
NI-7932

Specifications

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NI-7932R Specifications

This document lists the specifications for the NI-7932R. Specifications are subject to change without notice. For the most recent device specifications, refer to ni.com/manuals. Refer to your adapter module documentation for the adapter module specifications.



Note Using the NI-7932R in a manner not described in this document might impair the protection the NI-7932R provides.



Note Typical values are representative of an average unit operating at room temperature. These specifications are typical at 25 °C unless otherwise noted.

FlexRIO Documentation

Table 1. FlexRIO Documentation Locations and Descriptions

Document	Location	Description
Getting started guide for your Controller for FlexRIO	Available from the Start menu and at ni.com/manuals .	Contains installation instructions for your FlexRIO system.
Specifications document for your Controller for FlexRIO	Available from the Start menu and at ni.com/manuals .	Contains specifications for your Controller for FlexRIO.
Getting started guide for your adapter module	Available from the Start menu and at ni.com/manuals .	Contains signal information, examples, and CLIP details for your adapter module.
Specifications document for your adapter module	Available from the Start menu and at ni.com/manuals .	Contains specifications for your adapter module.
LabVIEW FPGA Module Help	Embedded in LabVIEW Help and at ni.com/manuals .	Contains information about the basic functionality of the LabVIEW FPGA Module.
Real-Time Module Help	Embedded in LabVIEW Help	Contains information about

Document	Location	Description
	and at ni.com/manuals .	real-time programming concepts, step-by-step instructions for using LabVIEW with the Real-Time Module, reference information about Real-Time Module VIs and functions, and information about LabVIEW features on real-time operating systems.
<i>FlexRIO Help</i>	Available from the Start menu and at ni.com/manuals .	Contains information about the FPGA module front panel connectors and I/O, controller for FlexRIO front panel connectors and I/O, programming instructions, and adapter module component-level IP (CLIP).
LabVIEW Examples	Available in NI Example Finder. In LabVIEW, click Help » Find Examples » Hardware Input and Output » FlexRIO .	Contains examples of how to run FPGA VIs and Host VIs on your device.
IPNet	Located at ni.com/ipnet .	Contains LabVIEW FPGA functions and intellectual property to share.
FlexRIO product page	Located at ni.com/flexrio .	Contains product information and data sheets for FlexRIO devices.

Processor

Type	Xilinx Zynq-7020, XC7Z020 All Programmable SoC, CLG484
Architecture	ARM Cortex-A9

Speed	667 MHz
Cores	2
Real-time clock accuracy	5 ppm
Operating system	NI Linux Real-Time (32-bit)
Nonvolatile memory	512 MB ^[1] , SLC NAND Flash
Volatile memory (DRAM)	512 MB, DDR3
Flash reboot endurance	100,000 cycles ^[2]

For information about the life span of the nonvolatile memory and about best practices for using nonvolatile memory, visit ni.com/info and enter the Info Code SSDBP.

CMOS Battery

Typical battery life with power applied to power connector	10 years
Typical battery life in storage up to 70 °C	10 years

Internal Reference Clock

General Characteristics

Clock distribution part number	AD9511 ^[3] ; clock distribution
Oscillator type	VCXO
Oscillator model	Epson Toyocom TCO-2121U2
Frequency	100 MHz ^[4]
Frequency pull range	± 100 ppm

Typical Specifications

Frequency stability	
Temperature	±30 ppm over the operating temperature range
Aging	±5 ppm per year

Network/Ethernet Port

Number of ports	1
Network interface	10Base-T, 100Base-TX, and 1000Base-T Ethernet

Compatibility	IEEE 802.3
Communication rates	10 Mbps, 100 Mbps, 1000 Mbps auto-negotiated, half/full-duplex
Maximum cabling distance	100 m/segment

USB Ports

Number of ports	
USB device port	1 standard micro-B connector
USB host port	1 standard A connector
USB interface	USB 2.0, Hi-Speed
Maximum data rate	480 Mb/s per port
Maximum current (USB Host Port)	1 A

SD Card Slot

Form factor	MicroSD
SD card support	SD and SDHC standards

Non-volatile memory ^[5]	Up to 32 GB ^[6]
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REF IN

Number of channels	1, single-ended
Connector type	SMA
Frequency	10 MHz
Input impedance	50 Ω
Input coupling	AC
Input voltage range	0.75 V _{pk-pk} to 5.2 V _{pk-pk}
Absolute maximum voltage	± 8.0 VDC, 8.0 V _{pk-pk} AC
Duty cycle	40% to 60%

TRIG General Characteristics

Number of channels	1, single-ended
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Connector type	SMA
Coupling	DC
Impedance	
Input	10 k Ω
Output	50 Ω
Logic level	3.3V CMOS
Voltage	
V_{IH_MIN}	2 V
V_{IL_MAX}	0.8 V
V_{OH_MIN} (unloaded)	3.1 V
V_{OL_MAX} (unloaded)	0.2 V
Absolute maximum voltage	± 20 VDC, +21 dBm (7.1 V _{pk-pk})
Current	
I_{OH_MAX}	12 mA

I_{OL_MAX}	-12 mA
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High Speed Serial Ports

Data rate	10.3125 Gbps, 6.25 Gbps, 3.125 Gbps
Connector type	SFP+
Number of TX channels	2
Number of RX channels	2
Supported high speed cable type ^[7]	Electrical/optical
Optical cable power	3.3 V \pm 5%, 500 mA per port, characteristic



Note For detailed FPGA and high speed serial port specifications, refer to Xilinx documentation.

Non-volatile Storage

For information about the life span of the nonvolatile memory and about best practices for using nonvolatile memory, visit ni.com/info and enter the Info Code SSDBP.

Non-volatile memory

SD removable (user supplied)	Up to 32 GB ^[8]
System memory	512 MB

Reconfigurable FPGA

FPGA	Kintex-7 XC7K325T
LUTs	203,800
DSP48 Slices (25 × 18 multiplier)	840
Embedded Block RAM (kbits)	16,020
Default timebase	40 MHz
Timebase accuracy	±100 ppm, 250 ps peak-to-peak jitter
Data transfers	DMA, interrupts, programmed I/O
Number of DMA channels	16

For detailed FPGA specifications, refer to Xilinx documentation.

FPGA Digital Input/Output

Number of general-purpose channels	136, configurable as 136 single-ended, 68 differential, or a combination of both ^[9]	
Channels per bank		
Bank 0/Bank 1	48	
Bank 2	40	
Compatibility	Configured through the FPGA and based on the attached adapter module; 1.2 V, 1.5 V, 1.8 V, 2.5 V, and 3.3 V I/O standards (refer to xilinx.com).	
Protection	Refer to xilinx.com .	
Current	Refer to xilinx.com .	
Maximum I/O data rates		
Single-ended	400 Mb/s	
Differential	1 Gb/s for LVDS	
Multi-region clock inputs	6	
Single-region clock inputs	5	

Connection resources	SMA connector (TRIGGER and REF CLK)
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FPGA-Accessible DRAM

Memory size	2 GB
Theoretical maximum data rate	10.5 GB/s

Power Requirements

The NI-7932R requires a power supply connected to the power connector.



Caution You must use either the recommended power supply, or another UL listed ITE power supply with the NI-7932R.



Caution Exceeding the power limits may cause unpredictable behavior by the NI-7932R.

Voltage input range	9 V to 30 V (measured at the NI-7932R power connector)
Maximum power consumption ^[10]	60 W
Typical standby power consumption	11.4 W
Recommended power supply	>75 W, 12 VDC

EMC ratings for power input as described in IEC 61000		Short lines, long lines, and DC distributed networks
Power input connector		
Power receptacle	Weidmuller OMNIMATE Signal, S2C-SMT 3.50/04/90LF 1.8AU BK BX, part number 1993840000	
Power plug	Weidmuller OMNIMATE Signal, B2CF 3.50/04/180F AU BK BX, part number 1993830000	

Physical

Dimensions (not including connectors)	23.4 cm × 13.1 cm × 4.4 cm (9.21 in. × 5.14 in. × 1.73 in.)
Weight	1,170 g (41.27 oz.)

Safety Voltages

Connect only voltages that are below these limits.

Positive terminal to negative terminal	30 VDC maximum, Measurement Category I
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Note Measurement Categories CAT I and CAT O (Other) are equivalent. The input circuits are not intended for direct connection to the MAINS building installations of Categories CAT II, CAT III, or CAT IV.



Caution You can impair the protection provided by the NI-7932R if you use

it in a manner not described in this document.

Maximum Working Voltage at the FlexRIO Adapter Module Connector



Note Maximum working voltage refers to the signal voltage plus the common-mode voltage between the NI-7932R and the adapter module.

Channel-to-earth	0 V to 3.3 V, Measurement Category I
Channel-to-channel	0 V to 3.3 V, Measurement Category I



Caution Do not use this device for connecting to signals in Measurement Categories II, III, or IV.

Environment

Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Operating Environment

Ambient temperature range	0 °C to 55 °C
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Relative humidity range	10% to 90%, noncondensing
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Storage Environment

Ambient temperature range	-40 °C to 71 °C
Relative humidity range	5% to 95%, noncondensing

Shock and Vibration

Operating shock	30 g peak, half-sine, 11 ms pulse
Random vibration	
Operating	5 Hz to 500 Hz, 0.3 grms
Nonoperating	5 Hz to 500 Hz, 2.4 grms

Compliance and Certifications

Safety Compliance 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



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

Electromagnetic Compatibility

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; Basic 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, certifications, and additional information, refer to the [Product Certifications and Declarations](#) section.

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.

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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