

200 MS/s, 16-Bit Arbitrary Waveform Generator

NI PXI-5422

- 16-bit resolution, 200 MS/s sampling rate
- 8, 32, 256, or 512 MB of onboard memory
- 80 MHz analog bandwidth
- Multimodule synchronization with <20 ps_{rms} skew
- Time and frequency-domain waveform creation software
- Function generator emulation mode for easy standard waveform generation
- External clock and reference inputs
- 16-bit LVDS digital pattern output (32, 256, and 512 MB models)

Operating Systems

- Windows 2000/NT/XP

Recommended Software

- NI Modulation Toolkit
- LabVIEW
- LabWindows/CVI
- Measurement Studio

Driver Software (included)

- NI-FGEN
- LabVIEW Express VIs
- FGEN Soft Front Panel
- NI Analog Waveform Editor (with 32, 265 and 512 MB models)

Calibration

- Gain, offset and timing self-calibration
- 2 year external calibration cycle

NEW



Description

The National Instruments PXI-5422 is a 200 MS/s arbitrary waveform generator featuring 16-bit resolution and up to 512 MB of onboard memory in a compact, 1 slot 3U PXI module. Because the NI PXI-5422 uses the PCI-based PXI platform, waveforms can be downloaded at up to 84 MB/s, far faster than traditional GPIB-based instruments. Using the Synchronization and Memory Core (SMC) architecture of the PXI-5422, you can create mixed signal test systems by synchronizing the generator with digitizers and digital waveform generator/analyzers or synchronize multiple arbitrary waveform generators to form a phase-coherent multichannel generator.

Exceptional Time and Frequency-Domain Performance

- 1.8 ns rise time, 6% pulse aberration
- -60 dBc (0.1%) total harmonic distortion (THD) at 10 MHz
- -139 dBm/Hz average noise density
- -81 dBc intermodulation distortion (IMD) with intermediate frequency (IF) optimized direct path
- <1.3 ps_{rms} jitter -138 dBc/Hz phase noise (10 MHz carrier, 10 kHz offset)

Triggering and Sequencing

- Four triggering modes – single, continuous, stepped, and burst
- Up to 2 million waveform segments
- Up to 3 million sequence instructions (links and loops)
- Segment looping up to 16,777,216 times or infinitely

Timing and Synchronization

- Multi-instrument synchronization with <20 ps_{rms} of skew
- 3 sample clock sources – Divide-by-N, High-Resolution, and External.
- 1.06 μ Hz sample rate resolution with high-resolution clock
- Phase lock to external reference or the PXI 10 MHz reference clock

Software

- NI Analog Waveform Editor for creating frequency and time-domain signals
- NI-FGEN instrument driver with LabVIEW Express VIs for function and arbitrary waveform generation
- FGEN Soft Front Panel for interactive control

Applications

Communications

- Digitally modulated I/Q signals
- Direct to IF modulated signals

Semiconductor

- Imaging sensors (CCD, CMOS)
- Display devices (LCD)
- Biomedical devices
- Mixed signal devices

Automotive

- Telematics systems
- Antilock brake systems

Aerospace/Defense

- Avionics
- Radar

Scientific Research

- Analytical instruments

Ordering Information

NI PXI-5422779087-0M¹

Includes SMB112 cable, NI-FGEN, and FGEN Soft Front Panel.

32, 256, and 512 MB models include NI Analog Waveform Editor.

¹M (onboard memory): 1 (8 MB), 2 (32 MB), 3 (256 MB), 4 (512 MB)

Recommended PXI Switch

NI PXI-2593778793-01

BUY NOW!

For complete product specifications, pricing, and accessory information, call (866) 265-9891 (U.S. only) or go to ni.com and search on a four-digit model number listed above.



200 MS/s, 16-Bit Arbitrary Waveform Generator

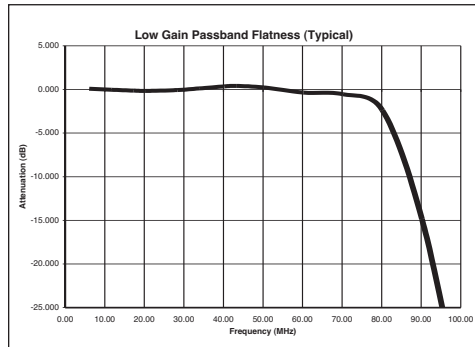
Specifications

General

Number of channels.....	1
DAC resolution.....	16 bits
Maximum sampling rate.....	200 MS/s
Output paths.....	1. Main Output Path setting with driver selected Low Gain Amplifier or High Gain Amplifier 2. Direct Path optimized for IF applications
Recommended Maximum Output Frequencies	
Direct Path.....	80 MHz
Low Gain Path.....	80 MHz
High Gain Path.....	40 MHz up to 12 V _{pp} (80 MHz up to 8 V _{pp})

Analog Output

Amplitude range (full scale)	
Main output path.....	12 V _{pp} to 5.64 mV _{pp} (50 Ω load)
Direct path.....	1 V _{pp} to 0.707 V _{pp} (50 Ω load)
Offset range.....	±50% of Amplitude Range (Signal plus offset not to exceed amplitude range)
Output impedance.....	50Ω or 75Ω, software selectable
DC Accuracy.....	±0.4% of Amplitude ±0.05% of offset ±1 mV
AC amplitude accuracy.....	± 1.0% of Amplitude ± 1 mV at 50 kHz
Output filter.....	Software enabled seven-pole elliptical analog filter available on Main Output Path



Rise time.....	< 1.8 ns for Main Output Low Gain Path
Fall time.....	< 2.1 ns for Main Output Low Gain Path
Pulse Aberration.....	< 6 % for Main Output Low Gain Path

Spectral Characteristics	Frequency	Direct Path	Low Gain Path	Comments
Total Harmonic Distortion (THD)	20 kHz	-85 dBc (0.006%)	-81 dBc (0.009%)	Amplitude -1 dBFS
	1 MHz	-87 dBc	-63 dBc	2nd through 6th harmonics
	10 MHz	-67 dBc	-60 dBc	
Intermodulation Distortion (IMD)	10 MHz	-80 dBc	-78 dBc	Each tone is -7 dBFS. 200kHz spacing
	40 MHz	-65 dBc	-63 dBc	Typical
	70 MHz	-60 dBc	-55 dBc	

Average Noise Density

Path	Amplitude Range		Average Noise Density		
	V _{pk-pk}	dBm	nV/√Hz	dBm/Hz	dBfs/Hz
Direct Path	1	4	25	-139	-143.0
Low Gain	0.1	-16.0	14	-144	-128.0
Low Gain	2	10.0	45	-134	-144.0
High gain	12	25.6	282	-118	-143.6

Sample Clock

Sources.....	Internal Divide-by-N, Internal High-Resolution, External CLK IN, External DDC Clk In, PXI star Trigger, PXI_TRIG <0:7>
Frequency resolution	
Divide-by-N.....	(200 MS/s) / N where 1 ≤ N 40
High Resolution.....	1.06 μHz

System Phase Noise and Jitter

	System Phase Noise Density	System Output Jitter	Comment
Divide-by-N	-138 dBc/Hz (10 kHz offset)	< 1.3 ps rms	10 MHz carrier
High Resolution	-122 dBc/Hz (10 kHz offset)	< 3.0 ps rms	
External Clock	-143 dBc/Hz (10 kHz offset)	< 1.1 ps rms	

Onboard Clock (Internal VCXO)

Frequency accuracy.....	±25 ppm
PLL reference clock sources.....	PXI_CLK10, CLK IN

Digital Data and Control, DDC (optional front panel connector)

Data output signals.....	16 LVDS data lines (ANSI/TIA/EIA-644 compliant)
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Start Trigger

Sources.....	PFI <0:3>, PXI_TRIG<0:6>, PXI Star Trigger, Software, Immediate
Modes.....	Single, Continuous, Stepped, Burst

Markers

Destinations.....	PFI <0:1>, PFI <4:5>, PXI_TRIG <0:6>
Quantity.....	1 Marker per Segment

Waveform and Instruction Memory Utilization

	8 MB Standard	32 MB Option	256 MB Option	512 MB Option
Onboard Memory Size	8,388,608 bytes	33,554,432 bytes	268,435,456 bytes	536,870,912 bytes

Output modes.....	Function Generator Emulation, Arbitrary Waveform and Arbitrary Sequence
Loop count.....	1 to 16,777,215. Burst Trigger: Unlimited

Memory Limits	8 MB Standard	32 MB Option	256 MB Option	512 MB Option
Arbitrary Waveform Mode Maximum Waveform Memory	4,194,176 Samples	16,777,088 Samples	134,217,600 Samples	268,435,328 Samples
Arbitrary Sequence Mode Maximum Waveform Memory ¹	4,194,120 Samples	16,777,008 Samples	134,217,520 Samples	268,435,200 Samples
Arbitrary Sequence Mode Maximum Waveforms ¹	65,000 Samples	262,000 Samples	2,097,000 Samples	4,194,000 Samples
Arbitrary Sequence Mode Maximum Segments in a Sequence ²	104,000 Samples	418,000 Samples	3,354,000 Samples	6,708,000 Samples

Refer to detailed specifications for all trigger modes.

¹Condition One or two segments in a sequence

²Condition: Waveform memory is <4,000 samples.

Power

+3.3 VDC	+5 VDC	+12 VDC	-12 VDC	Total Power	
2.0 A	2.0 A	0.46 A	0.01 A	22.2 W	Typical operating conditions
2.0 A	3.0 A	0.46 A	0.01 A	27.2 W	Maximum overload

Physical

Dimensions.....	Single 3U PXI slot
Front panel connectors	
CHO.....	SMB (Jack)
CLK IN.....	SMB (Jack)
PFI 0.....	SMB (Jack)
PFI 1.....	SMB (Jack)
Digital data and control.....	68-pin VHDCI Female Receptacle

Environment

Operating temperature.....	0 to +55 °C (Meets IEC-60068-2-1 and IEC-60068-2-2)
Storage temperature.....	-25 to +85 °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.....	DC gain and offset
External calibration interval.....	2 years

Certifications and Compliances

CE Mark Compliance

Note

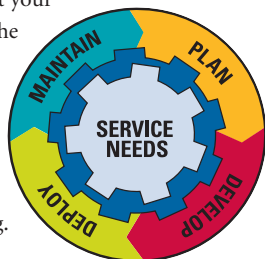
Unless otherwise noted, the following conditions were used for each specification:

- Analog filter enabled
- Signals terminated with 50Ω
- Direct path set to 1 V_{pk-pk}, Low Gain Amplifier Path set to 2 V_{pk-pk}, and High Gain Amplifier Path set to 12 V_{pk-pk}
- Sample clock set to 200 MS/s

Specifications subject to change without notice. Please see detailed specifications for more information.

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