2 GS/s, 1 GHz Digitizers, Optimized for Automated Test

NI PCI-5154, NI PXI-5154 *NEW!*

- 2 GS/s real-time sampling on 1 channel
- 1 GHz bandwidth
- 8-bit resolution
- 20 GS/s equivalent-time sampling
- 100 mV_{pp} to 5 V_{pp} input ranges
- 8, 64, or 256 MB memory per channel
- Edge, window, hysteresis, and digital immediate and software triggering

Calibration

- Gain, offset, triggering, and timing self-calibration
- 2-year external calibration interval

Operating Systems

- Windows Vista/XP/2000
- LabVIEW Real-Time

Recommended Software

- LabVIEW
- LabWindows™/CVI
- Measurement Studio for Visual Studio
- LabVIEW SignalExpress

Driver Software (included)

- NI-SCOPE driver
- LabVIEW Express VIs
- Scope Soft Front Panel

Overview

Applications
Communications
xDSL
Wireless communications
Baseband I & Q
Consumer Electronics
DVD, DVD-R, and PVR
Set-top box
Gaming console
Biomedical and Scientific Research
Ultrasonic medical imaging
Mass spectrometry
Particle physics
Aerospace/Defense
RADAR, SONAR, and LIDAR
Satellite
Signal intelligence

NI 5154 digitizers/PC-based oscilloscopes provide the industry's first gigahertz solutions optimized for automated test. They feature a 1 GHz analog bandwidth and up to 2 GS/s real-time sample rate. A digitizer optimized for automated test leverages a high-throughput bus to lower test times, provides picosecond-level synchronization among modules, and integrates with the entire suite of NI hardware – including arbitrary waveform generators, high-speed digital I/O, and other digitizers – so you can build and customize a complete mixed-signal or high-channel-count test system.

Dual 1 GS/s, 8-Bit Input Channels

- 2 GS/s real-time sampling on 1 channel
- 1 GS/s real-time sampling on 2 channels, simultaneously sampled
- 1 GHz input bandwidth with noise filters
- 20 GS/s equivalent-time sampling (ETS) for repetitive signals
- Independent channel-selectable 100 mV_{pp} to 5 V_{pp} input ranges
- 2-year calibration interval and 0 to +55 °C operating temperature

Deep Onboard Memory

- Take advantage of 8, 64, or 256 MB of memory per channel
- Capture more than 1 million triggered waveforms in multiple record mode with trigger rearm time as fast as 1 µs
- Stream data continuously from onboard memory to host memory or disk

Triggering, Clocking, and Synchronization

- Edge, window, hysteresis, and digital triggering with 5 ps timestamping
- Pretrigger and posttrigger acquisition in single- and multiple-record mode
- Internal 1 GHz clock or external clock from 350 MHz to 1 GHz
- Phase lock to PXI 10 MHz reference or external reference from 1 to 20 MHz

Software

- IVI-compliant NI-SCOPE driver for NI LabVIEW and LabWindows/CVI as well as Microsoft C++ and Visual Basic with more than 50 built-in measurements
- Scope Soft Front Panel for interactive control

Ordering Information

NI PXI-5154 .....780319-0M
NI PCI-5154 .....780320-0M

M (memory per channel): 1 (8 MB), 2 (64 MB), 3 (256 MB)
Includes NI-SCOPE driver and Scope Soft Front Panel.

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S. only) or go to **ni.com/modularinstruments**.

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Specifications

These specifications are valid for 0 to 55 °C unless otherwise stated.

Acquisition System

Number of channels ..... 2 simultaneously sampled
Vertical resolution ..... 8 bits
Bandwidth (-3 dB) ..... 1 GHz minimum
Bandwidth limit filters (software-selectable) ..... 20 MHz noise filter
Maximum sampling rate ..... 1 GS/s (2 ch) or 2 GS/s (1 ch) real-time sampling, 20 GS/s equivalent-time/random-interleaved sampling
Onboard sample memory ..... 8, 64, or 256 MB per channel (8, 64, or 256 million samples)

Multiple Record Acquisition	
Memory/Channel	**Maximum Number of Records**
8 MB	32,768
64 MB	100,000[1]
256 MB	100,000[1]

[1]More than 1 million in streaming configuration

Full-Scale Input Range					
Ranges (V_{pp})					
0.1	0.2	0.5	1	2	5

Input impedance ..... 50 Ω ± 2 Ω
Maximum input overload ..... 50 Ω: 7 V_{rms} with | peaks | ≤10 V
Input coupling ..... AC, DC
AC coupling cutoff frequency (-3 dB).. 114 kHz (50 Ω)

Accuracy

DC Accuracy		
Typical	0.1 to 1 V_{pp}	±(1.0% of Input + 1.3% of FS)
	2 to 5 V_{pp}	±(1.4% of Input + 1.3% of FS)
Maximum	0.1 to 1 V_{pp}	±(2.2% of Input + 1.8% of FS)
	2 to 5 V_{pp}	±(2.9% of Input + 1.8% of FS)

Channel-to-channel crosstalk ..... <-80 dB at 10 MHz, <-60 dB at 100 MHz

Spectral Characteristics

	Noise Filter ON	Noise Filter OFF
ENOB	7.3	6.7
Signal-to-noise-and-distortion (SINAD) ratio, typical	45 dB	41 dB

Timebase System

Timebase options ..... Internal, external (PFI 0)

Internal

Internal sample clock frequency ..... 1 GS/s sampling rate with decimation by n, 1 ≤ n ≤ 65,535
Timebase accuracy[2] ..... ±25 ppm (±0.0025%) if phase-locked to 10 MHz backplane clock

[2]Accuracy will improve when phase-locking to a more accurate reference, such as an NI PXI-665x timing and synchronization module, which can provide timebase accuracy down to ±50 ppb.

External

External clock sources ..... PFI 0 (SMB connector)
External clock range ..... 350 MHz to 1 GHz, variable with decimation by n where 1 ≤ n ≤ 65,535
External reference sources ..... PXI_CLK10 (backplane connector); PFI 0 (front panel SMB connector)
External reference range ..... 1 to 20 MHz in 1 MHz increments; default to 10 MHz
External clock/reference amplitude ..... Sine wave: 0.65 to 2.8 V_{pp} (0 to 13 dBm)
External clock/reference impedance.... 50 Ω, AC coupled

Trigger System

Modes ..... Edge, hysteresis, window, digital, immediate, software
Sources ..... CH 0, CH 1, TRIG, PFI <0..1> PXI_Trig <0..6>, PXI Star Trigger, and Software
Slope ..... Rising or falling
Hysteresis ..... Fully programmable
High-frequency reject filter ..... 50 kHz software-selectable
Low-frequency reject filter ..... 50 kHz software-selectable
Sensitivity
  CH 0 and CH 1 ..... 15% FS
  TRIG ..... 15% FS
Level accuracy
  CH 0, CH 1 ..... ±5% FS up to 10 MHz
  TRIG ..... ±1 V up to 10 MHz
Time resolution ..... 5 ps with time-to-digital converter enabled
Holdoff ..... From Rearm Time up to [(2^{32} – 1) x Sample Clock Period]

External Trigger Channel (TRIG)

Impedance ..... 2.25 kΩ
Vertical range ..... ±5 V
Coupling ..... DC

Intermodule SMC Synchronization Using NI-TClk (typical)

Skew ..... 500 ps, ≤5 ps after manual adjustment

Power Requirements (typical)

PXI-5154

+3.3 VDC	+5 VDC	+12 VDC	-12 VDC	Total Power
1.7 A	1.8 A	520 mA	200 mA	23.25 W

Environment

Operating temperature ..... 0 to +55 °C in all NI PXI chassis except the following: 0 to +45 °C when installed in an NI PXI-1000/B or PXI-101x chassis (meets IEC 60068-2-1 and IEC 60068-2-2)

Storage temperature..... -40 to +71 °C (meets IEC 60068-2-1 and IEC 60068-2-2)

Relative humidity ..... 10 to 90%, noncondensing (meets IEC 60068-2-56)

Calibration

Self-calibration..... Gain, offset, triggering, and timing for all input ranges (excluding External Trigger Input)

External calibration interval..... 2 years

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Hardware Services

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NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with **ni.com/pxiadvisor**.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit **ni.com/calibration**.

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