
NI-9871

Specifications

2025-03-10



Contents

NI-9871 Specifications	3
------------------------------	---

NI-9871 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.

NI-9871 Pinout

The NI-9871 has four RJ-50 receptacles that provide connections for four RS485/RS422 devices.

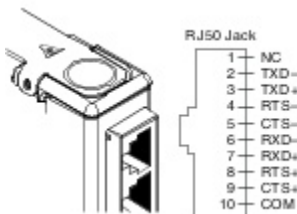
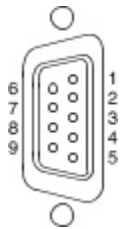


Table 1. RS485/RS422 Port Pinout

RJ-50 Pin	Signal Name*
1	No Connect
2	TXD-
3	TXD+
4	RTS-
5	CTS-
6	RXD-
7	RXD+
8	RTS+
9	CTS+
10	GND

*These signals are shared by all four RJ-50 connectors on the NI-9871.

The cables included with your kit convert the RJ-50 pinout to the standard NI pinout on a DB-9 male connector, as shown in the following table.

**Table 2.** Pin Assignments for RS485/RS422 DB-9 Male Connector

RJ-50 Pin	Signal Name
1	GND
2	CTS+
3	RTS+
4	RXD+
5	RXD-
6	CTS-

RJ-50 Pin	Signal Name
7	RTS-
8	TXD+
9	TXD-

Specifications

Maximum baud rate	3.6864 Mbps
Maximum module throughput	1.28 Mbps
Maximum cable length	1.2 km (4,000 ft)
Data line ESD protection (human body model)	± 15 kV
MTBF	514,016 hours at 25 °C; Bellcore Issue 6, Method 1, Case 3, Limited Part Stress Method



Note Contact NI for Bellcore MTBF specifications at other temperatures or MIL-HDBK-217F specifications.

Power Requirements

Power consumption from chassis	
Active mode	0.5 W maximum

Sleep mode	50 μ W maximum
Thermal dissipation (at 70 °C)	
Active mode	1.5 W maximum
Sleep mode	55 mW maximum
Required external supply voltage range (V sup)	+8 to +28 V DC
Power supply consumption from external supply V sup	
Typical	1 W
Maximum	3.5 W

Physical Characteristics

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

Weight	Approx. 153 g (5.4 oz)
--------	------------------------

Safety Voltages

Maximum Measurement Voltages

Connect only voltages that are within these limits.

RS485/RS422 Port-to-COM	-8 to +13 VDC maximum, Measurement Category I
V sup-to-COM	±28 V maximum, Measurement Category I

Isolation Voltages

Port-to-earth ground	
Continuous	60 V DC, Measurement Category I up to 5,000 m in altitude
Withstand	
up to 2,000 m in altitude	1000 V RMS verified by a 5s dielectric withstand test
up to 5,000 m in altitude	500 V RMS verified by a 5s dielectric withstand test

Measurement Category I



Warning Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINS circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.



Mise en garde Ne pas connecter le produit à des signaux dans les

catégories de mesure II, III ou IV et ne pas l'utiliser pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies, sous peine d'endommager et de compromettre l'isolation. Le produit peut tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

Measurement Category I 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.



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

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		IP30
Pollution Degree		2
Maximum altitude		5,000 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.

Indoor use only.