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Find the *National Instruments PXI-4072* at our website: *Click HERE*

6½-Digit Digital Multimeter, 1.8 MS/s Isolated Digitizer, and LCR Meter

NI PXI-4072

- Multifunction device
  - 6½-digit digital multimeter
  - 1.8 MS/s isolated digitizer
  - LCR meter (inductance, capacitance, and resistance)
- 20 built-in measurements
- 10- to 23-bit flexible resolution
- Built-in self-calibration
- ±300 VDC/V_{rms} isolation
- 425 V_p AC measurements

Calibration

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

Operating Systems

- Windows Vista/XP/2000
- Linux®

Recommended Software

- LabVIEW
- LabVIEW Real-Time Module
- LabWindows™/CVI
- LabVIEW SignalExpress

Driver Software (included)

- NI-DMM driver
- DMM Express VI for LabVIEW
- DMM Soft Front Panel



Overview

The National Instruments PXI-4072 FlexDMM, based on the NI 4070 architecture, combines the functionality found in three common test instruments – a digital multimeter, an LCR meter, and a digitizer. This functionality provides engineers with the 20 most common test functions in a compact 3U PXI module, including voltage, current, capacitance, inductance, temperature, and resistance. Integrating these measurements in a PXI module reduces test system size and cost, increases throughput, and shortens test development time, making the NI PXI 4072 an excellent fit for use in automated tests on both the production floor and in an R&D environment.

The PXI-4072 offers a DC reading rate from 10 kS/s at 4½ digits to 5 S/s at 7 digits. As a digitizer, the FlexDMM can acquire both AC- and DC-coupled voltage and current waveforms up to ±300 V and ±1 A input at a maximum sampling rate of 1.8 MS/s. As an LCR meter, the FlexDMM delivers 0.25 percent basic accuracy for both inductance and capacitance at measurement rates up to 40 S/s. Using the intuitive NI-DMM instrument driver, you can quickly change from function to function in a single application programming interface (API).

Mode	Ranges	Reading Rate (S/s)
Capacitance	300 pF, 1 nF, 10 nF, 100 nF, 1 µF, 10 µF	20
	100 µF, 1000 µF, 10,000 µF	3
Inductance	10 µH, 100 µH	40
	1 mH, 10 mH	20
	100 mH, 1 H, 5 H	3

Table 1. PXI-4072 Key Specifications

Ordering Information

NI PXI-4072 778270-01
Includes the P-1 Probe Set, NI-DMM, DMM Express VI, and DMM Soft Front Panel.

Recommended Switching and Accessories

NI PXI-2527
300 V multiplexer switch 778572-27
NI PXI-2530
128x1 multiplexer switch 778660-01
P-1 Probe Set (standard probe) 761000-01
P-2 Probe Set (additional probe) 184698-01
P-3 Probe Set (banana plug to bare wire) 185692-01
10 A current shunt, CSM-10A 777488-02

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to **ni.com/dmm.**

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Specifications

Specifications subject to change without notice.
For the most current and complete specifications, visit **ni.com/modularinstruments**.

DC Functions

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

Range	Resolution	Input Resistance	24 Hr T_{cal} ±1 °C	90-Day T_{cal} ±5 °C	2-Year T_{cal} ±5 °C	Tempco/°C Without Self-Cal	Tempco/°C With Self-Cal
100 mV	100 nV	>10 GΩ,10 MΩ	10 + 10	30 + 20	40 + 20	4 + 5	0.3 + 0.3
1 V	1 µV	>10 GΩ,10 MΩ	6 + 2	20 + 6	25 + 6	2 + 1	0.3 + 0.3
10 V	10 µV	>10 GΩ,10 MΩ	4 + 2	20 + 6	25 + 6	1 + 1	0.3 + 0.3
100 V	100 µV	10 MΩ	6 + 2	30 + 6	35 + 6	4 + 1	0.3 + 0.3
300 V	1 mV	10 MΩ	6 + 6	30 + 20	35 + 20	4 + 3	0.3 + 0.3

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

Range	Resolution	Burden Voltage (typical)	Noise (ppm of range rms)	2-Year	Tempco/°C
20 mA	10 nA	<20 mV	20	400 + 75	8 + 1
200 mA	100 nA	<200 mV	3	400 + 20	8 + 0.2
1 A	1 µA	<800 mV	3	500 + 20	8 + 0.4

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

Range	Resolution	Test Current	Max Test Voltage	24 Hr T_{cal} ±1 °C	90-Day T_{cal} ±5 °C	2-Year T_{cal} ±5 °C	Tempco/°C Without Self-Cal	Tempco/°C With Self-Cal
100 Ω	100 µΩ	1 mA	100 mV	15 + 10	50 + 10	80 + 10	8 + 1	0.8 + 1
1 kΩ	1 mΩ	1 mA	1 V	12 + 2	50 + 3	80 + 3	8 + 0.1	0.8 + 0.1
10 kΩ	10 mΩ	100 µA	1 V	12 + 2	50 + 3	80 + 3	8 + 0.1	0.8 + 0.1
100 kΩ	100 mΩ	10 µA	1 V	15 + 2	50 + 6	80 + 6	8 + 0.5	0.8 + 0.5
1 MΩ	1 Ω	10 µA	10 V	20 + 2	60 + 10	90 + 10	8 + 1	0.8 + 1
10 MΩ	10 Ω	1 µA	10 V	100 + 2	200 + 10	400 + 10	30 + 3	30 + 3
100 MΩ	100 Ω	1 µA II 10 MΩ	10 V	900 + 20	1,800 + 40	2,000 + 40	200 + 10	200 + 10

Diode Test

Range	Resolution	Test Current	Accuracy
10 V	10 µV	1 µA, 10 µA, 100 µA, 1 mA	Add 20 ppm of reading to 10 VDC voltage specifications

AC Functions

Digits	Reading Rate	Bandwidth
6½	0.25 S/s	1 Hz to 300 kHz
6½	2.5 S/s	10 Hz to 300 kHz
6½	25 S/s	100 Hz to 300 kHz
6½	100 S/s	400 Hz to 300 kHz
5½	1.0 kS/s	20 to 300 kHz

AC Voltage 2-Year ± (% of reading + % of range), 23 °C ±5 °C

Range (rms)	Peak Voltage	Resolution	1 to 40 Hz	40 Hz to 20 kHz	20 to 50 kHz	50 to 100 kHz	100 to 300 kHz
50 mV	±105 mV	100 nV	0.1 + 0.04	0.05 + 0.04	0.09 + 0.04	0.5 + 0.08	3 + 0.1
500 mV	±1.05 V	1 µV	0.1 + 0.01	0.05 + 0.02	0.09 + 0.02	0.5 ± 0.02	3 + 0.05
5 V	±10.5 V	10 µV					
50 V	±105 V	100 µV					
300 V	±450 V	1 mV					
Tempco/°C			0.001 + 0.001	0.001 + 0.001	0.001 + 0.001	0.001 + 0.001	0.01 + 0.01

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AC Current 2-Year ±(% of reading + % of range)

Range (rms)	Peak Current	Resolution	Burden Voltage (rms)	1 Hz to 20 kHz	Tempco/°C
10 mA	±20 mA	10 nA	<10 mV	0.04 + 0.02	0.001 + 0.0001
100 mA	±200 mA	100 nA	<100 mV	0.04 + 0.02	0.001 + 0.0001
1 A	±2 A	1 µA	<800 mV	0.1 + 0.02	0.001 + 0.0001

Frequency and Period

Input Range	Frequency Range	Period Range	Resolution	2-Year Accuracy % of Reading
50 mV to 300 V	1 Hz to 500 kHz	1 s to 2 µs	6½ digits	0.01

Capacitance and Inductance (PXI-4072 only)

Capacitance ±(% of reading + % of range), 23 °C ±10 °C

Range	Resolution	2-year	Tempco/°C (0 to 55 °C)	Effective Test Current	Effective Frequency	Default Model
300 pF	0.05 pF	0.15 + 0.5	0.01 + 0.025	160 nA	3 kHz	Parallel
1 nF	0.1 pF	0.15 + 0.1	0.01 + 0.003	330 nA	3 kHz	Parallel
10 nF	1 pF	0.15 + 0.1	0.01 + 0.001	330 nA	3 kHz	Parallel
100 nF	10 pF	0.15 + 0.1	0.01 + 0.001	3.3 µA	3 kHz	Parallel
1 µF	100 pF	0.18 + 0.1	0.01 + 0.001	100 µA	1 kHz	Series
10 µF	1 nF	0.18 + 0.1	0.01 + 0.001	1 mA	1 kHz	Series
100 µF	10 nF	0.18 + 0.1	0.01 + 0.001	1 mA	91 Hz	Series
1,000 µF	100 nF	0.18 + 0.1	0.01 + 0.001	1 mA	91 Hz	Series
10,000 µF	1 µF	0.18 + 0.1	0.01 + 0.001	1 mA	91 Hz	Series

Inductance ±(% of reading + % of range), 23 °C ±10 °C

Range	Resolution	2-year	Tempco/°C (0 to 55 °C)	Effective Test Current	Effective Frequency	Default Model
10 µH	1 nH	0.5 + 1	0.01 + 0.01	330 µA	30 kHz	Series
100 µH	10 nH	0.2 + 0.1	0.01 + 0.01	330 µA	30 kHz	Series
1 mH	100 nH	0.2 + 0.1	0.01 + 0.001	330 µA	3 kHz	Series
10 mH	1 µH	0.15 + 0.1	0.005 + 0.001	3.3 µA	3 kHz	Series
100 mH	10 µH	0.15 + 0.1	0.005 + 0.001	33 µA	273 Hz	Series
1 H	100 µH	0.18 + 0.1	0.007 + 0.001	3.3 µA	273 Hz	Series
5 H	1 mH	0.18 + 0.1	0.007 + 0.001	330 nA	273 Hz	Series

Capacitance and Inductance, General Specifications

Mode	Ranges	Reading Rate
Capacitance	300 pF, 1 nF, 10 nF, 100 nF, 1 µF, 10 µF	20 S/s
	100 µF, 1,000 µF, 10,000 µF	3 S/s
Inductance	10 µH, 100 µH	40 S/s
	1 mH, 10 mH	20 S/s
	100 mH, 1 H, 5 H	3 S/s

Isolated Digitizer Mode

Acquisition System

Available sample rates ..... $\frac{1.8\ \text{MS/s}}{n}$, where n = 1, 2, 3,…1.8 x 10^5
Variable resolution ..... 10 to 23 bits
Available functions ..... Voltage and current
Voltage ranges ..... ±100 mV to ±300 V (DC or AC coupled)
Current ranges ..... 20 mA to 1 A

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

Range	Input Impedance	Flatness Error (20 kHz)	Bandwidth (-3 dB)	THD 1 kHz Signal (-1 dBFS)	THD 1 kHz Signal (-1 dBFS)
100 mV	>10 GΩ,1 MΩ	-0.03 dB	300 kHz	-104 dB	-78 dB
1 V	>10 GΩ,1 MΩ	-0.03 dB	300 kHz	-109 dB	-83 dB
10 V	>10 GΩ,1 MΩ	-0.03 dB	300 kHz	-96 dB	-70 dB
100 V	1 MΩ	-0.03 dB	300 kHz	-96 dB	-70 dB
300 V	1 MΩ	-0.03 dB	300 kHz	-98 dB	-72 dB

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

Range	Resolution	Burden Voltage (typical)	Flatness Error (20 kHz)	Bandwidth (-3 dB)
20 mA	10 nA	<20 mV	±0.01 dB	430 kHz
200 mA	100 nA	<200 mV	±0.01 dB	430 kHz
1 A	1 µA	<800 mV	±0.01 dB	400 kHz

Certifications and Compliance

Safety

IEC 61010-1; EN 61010-1; UL 61010-1; CSA 61010-1

Installation category II

Pollution degree 2

Electromagnetic compatibility

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

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