High-Speed PCI Interfaces for CompactRIO

NI cRIO-9052, NI cRIO-9052CardBus, NI cRIO-9052PXI, NI cRIO-9052PCI *NEW!*

- Laptop, PXI, or PC control of any CompactRIO reconfigurable chassis
- High bandwidth for high-channel-count CompactRIO applications
- Up to 50 MB/s sustained throughput from any NI cRIO-910x chassis
- Up to 14 m cable length
- Dual 9 to 35 VDC supply inputs that deliver isolated power to CompactRIO chassis/modules
- -40 to 70 °C temperature range



Overview and Applications

The National Instruments cRIO-9052 is a high-performance solution for remote control of any NI cRIO-910x reconfigurable chassis using a laptop, PXI system, or PC. With the NI cRIO-9052, you can interface with the FPGA inside of a CompactRIO reconfigurable chassis at rates up to 50 MB/s. The result is a reconfigurable solution ideal for applications requiring the flexibility of the FPGA within CompactRIO and high bandwidth for high-channel-count applications. The cRIO-9052 is designed for extreme ruggedness, reliability, and low power consumption with dual 9 to 35 VDC supply inputs that deliver isolated power to the CompactRIO chassis/modules and a -40 to 70 °C temperature range.



System Configuration

The cRIO-9052, attached to a cRIO-910x reconfigurable chassis, communicates with an NI 8310 device (CardBus, PXI, or PCI) over two CAT-5 cables at distances up to 14 m. The cRIO-9052 and NI 8310 devices use a StarFabric interface to implement a PCI-to-PCI bridge, providing a transparent link where the CompactRIO reconfigurable chassis appears to users as if it were a PCI board within the host computer itself.

You can use built-in functions within NI LabVIEW and LabVIEW Real-Time software for interfacing directly with the FPGA in the CompactRIO chassis. This feature provides PXI and PC users the ability to build a deterministic, real-time application to communicate with the LabVIEW code running on the FPGA of a CompactRIO reconfigurable chassis. Once you have started an application using the CompactRIO chassis, you can disconnect your laptop, PC, or PXI system from CompactRIO while the application continues to run. This functionality eliminates the need to dedicate the laptop, PC, or PXI system to the CompactRIO application only.



Ordering Information

CompactRIO Interface Module

NI cRIO-9052 779506-01

Laptop Interface Kit

NI cRIO-9052CardBus 779528-01

Includes one cRIO-9052, one CardBus card (CardBus-8310), and two 3 m cables.

PXI Interface Kit

NI cRIO-9052PXI 779529-01

Includes one cRIO-9052, one PXI module (PXI-8310), and two 3 m cables.

PC Interface Kit

NI cRIO-9052PCI 779530-01

Includes one cRIO-9052, one PCI board (PCI-8310), and two 3 m cables.

Cables

Ethernet Cable Kits (includes two cables)

3 m 779544-03

10 m 779544-10

14 m 779544-14

BUY NOW!

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

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Specifications

StarFabric Communication

Interface	4 LVDS transmit pairs, 4 LVDS receive pairs
Communication rates	
Theoretical maximum	133 MB/s
Typical[1]	50 MB/s

[1] This rate varies depending on your host system specifications, such as processor, RAM, and so on.

Cabling requirements	
Cables	2 shielded CAT5 Ethernet cables
Maximum difference between the lengths of the two cables	2.54 cm (1 in.)
Maximum cabling length	14 m (45.93 ft)

Power Requirements

You must use a National Electric Code (NEC) Class 2 power source with the cRIO-9052.

Recommended power supply	48 W secondary, 18 VDC to 24 VDC
Power consumption	
cRIO-9052 only	1.5 W, max
cRIO-9052 supplying power to 8 CompactRIO modules	17 W, max[1]
Power supply	
On power up	9 to 35 V
After power up	6 to 35 V

[1] This is the maximum amount of power that the entire system should consume at the power connector.

Note: The cRIO-9052 powers up only at 9 V or higher, but after it is powered up, it can run on as little as 6 V.

Physical Characteristics

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

Screw-terminal wiring	12 to 24 AWG copper conductor wire with 10 mm (0.39 in.) of insulation stripped from the end
Torque for screw terminals	0.5 to 0.6 N • m (4.4 to 5.3 lb • in.)
Weight	Approx. 546 g (19.2 oz)

Safety

Safety Voltages

Connect only voltages that are within these limits.

V-to-C	35 V max, Measurement Category I

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.

Safety Standards

The cRIO-9052 is designed to meet the requirements of the following safety standards for electrical equipment for measurement, control,and laboratory use:

EN 61010-1, IEC 61010-1
UL 61010-1
CAN/CSA-C22.2 No. 61010-1

Note: For UL and other safety certifications, refer to the product label, or visit **ni.com/certification**.

Environmental

The cRIO-9052 is intended for indoor use only. For outdoor use, mount the CompactRIO system in a suitably rated enclosure.

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

Note: To meet this operating temperature range, follow the guidelines in the installation instructions for the CompactRIO system.

Storage temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 to 85 °C
Ingress protection	IP 40
Operating humidity (IEC 60068-2-56)	10 to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5 to 95% RH, noncondensing
Maximum altitude	2,000 m
Pollution degree (IEC 60664)	2

Shock and Vibration

To meet these specifications, you must panel mount the CompactRIOsystem and affix ferrules to the end of the terminal wires.

Operating vibration	
Random (IEC 60068-2-64)	5 g_{rms}, 10 to 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 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

Electromagnetic Compatibility

Emissions	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity	Industrial levels per EN 61326:1997 + A2:2001, Table A.1
EMC/EMI	CE, C-Tick, and FCC Part 15 (Class A) Compliant

Note: For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC

Note: Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit **ni.com/certification**.

NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit **ni.com/services**.

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OEM Support

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Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with **ni.com/pxiadvisor**.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit **ni.com/calibration**.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit **ni.com/services**.

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