

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 k Ω

Absolute accuracy

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

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

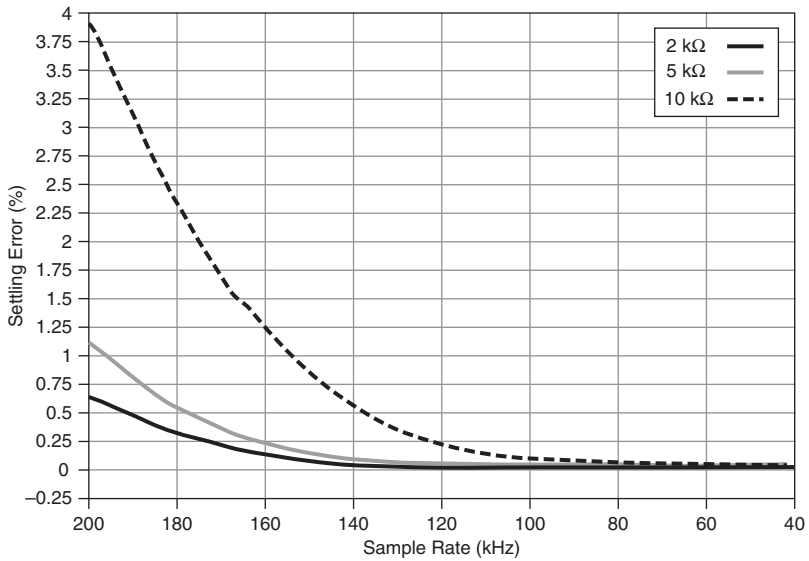
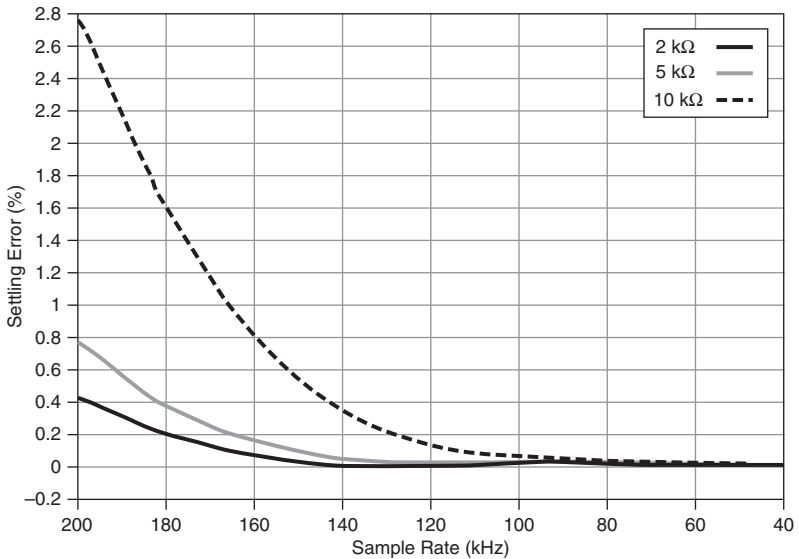


Figure 2. Settling Time (2 V Range) versus Different Source Impedance



| | |
|--|---|
| 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 G Ω 100 pF |
| AI+ to AI- | >10 G Ω 100 pF |
| Device off | |
| AI+ or AI- to AGND | 5 k Ω |
| AI+ to AI- | 10 k Ω |
| 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.

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

Slew rate 4 V/ μ s

Timing accuracy 100 ppm of sample rate

Timing resolution 10 ns

Overdrive protection ± 16 V to AGND

Maximum power-on voltage¹ ± 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 k Ω

Logic level 5 V compatible LVTTTL input; 3.3 V LVTTTL output

V_{IH} min 2.0 V

V_{IL} max 0.8 V

Maximum output current per line² 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.

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.



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 |
| <p>* 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:</p> $10 \text{ V} \times 0.5\% + 20 \text{ mV} = 0.07 \text{ V}$ | | | | |

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.

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

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 current¹ 32 mA

Maximum load capacitance 470 μ F

-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 current¹ 32 mA

Maximum load capacitance 470 μ F

+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 current¹ 100 mA

Maximum load capacitance 33 μ F

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.

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:

$$5 \text{ V} \times 50 \text{ mA} = 250 \text{ mW}$$

$$|+15 \text{ V}| \times 2 \text{ mA} = 30 \text{ mW}$$

$$|-15 \text{ V}| \times 1 \text{ mA} = 15 \text{ mW}$$

$$3.3 \text{ V} \times 3 \text{ mA} \times 4 = 39.6 \text{ mW}$$

$$15 \text{ V} \times 1 \text{ mA} \times 2 = 30 \text{ mW}$$

$$\text{Total output power consumption} = 250 \text{ mW} + 30 \text{ mW} + 15 \text{ mW} + 39.6 \text{ mW} + 30 \text{ mW} = 364.6 \text{ mW}$$

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: 195509x-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.)

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 I¹ 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.

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

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.

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.

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.)

Worldwide Support and Services

The National Instruments website is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit ni.com/services for NI Factory Installation Services, repairs, extended warranty, and other services.

Visit ni.com/register to register your National Instruments product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world. For telephone support in the United States, create your service request at ni.com/support or dial 1 866 ASK MYNI (275 6964). For telephone support outside the United States, visit the Worldwide Offices section of ni.com/niglobal to access the branch office websites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

Refer to the *NI Trademarks and Logo Guidelines* at ni.com/trademarks for more information on National Instruments trademarks. Other product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering National Instruments products/technology, refer to the appropriate location: **Help»Patents** in your software, the `patents.txt` file on your media, or the *National Instruments Patents Notice* at ni.com/patents. You can find information about end-user license agreements (EULAs) and third-party legal notices in the readme file for your NI product. Refer to the *Export Compliance Information* at ni.com/legal/export-compliance for the National Instruments global trade compliance policy and how to obtain relevant HTS codes, ECCNs, and other import/export data. NI MAKES NO EXPRESS OR IMPLIED WARRANTIES AS TO THE ACCURACY OF THE INFORMATION CONTAINED HEREIN AND SHALL NOT BE LIABLE FOR ANY ERRORS. U.S. Government Customers: The data contained in this manual was developed at private expense and is subject to the applicable limited rights and restricted data rights as set forth in FAR 52.227-14s, DFAR 252.227-7014, and DFAR 252.227-7015.

© 2010–2014 National Instruments. All rights reserved.