

Low-Cost 6½-Digit Multimeters

Specifications

DC Specifications

Resolution (Digits)	Reading Rate ¹ (S/s)	Aperture Time (NPLC)	RMS Noise ² (ppm of range)
6½	0.6 (0.5)	100	0.06
	6 (5)	10	0.2
	10 (8.33)	6	0.25
5½	30 (25)	2	0.4
	60 (50)	1	0.55
	900	0.06	1.7
	1,500	0.04	2.5
4½	3,000	0.02	11.5

¹ Specified for 60 Hz and (50 Hz) operation

² Measured on the 10 V range

DC Voltage ± (ppm of reading + ppm of range)¹

Range	Resolution	Input Resistance ⁴	24-Hour ² , T _{cal} ±1 °C	90-Day, T _{cal} ±5 °C	1-Year, T _{cal} ±5 °C	Tempco (0 to 55 °C)
100 mV ³	100 nV	>10 GΩ, 10 MΩ	30 + 30	65 + 35	90 + 35	5 + 2
1 V	1 μV	>10 GΩ, 10 MΩ	20 + 6	65 + 7	90 + 7	5 + 0.2
10 V	10 μV	>10 GΩ, 10 MΩ	15 + 5	65 + 6	90 + 6	5 + 0.2
100 V	100 μV	10 MΩ	20 + 6	75 + 7	110 + 7	6 + 0.2
300 V	1 mV	10 MΩ	20 + 20	75 + 20	110 + 20	6 + 0.5

¹ppm (part per million) = 0.0001%

²Relative to external calibration source

³With offset nulling

⁴Default input resistance is 10 MΩ

T_{cal} = temperature at which last external calibration was performed NI factory calibration is 23 °C ± 1 °C

Tempco = temperature coefficient

DC Current ± (ppm of reading + ppm of range)

Range	Resolution	Burden Voltage (typical)	24-Hour ² , T _{cal} ±1 °C	90-Day, T _{cal} ±5 °C	1-Year, T _{cal} ±5 °C	Tempco (0 to 55 °C)
10 mA	10 nA	<60 mV	50 + 100	300 + 200	500 + 200	30 + 20
100 mA	100 nA	<0.6 V	100 + 40	300 + 50	500 + 50	30 + 5
1 A	1 μA	<0.35 V	500 + 60	800 + 100	1000 + 100	65 + 10
3 A	3 μA	<1 V	1000 ¹ + 200	1200 ¹ + 200	1200 ¹ + 200	65 + 20

¹Add 650 ppm/A of reading for currents above 1.5 A

²Relative to external calibration source

Resistance (4- and 2-Wire) ± (ppm of reading + ppm of range)

Range	Resolution	Test Current	24-Hour ¹ , T _{cal} ±1 °C	90-Day, T _{cal} ±5 °C	1-Year, T _{cal} ±5 °C	Tempco (0 to 55 °C)
100 Ω	100 μΩ	1 mA	30 + 30	95 + 40	110 + 40	8 + 3
1 kΩ	1 mΩ	1 mA	20 + 6	95 + 10	110 + 10	8 + 1
10 kΩ	10 mΩ	100 μA	20 + 6	95 + 10	110 + 10	8 + 1
100 kΩ	100 mΩ	10 μA	20 + 6	95 + 10	110 + 10	8 + 1
1 MΩ	1 Ω	5 μA	20 + 10	110 + 12	125 + 12	10 + 1
10 MΩ	10 Ω	500 nA	150 + 10	400 + 12	500 + 12	30 + 2
100 MΩ	100 Ω	500 nA 10 MΩ	2000 + 20	6000 + 40	8000 + 40	400 + 4

¹Relative to external calibration source

Specifications are for 4-wire measurements. For 2-wire measurements, perform offset nulling or add 200 mΩ to reading.

Diode Test¹

Range	Resolution	Test Current	Accuracy
10 V	10 μV	100 μA, 1 mA	Add 50 ppm of reading and 50 ppm of range to 10 VDC voltage specifications.

¹Can be used to test p-n junctions, LEDs, or zener diodes up to 10 V=

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DC Functions General Specifications

Effective common-mode rejection ratio (CMRR) (1 kΩ resistance in LO lead).....	>150 dB (DC, 50 and 60 Hz ± 1%) with second-order DC noise rejection, 10 PLC aperture
Maximum 4-wire lead resistance.....	Use the lesser of 10% of range or 1 kΩ
Overrange.....	105% of range except 300 V and 3 A range
DC voltage input bias current.....	<40 pA at 23 °C (typical)

AC Specifications

Digits	Desired Bandwidth	Recommended Reading Rate
6½	10 Hz to 100 kHz	1 S/s
5½	100 Hz to 100 kHz	10 S/s
4½	500 Hz to 100 kHz	100 S/s

AC Voltage ± (% of reading + % of range)

Range (Peak Voltage)	Frequency	24-Hour, T _{cal} ±1 °C	90-Day, T _{cal} ±5 °C	1-Year, T _{cal} ±5 °C	Tempco (0 to 55 °C)
200 mV (±320 mV)	10 to 40 Hz	1.5 + 0.04	2 + 0.05	2 + 0.05	0.01 + 0.003
2 V (±3.2 V)	>40 Hz to 20 kHz	0.2 + 0.04	0.2 + 0.05	0.2 + 0.05	0.005 + 0.003
20 V (±32 V)	>20 to 50 kHz	0.3 + 0.04	0.3 + 0.05	0.3 + 0.05	0.01 + 0.003
300 V (±425 V)	>50 to 100 kHz	1.5 + 0.08	1.5 + 0.08	1.5 + 0.08	0.02 + 0.005

Tempco = temperature coefficient

AC Current ± (% of reading + % of range)

Range (Peak Current)	Frequency	24-Hour, T _{cal} ±1 °C	90-Day, T _{cal} ±5 °C	1-Year, T _{cal} ±5 °C	Tempco (0 to 55 °C)
10 mA (±15 mA)	10 to 40 Hz	1.6 + 0.05	2.1 + 0.05	2.1 + 0.05	0.015 + 0.03
100 mA (±150 mA)					
500 mA (±750 mA)	>40 Hz to 5 kHz	0.3 + 0.05	0.3 + 0.06	0.3 + 0.06	0.015 + 0.03
3 A (±4.2 A)					

Tempco = temperature coefficient

High Crest Factor Additional Error¹

Crest Factor	Additional Error (% of reading)
1 to 3	0.05%
3 to 4	0.1%
4 to 5	1% ²

¹Applicable for non-sine wave signals up to the rated peak voltage/current or bandwidth
²For frequencies above 2 kHz

AC Functions General Specifications

Input impedance	10 MΩ in parallel with 200 pF
Input coupling	AC coupling
Maximum volt-hertz product	>3 x 10 ⁷ V-Hz
Maximum DC voltage component	250 V
CMRR (1 kΩ resistance in LO lead)	>70 dB (DC to 60 Hz)
Overrange.....	105% of range except 300 V, 3 A range

General Specifications

External calibration interval	1 year recommended
Input protection	
Resistance, diode	Up to 300 VDC
DC V, AC V	Up to 300 VDC, 300 V _{rms} , 450 V _p
DC I and AC I	F 3.15 A 250 V fast-acting fuse, user-replaceable

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Maximum common-mode voltage	300 VDC or V_{rms}
Input terminals.....	Gold-plated low-thermal emf solid copper
Dimensions	PXI: 3U, 1 slot, PXI/CompactPCI module; 21.6 by 2.0 by 13.0 cm (8.5 by 0.8 by 5.1 in.) PCI/PCI Express: 1 slot, PCI or PCI Express board; 18.3 by 12 cm (7.2 by 4.72 in.) USB: 17.8 by 10.4 by 3.3 cm (7.0 by 4.1 by 1.3 in.)
Operating temperature	PXI: 0 to 55 °C; PCI/PCI Express: 0 to 40 °C; USB: 0 to 45°C
Storage temperature.....	-40 to 70 °C
Relative humidity	Up to 95% at 40 °C
Measurement category.....	CAT II
Pollution degree.....	2
Approved at altitudes	Up to 2000 m

Safety

An NI 4065 meets the requirements of the following standards of safety and electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note: For UL and other safety certifications, refer to the product label, or visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note: For EMC compliance, operate this device according to product documentation.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Note: Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers: At the end of their life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.htm.