

SPECIFICATIONS FOR THE NI PXI/PCI-4060

This document lists the specifications of the NI PXI/PCI-4060. These specifications are guaranteed between 15 and 35 °C unless otherwise specified.

DC Voltage

Accuracy

(% of reading \pm μ V)

Range	24 Hour (25 °C \pm 1 °C)	90 Day (25 °C \pm 10 °C)	1 Year (25 °C \pm 10 °C)	Tempco (% of reading/ $^{\circ}$ C \pm μ V/ $^{\circ}$ C)
250 V*	0.0032% \pm 1.25 mV	0.021% \pm 1.25 mV	0.024% \pm 1.25 mV	0.0017% \pm 480 μ V
25 V	0.0032% \pm 1 mV	0.021% \pm 1 mV	0.024% \pm 1 mV	0.0017% \pm 480 μ V
2 V	0.0029% \pm 10 μ V	0.014% \pm 10 μ V	0.017% \pm 10 μ V	0.0009% \pm 5 μ V
200 mV	0.0029% \pm 6 μ V	0.014% \pm 6 μ V	0.017% \pm 6 μ V	0.0009% \pm 1 μ V
20 mV	0.0029% \pm 6 μ V	0.014% \pm 6 μ V	0.017% \pm 6 μ V	0.0009% \pm 1 μ V

Accuracy numbers are for 5 1/2 digits with autozero on and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise.

*The NI 4060 can overrange to 300 V.

Noise Rejection

NMRR

(10 Hz filter setting, 50/60 Hz
powerline frequency \pm 1%)..... 80 dB

DC ECMRR

(with a 1 k Ω imbalance in HI lead)..... 140 dB

AC ECMR (RDC to 50/60 Hz)

(with a 1 k Ω imbalance in HI lead)..... 150 dB

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Input Characteristics

Input bias current 1 nA max

Input resistance >1 G Ω (2 V, 200 mV, 20 mV ranges);
1 M Ω (250 V, 25 V)

DC Current

Accuracy

(% of reading \pm μ A)

Range	24 Hour (25 °C \pm 1 °C)	90 Day (25 °C \pm 10 °C)	1 Year (25 °C \pm 10 °C)	Tempco (% of reading/°C \pm μ A/°C)
20 mA	0.015% \pm 10 μ A	0.039% \pm 10 μ A	0.042% \pm 10 μ A	0.0035% \pm 1 μ A
200 mA	0.015% \pm 10 μ A	0.039% \pm 10 μ A	0.042% \pm 10 μ A	0.0035% \pm 1 μ A
10 A*	0.11% \pm 1 mA	0.035% \pm 2 mA	0.0035% \pm 2 mA	0.007% \pm 0.1 mA

Accuracy numbers are for 5 1/2 digits with autozero on and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise.

* Requires 10 A shunt, CSM-10A.

Input Characteristics

Maximum input 200 mA/250 V

Input protection Fuse F1 500 mA/250 V fast fusing

Shunt resistor 1 Ω

Burden voltage <400 mV at 200 mA DC

AC Voltage

Accuracy

(% of reading \pm mV)

Range	24 Hour (25 °C \pm 1 °C)	90 Day (25 °C \pm 10 °C)	1 Year (25 °C \pm 10 °C)	Tempco (% of reading/ $^{\circ}$ C \pm mV/ $^{\circ}$ C)
250 V*	0.6% \pm 250 mV	0.62% \pm 680 mV	0.62% \pm 680 mV	0.007% \pm 20 mV
25 V	0.16% \pm 30 mV	0.18% \pm 210 mV	0.18% \pm 210 mV	0.007% \pm 20 mV
2 V	0.28% \pm 3 mV	0.30% \pm 21 mV	0.30% \pm 21 mV	0.019% \pm 2 mV
200 mV	0.16% \pm 0.22 mV	0.18% \pm 1.20 mV	0.18% \pm 1.20 mV	0.007% \pm 0.110 mV
20 mV	0.28% \pm 100 μ V	0.30% \pm 170 μ V	0.30% \pm 170 μ V	0.019% \pm 12 μ V

Accuracy numbers are for 5 1/2 digits and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise, applies for sine waves \geq 10% of input range. Accuracy may be affected by source impedance, cable capacitances dielectric absorption, or slew rate.

* The NI 4060 can overrange to 300 V.

Noise Rejection

AC CMRR at 50/60 Hz

(with a 1 k Ω imbalance in HI lead)..... >80 dB

Input Characteristics

Input resistance 1 M Ω

Bandwidth 20 Hz–25 kHz

Additional AC Errors

Frequency-dependent errors

Input Frequency	Additional Error (% of Full-Scale)
20 Hz–50 Hz	2.5%
50 Hz–100 Hz	0%
100 Hz–20 kHz	1%
20 kHz–25 kHz	2.5%

AC Current

Accuracy

(% of reading \pm mA)

Range	24 Hour (25 °C \pm 1 °C)	90 Day (25 °C \pm 10 °C)	1 Year (25 °C \pm 10 °C)	Tempco (% of reading/°C \pm mA/°C)
200 mA	0.18% \pm 0.22 mA	0.20% \pm 1.2 mA	0.20% \pm 1.2 mA	0.009% \pm 0.110 mA
20 mA	0.30% \pm 100 μ A	0.32% \pm 170 μ A	0.32% \pm 170 μ A	0.022% \pm 12 μ A
10 A*	0.3% \pm 22 mA	0.32% \pm 120 mA	0.32% \pm 120 mA	0.026% \pm 11 mA

Accuracy numbers are for 5 1/2 digits and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise.

* Requires 10 A shunt, CSM-10A.

Input Characteristics

Maximum input200 mA/250 V

Input protection Fuse F1 500 mA/250 V fast fusing

Shunt resistor 1 Ω

Burden voltage.....<400 mV at 200 mA AC

Resistance

Accuracy

(% of reading \pm Ω)

Range	24 Hour (25 °C \pm 1 °C)	90 Day (25 °C \pm 10 °C)	1 Year (25 °C \pm 10 °C)	Tempco (% of reading/°C \pm Ω /°C)
Extended resistance (> 2 M Ω)	0.1% \pm 6 k Ω	0.1% \pm 60 k Ω	0.1% \pm 60 k Ω	0.0072% \pm 6 k Ω
2 M Ω *	0.012% \pm 9 Ω	0.077% \pm 27 Ω	0.080% \pm 27 Ω	0.0072% \pm 2 Ω
200 k Ω	0.012% \pm 5 Ω	0.077% \pm 22 Ω	0.080% \pm 22 Ω	0.0072% \pm 2 Ω
20 k Ω	0.006% \pm 0.09 Ω	0.024% \pm 0.3 Ω	0.027% \pm 0.3 Ω	0.0020% \pm 0.02 Ω
2 k Ω	0.006% \pm 0.05 Ω	0.024% \pm 0.2 Ω	0.027% \pm 0.2 Ω	0.0020% \pm 0.02 Ω
200 Ω	0.006% \pm 0.05 Ω	0.024% \pm 0.2 Ω	0.027% \pm 0.2 Ω	0.0020% \pm 0.02 Ω

Accuracy numbers are for the 4-wire resistance measurements 5 1/2 digits with autozero on and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise.

* With autozero on or while scanning, and when large resistance with capacitive loads is measured, additional delay time is required.

Measurement modes

Resistance 2-wire or 4-wire resistance
 Extended resistance..... 2-wire resistance only

Maximum lead resistance..... 10 Ω (200 Ω range);
 1 kΩ (all other ranges)

Test current..... 100 μA for 200 Ω, 2 kΩ,
 20 kΩ ranges;
 1 μA for 2 MΩ, 200 kΩ ranges;
 1 μA and 1 MΩ in parallel for
 extended resistance measurements

Additional error for 2-wire resistance 0.6 Ω

Diode Testing

Accuracy

(% of reading ± μV)

Range	24 Hour (25 °C ± 1 °C)	90 Day (25 °C ± 10 °C)	1 Year (25 °C ± 10 °C)	Tempco (% of reading/°C ± μV/°C)
2 V	0.006% ± 7 μV	0.024% ± 22 μV	0.027% ± 22 μV	0.0020% ± 2 μV
Accuracy numbers are for 5 1/2 digits and include the effects of full-scale and zero-scale errors, temperature variation, linearity, and noise.				

Test current 100 μA

General Specifications

Settling time Affected by source impedance
 and input signal changes

Warm-up time 30 minutes for measurements
 accurate within specifications

Bus type

PCI Slave
 PXI..... Slave
 CompactPCI Slave

Altitude..... Up to 2,000 m; at higher altitudes
 the installation category must be
 derated

Working voltage	300 V maximum between either input terminal and earth ground
Power requirement.....	+5 VDC, 250 mA in operational mode

Safety

Designed in accordance with IEC 61010-1 and UL 3111-1 for electrical and testing equipment. Reinforced insulation. Indoor use only.

Installation Category.....II

Pollution Degree2

Physical

Dimensions

PCI.....	10.8 by 17.5 cm (4.25 by 6.9 in.)
PXI.....	10 by 16 cm (3.9 by 6.33 in.)

Environment

Operating temperature0 to 55 °C

Storage temperature-20 to 70 °C

Relative humidity10 to 90% noncondensing