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DEVICE SPECIFICATIONS

NI PXI-5900

Differential Amplifier

This document lists the specifications for the NI PXI-5900. The PXI-5900 is a differential amplifier.

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PXI-5900 Specifications

Specifications are subject to change without notice. For the most recent PXI-5900 specifications, visit *ni.com/manuals*.

Specifications describe the warranted, traceable performance of the device over an ambient temperature range of 0 °C to 55 °C and include guardband for measurement uncertainty, unless otherwise noted. Specifications are valid under the following conditions unless otherwise noted:

- The PXI-5900 module is warmed up for 15 minutes at ambient temperature.
- Calibration cycle is maintained.
- The PXI chassis fan speed is set to HIGH, the foam fan filters are removed if present, and the empty slots contain PXI chassis slot blockers and filler panels. For more information about cooling, refer to the *Maintain Forced-Air Cooling Note to Users* available at *ni.com/manuals*.
- External calibration is performed at 23 °C ±3 °C.

Typical values are representative of an average unit operating at room temperature.

Characteristics (or supplemental information) describe basic functions and attributes of the device established by design.

NATIONAL INSTRUMENTS

Data in this document are Specifications unless otherwise noted.

To access PXI-5900 documentation, navigate to **Start»All Programs»National Instruments» NI-SCOPE»NI-SCOPE Documentation**.

Caution Do not operate the PXI-5900 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Analog Input

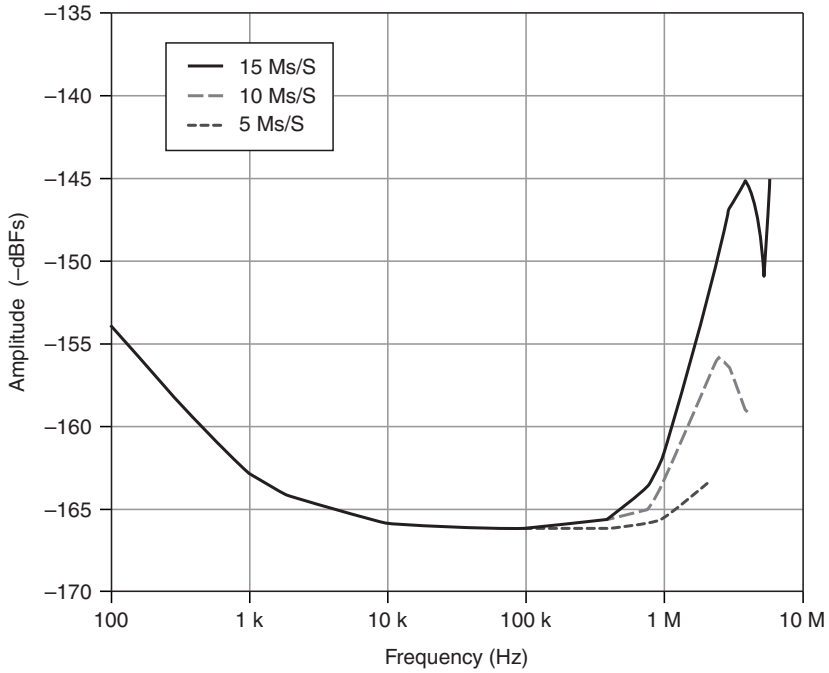
Number of channels	2, differential
Connectors	BNC input, SMB output
Input coupling	AC, DC, GND[1]
Input impedance, either input to GND (software-selectable)	50 Ω ±2% 1 MΩ ±1.0% in parallel with 60 pF, characteristic
Vertical gain	0.25 ±0.2%
Zero input offset error	500 µV
Small-signal bandwidth (-3 dB; 1 Vpp input)	6 MHz
Passband flatness (DC to 5 MHz)	1 dB
Common-mode rejection ratio (CMRR)	70 dB at 60 Hz, typical
Input bias current	<10 pA ($T_{ambient}$ = 25 ºC), typical
Zero stability	<10 µV/ºC referred to input, typical <2.5 µV/ºC referred to output, typical
Slew rate	100 V/µs referred to balanced differential input, typical
Rise time (single-ended, 10% to 90%)	0 V to 10 V step <180 ns, typical 0 V to 2 V step <60 ns, typical
Crosstalk	≤100 dB at 1 MHz, typical
Total harmonic distortion (THD) and noise	<0.02% VIN = 2 Vrms at 10 kHz, typical

[1] Refer to the *Diagrams* section for more information.

Table 1. RMS Noise Referred to Input, Typical

Bandwidth	dBFS	µVrms
20 kHz	-126	6.8
40 kHz	-123	9.7
400 kHz	-113	30
2 MHz	-106	68
4 MHz	-103	97
6 MHz	-101	119

Figure 1. Noise Density of Combined PXI-5900 Differential Amplifier and NI PXI-5922, Typical



Differential input voltage range	±20 V (40 Vpk-pk), characteristic
Output voltage, single-ended	±5 V (10 Vpk-pk), characteristic
Common-mode input voltage range	±10 V, characteristic

Input protection	
1 MΩ	±120 V, characteristic
50 Ω	14 Vrms with peaks <20 V, characteristic

Calibration

External Calibration

External calibration calibrates the vertical offset and vertical gain of the PXI-5900 and confirms if the PXI-5900 is operating within the published specifications.

All calibration constants are stored in nonvolatile memory.

Calibration Specifications

Interval for external calibration	2 years
Warm-up time	15 minutes

Software

Driver Software

Driver support for this device was first available in NI-SCOPE 3.5.1.

NI-SCOPE is an IVI-compliant driver that allows you to configure, control, and calibrate the PXI-5900. NI-SCOPE provides application programming interfaces for many development environments.

Application Software

NI-SCOPE provides programming interfaces, documentation, and examples for the following application development environments:

- LabVIEW
- LabWindows™/CVI™
- Measurement Studio
- Microsoft Visual C/C++

Interactive Configuration

National Instruments Measurement & Automation Explorer (MAX) provides interactive configuration and test tools for the PXI-5900. MAX is included on the NI-SCOPE DVD.

The PXI-5900 does not have a test panel.

Physical Characteristics

Dimensions	3U, one slot, PXI/cPCI module, 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)
Weight	173 g (6.1 oz)

Caution Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Environment

Maximum altitude	2,000 m (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Operating Environment

Ambient temperature range	0 °C to 55 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)
Relative humidity range	10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Storage Environment

Ambient temperature range	-40 °C to 71 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)
Relative humidity range	5% to 95%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)

Random vibration	
Operating	5 Hz to 500 Hz, 0.31 g_{rms} (Tested in accordance with IEC 60068-2-64.)
Nonoperating	5 Hz to 500 Hz, 2.46 g_{rms} (Tested in accordance with IEC 60068-2-64. Test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Compliance and Certifications

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards 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 the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia, and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, refer to the *Online Product Certification* section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and 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.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

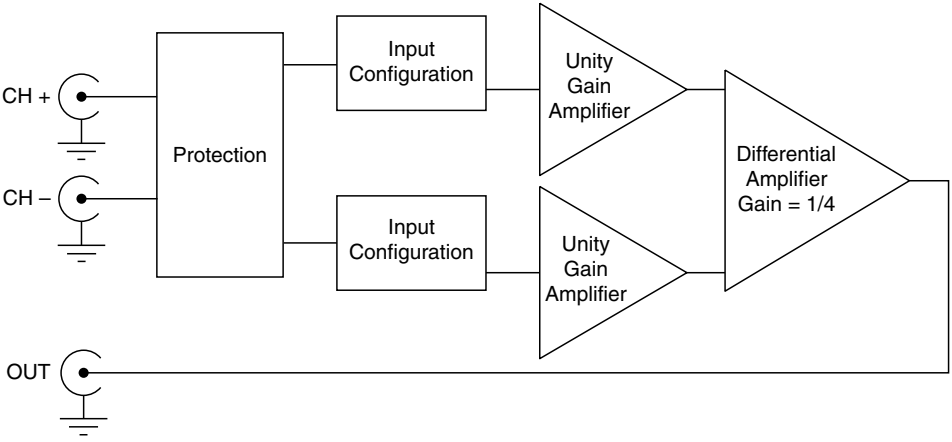
电子信息产品污染控制管理办法（中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)

Diagrams

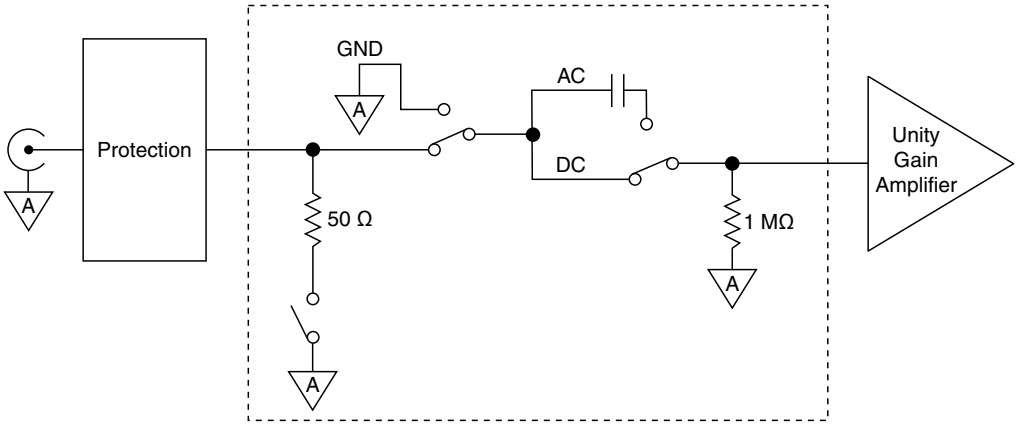
Refer to the following figure for a block diagram of one of the two channels of the PXI-5900.

Figure 2. PXI-5900 Block Diagram



Refer to the following figure for the default input configuration of the PXI-5900.

Figure 3. PXI-5900 Input Configuration



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