
cRIO-9034

Specifications

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cRIO-9034 Specifications

This document lists the specifications for the National Instruments cRIO-9034. The following specifications are typical for the -20 °C to 55 °C operating temperature range unless otherwise noted.



Caution Do not operate the cRIO-9034 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

| | |
|-----------------|------------------|
| CPU | Intel Atom E3845 |
| Number of cores | 4 |
| CPU frequency | 1.91 GHz |
| On-die L2 cache | 2 MB (shared) |

Operating System



Note For minimum software support information, visit ni.com/info and enter the Info Code swsupport.

| | |
|------------------------------|-----------------------------|
| Supported operating system | NI Linux Real-Time (64-bit) |
| Software requirements | |
| Application software | |

| | |
|--|--|
| LabVIEW | LabVIEW 2014 or later, LabVIEW Real-Time Module 2014 or later, LabVIEW FPGA Module 2014 or later [1] , |
| C/C++ Development Tools for NI Linux Real-Time [2] | Eclipse Edition 2014 or later |
| Driver software | NI CompactRIO Device Drivers August 2014 or later |

Network/Ethernet Port

| | |
|--------------------------|--|
| Number of ports | 2 |
| Network interface | 10Base-T, 100Base-TX, and 1000Base-T Ethernet |
| Compatibility | IEEE 802.3 |
| Communication rates | 10 Mbit/s, 100 Mbit/s, 1000 Mbit/s/auto-negotiated |
| Maximum cabling distance | 100 m/segment |

RS-232 Serial Port

| | |
|-------------------|------------------------|
| Maximum baud rate | 115,200 bps |
| Data bits | 5, 6, 7, 8 |
| Stop bits | 1, 2 |
| Parity | Odd, even, mark, space |

| | |
|----------------------------|----------------------------|
| Flow control | RTS/CTS, XON/XOFF, DTR/DSR |
| RI wake maximum low level | 0.8 V |
| RI wake minimum high level | 2.4 V |
| RI overvoltage tolerance | ± 24 V |

RS-485/422 (DTE) Serial Port

| | |
|-------------------|---|
| Maximum baud rate | 115,200 bps |
| Data bits | 5, 6, 7, 8 |
| Stop bits | 1, 2 |
| Parity | Odd, even, mark, space |
| Flow control | XON/XOFF |
| Wire mode | 4-wire, 2-wire, 2-wire auto |
| Isolation voltage | 60 VDC continuous, port to earth ground |



Note The RS-485 serial port ground and shield are not connected to chassis ground. This isolation is intended to prevent ground loops and does not meet UL ratings for safety isolation.

| | |
|-------------------|--|
| Cable requirement | Unshielded, 30 m maximum length (limited by EMC/surge) |
|-------------------|--|



Note RS-485 is capable of 1.2 km (4,000 ft) length without surge limitation.

USB Ports

Number of ports

| | |
|--------------|-------------------------|
| Device ports | 1 standard B connector |
| Host ports | 2 standard A connectors |



Note The USB device port is intended for use in device configuration, application deployment, debugging, and maintenance.

| | |
|----------------------------------|-------------------|
| USB interface | USB 2.0, Hi-Speed |
| Maximum data rate | 480 Mb/s per port |
| Maximum current (USB host ports) | 1 A (aggregate) |

Mini DisplayPort

| | |
|--------------------|----------------------|
| Maximum resolution | 2560 × 1600 at 60 Hz |
|--------------------|----------------------|

SD Card Slot

| | |
|-----------------|-----------------------|
| SD card support | SD and SDHC standards |
|-----------------|-----------------------|

Memory

Nonvolatile^[3]

| | |
|------------------------------|-------------|
| SD removable (user supplied) | Up to 32 GB |
| Solid-state drive | 16 GB |



Note Visit ni.com/info and enter the Info Code ssdbp for information about the life span of the nonvolatile memory and about best practices for using nonvolatile memory.

Volatile

Processor memory

| | |
|-------------------------------|------------|
| Density | 2 GB |
| Type | DDR3L |
| Maximum theoretical data rate | 10.67 GB/s |

FPGA memory

| | |
|-------------------------------|----------|
| Density | 128 MB |
| Type | DDR3 |
| Maximum theoretical data rate | 1.6 GB/s |

Data throughput

System memory to SD removable storage^[4] 10 MB/s

| | |
|-------------------------------|--|
| Module slots to system memory | 20 MB/s, application- and system-dependent |
|-------------------------------|--|

Reconfigurable FPGA

| | |
|--|------------------------|
| FPGA type | Xilinx Kintex-7 7K325T |
| Number of flip-flops | 407,600 |
| Number of 6-input LUTs | 203,800 |
| Number of DSP slices (18 × 25 multipliers) | 840 |
| Available block RAM | 16,020 kbits |
| Number of DMA channels | 16 |
| Number of logical interrupts | 32 |

Internal Real-Time Clock

| | |
|----------|--------------------------|
| Accuracy | 200 ppm; 40 ppm at 25 °C |
|----------|--------------------------|

CMOS Battery

| | |
|--|-----------|
| Typical battery life with power applied to power connector | 10 years |
| Typical battery life when stored at temperatures up to 25 °C | 7.8 years |
| Typical battery life when stored at temperatures up to 85 °C | 5.4 years |

Power Requirements



Note Some C Series modules have additional power requirements. For more information about C Series module power requirements, refer to the C Series module(s) documentation.

Voltage input range (measured at the cRIO-9034 power connector)

| | |
|----|-------------|
| V1 | 9 V to 30 V |
| V2 | 9 V to 30 V |

| | |
|---------------------------|------|
| Maximum power consumption | 40 W |
|---------------------------|------|



Note The maximum power consumption specification is based on a fully populated system running a high-stress application at elevated ambient temperature and with all C Series modules and USB devices consuming the maximum allowed power.

| | |
|-----------------------------------|------------------------|
| Typical standby power consumption | 3.4 W at 24 V DC input |
| Recommended power supply | 100 W, 24 V DC |

Typical leakage current from secondary power input (V2) while system is powered from primary power input (V1)

| | |
|---------|---------|
| At 9 V | 0.4 mA |
| At 30 V | 1.93 mA |



Notice Do not connect V2 to a DC mains supply or to any supply that requires a connecting cable longer than 3 m (10 ft). A DC mains supply

is a local DC electricity supply network in the infrastructure of a site or building.

EMC ratings for inputs as described in IEC 61000

V1 Short lines, long lines, and DC distributed networks

V2 Short lines only

| | |
|-----------------------|--|
| Power input connector | 4-position, 3.5 mm pitch, pluggable screw terminal with screw locks, Sauro CTF04BV8-AN000A |
|-----------------------|--|

Physical Characteristics



Tip For two-dimensional drawings and three-dimensional models of the cRIO-9034, visit ni.com/dimensions and search by module number.

| | |
|-----------------------|--|
| Weight (unloaded) | 1,800 g (3 lbs, 15 oz) |
| Dimensions (unloaded) | 219.5 mm × 88.1 mm × 121.2 mm (8.64 in. × 3.47 in. × 4.77 in.) |

Screw-terminal wiring

| | |
|----------------------------|---|
| Gauge | 0.5 mm ² to 2.1 mm ² (20 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 | 0.20 N · m to 0.25 N · m (1.8 lb · in. to 2.2 lb · in.) |

Safety Voltages

Connect only voltages that are below these limits.

| | |
|------------------------------|---|
| V1 terminal to C terminal | 30 V DC maximum, Measurement Category I |
| V2 terminal to C terminal | 30 V DC maximum, Measurement Category I |
| Chassis ground to C terminal | 30 V DC maximum, Measurement Category I |

Environmental

Temperature

| | |
|-----------|-----------------|
| Operating | -20 °C to 55 °C |
| Storage | -40 °C to 85 °C |

Humidity

| | |
|-----------|---------------------------------|
| Operating | 10% RH to 90% RH, noncondensing |
| Storage | 5% RH to 95% RH, noncondensing |

| | |
|--------------------|------|
| Ingress protection | IP20 |
| Pollution Degree | 2 |

| | |
|----------------------------|------------------------------|
| Maximum altitude | 5,000 m |
| Shock and Vibration | |
| Operating vibration | 5 Hz to 500 Hz, 0.3 g RMS |
| Non-operating vibration | 5 Hz to 500 Hz, 2.4 g RMS |
| Operating shock | 30 g, half-sine, 11 ms pulse |

To meet the shock and vibration specifications, you must mount the cRIO-9034 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.

Hazardous Locations

| | |
|---|---|
| U.S. (UL) | Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4 Gc |
| Canada (C-UL) | Class I, Division 2, Groups A, B, C, D, T4; Ex nA IIC T4 Gc |
| Europe (ATEX) and International (IECEx) | Ex nA IIC T4 Gc DEMKO 12 ATEX 1202658X IECEx UL 14.0089X |

Shock and Vibration

To meet these specifications, you must mount the cRIO-9034 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.

| Operating vibration | |
|---------------------|--|
| Random | 5 g RMS, 10 Hz to 500 Hz |
| Sinusoidal | 5 g, 10 Hz to 500 Hz |
| Operating shock | 30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations |

Safety Compliance 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 C22.2 No. 61010-1
- EN 60079-0, EN 60079-7
- IEC 60079-0, IEC 60079-7
- UL 60079-0, UL 60079-7
- CSA C22.2 No. 60079-0, CSA C22.2 No. 60079-7



Note For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

Electromagnetic Compatibility

CE Compliance

- 2014/34/EU; Potentially Explosive Atmospheres (ATEX)

Product Certifications and Declarations


Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

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 **Engineering a Healthy Planet** 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.

EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—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.

Battery Replacement and Disposal

-  **Battery Directive**—This product contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized NI service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit ni.com/environment/batterydirective.

电子信息产品污染控制管理办法（中国 RoHS）

-  **中国 RoHS**—NI 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 NI 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.)

NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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¹ LabVIEW FPGA Module is not required when using Scan Interface mode. To program the user-accessible FPGA on the cRIO-9034, LabVIEW FPGA Module is required.

² C/C++ Development Tools for NI Linux Real-Time is an optional interface for C/C++ programming of the cRIO-9034 processor. Visit ni.com/info and enter Info Code RIOCdev for more information about the C/C++ Development Tools for NI Linux Real-Time.

³ 1 MB is equal to 1 million bytes. 1 GB is equal to 1 billion bytes. The actual formatted capacity might be less.

⁴ Consult the manufacturer specifications of your SD removable storage.