

# 6-Wire Guard and Current Amplifier

## NI PXI-4022 **NEW!**

- High-speed, high-precision guard and current amplifier
- Applications
  - 6-wire guarded measurements
  - Low-current measurements
- Used as an accessory to NI PXI-407x digital multimeters and M Series data acquisition devices
- $\pm 200 \mu\text{V}$  guard accuracy, typical
- $1 \pm 0.0005\%$  DC gain

### Operating Systems

- Windows 2000/NT/XP
- Linux

### Recommended Software

- LabVIEW

### Driver Software (included)

- NI-DMM



## Overview

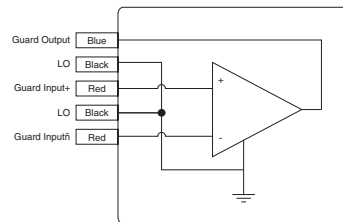
The National Instruments PXI-4022 guard and current amplifier is a PXI accessory module consisting of a high-speed, high-precision amplifier that conditions signals for measurement devices. With the guarding functionality, you can make 6-wire resistance measurements for resistors connected in a network, on complex printed circuit board layouts, or cable test applications. For low-current measurements, the NI PXI-4022 amplifier and high-precision resistors create a feedback current amplifier. This implementation minimizes burden voltages and converts current to voltage, so you can measure pA signals with fA noise.

## Add Functionality to DMMs and Data Acquisition Devices

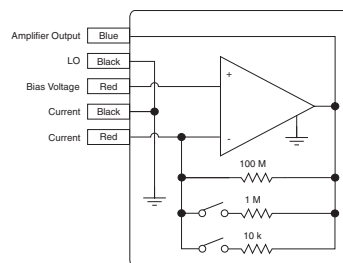
You can use the PXI-4022 with NI PXI-407x digital multimeters (DMMs) for 6-wire resistance/capacitance measurements or ultralow-current measurements in a wide variety of applications. You also can use it with an M Series data acquisition device to form a low-cost, high-resolution acquisition module for basic in-circuit test needs.

## Software

The PXI-4022 is shipped with NI-DMM driver software, an IVI-compliant driver that provides numerous example programs and access to the complete functionality of the PXI-4022 through an easy-to-use application programming interface (API).



PXI-4022 Guard Mode



PXI-4022 Current Amplifier Mode

## Ordering Information

NI PXI-4022.....	779614-01
Includes NI-DMM software.	
Low-leakage, low thermal cable set .....	779410-01
Low-leakage, low thermal connectivity set.....	779499-01

## BUY NOW!

For complete product specifications, pricing, and accessory information, call (800) 813 3693 (U.S.) or go to [ni.com/multimeters](http://ni.com/multimeters).



## 6-Wire Guard and Current Amplifier

### Specifications

#### Guard Amplifier

Input-output offset.....	±200 µV typical; ±500 µV max
Gain .....	1 ±0.0005% at DC
Slew rate.....	40 V/µS minimum
Bandwidth.....	1 MHz typical minimum

#### Current Amplifier

Gain Setting V/A (Range)	Accuracy <sup>1</sup> 23 °C ± 5 °C	Usable Sensitivity <sup>2</sup>	Settling Time <sup>3</sup>	Burden Voltage (max)	Tempco/°C (0 to 55 °C)
10 <sup>8</sup> (100 nA)	0.7% ± 5 pA	0.5 pA	100 ms	20 µV	0.01% + 0.2 pA
10 <sup>6</sup> (10 µA)	0.5% ± 0.5 nA	50 pA	33 ms	2 mV	0.005% + 2 pA
10 <sup>4</sup> (1 mA)	0.5% ± 50 nA	5 nA	1 ms	200 mV	0.005% + 200 pA

<sup>1</sup>Recommended for laboratory environments, 0 to 35 °C up to 60% relative humidity. <sup>2</sup>10 Hz bandwidth <sup>3</sup>10 to 90%, 3 dB bandwidth = 0.5/settling time

#### Input Characteristics

Input impedance .....	>10 <sup>10</sup> Ω
Input bias current.....	<5 pA at 23 °C, typical

#### Output Characteristics

Voltage output range .....	±12 V max
Output drive current.....	±15 mA max

#### Overvoltage Protection

Guard Out, Guard In+, Guard In-.....	120 VAC, continuous; 100 VDC, continuous; 300 VDC (5 s); 250 VAC (10 s)
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#### Physical

Dimensions .....	10 by 16 cm (3.9 by 6.3 in.); single PXI slot, 3U
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#### Environment

Operating temperature .....	0 to 55 °C
Storage temperature.....	-20 to 70 °C
Relative humidity .....	5 to 85% noncondensing
Pollution degree.....	2
Approved at altitudes up to 2000 m	

#### Safety

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

- IEC 61010-1, EN 61010-1
- UL 61010-1
- CAN/CSA C22.2 No. 61010-1

#### Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) Compliant

Emissions .....	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity .....	EN 61326:1997 +A2:2001, Table 1

#### CE Compliance

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

Low-Voltage Directive (safety) .....	73/23/EEC
Electromagnetic Compatibility Directive (EMC).....	89/336/EEC

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## Hardware Services

### NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

### Calibration Services

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