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**NI-9918**

## SPECIFICATIONS

# NI cRIO-9065

## Embedded Real-Time Controller with Reconfigurable FPGA for C Series Modules

This document lists the specifications for the NI cRIO-9065. The following specifications are typical for the -40 °C to 70 °C operating temperature range unless otherwise noted.



**Caution** Do not operate the cRIO-9065 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.

## Processor

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Type	Xilinx Zynq-7000, XC7Z020 All Programmable SoC
Architecture	ARM Cotex-A9
Speed	667 MHz
Cores	2
Flash reboot endurance <sup>1</sup>	100,000 cycles

## Operating System

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**Note** For minimum software support information, visit [ni.com/info](https://ni.com/info) and enter the Info Code `swsupport`.

Supported operating system	NI Linux Real-Time (32-bit)
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<sup>1</sup> You can increase the flash reboot endurance value by performing field maintenance on the device. If you expect that your application may exceed the maximum cycle count listed in this document, contact NI support for information about how to increase the reboot endurance value.

## Software requirements

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### Application software

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LabVIEW

LabVIEW 2014 SP1 or later,  
LabVIEW Real-Time Module 2014 SP1 or later,  
LabVIEW FPGA Module 2014 SP1 or later<sup>2</sup>

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Driver software

NI-RIO Device Drivers 14.5 or later

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## Memory

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Nonvolatile memory<sup>3</sup>

1 GB

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Volatile memory (DRAM)

512 MB

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## Network

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Network interface

10Base-T, 100Base-T, 1000Base-T Ethernet

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Compatibility

IEEE 802.3

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Communication rates

10 Mbps, 100 Mbps, 1,000 Mbps auto-negotiated, half/full-duplex

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Maximum cabling distance

100 m/segment

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## Internal Real-Time Clock

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Accuracy

5 ppm

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## USB Ports

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USB device port

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Type

USB 2.0 Hi-Speed, with standard B connector

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Maximum data rate

480 Mbps

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USB host port

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Type

USB 2.0 Hi-Speed, with standard A connector

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Maximum data rate

480 Mbps

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<sup>2</sup> LabVIEW FPGA Module is not required when using Scan Interface mode. To program the user-accessible FPGA on the cRIO-9065, LabVIEW FPGA Module is required.

<sup>3</sup> Formatted capacity of nonvolatile memory may be slightly less than this value.

# Reconfigurable FPGA

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Type	Xilinx Zynq-7000, XC7Z020 All Programmable SoC
Number of logic cells	85,000
Number of flip-flops	106,400
Number of 6-input LUTs	53,200
Number of DSP slices (18 × 25 multipliers)	220
Available block RAM	4480 kbits
Number of DMA channels	16
Number of logical interrupts	32

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## Battery

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**Note** The battery is not user-replaceable. Refer to the [Battery Replacement and Disposal](#) section for information about replacing the battery.



**Note** Battery life may drop dramatically in extreme temperatures.

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Typical extended-temperature battery life in storage at 55 °C	5.7 years
Typical extended-temperature battery life in storage at 85 °C	5.3 years

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## Power Requirements

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Voltage input range	9 VDC to 30 VDC
Reverse-voltage protection	30 VDC maximum
Maximum power input, with four C Series modules	18 W
Maximum power input, without C Series modules	14 W

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# Physical Characteristics

If you need to clean the cRIO-9065, wipe it with a dry towel.



**Tip** For two-dimensional drawings and three-dimensional models of the cRIO-9065, visit [ni.com/dimensions](https://ni.com/dimensions) and search by module number.

Weight (unloaded)	696 g (24.56 oz)
Dimensions (unloaded)	178.1 mm × 87.3 mm × 64.3 mm (7.01 in. × 3.44 in. × 2.63 in.)
Screw-terminal wiring	
Gauge	0.2 mm <sup>2</sup> to 2.1 mm <sup>2</sup> (24 AWG to 14 AWG) copper conductor wire
Wire strip length	6 mm (0.24 in.) of insulation stripped from the end
Temperature rating	85 °C
Torque for screw terminals	0.20 N · m to 0.25 N · m (1.8 lb · in. to 2.2 lb · in.)
Wires per screw terminal	One wire per screw terminal
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.3 N · m to 0.4 N · m (2.7 lb · in. to 3.5 lb · in.)

## Safety Voltages

Connect only voltages that are within the following limits:

V terminal to C terminal	30 VDC max, Measurement Category I
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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.



**Caution** Do not connect the cRIO-9065 to signals or use for measurements within Measurement Categories II, III, or IV.



**Note** Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

## Safety and Hazardous Locations Standards

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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

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This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



**Note** In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.



**Note** Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



**Note** For EMC declarations and certifications, and additional information, refer to the [Online Product Certification](#) section.

# CE Compliance

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](https://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## 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

## Environmental

Temperature (IEC 60068-2-1 and IEC 60068-2-2)

Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C



**Caution** Failure to follow the mounting instructions in the user manual can cause temperature derating. Visit [ni.com/info](https://ni.com/info) and enter Info Code `criomounting` for more information about mounting configurations and temperature derating.

Ingress protection	IP40
Operating humidity (IEC 60068-2-56)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5% RH to 95% RH, noncondensing
Pollution Degree (IEC 60664)	2
Maximum altitude	5,000 m

Indoor use only.<sup>4</sup>

# Shock and Vibration

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To meet these specifications, you must mount the cRIO-9065 system directly on a flat, rigid surface as described in the user manual, affix ferrules to the ends of the terminal wires, install an SD card cover (SD Door Kit, 783660-01), and use retention accessories for the USB host ports (NI Industrial USB Extender Cable, 152166-xx), USB device port (NI Locking USB Cable, 157788-01), and mini DisplayPort connector (NI Retention Accessory for Mini DisplayPort, 156866-01). All cabling should be strain-relieved near input connectors. Take care to not directionally bias cable connectors within input connectors when applying strain relief.

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## Operating vibration

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Random (IEC 60068-2-64)	5 g <sub>rms</sub> , 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

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# Environmental Management

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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](http://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](http://ni.com/environment/weee).

## Battery Replacement and Disposal



**Battery Directive** This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and

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<sup>4</sup> Use NI 9917 and NI 9918 industrial enclosures to protect the device in harsh, dirty, or wet environments.



Accumulators and Waste Batteries and Accumulators, visit [ni.com/environment/batterydirective](http://ni.com/environment/batterydirective).

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