
NI-9264

Specifications

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NI 9264 Datasheet



- DSUB or spring terminal connectivity
- 250 V RMS, CAT II, channel-to-earth isolation (spring terminal); 60 V DC, CAT I, channel-to-earth isolation (DSUB)

The NI-9264 is a C Series module for NI CompactDAQ and CompactRIO systems that accommodates higher-channel-count systems in either chassis type. Higher-density modules conserve chassis space and leave room for other measurement types. Each channel can update at up to 25 kS/s because each channel has its own digital-to-analog converter. The spring-terminal version of the NI-9264 uses a 36-position connector for the 16 channels of output, each of which has a ground connection. The DSUB version of the NI-9264 module was designed to accommodate standard 37-pin DSUB components.

 <p>Kit Contents</p>	<ul style="list-style-type: none"> • NI 9264 • NI 9264 Getting Started Guide • Flathead Screwdriver (Spring Terminal)
 <p>Accessories</p>	<ul style="list-style-type: none"> • NI 9940 Backshell Connector Kit (Spring Terminal) • NI 9923 Screw-Terminal Block (DSUB)

C SERIES ANALOG OUTPUT MODULE COMPARISON							
Product Name	Module Type	Signal Ranges	Channels	Update Rate	Isolation	Resolution	Connectivity
NI 9260	Voltage Output	3 V RMS	2	51.2 kS/s/ch	None	24-Bit	BNC, mini XLR
NI 9262	Voltage Output	±10 V	6	1 MS/s/ch	60 V DC Ch-Earth	16-Bit	37-Pin DSUB
NI 9263	Voltage Output	±10 V	4	100 kS/s/ch	250 V RMS Ch-Earth	16-Bit	Screw Terminal, Spring Terminal
NI 9264	Voltage Output	±10 V	16	25 kS/s/ch	250 V RMS Ch-Earth (Spring) 60 V DC Ch-Earth (DSUB)	16-Bit	Spring Terminal, 37-Pin DSUB
NI 9265	Current Output	0 mA to 20 mA	4	100 kS/s/ch	250 V RMS Ch-Earth, Vsup-Earth, COM-Earth	16-Bit	Screw Terminal
NI 9266	Current Output	0 mA to 20 mA	8	24 kS/s/ch	250 V RMS Ch-Earth (Screw) 60 V DC Ch-Earth (DSUB)	16-Bit	Screw Terminal, 37-Pin DSUB
NI 9269	Voltage Output	±10 V	4	100 kS/s/ch	250 V RMS Ch-Ch 250 V RMS Ch-Earth	16-Bit	Screw Terminal

NI C Series Overview



NI provides more than 100 C Series modules for measurement, control, and communication applications. C Series modules can connect to any sensor or bus and allow for high-accuracy measurements that meet the demands of advanced data acquisition and control applications.

- Measurement-specific signal conditioning that connects to an array of sensors and signals
- Isolation options such as bank-to-bank, channel-to-channel, and channel-to-earth ground
- -40 °C to 70 °C temperature range to meet a variety of application and environmental needs
- Hot-swappable

The majority of C Series modules are supported in both CompactRIO and CompactDAQ platforms and you can move modules from one platform to the other with no modification.

CompactRIO



CompactRIO combines an open-embedded architecture with small size, extreme ruggedness, and C Series modules in a platform powered by the NI LabVIEW reconfigurable I/O (RIO) architecture. Each system contains an FPGA for custom timing, triggering, and processing with a wide array of available modular I/O to meet any embedded application requirement.

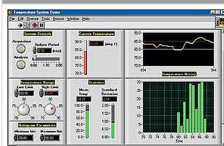
CompactDAQ

CompactDAQ is a portable, rugged data acquisition platform that integrates connectivity, data acquisition, and signal conditioning into modular I/O for directly interfacing to any sensor or signal. Using CompactDAQ with LabVIEW, you can easily customize how you acquire, analyze, visualize, and manage your measurement data.



Software

LabVIEW Professional Development System for Windows

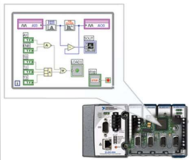


- Use advanced software tools for large project development
- Generate code automatically using DAQ Assistant and Instrument I/O Assistant
- Use advanced measurement analysis and digital signal processing

LabVIEW Professional Development System for Windows

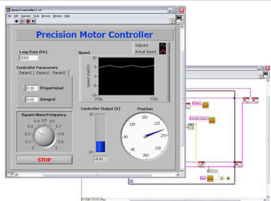
- Take advantage of open connectivity with DLLs, ActiveX, and .NET objects
- Build DLLs, executables, and MSI installers

NI LabVIEW FPGA Module



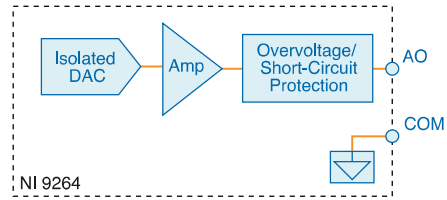
- Design FPGA applications for NI RIO hardware
- Program with the same graphical environment used for desktop and real-time applications
- Execute control algorithms with loop rates up to 300 MHz
- Implement custom timing and triggering logic, digital protocols, and DSP algorithms
- Incorporate existing HDL code and third-party IP including Xilinx IP generator functions
- Purchase as part of the LabVIEW Embedded Control and Monitoring Suite

NI LabVIEW Real-Time Module



- Design deterministic real-time applications with LabVIEW graphical programming
- Download to dedicated NI or third-party hardware for reliable execution and a wide selection of I/O
- Take advantage of built-in PID control, signal processing, and analysis functions
- Automatically take advantage of multicore CPUs or set processor affinity manually
- Take advantage of real-time OS, development and debugging support, and board support
- Purchase individually or as part of a LabVIEW suite

Circuitry



Each channel has a digital-to-analog converter (DAC) that produces a voltage signal. Each channel also has overvoltage and short-circuit protection.

NI-9264 Specifications

The following specifications are typical for the range -40 °C to 70 °C unless otherwise noted. All voltages are relative to COM unless otherwise noted.

Caution Do not operate the NI-9264 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Output Characteristics

Number of channels	16 analog output channels
DAC resolution	16 bits
Type of DAC	String
Power-on output state	Channels off
Startup voltage ^[1]	0 V
Power-down voltage ^[2]	0 V
Output range	
Nominal	±10 V
Minimum	±10.35 V
Typical	±10.5 V

Maximum	± 10.65 V
Current drive	± 16 mA all channels maximum; ± 4 mA per channel typical
Output impedance	2.0 Ω

	Measurement Conditions	Percent of Reading (Gain Error)	Percent of Range ^[3] (Offset Error)
Calibrated	Maximum (-40 °C to 70 °C)	0.15%	0.15%
	Typical (25 °C)	0.05%	0.05%
Uncalibrated ^[4]	Maximum (-40 °C to 70 °C)	0.6%	1.0%
	Typical (25 °C)	0.2%	0.25%

Table 1. Accuracy

Stability	
Gain drift	6 ppm/°C
Offset drift	80 μ V/°C
Protection	
Overvoltage	± 27 V at 25 °C
Short-circuit	Indefinitely

Number of Channels	Update Time for NI cRIO-9151 R Series Expansion Chassis	Update Time for All Other Chassis
1	3.7 μ s minimum	3.1 μ s minimum
2	6.6 μ s minimum	5.3 μ s minimum
3	9.4 μ s minimum	7.5 μ s minimum
16	47 μ s minimum	37 μ s minimum

Table 2. Update Time

Noise ^[5]	500 μ Vrms
Slew rate	4 V/ μ s
Crosstalk at 1 kHz sine wave	85 dB
Settling time (100 pF load, to 1 LSB)	
20 V step	20 μ s
1 V step	15 μ s
0.1 V step	13 μ s
Capacity drive	1,500 pF maximum
Monotonicity	16 bits
DNL	\pm 1 LSB maximum
INL (endpoint)	\pm 12 LSBs maximum
MTBF	595,509 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

Power Requirements

Power consumption from chassis	
Active mode	1 W maximum
Sleep mode	25 μ W maximum

Thermal dissipation (at 70 °C)

Active mode	1 W maximum
Sleep mode	25 μ W maximum

Physical Characteristics

Spring-terminal wiring

Gauge	copper conductor wire
Wire strip length	of insulation stripped from the end
Temperature rating	
Wires per spring terminal	

Connector securement

Securement type	Screw flanges provided
Torque for screw flanges	

Weight

NI-9264 with spring terminal
NI-9264 with DSUB

NI-9264 with Spring Terminal (Black Connector) Safety Voltages

Connect only voltages that are within the following limits.

Isolation

Channel-to-channel None

Channel-to-earth ground

Continuous 250 V RMS, Measurement Category II

Withstand 2,300 V RMS, verified by a 5 s dielectric withstand test

NI 9264 with DSUB Safety Voltages

Isolation

Channel-to-channel None

Channel-to-earth ground

Continuous 60 VDC, Measurement Category I

Withstand 1,000 Vrms, verified by a 5 s dielectric withstand test

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.

Hazardous Locations

U.S. (UL)	;
Canada (C-UL)	;
Europe (ATEX) and International (IECEX)	

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 5, UL 60079-15; Ed 3
- 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 sensitive electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions

- ICES-001: Class A emissions

Note For the standards applied to assess the EMC of this product, refer to the [Online Product Certification](#) section.

CE Compliance

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)
- 94/9/EC; Potentially Explosive Atmospheres (ATEX)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

Shock and Vibration

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

Operating vibration	
Random (IEC 60068-2-64)	5 grms, 10 Hz to 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 Hz 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

Environmental

Refer to the manual for the chassis you are using for more information about meeting these specifications.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 70 °C
Storage temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 85 °C
Ingress protection	IP40
Operating humidity (IEC 60068-2-78)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-78)	5% RH to 95% RH, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m


Indoor use only.

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 **Engineering a Healthy Planet** 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.

EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—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 RoHS**— NI 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 NI 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.)

Calibration

You can obtain the calibration certificate and information about calibration services for the NI-9264 at ni.com/calibration.

Calibration interval	1 year
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¹ When the module powers on, a glitch occurs for 20 μ s peaking at 500 mV.

² The power-down voltage peaks at 1.7 V, then exponentially discharges to 0 V in 200 ms. You can add a load to reduce peak voltage.

³ Range equals 10.5 V

⁴ Uncalibrated accuracy refers to the accuracy achieved when acquiring in raw or unscaled modes where the calibration constants stored in the module are not applied to the data.

⁵ The noise specification includes the glitch energy.