
NI-9426

Specifications

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NI 9426 Datasheet



- DSUB connectivity
- 60 V DC, CAT I, channel-to-earth isolation

The NI 9426 is a 32-channel sourcing digital input module for CompactDAQ and CompactRIO systems. The NI 9426 uses an industry-standard 37-pin DSUB

connector and works with 24 V industrial logic levels and signals for direct connection to a wide array of industrial devices.

	<p>Kit Contents</p>	<ul style="list-style-type: none"> • NI 9426 • NI 9426 Getting Started Guide
	<p>Accessories</p>	<p>Front-Mount</p> <ul style="list-style-type: none"> • NI 9923 Screw-Terminal Block <p>Cable</p> <ul style="list-style-type: none"> • DSUB Cable, 1 m (778621-01)

C SERIES DIGITAL INPUT MODULE COMPARISON							
Product Name	Module Type	Signal Levels	Direction	Channels	Update Rate	Connectivity	Isolation
NI 9411	Digital Input	±5, 24 V	Sinking/Sourcing Diff/ SE Input	6	500 ns	15-Pin DSUB	60 V DC Ch-Earth
NI 9421	Digital Input	12, 24 V	Sinking Input	8	100 μ s	Screw Terminal, Spring Terminal, 25-Pin DSUB	250 V RMS Ch-Earth (Screw/Spring) 60 V DC Ch-Earth (DSUB)
NI 9422	Digital Input	24, 48, 60 V	Sinking/Sourcing Input	8	250 μ s	Screw Terminal	250 V RMS Ch-Ch and Ch-Earth
NI 9423	Digital Input	12, 24 V	Sinking Input	8	1 μ s	Screw Terminal, Spring Terminal	60 V DC Ch-Earth
NI 9425	Digital Input	12, 24 V	Sinking Input	32	7 μ s	Spring Terminal, 37-Pin DSUB	250 V RMS Ch-Earth (Spring) 60 V DC Ch-Earth (DSUB)
NI 9426	Digital Input	24 V	Sourcing Input	32	7 μ s	37-Pin DSUB	60 V DC Ch-Earth
NI 9435	Digital Input	250 V DC/ V AC	Sinking/ Sourcing Input	4	3 ms	Screw Terminal	250 V RMS Ch-Earth
NI 9436	Digital Input	250 V DC/ V AC	Sinking/ Sourcing Input	8	20 ms	Screw Terminal	250 V RMS Ch-Ch and Ch-Earth
NI 9437	Digital Input	24 V to 250 V	Sinking Input	8	1 μ s	Screw Terminal, Spring Terminal	300 V RMS Ch-Earth

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.



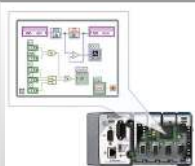
Software

LabVIEW Professional Development System for Windows



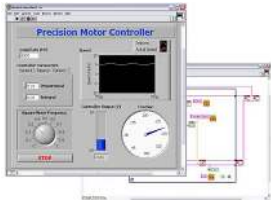
- Use advanced software tools for large project development
- Generate code automatically using DAQ Assistant and Instrument I/O Assistant
- Use advanced measurement analysis and digital signal processing
- Take advantage of open connectivity with DLLs, ActiveX, and .NET objects
- Build DLLs, executables,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

NI LabVIEW FPGA Module



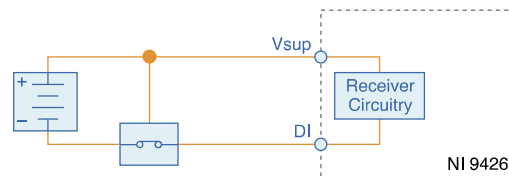
- Design FPGA applications for NI RIO hardware
- Program with the same graphical environment used for desktop and real-time applications
- Execute control algorithms with loop rates up to 300 MHz
- Implement custom timing and triggering logic, digital protocols, and DSP algorithms
- Incorporate existing 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

Circuitry



The NI-9426 has sourcing inputs. Sourcing inputs source current from V_{sup} to the sinking device connected to the NI-9426.

Tip For more information about sourcing inputs, visit ni.com/info and enter the Info Code sinksource.

NI-9426 Specifications

The following specifications are typical for the range $-40\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$ unless otherwise noted. All voltages are relative to V_{sup} unless otherwise noted.

Caution Do not operate the NI-9426 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	Sourcing	
Digital logic levels		
OFF state		
Input voltage ^[1]	$\geq (V_{sup} - 5 \text{ V})$	
Input current	$\leq 150 \text{ }\mu\text{A}$ from DI pin	
ON state		
Input voltage ^[1]	$\leq (V_{sup} - 10 \text{ V})$	
Input current	$\geq 330 \text{ }\mu\text{A}$ from DI pin	
Hysteresis		
Input voltage	1.9 V minimum	
Input current	65 μA minimum	
Input impedance	30 k Ω \pm 5%	
I/O protection (V_{sup}-to-channel)		
Input voltage	30 V maximum	
Reverse-biased voltage	-30 V maximum	
Hold time ^[2]	0 s minimum	
Setup time ^[3]	1 μs minimum	
Update/transfer time ^[4]	7 μs maximum	

MTBF	955,723 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method
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Power Requirements

Power consumption from chassis	
Active mode	615 mW maximum
Sleep mode ^[5]	5 mW maximum
Thermal dissipation (at 70 °C)	
Active mode	1.35 W maximum
Sleep mode	1.16 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:

Vsup-to-channel	30 VDC maximum
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

Measurement Category I

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

Attention Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour effectuer des mesures dans ces catégories.

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.

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4 Gc
Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Ex nA IIC T4 Gc
Europe (ATEX) and International (IECEX)	Ex nA IIC T4 Gc DEMKO 07 ATEX 0626664X IECEX UL 14.0089X

Safety Compliance 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 C22.2 No. 61010-1
- EN 60079-0, EN 60079-7
- IEC 60079-0, IEC 60079-7
- UL 60079-0, UL 60079-7
- CSA C22.2 No. 60079-0, CSA C22.2 No. 60079-7

Note For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

Electromagnetic Compatibility

- 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 cables.

CE Compliance

- 2014/34/EU; 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	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

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 60068-2-30)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-30)	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.)

¹ V_{sup} is the external power supply voltage.

² **Hold time** is the amount of time input signals must be stable after initiating a read from the module.

³ **Setup time** is the amount of time input signals must be stable before reading from the module.

⁴ 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.

⁵ The external power supply may power the module during sleep mode.