NI-9402 Specifications

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NI-9402 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.

Related information:

- Software Support for CompactRIO, CompactDAQ, Single-Board RIO, R Series, and EtherCAT

Conditions

Specifications are valid for the range -40 °C to 70 °C unless otherwise noted. All voltages are relative to GND unless otherwise noted.

Input/Output Characteristics

Number of channels	4 DIO channels
Default power-on line	Input

direction	
Input/output type	LVTTL, single-ended
Digital logic levels	
Maximum input voltage	5.25 V
Input high, V_{IH}	2 V minimum
Input low, V_{IL}	0.8 V maximum
Output high, V_{OH} (3.4 V maximum)	
Sourcing 100 µA	3.0 V minimum
Sourcing 2 mA	2.8 V minimum
Output low, VOL	
Sinking 100 µA	0.1 V maximum
Sinking 2 mA	0.3 V maximum
Maximum I/O switching frequency	
4 channels	16 MHz
2 channels	20 MHz

I/O propagation delay[1],[2]	55 ns maximum, 18 ns typical
I/O pulse width distortion[2]	25 ns maximum
Input low current, I_{IL} (V_{IN} = 0 V)	-55 µA maximum
Input high current, I_{IH} (V_{IN} = 4.5 V)	150 µA maximum
Input impedance	
Input capacitance	50 pF maximum
Input resistance	49 kΩ minimum
Input rise/fall rate	10 ns/V maximum
Input protection	±30 V maximum on one channel at a time
MTBF	1,482,777 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

1. Propagation delay is the maximum amount of time it takes for an input or output signal to propagate between the backplane and the I/O connector, and does not include any additional delay introduced by the cable.
2. Measured at the I/O connector of a load with requirements similar to the NI-9402 and driven through a 2 m coaxial cable.

Safety Voltages

Connect only voltages that are within the following limits:

Channel-to-earth ground	±30 V maximum
Isolation	
Channel-to-channel	None
Channel-to-earth ground	None

Environmental Characteristics

Temperature	
Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C
Humidity	
Operating	10% RH to 90% RH, noncondensing
Storage	5% RH to 95% RH, noncondensing
Ingress protection	IP40
Pollution Degree	2

Maximum altitude	2,000 m
Shock and Vibration	
Operating vibration	
Random	5 g RMS, 10 Hz to 500 Hz
Sinusoidal	5 g, 10 Hz to 500 Hz
Operating shock	30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations

To meet these shock and vibration specifications, you must panel mount the system.

Power Requirements

Power consumption from chassis	
Active mode	550 mW maximum
Sleep mode	1 mW maximum
Thermal dissipation (at 70 °C)	
Active mode	550 mW maximum
Sleep mode	1 mW maximum

Physical Characteristics

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

Cable	50 Ω BNC
Cable length	2 m maximum
Weight	199 g (6.9 oz)