

DAQ for High-Voltage Measurements

16-Bit, 200 kS/s, 8 Analog Inputs

New

NI PXI-4204

- 8 analog inputs at 200 kS/s, 16-bit resolution
- ± 100 V input range
- Programmable gain (0.5, 1, 10, 100) per channel
- Programmable 2-pole Butterworth filter (6 Hz or 10 kHz) per channel
- Differential simultaneous sampling inputs
- CombiCon screw terminal direct connectivity
- NI-DAQ driver simplifies configuration and measurements

Operating Systems

- Windows 2000/NT/XP

Recommended Software

- LabVIEW
- LabWindows/CVI
- Measurement Studio for Visual Studio.NET

Other Compatible Software

- Visual Basic, C/C++, and C#

Driver Software (Included)

- NI-DAQ 7



Device	Bus	Analog Inputs	Resolution	Sampling Rate	Input Range	Triggers	Filter Settings
NI PXI-4204	PXI	8 DI	16 bits	200 kS/s	± 0.5 to ± 100 V	Digital (2)	2-pole Butterworth (6 Hz or 10 kHz)

Table 1. NI PXI-4204 Channel, Speed, and Resolution Specifications

Overview and Applications

The National Instruments PXI-4204 module delivers accurate data acquisition for input ranges up to 100 V. With this module you can handle a broad variety of applications including:

- 42 V automotive applications
- High-voltage, multichannel data logging applications
- Fuel cell and battery test applications

Features

The NI PXI-4204 is a full-featured data acquisition module with a ± 100 V input range, 16-bit accuracy, and software-selectable filter and gain settings per channel. Programmable filter and gain settings ensure that the PXI-4204 achieves maximum accuracy over the entire ± 100 V input range. In addition, the PXI-4204 is designed to work with LabVIEW 7 Express and NI-DAQmx. The DAQ Assistant in LabVIEW 7 can configure the PXI-4204 and acquire data through a menu-based window, eliminating the need to manually program the device.

For high-channel-count, high-voltage applications, explore NI signal conditioning hardware. Visit ni.com/sigcon

Driver Software

NI-DAQ 7 is the robust driver software included with all National Instruments data acquisition and signal conditioning products. This easy-to-use software tightly integrates the full functionality of your DAQ hardware to LabVIEW, LabWindows/CVI, and Measurement Studio for Visual Studio.NET. High-performance features include multidevice synchronization, networked measurements, and DMA data management. Bundled with NI-DAQ 7, the Measurement & Automation Explorer (MAX) utility simplifies the configuration of your measurement hardware with device test panels, interactive measurements, and scaled I/O channels. NI-DAQ also provides numerous example programs for LabVIEW and other application development environments to get you started with your application quickly.

Ordering Information

NI PXI-4204778745-4204

Includes NI-DAQ driver software.

For more information on extended warranty and value-added services, visit ni.com/services

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Specifications – PXI-4204

Complete Accuracy Tables

Input Characteristics

SSH Disabled		Absolute Accuracy						Absolute Accuracy	Percent Error
Nominal Range (V)		% of Reading		Offset	Noise + Quantization (mV)		Temp	at Full Scale	at Full Scale
Positive FS	Negative FS	24 Hrs	1 Year	(mV)	Single Pt.	Averaged	Drift (%/°C)	(mV)	(%)
100	-100	0.063	0.070	± 16.8	± 9.34	± 0.92	0.0027	88	0.088
50	-50	0.031	0.038	± 10.4	± 4.68	± 0.57	0.0025	30	0.060
5	-5	0.061	0.068	± 4.7	± 0.69	± 0.40	0.0027	8.5	0.17
0.5	-0.5	0.061	0.068	± 4.1	± 0.49	± 0.40	0.0027	4.8	0.97

SSH Enabled		Absolute Accuracy						Absolute Accuracy	Percent Error
Nominal Range (V)		% of Reading		Offset	Noise + Quantization (mV)		Temp	at Full Scale	at Full Scale
Positive FS	Negative FS	24 Hrs	1 Year	(mV)	Single Pt.	Averaged	Drift (%/°C)	(mV)	(%)
100	-100	0.085	0.090	± 19.0	± 9.35	± 1.02	0.0027	110	0.110
50	-50	0.035	0.042	± 12.6	± 4.70	± 0.73	0.0025	34	0.069
5	-5	0.063	0.070	± 6.8	± 0.82	± 0.60	0.0027	11	0.22
0.5	-0.5	0.063	0.070	± 6.3	± 0.66	± 0.60	0.0027	7.2	1.4

Note: Accuracies are valid for measurements following an internal calibration. Averaged numbers assume dithering and averaging of 100 single-channel readings. Measurement accuracies are listed for operational temperatures within ±1°C of internal calibration temperature and ±10°C of external or factory calibration temperature.

Number of Channels

PXI-4204	8 differential
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Input signal ranges..... see accuracy tables

Resolution 16 bits, 1 in 65,536

Sampling Rate

Maximum Sampling Rate 200 kS/s aggregate multi-channel

Module	Single Channel	Max per channel (scanning all channels)	
		Scan Rate w/SSH*	Scan Rate w/o SSH*
PXI-4204	333 kS/s	20 kS/s/ch	25 kS/s/ch

*SSH = Simultaneous Sample and Hold

Connector	Powered On	Powered Off
Screw Terminals	± 100 VDC	± 100 VDC
SMB Connector	± 15 V	± 15 V

Overvoltage protection

Inputs with overvoltage protection CH<0..7>

Input coupling DC

Data transfers DMA, interrupts, programmed I/O

Transfer Characteristics

Nonlinearity

Range	Percent of Full Scale (Typical)
± 100 V	0.02%
Other Ranges	0.01%
± 100 V, SSH Enabled	0.06%
Other Ranges, SSH Enabled	0.02%

DNL

Module	Typical	Maximum
PXI-4204	± 0.5 LSB	± 1 LSB

Gain Error See Accuracy Table

Offset Error See Accuracy Table**

Amplifier Characteristics

Input Impedance

Module	Input Configuration	Normal Powered On	Powered Off
PXI-4204	Differential Input	2 MΩ	2MΩ
	Single-Ended	1 MΩ	1MΩ

NMR (60 Hz)

PXI-4204	40 dB @ 6 Hz filter setting
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CMRR

Module	Input Frequency Ranges	CMRR
PXI-4204	DC to 60 Hz	>60 dB
PXI-4204	100 Hz to 10 kHz	>40 dB

Filter Characteristics

Filter Type 6 Hz or 10 kHz, 2-pole, Butterworth
Stability

Module	Input Range	Gain Temperature Coefficient	Offset Temperature Coefficient
PXI-4204	± 100 V	± 25 ppm/°C	± 385 uV/°C

Triggers

Digital Triggers

Number of triggers 2
Purpose Start & stop trigger, gate, clock
Source PFI0/TRIG1 (front SMB connector),
PXI_TRIG_0...PXI_TRIG_6
(PXI trigger bus)

Slope Positive or negative; software selectable

Compatibility 5V/TTL
Response Rising or falling edge
Pulse width 10 ns minimum
Impedance 10 kOhm
Coupling DC

PXI Trigger Bus

Trigger lines 6
Star trigger 1

Bus Interface

PXI Master, slave

Power Requirements

Module	5 VDC (±5%)
PXI-4204	1 A

Calibration

Recommended warm-up time 15 minutes
External calibration interval 1 year
Onboard calibration reference
Level 5.000V +/- 1mV
Temperature coefficient + 0.6 ppm/°C
Long-term stability 6 ppm/Sqrt(1000h)

Physical

Dimensions (not including connectors) 16.0 by 10.0 cm by 2.0 cm
(6.3 x 3.9 x 0.79 in)
Analog input signal connector 16 x 1 minicombicon, 3.81 mm pitch
Analog input signal mating connector 16 x 1 minicombicon, 3.81 mm pitch, 28-16 AWG signal wire

**Gain Error = Actual Input Voltage * % of Reading

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Specifications

I/O Connectors

Module	Front
PXI-4204	16 screw terminals, 1 SMB

Environment:

Operating temperature	0 to 55 °C
Storage temperature	-20 to 70 °C
Relative humidity	10 to 90%, non-condensing
Maximum altitude	2,000m
Pollution degree (indoor use only)	2

Certification and Compliance

European Compliance **CE**

Emissions	EN 55011 Class A 10 meters
Immunity	EN 61326:1997 + A2:2001, Table 1
EMC	CE, C-Tick and FCC Part 15 (Class A) Compliant
Safety	IEC 61010-1, EN 61010-1

North American Compliance **CE**

Emissions	FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 + A2:2001, Table 1
EMC	CE, C-Tick and FCC Part 15 (Class A) Compliant
Safety	IEC 61010-1, UL 3111-1, UL 61010B-1, CAN/SA C22.2 No. 1010.1

Global Services and Support

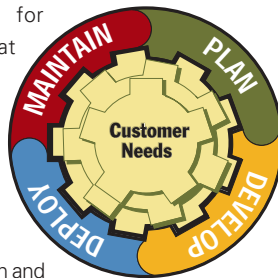
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