DATASHEET

NI 9423

8-Channel Sinking Digital Input Module

- 8-channel, 100 µs digital input
- 24 V logic, sinking digital input
- Compatible with NI CompactDAQ counters
- 250 Vrms, CAT II isolation
- 10-position spring-terminal or 10-position screw-terminal connectors available
- -40 °C to 70 °C operating, 5 g vibration, 50 g shock

The NI 9423 is an 8-channel, 100 µs sinking digital input module for any NI CompactDAQ or CompactRIO chassis. Each channel is compatible with 24 V signals and features transient overvoltage protection of 2,300 Vrms between the input channels and earth ground. Each channel also has an LED that indicates the state of that channel. The NI 9423 works with industrial logic levels and signals for direct connection to a wide array of industrial switches, transducers, and devices.

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

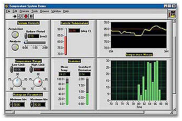
CompactRIO combines an open-embedded architecture with small size, extreme ruggedness, and C Series modules in a platform powered by the NI LabVIEW reconfigurable I/O (RIO) architecture. Each system contains an FPGA for custom timing, triggering, and processing with a wide array of available modular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

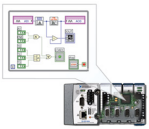
Software

LabVIEW Professional Development System for Windows



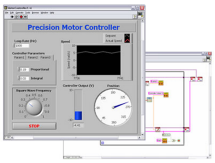
- Use advanced software tools for large project development
- Generate code automatically using DAQ Assistant and Instrument I/O Assistant
- Use advanced measurement analysis and digital signal processing
- Take advantage of open connectivity with DLLs, ActiveX, and .NET objects
- Build DLLs, executables, 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 9423 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 9423 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.....8 digital input channels

Input type.....Sinking

Digital logic levels

- OFF state
  - Input voltage.....≤5 V
  - Input current.....≤150 µA
- ON state
  - Input voltage.....11 V to 30 V
  - Input current.....≥3 mA

I/O protection

- Input voltage.....35 V maximum
- Reverse-biased voltage.....-30 V maximum
- Input current.....8.5 mA maximum, internally limited

Input delay time.....1 µs maximum

MTBF.....979,623 hours at 25 °C; Bellcore Issue 2, Method I, Case 3, Limited Part Stress Method

Power Requirements

Power consumption from chassis

- Active mode.....290 mW max
- Sleep mode.....7 mW max

Thermal dissipation (at 70 °C)

- Active mode.....1.5 W max
- Sleep mode.....1.3 W max

Physical Characteristics

Screw-terminal wiring

- Gauge.....0.2 mm^2 to 2.5 mm^2 (26 AWG to 14 AWG) copper conductor wire
- Wire strip length.....13 mm (0.51 in.) of insulation stripped from the end
- Temperature rating.....90 °C minimum
- Torque for screw terminals.....0.5 N · m to 0.6 N · m (4.4 lb · in. to 5.3 lb · in.)
- Wires per screw terminal.....One wire per screw terminal; two wires per screw terminal using a 2-wire ferrule

Spring-terminal wiring

- Gauge: 0.2 mm^2 to 2.5 mm^2 (30 AWG to 12 AWG) copper conductor wire
- Wire strip length: 10 mm (0.39 in.) of insulation stripped from the end
- Temperature rating: 90 °C minimum
- Wires per spring terminal: One wire per spring terminal; two wires per spring terminal using a 2-wire ferrule

Connector securement

- Securement type: Screw flanges provided
- Torque for screw flanges: 0.2 N · m (1.80 lb · in.)

NI 9423 Safety Voltages

Connect only voltages that are within the following limits:

Channel-to-COM: 30 V max

Isolation

- Channel-to-channel: None
- Channel-to-earth ground
  - Continuous: 250 Vrms, Measurement Category II
  - Withstand: 2,300 Vrms, 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.

Caution Do not connect the NI 9423 to signals or use for measurements within Measurement Categories 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 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.

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

CE Compliance CE

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.....-40 °C to 70 °C
(IEC 60068-2-1, IEC 60068-2-2)

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

Ingress protection.....IP40

Operating humidity.....10% RH to 90% RH, noncondensing
(IEC 60068-2-78)

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 *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）

中国客户 National Instruments 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 National Instruments 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.)

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