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SPECIFICATIONS

NI PXIe-7821R

R Series for PXI Express Digital RIO with Kintex-7 160T FPGA

Français	Deutsch	日本語	한국어	简体中文
ni.com/manuals				

This document contains the specifications for the NI PXIe-7821R. Specifications are typical at 25 °C unless otherwise noted.

Caution Using the NI PXIe-7821R in a manner not described in this document may impair the protection the NI PXIe-7821R provides.

Digital I/O

Number of connectors.....4

Number of channels per connector.....32

Maximum frequency.....80 MHz

Compatibility.....LVTTL, LVCMOS

Logic family.....Software-selectable

Default software setting.....3.3 V

Table 1. Digital Input Logic Levels

Logic Family	Input Low Voltage (V_{IL}) Max	Input High Voltage (V_{IH}) Min
1.2 V	0.42 V	0.84 V
1.5 V	0.51 V	1.01 V
1.8 V	0.61 V	1.21 V

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Table 1. Digital Input Logic Levels (Continued)

Logic Family	Input Low Voltage (V_{IL}) Max	Input High Voltage (V_{IH}) Min
2.5 V	0.70 V	1.60 V
3.3 V	0.80 V	2.00 V

Minimum input.....-0.3 V

Maximum input.....3.6 V

Input leakage current.....±15 µA max

Input impedance.....50 kΩ typ, pull-down

Table 2. Digital Output Logic Levels

Logic Family	Current	Output Low Voltage (V_{OL}) Max	Output High Voltage (V_{OH}) Min
1.2 V	100 µA	0.20 V	1.00 V
1.5 V	100 µA	0.20 V	1.25 V
1.8 V	100 µA	0.20 V	1.54 V
2.5 V	100 µA	0.20 V	2.22 V
3.3 V	100 µA	0.20 V	3.00 V
	4 mA	0.40 V	2.40 V

Maximum DC output current per channel

Source.....4.0 mA

Sink.....4.0 mA

Output impedance.....50 Ω

Power-on state.....Programmable, by line

Protection.....±20 V, single line[1]

Digital I/O voltage selection.....Programmable, per connector, and defined at compilation (not run-time configurable)

[1] NI recommends minimizing long-term over/under-voltage exposure to the Digital I/O. Prolonged DC voltage stresses that violate the maximum and minimum digital input voltage ratings may reduce device longevity. Over/under-voltage stresses are considered prolonged if the cumulative time in the abnormal condition exceeds 1 year.

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Direction control of digital I/O.....Per channel
channels

Minimum I/O pulse width.....6.25 ns

Minimum sampling period.....5 ns

External Clock

Direction.....Input into device

Maximum input leakage.....±15 µA

Characteristic impedance.....50 Ω

Power-on state.....Tristated

Minimum input.....-0.3 V

Maximum input.....3.6 V

Logic level.....Inherited from programmed digital voltage selection per connector

Maximum input frequency.....80 MHz

Reconfigurable FPGA

FPGA type.....Kintex-7 160T

Number of flip-flops.....202,800

Number of LUTs.....101,400

Embedded Block RAM.....11,700 kbits

Number of DSP48 slices.....600

Timebase.....10, 40, 80, 100, 120, 160, or 200 MHz

Default timebase.....40 MHz

Timebase reference source.....PXI Express 100 MHz (PXIe_CLK100)

Timebase accuracy.....±100 ppm, 250 ps peak-to-peak jitter

Data transfers.....DMA, interrupts, programmed I/O

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Onboard DRAM

Memory size.....1 Bank; 512 MB

Maximum theoretical data rate.....800 MB/s streaming

Synchronization Resources

Input/output source.....PXI_Trig<0..7>

Input source.....PXI_Star, PXIe_DStarA, PXIe_DStarB, PXI_Clk10, PXIe_Clk100, External Clock *x*

Output source.....PXIe_DStarC

Bus Interface

Form factor.....x4 PXI Express, specification v1.0 compliant

Slot compatibility.....x4, x8, and x16 PXI Express or PXI Express hybrid slots

Data transfers.....DMA, interrupts, programmed I/O

Number of DMA channels.....16

Maximum Power Requirements

Power requirements are dependent on the digital output loads and configuration of the LabVIEW FPGA VI used in your application.

+3.3 VDC (±5%).....3 A

+12 V.....2 A

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Physical Characteristics

Note If you need to clean the device, wipe it with a dry, clean towel.

Dimensions.....16 cm by 10 cm (6.3 in. by 3.9 in.)

Weight.....183 g (0.403 lb)

I/O connectors.....x4 68-pin female high-density VHDCI type

Environmental

Ambient Operating temperature.....0 °C to 55 °C
(IEC 60068-2-1, IEC 60068-2-2)

Ambient Storage temperature.....-40 °C to 71 °C
(IEC 60068-2-1, IEC 60068-2-2)

Operating humidity.....10% RH to 90% RH, noncondensing
(IEC 60068-2-56)

Storage humidity (IEC 60068-2-56).....5% RH to 95% RH, noncondensing

Pollution Degree.....2

Maximum altitude.....2,000 m at 25 °C

Indoor use only.

Shock and Vibration

Operational 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_{rms}
- Non-operating.....5 Hz to 500 Hz, 2.4 g_{rms} (Tested in accordance with IEC 60068-2-64. Meets MIL-PRF-28800F Class 3.)

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Safety Standards

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
- 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

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

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.

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.

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CE Compliance CE

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)

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.

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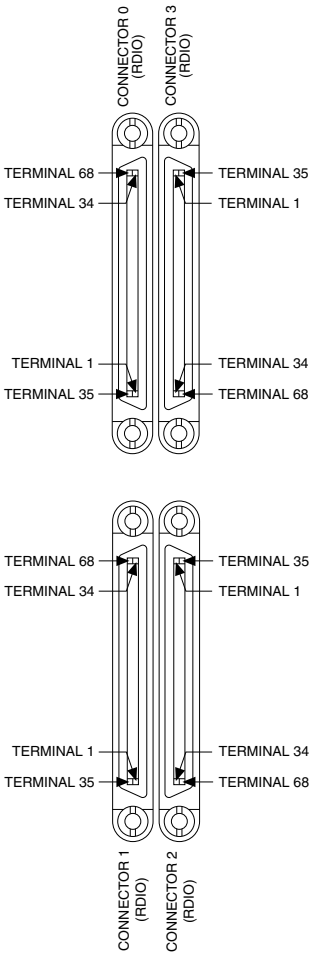
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NI PXIe-7821R Pinout

GND	68	34	GND
External Clock *x**	67	33	GND
GND	66	32	GND
DIO0	65	31	DIO1
GND	64	30	GND
DIO2	63	29	DIO3
GND	62	28	GND
DIO4	61	27	DIO5
GND	60	26	GND
DIO6	59	25	DIO7
GND	58	24	GND
DIO8	57	23	DIO9
GND	56	22	GND
DIO10	55	21	DIO11
GND	54	20	GND
DIO12	53	19	DIO13
GND	52	18	GND
DIO14	51	17	DIO15
GND	50	16	GND
DIO16	49	15	DIO17
GND	48	14	GND
DIO18	47	13	DIO19
GND	46	12	GND
DIO20	45	11	DIO21
GND	44	10	GND
DIO22	43	9	DIO23
GND	42	8	GND
DIO24	41	7	DIO25
GND	40	6	GND
DIO26	39	5	DIO27
GND	38	4	GND
DIO28	37	3	DIO29
GND	36	2	GND
DIO30	35	1	DIO31

* *x* is the connector number.
External Clock *x* is an input only.



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