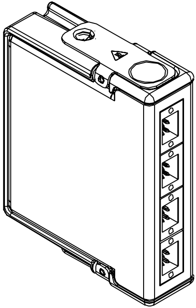
OPERATING INSTRUCTIONS

NI 9219

4-Channel, 24-Bit, Universal Analog Input Module

このドキュメントの日本語版については、ni.com/manuals を参照してください。(For the Japanese language version, go to ni.com/manuals.)



NATIONAL INSTRUMENTS™

These operating instructions describe how to use the National Instruments 9219. For information about installing, configuring, and programming the system, refer to the system documentation. Visit `ni.com/info` and enter the info code `rdsoftwareversion` to determine which software you need for the modules you are using.

Note The safety guidelines and specifications in this document are specific to the NI 9219. The other components in the system might not meet the same safety ratings and specifications. Refer to the documentation for each component in the system to determine the safety ratings and specifications for the entire system.

Safety Guidelines

Operate the NI 9219 only as described in these operating instructions.

Hot Surface This icon denotes that the component may be hot. Touching this component may result in bodily injury.

Safety Guidelines for Hazardous Voltages

If hazardous voltages are connected to the module, take the following precautions. A hazardous voltage is a voltage greater than 42.4 V_{pk} or 60 VDC to earth ground.

Caution Ensure that hazardous voltage wiring is performed only by qualified personnel adhering to local electrical standards.

Caution Do *not* mix hazardous voltage circuits and human-accessible circuits on the same module.

Caution Make sure that devices and circuits connected to the module are properly insulated from human contact.

Caution When module terminals are hazardous voltage LIVE (>42.4 V_{pk}/60 VDC), you must ensure that devices and circuits connected to the module are properly insulated from human contact. You must use the NI 9972 connector backshell kit to ensure that the terminals are *not* accessible.

Figure 1 shows the NI 9972 connector backshell.

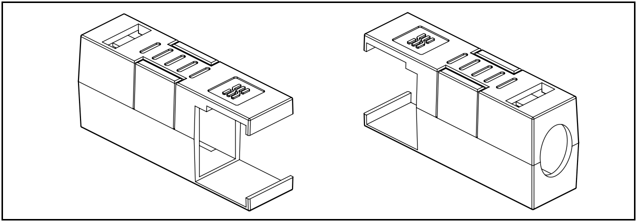


Figure 1. NI 9972 Connector Backshell

Safety Guidelines for Hazardous Locations

The NI 9219 is suitable for use in Class I, Division 2, Groups A, B, C, D, T4 hazardous locations; Class I, Zone 2, AEx nC IIC T4 hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI 9219 in a potentially explosive environment. Not following these guidelines may result in serious injury or death.

Caution Do *not* disconnect I/O-side wires or connectors unless power has been switched off or the area is known to be nonhazardous.

Caution Do *not* remove modules unless power has been switched off or the area is known to be nonhazardous.

Caution Substitution of components may impair suitability for Class I, Division 2.

Caution For Zone 2 applications, install the system in an enclosure rated to at least IP 54 as defined by IEC 60529 and EN 60529.

Special Conditions for Marine Applications

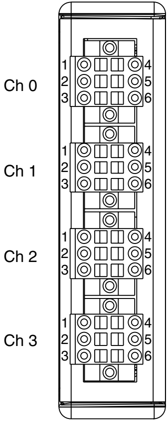
Some modules are Lloyd's Register (LR) Type Approved for marine applications. To verify Lloyd's Register certification, visit `ni.com/certification` and search for the LR certificate, or look for the Lloyd's Register mark on the module.

Caution To meet radio frequency emission requirements for marine applications, use shielded cables and install the system in a metal enclosure. Suppression ferrites must be installed on power supply inputs near power entries to modules and controllers. Power supply and module cables must be separated on opposite sides of the enclosure and must enter/exit through opposing enclosure walls.

Wiring the NI 9219

The NI 9219 has four 6-terminal connectors that provide connections for four analog input channels. Connect the positive signal of the signal source to the positive input signal terminal (HI) and the negative signal of the signal source to the negative input signal terminal (LO). Use the excitation terminals if your sensor requires a separate excitation connection. Refer to Table 1 for the signal names and Table 2 for the terminal assignments for each mode. Refer to the *NI 9219 Circuitry* section for information about connections in each mode.

Table 1. Signal Names

Module	Terminal	Signal Name	Signal Description
	1	T+	TEDS Data
	2	T–	TEDS COM
	3	EX+/HI*	Positive excitation or input signal
	4	HI	Positive input signal
	5	EX–/LO*	Negative excitation or input signal
	6	LO	Negative input signal

* Depending on the mode, terminals 3 and 5 are either the excitation signals or the input signals.

Table 2. Terminal Assignments

Mode	Terminal					
	1	2	3	4	5	6
Voltage	T+	T–	—	HI	LO	—
Current	T+	T–	HI	—	LO	—
4-Wire Resistance	T+	T–	EX+	HI	EX–	LO
2-Wire Resistance	T+	T–	HI	—	LO	—
Thermocouple	T+	T–	—	HI	LO	—
4-Wire RTD	T+	T–	EX+	HI	EX–	LO
3-Wire RTD	T+	T–	EX+	—	EX–	LO
Quarter-Bridge	T+	T–	HI	—	LO	—
Half-Bridge	T+	T–	EX+	HI	EX–	—
Full-Bridge	T+	T–	EX+	HI	EX–	LO
Digital In	T+	T–	—	HI	LO	—
Open Contact	T+	T–	HI	—	LO	—

Connecting Wires to the NI 9219 Connectors

Use a flathead screwdriver with a blade smaller than 2.3 × 1.0 mm (0.09 × 0.04 in.) to connect wires to the detachable spring-terminal connectors. Insert the screwdriver into a spring clamp activation slot and press a wire into the corresponding connector terminal, then remove the screwdriver to clamp the wire into the terminal. Refer to the *Specifications* section for more information about spring-terminal wiring. Refer to Figure 2 for an illustration of connecting wires to the NI 9219.

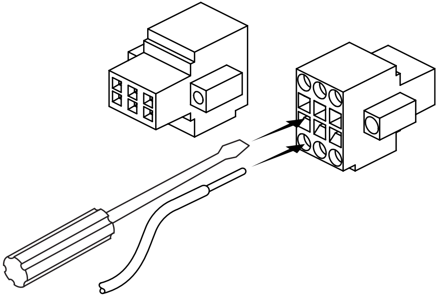


Figure 2. Connecting Wires to the NI 9219 Connectors

Wiring TEDS Channels

The NI 9219 supports only Class II TEDS sensors. Connect the two TEDS lines to TEDS Data (T+) and TEDS COM (T–) and ensure that neither T+ nor T– is tied in common to any of the signal inputs (terminals 3 through 6) on the NI 9219. Visit `ni.com/info` and enter the info code `rdteds` for information about TEDS sensors.

Grounding and Shielding Considerations

You can connect ground-referenced or floating signal sources to the NI 9219. If you make a floating connection between the signal source and the NI 9219, make sure the voltages on the positive and negative connections are within the channel-to-earth working voltage range to ensure proper operation of the NI 9219. Refer to the *Specifications* section for more information about operating voltages and overvoltage protection.

> **Note** For best signal quality, National Instruments recommends using shielded cables and twisted pair wiring whenever possible.

Figures 3 and 4 illustrate connecting grounded and floating signal sources to the NI 9219 in Voltage mode.

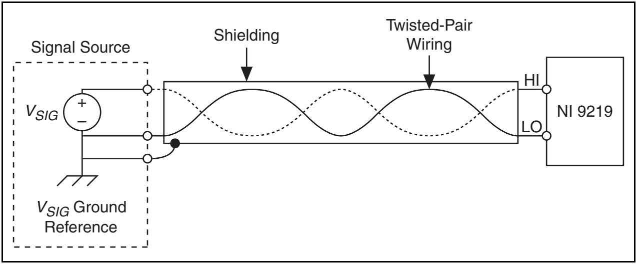


Figure 3. Connecting a Grounded Signal Source to the NI 9219

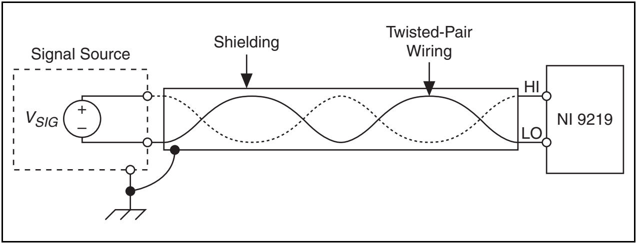


Figure 4. Connecting a Floating Signal Source to the NI 9219

NI 9219 Timing Options

The NI 9219 supports four different timing options that are optimized for different types of applications by using different ADC conversion times. High Speed is optimized for high speed at the expense of noise rejection, Best 60 Hz Rejection is optimized for rejection of 60 Hz noise, Best 50 Hz Rejection is optimized for rejection of 50 Hz noise, and High Resolution is optimized for maximum overall noise rejection and provides good rejection of 50 Hz and 60 Hz noise. Refer to the *Specifications* section for more information.

NI 9219 Circuitry

The NI 9219 is channel-to-channel isolated. Four 24-bit analog-to-digital converters (ADCs) simultaneously sample all four analog input channels. An excitation circuit is enabled for all input modes that require excitation. The ADC and excitation circuits are reconfigured in each mode to accommodate each type of sensor. Refer to Figure 5 for an illustration of the input circuitry for one channel of the NI 9219.

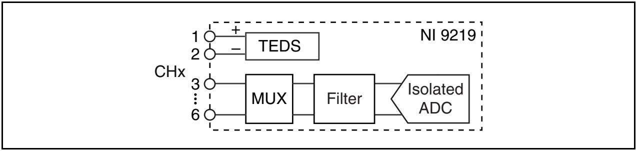


Figure 5. Input Circuitry for One Channel

Voltage and Current Modes

In Voltage and Current modes, connect the signal source to the NI 9219 across the HI and LO terminals. The current is computed from the voltage that the ADC measures across an internal shunt resistor. Refer to Figure 6 for an illustration of the connections.

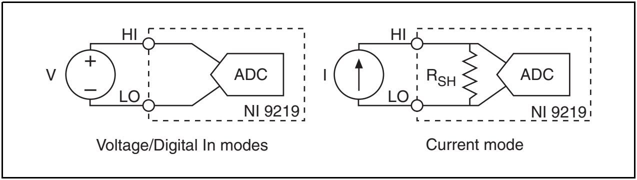


Figure 6. Connections in Voltage, Current, and Digital In Modes

4-Wire Resistance and 4-Wire RTD Modes

4-Wire Resistance and 4-Wire RTD modes source a current, which varies based on the resistance of the load, between the EX+ and EX– terminals. The measured resistance is computed from the resulting voltage reading. These modes are not affected by lead wire resistance because a negligible amount of current flows across the HI and LO terminals due to the high input impedance of the ADC. Refer to Figure 7 for an illustration of the connections.

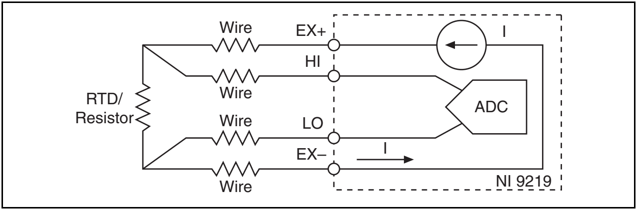


Figure 7. Connections in 4-Wire Resistance and 4-Wire RTD Modes

3-Wire RTD Mode

3-Wire RTD mode sources a current, which varies based on the resistance of the load, between the EX+ and EX– terminals. This mode compensates for lead wire resistance in hardware if all the lead wires have the same resistance. A gain of 2x is applied to the voltage across the negative lead wire and the ADC uses this voltage as the negative reference to cancel the resistance error across the positive lead wire. Refer to Figure 8 for an illustration of the connections.

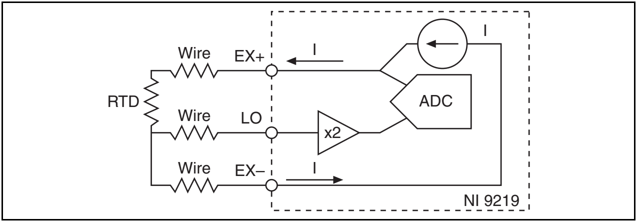


Figure 8. Connections in 3-Wire RTD Mode

2-Wire Resistance and Quarter-Bridge Modes

In 2-Wire Resistance and Quarter-Bridge modes, connect the two ends of the resistor or gauge to the NI 9219 across the HI and LO terminals. These modes source a current, which varies based on the resistance of the load, between the HI and LO terminals. The resulting resistance is computed from the voltage measurement. 2-Wire Resistance and Quarter-Bridge modes do not compensate for lead wire resistance. Refer to Figure 9 for an illustration of the connections.

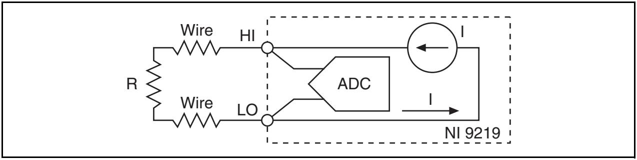
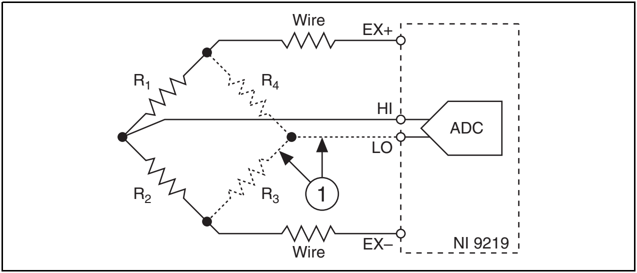


Figure 9. Connections in 2-Wire Resistance and Quarter-Bridge Modes

Half-Bridge and Full-Bridge Modes

Half-Bridge and Full-Bridge modes use the internal voltage excitation to set the input range of the ADC and return voltage readings that are proportional to the excitation level. The internal excitation voltage is nominally 2.5 V but it varies based on the resistance of the sensor. Refer to the *Specifications* section for more information about excitation levels.

In Half-Bridge mode, the HI input is referenced to EX–. In Full-Bridge mode, the ADC reads the HI and LO inputs differentially. Refer to Figure 10 for an illustration of the connections.



1 The dotted line represents the portion of the circuit that is connected only in Full-Bridge mode.

Figure 10. Connections in Half-Bridge and Full-Bridge Modes

Thermocouple Mode

In Thermocouple mode, connect the positive end of the thermocouple to HI and the negative end of the thermocouple to LO. This mode uses the ±125 mV range of the ADC to return a voltage reading. Use shielded cables and twisted pair wiring and ground the shielded cables. Each channel has a built-in thermistor for cold-junction compensation (CJC) calculations. For improved CJC sensor accuracy, operate the NI 9219 in a stable temperature environment and avoid placing heat sources near the module or its connectors. Refer to the *Specifications* section for more information about accuracy. The NI 9219 does not support open thermocouple detection. Refer to Figure 11 for an illustration of the connections.

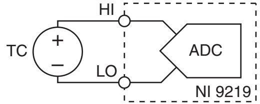


Figure 11. Connections in Thermocouple Mode

Digital In Mode

Digital In mode has a 60 V unipolar threshold that you can set in software. Refer to the software documentation for information about setting this threshold. Digital In mode is supported only in CompactRIO systems. Refer to Figure 6 for an illustration of the connections.

Open Contact Mode

Open Contact mode sources a current between the HI and LO terminals and determines if the two terminals are open or closed based on the measured current through the terminals. When the circuit is open, make sure no more than ±60 V is sourced across the switch. Open Contact mode is supported only in CompactRIO systems. Refer to Figure 12 for an illustration of the connections.

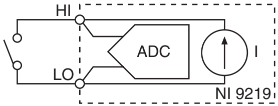


Figure 12. Connections in Open Contact Mode

Sleep Mode

This module supports a low-power sleep mode. Support for sleep mode at the system level depends on the chassis that the module is plugged into. Refer to the chassis documentation for information about support for sleep mode. You can enable sleep mode in software. Refer to the driver software documentation for more information.

Typically, when a system is in sleep mode, you cannot communicate with the modules. In sleep mode, the system consumes minimal power and may dissipate less heat than it does in normal mode. Refer to the *Specifications* section for more information about power consumption and thermal dissipation.

Binary Data

NI 9219 modules in the system return calibrated binary data when used in a CompactRIO chassis. For these modules, you can convert the data to engineering units in software. Refer to the software documentation for information about converting data. When used in a CompactDAQ chassis, NI 9219 modules automatically return the data in terms of engineering units. Refer to the software documentation for more information.

Excitation Protection

The NI 9219 excitation circuit is protected from overcurrent and overvoltage fault conditions. The circuit is automatically disabled in the event of a fault condition. Whenever possible, channels automatically recover after the fault is removed. Refer to the software documentation for information on how an excitation fault is displayed and handled.

Specifications

The following specifications are typical for the range –40 to 70 °C unless otherwise noted.

Input Characteristics

Number of channels .... 4 analog input channels

ADC resolution .... 24 bits

Type of ADC.................................... Delta-sigma (with analog prefiltering)

Sampling mode .... Simultaneous

Type of TEDS supported .... IEEE 1451.4 TEDS Class II (Interface)

Mode input ranges

Mode	Nominal Range(s)	Actual Range(s)
Voltage	±60 V, ±15 V, ±4 V, ±1 V, ±125 mV	±60 V, ±15 V, ±4 V, ±1 V, ±125 mV
Current	±25 mA	±25 mA
4-Wire and 2-Wire Resistance	10 kΩ, 1 kΩ	10.5 kΩ, 1.05 kΩ
Thermocouple	±125 mV	±125 mV
4-Wire and 3-Wire RTD	Pt 1000, Pt 100	5.05 kΩ, 505 Ω
Quarter-Bridge	350 Ω, 120 Ω	390 Ω, 150 Ω
Half-Bridge	±500 mV/V	±500 mV/V

Mode	Nominal Range(s)	Actual Range(s)
Full-Bridge	±62.5 mV/V, ±7.8 mV/V	±62.5 mV/V, ±7.8125 mV/V
Digital In	—	0–60 V
Open Contact	—	1.05 kΩ

Conversion time, no channels in TC mode
- High speed .... 10 ms for all channels
- Best 60 Hz rejection .... 110 ms for all channels
- Best 50 Hz rejection .... 130 ms for all channels
- High resolution .... 500 ms for all channels

Conversion time, one or more channels in TC mode
- High speed .... 20 ms for all channels
- Best 60 Hz rejection .... 120 ms for all channels
- Best 50 Hz rejection .... 140 ms for all channels
- High resolution .... 510 ms for all channels

Overvoltage protection
- Terminals 1 and 2 .... ±30 V
- Terminals 3 through 6, across any combination .... ±60 V

Input impedance

Voltage and Digital In modes (±60 V, ±15 V, ±4 V) .... 1 MΩ

Current mode............................. < 40 Ω

All other modes .... >1 GΩ

Accuracy

Mode, Range	Gain Error (% of Reading)	Offset Error (ppm of Range)
	Typ (25 °C, ±5 °C), Max (–40 to 70 °C)	
Voltage, ±60 V	±0.3, ±0.4	±20, ±50
Voltage, ±15 V	±0.3, ±0.4	±60, ±180
Voltage, ±4 V	±0.3, ±0.4	±240, ±720
Voltage, ±1 V	±0.1, ±0.18	±15, ±45
Voltage/Thermocouple, ±125 mV	±0.1, ±0.18	±120, ±360
Current, ±25 mA	±0.1, ±0.6	±30, ±100
4-Wire and 2-Wire* Resistance, 10 kΩ	±0.1, ±0.5	±120, ±320
4-Wire and 2-Wire* Resistance, 1 kΩ	±0.1, ±0.5	±1200, ±3200

Mode, Range	Gain Error (% of Reading)	Offset Error (ppm of Range)
	Typ (25 °C, ±5 °C), Max (–40 to 70 °C)	
4-Wire and 3-Wire RTD, Pt 1000	±0.1, ±0.5	±240, ±640
4-Wire and 3-Wire RTD, Pt 100	±0.1, ±0.5	±2400, ±6400
Quarter-Bridge, 350 Ω	±0.1, ±0.5	±2400, ±6400
Quarter-Bridge, 120 Ω	±0.1, ±0.5	±2400, ±6400
Half-Bridge, ±500 mV/V	±0.03, ±0.07	±300, ±450
Full-Bridge, ±62.5 mV/V	±0.03, ±0.08	±300, ±1000
Full-Bridge, ±7.8 mV/V	±0.03, ±0.08	±2200, ±8000
* 2-Wire Resistance mode accuracy depends on the lead wire resistance. This table assumes 0 Ω of lead wire resistance.		

Cold-junction compensation
sensor accuracy .... ±1°C typ

Stability

Mode, Range	Gain Drift (ppm of Reading/°C)	Offset Drift (ppm of Range/°C)
Voltage, ±60 V	±20	±0.2
Voltage, ±15 V	±20	±0.8
Voltage, ±4 V	±20	±3.2
Voltage, ±1 V	±10	±0.2
Voltage/Thermocouple, ±125 mV	±10	±1.6
Current, ±25 mA	±15	±0.4
4-Wire and 2-Wire Resistance, 10 kΩ	±15	±3
4-Wire and 2-Wire Resistance, 1 kΩ	±15	±30
4-Wire and 3-Wire RTD, Pt 1000	±15	±6
4-Wire and 3-Wire RTD, Pt 100	±15	±60
Quarter-Bridge, 350 Ω	±15	±120
Quarter-Bridge, 120 Ω	±15	±240
Half-Bridge, ±500 mV/V	±3	±20

Mode, Range	Gain Drift (ppm of Reading/°C)	Offset Drift (ppm of Range/°C)
Full-Bridge, ±62.5 mV/V	±3	±20
Full-Bridge, ±7.8 mV/V	±3	±20

Input noise in ppm of $\text{Range}_{\text{rms}}$

Mode, Range	Conversion Time			
	High speed	Best 60 Hz rejection	Best 50 Hz rejection	High reso-lution
Voltage, ±60 V	7.6	1.3	1.3	0.5
Voltage, ±15 V	10.8	1.9	1.9	0.7
Voltage, ±4 V	10.8	2.7	2.7	1.3
Voltage, ±1 V	7.6	1.3	1.3	0.5
Voltage/Thermocouple, ±125 mV	10.8	1.9	1.9	1.0
Current, ±25 mA	10.8	1.9	1.9	1.0

Mode, Range	Conversion Time			
	High speed	**Best 60 Hz rejection**	**Best 50 Hz rejection**	**High reso-lution**
4-Wire and 2-Wire Resistance, 10 kΩ	4.1	1.3	0.8	0.3
4-Wire and 2-Wire Resistance, 1 kΩ	7.1	1.8	1.2	0.7
4-Wire and 3-Wire RTD, Pt 1000	7.6	1.7	1.1	0.4
4-Wire and 3-Wire RTD, Pt 100	10.8	1.9	1.9	0.9
Quarter-Bridge, 350 Ω	5.4	1.0	1.0	0.7
Quarter-Bridge, 120 Ω	5.4	1.0	1.0	0.7
Half-Bridge, ±500 mV/V	3.8	0.5	0.5	0.2
Full-Bridge, ±62.5 mV/V	5.4	1.0	1.0	0.8
Full-Bridge, ±7.8 mV/V	30	4.7	4.7	2.3

Input bias current .... <1 nA
INL.. ±15 ppm
CMRR (f_{in} = 60 Hz) .... >100 dB
NMRR
Best 60 Hz rejection .... 90 dB at 60 Hz
Best 50 Hz rejection .... 80 dB at 50 Hz
High resolution .... 65 dB at 50 Hz and 60 Hz

Excitation level for Half-Bridge and Full-Bridge modes

Mode	Load Resistance (Ω)	Excitation (V)
Half-Bridge	700	2.5
Half-Bridge	240	2.0
Full-Bridge	350	2.7
Full-Bridge	120	2.2

Excitation level for Resistance, RTD, and Quarter-Bridge modes

Load Resistance (Ω)	**Excitation (mV)**
120	50
350	150
1 k	430
10 k	2200

MTBF .... 384,716 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 for MIL-HDBK-217F specifications.

Power Requirements

Power consumption from chassis

Active mode .... 750 mW max

Sleep mode .... 25 μW max

Thermal dissipation (at 70 °C)

Active mode .... 625 mW max

Sleep mode .... 25 μW max

Physical Characteristics

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

Spring-terminal wiring..................... 18 to 28 AWG copper conductor wire with 7 mm (0.28 in.) of insulation stripped from the end

Weight... 156 g (5.5 oz)

Safety

Safety Voltages

Connect only voltages that are within these limits.

Isolation

Channel-to-channel

Continuous .... 250 VAC, Measurement Category II

Withstand .... 1390 VAC, verified by a 5 s dielectric withstand test

Channel-to-earth ground

Continuous .... 250 VAC, Measurement Category II

Withstand .... 2300 VAC, verified by a 5 s dielectric withstand test

Measurement Category II is for measurements performed on circuits directly connected to the electrical distribution system. This category refers to local-level electrical distribution, such as that provided by a standard wall outlet, for example, 115 V for U.S. or 230 V for Europe. Do *not* connect the NI 9219 to signals or use for measurements within Measurement Categories 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 visit `ni.com/certification`, search by module number or product line, and click the appropriate link in the Certification column.

Hazardous Locations

U.S. (UL) .... Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nC IIC T4

Environmental

National Instruments C Series modules are intended for indoor use only but may be used outdoors if installed in a suitable enclosure. Refer to the installation instructions for the chassis you are using for more information about meeting these specifications.

Operating temperature
(IEC60068-2-1, IEC 60068-2-2) ...... –40 to 70 °C

Storage temperature
(IEC60068-2-1, IEC 60068-2-2) ...... –40 to 85 °C

Ingress protection.............................. IP 40

Operating humidity
(IEC 60068-2-56)................................ 10 to 90% RH, noncondensing

Storage humidity
(IEC 60068-2-56).............................. 5 to 95% RH, noncondensing

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

Shock and Vibration

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

Operating vibration

Random (IEC 60068-2-34).........5 g_{rms}, 10 to 500 Hz

Sinusoidal (IEC 60068-2-6).......5 g, 10 to 500 Hz

Operating shock
(IEC 60068-2-27).............................30 g, 11 ms half sine,
50 g, 3 ms half sine,
18 shocks at 6 orientations

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Industrial Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European directives, as amended for CE markings, as follows:

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; Electromagnetic Compatibility Directive (EMC)

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit `ni.com/certification`, search by module number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit `ni.com/environment/weee.htm`.

Calibration

You can obtain the calibration certificate and information about calibration services for the NI 9219 at `ni.com/calibration`.

Calibration interval .... 1 year

Where to Go for Support

The National Instruments Web site 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.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

Australia 1800 300 800, Austria 43 662 457990-0, Belgium 32 (0) 2 757 0020, Brazil 55 11 3262 3599,

Canada 800 433 3488, China 86 21 5050 9800,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00,
Finland 385 (0) 9 725 72511, France 01 57 66 24 24,
Germany 49 89 7413130, India 91 80 41190000,
Israel 972 3 6393737, Italy 39 02 413091, Japan 81 3 5472 2970,
Korea 82 02 3451 3400, Lebanon 961 (0) 1 33 28 28,
Malaysia 1800 887710, Mexico 01 800 010 0793,
Netherlands 31 (0) 348 433 466, New Zealand 0800 553 322,
Norway 47 (0) 66 90 76 60, Poland 48 22 3390150,
Portugal 351 210 311 210, Russia 7 495 783 6851,
Singapore 1800 226 5886, Slovenia 386 3 425 42 00,
South Africa 27 0 11 805 8197, Spain 34 91 640 0085,
Sweden 46 (0) 8 587 895 00, Switzerland 41 56 2005151,
Taiwan 886 02 2377 2222, Thailand 662 278 6777,
Turkey 90 212 279 3031, United Kingdom 44 (0) 1635 523545

374473D-01 Jun07