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Ordering Information

For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

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Quanser Q1-cRIO

Data Acquisition and Control Module

- 1 configurable analog output; ±10 V, ±5 V, ±10.8 V, +5 V, +10 V, +10.8 V output ranges
- 1 configurable analog input; ±5 V, ±10 V input ranges
- 16-bit resolution for analog input and analog output
- 2- to 24-bit optical encoder input interfaces with velocity estimation
- Driven and fully supported by Quanser Rapid Control Prototyping (RCP) Toolkit

Overview

The Quanser Q1-cRIO is a C Series module for the NI cRIO-9024 controller and NI cRIO-9113 backplane. It is designed to easily interface with more than 85 Quanser controls experiments. The convenient Q1-cRIO set of I/O and connectors minimizes setup time and errors so students can concentrate on learning the fundamentals of controls. With the Quanser RCP Toolkit installed, up to four configurations are supported. Because of this, educators can interface with Quanser controls experiments used for teaching controls topics from introductory to advanced levels. The Q1-cRIO is designed specifically for controls education. Each module has one analog input, one analog output, and two configurable, single-ended encoder input interfaces, which minimize the need for additional equipment. The Q1-cRIO, when driven by the Quanser RCP Toolkit, provides hardware velocity estimation. This results in controllers with greater stability that more closely match the theory. All inputs and outputs are accessed simultaneously using unbuffered single-point reads and writes, which is a requirement for real-time control applications. With plug-and-play connectors and the provided cables, students can make fast, error-free connections when setting up a controls workstation. With no requirement for stripping wires and soldiering custom cables, workstations can be assembled and disassembled reliably time and time again in seconds.

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Application and Technology

System Compatibility

You can use the Quanser Q1-cRIO DAQ module with only an NI cRIO-9024 controller paired with an NI cRIO-9113 backplane. The Quanser RCP Toolkit for NI LabVIEW 2012 is also required to access the module. All other configurations are not supported.

Advanced Features

Advanced features include configurable analog-to-digital converter (ADC) ranges, configurable digital-to-analog converter (DAC) ranges, configurable encoder inputs, simultaneous read and writes on all channels, overvoltage and short circuit protection, and hardware velocity estimation.

Key Features

- Unique high-performance combination of I/O for CompactRIO embedded systems
- Plug-and-play interface to more than 80 Quanser experiments
- 1 analog input, 1 analog output, 2 encoder inputs

Connectivity

The Q1-cRIO is designed to specifically interface with all Quanser educational experiments. Each of Quanser's experiments and supporting amplifiers is shipped with cables that plug directly into the Q1-cRIO. Common, 5-pin DIN connectors provide an interface to the encoder inputs while standard RCA audio connectors are used to interface to both the analog input and the analog output. The Q1-cRIO has a 2-pin power input terminal connector, which is shown in the figure below. The recommended mating terminal connector is a Phoenix Contact, part number 1714977, using wiring in the range of 26 AWG to 16 AWG.

Phoenix Terminal Contact

Within the voltage range listed in the detailed specifications, the inputs provide reverse input protection. The input power is isolated from the rest of the module until the correct polarity is applied (the correct polarity is indicated just above the power connector). It is recommended that all connections be made to the module prior to powering.

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Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number
Q1-cRIO Module			
Q1-cRIO Module	782689-01	No accessories required.	

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Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

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NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

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