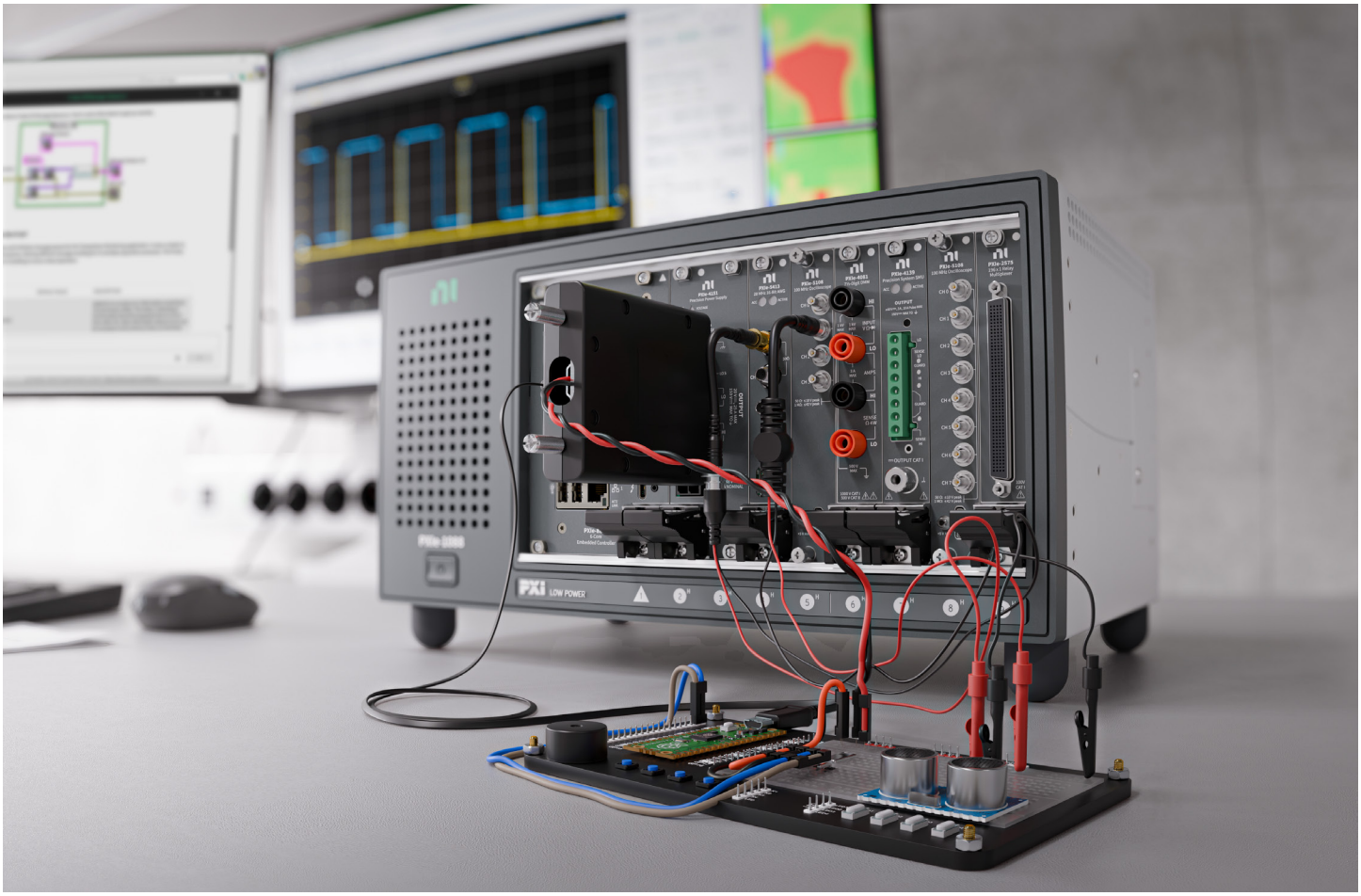
EMERSON

PRODUCT BROCHURE

PXI Oscilloscopes

Contents



NI PXI Oscilloscopes

Included software:
NI InstrumentStudio™
Recommended software (sold separately):
NI LabVIEW™
NI TestStand™
Driver support for:
C/C++, C#, Python, LabWindows™/CVI

NI PXI oscilloscopes offer:

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

Key Features

Build high-channel count systems—With synchronized multi-instrument sessions, you can automatically synchronize multiple PXI oscilloscopes of the same model with NI InstrumentStudio™ software, NI LabVIEW, Python, or any other API using the NI-SCOPE driver.

Store and process extensive data—NI PXI oscilloscopes feature deep onboard memory for high resolution, long-duration signal capture, and multiple acquisitions from single or parallel channels.

Avoid system downtime—NI CableSense™ technology can reduce risk of faulty electrical connection by detecting changes from a known, golden setup without having to alter the connections themselves.

NI PXI: Built for Automated Test and Measurement

PXI offers engineers high performance while reducing test time and cost compared to traditional box instruments. The combination of modularity and software connectivity is ideal for advanced test applications that require precise, large-channel count, mixed-measurement solutions.

Best for:

- High-channel, high-speed test applications
- Combining instruments, sensors, and electrical measurements
- Automated validation test
- Production test systems for electronic devices

NI PXI Oscilloscopes Portfolio

Selection Guide	Model	Part Number	Resolution	Bandwidth	Sample Rate	Channels	Memory Size	CableSense	Reconfigurable FPGA
General-Purpose	NI PXIe-5114	783591-01	8 bits	125 MHz	250 MS/s	2	8 MB	—	—
		783591-02					64 MB/ch	—	—
		783591-03					256 MB/ch	—	—
	NI PXIe-5105	783590-01	12 bits	60 MHz	60 MS/s	8	16 MB	—	—
		783590-02					128 MB	—	—
		783590-03					512 MB	—	—
	NI 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	—	—
	NI 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	—	—
	NI PXIe-5163	785182-01	14 bits	200 MHz	1 GS/s	2	512 MB	—	—
	NI 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)	NI 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	✓	—
	NI 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	✓	—
	NI 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	✓	—
	NI 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	✓	—
	NI 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	NI PXIe-5164	784183-01	14 bits	400 MHz	1 GS/s	2	1.5 GB	—	Kintex™-7 410T
	NI 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
	NI PXIe-5171	783692-01	14 bits	250 MHz	250 MS/s	8	1.5 GB	—	Kintex-7 410T
	NI 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 Probes

An oscilloscope probe is a critical link between your circuit under test and your oscilloscope. Even the most advanced oscilloscope cannot deliver reliable results without the right probe—so selecting the appropriate type is essential for accurate measurements.

Choosing the right probe ensures you capture signals accurately and safely. For a deeper dive into oscilloscope probe fundamentals, read the white paper **Select the Right Oscilloscope Probe for Your Application**.

PXI Oscilloscope Probes Compatibility

Single-Ended Passive Probes

The most common choice, containing only passive components. Ideal for general-purpose measurements.

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

Designed for high-frequency applications, offering extremely low capacitance and isolation from ground references.

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, 2 GHz, 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

Perfect for evaluating current signals alongside voltage lines, enabling comprehensive analysis.

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 to 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	—

Detailed View

PXI oscilloscopes break away from the bulky, stand-alone look of traditional box instruments. Instead of a large enclosure with a built-in screen and knobs, PXI oscilloscopes are compact, high-density modules that slide directly into a PXI chassis, similar in size to a graphics card (shown in Figure 1). You control them entirely through software, giving you the flexibility to configure, automate, and scale your system.

PXI oscilloscopes are purpose-built for automated test systems, allowing you to combine multiple instruments in a single, space-saving chassis. This modular approach eliminates cable clutter, reduces system size, and enables high channel count systems.

Figure 1. Detailed view shown for NI PXIe-5113 Oscilloscope; connectors and channels vary by PXI oscilloscope model.

Key Features

In general, NI PXI oscilloscopes provide the measurement performance of traditional box oscilloscopes in a form factor better suited for automated test and high-channel-count applications. Various advantages include integration with other instrument types, synchronization for high-channel-count systems, superior data throughput and lower bus latency, deep onboard memory, and debug monitoring and control support in InstrumentStudio software.

Synchronization and Integration

NI oscilloscopes use the inherent timing and synchronization capabilities of the PXI platform to communicate with switches and other instruments within the PXI chassis. Using the timing features of the PXI chassis and additional timing software, you can achieve synchronization of <10 ps between channels of multiple oscilloscopes. NI oscilloscopes can also "handshake" with NI waveform generators by sending and receiving hardware-timed triggers over the PXI backplane as shown in Figure 2, scanning through a list of frequencies in a scan list stored in memory onboard the waveform generator. This method of scanning removes the software overhead associated with traditional scan lists and helps you create a deterministic scan list for faster test execution with more repeatable timing.

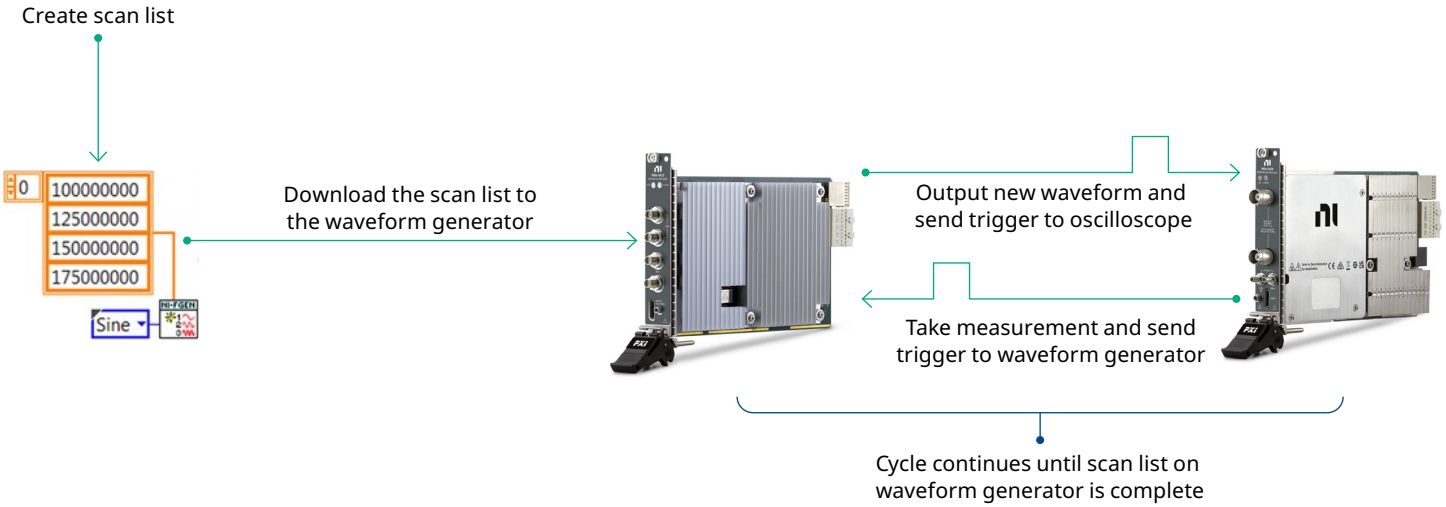


Figure 2. Timing and Synchronization

You also can implement the timing and synchronization of multiple instruments through NI-TClk. It aligns the sample clocks of multiple instruments in a single chassis or across multiple chassis using a timing and control module to distribute the 10 MHz reference clock and triggers from a master chassis to all worker chassis.

Learn more about NI-TClk timing and synchronization

Synchronize Multi-Instrument Session

Combine multiple NI PXIe oscilloscopes of the same model and channel count into a single, unified “n-channel” scope, with no manual setup or cabling required. Built on NI-TClk architecture, synchronization is handled automatically within the driver by routing triggers and clocks, eliminating complex manual configuration.

Synchronize multi-instrument session is supported in the NI-SCOPE API across InstrumentStudio, LabVIEW, Python, and other environments, enabling seamless integration and control for advanced test workflows, as shown in Figure 3.

Learn more about NI Synchronize Multi-Instruments Session

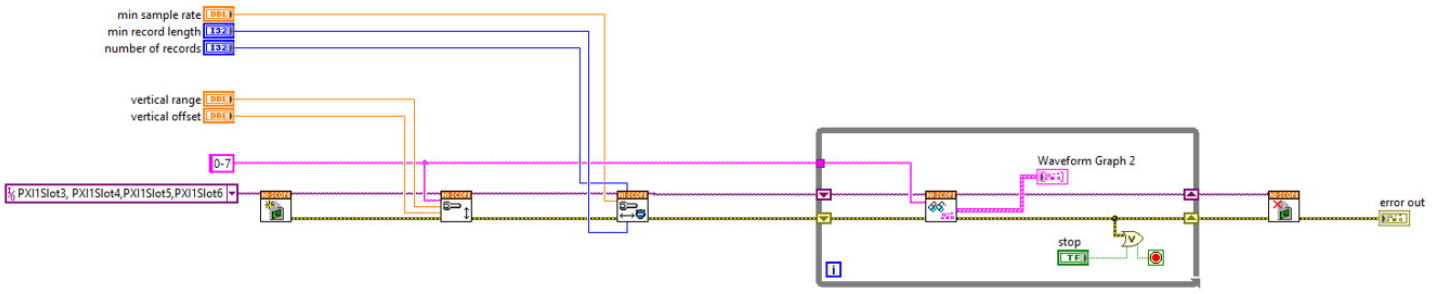


Figure 3. Example of a Synchronize Multi-Instruments Session Configuration in LabVIEW

Avoid Test System Downtime with CableSense

The NI PXIe-511x series as well as the PXIe-5160 and PXIe-5162 models work with CableSense technology by incorporating a pulse generator behind the oscilloscope channel’s 50 Ω path. Like a traditional time-domain reflectometer (TDR), the PXI oscilloscope sends a pulse along the entirety of the electrical path, allowing for the characterization of the impedance or reflection coefficient over time. This enables the early detection of common automated test equipment (ATE) connection issues without disrupting the ongoing test. By creating limit masks from a known, golden setup, you can programmatically verify the system’s physical setup against these known masks, as shown in Figure 4. This automates the detection of both major and minor failures, which ensures repeatability and the prevention of false failures.

Learn more about avoiding test system downtime using NI CableSense technology

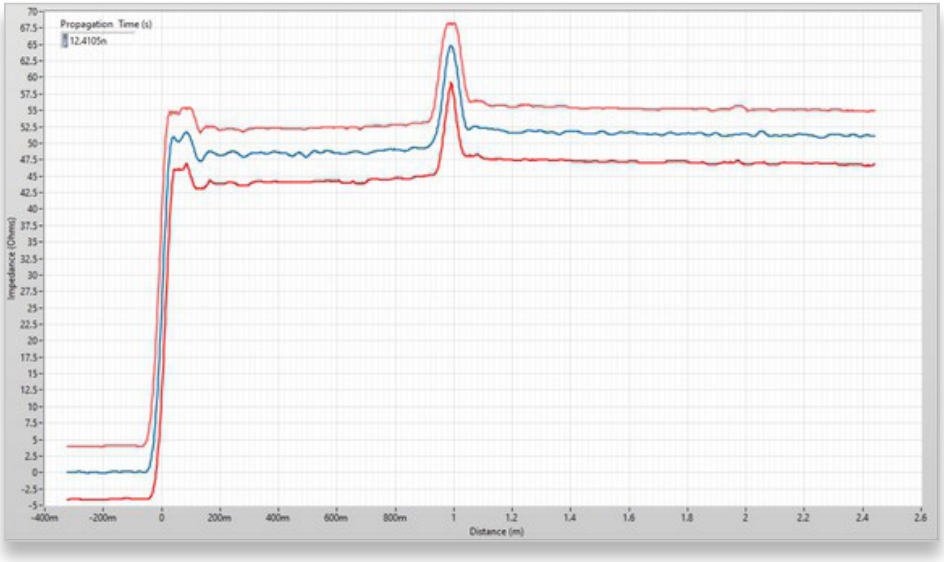


Figure 4. The CableSense pulse passes the mask check, meaning the setup has not varied from its known, golden setup.

Self-Calibration and Two-Year Guaranteed Specifications

As depicted in Figure 5, NI oscilloscopes offer self-calibration, which is a unique feature that corrects for all DC gain and offset drifts within the instrument using a precision, high-stability internal voltage. Using the self-calibration feature makes NI oscilloscopes highly accurate and stable at any operating temperature—well outside the traditional 18 °C to 28 °C range.

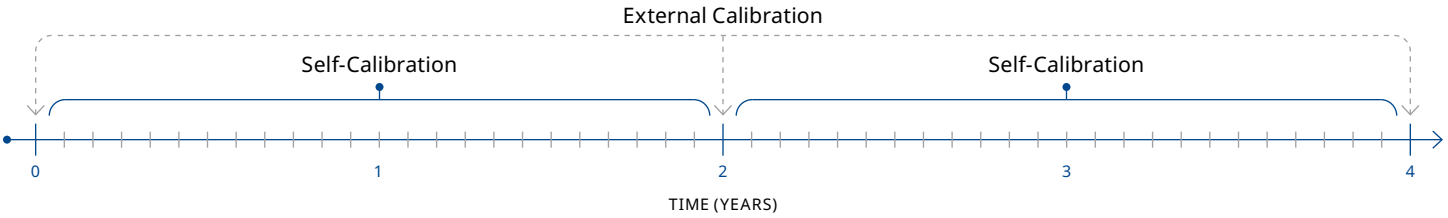


Figure 5. NI Oscilloscope Self-Calibration

Performing self-calibration takes only a few minutes and requires no external calibrator, which minimizes the maintenance burden of deployed systems. Most NI oscilloscopes have up to a two-year external calibration cycle thanks to the self-calibration precision circuitry.

Learn more about NI calibration services

NI PXIe-517x Key Feature

Several 14-bit NI PXI oscilloscopes also have a user-programmable Xilinx Kintex™-7 FPGA for implementing custom triggers or intensive inline processing, as shown in Figure 6.

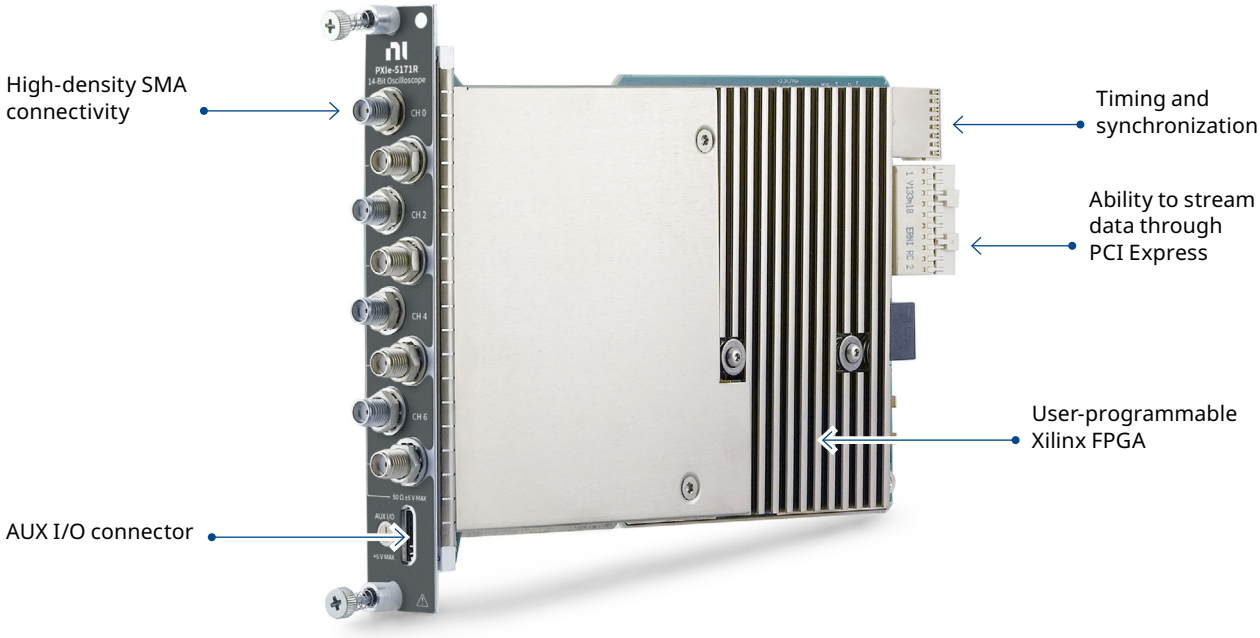


Figure 6. Detailed view shown for NI PXIe-5171 Oscilloscope; connectors and channels vary by PXI oscilloscope model.

To enable their compact, flexible, and powerful design, PXIe-517x oscilloscopes take advantage of multiple technological advances, including low-power, high-resolution ADCs that use the TI JESD204B for data transfer and high-performance, low-power Xilinx Kintex-7 FPGAs, as depicted in Figure 7.

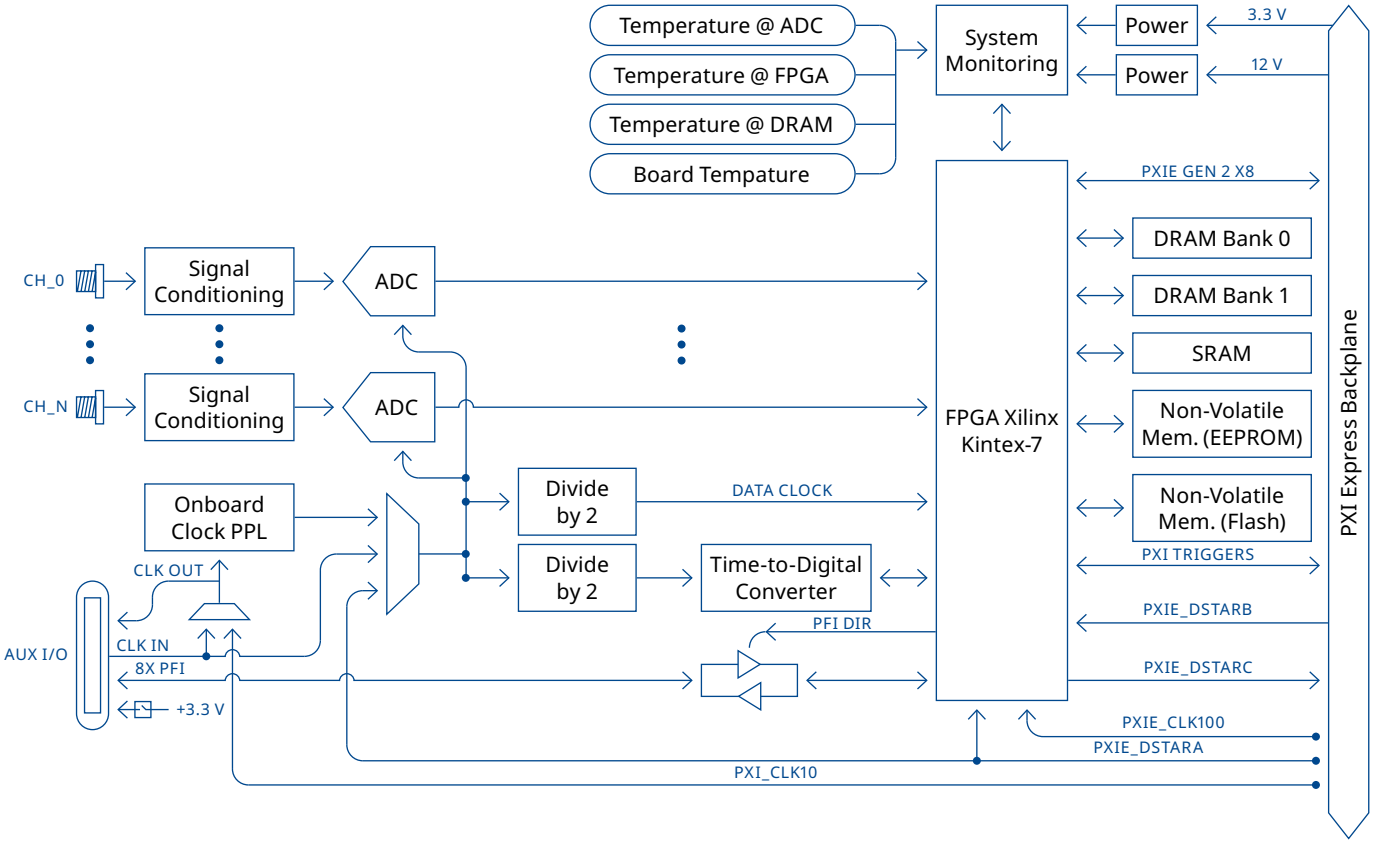


Figure 7. PXIe-517x oscilloscopes are built around a 14-bit Analog Devices ADC and a Xilinx Kintex-7 FPGA.

The First Oscilloscopes with LabVIEW-Programmable FPGAs

The NI PXIe-517x oscilloscopes are the first to include FPGAs that you can target and reprogram with the NI LabVIEW FPGA Module. With this leap forward in instrumentation technology, you can define the operation of your oscilloscopes to meet your needs now and in the future as your devices and experiments change, as depicted in Figure 8. PXIe-517x oscilloscopes give you excellent channel density, accuracy, and measurement flexibility along with a user-programmable FPGA for implementing custom triggers or inline processing. Future-proof your test equipment and improve your test yield with PXIe-517x reconfigurable oscilloscopes.

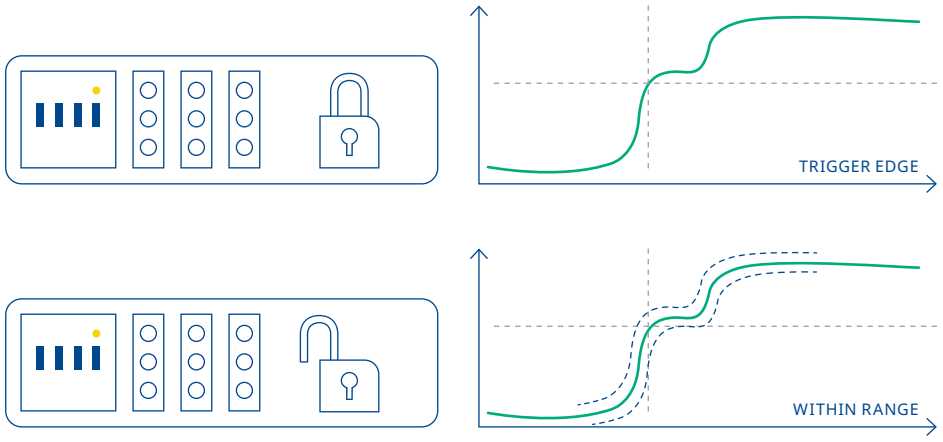


Figure 8. With the user-programmable FPGA in PXIe-517x oscilloscopes, you can customize the firmware of those oscilloscopes to achieve your required results.

NI PXIe-5164 Key Feature

The PXIe-5164 departs from the usual oscilloscope circuit arrangement to achieve a low noise floor and high measurement accuracy. Figure 9 shows the difference in the block diagrams of typical oscilloscopes, in which the 50 Ω mode is accomplished by connecting a 50 Ω resistor in parallel with the front panel input, and the approach taken in the PXIe-5164 oscilloscope, in which a dedicated 50 Ω path bypasses the 1 MΩ section and connects directly to the low-impedance amplifier section. Using one amplifier rather than several eliminates the noise and distortion generated during the multiple stages.

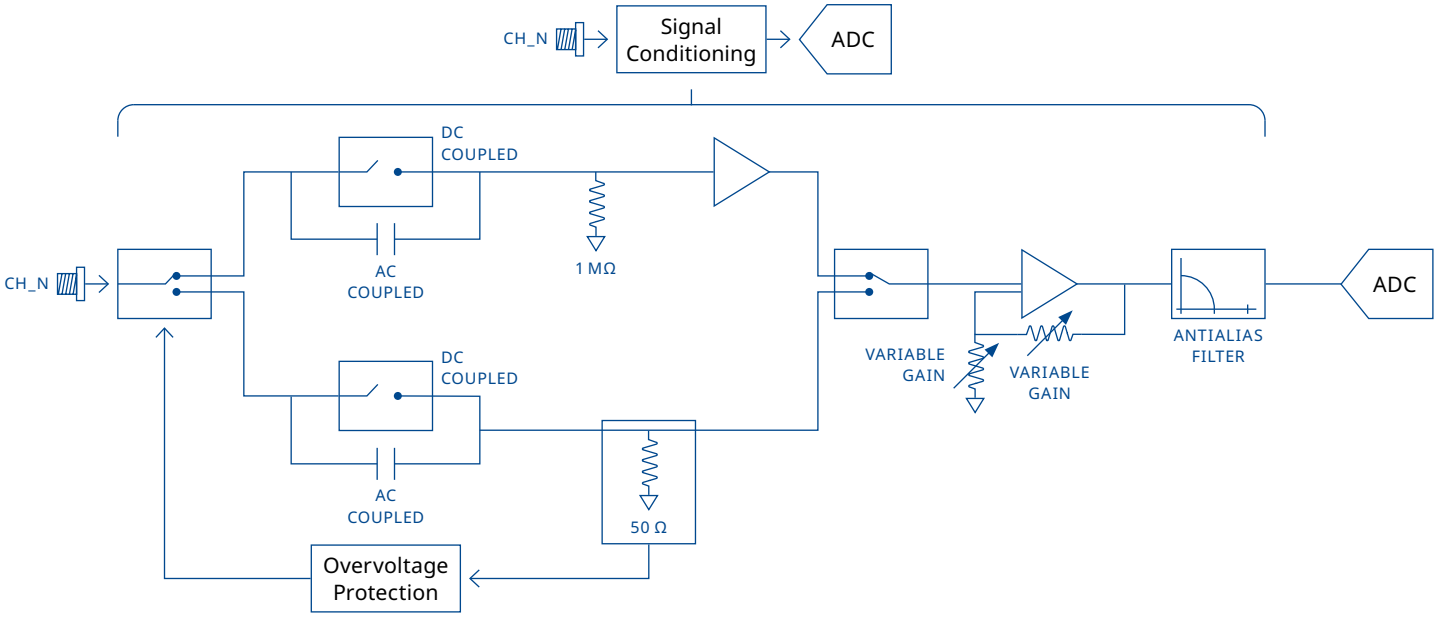


Figure 9. The PXIe-5164 oscilloscope has a signal path optimized for measurement accuracy by bypassing the 1 MΩ buffer on the 50 Ω path and having only a single gain stage. A typical oscilloscope signal path is optimized for high impedance and voltage.

A time domain plot of a one-time-event communications signal riding on a digital pulse taken with a box scope and a PXIe-5164 oscilloscope clearly illustrates the superior dynamic range of the PXIe-5164 over a popular 8-bit box oscilloscope. The communications signal is nearly indiscernible in the data captured with the 8-bit box scope but easily recognizable and decodable in the data captured by the PXIe-5164 oscilloscope, as depicted in Figure 10.

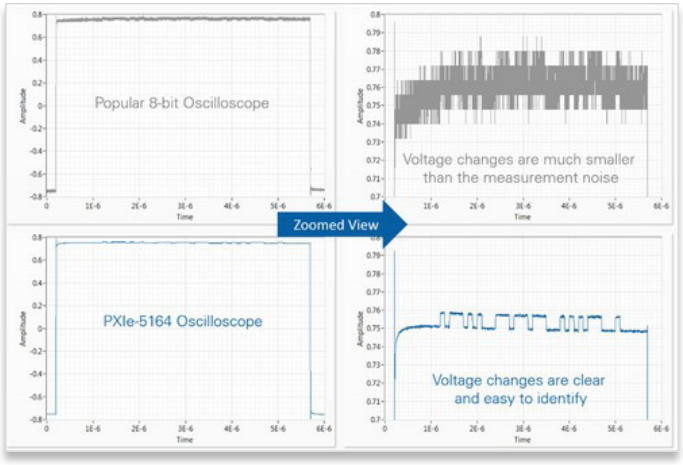


Figure 10. Compare the time domain plots of a popular 8-bit box oscilloscope with the PXIe-5164 oscilloscope. Both are sampling an identical one-time event communications signal riding on a digital pulse. The communications signal is nearly indiscernible on the 8-bit box scope yet easily recognizable and decodable on the PXIe-5164.

The superior dynamic range of the PXIe-5164 is even more pronounced in the frequency domain. The noise floor of the PXIe-5164 is a significant 22 dB lower than that of the popular 8-bit oscilloscope. The PXIe-5164 also has the better harmonic distortion performance.

Digital Signal Processing Stabilizes and Equalizes the Magnitude and Phase Responses

Digital filtering can offer a considerable improvement in range-to-range, channel-to-channel, and even unit-to-unit variability in the frequency and step response of an oscilloscope's analog front end. The PXIe-5164 oscilloscope has a 16-tap finite impulse response (FIR) filter in the FPGA and in line with the ADC data stream to realize a very flat frequency response of ±0.35 dB up to 330 MHz. Figure 11 shows a typical PXIe-5164 oscilloscope response in which the deviation from 0 dB is less than 0.022 dB for all ranges and channels, as well as a measured step response in which the symmetry in the waveform indicates the desired linear phase characteristic.

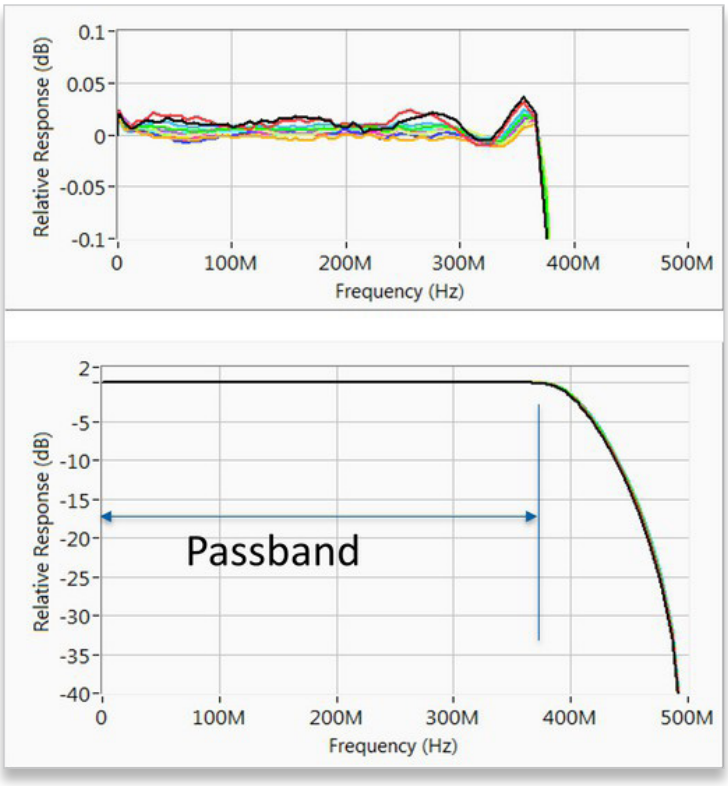


Figure 11. This graph shows the frequency and step response of a typical PXIe-5164 oscilloscope on the 50 Ω path up to the full bandwidth. The responses of all ranges and channels of one module are superimposed, and the maximum deviation in the passband is 0.022.

Software

NI PXI Platform Services API for System Health Monitoring

Automatically installed in each PXI system, PXI Platform Services is a software package that enables advanced PXI features such as chassis and module identification, synchronization, and triggering. It also allows you to monitor and manage system health programmatically using the System Configuration API. This API is accessible from LabVIEW as well as C, .NET, and other supported languages, enabling you to:

- Query chassis temperature, fan speed, and power status
- Retrieve module information and operational status
- Automate self-tests and calibration routines
- Log diagnostic data for predictive maintenance

Hardware Configuration Utility (HWCU)

Automatically installed in each PXI system, Hardware Configuration Utility is the next-generation NI tool for discovering, configuring, and managing test and measurement hardware:

- View local and remote real-time systems
- View hardware configuration information, including required software and drivers
- Perform built-in hardware operations such as resetting, calibrating, and self-testing
- View hardware documentation such as pinouts, user manuals, and specs
- View and manage system software.
- Manage base system images on real-time systems
- View hardware soft front panels
- Save and apply system configurations

HWCU is designed to replace NI Measurement & Automation Explorer (NI MAX) with a modern, streamlined interface and improved workflows. Most hardware is supported in Hardware Configuration Utility; however, if you encounter unsupported devices or tasks, you can continue using NI MAX for full functionality.

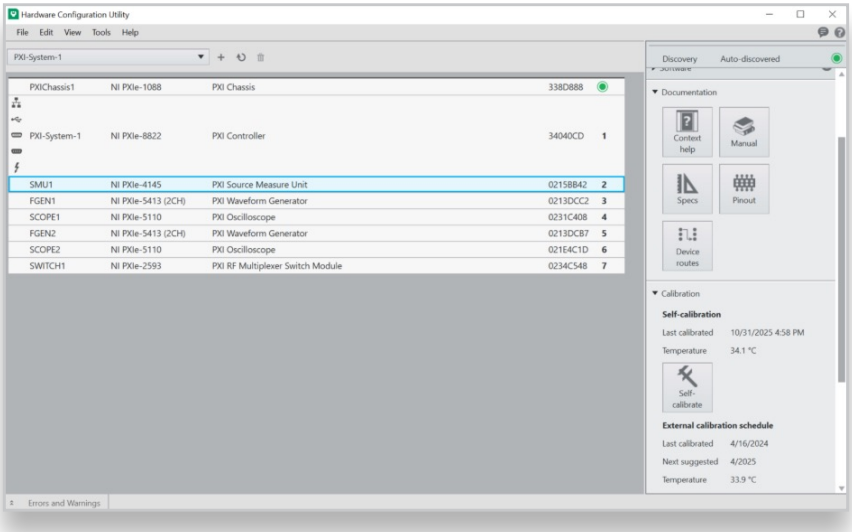


Figure 12. NI Hardware Configuration Utility displaying a PXI system setup. The right panel provides documentation links (manual, specs, pinout) and calibration details, including the last self-calibration date and temperature.

NI-SCOPE Driver and Application Programming Interface (API)

In addition to the InstrumentStudio Soft Front Panel, the NI-SCOPE driver includes a best-in-class API that works with a variety of development options such as LabVIEW, C, C#, Python, and others. To ensure long-term interoperability of oscilloscopes, the NI-SCOPE driver API is the same API used for all past and current NI oscilloscopes. The driver also provides access to help files, documentation, and dozens of ready-to-run shipping examples you can use as a starting point for your application.

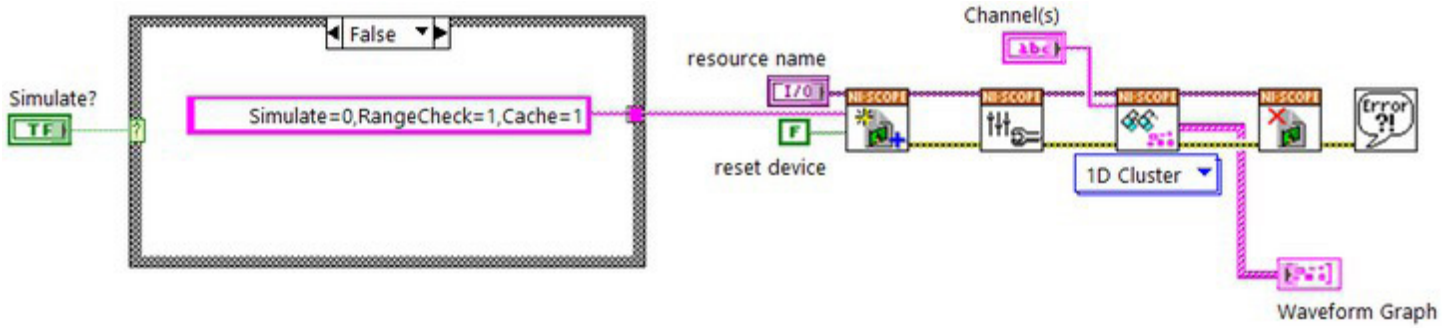


Figure 13. Simple LabVIEW code helps you get started taking measurements using NI-SCOPE.

Measure in Seconds, Automate in Minutes

NI's PXI platform streamlines every stage of automated test, from interactive measurements to full system automation and with NI Nigel, the first AI advisor for test and measurement, to Accelerates your setup and insight. Application Software includes:

- **NI InstrumentStudio™ software—**Simplify setup and control of multiple instruments in a single interface (included in every PXI system).
- **LabVIEW—**Rapidly develop custom measurements with intuitive graphical programming.
- **TestStand—**Orchestrate complex test sequences and reporting.
- **NI Nigel™ AI—**Accelerate your setup and insight with the first AI advisor for test and measurement.

For maximum flexibility, PXI hardware, Instrument Drivers and NI software supports Python, C, C++ code, .NET.

Learn more about support for NI and Python

Supporting Documentation

Document Type	Model
Getting Started Guide	PXIe-5105, PXIe-5108, PXIe-5110/5111/5113, PXIe-5122, PXIe-5160/5162, PXIe-5163, PXIe-5164, PXIe-5170/5171, PXIe-5172, PXIe-5922
Specifications	PXIe-5105, PXIe-5108, PXIe-5110, PXIe-5111, PXIe-5113, PXIe-5122, PXIe-5160, PXIe-5162, PXIe-5163, PXIe-5164, PXIe-5170, PXIe-5171, PXIe-5172, PXIe-5922

Configure a System

The NI online system advisors help you create a custom system based on your specific requirements. Use the advisors to choose compatible hardware, software, accessories, and services—and then save your selections as configurations for easy quoting and purchasing later. Visit **ni.com/advisor** to learn more.

NI PXI: Built for Automated Test and Measurement

NI PXI is a high-performance test and measurement platform that integrates hardware and software—including chassis, controllers, modular instruments, and I/O modules—with advanced synchronization to tackle complex measurement and automation challenges. Renowned for its flexibility and reliability, engineers use PXI to build complex, mixed-measurement systems for applications ranging from research to validation and production test.

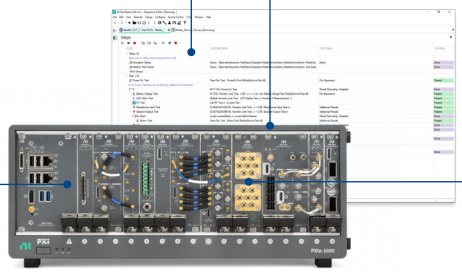
Developed in 1997 and launched in 1998, PXI is an open industry standard governed by the PXI Systems Alliance (PXISA), a group of more than 70 companies chartered to promote the PXI standard, ensure interoperability, and maintain the PXI specification.

Software

Test Management and Code
Development from measurement to automation. Manage, control and debug all in one connected workflow.

Powerful Computer

PXI Embedded or Remote Controller
Latest Intel® processors, Windows or Real-Time operating systems, up to 24 GB/s bandwidth, and up to 912 GB of storage.



Timing and Synchronization

PXI Chassis
2–18 slots options, up to 24 GB/s, sub-nanosecond latency, P2P streaming, integrated triggering.

Modular Instrumentation

PXI Modules
High density and variety of modules delivering power, precision, and flexibility across analog, digital, and RF signals.

Integrating the Latest Commercial Technology

By leveraging advanced commercial technologies, we deliver high-performance, high-quality products at a competitive price. Our systems incorporate high-bandwidth interconnects for faster data throughput, powerful multicore processors for efficient parallel testing, FPGAs that accelerate signal processing at the edge, and precision data converters that expand measurement range and enhance instrumentation performance.

NI PXI Instrumentation

PXI Oscilloscopes

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

PXI LCR Meters and SMUs

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

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

PXI Digital Pattern Instruments

- 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 Waveform Generators

- 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 Digital Waveform Instruments

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

PXI Counter/Timers

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

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
- Four-wire remote sense

PXI Power Supplies

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

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

PXI Switches

- 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 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 FlexRIO Module Development Kit

PXI Source Measure Units (SMUs)

- 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 Signal Conditioning Modules

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

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

PXI Sound and Vibration

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

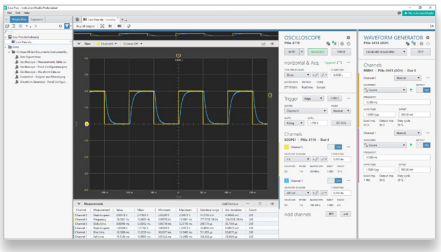
PXI Reconfigurable I/O (FPGA)

- 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

NI Test Software Portfolio Overview

NI Software: The Right Tools for the Job

NI has a variety of software for engineers working on research, validation, and production test applications. Learn about our software that helps engineers perform quick ad-hoc tests, build an automated test system, automate data analysis and reporting, develop test sequences, and more.



NI InstrumentStudio

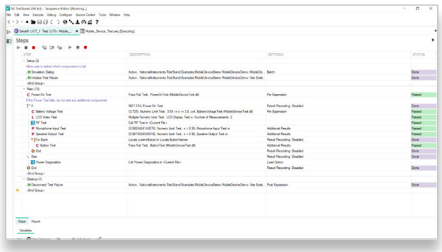
Interactive, configuration-based software for engineers to control and configure instruments.

- Take multi-instrument measurements within one unified environment
- Capture data and instrument configuration for test reports
- Export instrument configurations to LabVIEW and TestStand to shorten development time
- Monitor and debug instruments while software is running

NI LabVIEW

Graphical programming environment that engineers use to develop automated research, validation, and production test systems.

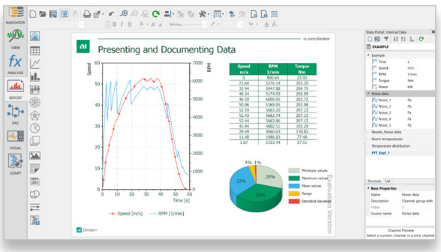
- Acquire data from NI and third-party hardware and communicate using industry protocols
- Use configurable, interactive display elements
- Take advantage of available analysis functions



NI TestStand

Test executive software that accelerates system development for engineers in validation and production.

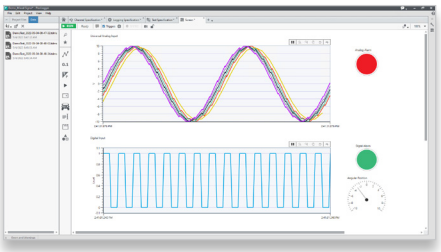
- Call and execute tests in LabVIEW, Python, C/C++, or .NET
- Conduct complex tasks, such as parallel testing
- Create customer operator interfaces and robust tools for deployment and debugging



NI DIAdem

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

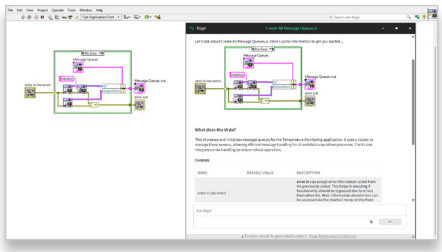
- Display data in multiple 2D-axis systems
- Perform calculations with a simple point-and-click interface
- Automate your measurement data analysis workflow, from import to analysis



NI FlexLogger™

No-code data acquisition software engineers use to build validation and verification test applications.

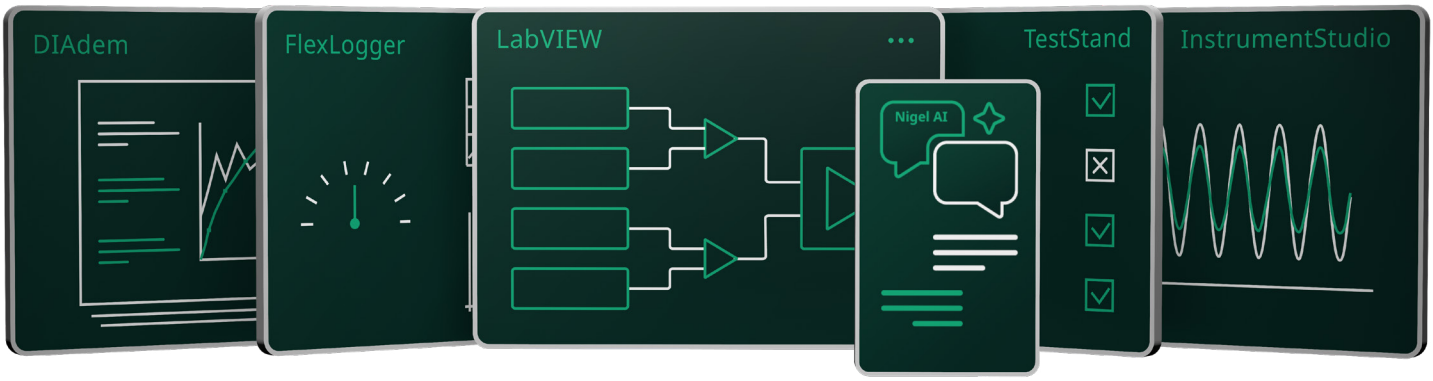
- Interactive visualization tools for monitoring tests with drag-and-drop charts, graphs, and controls
- Ability to set alarms that monitor single channels or groups for unexpected behavior



NI Nigel™ AI

AI tool that provides contextual guidance and insights, helping engineers to eliminate time-consuming tasks and boost productivity.

- Purpose-built for test and measurement workflows
- Optimized for test applications using NI domain expertise
- Integrated into LabVIEW and TestStand for real-time suggestions without switching tools



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

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:

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

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

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

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**.

NI Hardware Services

All NI hardware includes a one-year warranty for basic repair coverage and calibration in adherence to NI specifications prior to shipment. Additional entitlements are available to improve uptime and lower maintenance costs with service programs for hardware. Learn more at **ni.com/services/hardware**.

Benefits	Hardware Warranty	Standard Service Program	Premium Service Program	Description
Duration at Point of Sale	1 year; included	3 years; optional	3 years; optional	We enhance warranty coverage with additional service benefits provided with a hardware service program.
Technical Support Access	✓	✓	✓	We provide access to support resources for your hardware. Learn about support services
Repair Service Coverage*	Factory Defects and Workmanship	Comprehensive and Unlimited	Comprehensive and Unlimited	We restore your device's functionality. Includes firmware updates. Learn more
Adjustments to Factory Specifications with every repair[3]*	✓	✓	✓	We assure that your device will be adjusted to the manufacturer's specifications, ensuring all measurements are within tolerance as part of the repair process.
Repair Service Turnaround Time*	No Commitment	<10 working days[1] + standard shipping	<10 working days[1] + standard shipping	If we miss our committed repair turnaround time targets, you are entitled to a 25% discount on your next service renewal on that asset.[2]
System Configuration, Assembly, and Test	—	✓	✓	NI technicians assemble, install software in, and test your system per your custom configuration prior to shipment. Learn more
System Return Material Authorization (RMA)[4]	—	—	✓	We accept the delivery of fully assembled systems when performing repair services. Learn more
Advanced Replacement[5]	—	—	✓	We stock replacement hardware that can be shipped immediately if a repair is needed, fulfilled in <1 working day + express shipping. Learn more
Calibration Plan* (optional, with purchase)	—	✓	✓	We perform the requested level of calibration at the specified calibration interval for the duration of the service program. Learn more
Calibration Turnaround Time* (optional, with purchase)	—	Standard: <10 working days + standard shipping	Expedited: <3 working days + express shipping[6]	

Note: Updates marked with * will take effect starting in December 2025.

[1]Does not include shipping times. Some products are not eligible. Standard extended repair turnaround time for RF products is <15 working days + standard shipping.

[2]Discount is applied against the next sequential Service Program renewal period on the same asset. It is applicable only to renewals of same or higher-level service and has no cash value.

[3]Adjustment of Instrument to within tolerable limits as needed. Does not include certificate with as-found or as-left data.

[4]This option is available for PXI, CompactRIO, and CompactDAQ systems.

[5]This option is not available for all NI products in all countries. Contact your local NI sales engineer for more information.

[6]Expedited calibration is only available for the traceable calibration level.

Premium Plus Service Program

NI can customize the offerings listed on the previous page or offer additional entitlements such as on-site calibration, custom sparing, and lifecycle services through a PremiumPlus Service Program. Contact your NI sales representative to learn more.

Technical Support

NI hardware service programs and warranty include access to technical support provided by NI support agents during local business hours. Service requests can be managed online. Additionally, take advantage of award-winning NI online resources and communities.

Emerson Test & Measurement
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Austin, TX 78759-3504

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