

## SPECIFICATIONS

# PXIe-1095

This document contains specifications for the PXIe-1095 chassis.

## Electrical

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

### AC Input

Input rating <sup>1</sup>	100 to 240 VAC, 50/60 Hz, 15 - 7.5 A, 100 to 120 VAC, 440 Hz, 15 A
Operating voltage range <sup>2</sup>	90 to 264 VAC
Nominal input frequency	50 Hz/60 Hz/400 Hz <sup>3</sup>
Operating frequency range <sup>4</sup>	47 to 440 Hz
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.

<sup>1</sup> 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.

<sup>2</sup> The operating range is guaranteed by design.

<sup>3</sup> 400 Hz operation only supported from 100 to 120 VAC.

<sup>4</sup> The operating range is guaranteed by design.



**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 <sup>2</sup> (14 AWG)
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 <sub>AUX</sub>
System Controller Slot	15 A	-	15 A	30 A	-	3 A
System Timing Slot	-	-	9 A	6 A	-	1 A

**Table 1. Backplane Slot Current Capacity (Continued)**

Slot	+5 V	V (I/O)	+3.3 V	+12 V	-12 V	5 V <sub>AUX</sub>
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 $\leq 58$ W cooling capacity per slot	0 °C to 55 °C (IEC 60068-2-1 and IEC 60068-2-2.) <sup>5</sup> 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.) <sup>5</sup> 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.) <sup>5</sup>

<sup>5</sup> This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.

## Storage Environment

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

## Shock and Vibration

Operational shock	30 g peak, half-sine, 11 ms pulse (IEC-60068-2-27.) <sup>7</sup> Meets MIL-PRF-28800F Class 2 limits.
Operational random vibration	5 to 500 Hz, 0.3 g <sub>rms</sub>
Non-operating vibration	5 to 500 Hz, 2.4 g <sub>rms</sub> (IEC 60068-2-64.) <sup>7</sup> Non-operating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.

## 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

<sup>6</sup> This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.

<sup>7</sup> This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.

## 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

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 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 and 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:

- 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](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## 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, Rear Panel SMA)

Accuracy	±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)
Output amplitude	1 V <sub>pp</sub> ±20% square-wave into 50Ω, 2 V <sub>pp</sub> unloaded
Output impedance	50Ω ±5Ω

## External Clock Source

Frequency	10 MHz ±25 ppm
Input amplitude	
External 10 MHz Reference IN (Timing and Synchronization option, rear panel SMA)	100 mV <sub>pp</sub> to 5 V <sub>pp</sub> 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 <sub>IH</sub>	2.0 V
V <sub>IL</sub>	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 <sub>OH</sub>	2.4 V min ( $ I_{OH}  < 8$ mA)
V <sub>OL</sub>	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 <sub>IH</sub>	2.0 V
V <sub>IL</sub>	0.8 V
Input impedance	High-Z (>10 kΩ typical)
Output voltage range	0 V to 3.3 V typical
V <sub>OH</sub>	2.4 V min ( $ I_{OH}  < 8$ mA)
V <sub>OL</sub>	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)

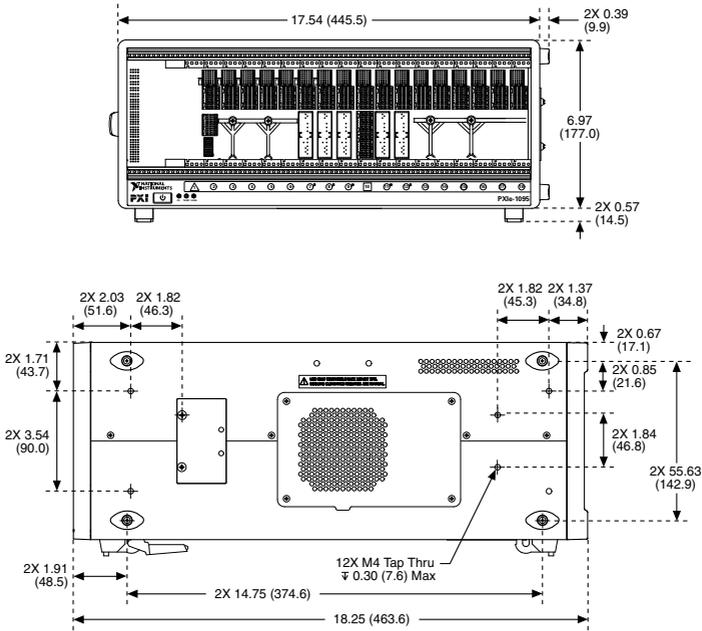
Chassis materials	Sheet Aluminum (5052-H32, 5754-H22), Extruded Aluminum (6063-T5, 6060-T6), Plate Aluminum (6063-T5, 6061-T6), Cold Rolled Steel, Cold Rolled Stainless Steel, Sheet Copper (C110), Santoprene, Urethane Foam, PC-ABS, Nylon, Polycarbonate, Polyethylene, Polyamide (FR-106)
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Finish	Conductive Clear Iridite on Aluminum, Electroplated Nickel on Cold Rolled Steel, Electroplated Zinc on Cold Rolled Steel, Electroplated Nickel on Copper
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The following figures show the PXIe-1095 chassis dimensions. The holes shown are for the installation of the optional rack mount kits.

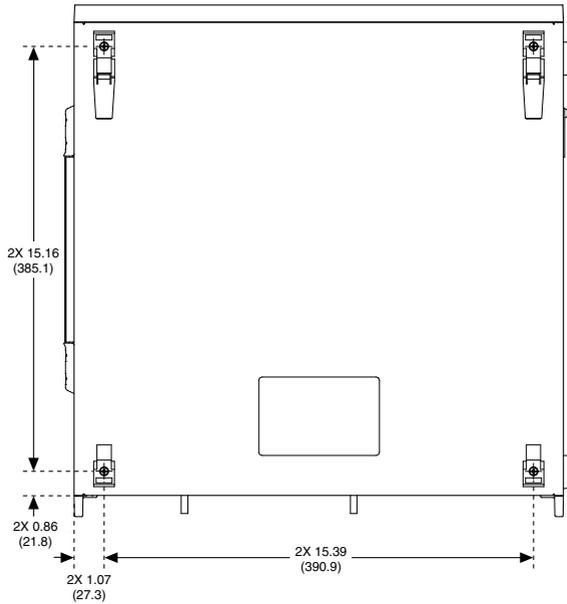
**Figure 1. PXIe-1095 Chassis Dimensions (Front and Side)**

Dimensions are in inches (millimeters)



**Figure 2. PXIe-1095 Chassis Dimensions (Bottom)**

Dimensions are in inches (millimeters)



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377373D-01 May 20, 2019