cDAQ-9171

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Integration Partner

SYSTEM INTEGRATOR

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cDAQ-9171 Specifications

These specifications are for the cDAQ-9171 chassis only. These specifications are typical at 25 °C unless otherwise noted. For the C Series module specifications, refer to the documentation for the C Series module you are using.

Analog Input

Input FIFO size	127 samples
Maximum sample rate[1]	Determined by the C Series module
Timing accuracy[2]	50 ppm of sample rate
Timing resolution[2]	12.5 ns
Number of channels supported	Determined by the C Series module

Analog Output

Number of channels supported

Hardware-timed task

Onboard regeneration	16
Non-regeneration	Determined by the C Series module
Non-hardware-timed task	Determined by the C Series module

Maximum update rate

Onboard regeneration	1.6 MS/s (multi-channel, aggregate)
Non-regeneration	Determined by the C Series module

Timing accuracy	50 ppm of sample rate
Timing resolution	12.5 ns

Output FIFO size

Onboard regeneration	8,191 samples shared among channels used
Non-regeneration	127 samples

AO waveform modes	Non-periodic waveform, periodic waveform regeneration mode from onboard memory, periodic waveform regeneration from host buffer including dynamic update

Digital Waveform Characteristics

Waveform acquisition (DI) FIFO

Parallel modules	511 samples
Serial modules	63 samples

Waveform generation (DO) FIFO

Parallel modules	2,047 samples

Serial modules	63 samples
Digital input sample clock frequency	
Streaming to application memory	System-dependent
Finite	0 MHz to 10 MHz
Digital output sample clock frequency	
Streaming from application memory	System-dependent
Regeneration from FIFO	0 MHz to 10 MHz
Finite	0 MHz to 10 MHz
Timing accuracy	50 ppm

General-Purpose Counters/Timers

Number of counters/timers	4
Resolution	32 bits
Counter measurements	Edge counting, pulse, semi-period, period, two-edge separation, pulse width
Position measurements	X1, X2, X4 quadrature encoding with Channel Z reloading; two-pulse encoding
Output applications	Pulse, pulse train with dynamic updates, frequency division, equivalent time sampling

Internal base clocks	80 MHz, 20 MHz, 100 kHz
External base clock frequency	0 MHz to 20 MHz
Base clock accuracy	50 ppm
Output frequency	0 MHz to 20 MHz
Inputs	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down
Routing options for inputs	Any module PFI, analog trigger, many internal signals
FIFO	Dedicated 127-sample FIFO

Frequency Generator

Number of channels	1
Base clocks	20 MHz, 10 MHz, 100 kHz
Divisors	1 to 16 (integers)
Base clock accuracy	50 ppm
Output	Any module PFI terminal

Module PFI Characteristics

Functionality	Static digital input, static digital output, timing input, and timing output

Timing output sources[3]	Many analog input, analog output, counter, digital input, and digital output timing signals
Timing input frequency	0 MHz to 20 MHz
Timing output frequency	0 MHz to 20 MHz

Digital Triggers

Source	Any module PFI terminal
Polarity	Software-selectable for most signals
Analog input function	Start Trigger, Reference Trigger, Pause Trigger, Sample Clock, Sample Clock Timebase
Analog output function	Start Trigger, Pause Trigger, Sample Clock, Sample Clock Timebase
Counter/timer function	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down

Module I/O States

At power-on	Module-dependent. Refer to the documentation for each C Series module.

Bus Interface

USB specification	USB 2.0 Hi-Speed
High-performance data streams	6

Data stream types available	Analog input, analog output, digital input, digital output, counter/timer input, counter/timer output, NI-XNET[4]

Note If you are connecting the NI cDAQ-9171 to a USB hub, the hub must be externally powered.

Power Requirements

Caution The protection provided by the NI cDAQ-9171 chassis can be impaired if it is used in a manner not described in this document.

Note Some C Series modules have additional power requirements. For more information about C Series module power requirements, refer to the documentation for each C Series module.

Note Sleep mode for C Series modules is not supported in the NI cDAQ-9171.

Power consumption from USB	5 V, 500 mA maximum
Suspend mode	2.5 mA maximum

Physical Characteristics

Weight (unloaded)	353 g (12.5 oz)
Dimensions (unloaded)	131.4 mm × 88.6 mm × 33.3 mm (5.17 in. × 3.49 in. × 1.31 in.) Refer to the following figure.

USB connector securement

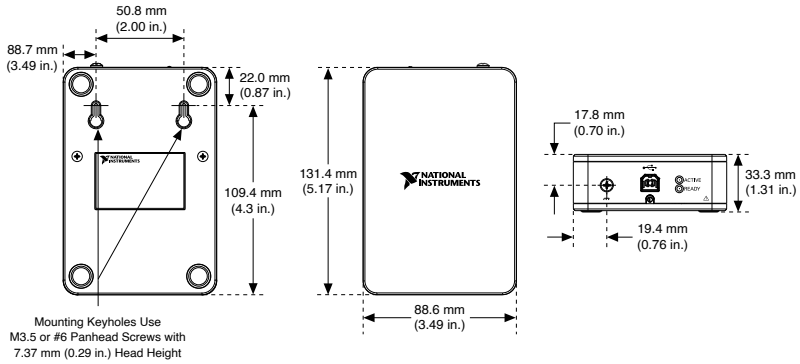
USB securement type	Jackscrew provided on locking USB cable (part number 198506-01 or 780534-01)
Torque for jackscrew	0.41 N · m (3.6 lb · in.)

Chassis ground

Gauge	1.31 mm^2 (16 AWG) or larger wire
Torque for ground screw	0.76 N · m (6.7 lb · in.)

If you need to clean the chassis, wipe it with a dry towel.

Figure 1. NI cDAQ-9171 Dimensions



Environmental

Operating temperature (IEC-60068-2-1 and IEC-60068-2-2)	-20 °C to 55 °C
Storage temperature (IEC-600068-2-1 and IEC-60068-2-2)	-40 °C to 85 °C
Operating humidity (IEC-60068-2-56)	10% to 90% RH, noncondensing
Storage humidity (IEC-60068-2-56)	5% to 95% RH, noncondensing

Pollution Degree (IEC 60664)	2
Maximum altitude	5,000 m

Indoor use only.

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4
Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, Ex nA IIC T4
Europe (ATEX) and International (IECEx)	Ex nA IIC T4 Gc

Shock and Vibration

To meet these specifications, you must panel mount the NI cDAQ-9171 system, use an NI locking USB cable, and affix ferrules to the ends of the terminal lines.

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, 0.3 g_{rms}
Non-operating	5 Hz to 500 Hz, 2.4 g_{rms} (Tested in accordance with IEC 60068-2-64. Non-operating test profile exceeds the requirements of MIL PRF-28800F, Class 3.)

Safety and Hazardous Locations Standards

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
- EN 60079-0:2012, EN 60079-15:2010
- IEC 60079-0: Ed 6, IEC 60079-15; Ed 4
- UL 60079-0; Ed 6, UL 60079-15; Ed 4
- CSA 60079-0:2011, CSA 60079-15:2012

> **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
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: 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, and additional information, 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)
- 2014/34/EU; Potentially Explosive Atmospheres (ATEX)

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.)

[1] Performance dependent on type of installed C Series module and number of channels in the task.

[2] Does not include group delay. For more information, refer to the documentation for each C Series module.

[3] Actual available signals are dependent on type of installed C Series module.

[4] When a session is active, CAN or LIN (NI-XNET) C Series modules use a total of two data streams regardless of the number of NI-XNET modules in the chassis.

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