PXIe-1095 Specifications

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Contents

PXIe-1095 Specifications

This document contains specifications for the PXIe-1095 chassis. Specifications are subject to change without notice.

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- PXIe-1095 User Manual
- Software and Driver Downloads
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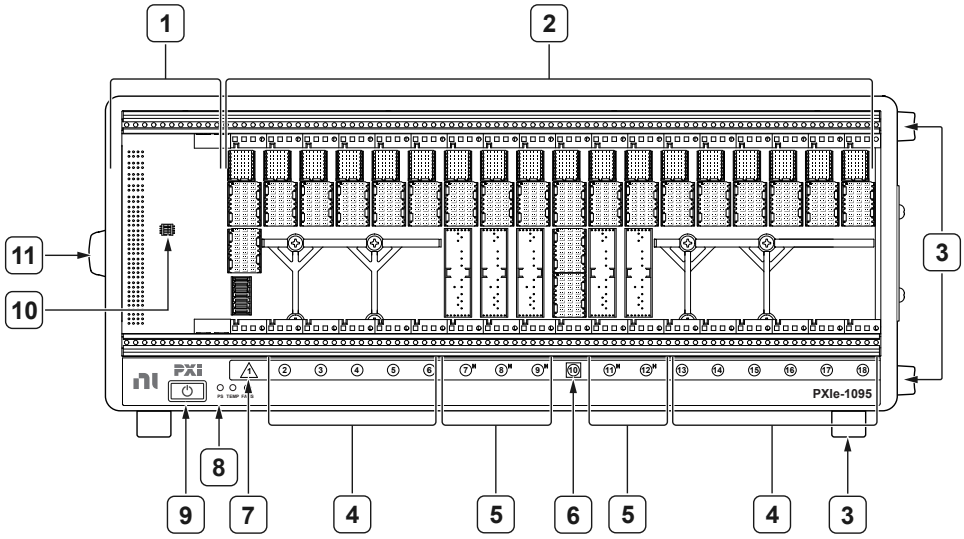
Chassis Components

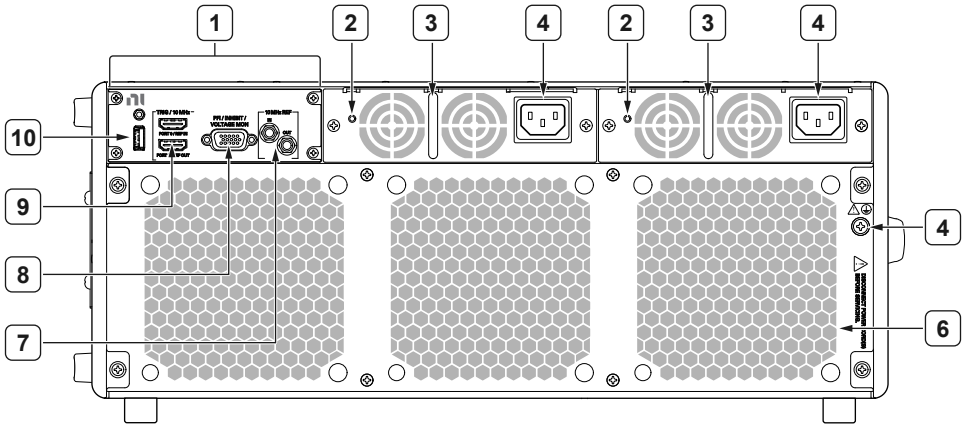
The following figures show key features of the PXIe-1095 chassis front and back panels.

Figure 1. Front View of the PXIe-1095



1. System Controller Expansion Slot
2. Backplane Connectors
3. Removable Feet
4. PXI Express Peripheral Slots (11x)
5. PXI Express Hybrid Peripheral Slots (5x)
6. PXI Express System Timing Slot
7. PXI Express System Controller Slot
8. Front Panel LEDs
9. Power Inhibit Switch
10. DIP Switch
11. Chassis Carry Handle

Figure 2. Rear View of the PXIe-1095



1. Timing and Synchronization Upgrade

2. Rear Panel Power Supply LED
3. Power Supply
4. Universal AC Input
5. Chassis Protective Earth Terminal
6. Fan Module
7. 10 MHz REF IN and OUT SMA Female Connectors
8. Remote Inhibit and Chassis Monitoring Port
9. High-Density Trigger Ports
10. USB 3.0 Port

Electrical

The following section provides information about the PXIe-1095 AC input and DC output.

AC Input

Input rating[1]	100 to 240 VAC, 50/60 Hz, 15 - 7.5 A, 100 to 120 VAC, 440 Hz, 15 A
Operating voltage range[2]	90 to 264 VAC
Nominal input frequency	50 Hz/60 Hz/400 Hz[3]
Operating	47 to 440 Hz

1. Care must be taken to not exceed the current rating of the branch circuit providing power to the chassis. For high power configurations with dual power supplies, the supplies may need to be powered by separate branch circuits.
2. The operating range is guaranteed by design.
3. 400 Hz operation only supported from 100 to 120 VAC.

frequency range[4]	
Efficiency	85% typical
Over-current protection	Internal fuse in line
Main power disconnect	The AC power cable provides main power disconnect. Do not position the equipment so that it is difficult to disconnect the power cord. The front-panel power switch causes the internal chassis power supply to provide DC power to the PXI Express backplane. With the Timing and Synchronization upgrade, you also can use the rear-panel 15-pin connector and inhibit mode switch to control the internal chassis power supply.

Caution High leakage current present when operating dual power supplies at 400 to 440 Hz. Connect the chassis to earth ground before connecting to AC power.

- The facility installation shall provide a means for connection to protective earth; ***and***
- Qualified personnel shall install a protective earthing conductor from the chassis protective earth terminal (# 8-32 SEMS screw) on the rear to the protective earth wire in the facility.

Protective Earth Terminal Wiring	
Grounding wire	2.1 mm^2 (14 AWG)

4. The operating range is guaranteed by design.

Ring lug	# 8
Protective earth terminal torque	1.13 N · m (10 lb · in.)

Caution Disconnect all power cords to completely remove power.

DC Output

DC output characteristics of the PXIe-1095.

Voltage Rail	Maximum Current, Single Power Supply	Maximum Current, Dual Power Supplies	Load Regulation	Maximum Ripple and Noise (20 MHz BW)
+5V_AUX	4.2 A	4.2 A	±5%	50 mVpp
+12 V	75 A	122 A	±5%	100 mVpp
+5 V	21.5 A	21.5 A	±5%	50 mVpp
+3.3 V	60 A	60 A	±5%	50 mVpp
-12 V	1.3 A	1.3 A	±5%	50 mVpp

Maximum total available power, PXIe-1095

Single AC/DC power supply (786300-01)	900 W
Dual AC/DC power supplies	1644 W

Table 1. Backplane Slot Current Capacity

Slot	+5 V	V (I/O)	+3.3 V	+12 V	-12 V	5 V_{AUX}
System Controller	15 A	—	15 A	30 A	—	3 A

Slot	+5 V	V (I/O)	+3.3 V	+12 V	-12 V	5 V_{AUX}
Slot						
System Timing Slot	—	—	9 A	6 A	—	1 A
PXI Express Peripheral Slot	—	—	9 A	6 A	—	1 A
Hybrid Peripheral Slot with PXI-5 Peripheral	—	—	9 A	6 A	—	1 A
Hybrid Peripheral Slot with PXI-1 Peripheral	6 A	5 A	6 A	1 A	1 A	—

Note Total System Controller Slot current should not exceed 45 A.

Note PCI V(I/O) pins in Hybrid Peripheral Slots are connected to +5 V.

Note The maximum power dissipated in a peripheral slot should not exceed 82 W.

Over-current protection	All outputs protected from short circuit and overload with automatic recovery
Over-voltage protection	+12 V, +5 V, and +3.3 V clamped at 20 to 30% above nominal output voltage
Power supply MTTR	Replacement in under 1 minute

Chassis Cooling

Module cooling	Forced air circulation (positive pressurization) through three 210 CFM fans
Module slot airflow direction	Bottom of module to top of module
Module intake	Rear of chassis
Module exhaust	Top of chassis
Slot cooling capacity	82 W
Secondary cooling	Forced air circulation (positive pressurization) through one 70 CFM fan
Side intake	Right side of chassis
Side exhaust	Left side of chassis
Power supply cooling	Forced air circulation through two integrated fans
Power supply intake	Rear of chassis
Power supply exhaust	Top of chassis

Timing and Synchronization upgrade intake	Right side of chassis
Timing and Synchronization upgrade exhaust	Top of chassis
Minimum chassis cooling clearances	
Above	44.45 mm (1.75 in.)
Rear	101.60 mm (4.00 in.)
Sides	44.45 mm (1.75 in.)

Environmental

Maximum altitude	4,600 m (15,000 ft.), 570 mbar (at 25 °C ambient, high fan mode)
Pollution Degree	2

Indoor use only.

Operating Environment

Ambient temperature range	
When all modules require ≤58 W cooling capacity per slot	0 °C to 55 °C (IEC 60068-2-1 and IEC 60068-2-2.)[5] Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.

When any module requires >58 W cooling capacity per slot	0 °C to 40 °C (IEC 60068-2-1 and IEC 60068-2-2.)[5] Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 4 high temperature limit.
Relative humidity range	10% to 90%, noncondensing (IEC 60068-2-78.)[5]

Storage Environment

Ambient temperature range	–40 °C to 71 °C (IEC-60068-2-1 and IEC-60068-2-2.)6[6] Meets MIL-PRF-28800F Class 3 limits.
Relative humidity range	5% to 95%, noncondensing (IEC-60068-2-78.)[6]

Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms pulse (IEC-60068-2-27.)[3] Meets MIL-PRF-28800F Class 2 limits.
Operational random vibration	5 to 500 Hz, 0.3 g_{rms}
Non-operating vibration	5 to 500 Hz, 2.4 g_{rms} (IEC 60068-2-64.)[3] Non-operating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.

5. This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.
6. This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.

Acoustic Emissions

Sound Pressure Level (at Operator Position)

(Tested in accordance with ISO 7779. Meets MIL-PRF-28800F requirements.)

38 W Profile	
Auto fan (up to 30 °C ambient)	37.7 dBA
High fan	56.6 dBA

58 W/82 W Profile	
Auto fan (up to 30 °C ambient)	52.1 dBA
High fan	66.2 dBA

Sound Power Level

38 W Profile	
Auto fan (up to 30 °C ambient)	50.1 dBA
High fan	67.8 dBA

58 W/82 W Profile	
Auto fan (up to 30 °C ambient)	63.8 dBA

High fan	78.0 dBA

Note The protection provided by the PXIe-1095 can be impaired if it is used in a manner not described in this document.

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.

EMC Standards

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 22: 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 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 and certifications, and additional information, refer to the Online Product Certification section.

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)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)
- 2014/53/EU; Radio Equipment Directive (RED)
- 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.

Backplane

Size	3U-sized; one system slot (with three system expansion slots) and 17 peripheral slots. Compliant with IEEE 1101.10 mechanical packaging. PXI Express Specification compliant. Accepts both PXI Express and CompactPCI (PICMG 2.0 R 3.0) 3U modules.

Backplane bare-board material	UL 94 V-0 Recognized
Backplane connectors	Conforms to IEC 917 and IEC 1076-4-101, UL 94 V-0 rated

System Synchronization Clocks

10 MHz System Reference Clock: PXI_CLK10

Maximum slot-to-slot skew	250 ps
Accuracy	±25 ppm max (guaranteed over the operating temperature range)
Accuracy with OCXO (Timing and Synchronization option)	±80 ppb max within 1 year of calibration adjustment within 0 °C to 55 °C operating temperature range (after 24 hours of operation); ±50 ppb/year long-term stability (after 72 hours of operation)
Maximum jitter	5 ps RMS phase-jitter (10 Hz–1 MHz range)
Duty-factor	45% to 55%
Unloaded signal swing	3.3 V ±0.3 V

Note For other specifications, refer to the ***PXI-1 Hardware Specification***.

100 MHz System Reference Clock: PXIe_CLK100 and PXIe_SYNC100

Maximum slot-to-slot skew	100 ps
Accuracy	±25 ppm max (guaranteed over the operating temperature range)
Accuracy with OCXO (Timing and Synchronization option)	±80 ppb max within 1 year of calibration adjustment within 0 °C to 55 °C operating temperature range (after 24 hours of operation); ±50 ppb/year long-term stability (after 72 hours of operation)
Maximum jitter	3 ps RMS phase-jitter (10 Hz to 12 kHz range), 2 ps RMS phase-jitter (12 kHz to 20 MHz range)
Duty-factor for PXIe_CLK100	45% to 55%
Absolute differential voltage (When terminated with a 50 Ω load to 1.30 V or Thévenin equivalent)	400 to 1000 mV

Note For other specifications, refer to the ***PXI-5 PXI Express Hardware Specification***

External 10 MHz Reference Out (Timing and Synchronization Option)

Accuracy	±5 ppb max vs temperature (guaranteed over the operating temperature range),

	±50 ppb/year aging
Maximum jitter	5 ps RMS phase-jitter (10 Hz–1 MHz range)
Output amplitude	1 Vpp ±20% square-wave into 50 Ω, 2 Vpp unloaded
Output impedance	50 Ω ±5 Ω

External Clock Source

Frequency	10 MHz ±25 ppm
Input amplitude	
External 10 MHz Reference IN (Timing and Synchronization option, rear panel SMA)	100 mVpp to 5 Vpp square-wave or sine-wave
System timing slot PXI_CLK10_IN	5 V or 3.3 V TTL signal
Maximum jitter introduced by backplane	1 ps RMS phase-jitter (10 Hz to 1 MHz range)
Rear panel SMA input impedance (Timing and Synchronization option)	50 Ω ±5 Ω

PXI Star Trigger

Maximum slot-to-slot skew	250 ps
Backplane characteristic impedance	65 Ω ±10%

For other specifications, refer to the ***PXI-1 Hardware Specification***.

PXI Differential Star Triggers

(PXIe-DSTARA, PXIe-DSTARB, PXIe-DSTARC)

Maximum slot-to-slot skew	150 ps
Maximum differential skew	25 ps
Backplane differential impedance	100 Ω ±10%

For other specifications, the PXIe-1095 complies with the ***PXI-5 PXI Express Hardware Specification***.

Remote Inhibit and Chassis Monitoring Connector (Timing and Synchronization Option)

Inhibit input signal	
Input voltage range	-0.5 V min to 5.5 V max
V_{IH}	2.0 V

V_{IL}	0.8 V
Input impedance	High-Z (>10 kΩ typical)

Note Internal 10 kΩ pull-up to an internal +3.3V_AUX rail.

Fault output signal	
Output voltage range	0 V to 3.3 V typical
V_{OH}	2.4 V min ($\|I_{OH}\|$ < 8 mA)
V_{OL}	0.4 V max ($\|I_{OL}\|$ < 8 mA)
Output impedance	65 Ω typical
PFI lines	
Input voltage range	-0.5 V min to 4.6 V max
V_{IH}	2.0 V
V_{IL}	0.8 V
Input impedance	High-Z (>10 kΩ typical)

Output voltage range	0 V to 3.3 V typical
V_{OH}	2.4 V min ($\|I_{OH}\|$ < 8 mA)
V_{OL}	0.4 V max ($\|I_{OL}\|$ < 8 mA)
Output impedance	65 Ω typical

Mechanical

Standard chassis dimensions	
Height	6.97 in. (177.1 mm)
Width	17.54 in. (445.5 mm)
Depth	18.25 in. (463.6 mm)

Weight	
Single power supply	35.2 lb (16.0 kg)
Dual power supplies	39.0 lb (17.7 kg)

Chassis materials	Sheet Aluminum (5052-H32, 5754-H22), Extruded Aluminum (6063-T5, 6060-T6), Plate Aluminum (6063-T5, 6061-T6), Cold Rolled Steel, Cold Rolled Stainless Steel, Sheet

	Copper (C110), Santoprene, Urethane Foam, PC-ABS, Nylon, Polycarbonate, Polyethylene, Polyamide (FR-106)
Finish	Conductive Clear Iridite on Aluminum, Electroplated Nickel on Cold Rolled Steel, Electroplated Zinc on Cold Rolled Steel, Electroplated Nickel on Copper

The following figures show the PXIe-1095 chassis dimensions. The holes shown are for the installation of the optional rack mount kits.

Figure 3. PXIe-1095 Chassis Dimensions (Front and Side)

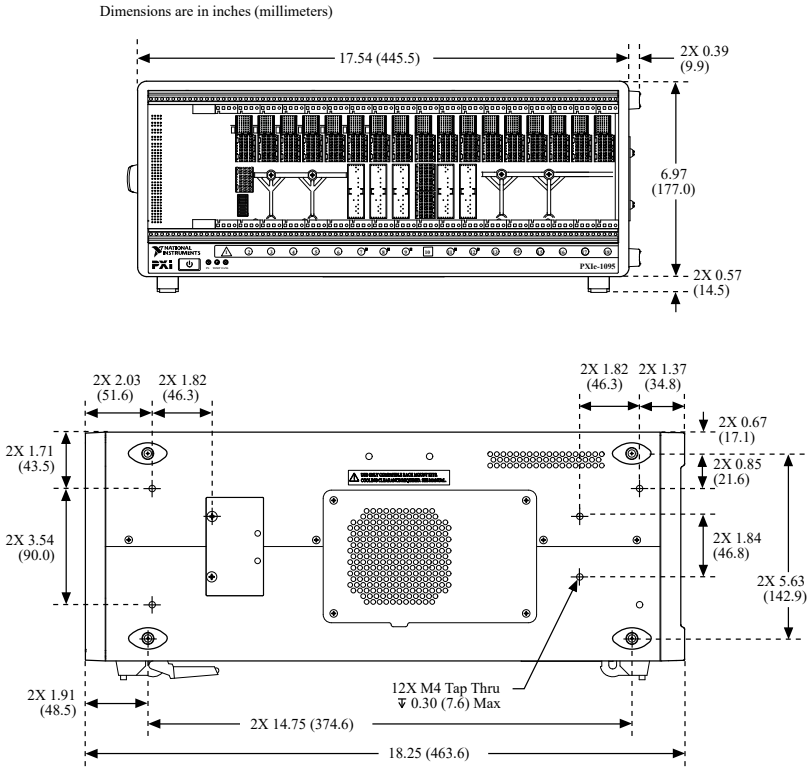


Figure 4. PXIe-1095 Chassis Dimensions (Bottom)