DEVICE SPECIFICATIONS

NI PXIe-7975R
NI FlexRIO™ FPGA Module for PXI Express

This document lists the specifications for the NI PXIe-7975R (NI 7975R) FPGA module. 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  Typical values are representative of an average unit operating at room temperature. These specifications are typical at 25 °C unless otherwise noted.

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How to Use Your NI FlexRIO Documentation Set

Figure 1. How to Use Your NI FlexRIO Documentation Set

Table 1. NI FlexRIO Documentation Locations and Descriptions

<table>
<thead>
<tr>
<th>Document</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting started guide for your FPGA module</td>
<td>Available from the Start menu</td>
<td>Contains installation instructions for your NI FlexRIO system.</td>
</tr>
<tr>
<td></td>
<td>and at <a href="http://ni.com/manuals">ni.com/manuals</a>.</td>
<td></td>
</tr>
<tr>
<td>Specifications document for your FPGA module</td>
<td>Available from the Start menu</td>
<td>Contains specifications for your NI 7975R module.</td>
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<td></td>
<td>and at <a href="http://ni.com/manuals">ni.com/manuals</a>.</td>
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<tr>
<td>Getting started guide for your adapter module</td>
<td>Available from the Start menu</td>
<td>Contains signal information, examples, and CLIP details for your adapter module.</td>
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<td>and at <a href="http://ni.com/manuals">ni.com/manuals</a>.</td>
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<tr>
<td><em>NI FlexRIO Help</em></td>
<td>Available from the Start menu</td>
<td>Contains information about the FPGA module, adapter module, and CLIP configuration information.</td>
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<td></td>
<td>and at ni.com/manuals.</td>
<td></td>
</tr>
<tr>
<td>LabVIEW Examples</td>
<td>Available in NI Example Finder.</td>
<td>Contains examples of how to run FPGA VIs and Host VIs on your device.</td>
</tr>
<tr>
<td></td>
<td>In LabVIEW, click Help»Find Examples»Hardware Input and Output»FlexRIO.</td>
<td></td>
</tr>
<tr>
<td>IPNet</td>
<td>ni.com/ipnet</td>
<td>Contains LabVIEW FPGA functions and intellectual property to share.</td>
</tr>
<tr>
<td>NI FlexRIO product page</td>
<td>ni.com/flexrio</td>
<td>Contains product information and data sheets for NI FlexRIO devices.</td>
</tr>
</tbody>
</table>

**Table 1. NI FlexRIO Documentation Locations and Descriptions (Continued)**

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**Reconfigurable FPGA**

FPGA.................................................................Kintex-7 XC7K410T
LUTs...............................................................254,200
DSP48 Slices (25 × 18 Multiplier)................1,540
Embedded Block RAM (kbits)..........................28,620
Default timebase..........................................40 MHz
Timebase reference sources.........................PXI Express 100 MHz (PXIe_CLK100)
Timebase accuracy........................................±100 ppm, 250 ps peak-to-peak jitter
Data transfers..............................................DMA, interrupts, programmed I/O
Number of DMA channels...............................32
FPGA Digital Input/Output

Number of general-purpose channels..................136, configurable as 136 single-ended, 68 differential, or a combination of both

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..............................PXI triggers, PXI_CLK10, PXI star trigger, PXIe_DStarA, PXIe_DStarB, PXIe_DStarC, and PXIe_Sync100

Onboard DRAM

Memory size.............................................2 GB single bank

Maximum theoretical data rate..................10.5 GB/s

Bus Interface

Form factor..............................................x4 PXI Express, specification v2.1 compliant
Slot compatibility....................................x4, x8, and x16 PXI Express or PXI Express hybrid slots

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1 The 136 channels span across three FPGA banks.
Maximum Power Requirements

**Note**  Power requirements are dependent on the adapter module and contents of the LabVIEW FPGA VI used in your application.

+3.3 VDC (±5%)........................................................................3 A
+12 V.........................................................................................3 A

Physical

Dimensions (not including connectors)...........................................18.8 cm × 12.9 cm (7.4 in. × 5.1 in.)
Weight..............................................................................................190 g (6.7 oz)

NI FlexRIO FPGA Module Signals

The following figure shows the available signals on the NI FlexRIO FPGA module. Refer to your adapter module specifications for your adapter module pinout.
Figure 2. NI FlexRIO FPGA Module Front Panel Connector Pin Assignment and Locations

**Note** Pins S72 and S146 are shorted together on the NI 7975R.

**Maximum Working Voltage**

**Note** Maximum working voltage refers to the signal voltage plus the common-mode voltage.

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 (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

Relative humidity range ....................................... 10% to 90%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Storage Environment

Ambient temperature range ................................. -20 °C to 70 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)

Relative humidity range ....................................... 5% to 95%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Shock and Vibration

Operating shock ..................................................... 30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC-60068-2-27. Meets MIL-PRF-28800F Class 2 limits.)

Random vibration

Operating .............................................................. 5 Hz to 500 Hz, 0.3 g\text{g}_{\text{rms}}

Nonoperating ....................................................... 5 Hz to 500 Hz, 2.4 g\text{g}_{\text{rms}} (Tested in accordance with IEC-60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)
Compliance and Certifications

Safety
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

**Note** For UL and other safety certifications, refer to the product label or the Online Product Certification 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 Online Product Certification section.

CE Compliance
This product meets the essential requirements of applicable European Directives, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)
Online Product Certification

To obtain product certifications and the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

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 Minimize Our Environmental Impact 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.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）

中国客户 National Instruments 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 National Instruments 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.)

Worldwide Support and Services

The National Instruments website is your complete resource for technical support. At ni.com/support, you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit ni.com/services for NI Factory Installation Services, repairs, extended warranty, and other services.

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

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer’s declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You
can obtain the DoC for your product by visiting \url{ni.com/certification}. If your product supports calibration, you can obtain the calibration certificate for your product at \url{ni.com/calibration}.

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