—	—	—
PXI-2520	80x SPST	✓	✓	✓	✓	—	—	—	—
PXI-2521	40x DPST	✓	✓	✓	✓	—	—	—	—
PXI-2522	40x SPDT	✓	✓	✓	✓	—	—	—	—
PXI-2523	26x DPDT	✓	✓	✓	✓	—	—	—	—
PXI-2564	8x DPST 16x SPST	—	—	—	—	✓	—	—	—
PXI-2566	8x DPDT 16x SPDT	—	—	—	—	—	—	—	—
PXI-2568	15x DPST 31x SPST	—	—	—	—	—	✓	—	—
PXI-2586	5x DPST 10x SPST	—	—	—	—	—	—	✓	✓

General-Purpose Switch Accessories (continued)

Accessory Type	Cables		Terminal Blocks			Customer Connectivity	
Description	LFH200 to 4x50-pin D-Sub, 1 m	LFH200 to 4x50-pin D-Sub, 2 m	NI TBX-50B, 50 Pin DSUB Screw Terminal Block	NI TBX-62 62-Pin DSUB Screw Terminal Block	TB-2666	Connector and Backshell for NI PCI-258x	Backshell and Connector Kit for PXI-2566
Part Number	779038-03	783139-02	782866-01	779957-01	778717-66	779168-01	779957-01
PXI-2569	✓	✓	—	—	✓	—	—
PXIe-2569	✓	✓	—	—	✓	—	—
PXI-2571	✓	✓	✓	—	—	—	—
PXI-2520	—	—	✓	—	—	—	—
PXI-2521	—	—	✓	—	—	—	—
PXI-2522	—	—	✓	—	—	—	—
PXI-2523	—	—	✓	—	—	—	—
PXI-2564	—	—	—	—	—	—	—
PXI-2566	—	—	—	—	✓	—	✓
PXI-2568	—	—	—	✓	—	—	—
PXI-2586	—	—	—	—	—	✓	—

Matrix Switches

Matrix Switch Accessories

Description	Topology	Cable for PXI-2510 (160-Pin DIN to 160-Pin DIN)	Cable for PXI-2510 (160-Pin DIN to Bare Wire)	160 Pin DIN to 4 D-SUB Cable for PXI Switches, 1 m	SHC68-68, 1 m	SHC68-68, 2 m	CB-68LP
Part Number		781090-02	781090-03	782417-03	191945-01	191945-02	777145-01
PXI-2529	4x32	—	—	—	—	—	—
	8x16	—	—	—	—	—	—
	4x16	—	—	—	—	—	—
PXIe-2529	4x32	—	—	—	—	—	—
	8x16	—	—	—	—	—	—
	4x16	—	—	—	—	—	—
PXI-2533	4x64	—	—	—	—	—	—
PXI-2534	8x32	—	—	—	—	—	—
PXIe-2737	4x64	✓	✓	✓	—	—	—
PXIe-2738	8x32	✓	✓	✓	—	—	—
PXIe-2739	16x16	✓	✓	✓	—	—	—
PXIe-2531	4x128	—	—	—	✓	✓	—
	4x64	—	—	—	✓	✓	—
	8x64	—	—	—	✓	✓	—
	8x32	—	—	—	✓	✓	—
PXIe-2532B	4x128	—	—	—	—	—	—
	8x64	—	—	—	—	—	—
	16x32	—	—	—	—	—	—
	4x64	—	—	—	—	—	—
	8x32	—	—	—	—	—	—
	16x16	—	—	—	—	—	—
	4x32	—	—	—	—	—	—
PXI-2535	4x135	—	—	—	✓	✓	✓
PXI-2536	8x68	—	—	—	✓	✓	✓

Matrix Switch Accessories (continued)

Description	2 X 68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 1 m	2 X 68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 2 m	2 X 68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 5 m	CB-68LPR	Screw Terminal Block Accessory for TB-264XB (60 VDC)	Matrix Expansion Cable for TB-264XB Terminal Blocks (60 VDC, 9 in.)	Row and Column Cable Kit for TB-264XB Terminal Blocks (60 VDC, 1.5 m)
Part Number	185262-01	185262-02	185262-05	777145-02	779341-01	779325-01	779346-01
PXI-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2533	✓	✓	✓	—	—	—	—
PXI-2534	✓	✓	✓	—	—	—	—
PXIe-2737	—	—	—	—	—	—	—
PXIe-2738	—	—	—	—	—	—	—
PXIe-2739	—	—	—	—	—	—	—
PXIe-2531	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2532B	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
	—	—	—	—	✓	✓	✓
PXI-2535	—	—	—	✓	—	—	—
PXI-2536	—	—	—	✓	—	—	—

Matrix Switch Accessories (continued)

Description	Terminal Block for NI 2531 as 4x128 Matrix	TB-2649 Terminal Block for NI 2531 as Dual 4x64 Matrix	TB-2650	TB-2651	TB-2640B Terminal Block for NI 2532B as 4x128 Matrix	TB-2640B Terminal Block for NI 2532B as 4x128 Matrix W/100 Ω	TB-2641B Terminal Block for NI 2532B as 8x64 Matrix
Part Number	781131-01	781131-02	781131-03	781131-04	782385-01	782385-02	782385-03
PXI-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2533	—	—	—	—	—	—	—
PXI-2534	—	—	—	—	—	—	—
PXIe-2737	—	—	—	—	—	—	—
PXIe-2738	—	—	—	—	—	—	—
PXIe-2739	—	—	—	—	—	—	—
PXIe-2531	✓	—	—	—	—	—	—
	—	✓	—	—	—	—	—
	—	—	✓	—	—	—	—
	—	—	—	✓	—	—	—
PXIe-2532B	—	—	—	—	✓	✓	—
	—	—	—	—	—	—	✓
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2535	—	—	—	—	—	—	—
PXI-2536	—	—	—	—	—	—	—

Matrix Switch Accessories (continued)

Description	TB-2641B Terminal Block for NI 2532B as 8x64 Matrix w/100 Ω	TB-2642B Terminal Block for NI 2532B as 16x32 Matrix	TB-2642B Terminal Block for NI 2532B as 16x32 Matrix w/100 Ω	TB-2643B Terminal Block for NI 2532B as 4x64 Matrix	TB-2643B Terminal Block for NI 2532B as 4x64 Matrix W/100 Ω	TB-2644B Terminal Block for NI 2532B as 8x32 Matrix	TB-2644B Terminal Block for NI 2532B as 8x32 Matrix W/100 Ω
Part Number	782385-04	782385-05	782385-06	782385-07	782385-08	782385-09	782385-10
PXI-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2533	—	—	—	—	—	—	—
PXI-2534	—	—	—	—	—	—	—
PXIe-2737	—	—	—	—	—	—	—
PXIe-2738	—	—	—	—	—	—	—
PXIe-2739	—	—	—	—	—	—	—
PXIe-2531	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2532B	—	—	—	—	—	—	—
	✓	—	—	—	—	—	—
	—	✓	✓	—	—	—	—
	—	—	—	✓	✓	—	—
	—	—	—	—	—	✓	✓
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2535	—	—	—	—	—	—	—
PXI-2536	—	—	—	—	—	—	—

Matrix Switch Accessories (continued)

Description	TB-2645B Terminal Block for NI 2532B as 16x16 Matrix	TB-2645B Terminal Block for NI 2532B as 16x16 Matrix W/100 Ω	TB-2646B Terminal Block for NI 2532B as 4x32 Matrix	TB-2646B Terminal Block for NI 2532B as 4x32 Matrix W/100 Ω	Matrix Expansion Cable for TB-264XB Terminal Blocks (100 VDC, 9 in.)	Row and Column Cable Kit for TB-264XB Terminal Blocks (100 VDC, 1.5 m)	TB-2633
Part Number	782385-11	782385-12	782385-13	782385-14	782426-01	782427-01	780270-01
PXI-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2529	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2533	—	—	—	—	—	—	✓
PXI-2534	—	—	—	—	—	—	—
PXIe-2737	—	—	—	—	—	—	—
PXIe-2738	—	—	—	—	—	—	—
PXIe-2739	—	—	—	—	—	—	—
PXIe-2531	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXIe-2532B	—	—	—	—	✓	✓	—
	—	—	—	—	✓	✓	—
	—	—	—	—	✓	✓	—
	—	—	—	—	✓	✓	—
	—	—	—	—	✓	✓	—
	✓	✓	—	—	✓	✓	—
	—	—	✓	✓	✓	✓	—
PXI-2535	—	—	—	—	—	—	—
PXI-2536	—	—	—	—	—	—	—

Matrix Switch Accessories (continued)

Description	SHC68-C68-S	TBX-50, 50 Pin DSUB Screw Terminal Block	TBX-50B	TB-2636 Terminal Block for PXI-2529 4x32 (2-Wire) Matrix	TB-2635, Terminal Block for PXI-2529 as 8x16 Matrix	TB-2634, Terminal Block for PXI-2529 as 4x32 Matrix	TBX-68 Connector Block
Part Number	186380-02	779305-01	782866-01	196762-01	778839-01	778840-01	777141-01
PXI-2529	—	—	—	✓	—	✓	—
	—	—	—	—	✓	—	—
	—	—	—	—	—	—	—
PXIe-2529	—	—	—	✓	—	✓	—
	—	—	—	—	✓	—	—
	—	—	—	—	—	—	—
PXI-2533	—	—	—	—	—	—	✓
PXI-2534	—	—	—	—	—	—	✓
PXIe-2737	—	✓	✓	—	—	—	—
PXIe-2738	—	✓	✓	—	—	—	—
PXIe-2739	—	✓	✓	—	—	—	—
PXIe-2531	—	—	—	—	—	—	✓
	—	—	—	—	—	—	✓
	—	—	—	—	—	—	✓
	—	—	—	—	—	—	✓
PXIe-2532B	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
	—	—	—	—	—	—	—
PXI-2535	✓	—	—	—	—	—	—
PXI-2536	—	✓	—	—	—	—	—

Multiplexer Switches

Multiplexer Switch Accessories

Description	Topology	TBX-50, 50 Pin DSUB Screw Terminal Block	160 Pin DIN to 4 D-SUB Cable for PXI Switches, 1 m	TBX-50B, 50 Pin DSUB Screw Terminal Block	Cable for PXI-2520 (160-Pin DIN to 160-Pin DIN)	160-Pin DIN to Bare Wire	LFH200 Connector to Bare Wire Switch Cable, 60 VDC, 2 m
Part Number		779305-01	782417-03	782866-01	781090-02	781090-03	779038-01
PXI-2503	6x1 12x1 24x1 48x1	—	—	—	—	—	—
PXI-2575	95x1 98x1 196x1	✓	—	✓	—	—	✓
PXI-2576	4x1 8x1 16x1 32x1 64x1	✓	—	✓	—	—	—
PXI-2584	6x1 12x1	—	—	—	—	—	—
PXI-2585	10x1	—	—	—	—	—	—
PXIe-2525	4x1 8x1 16x1 32x1 64x1	✓	✓	✓	✓	✓	—
PXIe-2527	16x1 32x1 64x1	—	—	—	—	—	—
PXI-2530B	16x1 32x1 64x1 128x1	✓	—	✓	—	—	—
PXIe-2524	8x1 16x1 32x1 64x1 128x1	✓	✓	✓	✓	✓	—
PXIe-2526	79x1 158x1	✓	✓	✓	✓	✓	—
PXIe-2575	95x1 98x1 196x1	✓	—	✓	—	—	✓

Multiplexer Switch Accessories (continued)

Description	LFH200 to 4x50-Pin DSUB Switch Cable (Ch-Com Twisted), 60 VDC, 1 m	TB-2605	2x68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 1 m	2x68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 2 m	2x68-Pos .050 Series D-Type Shielded, Type SH68-68-S, 5 m	TBX-68 Connector Block
Part Number	779038-02	777878-01	185262-01	185262-02	185262-05	777141-01
PXI-2503	—	✓	✓	✓	✓	✓
PXI-2575	✓	—	—	—	—	—
PXI-2576	—	—	—	—	—	—
PXI-2584	—	—	—	—	—	—
PXI-2585	—	—	—	—	—	—
PXIe-2525	—	—	—	—	—	—
PXIe-2527	—	—	—	—	—	—
PXI-2530B	—	—	—	—	—	—
PXIe-2524	—	—	—	—	—	—
PXIe-2526	—	—	—	—	—	—
PXIe-2575	✓	—	—	—	—	—

Multiplexer Switch Accessories (continued)

Description	TBX-68S	TB-2676 Terminal Block for PXI-2576	LFH160 to 50-Pin D-Sub	Connector and Backshell for PXI-2584	TB-2630B	LFH160 to 50-Pin D-Sub (2530B)	TB-2627
Part Number	777716-01	779535-01	780009-01	779168-02	781687-01	781692-01	779358-01
PXI-2503	✓	—	—	—	—	—	—
PXI-2575	—	—	—	—	—	—	—
PXI-2576	—	✓	✓	—	—	—	—
PXI-2584	—	—	—	✓	—	—	—
PXI-2585	—	—	—	—	—	—	—
PXIe-2525	—	—	—	—	—	—	—
PXIe-2527	—	—	—	—	—	—	✓
PXI-2530B	—	—	—	—	✓	✓	—
PXIe-2524	—	—	—	—	—	—	—
PXIe-2526	—	—	—	—	—	—	—
PXIe-2575	—	—	—	—	—	—	—

RF Switches

RF Switch Accessories

Description	Topology	MCX Plug to MCX Plug, 0.15 m	MCX Plug to BNC Plug, 1 m	MCX Plug to BNC Plug, 0.3 m	MCX Male to SMB Female Cable, 50 Ω, 30 cm	MCX Male to SMB Female Cable, 50 Ω, 1 m
Part Number		188374-0R15	188375-01	188375-0R3	188376-0R3	188376-01
PXI-2599	2x SPDT	—	—	—	—	—
PXI-2545	4x1	—	—	—	—	—
PXI-2546	4x1	—	—	—	—	—
PXI-2547	8x1	—	—	—	—	—
PXI-2594	4x1	—	—	—	—	—
PXI-2596	6x1	—	—	—	—	—
PXI-2597	6x1	—	—	—	—	—
PXI-2796	6x1	—	—	—	—	—
PXI-2797	6x1	—	—	—	—	—
PXIe-2542	2x16	—	—	—	—	—
PXIe-2543	4x1	—	—	—	—	—
PXIe-2544	8x1	—	—	—	—	—
PXIe-2593	4x1 8x1 16x1	✓	✓	✓	✓	✓
PXIe-2746	4x1	✓	✓	✓	✓	✓
PXIe-2747	8x1	✓	✓	✓	✓	✓
PXIe-2748	16x1	✓	✓	✓	✓	✓
PXIe-2540	8x9	✓	✓	✓	✓	✓
PXIe-2541	8x9	✓	✓	✓	✓	✓
PXI-2598	2x Transfer	—	—	—	—	—
PXI-2798	4x Transfer	—	—	—	—	—

RF Switch Accessories (continued)

Description	MCX Male to SMA Male Cable, 50 Ω, 1 m	MCX Male to MCX Male Cable, 50 Ω, 1 m	MCX Male to MCX Male Cable, 50 Ω, 30 cm	MCX Male to SMA Male Cable, 50 Ω, 30 cm	MCX Male to BNC Male Cable, 50 Ω, 1 m	MCX Male to BNC Male Cable, 50 Ω, 30 cm
Part Number	188377-01	188374-01	188374-0R3	188377-0R3	188375-01	188375-0R3
PXI-2599	—	—	—	—	—	—
PXI-2545	—	—	—	✓	✓	—
PXI-2546	—	—	—	✓	✓	—
PXI-2547	—	—	—	—	—	—
PXI-2594	—	—	—	—	—	—
PXI-2596	—	—	—	—	—	—
PXI-2597	—	—	—	—	—	—
PXI-2796	—	—	—	—	—	—
PXI-2797	—	—	—	—	—	—
PXIe-2542	—	—	—	—	—	—
PXIe-2543	—	—	—	—	—	—
PXIe-2544	—	—	—	—	—	—
PXIe-2593	✓	✓	✓	✓	✓	✓
PXIe-2746	✓	✓	✓	✓	✓	✓
PXIe-2747	✓	✓	✓	✓	✓	✓
PXIe-2748	✓	✓	✓	✓	✓	✓
PXIe-2540	✓	✓	✓	✓	✓	✓
PXIe-2541	✓	✓	✓	✓	✓	✓
PXI-2598	—	—	—	—	—	—
PXI-2798	—	—	—	—	—	—

RF Switch Accessories (continued)

Description	MCX Male to MCX Male Cable, 50 Ω, 15 cm	SMA Male to SMA Male Cable, 50 Ω, 38.1 cm	SMA Male to SMA Male Cable, 50 Ω, 12.7 cm	SMA Male to SMA Male Cable for USRP, 50 Ω, 2 m	SMA Male to SMA Male Cable, 50 Ω, 30 cm
Part Number	188374-0R15	763444-01	763443-01	783470-01	781846-01
PXI-2599	—	✓	✓	✓	✓
PXI-2545	—	—	—	—	—
PXI-2546	—	—	—	—	—
PXI-2547	—	✓	✓	✓	✓
PXI-2594	—	✓	✓	✓	✓
PXI-2596	—	✓	✓	✓	✓
PXI-2597	—	✓	✓	✓	✓
PXI-2796	—	✓	✓	✓	✓
PXI-2797	—	✓	✓	✓	✓
PXIe-2542	—	✓	✓	✓	✓
PXIe-2543	—	✓	✓	✓	✓
PXIe-2544	—	✓	✓	✓	✓
PXIe-2593	✓	—	—	—	—
PXIe-2746	✓	—	—	—	—
PXIe-2747	✓	—	—	—	—
PXIe-2748	✓	—	—	—	—
PXIe-2540	✓	—	—	—	—
PXIe-2541	✓	—	—	—	—
PXI-2598	—	✓	✓	✓	✓
PXI-2798	—	✓	✓	✓	✓

SwitchBlock

SwitchBlock Accessories

	Topology	Cables					Terminal Blocks	
Description		SH96F-96M Cable for NI SwitchBlock, 1 m	SH96F-96M Cable for NI SwitchBlock, 0.5 m	SH96F-96M Cable for NI SwitchBlock, 1.5 m	SH96F-96M-Res Cable for NI SwitchBlock (100 Ω Protection), 1 m	SH160F-160M	TBX-2808	96-Pin Screw Terminal Accessory for NI SwitchBlock
Part Number		150275-01	150275-0R5	150275-1R5	150579-01	153028-01	781420-08	781420-09
SWB-2834	8x34	—	—	—	—	✓	✓	—
SWB-2833	4x71	—	—	—	—	✓	✓	—
SWB-2816	4x86	✓	✓	✓	✓	—	—	✓
SWB-2815	4x86	✓	✓	✓	✓	—	—	✓
SWB-2810	4x43	✓	✓	✓	✓	—	—	✓

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Source Measure Units

- Achieve up to 24 SMU channels per slot—scaling to 408 channels per chassis
- Up to 200 V and 3 A (10 A pulse)
- Current sensitivity down to 10 fA
- Max power per channel of 40 W (500 W pulse)

Key Features:

Unmatched Channel Density

Reduce test time, increase throughput, and meet today's manufacturing requirements by reducing a full rack to a few inches of physical space with up to 408 SMU channels in a single PXI chassis.

Built-In IV Sweep

Reconfigure and repurpose the same SMUs across test cases with configuration-based IV sweeps in InstrumentStudio software and a path to more advanced customization in programming environments.

High-Power Pulsing

Operate beyond the basic DC power boundary of PXI SMUs by pulsing current or voltage instead of supplying a constant DC source, allowing you to test at high instantaneous power with limited or no heat sink infrastructure.

PXI Source Measure Unit Modules

Selection Guide	Model	Part Number	Channel Count	Max Voltage	Max Current	Current Sensitivity	Max Source Power	Max Sink Power	Pulsing	Max Sample Rate	SourceAdapt
1-Channel Precision SMU, 20 W	PXIe-4135	783762-01	1	200 V	1 A	10 fA	20 W	12 W	✓	1.8 MS/s	✓
1-Channel Precision SMU, 40 W	PXIe-4135	783762-02	1	200 V	1 A	10 fA	40 W	40 W	✓	1.8 MS/s	✓
1-Channel Lower-Cost SMU, 20 W	PXIe-4136	783760-01	1	200 V	1 A	1 pA	20 W	12 W	—	1.8 MS/s	—
1-Channel Precision SMU, 20 W	PXIe-4137	783761-01	1	200 V	1 A	100 fA	20 W	12 W	✓	1.8 MS/s	✓
1-Channel Precision SMU, 40 W	PXIe-4137	783761-02	1	200 V	1 A	100 fA	40 W	40 W	✓	1.8 MS/s	✓
1-Channel Lower-Cost SMU, 20 W	PXIe-4138	782856-01	1	60 V	3 A	1 pA	20 W	12 W	—	1.8 MS/s	—
1-Channel Precision SMU, 20 W	PXIe-4139	782856-02	1	60 V	3 A	100 fA	20 W	12 W	✓	1.8 MS/s	✓
1-Channel Precision SMU, 40 W	PXIe-4139	782856-03	1	60 V	3 A	100 fA	40 W	40 W	✓	1.8 MS/s	✓
4-Channel Lower-Cost SMU	PXIe-4142	782430-01	4	24 V	150 mA	100 pA	3.6 W	3.6 W	—	600 kS/s	—
4-Channel Precision SMU	PXIe-4143	782431-01	4	24 V	150 mA	10 pA	3.6 W	3.6 W	—	600 kS/s	✓
4-Channel Lower-Cost SMU	PXIe-4144	782432-01	4	6 V	500 mA	150 pA	3 W	3 W	—	600 kS/s	—
4-Channel Precision SMU	PXIe-4145	782435-01	4	6 V	500 mA	15 pA	3 W	3 W	—	600 kS/s	✓
4-Channel Precision SMU	PXIe-4147	786888-01	4	8 V	3 A	100 fA	24 W	24 W	—	1.8 MS/s	✓
12-Channel High-Density SMU	PXIe-4162	785680-01	12	24 V	100 mA	100 pA	2.4 W	1.2 W	—	100 kS/s	✓
12-Channel High-Density Precision SMU	PXIe-4162	785680-02	12	24 V	100 mA	10 pA	2.4 W	1.2 W	—	100 kS/s	✓
24-Channel High-Density SMU	PXIe-4163	784483-01	24	24 V	50 mA	100 pA	1.2 W	0.6 W	—	100 kS/s	✓
24-Channel High-Density Precision SMU	PXIe-4163	784483-02	24	24 V	50 mA	10 pA	1.2 W	0.6 W	—	100 kS/s	✓
1-Channel 500 kHz Lower-Cost LCR Meter and SMU	PXIe-4190	788101-01	1	10 V	100 mA	1 pA	1 W	1 W	—	600 kS/s	✓
1-Channel 2 MHz LCR Meter and SMU	PXIe-4190	788088-01	1	40 V	100 mA	1 fA	4 W	4 W	—	600 kS/s	✓

PXI Source Measure Unit Accessories

Cables

Cables	TriaxM-TriaxM Low-Noise Triaxial-to-Triaxial Cable			Safety Interlock Cable PXIe-4135/6/7		SH8M-7F-LL Low-Leakage Cable	
Length	1 m	3 m	5 m	8 in.	48 in.	1 m	2 m
Part Number	785659-01	785659-03	788746-05	142998-08	142998-48	130123-01	130123-02
PXIe-4135	✓	✓	✓	✓	✓	—	—
PXIe-4136	—	—	—	✓	✓	✓	✓
PXIe-4137	—	—	—	✓	✓	✓	✓
PXIe-4138	—	—	—	—	—	✓	✓
PXIe-4139	—	—	—	—	—	✓	✓
PXIe-4142	—	—	—	—	—	—	—
PXIe-4143	—	—	—	—	—	—	—
PXIe-4144	—	—	—	—	—	—	—
PXIe-4145	—	—	—	—	—	—	—
PXIe-4147	—	—	—	—	—	—	—
PXIe-4162	—	—	—	—	—	—	—
PXIe-4163	—	—	—	—	—	—	—

Cables (continued)

Cables	SHDB25F-DB25F Low-Leakage 25-Pin D-SUB Cable		SHDB62M-DB62M-LL Low-Leakage 62-Pin D-SUB Cable		SHDB62M-BW-LL Low-Leakage 62-Pin D-SUB to Bare Wire Cable	
Length	1 m	2 m	1 m	2 m	1 m	2 m
Part Number	132893-01	132893-02	142947-01	142947-02	142948-01	142948-02
PXIe-4135	—	—	—	—	—	—
PXIe-4136	—	—	—	—	—	—
PXIe-4137	—	—	—	—	—	—
PXIe-4138	—	—	—	—	—	—
PXIe-4139	—	—	—	—	—	—
PXIe-4142	✓	✓	—	—	—	—
PXIe-4143	✓	✓	—	—	—	—
PXIe-4144	✓	✓	—	—	—	—
PXIe-4145	✓	✓	—	—	—	—
PXIe-4147	✓	✓	—	—	—	—
PXIe-4162	—	—	✓	✓	✓	✓
PXIe-4163	—	—	✓	✓	✓	✓

Screw Terminal Connectors and Adapters

Screw Terminal Connectors and Adapters	SA-413B Banana Jack Adapter for PXIe-4136/7/8/9	SA-413T Triaxial Adapter for PXIe-4138/9	Additional or Replacement Connector Kit*				
Part Number	786818-01	784000-01	784484-01	784068-01	787611-01	786984-01	786985-01
PXIe-4135	—	—	✓	—	—	—	—
PXIe-4136	✓	—	—	✓	—	—	—
PXIe-4137	✓	—	—	✓	—	—	—
PXIe-4138	✓	✓	—	✓	—	—	—
PXIe-4139	✓	✓	—	✓	—	—	—
PXIe-4142	—	—	—	—	✓	—	—
PXIe-4143	—	—	—	—	✓	—	—
PXIe-4144	—	—	—	—	✓	—	—
PXIe-4145	—	—	—	—	✓	—	—
PXIe-4147	—	—	—	—	✓	—	—
PXIe-4162	—	—	—	—	—	✓	—
PXIe-4163	—	—	—	—	—	—	✓

*Replacement/extra

Protection Accessories

Protection Accessories	Open-Sense Protection Accessory without Detection		Current and Open-Sense Protection Accessory with Detection**		Open-Sense Protection Accessory with Detection	
Part Number	787719-01	787720-01	788403-01	788404-01	787719-02	787720-02
PXIe-4162	✓	—	✓	—	✓	—
PXIe-4163	—	✓	—	✓	—	✓

**Replacement/extra

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI LCR Meters and SMUs

- AC stimulus frequency up to 2 MHz
- AC stimulus amplitude up to 7.07 V_{rms}
- DC bias up to ± 40 V
- Basic impedance accuracy of 0.05 percent

Key Features:

High-Precision, High-Accuracy Measurements

NI LCR meters are built with a combination of off-the-shelf high-speed and high-precision data converter technology to provide low noise measurements across a wide range of LCR meter stimulus frequencies and SMU measurement speeds.

High-Speed Measurement and Update Rate

The NI PXIe-4190 provides flexible measurement time settings, including preset options (100 ms for slow, 10 ms for normal, and 1 ms for fast) and the ability to choose custom values outside of these three preset values.

SourceAdapt Digital Control Loop Technology

SourceAdapt is a digital control loop technology that gives you the ability to optimize the SMU response for any device under test (DUT). This provides fast and stable measurements for a variety of loads, even highly capacitive or inductive ones, and prevents damage to your DUT by removing harmful overshoots and oscillations.

PXI LCR Meter and SMU Modules

Selection Guide	Model	Part Number	Channel Count	Min AC Stimulus Frequency	Max AC Stimulus Frequency	Max AC Stimulus Voltage	Max AC Stimulus Current	Max DC Bias Voltage (DC + AC)	Max DC Bias Current (DC + AC)
1-Channel 500 kHz Lower-Cost LCR Meter and SMU	PXIe-4190	788101-01	1	40 Hz	500 kHz	7.07 V_{rms}	70.7 mA_{rms}	10 V	100 mA
1-Channel 2 MHz LCR Meter and SMU	PXIe-4190	788088-01			2 MHz			40 V	

PXI LCR Meter and SMU Accessories

Cable	SHDB13W6-4BNCM-LL Low-Leakage D-SUB to Male BNC Cable			SHDB13W6-4BNCF-LL Low-Leakage D-SUB to Female BNC Cable			SHDB13W6-4TriaxM-LL Low-Leakage D-SUB to Male Triax Cable			SHDB13W6-DB13W6-LL Low-Leakage D-SUB to D-SUB Cable		
Length	1 m	2 m	4 m	0.5 m	1 m	2 m	1 m	2 m	4 m	1 m	2 m	4 m
Part Number	788280-01	788280-02	788280-04	789536-0R5	789536-01	789536-02	788281-01	788281-02	788281-04	788279-01	788279-02	788279-04
PXIe-4190	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Included software:

Digital Pattern Editor™

NI InstrumentStudio™
(requires the Semiconductor Add-On)

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Semiconductor Device Control Add-On for NI InstrumentStudio

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Digital Pattern Instruments

- 32-channel module (up to 512 per chassis)
- 100 MHz vector rate, 39 ps edge placement
- Digital voltage of -2 V to 6 V
- Up to 200 Mb/s data rate

Key Features:

Dedicated Digital Pattern Editor

The Digital Pattern Editor is an interactive tool for importing, editing, or creating test patterns. The software integrates editing sheets for device pin maps, specifications, and patterns to develop or edit imported digital test vectors and patterns.

Debug Digital Test Patterns

The Digital Pattern Editor includes tools such as Shmoo plots to provide a deeper understanding of DUT performance across variation. The editor also offers debugging tools such as History RAM or using Digital Scope for an analog view of the pin data.

Programmatic Pattern Bursting

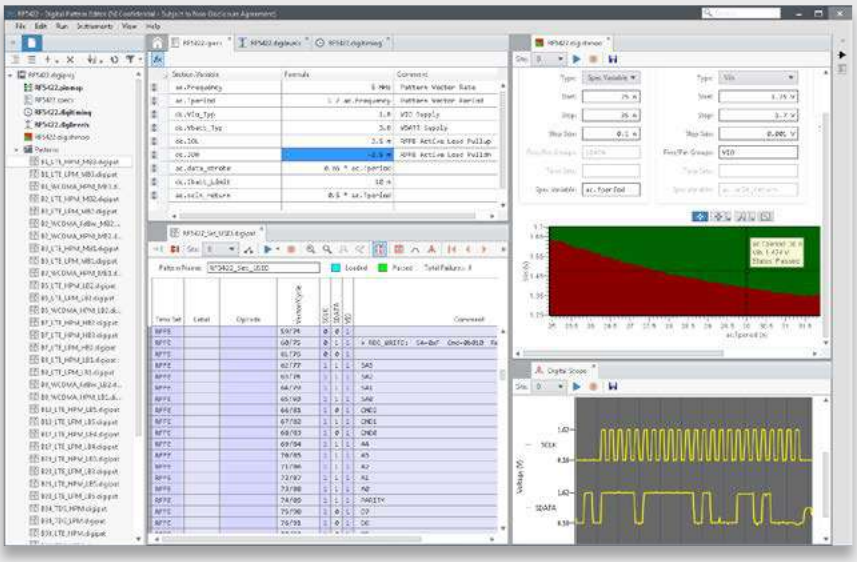
The NI-Digital Pattern Driver in LabVIEW, C, Python, or .NET offers the ability to develop test code to interact with PXI Digital Pattern Instruments.

PXI Digital Pattern Instrument Modules

Selection Guide	Model	Part Number	Supported Chassis	Active Load	Channels	Maximum Vector Rate	Maximum Data Rate	Maximum Clock Generation	Pattern Timing	Drive Formats	Timing Specifications
Higher Channel Count, Higher Active Load	PXIe-6570	785283-01	PXIe-6570 >= 38W	24 mA	32 per Module	100 MHz (10 ns Minimum Vector Period)	200 Mb/s	160 MHz*	31 Time Sets 39.0625 ps Edge-Placement Resolution	Nonreturn (NR), Return to Low (RL), Return to High (RH) (100 MHz max), Surround by Complement (SBC) (50 MHz max)	Warranted
Higher Channel Count	PXIe-6571	786320-01	PXIe-6571 32 ch = 82W	16 mA	32 per Module						Warranted
General Purpose	PXIe-6571	786320-02	PXIe-6571 8-ch >= 58W	16 mA	8 per Module						Typical

*Clock rates >133 MHz will have a non-50% duty cycle.

See **PXI Digital Waveform and Pattern Instrument Accessories



NI Digital Pattern Editor Application Software

The Digital Pattern Editor is an interactive tool for importing, editing, or creating test patterns. All the sheets developed in the Digital Pattern Editor can be reused by the API in LabVIEW, C, Python, or .NET languages, as well as in the TestStand Semiconductor Module.

Pattern Development and Format

A pattern file is a collection of vectors, with each vector containing time sets, labels, opcodes, pin states, and comments. The Digital Pattern Editor has development sheets for all of these items, as well as debug tools for refining patterns, time sets, and specifications. A compiled, binary format (.digipat) of the pattern file is required to edit or burst. Engineers can compile an ASCII text pattern file format (.digipatsrc) into a binary version using the Digital Pattern Editor or a command line compiler. The .digipatsrc format can be manipulated programmatically using the predefined schema. Design simulation and SCAN files generated by EDA tools can be cyclized and targeted to the NI format using existing customer in-house EDA workflows or third-party cyclizing tools.

Recommended software (sold separately):

NI LabVIEW

NI TestStand

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Digital Waveform Instruments

- Standard TTL/CMOS interface voltages and programmable voltage levels
- 32 bidirectional digital channels
- Advanced waveform sequencing and streaming features
- Up to 200 Mb/s SDR and 400 Mb/s DDR

Key Features:

Synchronization and Memory Core (SMC)

The synchronization and memory core architecture is designed to enhance testing efficiency through deep onboard memory, flexible data transfer cores, and precise timing synchronization.

Dedicated Digital Waveform Editor

The Digital Waveform Editor is a software tool that facilitates creating, editing, and importing digital waveforms for customized interfacing and test conditions. The editor also supports the design of digital vectors with six drive and compare states.

Driver and API Support

The NI-HSDIO driver includes a flexible API based on IVI guidelines, complete documentation of supported hardware, and configuration and testing utilities to communicate with PXI digital waveform instruments.

PXI Digital Waveform Instrument Modules

Selection Guide	Model	Part Number	Number of Bidirectional Digital Channels	Logic Family	Maximum Sample Clock	Maximum Generation Rate	Maximum Acquisition Rate	Onboard Memory	Hardware Compare
Starter Module	PXIe-6544	780992-01	32	1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V	100 MHz	100 Mb/s SDR	100 Mb/s SDR	1 Mb/ch (4 MB total)	—
		780992-02						8 Mb/ch (32 MB total)	
		780992-03						64 Mb/ch (256 MB total)	
Higher Clock Rate	PXIe-6545	780993-01	32	1.2 V, 1.5 V, 1.8 V, 2.5 V, 3.3 V	200 MHz	200 Mb/s SDR	200 Mb/s SDR	1 Mb/ch (4 MB total)	—
		780993-02						8 Mb/ch (32 MB total)	
		780993-03						64 Mb/ch (256 MB total)	
Programmable Voltage Levels	PXIe-6547	781011-01	32	1.2 V–3.3 V Program-mable	100 MHz	100 Mb/s SDR (200 Mb/s DDR)	100 Mb/s SDR (200 Mb/s DDR)	1 Mb/ch (4 MB total)	✓
		781011-02						8 Mb/ch (32 MB total)	
		781011-03						64 Mb/ch (256 MB total)	
Higher Clock Rate + Programmable Voltage Levels	PXIe-6548	781012-01	32	1.2 V–3.3 V Program-mable	200 MHz	200 Mb/s SDR (400 Mb/s DDR)*	200 Mb/s SDR (300 Mb/s DDR)*	1 Mb/ch (4 MB total)	✓
		781012-02						8 Mb/ch (32 MB total)	
		781012-03						64 Mb/ch (256 MB total)	

*Maximum DDR data rate is dependent on logic family or programmed voltage level. See specs for mapping of voltage levels to data rates.

PXI Digital Waveform and Pattern Instrument Accessories

Digital Cables

Digital Cables	SHC68-C68-D4 Shielded Single-Ended Cable, 0.55 m	SHC68-C68-D4 Shielded Single-Ended Cable, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, 2 m	SHC68-C68-D4 Shielded Single-Ended Cable, Low Leakage, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, Lower DC Resistance, 3 m	C68-C68-D4 Unshielded Cable, 2X68-Position VHDCI Offset, 1 m	SHC68-H1X38 High-Speed Digital Flying-Leads Cable Accessory, 1.5 m
Part Number	781013-01	196275-01	781293-01	152870-01	132625-03	195949-01	192681-1R5
Shielding	Shielded	Shielded	Shielded	Shielded	Shielded	Unshielded	Shielded
PXIe-6570	✓	✓	✓	✓	✓	✓	✓
PXIe-6571	✓	✓	✓	✓	✓	✓	✓
PXIe-6544	✓	✓	✓	✓	✓	✓	✓
PXIe-6545	✓	✓	✓	✓	✓	✓	✓
PXIe-6547	✓	✓	✓	✓	✓	✓	✓
PXIe-6548	✓	✓	✓	✓	✓	✓	✓

Breakout Terminal Blocks, Boxes, and Adapters

Breakout Terminal Blocks, Boxes, and Adapters	SCB-68 HSDIO, Shielded 68-Pin Connector Block for R Series DIO and HSDIO Products	CB-2162 Single-Ended Digital I/O Accessory	SMB-2163 Single-Ended Digital I/O Accessory (Rack-Mountable)	653x Cable Adapter, 68-Pin D-Type to 68-Pin VHDCI Adapter	SCB-68A Noise-Rejecting, Shielded I/O Connector Block	CB-68LP Low-Cost, Unshielded I/O Connector Block	CB-68LPR I/O Connector Block	TBX-68, 68-Pin Screw Terminal Connector Block
Part Number	782914-01	778592-01	778747-01	195846-01	782536-01	777145-01	777145-02	777141-01
Receptacle	68-Pin 0.8 mm VHDCI	68-Pin 0.8 mm VHDCI	68-Pin 0.8 mm VHDCI	68-Pin SCSI 0.050 D-Type Female	68-Pin SCSI 0.050 D-Type Male	68-Pin SCSI 0.050 D-Type Male	68-Pin SCSI 0.050 D-Type Male	68-Pin SCSI 0.050 D-Type Female
Output Connections	Screw Terminal	Through-Hold and Surface-Mount Solder Pads	SMB	68-Pin 0.8 mm VHDCI	Screw Terminal	Screw Terminal	Screw Terminal	Screw Terminal
Shielding	Shielded	Unshielded	Shielded	N/A	Shielded	Unshielded	Unshielded	Unshielded
PXIe-6570	✓	✓	✓	—	—	—	—	—
PXIe-6571	✓	✓	✓	—	—	—	—	—
PXIe-6544	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-6545	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-6547	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-6548	✓	✓	✓	✓	✓	✓	✓	✓

Included software:

NI InstrumentStudio™

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI Electronic Loads

- Ability to sink up to 300 W of DC power
- Voltage and current measurements with sample rates up to 1.8 MS/s and update rates up to 100 kS/s
- Hardware timing and triggering
- 4-wire remote sense

Key Features:

Acquire Data at High Speed

You can sink up to 300 W of power into the PXI electronic load module to test a range of electronic devices, all while gathering voltage and current measurements at rates up to 1.8 MS/s. The first PXI electronic load module in the industry also features high-speed data converters that offer update rates up to 100 kS/s.

Improve Accuracy with Selectable Ranges

When measuring voltage or current with the PXI electronic load module, you have multiple measurement ranges to choose from. You can enhance the accuracy of your measurement by selecting the most suitable range for the magnitude of the measurement, optimizing the ADC range.

Tune the Transient Response

You can maximize stability, reduce overshoot, and decrease test times by digitally controlling the transient response of the PXI electronic load module. NI SourceAdapt, a patented technology on the PXI electronic load module, power supplies, and source measure units (SMUs), eliminates custom circuitry.

PXI Electronic Load Modules

Selection Guide	Model	Part Number	PXI Slots	Maximum Voltage (V)	Maximum Current (A)	Maximum Power Per Channel (W)	Maximum Voltage Measurement Resolution	Maximum Current Measurement Resolution	SourceAdapt
1-Channel, 60 V, 40 A PXI Electronic Load Module	PXIe-4051	788179-01	3	60	40*	300	1 µV	10 µA	✓

*Requires an 82 W PXI chassis to achieve maximum power of 300 W

PXI Electronic Load Accessories

Connectors and Connector Kits

Connectors and Connector Kits	Connector Kit for PXIe-4150/1 Power Supplies and PXIe-4051 Electronic Load
Part Number	788197-01
PXIe-4051	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Real-Time Module
- LabVIEW FPGA Module
- NI TestStand

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

PXI High-Speed Serial

- Up to 48 Xilinx multigigabit transceivers (MGTs) with line rates up to 28.2 Gb/s
- Various high-speed serial protocols on the user-programmable Xilinx Kintex UltraScale + or 7 series FPGAs
- High-speed P2P backplane data streaming up to 7 GB/s to host, disk, or other PXI Express modules
- Up to 20 GB onboard DDR3 DRAM

Key Features:

Protocol Flexibility

PXI high-speed serial instruments leverage Xilinx FPGAs and flexible clocking circuitry to implement a variety of both standard and custom high-speed serial protocols.

Data Streaming

High-speed serial instruments benefit from PXI high-speed data movement capabilities. The modules have a PCI Express Gen 3 x8 interface for sustained data streaming rates of 7 GB/s unidirectional and 2.4 GB/s bidirectional to or from a host processor or other instruments that support P2P streaming.

Flexible Software Experience

PXI high-speed serial instruments support programming with either NI LabVIEW FPGA or VHDL via Xilinx Vivado.

PXI High-Speed Serial Modules

Selection Guide	Model	Part Number	HSS Physical Ports	Multi-Gigabit Transceivers (MGTs)	Max Line Rate (Gb/s)	Max Throughput (GB/s)	FPGA Family	High-Speed Serial Connector	PXI Express Slots
Lowest Cost	PXIe-6592	783639-01	4	4	10	5	Kintex-7 K410	SFP+	1
Low Cost	PXIe-6591	783638-01	2	8	12.5	13	Kintex-7 K410	MiniSAS-HD	1
	PXIe-6593	785976-01	2	8	16.3	16	UltraScale KU040	QSFP28	1
		785977-01					UltraScale KU060		
High Throughput, Large FPGA	PXIe-6594	786939-01	2	8	28.2	28	UltraScale+ KU15R	QSFP28	1
High Throughput	PXIe-7902	784232-01	6	24	12.5	38	Virtex-7	MiniSAS-HD	1
Highest Throughput, Largest FPGA	PXIe-7903	788917-01	12	48	28.2	169	UltraScale+ VU11P	MiniSAS-zHD	2

PXI High-Speed Serial Accessories

Cables

Cable	MINI-SAS HD Cable x4 Lanes, 1 m	MINI-SAS HD Cable x4 Lanes, 3 m	MINI-SAS HD Optical Cable x4 Lanes, 10 m	SMA-SMA Cable, 1 m	SMB-SMB Cable, 1 m	QSFP28-QSFP28 Cable, 1 m	QSFP28-QSFP28 Cable, 2 m	QSFP28-QSFP28 Active Optical Cable, 10 m
Part Number	783976-01	783977-01	783978-01	783469-01	188859-01	788256-01	788256-02	788257-10
PXIe-6591	✓	✓	—	✓	—	—	—	—
PXIe-6592	—	—	—	—	✓	—	—	—
PXIe-6593	—	—	—	✓	—	✓	✓	✓
PXIe-6594	—	—	—	✓	—	✓	✓	✓
PXIe-7902	✓	✓	✓	✓	—	—	—	—
PXIe-7903	—	—	—	✓	—	—	—	—

Cables (continued)

Cable	zHD to QSFP28 Cable, 2 m	zHD to zHD Cable, 1 m	zHD to zHD Cable, 2 m	zHD to zHD Cable, 0.5 m	SHC68-C68-D4 Single-Ended Cable, 1 m	SFP+ Copper Cable, 1 m	Nano-Pitch-Nano-Pitch Cable, 1 m	mHDMI to mHDMI, 1 m
Part Number	788928-02	788927-01	788927-02	788927-0R5	152870-01	784076-01	785486-01	784091-01
PXIe-6591	—	—	—	—	✓	—	—	—
PXIe-6592	—	—	—	—	—	✓	—	—
PXIe-6593	—	—	—	—	—	—	✓	—
PXIe-6594	—	—	—	—	—	—	✓	—
PXIe-7902	—	—	—	—	—	—	—	—
PXIe-7903	✓	✓	✓	✓	—	—	—	✓

Connector Blocks

Connector Block	CB-2162 Digital Connector Block	SCB-12 Nano-Pitch Connector Block	SCB-19 mHDMI Connector Block
Part Number	778592-01	787419-01	783959-01
PXIe-6591	✓	—	—
PXIe-6592	—	—	—
PXIe-6593	—	✓	—
PXIe-6594	—	✓	—
PXIe-7902	—	—	—
PXIe-7903	—	—	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Real-Time Module
- NI TestStand

Driver support for:

C/C++

- LabWindows/CVI

PXI Timing and Synchronization

- Generate high-stability PXI system reference clocks and high-resolution sample clocks
- Achieve synchronization over long distance through GPS, IEEE 1588, IRIG-B, or PPS
- Develop advanced timing and sync applications with NI-Sync and NI-TClk software
- Import and export system reference clocks for synchronization between multiple chassis or external devices

Key Features:

High-Stability, High-Accuracy Onboard Clock

Replace this backplane system reference clock using a higher accuracy oscillator for high-performance applications.

Time-Base Synchronization

Generate triggers and clock signals at programmable future times, and timestamp input events with the synchronized system time.

Advanced Clock and Trigger Routing

Timing and synchronization modules provide many more source-to-destination routes for more flexible designs and efficient use of system resources.

PXI Timing and Synchronization Modules

Selection Guide	Model	Part Number	Connector Types	Supported Timing Protocols	Onboard Oscillator Accuracy	DDS Range	Override PXI 10 MHz Backplane Clock	PXI Star-Capable	PXI Express DSTAR-Capable
Ethernet and GPS Time Sync	PXI-6683H	782110-01 782110-02	RJ-45, SMB	IEEE-1588, GPS, IRIG-B, IEEE-802.1as (Linux only), PPS	+/-3.5 ppm	—	—	—	—
Clock and Trigger Routing and Generation	PXIe-6672	783639-01	SMB	—	+/-3.5 ppm	DC to 105 MHz	✓	✓	—
High-Performance Clock and Trigger Routing and Generation	PXIe-6674T	785976-01	SMA	—	+/-80 ppb	0.3 Hz to 1 GHz	✓	✓	✓

PXI Timing and Synchronization Accessories

Cables and Terminal Blocks

Description	Ethernet Cable, 2 m	Ethernet Cable, 5 m	GPS Antenna, Bullet III	SMB-SMB Cable, 1 m	SMB-Alligator Cable	SMA-SMA Cable, 1 m
Part Number	151733-02	151733-05	196304-30	188859-01	763388-01	783469-01
PXI-6683H	✓	✓	✓	✓	✓	—
PXIe-6672	—	—	—	✓	✓	—
PXIe-6674T	—	—	—	—	—	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Sound and Vibration Toolkit
- NI TestStand

Driver support for:

C/C++, C#, Python,

- LabWindows/CVI
- NI FlexLogger

PXI Sound and Vibration Modules

- Dynamic sensor measurements at 51.2 kS/s, 102.4 kS/s, 204.8 kS/s, or 1.25 MS/s
- Built-in highpass filtering
- Reliable dynamic signal characterization
- Per-channel, software-selectable AC input coupling
- Per-channel, software-selectable input gain settings

Key Features:

Perform Signal-Chain Distortion Analysis

The PXIe-4468 sound and vibration module supports benchtop-quality signal-chain distortion analysis in a single-slot PXI Express form factor. Additional new features include Pure Tone sine wave generation mode for more test coverage as well as support for independent operation and synchronization of each channel for improved utilization in test systems.

Generate and Acquire High-Dynamic-Range Signals

NI's PXI Sound and Vibration Module is a dynamic signal acquisition (DSA) device that can accurately measure the frequency content of signals with a very high dynamic range. Modules provide software-configurable AC/DC coupling, antialiasing filters, and IEPE conditioning to ensure precision measurements with microphones, accelerometers, and other transducers with large dynamic ranges.

Add Accelerometer Measurements to Your System

PXI Sound and Vibration Modules and the accompanying NI software make it fast to connect microphones and accelerometers for vibration test and measurement. NI-DAQmx supports NI programming environments as well as Python, ANSI C, C#.NET, and MathWorks® MATLAB® software.

PXI Sound and Vibration Modules

Selection Guide	Model	Part Number	DSA Dynamic Range	Highpass Filter Cutoff Frequency	Max Differential Analog	Max Sample Rate	Analog Output Channels	Gain Settings	Front Connection Type
A/O Only	PXIe-4463	783086-01	—	3.4 Hz	—	51.2 kS/s	2	3	BNC
		783086-02							Mini-XLR
A/I Only	PXIe-4464	783087-01	119 dB	0.72 Hz	4	204.8 kS/s	—	6	BNC
		783087-02							Mini-XLR
2 A/I, 2 A/O	PXIe-4468	788511-01	121 dB	0.8 Hz	2	250 kS/s	2	6	BNC
		788512-01							Mini-XLR
High Bandwidth with Signal Conditioning	PXIe-4480*	784277-01	115 dB	0.5 Hz	6	1.25 MS/s	—	4	InfiniBand (IB)
High Bandwidth	PXIe-4481	784278-01	115 dB	0.5 Hz	6	1.25 MS/s	—	4	InfiniBand (IB)

*Antialiasing Filter, Voltage Excitation, Current Excitation Signal Conditioning

PXI Sound and Vibration Modules Accessories

Cables

Cables	BNC Male to BNC Male Cable, 75 Ω, 2 m (x4)	Extended Temperature, BNCM-MXLRF, 0.46 m	Extended Temperature, BNCM-MXLRF 0.91 m	Extended Temperature, BNCM-MXLRF 2.4 m	Extended Temperature, MXLRF-MXLRF 0.46 m
Part Number	779697-02	140150-0R46	140150-0R91	140150-2R4	140151-0R46
PXIe-4463, MXLR [783086-02]	—	✓	✓	✓	✓
PXIe-4463, BNC [783086-01]	✓	—	—	—	—
PXIe-4464, MXLR [783097-02]	—	✓	✓	✓	✓
PXIe-4464, BNC [783097-01]	✓	—	—	—	—
PXIe-4468, MXLR [788512-01]	—	✓	✓	✓	✓
PXIe-4468, BNC [788511-01]	✓	—	—	—	—
PXIe-4480, InfiniBand [784277-01]	—	—	—	—	—
PXIe-4481, Infiniband [784278-01]	—	—	—	—	—

Cables (continued)

Cables	Extended Temperature, MXLRF-MXLRF 0.91 m	Extended Temperature, MXLRF-MXLRF 2.4 m	Extended Temperature, MXLRF-XLRM, 0.46M, 3-Pin Female Mini-XLR	SMB-100, SMB Female to BNC Female Coax Cable, 50 Ω, 0.08 m	SMB-100, SMB Female to BNC Female Coax Cable, 50 Ω, 0.6 m
Part Number	140151-0R91	140151-2R4	140152-0R46	781449-01	763389-01
PXIe-4463, MXLR [783086-02]	✓	✓	✓	—	—
PXIe-4463, BNC [783086-01]	—	—	—	✓	✓
PXIe-4464, MXLR [783097-02]	✓	✓	✓	—	—
PXIe-4464, BNC [783097-01]	—	—	—	✓	✓
PXIe-4468, MXLR [788512-01]	✓	✓	✓	✓	✓
PXIe-4468, BNC [788511-01]	—	—	—	✓	✓
PXIe-4480, InfiniBand [784277-01]	—	—	—	—	—
PXIe-4481, Infiniband [784278-01]	—	—	—	—	—

Cables (continued)

Cables	SMB Female to 2 Alligator Clips Cable, 50 Ω, 1 m	SMB Female to BNC Male Coax Cable, 50 Ω, 1 m	InfiniBand SHB12x-6BNC, 0.2 m	InfiniBand SHB12x-6MXLRM, 0.2 m	InfiniBand SHB12x-6RJ50, 0.2 m
Part Number	763388-01	763405-01	140296-0R2	140303-0R2	140304-0R2
PXIe-4463, MXLR [783086-02]	—	—	—	—	—
PXIe-4463, BNC [783086-01]	✓	✓	—	—	—
PXIe-4464, MXLR [783097-02]	—	—	—	—	—
PXIe-4464, BNC [783097-01]	✓	✓	—	—	—
PXIe-4468, MXLR [788512-01]	✓	✓	—	—	—
PXIe-4468, BNC [788511-01]	✓	✓	—	—	—
PXIe-4480, InfiniBand [784277-01]	—	—	✓	✓	✓
PXIe-4481, Infiniband [784278-01]	—	—	✓	✓	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Real-Time Module
- LabVIEW FPGA Module
- NI TestStand

Driver support for:

C/C++

- LabWindows/CVI

PXI Reconfigurable I/O Module (FPGA)

- Onboard FPGAs, all programmable with LabVIEW—no VHDL programming required
- 16-bit analog input resolution and 16-bit analog output resolution
- Up to 16 analog input channels, 1 MS/s/ch analog sample rates
- Up to 24 analog output channels, 1 MS/s/ch analog update rates
- Up to 48 bidirectional digital I/O with selectable logic levels

Key Features:

Flexible Functionality

Each module features a user-programmable FPGA for high-performance onboard processing and direct control over I/O signals to ensure complete flexibility of system timing and synchronization.

Graphical FPGA Programming

You can customize these devices with the LabVIEW FPGA Module to develop applications requiring precise timing and control such as hardware in the loop testing, custom protocol communication, sensor simulation, and high-speed control.

Advanced I/O Timing and Triggering

Each analog input and output has dedicated ADCs and DACs per channel. FPGA-based sample clocks and triggers offer specialized functionality such as multi-rate sampling and individual channel triggering, which are outside the capabilities of typical data acquisition hardware.

PXI Reconfigurable I/O Modules (FPGA)

Category	Model	Part Number	Analog Input Voltage Range	Digital I/O Logic Levels	Dynamic RAM (DRAM)	FPGA	Max Clock Rate	Max Sample Rate	Channels
Multifunction I/O, General Purpose	PXI-7841	780337-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX30	40 MHz	200 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXI-7842	780338-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX50	40 MHz	200 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXIe-7846	784143-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	1.2 V 1.5 V 1.8 V 2.5 V 3.3 V	0 MB	Kintex-7 160T	80 MHz	500 kS/s	Analog Input: 8 Analog Output: 8 Digital: 48
Fast Clock Rate	PXI-7851	780339-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX30	40 MHz	750 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXI-7852	780340-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX50	40 MHz	750 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXI-7853	780341-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX85	40 MHz	750 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXI-7854	780342-01	-10 V to 10 V	3.3 V 5 V	0 MB	Virtex-5 LX110	40 MHz	750 kS/s	Analog Input: 8 Analog Output: 8 Digital: 96
	PXIe-7856	784145-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	1.2 V 1.5 V 1.8 V 2.5 V 3.3 V	0 MB	Kintex-7 160T	80 MHz	1 MS/s	Analog Input: 8 Analog Output: 8 Digital: 48
Dynamic RAM (DRAM) Available	PXIe-7847	784144-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	1.2 V 1.5 V 1.8 V 2.5 V 3.3 V	512 MB	Kintex-7 160T	80 MHz	500 kS/s	Analog Input: 8 Analog Output: 8 Digital: 48
	PXIe-7857	784146-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	1.2 V 1.5 V 1.8 V 2.5 V 3.3 V	512 MB	Kintex-7 160T	80 MHz	1 MS/s	Analog Input: 8 Analog Output: 8 Digital: 48
	PXIe-7861	786671-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	3.3 V	512 MB	Kintex-7 160T	10 MHz	1 MS/s	Analog Input: 16 Analog Output: 8 Digital: 32
	PXIe-7865	787355-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	5 V 3.3 V	512 MB	Kintex-7 160T	20 MHz	1 MS/s	Analog Input: 2 Analog Output: 24 Digital: 32
	PXIe-7867	785570-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	3.3 V	512 MB	Kintex-7 160T	80 MHz	1 MS/s	Analog Input: 6 Analog Output: 18 Digital: 48
	PXIe-7868	785571-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	3.3 V	512 MB	Kintex-7 325T	80 MHz	1 MS/s	Analog Input: 6 Analog Output: 18 Digital: 48
Dynamic RAM (DRAM) Available, Largest FPGA	PXIe-7862	786672-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	3.3 V	512 MB	Kintex-7 325T	10 MHz	1 MS/s	Analog Input: 16 Analog Output: 8 Digital: 32
	PXIe-7866	787354-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	3.3 V 5 V	512 MB	Kintex-7 325T	20 MHz	1 MS/s	Analog Input: 2 Analog Output: 24 Digital: 32
	PXIe-7858	784147-01	-10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	1.2 V 1.5 V 1.8 V 2.5 V 3.3 V	512 MB	Kintex-7 325T	80 MHz	1 MS/s	Analog Input: 8 Analog Output: 8 Digital: 48

PXI Reconfigurable I/O Accessories (FPGA)

Cables

Cables	SHC68-68-RDIO Cable, 68-Pos .50 Series D-Type To 68-Pos VHDCI Offset, 1 m	SHC68-68-RMIO Cable, 68-Pos .50 Series D-Type To 68-Pos VHDCI Offset, 1 m	SHC68-68-RMIO Cable, 68-Pos .50 Series D-Type To 68-Pos VHDCI Offset, 2 m	Shielded R Series High-Speed Digital Cable, 2 m	Shielded R Series High-Speed Digital Cable, 1 m
Part Number	191667-01	189588-01	189588-02	156166-02	156166-01
PXI-7841	✓	✓	✓	—	—
PXI-7842	✓	✓	✓	—	—
PXI-7851	✓	✓	✓	—	—
PXI-7852	✓	✓	✓	—	—
PXI-7853	✓	✓	✓	—	—
PXI-7854	✓	✓	✓	—	—
PXIe-7846	—	✓	✓	✓	✓
PXIe-7847	—	✓	✓	✓	✓
PXIe-7856	—	✓	✓	✓	✓
PXIe-7857	—	✓	✓	✓	✓
PXIe-7858	—	✓	✓	✓	✓
PXIe-7861	—	✓	✓	✓	✓
PXIe-7862	—	✓	✓	✓	✓
PXIe-7865	—	✓	✓	✓	✓
PXIe-7866	—	✓	✓	✓	✓
PXIe-7867	—	✓	✓	✓	✓
PXIe-7868	—	✓	✓	✓	✓

Connector Block

Model	SCB-68A Shielded Connector Block	SCB-68 HSDIO, Shielded 68-Pin Connector Block
Part Number	782536-01	782914-01
PXI-7841	✓	—
PXI-7842	✓	—
PXI-7851	✓	—
PXI-7852	✓	—
PXI-7853	✓	—
PXI-7854	✓	—
PXIe-7846	✓	✓
PXIe-7847	✓	✓
PXIe-7856	✓	✓
PXIe-7857	✓	✓
PXIe-7858	✓	✓
PXIe-7861	✓	✓
PXIe-7862	✓	✓
PXIe-7865	✓	✓
PXIe-7866	✓	✓
PXIe-7867	✓	✓
PXIe-7868	✓	✓

Recommended software (sold separately):

- NI LabVIEW
- LabVIEW Real-Time Module
- LabVIEW FPGA Module
- NI TestStand

Driver support for:

C/C++, Python,
LabWindows/CVI

PXI NI FlexRIO

- Analog I/O up to 6.4 GS/s, digital I/O up to 1.25 Gb/s, RF I/O up to 4.4 GHz
- High-performance Xilinx FPGAs with up to 20 GB of onboard DRAM
- Program with LabVIEW FPGA or Xilinx Vivado
- Develop application-specific I/O with the FlexRIO Module Development Kit

Key Features:

Leverage Rapidly Evolving Technology

FlexRIO provides the latest high-speed converter and FPGA technologies before they are widely available in commercial instruments. You can use FlexRIO to develop applications that push the requirements for sample rate, bandwidth, resolution, and channel count.

Accelerate FPGA Programming

LabVIEW FPGA is a powerful tool for designing and implementing custom hardware circuits that can provide high-speed and low-latency processing for a wide range of applications.

Process Signals in Real Time

FlexRIO can help you keep up with faster converters. Modules from the Xilinx Kintex UltraScale FPGA to the Xilinx Virtex UltraScale+ VU11P FPGA, paired with LabVIEW FPGA, provide the resources you need to engineer complex algorithms, process data in real time between the I/O and CPU, and deploy your designs to hardware.

FPGA Modules for FlexRIO

Selection Guide	Model	Part Number	FPGA	FPGA Slices	FPGA DSP Slices	FPGA Block RAM (Kb)	Onboard Memory	Streaming Throughput
Highest Performance	PXIe-7976	783625-01	Kintex 7 K410T	63,550	1,540	28,620	2 GB	3.2 GB/s
Larger FPGA	PXIe-7975	782955-01	Kintex 7 K410T	63,550	1,540	28,620	2 GB	1.7 GB/s
Lower Cost with DRAM	PXIe-7972	782954-01	Kintex 7 K325T	50,950	840	16,020	2 GB	1.7 GB/s
Lowest Cost	PXIe-7971	782953-01	Kintex 7 K325T	50,950	840	16,020	0 GB	1.7 GB/s

FPGA Modules and Adpater Module Compatability

Adapter Module Compatability

Adapter Module Type	FlexRIO Digitizer Adapter Modules					FlexRIO Signal Generator Adapter Modules	
Model	NI-5734	NI-5751B	NI-5752B	NI-5771	NI-5772	AT-1120	AT-1212
PXIe-7976	✓	✓	✓	✓	✓	✓	✓
PXIe-7975	✓	✓	✓	✓	✓	✓	✓
PXIe-7972	✓	✓	✓	✓	✓	✓	✓
PXIe-7971	✓	✓	✓	✓	✓	✓	✓

Adapter Module Compatability (continued)

Adapter Module Type	FlexRIO Digital Adapter Modules					FlexRIO Transceiver Adapter Modules	FlexRIO RF Adapter Modules	FlexRIO Camera Link Adapter Modules
Model	NI-6581B	NI-6583	NI-6584	NI-6585B	NI-6589	NI-5783	NI-5791	NI-1483
PXIe-7976	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-7975	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-7972	✓	✓	✓	✓	✓	✓	✓	✓
PXIe-7971	✓	✓	✓	✓	✓	✓	✓	✓

FlexRIO Digitizers Adapter Modules

Selection Guide	Model	Part Number	Compatible FPGA	Resolution	Channels	Maximum Sample Rate	Maximum Bandwidth	Coupling	Full-Scale Input Range	Connectivity
High-Resolution FlexRIO Digitizer FAM	NI-5734	781659-04	Refer to FPGA Modules for FlexRIO	16	4	120 MS/s	117 MHz	AC and DC	2 Vpp	BNC
High-Density FlexRIO Digitizer FAMs	NI-5751B	784061-01	Refer to FPGA Modules for FlexRIO	14	16	50 MS/s	26 MHz	DC	2 Vpp	VHDCI
	NI-5752B	784062-01	Refer to FPGA Modules for FlexRIO	12	32	50 MS/s	14 MHz	AC	2 Vpp	VHDCI
Wide-Bandwidth FlexRIO Digitizer FAMs	NI-5771	781419-02	Refer to FPGA Modules for FlexRIO	8	2	3 GS/s	900 MHz	DC	1.3 Vpp	SMA
	NI-5772	782097-01	Refer to FPGA Modules for FlexRIO	12	2	1.6 GS/s	2.2 GHz	AC	2 Vpp	SMA
		782097-02	Refer to FPGA Modules for FlexRIO	12	2	1.6 GS/s	2.2 GHz	DC	2 Vpp	SMA

FlexRIO Digitizer Adapter Modules Accessories

Cables

Cables	BNC Male (Plug) To BNC Male (Plug), 75 Ω, 2 m Cables, 4-Pack	SHH19-H19-AUX Shielded Single-Ended Cable For Aux Digital I/O With Jackscrew, 2 m	SHC68-C68-D4 Shielded Single-Ended Cable, Lower DC Resistance, 3 m	SHC68-C68-D4 Shielded Single-Ended Cable, Low Leakage, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, 0.55 m	SHC68-C68-D4 Shielded Single-Ended Cable, 2 m	SHC68-C68-D3, Male VHDCI To Male VHDCI, Shielded LVDS Cable, 1 m	Shc68-C68-D3, Male VHDCI To Male VHDCI, Shielded LVDS Cable, 2 m
Part Number	779697-02	152629-02	132625-03	152870-01	196275-01	781013-01	781293-01	188143-01	788905-02
NI-5734	✓	✓	—	—	—	—	—	—	—
NI-5751B	—	—	✓	✓	✓	✓	✓	—	—
NI-5752B	—	—	✓	✓	✓	✓	✓	✓	✓
NI-5771	—	✓	—	—	—	—	—	—	—
NI-5772	—	✓	—	—	—	—	—	—	—

Connector Block

Connector Blocks	SCB-19 Noise-Rejecting, Shielded AUX I/O Connector Block	SMB-2147 16-Channel Analog Input Accessory	SMB-2146 2-Ch Input, 16-Channel Output Digital I/O Accessory	SMB-2145 16-Channel Analog Input Accessory
Part Number	782444-01	781518-01	781517-01	781516-01
NI-5734	✓	—	—	—
NI-5751B	—	✓	—	—
NI-5752B	—	—	✓	✓
NI-5771	✓	—	—	—
NI-5772	✓	—	—	—

FlexRIO Digitizers With Integrated I/O Modules

Selection Guide	Model	Part Number	FPGA	Analog Input Bandwidth	Analog Input Resolution	Analog Input Voltage Range	Max Sample Rate	Voltage Input Channels	Analog Input Coupling	CableSense™	Dynamic RAM (DRAM)
High-Resolution Integrated FlexRIO Digitizer	PXIe-5763	785160-01	Kintex UltraScale KU035	225 MHz	16 Bits	-1 v to 1 v	500 MS/s	4	AC	—	0 GB
		785161-01	Kintex UltraScale KU040							—	4 GB
		785162-01	Kintex UltraScale KU060							—	4 GB
		785163-01	Kintex UltraScale KU035						DC	—	0 GB
		785164-01	Kintex UltraScale KU040							—	4 GB
		785165-01	Kintex UltraScale KU060							—	4 GB
	PXIe-5764	785166-01	Kintex UltraScale KU035	1.15 GHz	16 Bits	-1 V to 1 V	1 GS/s	4	AC	—	0 GB
		785167-01	Kintex UltraScale KU040							—	4 GB
		785168-01	Kintex UltraScale KU060							—	4 GB
		785169-01	Kintex UltraScale KU035	400 MHz					DC	—	0 GB
		785170-01	Kintex UltraScale KU040							—	4 GB
		785171-01	Kintex UltraScale KU060							—	4 GB
High-Bandwidth Integrated FlexRIO Digitizers	PXIe-5774	785646-01	Kintex UltraScale KU040	3 GHz	12 Bits	200 mVpp to 1 Vpp	6.4 GS/s	2	DC	—	4 GB
		785646-02	Kintex UltraScale KU040	1.6 GHz						—	
		785647-01	Kintex UltraScale KU060	3 GHz						—	
		785647-02	Kintex UltraScale KU060	1.6 GHz						—	
		785647-11	Kintex UltraScale KU060	3 GHz						✓	
		785647-12	Kintex UltraScale KU060	1.6 GHz						✓	
	PXIe-5775	785590-01	Kintex UltraScale KU035	6 GHz	12 Bits	1.25 Vpp	6.4 GS/s	2	AC	—	0 GB
		785591-01	Kintex UltraScale KU040							—	4 GB
		785592-01	Kintex UltraScale KU060							—	4 GB

FlexRIO Digitizers With Integrated I/O Accessories

Connector Block

	SCB-12, Nano-Pitch Connector Block, 8 SE DIO, 1 QSFP+	SCB-8 Noise-Rejecting, Shielded Nano-Pitch Connector Block
Part Number	787419-01	786335-01
PXIe-5763	✓	✓
PXIe-5764	✓	✓
PXIe-5774	✓	✓
PXIe-5775	✓	✓

FlexRIO Signal Generator Adapter Modules

Selection Guide	Model	Part Number	Compatible FPGA	Resolution (Bits)	Channels	Maximum Sample Rate	Maximum Bandwidth	Coupling	Signaling	Connectivity
High-Speed FlexRIO Signal-Generator FAMs	AT-1120	782248-01	Refer to FPGA Modules for FlexRIO	14	1	2 GS/s	550 MHz	DC	Differential	SMA
	AT-1212	782248-02	Refer to FPGA Modules for FlexRIO	14	2	1.25 GS/s	400 MHz	DC	Differential	SMA

FlexRIO Signal Generator Adapter Modules Accessories

Cables

Cables	SMA Male to SMA Male Cable, 50 Ω, 38.1 cm	SMA Male to SMA Male Cable, 50 Ω, 12.7 cm	SMA Male to SMA Male Cable for USRP, 50 Ω, 2 m	SMA Male to SMA Male Cable, 50 Ω, 30 cm
Part Number	763444-01	763443-01	783470-01	781846-01
AT-1120	✓	✓	✓	✓
AT-1212	✓	✓	✓	✓

FlexRIO Signal Generator Integrated I/O Modules

Selection Guide	Model	Part Number	FPGA	Resolution (Bits)	Channels	Maximum Sample Rate	Maximum Bandwidth	Coupling	Signaling	Connectivity	Reconstruction Filter
High-Speed Integrated FlexRIO Signal Generator	PXIe-5745	785596-01	Kintex UltraScale KU035	12	2	3.2 GS/s per Channel	2.9 GHz	AC	Single-Ended	SMA	—
		785596-02									✓
		785597-01	Kintex UltraScale KU040								—
		785597-02									✓
		785598-01	Kintex UltraScale KU060								—
		785598-02									✓

FlexRIO Signal Generator Integrated I/O Module Accessories

Connector Blocks

Connector Block	SCB-12, Nano-Pitch Connector Block, 8 SE DIO, 1 QSFP+	SCB-8 Noise-Rejecting, Shielded Nano-Pitch Connector Block
Part Number	787419-01	786335-01
PXIe-5745	✓	✓

FlexRIO Digital Adapter Modules

Selection Guide	Model	Part Number	Compatible FPGA	Digital I/O Termination	Duplex	Logic Levels And Range	Max Clock Rate	Max Data Rate	Number of Bidirectional Digital Channels	Signaling Type
General Purpose	NI-6581B	783887-01	Refer to FPGA Modules for FlexRIO	50 Ω	—	1.8 V 2.5 V 3.3 V	100 MHz	100 Mb/s	54	Single-Ended
General Purpose + LVDS	NI-6583	781320-01	Refer to FPGA Modules for FlexRIO	50 Ω	—	LVDS Programmable 1.2 V—3.3 V	200 MHz	300 Mb/s	32	Single-Ended Differential
		781320-02	Refer to FPGA Modules for FlexRIO			mLVDS Programmable 1.2 V—3.3 V				
RS422 and RS485	NI-6584	781290-01	Refer to FPGA Modules for FlexRIO	100 Ω	Half Duplex	RS422/ RS485	16 MHz	16 Mb/s	16	Differential
		781290-02	Refer to FPGA Modules for FlexRIO	100 Ω	Full Duplex					
		781290-03	Refer to FPGA Modules for FlexRIO	N/A, External Termination Recommended	Full Duplex					
LVDS	NI-6585B	784060-01	Refer to FPGA Modules for FlexRIO	100 Ω	—	LVDS	200 MHz	300 Mb/s	32	Differential
LVDS	NI-6589	783888-01	Refer to FPGA Modules for FlexRIO	100 Ω	—	LVDS	1 GHz	1 Gb/s	20	Differential

FlexRIO Digital Adapter Module Accessories

Cables

Cable	C68-C68-D4 Unshielded Cable For High-Speed Digital I/O, 2X 68-Position VHDCI Offset, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, Lower DC Resistance, 3 m	SHC68-C68-D4 Shielded Single-Ended Cable, Low Leakage, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, 1 m	SHC68-C68-D4 Shielded Single-Ended Cable, 0.55 m	SHC68-C68-D4 Shielded Single-Ended Cable, 2 m	C68-C68-D4 Unshielded Cable For High-Speed Digital I/O, 2X 68-Position VHDCI Offset, 1 m
Part Number	195949-01	132625-03	152870-01	196275-01	781013-01	781293-01	195949-01
NI-6581B	✓	✓	✓	✓	✓	✓	✓
NI-6583	✓	✓	✓	✓	✓	✓	✓
NI-6584	✓	✓	✓	✓	✓	✓	✓
NI-6585B	—	—	—	—	—	—	—
NI-6589	—	—	—	—	—	—	—

Cables (continued)

Cable	SHB12X-B12X, Male InfiniBand to Male Infiniband, Shielded LVDS Cable, 1 m	SHB12X-B12X, Male InfiniBand to Male Infiniband, Shielded LVDS Cable, 2 m	SHB12X-H3X24, Male InfiniBand to Differential Flying Leads, Shielded LVDS Cable, 1.5 m	BNC Male (Plug) to BNC Male (Plug), 75 Ω, 2 m Cables, 4 Pack	SHC68-C68-D3, Male VHDCI to Male VHDCI, Shielded LVDS Cable, 1 m	SHC68-C68-D3, Male VHDCI to Male VHDCI, Shielded LVDS Cable, 2 m	68 Pos VHDCI Connector to Eight 9 POS D-SUB, RS485, 1 m
Part Number	192344-01	192344-02	196236-1R5	779697-02	188143-01	788905-02	197546-01
NI-6581B	—	—	—	—	—	—	—
NI-6583	✓	✓	✓	—	—	—	—
NI-6584	—	—	—	✓	—	—	✓
NI-6585B	—	—	—	—	✓	✓	—
NI-6589	✓	✓	✓	—	—	—	—

Breakout Boxes and Adapters

Breakout Boxes and Adapters	CB-2162 Single-Ended Digital I/O Accessory	SMB-2163 Single-Ended Digital I/O Accessory (Rack-Mountable)	SMA-2164 LVDS Prototyping Accessory	SMA-2165 Prototyping Accessory For NI 6585	SCB-68 HSDIO, Shielded 68-Pin Connector Block
Part Number	778592-01	778747-01	779323-01	782092-01	782914-01
NI-6581B	✓	✓	—	—	✓
NI-6583	✓	✓	✓	—	✓
NI-6584	✓	✓	—	—	✓
NI-6585B	—	—	—	✓	—
NI-6589	—	—	✓	—	—

FlexRIO Digital Integrated I/O Modules

Selection Guide	Model	Part Number	FPGA	Digital Input Only Channels	Digital Output Only Channels	Logic Levels And Range	Max Data Rate
LVDS FlexRIO Digital I/O Module	PXIe-6569	787280-01	Kintex UltraScale KU035	32	32	LVDS	300 Mb/s
		787281-01	Kintex UltraScale KU060	—	64		
		787282-01	Kintex UltraScale KU060	64	0		
		787283-01	Kintex UltraScale KU060	32	32		
		787284-01	Kintex UltraScale KU035	0	64		
		787285-01	Kintex UltraScale KU035	64	0		

FlexRIO Digital Integrated I/O Module Accessories

Cables

Cable	MINI-SAS HD Breakout Cable To 16 SMA	SR240M-SR240M Cable, LVDS With SE, 1 m	SR240M-SR240M Cable, LVDS With SE, 0.5 m
Part Number	788260-01	787317-01	787317-0R5
PXIe-6569	✓	✓	✓

Terminal Block

Terminal Block	TB-6569 High-Speed SEARAY To Mini-SAS HD Breakout
Part Number	788259-01
PXIe-6569	✓

FlexRIO Transceiver Adapter Modules

Selection Guide	Model	Part Number	Available Filters	Analog Input Sampling Rate	Compatible FPGA	IF Transceiver Max Bandwidth	Input Coupling	Max Analog Output Update Rate	Analog Input Channels	Analog Output Channels	Resolu-tion
40 MHz Bandwidth Transceiver Adapter Module for FlexRIO	NI-5783	784364-01	Elliptic	100 MS/s	Refer to FPGA Modules for FlexRIO	175 MHz	DC	400 MS/s	4	4	16
		784364-02	Butterworth								

FlexRIO Transceiver Adapter Module Accessories

Cables

Cable	HD BNC Male to Bnc Female Cable, 50 Ω, 20 cm	HD BNC To SMA Cable, 50 Ω, 1 m	SHH19-H19-Aux Shielded Single-Ended Cable For Aux Digital I/O With Jackscrew, 2 m
Part Number	787230-0R2	784995-01	152629-02
NI-5783	✓	✓	✓

Digital Cables

Digital Cable	SHH19-H19-AUX Shielded Single-Ended Cable, 2 m
Part Number	152629-02
NI-5783	✓

Connector Blocks

Connector Block	SCB-19 Noise-Rejecting, Shielded Aux I/O Connector Block
Part Number	782444-01
NI-5783	✓

FlexRIO Transceiver Integrated I/O Modules

Selection Guide	Model	Part Number	FPGA	Dynamic RAM (DRAM)	Analog Output Bandwidth	Recon-struction Filter	Channels	Max Input Sample Rate	Max Output Sample Rate	Coupling	Resolu-tion
12-Bit, 6.4 GS/s, 2-Channel PXI FlexRIO IF Transceiver	PXIe-5785	785584-01	Kintex UltraScale KU035	0 GB	2.9 GHz	—	2 A/I, 2 A/O	6.4 GS/s	3.2 GS/s	AC	12
		785584-02	Kintex UltraScale KU035	0 GB	2.4 GHz	✓					
		785585-01	Kintex UltraScale KU040	4 GB	2.9 GHz	—					
		785585-02	Kintex UltraScale KU040	4 GB	2.4 GHz	✓					
		785586-01	Kintex UltraScale KU060	4 GB	2.9 GHz	—					
		785586-02	Kintex UltraScale KU060	4 GB	2.4 GHz	✓					

FlexRIO Transceiver Integrated I/O Module Accessories

Cables

Description	Nano-Pitch Male to Nano-Pitch Male OCuLink x4 Cable, 1 m	SMA Male to SMA Male Cable, 50 Ω, 30 cm	SMA Male to SMA Male Cable, 50 Ω, 1 m
Part Number	785486-01	781846-01	781845-01
PXIe-5785	✓	✓	✓

Connector Block

Description	SCB-12, Nano-Pitch Connector Block, 8 SE DIO, 1 QSFP+	SCB-8 Noise-Rejecting, Shielded Nano-Pitch Connector Block
Part Number	787419-01	786335-01
PXIe-5785	✓	✓

FlexRIO RF Adapter Modules

Selection Guide	Model	Part Number	Input Noise Density	Max Input Power	Max Output Power	RF Analyzer Instantaneous Band	RF Generator Frequency Range	RF Generator Instantaneous Band	Compatible FPGA
100 MHz Bandwidth, 200 MHz to 4.4 GHz, RF Adapter Module for FlexRIO	NI-5791	782510-01	-148 dBm/Hz	20 dBm	8 dBm	100 MHz	200 MHz to 4.4 GHz	100 MHz	Refer to FPGA Modules for FlexRIO

FlexRIO RF Adapter Module Accessories

Cables

Description	SMA Male to SMA Male Cable, 50 Ω, 30 cm	SMA Male to SMA Male Cable, 50 Ω, 1 m
Part Number	781846-01	781845-01
NI-5791	✓	✓

FlexRIO CameraLink Adapter Modules

Selection Guide	Model	Part Number	Supported Configurations	Connector	Supported Pixel Clock Frequency	Aux I/O	Compatible FPGA
Full-Configuration CameraLink Adapter Module for FlexRIO	NI-1483	781341-01	Base, Medium, Full CameraLink	2x 26-Pin SDR	20–85 MHz	4x TTL, 2x Isolated Digital Inputs, 1x Quadrature Encoder	Refer to FPGA Modules for FlexRIO

FlexRIO CameraLink Adapter Module Accessories

Cables

Description	Cable, Power Over CameraLink (PoCL), MDR to MDR, 2 m	Cable, Power Over CameraLink (PoCL), MDR to MDR, 5 m	Cable, Power Over CameraLink (PoCL), MDR to SDR, 5 m	Cable, Power Over CameraLink (PoCL), SDR to SDR, 5 m
Part Number	199744-02	199744-05	199745-05	199746-05
NI-1483	✓	✓	✓	✓

FlexRIO Coprocessor Modules

Selection Guide	Model	Part Number	I/O	Block RAM	DSP Slices	Dynamic RAM	FPGA	Max Line Rate
Lowest Cost	PXIe-7912	785173-01	4 HSS MGTs 8 GPIO	21 Mb	1,920	4 GB	Kintex UltraScale KU040	16.375 Gb/s
Low Cost	PXIe-7915	785174-01	4 HSS MGTs 8 GPIO	38 Mb	2,760	4 GB	Kintex UltraScale KU060	16.375 Gb/s
Highest Throughput and Largest FPGA	PXIe-7903	788917-01	48 HSS MGTs 8 GPIO	341 Mb	9,216	20 GB	Virtex UltraScale+ XCVU11P	28.2 Gb/s

FlexRIO Coprocessor Module Accessories

Cables

Description	Nano-Pitch Male to Nano-Pitch Male OCuLink x4 Cable, 1 m	Nano-Pitch Male to Mini-SAS HD Male OCuLink x4 Cable, 1 m
Part Number	785486-01	786215-01
PXIe-7912	✓	✓
PXIe-7915	✓	✓

Connector Blocks

Description	SCB-12, Nano-Pitch Connector Block, 8 SE DIO, 1 QSFP+	SCB-8 Noise-Rejecting, Shielded Nano-Pitch Connector Block
Part Number	787419-01	786335-01
PXIe-7912	✓	✓
PXIe-7915	✓	✓

FlexRIO Camera Interface Modules

Selection Guide	Model	Part Number	Deserializer	Digital Input-Only Channels	Digital Output-Only Channels	Serializer	Supported Modes	Serial Link	FPGA
8-Channel GMSL2 Automotive Camera Interface Module	PXIe-1487	787456-01	MAX9296A	8	0	—	Pixel	GMSL2	Kintex UltraScale+ KU11P
		787457-01	MAX9296A	4	4	MAX9295A	Pixel		
		787458-01	—	0	8	MAX9295A	Pixel		
		788714-01	MAX96716A	4	4	MAX96717	Pixel Tunneling		
		788715-01	—	0	8	MAX96717	Pixel Tunneling		
		788716-01	MAX96716A	8	0	—	Pixel Tunneling		
		788719-01	—	0	8	MAX96717F	Pixel Tunneling		
		788781-01	MAX96716A	4	4	MAX96717F	Pixel Tunneling		
4-Channel GMSL3 Automotive Camera Interface Module	PXIe-1489	788355-01	MAX96792A	4	0	—	Pixel Tunneling	GMSL3	Kintex UltraScale+ KU11P
		788356-01	MAX96792A	2	2	MAX96793	Pixel Tunneling		
		788357-01	—	0	4	MAX96793	Pixel Tunneling		
8-Channel FPD-LINK III Automotive Camera Interface Module	PXIe-1486	787453-01	DS90UB954	8	0	—	—	FPD-LINK III	Kintex UltraScale+ KU11P
		787454-01	DS90UB954	4	4	DS90UB953	—		
		787455-01	—	0	8	DS90UB953	—		
		788711-01	DS90UB638	8	0	—	—		
		788712-01	DS90UB638	4	4	DS90UB635	—		
		788713-01	—	0	8	DS90UB635	—		
8-Channel FPD-LINK IV Automotive Camera Interface Module	PXIe-1488	788350-01	DS90UB9702	8	0	—	—	FPD-LINK IV	Kintex UltraScale+ KU11P
		788351-01	DS90UB9702	4	4	DS90UB971	—		
		788352-01	—	0	8	DS90UB971	—		

Recommended software (sold separately):

NI LabVIEW™

NI TestStand™

Driver support for:

C/C++, C#, Python,
LabWindows/CVI

NI FlexLogger™

PXI Signal-Conditioning Modules

- High channel density for conditioned and sensor measurements
- Flexible, synchronized, and accurate measurements
- Isolated measurement options
- Swappable front-mount terminal block
- Strain Bridge Input
- Displacement Input
- Temperature Input

Key Features:

Accessory Autodetection

SC Express modules automatically detect compatible accessories or terminal blocks. The RSVD pins on the I/O connector provide power to the accessories as well as digital communication lines.

Multiple Timing Engines

Several SC Express modules are equipped with multiple timing engines, each customizable with its own configuration settings for timing, triggering, and sample mode (buffered or hardware-timed single point). This feature enables devices to execute multiple tasks simultaneously.

Chopping Mode

The PXIe-4309 supports chopping mode, which is a feature that can be used to remove offset voltages and other low frequency errors. By measuring a signal twice, once normally and once with the inputs inverted, the measurements can be averaged by the device to create each sample. This provides significant noise rejection to enable 10 nV measurements and better measurement stability over temperature.

PXI High Voltage and Isolated Modules

Selection Guide	Model Name	Part Number	Analog Input Isolation	Analog Input Resolution	Analog Input Voltage Range	Discrete Lowpass Filter	Max Differential Analog	Max Sample Rate
Isolated AI	**PXIe-4300**	781337-01	300 V Ch-Ch Isolation	16 Bits	-300 V to 300 V -150 V to 150 V -60 V to 60 V -30 V to 30 V -10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	10 kHz 100 kHz	8	250 kS/s/ch
General-Purpose Filtered AI	**PXIe-4302**	783865-01	—	24 Bits	-10 V to 10 V -0.1 V to 0.1 V	2 Hz; 20 Hz; 200 Hz; 1 kHz; 2 kHz	32	5 kS/s/ch
General-Purpose Filtered AI with Higher Sampling	**PXIe-4303**	783866-01	—	24 Bits	-10 V to 10 V -0.1 V to 0.1 V	2 Hz; 20 Hz; 200 Hz; 1 kHz; 2 kHz	32	51.2 kS/s/ch
High-Voltage Filtered AI	**PXIe-4304**	783867-01	—	24 Bits	-42 V to 42 V	2 Hz; 20 Hz; 200 Hz; 1 kHz; 2 kHz	32	5 kS/s/ch
High-Voltage Filtered AI with Higher Sampling	**PXIe-4305**	783868-01	—	24 Bits	-42 V to 42 V	2 Hz 20 Hz 200 Hz 1 kHz 2 kHz	32	51.2 kS/s/ch
High-Resolution Simultaneous AI	**PXIe-4309**	784471-01	—	Flexible Resolution 18-28 bits	-15 V to 15 V -10 V to 10 V -1 V to 1 V -0.1 V to 0.1 V	—	32	2 MS/s/ch
Highest-Voltage Isolated AI	**PXIe-4310**	784813-01	600 V Ch-Ch Isolation	16 Bits	-600 V to 600 V -300 V to 300 V -120 V to 120 V -60 V to 60 V -10 V to 10 V -5 V to 5 V -2 V to 2 V -1 V to 1 V	10 kHz; 100 kHz	8	400 kS/s/ch
High Channel, High Speed Simultaneous AI	**PXIe-4311**	789864-01	-	Flexible Resolution 16-22 bit	-150mV to 150mV, 0-6V, 0-25 V	—	32	4 MS/s/ch
Isolated AO	**PXIe-4322**	782878-01	—	16 Bits	-16 V to 16 V	—	8	250 kS/s/ch

PXI Strain Bridge Input Modules

Selection Guide	Model Name	Part Number	Analog Input Voltage Range	Bridge Configurations	Bridge Resistance	Max Differential Analog	Max Sample Rate
Starter Module	**PXIe-4330**	781346-01	-100 mV/V to 100 mV/V -25 mV/V to 25 mV/V	Full-Bridge Quarter-Bridge Half-Bridge	120 Ω 350 Ω 1,000 Ω	8	25.6 kS/s
Fastest Sample Rates	**PXIe-4331**	781345-01	-100 mV/V to 100 mV/V -25 mV/V to 25 mV/V	Full-Bridge Half-Bridge Quarter-Bridge	120 Ω 350 Ω 1,000 Ω	8	102.4 kS/s
Largest Input Ranges	**PXIe-4339**	783531-01	-10 V to 10 V -4 V to 4 V -1 V to 1 V -0.5 V to 0.5 V -0.2 V to 0.2 V -200 mV/V to 200 mV/V -0.1 V to 0.1 V -80 mV/V to 80 mV/V -50 mV/V to 50 mV/V -40 mV/V to 40 mV/V -20 mV/V to 20 mV/V -10 mV/V to 10 mV/V’	Quarter-Bridge Full-Bridge Half-Bridge	120 Ω 350 Ω 1,000 Ω	8	25.6 kS/s

PXI Displacement Input Modules

Selection Guide	Model	Part Number	Analog Input Resolution	Input Level	Analog Inputs	Max Sample Rate	Excitation Voltage	Excitation Frequency	Max Sample Rate
Displacement Module	**PXIe-4340**	785068-01	24 Bits	+/-7 V_{rms}	4	25.6 kS/s	1-7 V_{rms} with 0.5 VB_{rms} Increments	400 Hz to 10 kHz with 10 Hz Increments	25.6 kS/s

PXI Temperature Input Modules

Selection Guide	Model Name	Part Number	Supported Sensor Type	Analog Input Isolation	Max Number of Differential Analog
Thermocouple Module	**PXIe-4353**	781348-01	Thermocouple	300 V Bank Isolation	32
RTD Measurement Module	**PXIe-4357**	782118-01	RTD	—	20

PXI Signal-Conditioning Accessories

Terminal Blocks

Description	TB-4300, 10 V Input	TB-4300, 20 mA Input	TB-4300B, 300 V Input	TB-4302, 10 V Input	TB-4302, 20 mA Input	TB-4304	TB-4309, Screw Terminals
Part Number	781338-01	784280-01	781338-02	783869-01	783871-01	783870-01	784956-01
PXIe-4300	✓	✓	✓	—	—	—	—
PXIe-4302	—	—	—	✓	✓	—	—
PXIe-4303	—	—	—	✓	✓	—	—
PXIe-4304	—	—	—	—	—	✓	—
PXIe-4305	—	—	—	—	—	✓	—
PXIe-4309	—	—	—	—	—	—	✓
PXIe-4311	—	—	—	—	—	—	✓

Terminal Blocks (continued)

Description	TB-4309, VHDCI Terminals	TB-4309, High Channel Density VHDCI Terminal	TB-4310, 10 V Input	TB-4310, 600V Input	TB-4310, 10 V Input, 10 Hz Filter	TB-4322	TB-4330
Part Number	784957-01	785743-01	785021-01	785022-01	786281-01	782882-01	781347-01
PXIe-4309	✓	✓	—	—	—	—	—
PXIe-4310	—	—	✓	✓	✓	—	—
PXIe-4311	✓	✓	—	—	—	—	—
PXIe-4322	—	—	—	—	—	✓	—
PXIe-4330	—	—	—	—	—	—	✓
PXIe-4331	—	—	—	—	—	—	✓

Terminal Blocks (continued)

Description	TB-4339, 120 Ohm 1/4 Bridge, 50,000 Ω Shunt Cal	TB-4339B, 350 Ohm 1/4 Bridge, 100,000 Ω Shunt Cal	TB-4339C, 1K Ohm 1/4 Bridge, 100,000 Ω Shunt Cal	TB-4340	TB-4353, Isothermal Terminal Block	TC-4353, mini TC Connector Terminal Block	TB-4357
Part Number	783532-01	783533-01	783534-01	784087-01	781349-01	782403-01	782119-01
PXIe-4339	✓	✓	✓	—	—	—	—
PXIe-4340	—	—	—	✓	—	—	—
PXIe-4353	—	—	—	—	✓	✓	—
PXIe-4357	—	—	—	—	—	—	✓

Rack Mounts

Rack Mount	RM-4302	RM-4304	RM-24999	RM-4339, Rack-Mount TB for PXIe-4339 with In Situ Calibration	Custom Shunt Calibration Accessory for RM-4339 (SCAL-4339)
Part Number	783872-01	783873-01	785840-01	783535-01	783536-01
PXIe-4302	✓	—	—	—	—
PXIe-4303	✓	—	—	—	—
PXIe-4304	—	✓	—	—	—
PXIe-4305	—	✓	—	—	—
PXIe-4331	—	—	✓	—	—
PXIe-4339	—	—	—	✓	✓

Cables

Description	SH96-96-2 Cable (1 m)	SH96-96-2 Cable (3 m)	SH96-96-2 Cable (5 m)	SH96F-96M-42 V Shielded Cable for PXIe-4304/5 to Rack-Mount Terminal Block, 1 m	SH96F-96M-42 V Shielded Cable for PXIe-4304/5 to Rack-Mount Terminal Block, 3 m	SH96F-96M-42 V Shielded Cable for PXIe-4304/5 to Rack-Mount Terminal Block, 5 m	SH96-96-1, 1 m	SH96-96-1, 3 m	SH96-96-1, 5 m
Part Number	157350-01	157350-03	157350-05	158228-01	158228-03	158228-05	190668-01	190668-03	190668-05
PXIe-4302	✓	✓	✓	—	—	—	—	—	—
PXIe-4303	✓	✓	✓	—	—	—	—	—	—
PXIe-4304	—	—	—	✓	✓	✓	—	—	—
PXIe-4305	—	—	—	✓	✓	✓	—	—	—
PXIe-4339	✓	✓	✓	—	—	—	—	—	—
PXIe-4353	—	—	—	—	—	—	✓	✓	✓

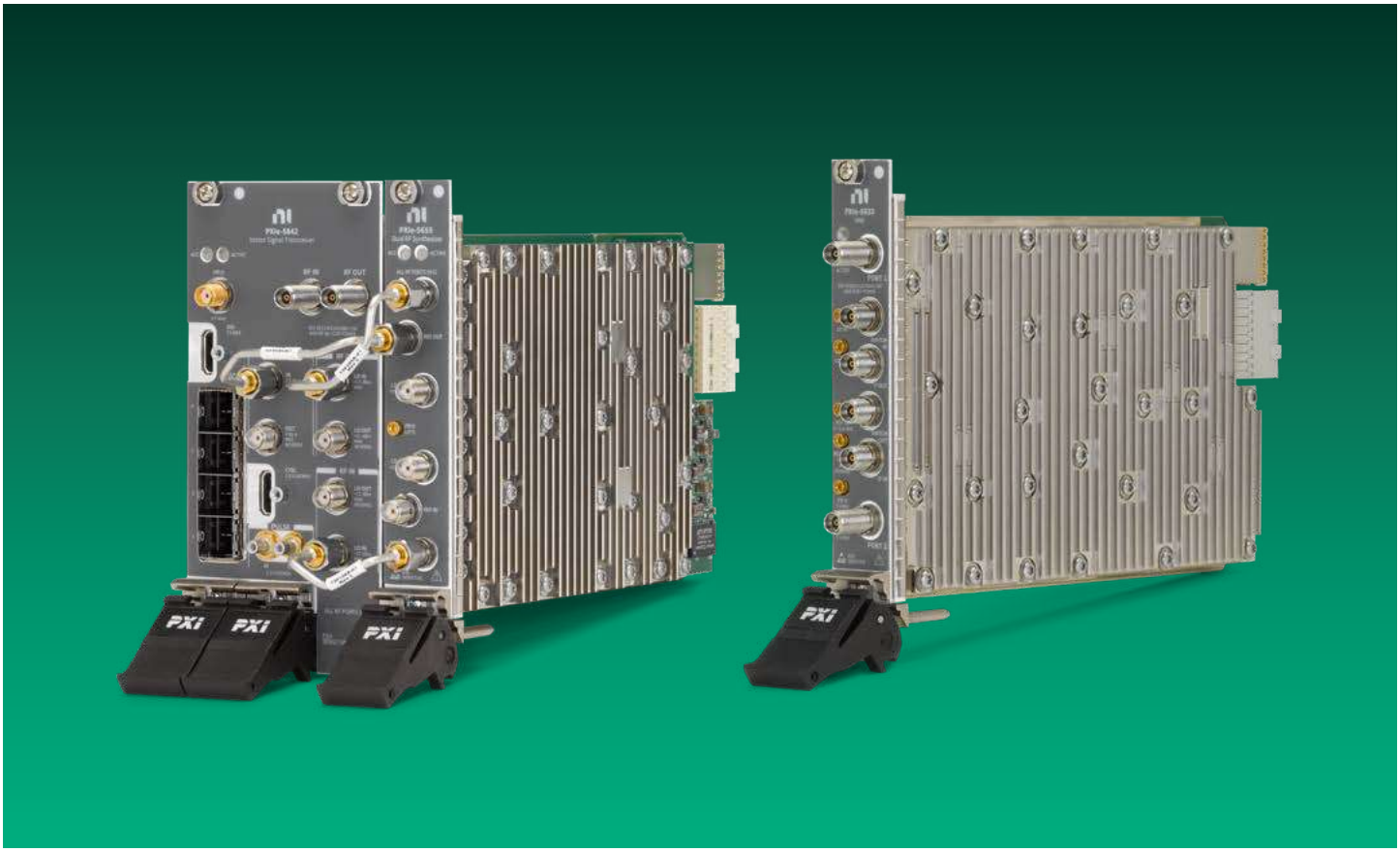
Calibration Accessories

Calibration Accessories	CAL-4300B	CAL-4309	CAL-4330	CAL-4353
Part Number	781852-01	784958-01	786988-01	781350-01
PXIe-4300	✓	—	—	—
PXIe-4309	—	✓	—	—
PXIe-4311	—	✓	—	—
PXIe-4330	—	—	✓	—
PXIe-4353	—	—	—	✓

Sensors

Sensors	J-Type Fiberglass Thermo-couple, 1 m (32 °F to 900 °F)	J-Type Fiberglass Thermo-couple, 2 m (32 °F to 900 °F)	K-Type Fiberglass Thermo-couple, 1 m (3-2 °F to 900 °F)	K-Type Fiberglass Thermo-couple, 2 m (32 °F to 900 °F)	K-Type Thermo-couple Wire, 30 m (32 °F to 900 °F)	K-Type Thermo-couple Wire, 300 m (32 °F to 900 °F)	T-Type Fiberglass Thermo-couple, 2 m (32 °F to 500 °F)	3-Wire, 100 Ω Platinum RTD (Field-Cuttable Probe)
Part Number	745690-J001	745690-J002	745690-K001	745690-K002	745687-K030	745687-K300	745690-T002	745686-01
PXIe-4353	✓	✓	✓	✓	✓	✓	✓	—
PXIe-4357	—	—	—	—	—	—	—	✓

RF



As we push the boundaries of wireless communications, NI offers software defined radios, generators, analyzers, and transceivers for rapid prototyping and production test.

Recommended software (sold separately):

- NI LabVIEW
- RFmx
- NI InstrumentStudio

Additional resources for software development:

- InstrumentStudio

Vector Signal Transceivers

- Generate and acquire wide instantaneous bandwidth
- Ensure test coverage for new and legacy wireless standards
- Achieve better than -50 dB EVM performance for higher-order modulation schemes

Key Features:

Test High Frequency and Wide Instantaneous Bandwidth

With frequency coverage from baseband to mmWave and up to 4 GHz instantaneous bandwidth, Vector Signal Transceivers (VSTs) are ideally suited for carrier aggregation, digital predistortion, and radar testing.

Perform Fast and Accurate EVM Measurements

Low phase noise, high linearity, and patented IQ calibration combine to achieve best-in-class EVM performance with higher-order modulation schemes.

Optimize RF Front-End Validation

Easy-to-use and customizable DPD algorithms and up to 4 GHz of instantaneous RF bandwidth translate to quick and easy DPD implementation in RFIC characterization.

Vector Signal Transceiver Modules

Selection Guide	Model	Part Number	I/O Type	Module Width	Frequency Range	Instantaneous Bandwidth	EVM (5G NR 100 MHz, Loopback @ 5.5 GHz)	Tuning Time	P2P Streaming
High-Performance RF	PXIe-5842	789600-26211	RF In, RF Out, or Both	4 Slots	30 MHz–26.5 GHz	2 GHz	-58 dB	230 µs	Yes, up to 1 GHz
	PXIe-5842	789600-18211			30 MHz–18 GHz	2 GHz			
	PXIe-5842	789600-12211			30 MHz–12 GHz	2 GHz			
	PXIe-5842	789600-08211			30 MHz–8 GHz	2 GHz			
	PXIe-5842	789600-08111			30 MHz–8 GHz	1 GHz			
	PXIe-5842	789600-12111			30 MHz–12 GHz	1 GHz			
	PXIe-5842	789600-08511			30 MHz–8 GHz	500 MHz			
	PXIe-5842	789600-12511			30 MHz–12 GHz	500 MHz			
	PXIe-5842	788566-02	RF In and RF Out	6 Slots	200 MHz–26.5 GHz, 22.5 GHz–54 GHz	4 GHz, 2 GHz			
High Density VST	PXIe-5860	789449-01	Dual RF In and RF Out	2 slots	50 MHz–8.5 GHz	1 GHz	-55 dB	150 µS	Yes, up to 1 GHz
Sub-6 GHz	PXIe-5841	786982-01	RF In and RF Out	2 Slots	9 kHz–6 GHz	1 GHz	-49 dB	380 µs	Yes, up to 1 GHz
	PXIe-5841	785832-01		3 Slots				175 µs	
mmWave, Built-In Switching	PXIe-5831	786856-01	RF In and RF Out	6 Slots	5 GHz–31.3 GHz, 37 GHz–44 GHz	1 GHz	-51 dB	500 µs	Yes, up to 1 GHz
IF	PXIe-5831	786853-01		4 Slots	5 GHz–21 GHz				
Baseband	PXIe-5820	783967-01	I/Q In and I/Q Out	2 Slots	DC–500 MHz	1 GHz	N/A	380 µs	Yes, up to 1 GHz

*See **RF Module Accessories**

Recommended software (sold separately):

- NI LabVIEW
- RFmx
- NI InstrumentStudio

Additional resources for software development:

C/C++, .NET

- LabWindows/CVI
- InstrumentStudio

Vector Network Analyzers

- Single-slot 26.5 GHz 2-port VNA with pass-through mode for VSG and VSA testing at VNA ports
- Combined VST and VNA simplifies large and small signal testing to one test insertion
- Vector Calibration Module for automated 1-port and 2-port S-parameter calibrations
- Software support with RFmx VNA and InstrumentStudio™ software

Key Features:

Single-Connection Modulation Analysis and S-Parameter Testing

Pair the latest NI VNA and VST to integrate both S-parameter and modulation measurements into a DUT test plan without complex switching setups.

Simplified Calibration Process

Simplify calibration using an electronic vector calibration module for easy and convenient S-parameter calibration.

Powerful Software

RFmx is a set of interoperable measurement personalities together with waveform creation software that extends the capability of NI RF instrumentation for general-purpose, connectivity, cellular, and aerospace and defense test applications.

Vector Network Analyzers Modules

Selection Guide	Model	Part Number	Frequency Range	Ports	Dynamic Range (Typical)	Maximum Source Power (Typical)	Corrected Directivity
High-Performance S-Parameter Capability	PXIe-5633	788182-26	50 MHz-26.5 GHz	2	125 dB (> 22 GHz to 26.5 GHz) 134 dB (> 18 GHz to 22 GHz) 137 dB (> 8 GHz to 18 GHz) 138 dB (> 6 GHz to 8 GHz) 146 db (> 300 MHz to 6 GHz) 134 dB (100 MHz to 300 MHz)	+5 dBm (> 22 GHz to 26.5 GHz) +10 dBm (> 18 GHz to 22 GHz) +13 dBm (> 12 GHz to 18 GHz) +15 dBm (> 8 GHz to 12 GHz) +16 dBm (> 6 GHz to 8 GHz) +18 dBm (50 MHz to 6 GHz)	≥ 39 dB (> 20 GHz to 26.5 GHz) ≥ 40 dB (> 12 GHz to 20 GHz) ≥ 41 dB (> 8 GHz to 12 GHz) ≥ 42 dB (100 MHz to 8 GHz)
		788182-18	50 MHz-18 GHz	2	137 dB (> 8 GHz to 18 GHz) 138 dB (> 6 GHz to 8 GHz) 146 db (> 300 MHz to 6 GHz) 134 dB (100 MHz to 300 MHz)	+13 dBm (> 12 GHz to 18 GHz) +15 dBm (> 8 GHz to 12 GHz) +16 dBm (> 6 GHz to 8 GHz) +18 dBm (50 MHz to 6 GHz)	≥ 40 dB (> 12 GHz to 20 GHz) ≥ 41 dB (> 8 GHz to 12 GHz) ≥ 42 dB (100 MHz to 8 GHz)
		788182-12	50 MHz-12 GHz	2	138 dB (> 6 GHz to 8 GHz) 146 db (> 300 MHz to 6 GHz) 134 dB (100 MHz to 300 MHz)	+15 dBm (> 8 GHz to 12 GHz) +16 dBm (> 6 GHz to 8 GHz) +18 dBm (50 MHz to 6 GHz)	≥ 41 dB (> 8 GHz to 12 GHz) ≥ 42 dB (100 MHz to 8 GHz)
		788182-08	50 MHz-8 GHz	2	138 dB (> 6 GHz to 8 GHz) 146 db (> 300 MHz to 6 GHz) 134 dB (100 MHz to 300 MHz)	+16 dBm (> 6 GHz to 8 GHz) +18 dBm (50 MHz to 6 GHz)	≥ 42 dB (100 MHz to 8 GHz)

RF Module Accessories

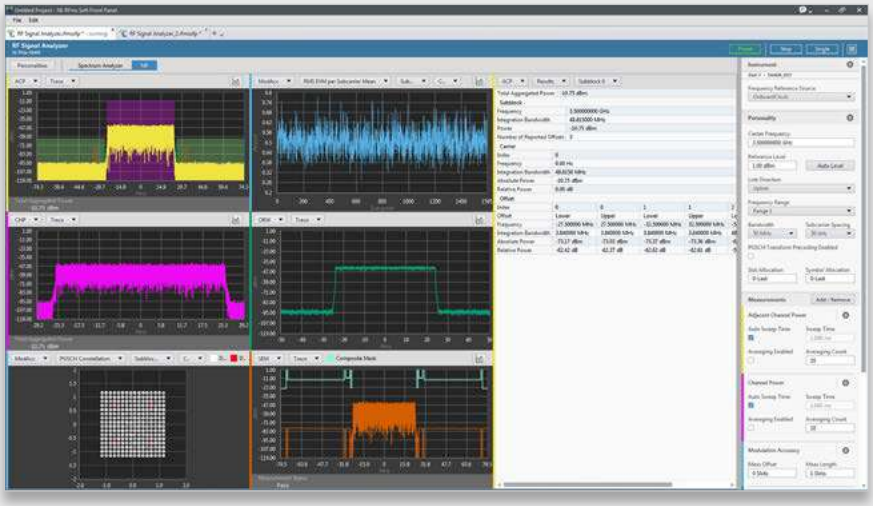
VST and VNA Accessories

Selection Guide	Cable Part Number	Length	Back-End Connection	Front-End Connection	Max Frequency	Description	Model Compatibility
High Performance, Temperature-Stable	136692-1000	1,000 mm	2.92 mm (Male)	2.92 mm (Male)	26.5 GHz	Phase stability over temperature for wideband and some VNA applications. Lower insertion loss.	PXIe-5842 PXIe-5841 PXIe-5831 PXIe-5633
	136692-0650	650 mm					
Temperature-Stable	136691-0870	870 mm	SMA (Male)	SMA (Male)	26.5 GHz	Phase stability over temperature for wideband and some VNA applications. Higher insertion loss.	PXIe-5842 PXIe-5841 PXIe-5831 PXIe-5633
	136691-0670	670 mm					
	136691-0400	400 mm					
High Performance, Phase-Stable for VNA Applications	137445-01	1,000 mm	3.5 mm (Male)	3.5 mm (Male)	26.5 GHz	Phase stable measurements (S-parameters). Best performance.	PXIe-5842 PXIe-5841 PXIe-5831 PXIe-5633
Phase-Stable for VNA Applications	137446-03	3,000 mm	3.5 mm (Male)	3.5 mm (Male)	26.5 GHz	Phase stable measurements (S-parameters). Higher flexibility.	PXIe-5842 PXIe-5841 PXIe-5831 PXIe-5633
	137446-01	1,000 mm					
Low Cost	137833-1000	1,000 mm	SMA (Male)	SMA (Male)	26.5 GHz	Suitable for most configurations needing 26 GHz. Low cost.	PXIe-5842 PXIe-5841 PXIe-5831 PXIe-5633
	137833-0600	600 mm					
	137833-0300	300 mm					
	137833-0150	150 mm					
Rated for mmWave Applications	138286-1000	1,000 mm	1.85 mm (Male)	1.85 mm (Male)	67 GHz	High-performance, suitable for mmWave applications.	PXIe-5842 PXIe-5831

VNA Calibration Kits and Accessories

Selection Guide	Model	Part Number	Number of Ports	Frequency Coverage	Calibration Method
Electronic Vector Calibration Module	CAL-5501*	788189-01	2	50 MHz – 26.5 GHz	Short, Open, Load (SOL) and Short, Open, Load, Through (SOLT)

*For Use with PXIe-5633 VNA Only



RFmx General Purpose Bundle: 790556-35

RFmx Cellular Bundle: 788033-35

RFmx Connectivity Bundle: 790555-35

NI RFmx

RFmx is a set of interoperable software applications that optimize NI RF instrumentation for general-purpose, cellular, connectivity, and aerospace/defense test applications. RFmx simplifies your signal generation and measurement experience.

Key Features:

Standard-Compliant

Test multiple wireless standards for cellular, connectivity, and IoT signals. Select the personality of RFmx for your specific application and testing needs.

Quicker Start

Begin measurement out of the box with interactive soft front panels and, with waveform creation software, generate and modify unlocked waveforms.

Faster Execution

Complete testing quicker by taking advantage of innate high-speed measurement algorithms and composite measurement functionality.

Recommended software:
UHD, RF Network on Chip (RFNoC)
Additional resources for software development:
Python, GNU Radio, C/C++, VHDL/Verilog
Additional software (sold separately):
NI LabVIEW™

Software Defined Radios

- 1 MHz to 8.4 GHz frequency ranges
- Up to 1.6 GHz/channel of bandwidth
- Up to eight transmit and eight receive channels per radio
- Development tools such as LabVIEW, open-source UHD, GNU Radio, and MathWorks MATLAB® software

Key Features:

Build Advanced Wireless Systems

Modern wireless systems require a new generation of software defined radios (SDRs) for prototyping and deployment. Systems need wider bandwidth, higher frequencies, and more advanced digital signal-processing architectures. Explore how the latest USRP (Universal Software Radio Peripheral) options offer enhanced performance to build your next advanced wireless prototype.

Prototype with Wider Bandwidth

Prototyping algorithms for applications such as radar research requires the need for wider bandwidths and more channels. At up to 1.6 GHz of bandwidth and eight transmit and receive channels, the NI Ettus USRP X440 achieves higher accuracy for direction-finding while maintaining phase coherency.

Use the Software of Your Choice

No matter your development tool preferences, you can be confident in USRP hardware, which is compatible with the broadest range of software workflows on the market. You can choose LabVIEW for a unified dataflow programming style, or use the open-source driver with support for C, C++, MathWorks MATLAB®, GNU Radio, and more.

Software Defined Radio Modules

Selection Guide	NI Model	NI Ettus Model	Part Number	#TX	#RX	Frequency Range	Bandwidth
Stand-Alone, FPGA-Enabled, High-Performance	**USRP X440**	USRP X440	788670-01	8	8	30 MHz—4 GHz	1.6 GHz
	USRP X410	USRP X410	787272-01	4	4	1 MHz—7.2 GHz	400 MHz
	—	**USRP N320**	786503-01	2	2	3 MHz—6 GHz	200 MHz
	—	**USRP N321**	786504-01				
	—	**USRP N310**	785067-01	4	4	10 MHz—6 GHz	100 MHz
	USRP-2974	N/A	785606-01	2	2	10 MHz—6 GHz	160 MHz
Host-Connected, FPGA-Enabled, High-Performance	—	OBX daughterboard for USRP X310	789162-01	2	2	10 MHz—8.4 GHz	160 MHz
	USRP-2944	USRP X310 + UBX	783149-01	2	2	30 MHz—6 GHz	160 MHz
	USRP-2945	USRP X310 + TwinRx	785263-01	0	4	10 MHz—6 GHz	80 MHz
	USRP-2954	USRP X310 + UBX + GPSDO	783153-01	2	2	30 MHz—6 GHz	160 MHz
	USRP-2955	USRP X310 + TwinRx + GPSDO	785264-01	0	4	10 MHz—6 GHz	80 MHz
Low Size, Weight, and Power (SWAP), Stand-Alone, Embedded	—	**USRP E320 (Larger FPGA)**	786189-01	2	2	70 MHz—6 GHz	56 MHz
Low SWAP, Low Cost, USB-Connected	—	**USRP B206mini-i**	789155-01	1	1	70 MHz—6 GHz	56 MHz
	USRP-2900	USRP B200	784039-01	1	1	70 MHz—6 GHz	56 MHz
	USRP-2901	USRP B210	784040-01	2	2	70 MHz—6 GHz	56 MHz

Software Defined Radio Accessories

USRP Power Cables

Part Description	EMI Supression Ferrite, 13.05 mm	Power Cord for USRP RIO, Australia	Power Cord for USRP RIO, China	Power Cord for USRP RIO, Europe	Power Cord for USRP RIO, Japan	Power Cord for USRP RIO, Korea	Power Cord for USRP RIO, UK	Power Cord for USRP RIO, US	International Power Cords for USRP RIO
Part Number	784968-01	785023-03	785023-10	785023-04	785023-07	785023-09	785023-06	785023-01	783490-01
USRP X440	✓	✓	✓	✓	✓	✓	✓	✓	✓
USRP X410	✓	✓	✓	✓	✓	✓	✓	✓	✓
USRP 2955	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP 2954	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP 2945	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP 2974	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP N321	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP N320	✓	✓	✓	✓	✓	✓	✓	✓	—
USRP N310	✓	✓	✓	✓	✓	✓	✓	✓	—

RF Cables

Part Description	Kit for USRP Systems Includes Two SMA-M to SMA-M Cables (1 m) and Two SMA-F to SMA-M Attenuators (30 dB, 50 Ω, DC-6 GHz)	One SMA-M to SMA-M Cable, New Low-Loss Coax Good to 6 GHz, 1 m
Part Number	782781-01	783469-01
USRP X440	—	—
USRP X410	✓	✓
USRP 2955	✓	✓
USRP 2954	✓	✓
USRP 2945	✓	✓
USRP 2974	✓	✓
USRP N321	✓	✓
USRP N320	✓	✓
USRP N310	✓	✓
USRP 2900	✓	✓
USRP 2901	✓	✓
USRP B206mini	✓	✓

USRP X4XX Accessories

Part Description	USRP X4XX 19'' Rack-Mount Accessory, 1U, 1 USRP X4XX Device, w/ Surrogate Extension	USRP X4XX 19'' Rack-Mount Accessory, 1U, 2 USRP X4XX Devices, Shoulder to Shoulder	USRP X4XX Desktop Stack Accessory, Single USRP X4XX Device Fastened Buildup	USRP X4XX Fan Cartridge Accessory, Exhaust	USRP X4XX Fan Cartridge Accessory, Intake
Part Number	788149-01	788147-01	788148-01	788164-01	788165-01
USRP X440	✓	✓	✓	✓	✓
USRP X410	✓	✓	✓	✓	✓

USRP X4XX Accessories (continued)

Part Description	Dual 100 Gigabit Ethernet PCIe Interface Kit for Ettus USRP X4XX	SHH19-H19-AUX Shielded Single-Ended Cable for AUX Digital I/O with Jackscrew, 2 m	PCIe Gen3 Interface Kit for Ettus USRP X4XX (Desktop)	QSFP28 to 4XSFP28 Breakout Cable, 1 m	QSFP28 Twinaxial Cable, 3 m	SCB-19 Noise-Rejecting, Shielded Auxiliary I/O Connector Block
Part Number	788216-01	152629-02	788264-01	788214-01	788215-03	782444-01
USRP X440	✓	✓	✓	✓	✓	✓
USRP X410	✓	✓	✓	✓	✓	✓

USRP RIO Accessories

Part Description	PCIe-MXI Express Interface Kit for USRP RIO	PXIe-MXI Express Interface Kit for USRP RIO	SFP+ Cable, 1 m	GPIO Connection Kit for USRP RIO
Part Number	783487-01	783488-01	784076-01	783491-01
USRP 2974	✓	✓	✓	✓
USRP 2955	✓	✓	✓	✓
USRP 2954	✓	✓	✓	✓
USRP 2945	✓	✓	✓	✓
USRP 2944	✓	✓	✓	✓

Software Defined Radio Accessories

Clocking Accessories

Part Description	OctoClock-G CDA-2990	OctoClock CDA-2990	Board-Mounted GPSDO (TCXO) Recommended for USRP B200/B210	Board-Mounted GPSDO (OCXO) Recommended for USRP X300/X310
Part Number	784306-01	784305-01	783454-01	783173-01
USRP X4xx	✓	✓	—	—
USRP X3xx	✓	✓	—	✓
USRP N3xx	✓	✓	—	—
USRP 294x	✓	✓	—	✓
USRP 295x	✓	✓	—	included
USRP B2xx, 2900	✓	✓	✓	—
USRP 320	✓	✓	—	—

Instrument Control

Too often, powerful box instruments are left on the shelf collecting dust because they communicate using outdated interfaces like serial and GPIB. NI instrument-control hardware can connect these instruments to your laptop or desktop using USB, Ethernet, or PCI Express. Take advantage of thousands of ready-to-use instrument drivers that make it easy to control your instruments using LabVIEW.

Instrument Connection	Form Factor	Notes	Model Name
GPIB	Ethernet	—	**GPIB-ENET/1000**
GPIB	RS232	—	**GPIB-RS232**
GPIB	USB 2.0	Onboard GPIB Analyzer	**GPIB-USB-HS+**
GPIB	PCI Express	—	**PCIe-GPIB**
GPIB	PCI Express	Onboard GPIB Analyzer	**PCIe-GPIB+**
RS232	PCI Express	2 Channels	**PCIe-8430/2**
RS232	PCI Express	8 Channels	**PCIe-8430/8**
RS232	PCI Express	16 Channels	**PCIe-8430/16**
RS485, RS422	PCI Express	2 Channels	**PCIe-8431/2**
RS485, RS422	PCI Express	8 Channels	**PCIe-8431/8**
RS485, RS422	PCI Express	16 Channels	**PCIe-8431/16**
RS232	PCI Express	2 Channels, Port-Port Isolation	**PCIe-8432**
RS485, RS422	PCI Express	2 Channels, Port-Port Isolation	**PCIe-8433**
RS232	USB 2.0	1, 2, and 4 Channels	**USB-232**
RS485, RS422	USB 2.0	1, 2, and 4 Channels	**USB-485**
RS232	PXI Express	16 Channels	**PXIe-8430/16**
RS232	PXI Express	8 Channels	**PXIe-8430/8**
RS485, RS422	PXI Express	16 Channels	**PXIe-8431/16**
RS485, RS422	PXI Express	8 Channels	**PXIe-8431/8**
Ethernet	PXI Express	Ethernet bandwidth 25 Gb/s	**PXIe-8285**
Ethernet	PXI Express	Ethernet bandwidth 1 Gb/s	**PXIe-8245**
Ethernet	PXI Express	Ethernet bandwidth 40 Gb/s	**PXIe-8240**
Ethernet	PXI Express	Ethernet bandwidth 10 Gb/s	**PXIe-8238**
Ethernet	PXI Express	Ethernet bandwidth 50 Gb/s	**PXIe-8280**
GPIB (IEEE 488) RJ45	PXI	Linux, Windows, and LabVIEW Real-Time Module	**PXI-GPIB**

LabVIEW for Instrument Control

- 7000+ ready-to-run instrument drivers with examples and documentation
- Plug-and-play functionality for popular vendors like Tektronix, Keysight, Keithley, Rohde & Schwarz, and more
- Immediate start with open-and-run examples
- Flexible, scalable software platform to accomplish more with less time, effort, and budget

Visit our Instrument Driver Network (NI.com/idnet) to download a driver to communicate with third-party instruments.

NI Partner Network

The NI Partner Program offers domain, application, and overall test development expertise to help your team get ahead and stay ahead:

- Innovate faster with proven scalable solutions
- Reduce development time and cost through integration and consulting assistance

Types of Partners

Solution Partners

- Experts in delivering products and solutions to solve your specific automated test or automated measurement application challenges.

System Integrators

- Specialists in integrating and deploying test and measurement systems, based on your specific requirements and their mature industry capabilities.

Consultants

- Experts in project services in areas such as software development, engineering, science, analytics, regulatory compliance, or other specialized skills to support complex systems.

Distributors

- Globally and regionally accessible, authorized distributors with local knowledge and an understanding of the available NI product portfolio, providing a one-stop option for configuring and sourcing your project needs.

Connect with our global community of trusted NI Partners ready to give your business a competitive edge. Find a partner or solution at ni.com/findapartner.

Services

NI offers a variety of services to ensure you can be successful throughout the lifecycle of your application. With global solution centers, NI engineers in more than 40 countries, and a vast network of more than 900 NI Partners, NI service programs help you mitigate risks, develop faster, and reduce costs to achieve your goals.

Hardware Services

From the moment you unbox your hardware to deployment and maintenance, NI hardware services help you get started quickly and operate efficiently throughout the lifecycle of your test system.

Entitlement	Hardware Warranty	Standard	Premium	Description
Duration at Point of Sale	1 Year; Included	3 Years; Optional	3 Years; Optional	NI enhances warranty coverage with additional service benefits provided with a hardware service program.
Maximum Duration with Renewal	≤5 Years with Service Program	≤5 Years	≤5 Years	NI maintains high performance and availability of your hardware for up to 5 years with a hardware service program. For coverage beyond 5 years, NI provides lifecycle service options.
Extended Repair Coverage (3 or 5 years)	✓	✓	✓	NI restores your device's functionality and includes firmware updates and factory calibration.
System Configuration, Assembly, and Test	—	✓	✓	NI technicians assemble, install software on, and test your system per your custom configuration prior to shipment.
Advanced Replacement	—	—	✓	NI stocks replacement hardware that can be shipped immediately if a repair is needed.
System RMA	—	—	✓	NI accepts the delivery of fully assembled systems when performing repair services.
Technical Support	✓	✓	✓	NI provides access to support resources for your hardware.
Calibration Plan (Optional)	—	Standard	Expedited	NI performs the requested level of calibration at a specified calibration interval for the duration of the service program.

Education Services

Whether you are new to NI products or have been using them for years, access to the right learning resources when you need them is critical to your success. We offer courses and certification programs to help you develop applications, work with NI hardware, and more.

Customer Education Courses

Whether it's a class held at a local facility, on-site at your office, or in a virtual classroom, you can select a training delivery format to accommodate your learning preferences.

Training Entitlements

All of our software subscriptions include access to introductory on-demand courses. Discover NI's complete library of on-demand lessons and learning paths available for free and for purchase.

Certification Program

With certifications from associate developer to architect for LabVIEW and NI TestStand software, you can join the ranks of the thousands of engineers with NI professional certifications.

NI provides flexible options for purchasing training and certification. Whether you want to make an upfront investment or pay as you go, NI meets you at your budgetary needs.

Save money with a training membership

A training membership is a cost-effective way to take multiple instructor-led training courses. This program provides one year of unlimited access to instructor-led training and certification.

Buy credits now, schedule later

Purchase Education Services Credits now and redeem later for any training or certification offering. Education Services Credits expire after one year.

Secure a seat in a public course

View NI's global training calendar and secure a seat in an upcoming virtual or classroom instructor-led course.

Take advantage of on-demand learning

NI software licenses include one-year access to introductory on-demand learning content so you can onboard quickly. Additional on-demand courses are available for purchase.

Organize a private training event

NI offers private training events for teams of up to 12 students. Private training events can leverage standard NI training courses and include custom materials tailored to your needs.

Technical Support Services

With the knowledge, experience, and responsiveness of NI applications engineers in more than 30 languages and 40 countries, NI has the technical support resources to ensure your success.

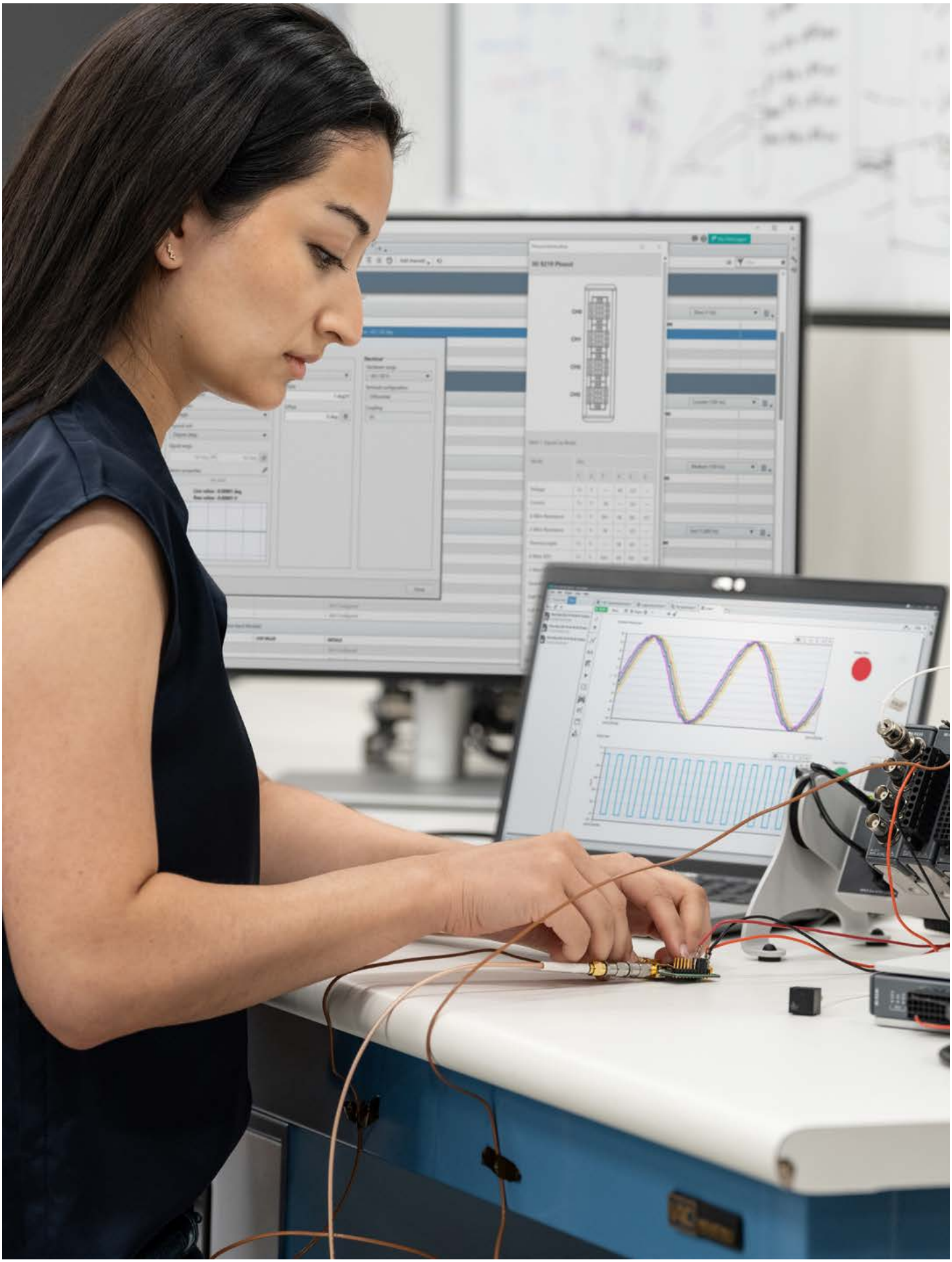
Access Your NI Standard Technical Support:

Included with Software

- Technical support included with your software subscription license

Included with NI Hardware Warranty

- One year of standard technical support is included with all NI hardware through your hardware warranty



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