PXIe-4086 Specifications

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These specifications apply to the PXIe-4086.

Revision History

Version	Date changed	Description
379294A-01	October 2026	Initial release.

Looking For Something Else?

For information not found in the specifications for your product, such as operating instructions, browse *Related Information*.

Related information:

- PXIe-4086 User Manual
- Calibration Procedure
- Software and Driver Downloads
- Dimensional Drawings
- Product Certifications
- Letter of Volatility
- Discussion Forums
- NI Learning Center

Definitions

Warranted Specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- *Typical* describes the performance met by a majority of models.
- *Nominal* describes an attribute that is based on design, conformance testing, or supplemental testing.

Values are *Warranted Specifications* unless otherwise noted.

T_{extcal} is the device temperature at last external calibration.

$T_{selfcal}$ is the device temperature at last self-calibration.

Conditions

Specifications are valid under the following conditions unless otherwise noted.

- Self-calibration performed within the last 24 hours
- Calibration interval of 2 years
- Warm-up time of 60 minutes
- Resolution set to 6.5 digits or higher for specifications requiring an aperture greater than or equal to 100 ms

PXIe-4086 Pinout

Figure 1. PXIe-4086 Connector Pinout

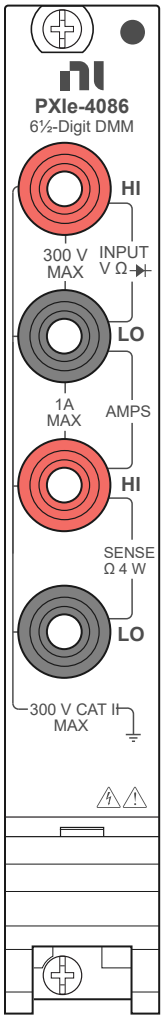


Table 1. Signal Descriptions

Signal Name	Description
Input HI	High-input impedance terminal with a positive polarity defined as Input HI > Input LO. Use this terminal in conjunction with Input LO to measure voltage, 2-wire resistance, and to source a test current in 4-wire resistance mode.
Input LO	Low-input impedance terminal that must be connected for all measurement types. Use this terminal in conjunction with Input HI to measure voltage, 2-wire resistance, and to source a test current in 4-wire resistance mode. Use this

Signal Name	Description
	terminal in conjunction with Sense HI to measure current.
Sense HI	Positive input terminal when measuring current. Positive current is current flowing into the Sense HI terminal and out of the Input LO terminal. Sense HI is also a high-input impedance terminal when measuring 4-wire resistance. In this mode, connect the terminal to Input HI as close to the DUT as possible. This helps avoid measuring parasitic resistance in the cabling and fixturing.
Sense LO	High-input impedance terminal when measuring 4-wire resistance. In this mode, connect the terminal to Input LO as close to the DUT as possible. This helps avoid measuring parasitic resistance in the cabling and fixturing.

DC Voltage Specifications

DC Voltage Accuracy Specifications

All DC voltage accuracy specifications apply to apertures of ≥100 ms, with Auto Zero and ADC calibration enabled. Assumes offset nulling. Otherwise, add 2 µV to the specifications.

Table 2. DC Voltage ± (ppm of Reading + ppm of Range)

Range	Input Resistance[1]	24 Hour[2] $T_{selfcal}$ ±1 °C	90 Day $T_{selfcal}$ ±5 °C	2 Year $T_{selfcal}$ ±5 °C	Tempco/°C, Without Self-Cal	Tempco/°C, With Self-Cal
100 mV	10 MΩ ± 2%, >10 GΩ	10 + 10	40 + 20	50 + 20	4 + 5	0.3 + 0.3
1 V	10 MΩ ± 2%, >10 GΩ	6 + 2	25 + 6	35 + 6	2 + 1	0.3 + 0.3
10 V	10 MΩ ± 2%, >10 GΩ	4 + 2	25 + 6	35 + 6	1 + 1	0.3 + 0.3

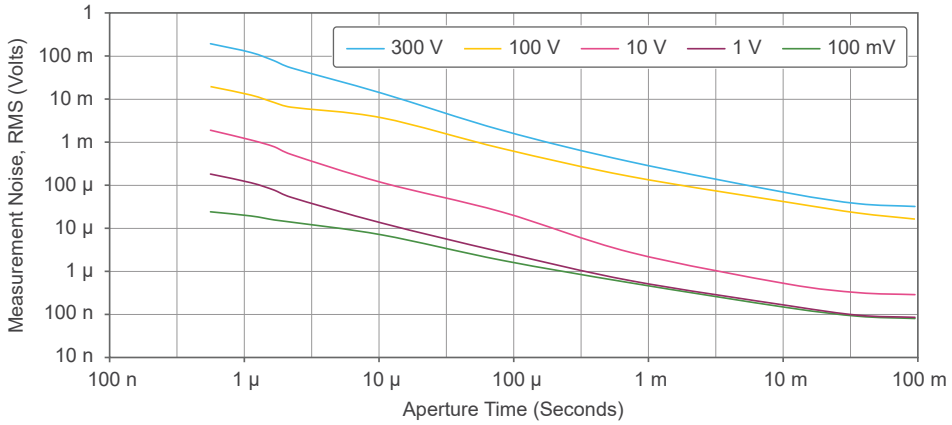
1. In parallel with 150 pF, typical.
2. Relative to external calibration source.

Range	Input Resistance	24 Hour $T_{selfcal}$ ±1 °C	90 Day $T_{selfcal}$ ±5 °C	2 Year $T_{selfcal}$ ±5 °C	Tempco/°C, Without Self-Cal	Tempco/°C, With Self-Cal
100 V	10 MΩ ± 2%	6 + 2	35 + 6	45 + 6	4 + 1	0.3 + 0.3
300 V	10 MΩ ± 2%	6 + 6	35 + 20	45 + 20	4 + 1	0.3 + 0.3

DC Voltage Noise

The following graph represents DC voltage noise with input shorted, Normal DC Noise Rejection, and Auto Zero ON. For apertures less than 100 ms, add five times the typical rms noise to the accuracy specification.

Figure 2. DC Voltage Noise, Typical



DC Voltage General Specifications

Table 3. DC Voltage General Specifications

ADC linearity	0.5 ppm of reading + 1 ppm of range
Effective common-mode rejection ratio (CMRR) (1 kΩ resistance in LO lead)	>140 dB (DC), 100 ms aperture; >170 dB (>46 Hz) with high-order DC noise rejection, 100 ms aperture, typical
Overrange	105% of range except 300 V
DC voltage input bias current	<30 pA at 23 °C, typical

Resistance Specifications

Resistance Accuracy Specifications

All resistance accuracy specifications apply to apertures of ≥100 ms, with Offset Compensated Ohms (for ranges ≤10 kΩ) or Auto Zero (for ranges ≥100 kΩ) and ADC calibration enabled.

Table 4. Resistance (4-Wire and 2-Wire) ± (ppm of Reading + ppm of Range)

Range	Test Current[3]	Max Test Voltage[4]	Open Circuit Voltage[5]	90 Day $T_{selfcal}$ ±5 °C	2 Year $T_{selfcal}$ ±5 °C	Tempco/°C, Without Self-Cal	Tempco/°C, With Self-Cal
100 Ω	1 mA	100 mV	11.3	50 + 15	80 + 15	5 + 1	0.8 + 1
1 kΩ	1 mA	1 V	11.3	50 + 3	80 + 3	5 + 0.1	0.8 + 0.1
10 kΩ	100 µA	1 V	11.7	50 + 3	80 + 3	5 + 0.1	0.8 + 0.1
100 kΩ [6]	10 µA	1 V	11.7	90 + 6	95 + 6	5 + 0.5	2 + 0.5
1 MΩ	10 µA	10 V	11.7	90 + 10	95 + 10	5 + 1	2 + 1
10 MΩ	1 µA	10 V	11.6	800 + 10	800 + 10	20 + 3	20 + 3
100 MΩ [7]	1 µA || 10 MΩ	10 V	9.7	3,000 + 10	3,000 + 10	300 + 10	300 + 10

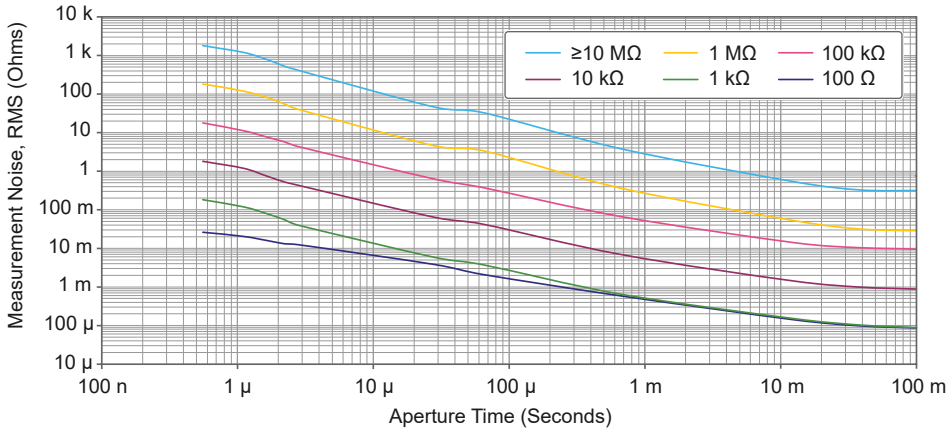
Note For 2-wire resistance measurements, perform offset nulling or add 200 mΩ to the reading.

Resistance Noise

The following graph represents resistance noise with input shorted, Normal DC Noise Rejection, and Auto Zero ON. For apertures less than 100 ms, add five times the typical rms noise to the accuracy specification.

3. -13% to 0% tolerance, typical.
4. Highest nominal voltage present with highest range resistance applied.
5. Nominal voltage present at output with no resistance load.
6. Perform offset nulling or add 2 ppm of range to the specifications.
7. 2-wire resistance measurement only. Use tempco outside T_{extcal} +/- 10 °C. Typical accuracy is 5% between 105 MΩ and 1.05 GΩ.

Figure 3. PXIe-4086 Resistance Noise, Typical



Resistance General Specifications

Table 5. Maximum 4-Wire Lead Resistance

Maximum 4-wire lead resistance	Use the lesser of 10% of range or 1 kΩ

DC Current Specifications

DC Current Accuracy Specifications

All DC current accuracy specifications apply for apertures ≥100 ms, with Auto Zero and ADC calibration enabled.

Table 6. DC Current ± (ppm of Reading + ppm of Range)

Range	Burden Voltage, Typical	24 hour[8] $T_{selfcal}$ ±1 °C	2 Year $T_{selfcal}$ ±5 °C	Tempco/°C
20 mA	<20 mV	20 + 15	450 + 200	8 + 10
200 mA	<200 mV	20 + 15	550 + 20	8 + 1
1 A	<800 mV	20 + 15	700 + 50	8 + 2

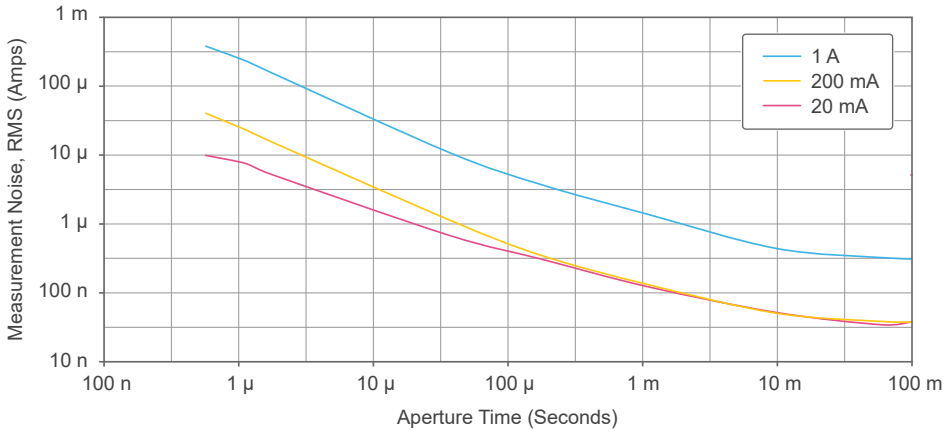
DC Current Noise

The following graph represents DC current noise with input open, Normal DC Noise Rejection, and Auto Zero ON. For apertures less than 100 ms, add five times the typical

8. Relative to external calibration source.

rms noise to accuracy specification.

Figure 4. PXIe-4086 DC Current Noise, Typical



DC Current General Specifications

Table 7. Overrange

Overrange	105% of range except 1 A range

AC Voltage Specifications

AC Voltage Accuracy Specifications

The following measurement conditions apply to the information provided in the following table:

- Measurement aperture greater than $4/f_L$, where f_L is the lowest frequency component of the signal being measured.
- Signal amplitudes greater than 1% of range.

Table 8. AC Voltage Accuracy ± (% of Reading + % of Range), 2 Years, T_{extcal} ± 10 °C, $T_{selfcal}$ ± 5 °C

Range (RMS)	Peak Voltage	1 Hz to 40 Hz[9]	>40 Hz to 20 kHz	>20 kHz to 50 kHz	>50 kHz to 100 kHz
50 mV [10]	±105 mV	0.1 + 0.04	0.05 + 0.04	0.09 + 0.04	0.5 + 0.08
500 mV	±1.05 V	0.1 + 0.01	0.05 + 0.02	0.09 + 0.02	0.5 + 0.02

9. Applies to DC coupled only.
10. Applies to signals >2 mV.

Range (RMS)	Peak Voltage	1 Hz to 40 Hz	>40 Hz to 20 kHz	>20 kHz to 50 kHz	>50 kHz to 100 kHz
5 V	±10.5 V	0.1 + 0.01	0.05 + 0.02	0.09 + 0.02	0.5 + 0.02
50 V	±105 V	0.1 + 0.01	0.05 + 0.02	0.09 + 0.02	0.5 + 0.02
300 V	±450 V	0.1 + 0.01	0.05 + 0.02	0.09 + 0.02	0.5 + 0.02
Tempco/°C	Tempco/°C	0.001 + 0.001	0.001 + 0.001	0.001 + 0.001	0.001 + 0.001

AC Voltage General Specifications

Table 9. AC Voltage General Specifications

Input impedance	1 MΩ ± 2% in parallel with 150 pF, typical
Input coupling	AC or DC coupled
Overrange	105% of range except 300 V
Maximum Volt-Hertz product	Verified to 2.2×10^7 V-Hz
Maximum DC voltage component	250 V
Common mode rejection ratio (CMRR), 1 kΩ resistance in LO lead	>70 dB (DC to 60 Hz), typical

AC Current Specifications

AC Current Accuracy Specifications

The following measurement conditions apply to the information provided in the following table:

- Measurement aperture greater than $4/f_L$, where f_L is the lowest frequency component of the signal being measured.
- Signal amplitudes greater than 1% of range.

Table 10. AC Current Specifications ± (% of Reading + % of Range), 2 Years, Full Operating Temperature Range

Range (RMS)	Peak Current	Burden Voltage (RMS), Typical	1 Hz to 20 kHz[11]	Tempco/°C
10 mA	±20 mA	<10 mV	0.04 + 0.02	0.001 + 0.0001
100 mA	±200 mA	<100 mV	0.04 + 0.02	0.001 + 0.0001
1 A	±2 A	<800 mV	0.1 + 0.02	0.001 + 0.0001

AC Current General Specifications

Table 11. Overrange

Overrange	105% of range except 1 A

Diode Test Specifications

Table 12. Diode Test Specifications

Range	10 V
Test current[12]	1 µA, 10 µA, 100 µA, 1 mA[13]
Accuracy	Add 20 ppm of reading to 10 V DC voltage specifications.

Frequency and Period Specifications

The following measurement range specifications are valid with the aperture time set to 150 ms.

Table 13. Frequency and Period Measurement Range

Frequency measurement range	15 Hz to 500 kHz
Period measurement range	2 µs to 66.67 ms

11. Specification is typical above 5 kHz.
12. -13% to 0% tolerance, typical.
13. Up to 4.5 V measurement for 1 mA test current.

Table 14. AC Input Voltage Range and Peak-to-Peak Signal Amplitude

AC Input Voltage Range	Minimum Peak-to-Peak Signal Amplitude[14]	Maximum Peak-to-Peak Signal Amplitude
50 mV	5 mV	200 mV
500 mV	50 mV	2 V
5 V	500 mV	20 V
50 V	5 V	200 V
300 V	50 V	450 V

Note For accuracy, refer to the PXIe_CLK100 accuracy of the chassis.

Temperature Specifications

All temperature accuracy specifications apply to apertures ≥100 ms, Auto Zero, and ADC calibration enabled. Use the lowest possible resistance or voltage range for each temperature. Add probe accuracy and cold junction accuracy where applicable.

Table 15. Temperature Specifications

Sensor Type	Temperature Range	Accuracy
RTD[15]	-200 °C to 600 °C	0.1 °C
Thermistor[16]	-80 °C to 150 °C	0.08 °C
J Thermocouple	-210 °C to 1,200 °C	0.2 °C
K Thermocouple	-200 °C to 1,200 °C	0.3 °C
N Thermocouple	-200 °C to 1,300 °C	0.4 °C
T Thermocouple	-200 °C to 400 °C	0.3 °C
E Thermocouple	-200 °C to 1,000 °C	0.2 °C
R Thermocouple	-50 °C to 1,760 °C	0.8 °C

14. Square wave input. Minimum required peak-to-peak signal level is valid only for frequencies up to the -3 dB bandwidth. For higher frequencies, the signal amplitude must be increased. Typical -3 dB bandwidth is 240 kHz.
15. Based on Pt3851 RTD in a 4-wire configuration.
16. Based on 44004, 44006, and 44007 interchangeable thermistors.

Sensor Type	Temperature Range	Accuracy
S Thermocouple	-50 °C to 1,760 °C	0.8 °C
B Thermocouple	400 °C to 1,820 °C	0.8 °C

General Specifications

Table 16. General Specifications

External calibration interval	2 years
Warm-up	60 minutes to rated accuracy
Measurement Category	I (up to 300 V) II (up to 250 V AC_{rms}, 220 V DC)

Caution Do not connect the product to signals or use for measurements within Measurement Categories III or IV.

Table 17. Input Protection and Fuse Specifications

Input protection (between terminals or terminal to ground)	300 V DC or VAC_{rms}
Current mode fuse	T 1 A, 400 V, time-lag, user-replaceable Minimum interrupt rating: 500 A Littelfuse 0477001.MXP
Maximum common-mode voltage	300 V DC or V AC_{rms}

Table 18. Maximum Voltage to Earth Ground

HI	300 V DC or V AC_{rms}
LO	300 V DC or V AC_{rms}
HI SENSE	300 V DC or V AC_{rms}
LO SENSE	300 V DC or V AC_{rms}

Fuse When this fuse symbol is marked on a device, take proper precautions.

Caution Take precautions to avoid electrical shock.

Timing

Table 19. Timing Specifications

Mode	Trigger Latency, AC Voltage	Trigger Latency, All Functions Except AC Voltage[17]	Maximum Reading Rate[18]
Voltage, current, and resistance	15 µs	<0 µs	15 kS/s

Power

Table 20. Power Specifications

Power consumption	<9 W from PXI Express backplane
+12 V load	0.55 A maximum
+3.3 V load	0.55 A maximum

Physical Characteristics

Table 21. Physical Characteristics

Dimensions	3U, one-slot, PXI/cPCI module 2.0 cm x 13.0 cm x 21.6 cm (0.8 in. x 5.1 in. x 8.5 in.), nominal
Weight	340 g (12 oz), nominal

17. Trigger latency for all functions except AC Voltage assumes Auto Zero, Offset Compensated Ohms, and ADC Calibration are OFF.
18. Maximum Reading Rate assumes minimum aperture time, Auto Zero is OFF, Offset Compensated Ohms is OFF, ADC Calibration is OFF, Number of Averages is 1, and Settle Time is 0 seconds. Varying these settings affects the reading rate.

Note If you need to clean the device, wipe it with a dry towel.

Environmental Guidelines

Notice Failure to follow the mounting instructions in the *PXIe-4086 User Manual* can cause temperature derating.

Notice Use this product indoors only.

Notice Apply strain relief near the input connectors of all cables. Ensure the strain relief does not cause directional bias on the cable connectors within the input connectors.

Notice Cover all empty slots with filler panels.

Environmental Characteristics

Table 22. Temperature

Operating temperature	0 °C to 55 °C
Storage temperature	-40 °C to 71 °C

Table 23. Humidity

Operating humidity	10% to 90% relative, non-condensing
Storage humidity	5% to 95% relative, non-condensing

Table 24. Pollution Degree

Pollution degree	2

Table 25. Maximum Altitude

Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)

Table 26. Shock and Vibration

Operating vibration	5 Hz to 500 Hz, 0.3 g RMS
Non-operating vibration	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse, 3 shocks at 6 orientations, 18 total
Non-operating shock	50 g, half-sine, 11 ms pulse, 3 shocks at 6 orientations, 18 total

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