cDAQ™-9171 Specifications

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cDAQ-9171 Specifications

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- ***Typical*** specifications describe the performance met by a majority of models.
- ***Nominal*** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are ***Typical*** unless otherwise noted.

Conditions

Specifications are valid at 25 °C unless otherwise noted.

Analog Input

Input FIFO size	127 samples
Maximum sample rate[1]	Determined by the C Series module
Timing accuracy[2][2]	50 ppm of sample rate

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.

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 per slot
Serial modules	63 samples per slot
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

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

Module I/O States

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

Note The cDAQ-9171 may revert the input/output of the modules to their power-on state when the USB cable is removed.

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 cDAQ-9171 to a USB hub, the hub must be externally powered.

Environmental Characteristics

Temperature	
Operating	-20 °C to 55 °C
Storage	-40 °C to 85 °C

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.

Humidity	
Operating	10% to 90% RH, noncondensing
Storage	5% to 95% RH, noncondensing

Pollution Degree	2
Maximum altitude	5,000 m

Power Requirements

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 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	131.4 mm × 88.6 mm × 33.3 mm(5.17 in. × 3.49 in. × 1.31 in.) Refer to the

(unloaded)	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.)

Figure 1. cDAQ-9171 Dimensions