C Series Digital Output and Relay Modules

NI 940x, NI 947x, NI 948x *NEW!*

- High- and low-speed high-voltage digital outputs (up to 60 V), 5 V/TTL, SPST (Form A) electromechanical relay outputs or solid-state relay outputs
- Up to 32 channels per module; up to 256 channels per 8-slot chassis
- Down to 100 ns output rate for ultrahigh-speed control, pulse-width modulation (PWM), or digital communication
- Isolation up to 2,300 V_{rms} (withstand), up to 250 V_{rms} (continuous)
- Externally powered with high current-switching capacity (up to 20 A per module) for direct control of a wide array of industrial actuators
- Short-circuit-proof outputs available to protect from damage caused by current surges



	Compatibility									
Product	**CompactRIO**	**NI CompactDAQ**	**Logic**	**Channels**	**Sink/Source**	**I/O Delay Time**	**Signal Levels**	**Output Current per Channel**	**Isolation**	**Connector Options**
NI 9401	✓	✓	5 V/TTL	8	Sink/Source	100 ns	5 V	2 mA	✓	D-Sub
NI 9403	✓	✓	5 V/TTL	32	Sink/Source	7 µs	5 V	2 mA	✓	D-Sub
NI 9472	✓	✓	High Voltage	8	Source	100 µs	6 to 30 V	750 mA	✓	Screw Terminal, D-Sub
NI 9474	✓	✓	High Voltage	8	Source	1 µs	5 to 30 V	1 A	✓	Screw Terminal
NI 9476	✓	✓	High Voltage	32	Source	500 µs	6 to 36 V	250 mA	✓	D-Sub
NI 9477	✓	✓	High Voltage	32	Sink	8 µs	5 to 60 V	625 mA	✓	D-Sub
NI 9481	✓	✓	Form A	4	Sink/Source	10 ms	60 VDC, 250 VAC	2 A (30 VDC)	✓	Screw Terminal
NI 9485	✓	✓	SSR	8	Sink/Source	9 ms	60 VDC, 30 VAC	750 mA	✓	Screw Terminal

Table 1. C Series Digital Output and Relay Module Selection Guide

Overview

High-performance digital output and switching modules for National Instruments CompactRIO embedded systems, R Series expansion chassis, and NI CompactDAQ systems provide extended voltage ranges and high current-switching capacity for direct control of a wide array of industrial and automotive actuators. Each module features an integrated connector junction box with screw-terminal or cable options for flexible, low-cost signal wiring. All modules feature the NI CompactRIO Extreme Industrial Certifications and Ratings.

System Compatibility

You can use NI C Series modules interchangeably in CompactRIO and NI CompactDAQ chassis. Many of the advanced timing features described apply only to CompactRIO reconfigurable I/O systems and not to NI CompactDAQ.

Advanced Features

When used in CompactRIO, C Series digital output modules connect directly to reconfigurable I/O (RIO) FPGA hardware to create high-performance embedded systems. The reconfigurable FPGA hardware within CompactRIO provides a variety of options for timing, triggering, synchronization, digital waveform generation, or digital communication. For instance, with CompactRIO you can implement a circuit to generate pulse-width modulation (PWM) outputs for controlling motors, heaters, or fans, as well as perform pulse code modulation encoding (PCME) for wireless telemetry applications.

Key Features

- High-performance digital output switching for any CompactRIO embedded system, R Series expansion chassis, or NI CompactDAQ system
- Screw-terminal, strain relief, high-voltage, cable, solder-cup backshell, and other connectivity options
- Channel-to-earth ground double-isolation barrier for safety and noise immunity
- NI CompactRIO Extreme Industrial Certifications and Ratings

Visit **ni.com/compactrio** or **ni.com/compactdaq** for up-to-date information on module availability, example programs, application notes, and other developer tools.

Typical certifications – Actual specifications vary from product to product. Visit **ni.com/certification** for details.

North American Hazardous Locations

NATIONAL INSTRUMENTS

Connectivity Accessories

CompactRIO and NI CompactDAQ systems are designed to provide flexible options for low-cost field wiring and cabling. Most C Series modules have a unique connector block option to provide secure and safe connections to your CompactRIO or NI CompactDAQ system. Table 2 contains all of the connector blocks available for C Series I/O modules.

Accessory	Description
NI 9932	10-position strain relief and high-voltage screw-terminal connector kit
NI 9933	37-pin D-Sub connector kit with strain relief and D-Sub shell
NI 9934	25-pin D-Sub connector kit with strain relief and D-Sub shell
NI 9935	15-pin D-Sub connector kit with strain relief and D-Sub shell
NI 9936	10-position screw-terminal plugs (quantity 10)

Note: To meet shock and vibration requirements, you must affix ferrules to the ends of the wires on all screw-terminal connectors.

Table 2. C Series I/O Module Connector Blocks

Table 3 lists the recommended connector block accessories for each C Series digital output and relay module.

C Series Digital Output and Relay Module	Recommended Module Accessory
NI 9401	NI 9934[1]
NI 9403	NI 9933[2]
NI 9472	NI 9932, NI 9936
NI 9472 with D-Sub	NI 9934[1]
NI 9474	NI 9932, NI 9936
NI 9476	NI 9933[2]
NI 9477	NI 9933[2]
NI 9481	NI 9932, NI 9936
NI 9485	NI 9939

[1]Requires a 25-pin D-Sub connector such as the NI 9934 accessory kit.
[2]Requires a 37-pin D-Sub connector such as the NI 9933 accessory kit.

Table 3. Recommended Connector Block Accessories for CompactRIO

The NI 9932 kit provides strain relief and operator protection from high-voltage signals for any 10-position screw-terminal module.



Figure 1. NI 9932 10-Position Strain Relief and High-Voltage Screw-Terminal Connector Kit

The NI 9933 includes a screw-terminal connector with strain relief as well as a D-Sub solder-cup backshell for creating custom cable assemblies for any module with a 37-pin D-Sub connector.

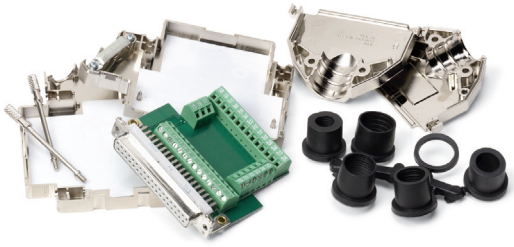


Figure 2. NI 9933 37-Pin D-Sub Connector Kit with Strain Relief and D-Sub Shell

The NI 9934 includes a screw-terminal connector with strain relief as well as a D-Sub solder-cup backshell for creating custom cable assemblies for any module with a 25-pin D-Sub connector.

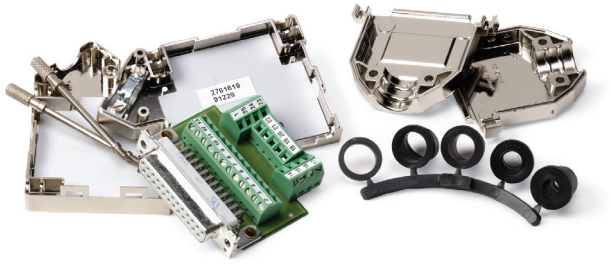


Figure 3. NI 9934 25-Pin D-Sub Connector Kit with Strain Relief and D-Sub Shell

The NI 9935 includes a screw-terminal connector with strain relief as well as a D-Sub solder-cup backshell for creating custom cable assemblies for any module with a 15-pin D-Sub connector.

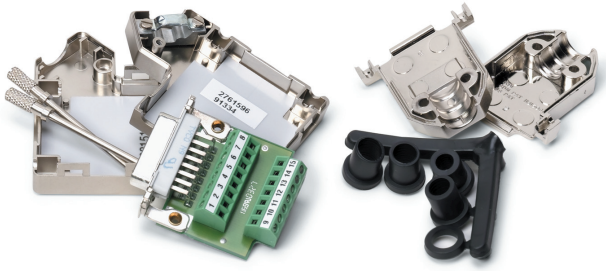


Figure 4. NI 9935 15-Pin D-Sub Connector Kit with Strain Relief and D-Sub Shell

C Series Module Accessories

The NI 9936 consists of 10-position screw-terminal plugs for any 10-position screw-terminal module.



Figure 5. NI 9936 10-Position Screw-Terminal Plugs

Visit **ni.com/compactrio** or **ni.com/compactdaq** for up-to-date information on availability of accessories.

Ordering Information

Developer Kits

NI cRIO-9961 Embedded System Developer
Hardware Evaluation Kit 779107-01
NI Reconfigurable I/O
Software Development Kit 779149-03

Reconfigurable Embedded Systems

Real-Time Controllers

NI cRIO-9012 779563-01
NI cRIO-9014 779564-01
NI cRIO-9002 779000-01
NI cRIO-9004 779055-01

Reconfigurable Chassis

NI cRIO-9101 779052-01
NI cRIO-9102 779007-01
NI cRIO-9103 779053-01
NI cRIO-9104 779054-01

Power Supplies

NI PS-1 777567-01
NI PS-2
U.S. 120 VAC/Japan 100 VAC 777584-01
North American 240 VAC 777584-05
NI PS-3
U.S. 120 VAC/Japan 100 VAC 777585-01
North American 240 VAC 777585-05
NI PS-4 778586-90
NI PS-5 778805-90

R Series Expansion Systems

Expansion Chassis

NI cRIO-9151 chassis 779008-01
SH68-C68-S cable, 2 m 186381-02

R Series Devices

PCI

NI PCI-7811R digital I/O 779363-01
NI PCI-7813R digital I/O 779370-01
NI PCI-7830R multifunction I/O 779361-01
NI PCI-7831R multifunction I/O 778797-01
NI PCI-7833R multifunction I/O 779359-01

PXI

NI PXI-7811R digital I/O 778800-01
NI PXI-7813R digital I/O 779362-01
NI PXI-7830R multifunction I/O 779364-01
NI PXI-7831R multifunction I/O 778668-01
NI PXI-7833R multifunction I/O 779360-01

C Series Modules[1]

Analog Input Modules

NI 9201 779013-01
NI 9201 with D-Sub 779372-01
NI 9203 779516-01
NI 9205 779519-01
NI 9205 with D-Sub 779357-01
NI 9206 779526-01
NI 9211 779001-01
NI 9215 779011-01
NI 9215 with BNC 779138-01
NI 9217 779592-01
NI 9221 779014-01
NI 9221 with D-Sub 779373-01
NI 9233 779015-01
NI 9237 779521-01

Analog Output Module

NI 9263 779012-01
NI 9265 779334-01

Digital Input and Counter/Timer Modules

NI 9401 779351-01
NI 9403 779787-01
NI 9411 779005-01
NI 9421 779002-01
NI 9421 with D-Sub 779136-01
NI 9422 779522-01
NI 9423 779009-01
NI 9425 779139-01
NI 9435 779010-01

Digital Output and Relay Modules

NI 9401 779351-01
NI 9472 779004-01
NI 9472 with D-Sub 779137-01
NI 9474 779003-01
NI 9476 779140-01
NI 9477 779517-01
NI 9481 779006-01
NI 9485 779600-01

Accessories

NI 9912 779019-01
NI 9915 779018-01
NI 9917 779454-01
NI 9918 779455-01
NI 9932 779017-01
NI 9933 779103-01
NI 9934 779104-01
NI 9935 779016-01
NI 9936 779105-01
NI 9937 779106-01
NI 9939 192692-01

Ethernet Cables

CAT5
5 m 182219-05
CAT5 Crossover
5 m 187375-05

OEM Discounts Available

NI offers aggressive OEM pricing discounts for high-volume OEM applications. Contact NI for a quote.

[1]Visit **ni.com/compactrio** for up-to-date information on module availability.

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to **ni.com/compactrio**.

Ordering Information

System Chassis

NI cDAQ-9172
- U.S., 120 VAC 779508-01
- Swiss, 220 VAC 779508-02
- Australian, 240 VAC 779508-03
- Universal Euro, 240 VAC 779508-04
- UK, 240 VAC 779508-06
- Japanese, 100 VAC 779508-07

C Series Modules[1]

Analog Input Modules

NI 9205 779519-01
NI 9205 with D-Sub 779357-01
NI 9206 779526-01
NI 9211 779001-01
NI 9215 779011-01
NI 9215 with BNC 779138-01
NI 9233 779015-01
NI 9237 779521-01

Analog Output Module

NI 9263 779012-01

Digital Input Modules

NI 9401 779351-01
NI 9421 779002-01
NI 9421 with D-Sub 779136-01

[1]Visit **ni.com/compactrio** or **ni.com/compactdaq** for up-to-date information on module availability.

Digital Output and Relay Modules

NI 9401 779351-01
NI 9472 779004-01
NI 9472 with D-Sub 779137-01
NI 9481 779006-01

Accessories

NI 9901 779473-01
NI 9915 779018-01
NI 9917 779454-01
NI 9918 779455-01
NI 9932 779017-01
NI 9933 779103-01
NI 9936 779105-01
NI 9940 779567-01
NI 9941 779568-01

Academic Bundles

Standard Bundle 777448-60
Instrumentation Bundle 777448-61
DSA (Sound and Vibration) Bundle 777448-62

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351516A-01 2007-9168-161-101-D

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