2 GS/s, 300 MHz, 8-Bit Digitizers

NI 5152

- 2 GS/s real-time sampling on 1 channel
- 1 GS/s real-time sampling on 2 channels, simultaneously sampled
- 20 GS/s random-interleaved sampling
- 8-bit resolution
- 300 MHz bandwidth
- 100 mV_{pp} to 10 V_{pp} input range
- 8, 64, or 256 MB memory per channel
- Edge, window, hysteresis, and digital triggering with 5 ps timestamping

Calibration

- Gain, offset, compensated 1 MW attenuator, 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
Aerospace/Defense
RADAR, SONAR, and LIDAR
Satellite
Signal intelligence
Biomedical and Scientific Research
Ultrasonic medical imaging
Mass spectrometry
Particle physics
Communications
xDSL
Wireless communications
Baseband I & Q

National Instruments 5152 high-speed digitizers feature two 1 GS/s simultaneously sampled input channels with 8-bit resolution, 300 MHz bandwidth, and up to 256 MB of memory per channel in a compact, 3U PXI/PXI Express or PCI device. With the National Instruments Synchronization and Memory Core (SMC) architecture of an NI 5152, you can create mixed-signal systems using signal generators and digital waveform generator/analyzers or build a high-channel-count digitizer with subnanosecond synchronization between channels. An NI 5152 is ideal for a wide range of application areas including communications, scientific applications, military/aerospace, and consumer electronics.

Dual 1 GS/s, 8-Bit Input Channels

- 2 GS/s real-time sampling on 1 channel
- 300 MHz input bandwidth with noise filters
- 20 GS/s equivalent-time sampling (ETS) for repetitive signals
- Independent channel-selectable 100 mV_{pp} to 10 V_{pp} input ranges
- Independent channel-selectable 50 Ω or 1 MΩ input impedance
- 2-year calibration interval and 0 to 55 °C operating temperature

Deep Onboard Memory

- 8, 64, or 256 MB of memory per channel
- Capture more than 1 million triggered waveforms in multiple record mode with hardware trigger rearming
- 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
- Timestamp-triggered events with 100 ps resolution

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-5152 .....779772-0M[1]

NI PCI-5152 .....779945-0M[1]

[1]M (memory per channel): 1 (8 MB), 2 (64 MB), 3 (256 MB)

Includes NI-SCOPE driver and Scope Soft Front Panel.

Recommended PXI Switch

NI PXI-2593 (500 MHz mux/matrix) 778793-01

BUY NOW!

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

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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)

Range (Vpp)	Cable	Carrier
All except 0.1	340 MHz, typical 300 MHz, minimum	300 MHz, typical 260 MHz, minimum
0.1	165 MHz, typical 135 MHz, minimum	135 MHz, typical 110 MHz, 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 (0 to 100% pretrigger and posttrigger data)	
Memory/Channel	Maximum Number of Records
8 MB	32,768
64 MB	100,000[1]
256 MB	100,000[1]

[1]Infinite in streaming configuration.

Input impedance..... 50 Ω and 1 MΩ ll 22 pF, software-selectable

Full-Scale Input Range and Programmable Vertical Offset			
50 Ω		1 MΩ	
Range (V_{pp})	Vertical Offset Range (V)	Range (V_{pp})	Vertical Offset Range (V)
0.1	±1	0.1	±1
0.2	±1	0.2	±1
0.4	±1	0.4	±1
1	±1	1	±1
2	±6	2	±10
4	±5	4	±10
10	±2	10	±10

Maximum input overload..... 50 Ω: 7 V_{rms} with I peaks I ≤10 V; 1 MΩ: I peaks I ≤42 V
Input coupling..... AC, DC, GND
AC coupling cutoff frequency (-3 dB).. 106 kHz (50 Ω), 12 Hz (1 MΩ)

Accuracy

DC accuracy (0 V offset setting)..... ±(1.26% of input +1.0% of FS + 500 µV) for 0.1 to 1 V ranges
±(1.26% of input +1.0% of FS + 5 mV) for 2 to 10 V ranges
Channel-to-channel crosstalk..... -80 dB at 10 MHz

Spectral Characteristics (typical)

Dynamic performance (10 MHz, -1 dBFS input signal)

20 MHz Noise Filter	SINAD (dB)	ENOB
Enabled	45	7.3
Disabled	43	7.1

RMS Noise

20 MHz filter enabled..... 0.24% of FS

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..... ±25 ppm (±0.0025%)

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..... PFI 0 (SMB connector), PXI_CLK10 (PXI backplane 10 MHz)
External reference range..... 1 to 20 MHz in 1 MHz increments
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, PXI_Trig <0..6>, PXI star, 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
CH0 and CH1..... 10% FS
TRIG..... 0.5 V_{pp}
Level accuracy
CH0, CH1..... ±5% FS up to 10 MHz
TRIG..... ±1 V up to 10 MHz
Time resolution..... 5 ps with time-to-digital converter enabled
Holdoff[1]..... From 1 µs to [(232-1) x (sample clock period)], software-selectable

[1]Time-to-digital converter disabled.

External Trigger Channel (TRIG)

Impedance ..... 1 MΩ II 22 pF
Vertical range ..... ±5 V
Coupling ..... AC, DC

Intermodule SMC Synchronization Using NI-TClk (typical)

Skew ..... 500 ps
≤10 ps after manual adjustment

Power Requirements (typical)

	+3.3 VDC	+5 VDC	+12 VDC	-12 VDC	Total Power
PXI	1.1 A	1.9 A	500 mA	210 mA	21.65 W
PCI	2.5 A	2.4 A	200 mA	0 A	22.65 W

Environment

Operating temperature[2] ..... 0 to 55 °C (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)

[2]0 to 45 °C in PXI-101x or PXI-1000/B chassis.

Calibration

Self-calibration ..... Gain, offset, compensated 1 MΩ attenuator, triggering, and timing for all input ranges
External calibration interval ..... 2 years

Certification and Compliances

CE Mark Compliance CE

For detailed specifications, visit ni.com/manuals.

For access to certifications, marks, and DoCs, visit ni.com/certification.

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NI Factory Installation Services

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**.

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