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SPECIFICATIONS

NI myDAQ

Français Deutsch 日本語 한국어 简体中文

ni.com/manuals

Analog Input

Number of channels ..... 2 differential or 1 stereo audio input

ADC resolution ..... 16 bits

Maximum sampling rate ..... 200 kS/s

Timing accuracy ..... 100 ppm of sample rate

Timing resolution ..... 10 ns

Range

- Analog input ..... ±10 V, ±2 V, DC-coupled
- Audio input ..... ±2 V, AC-coupled

Passband (-3 dB)

- Analog input ..... DC to 400 kHz
- Audio input ..... 1.5 Hz to 400 kHz

Connector type

- Analog input ..... Screw terminals
- Audio input ..... 3.5 mm stereo jack

Input type (audio input) ..... Line-in or microphone

Microphone excitation (audio input) ..... 5.25 V through 10 kΩ

Absolute accuracy

Nominal Range			
Positive Full Scale	**Negative Full Scale**	**Typical at 23 °C (mV)**	**Maximum (18 to 28 °C) (mV)**
10	-10	22.8	38.9
2	-2	4.9	8.6

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Figure 1. Settling Time (10 V Range) versus Different Source Impedance

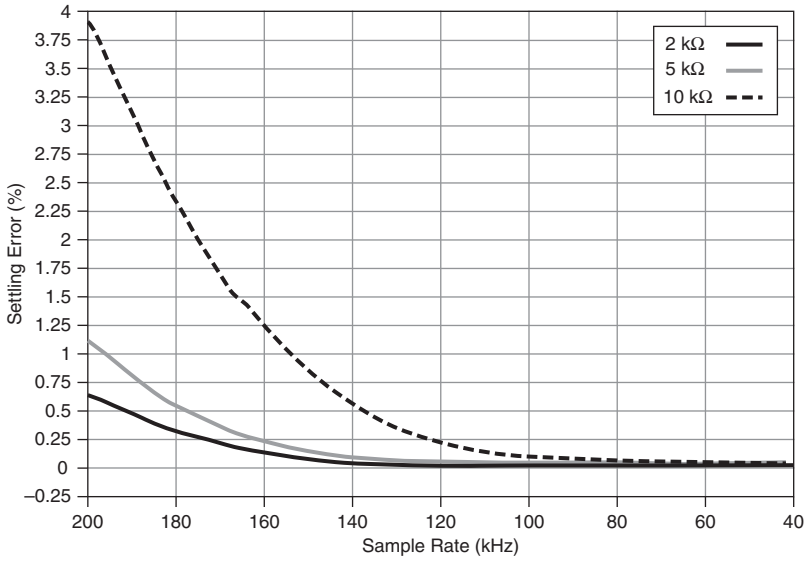
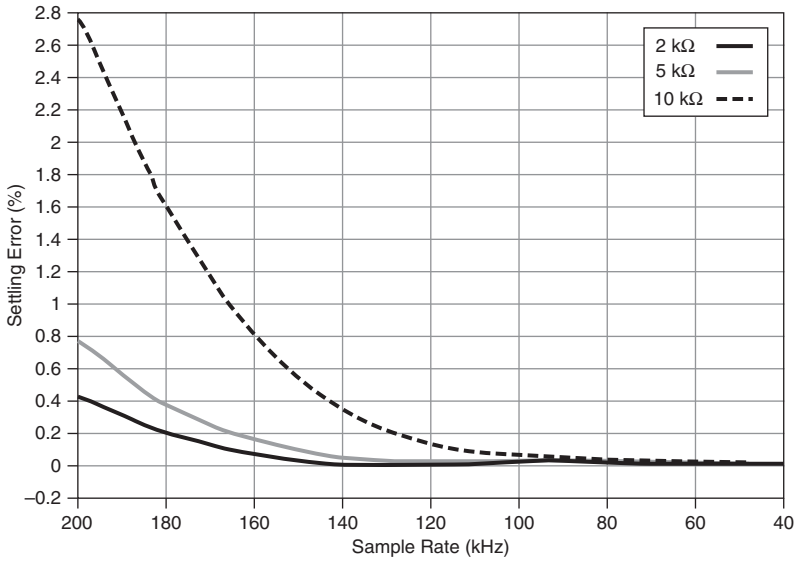


Figure 2. Settling Time (2 V Range) versus Different Source Impedance



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Input FIFO size ..... 4,095 samples, shared among channels used

Maximum working voltage for analog inputs (signal + common mode) ..... ±10.5 V to AGND

Common-mode rejection ratio (CMRR) (DC to 60 Hz) ..... 70 dB

Input impedance

- Device on
  - AI+ or AI- to AGND ..... >10 GΩ || 100 pF
  - AI+ to AI- ..... >10 GΩ || 100 pF
- Device off
  - AI+ or AI- to AGND ..... 5 kΩ
  - AI+ to AI- ..... 10 kΩ

Anti-aliasing filter ..... None

Overvoltage protection AI+ or AI - to AGND ..... ±16 V

Overvoltage protection (audio input left and right) ..... None

Analog Output

Number of channels ..... 2 ground-referenced or 1 stereo audio output

DAC resolution ..... 16 bits

Maximum update rate ..... 200 kS/s

Range

- Analog output ..... ±10 V, ±2 V, DC-coupled
- Audio output ..... ±2 V, AC-coupled

Maximum output current (analog output)[1] ..... 2 mA

Output impedance

- Analog output ..... 1 Ω
- Audio output ..... 120 Ω

Minimum load impedance (audio output) ..... 8 Ω

[1] The total power available for the power supplies, analog outputs, and digital outputs is limited to 500 mW (typical)/100 mW (minimum). Refer to the *Calculating Power Consumption* section for information on calculating the total power consumption of the components of your system.

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Connector type

Analog output ..... Screw terminals

Audio output ..... 3.5 mm stereo jack

AC-coupling high-pass frequency (audio output with 32 Ω load) ..... 48 Hz

Absolute accuracy

Nominal Range			
Positive Full Scale	**Negative Full Scale**	**Typical at 23 °C (mV)**	**Maximum (18 to 28 °C) (mV)**
10	-10	19.6	42.8
2	-2	5.4	8.8

Slew rate ..... 4 V/µs

Timing accuracy ..... 100 ppm of sample rate

Timing resolution ..... 10 ns

Overdrive protection ..... ±16 V to AGND

Maximum power-on voltage[1] ..... ±110 mV

Output FIFO size ..... 8,191 samples, shared among channels used

Digital I/O

Number of lines ..... 8; DIO <0..7>

Direction control ..... Each line individually programmable as input or output

Update mode ..... Software-timed

Pull-down resistor ..... 75 kΩ

Logic level ..... 5 V compatible LVTTL input; 3.3 V LVTTL output

V_{IH} min ..... 2.0 V

V_{IL} max ..... 0.8 V

Maximum output current per line[2] ..... 4 mA

[1] When powered on, the analog output signal is not defined until after USB configuration is complete.

[2] The total power available for the power supplies, analog outputs, and digital outputs is limited to 500 mW (typical)/100 mW (minimum). Refer to the *Calculating Power Consumption* section for information on calculating the total power consumption of the components of your system.

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General Purpose Counter/Timer

Number of counter/timers 1

Resolution ..... 32 bits

Internal base clocks ..... 100 MHz

Base clock accuracy ..... 100 ppm

Maximum counting and pulse generation update rate ..... 1 MS/s

Default routing

- CTR 0 SOURCE ..... PFI 0 routed through DIO 0
- CTR 0 GATE ..... PFI 1 routed through DIO 1
- CTR 0 AUX ..... PFI 2 routed through DIO 2
- CTR 0 OUT ..... PFI 3 routed through DIO 3
- FREQ OUT ..... PFI 4 routed through DIO 4

Data transfers ..... Programmed I/O

Update mode ..... Software-timed

Digital Multimeter

Functions[1] ..... DC voltage, AC voltage, DC current, AC current, resistance, diode, continuity

Isolation level ..... 60 VDC/20 V_{rms}, Measurement Category I

Caution Do *not* use this device for connection to signals or for measurements within Measurement Categories II, III, or IV. For more information on Measurement Categories, refer to the *Safety Voltages* section.

Connectivity ..... Banana jacks

Resolution ..... 3.5 digits

Input coupling ..... DC (DC Voltage, DC Current, Resistance, Diode, Continuity); AC (AC Voltage, AC Current)

Voltage Measurement

DC ranges ..... 200 mV, 2 V, 20 V, 60 V

AC ranges ..... 200 mV_{rms}, 2 V_{rms}, 20 V_{rms}

[1] All AC specifications are based on sine wave RMS.

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Note All AC voltage accuracy specifications apply to signal amplitudes greater than 5% of range.

Accuracy

Function	Range	Resolution	Accuracy	
			± ([% of Reading] + Offset)	
DC Volts	200.0 mV	0.1 mV	0.5% + 0.2 mV	
	2.000 V	0.001 V	0.5% + 2 mV	
	20.00 V	0.01 V	0.5% + 20 mV	
	60.0 V	0.1 V	0.5% + 200 mV	
			40 to 400 Hz	**400 to 2,000 Hz**
AC Volts	200.0 mV	0.1 mV	1.4% + 0.6 mV*	—
	2.000 V	0.001 V	1.4% + 0.005 V	5.4% + 0.005 V
	20.00 V	0.01 V	1.5% + 0.05 V	5.5% + 0.05 V

* The accuracy for AC Volts 200.0 mV range is in the frequency range of 40 Hz to 100 Hz. For example, for a 10 V using the DC Volts function in the 20.00 V range, calculate the accuracy using the following equation:

$$10\ V \times 0.5\% + 20\ mV = 0.07\ V$$

Input impedance.....10 MΩ

Current Measurement

DC ranges .....20 mA, 200 mA, 1 A

AC ranges .....20 mA_{rms}, 200 mA_{rms}, 1 A_{rms}

Note All AC accuracy specifications within 20 mA and 200 mA ranges apply to signal amplitudes greater than 5% of range. All AC accuracy specifications within the 1 A range apply to signal amplitudes greater than 10% of range.

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Accuracy

Function	Range	Resolution	Accuracy	
			± ([% of Reading] + Offset)	
DC Amps	20.00 mA	0.01 mA	0.5% + 0.03 mA	
	200.0 mA	0.1 mA	0.5% + 0.3 mA	
	1.000 A	0.001 A	0.5% + 3 mA	
			40 to 400 Hz	400 to 2,000 Hz
AC Amps	20.00 mA	0.01 mA	1.4% + 0.06 mA	5% + 0.06 mA
	200.0 mA	0.1 mA	1.5% + 0.8 mA	5% + 0.8 mA
	1.000 A	0.001 A	1.6% + 6 mA	5% + 6 mA

Input protection..... Internal ceramic fuse, 1.25 A 250 V, fast-acting, 5 × 20 mm, F 1.25A H 250V (Littelfuse part number 02161.25)

Resistance Measurement

Ranges ..... 200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 2 MΩ, 20 MΩ

Accuracy

Function	Range	Resolution	Accuracy
			± ([% of Reading] + Offset)
Ω	200.0 Ω	0.1 Ω	0.8% + 0.3 Ω*
	2.000 kΩ	0.001 kΩ	0.8% + 3 Ω
	20.00 kΩ	0.01 kΩ	0.8% + 30 Ω
	200.0 kΩ	0.1 kΩ	0.8% + 300 Ω
	2.000 MΩ	0.001 MΩ	0.8% + 3 kΩ
	20.00 MΩ	0.01 MΩ	1.5% + 50 kΩ

* Exclusive of lead wire resistance

Diode Measurement

Range ..... 2 V

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Power Supplies

Caution Do *not* mix power from NI myDAQ with power from external power sources. When using external power, remove any connections to the power supply terminals on NI myDAQ.

+15V Supply

Output voltage

- Typical (no load) ..... 15.0 V
- Maximum voltage with no load ..... 15.3 V
- Minimum voltage with full load ..... 14.0 V

Maximum output current[1] ..... 32 mA

Maximum load capacitance ..... 470 µF

-15V Supply

Output voltage

- Typical (no load) ..... -15.0 V
- Maximum voltage with no load ..... -15.3 V
- Minimum voltage with full load ..... -14.0 V

Maximum output current[1] ..... 32 mA

Maximum load capacitance ..... 470 µF

+5V Supply

Output voltage

- Typical (no load) ..... 4.9 V
- Maximum voltage with no load ..... 5.2 V
- Minimum voltage with full load ..... 4.0 V

Maximum output current[1] ..... 100 mA

Maximum load capacitance ..... 33 µF

Calculating Power Consumption

The total power available for the power supplies, analog outputs, and digital outputs is limited to 500 mW (typical)/100 mW (minimum). To calculate the total power consumption of the power supplies, multiply the output voltage by the load current for each voltage rail and sum them together. For digital output power consumption, multiply 3.3 V by the load current. For

[1] The total power available for the power supplies, analog outputs, and digital outputs is limited to 500 mW (typical)/100 mW (minimum). Refer to the *Calculating Power Consumption* section for information on calculating the total power consumption of the components of your system.

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analog output power consumption, multiply 15 V by the load current. Using audio output subtracts 100 mW from the total power budget.

For example, if you use 50 mA on +5 V, 2 mA on +15 V, 1 mA on -15 V, use four DIO lines to drive LEDs at 3 mA each, and have a 1 mA load on each AO channel, the total output power consumption is:

5 V × 50 mA = 250 mW

|+15 V| × 2 mA = 30 mW

|-15 V| × 1 mA = 15 mW

3.3 V × 3 mA × 4 = 39.6 mW

15 V × 1 mA × 2 = 30 mW

Total output power consumption = 250 mW + 30 mW + 15 mW + 39.6 mW + 30 mW = 364.6 mW

Communication

Bus interface ..... USB 2.0 Hi-Speed

Physical Characteristics

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.

Dimensions (without screw terminal connector)

NI myDAQ device part number 195509D-01L and earlier..... 14.6 cm × 8.7 cm × 2.2 cm (5.75 in. × 3.43 in. × 0.87 in.)

NI myDAQ device part number 195509E-01L and later ..... 13.6 cm × 8.8 cm × 2.4 cm (5.36 in. × 3.48 in. × 0.95 in.)

Weight

NI myDAQ device part number 195509D-01L and earlier..... 175.0 g (6.1 oz)

NI myDAQ device part number 195509E-01L and later ..... 164.0 g (5.8 oz)

Note NI myDAQ device part number (*P/N: 195509*x-*01L*) is located on the product label on the bottom of the device.

Screw-terminal wiring ..... 16 to 26 AWG

Torque for screw terminals ..... 0.22-0.25 N · m (2.0-2.2 lb · in.)

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Environmental

Operating temperature
(IEC 60068-2-1 and IEC 60068-2-2).....0 to 45 °C

Storage temperature
(IEC 60068-2-1 and IEC 60068-2-2).....-20 to 70 °C

Operating humidity
(IEC 60068-2-56).....10 to 90% RH, noncondensing

Storage humidity
(IEC 60068-2-56).....10 to 90% RH, noncondensing

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

Pollution Degree (IEC 60664).....2

Indoor use only.

Safety

Safety Voltages

Measurement Category I[1] is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Caution Do not use this module for connection to signals or for measurements within Measurement Categories II, III, or IV.

Safety Standards

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, CSA 61010-1

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Caution Using the NI myDAQ in a manner not described in this document may impair the protection the NI myDAQ provides.

[1] Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

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Hazardous Locations

The NI myDAQ device is not certified for use in hazardous locations.

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 B emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class B emissions
- EN 55022 (CISPR 22): Class B emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class B emissions
- AS/NZS CISPR 22: Class B emissions
- FCC 47 CFR Part 15B: Class B emissions
- ICES-001: Class B emissions

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:

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

Online Product Certification

To obtain product certifications and the Declaration of Conformity (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.

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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 This symbol indicates that waste products must be disposed of separately from municipal household waste, according to Directive 2002/96/EC of the European Parliament and the Council on waste electrical and electronic equipment (WEEE). All products at the end of their life cycle must be sent to a WEEE collection and recycling center. Proper WEEE disposal reduces environmental impact and the risk to human health due to potentially hazardous substances used in such equipment. Your cooperation in proper WEEE disposal will contribute to the effective usage of natural resources. For information about the available collection and recycling scheme in a particular country, go to ni.com/citizenship/weee.

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