

DATASHEET

NI 9425 Datasheet

32-Channel, 24 V Sinking Digital Input Module



- 32 channels, 7 μ s sinking digital inputs
- Compatible with 24 V logic levels
- Hot-swappable operation
- 60 VDC, CAT I isolation
- Industry-standard 37-pin D-SUB connector
- -40 °C to 70 °C operating range

The NI 9425 is a 32-channel, 7 μ s sinking digital input C Series module for any CompactDAQ or CompactRIO chassis. Each channel is compatible with 24 V levels and features 1,000 Vrms of transient overvoltage protection from channel-to-earth ground. The NI 9425 contains an industry-standard 37-pin D-SUB connector for low-cost cabling to a wide variety of 37-pin accessories from NI or other vendors. It works with industrial logic levels and signals to directly connect to a wide array of industrial switches, transducers, and other devices.

The NI 9425 is a serial digital module, so it cannot be used to perform counter operations when installed in an CompactDAQ chassis.

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.



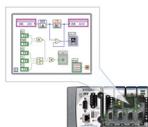
Software

LabVIEW Professional Development System for Windows



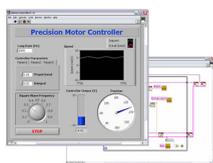
- Use advanced software tools for large project development
- Generate code automatically using DAQ Assistant and Instrument I/O Assistant
- Use advanced measurement analysis and digital signal processing
- Take advantage of open connectivity with DLLs, ActiveX, and .NET objects
- Build DLLs, executables, 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

NI 9425 Specifications

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



Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



Caution Do not operate the NI 9425 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.

Input Characteristics

Number of channels	32 digital input channels
Input type	Sinking

Digital logic levels

OFF state	
Input voltage	≤ 5 V
Input current	≤ 150 μ A
ON state	
Input voltage	≥ 10 V
Input current	≥ 330 μ A
Hysteresis	
Input voltage	2 V minimum
Input current	60 μ A minimum
Input impedance	30 k Ω \pm 5%
I/O protection	
Input voltage	
8 channels	60 VDC maximum
32 channels	30 VDC maximum
Reverse-biased voltage	
8 channels	-60 VDC maximum
32 channels	-30 VDC maximum
Hold time ¹	0 μ s minimum
Setup time ²	1 μ s minimum
Update/transfer time ³	
cRIO-9151 R Series Expansion chassis	8 μ s maximum
All other chassis	7 μ s maximum
MTBF	1,256,699 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

Power Requirements

Power consumption from chassis

Active mode	410 mW maximum
Sleep mode	0.5 mW maximum

¹ *Hold time* is the amount of time input signals must be stable after initiating a read from the module.

² *Setup time* is the amount of time input signals must be stable before reading from the module.

³ The update/transfer time is valid when the module is used in a CompactRIO system. When used in other systems, driver software and system latencies impact this time.

Thermal dissipation (at 70 °C)

Active mode	1.45 W maximum
Sleep mode	1 W maximum

Physical Characteristics

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



Tip For two-dimensional drawings and three-dimensional models of the C Series module and connectors, visit ni.com/dimensions and search by module number.

Weight	147 g (5.2 oz)
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Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-COM	60 VDC maximum
Isolation, channel-to-channel	None
Isolation, channel-to-earth ground	
Continuous	60 VDC, Measurement Category I
Withstand	
Up to 2,000 m altitude	1,000 Vrms, verified by a 5 s dielectric withstand test
Up to 5,000 m altitude	500 Vrms, verified by a 5 s dielectric withstand test

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 Do not connect the NI 9425 to signals or use for measurements within Measurement Categories II, III, or IV.

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4
Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, Ex nA IIC T4
Europe (ATEX) and International (IECEX)	Ex nA IIC T4 Gc

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 electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): 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 EMC declarations and certifications, and additional information, refer to the [Online Product Certification](#) section.



Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories.

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)

Online Product Certification

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

Shock and Vibration

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

Operating vibration	
Random (IEC 60068-2-64)	5 g _{rms} , 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	5,000 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 *Minimize Our Environmental Impact* 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.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers 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）



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