

NI FlexRIO FPGA Module Specifications

This document lists the specifications of the National Instruments FlexRIO FPGA modules (NI PXI-7951R, NI PXI-7952R, NI PXI-7953R, NI PXI-7954R, NI PXIe-7961R, NI PXIe-7962R, and NI PXIe-7965R) devices. Typical values are representative of an average unit operating at room temperature. These specifications are typical at 25 °C unless otherwise noted.

Reconfigurable FPGA

Device	FPGA	LUTs/Flip-Flops	DSP48 Slices (25 × 18 Multiplier)	Embedded Block RAM (kbits)
NI PXI-7951R	Virtex-5 LX30	19,200	32	1,152
NI PXI-7952R	Virtex-5 LX50	28,800	48	1,728
NI PXI-7953R	Virtex-5 LX85	51,840	48	3,456
NI PXI-7954R	Virtex-5 LX110	69,120	64	4,608
NI PXIe-7961R	Virtex-5 SX50T	32,640	288	4,752
NI PXIe-7962R	Virtex-5 SX50T	32,640	288	4,752
NI PXIe-7965R	Virtex-5 SX95T	58,880	640	8,784

Default timebase 40 MHz

Timebase reference sources

NI PXI-795xR..... PXI 10 MHz

NI PXIe-796xR..... PXIe 100 MHz

Timebase accuracy

NI PXI-795xR..... ±100 ppm, 250 ps
peak-to-peak jitter

NI PXIe-796xR..... ±50 ppm, 250 ps
peak-to-peak jitter

Data transfers DMA, interrupts,
programmed I/O

Number of DMA channels

NI PXI-795xR..... 3

NI PXIe-796xR..... 16

FPGA Digital Input/Output

Number of general-purpose channels	132, configurable as 132 single-ended, 66 differential, or a combination of both ¹
Channels per bank	
Bank 0/Bank 2	32, single-ended per bank
Bank 1/Bank 3	34, single-ended per bank
Compatibility	Configured via FPGA, 1.2 V to 3.3 V I/O standards (refer to www.xilinx.com)
Protection	Refer to www.xilinx.com
Current	Refer to www.xilinx.com
Maximum I/O data rates	
Single-ended	400 Mb/s for LVDCI25
Differential	1 Gb/s for LVDS
Global clock inputs	1 LVTTTL, 1 LVDS
Connection resources	
NI PXI-795xR	PXI triggers, Clk10, and PXI star trigger
NI PXIe-796xR	PXI triggers, Clk10, PXI star trigger, DStarA, DStarB, DStarC, and Sync100

¹ The 132 channels span across four FPGA banks. Refer to the [Device Signals](#) section for more information.

Device Signals

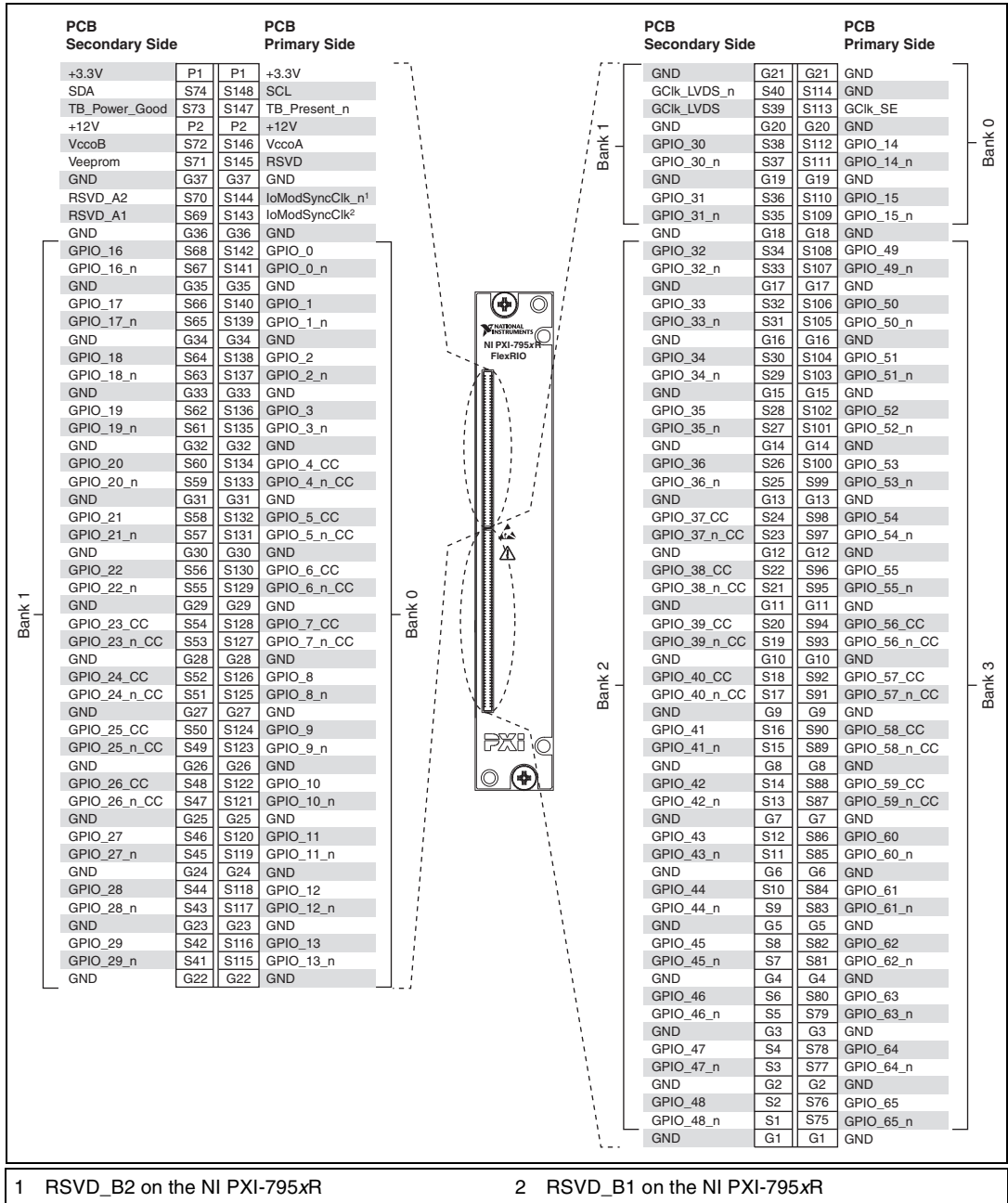


Figure 1. NI FlexRIO FPGA Module Front Connector Pin Assignments and Locations

Onboard DRAM¹

Memory size

NI PXI-795xR	2 banks; 64 MB per bank
NI PXIe-796xR	2 banks; 256 MB per bank

Maximum theoretical data rate

NI PXI-795xR	800 MB/s per bank
NI PXIe-796xR	1.6 GB/s per bank

Bus Interface

PXI.....Master, slave

PXI Express

Form factor	x4 PXI Express, specification v1.0 compliant
Slot compatibility.....	x4, x8, and x16 PXI Express or PXI Express hybrid slots

Maximum Power Requirement²

NI PXI-795xR

+5 VDC ($\pm 5\%$).....	2 A
+3.3 VDC ($\pm 5\%$).....	2 A
+12 V	0.5 A
-12 V	0 A

NI PXIe-796xR

+3.3 VDC ($\pm 5\%$).....	3 A
+12 V	2 A

Physical

Dimensions (not including connectors)

NI PXI-795xR	18.8 cm \times 12.9 cm (7.4 in. \times 5.1 in.)
NI PXIe-796xR	16.1 cm \times 10.8 cm (6.3 in. \times 4.3 in.)

Weight

NI PXI-795xR	190 g (6.7 oz)
NI PXIe-796xR	213 g (7.5 oz)

I/O connector.....High-density card edge

Maximum Working Voltage³

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 connection to signals in Measurement Categories II, III, or IV.

Environmental

This device is intended for indoor use only.

Operating environment 0 °C to 55 °C,
tested in accordance with
IEC-60068-2-1 and
IEC-60068-2-2.

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

Altitude 2,000 m at 25 °C ambient
temperature

Pollution Degree 2

Storage environment

Ambient temperature range -40 °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.



Note Clean the device with a soft, non-metallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

¹ The NI PXI-7951R/NI PXIe-7961R does not have onboard DRAM.

² Power requirements are dependent on the adapter module and contents of the LabVIEW FPGA VI used in your application.

³ Voltage ranges are dependent on the I/O standards available for your application. For more information on available I/O standards, refer to Xilinx documentation, available at www.xilinx.com.

Shock and Vibration

Operational shock 30 g peak, half-sine,
11 ms pulse,
tested in accordance with
IEC-60068-2-27. Test
profile developed in
accordance with
MIL-PRF-28800F.

Random vibration

Operating 5 Hz to 500 Hz, 0.3 g_{rms}
Nonoperating 5 Hz to 500 Hz, 2.4 g_{rms},
tested in accordance with
IEC-60068-2-64.
Nonoperating test profile
exceeds the requirements
of MIL-PRF-28800F,
Class 3.

Safety

This product meets the requirements of the following standards of safety for electrical equipment 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 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.



Note EMC compliance evaluated with a wrapback adapter module and general purpose I/O (GPIO) signals configured to LVTTTL I/O standard, slew rate set to slow, and drive strength set to 6 mA. EMC compliance of other I/O standards, faster slew rates, and greater drive strength is not guaranteed.

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

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, search by model number or product line, and click the appropriate link in the Certification column.

Environmental Management

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* 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）



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