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SPECIFICATIONS

# PXIe-1092

This document contains specifications for the PXIe-1092 chassis.

**Note** Specifications are subject to change without notice.

## Electrical

The following section provides information about the PXIe-1092 AC input and DC output.

### AC Input

| | |
|---|---|
| Input rating[1] | 100 to 240 VAC, 50/60 Hz, 15 to 7.5 A<br>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 frequency range[2] | 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. |

**Caution** Disconnect power cord to completely remove power.

1 Care must be taken to not exceed the current rating of the branch circuit providing power to the chassis.
2 The operating range is guaranteed by design.
3 400 Hz operation only supported from 100 to 120 VAC.

NATIONAL INSTRUMENTS

# DC Output

DC output characteristics of the PXIe-1092.

| Voltage Rail | Maximum Current | Load Regulation | Maximum Ripple and Noise (20 MHz BW) |
|---|---|---|---|
| +5V_AUX | 3 A | ±5% | 50 mVpp |
| +12 V | 74 A | ±5% | 100 mVpp |
| +5 V | 26.5 A | ±5% | 50 mVpp |
| +3.3 V | 36 A | ±5% | 50 mVpp |
| -12 V | 1.75 A | ±5% | 50 mVpp |

Maximum total available power for the PXIe-1092 is 988 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 Slot | 15 A | - | 15 A | 30 A | - | 3 A |
| System Timing 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 | - |
| Expansion Slot | - | - | 9 A | 6 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 two 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 peripheral modules require ≤58 W cooling capacity per slot | 0 °C to 55 °C (IEC 60068-2-1 and IEC 60068-2-2.)[4] Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit. |
| When any peripheral module requires >58 W cooling capacity per slot | 0 °C to 40 °C (IEC 60068-2-1 and IEC 60068-2-2.)[4] 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.)[4] |

## Storage Environment

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

## Shock and Vibration

| | |
|---|---|
| Operational shock | 30 g peak, half-sine, 11 ms pulse (IEC-60068-2-27.)[6] 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.)[6] Non-operating test profile exceeds the requirements of MIL-PRF-28800F, Class 3. |

[4] This product meets the requirements of the environmental standards for electrical equipment for measurement, control, and laboratory use.

[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) | 35.9 dBA |
| High fan | 55.7 dBA |
| 58 W/82 W Profile | |
| Auto fan (up to 30 °C ambient) | 50.7 dBA |
| High fan | 63.4 dBA |

## Sound Power Level

| | |
|---|---|
| 38 W Profile | |
| Auto fan (up to 30 °C ambient) | 47.5 dBA |
| High fan | 66.2 dBA |
| 58 W/82 W Profile | |
| Auto fan (up to 30 °C ambient) | 61.6 dBA |
| High fan | 74.5 dBA |

**Note** The protection provided by the PXIe-1092 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 UL and other safety certifications, refer to the product label or the *Product Certifications and Declarations* section.

# Electromagnetic Compatibility 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 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** 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** 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** For EMC declarations and certifications, and additional information, refer to the *Product Certifications and Declarations* 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)

## 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), eight peripheral slots, and one peripheral expansion slot. 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 Vpp ±20% square-wave into 50Ω, 2 Vpp 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 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-1092 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 | 177.1 mm (6.97 in.) |
| Width | 303.3 mm (11.94 in.) |
| Depth | 463.6 mm (18.25 in.) |
| Weight | 12.3 kg (27.1 lb) |
| 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-1092 chassis dimensions. The holes shown are for the installation of the optional rack mount kits.

**Figure 1.** PXIe-1092 Chassis Dimensions (Front)

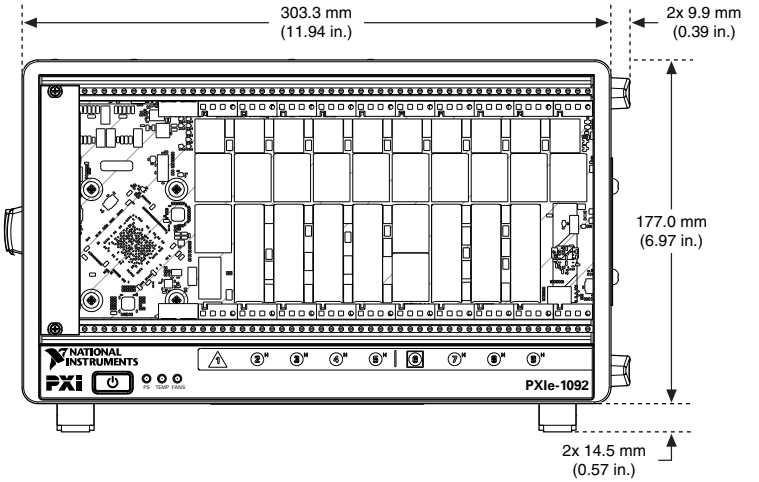



**Figure 2.** PXIe-1092 Chassis Dimensions (Side)

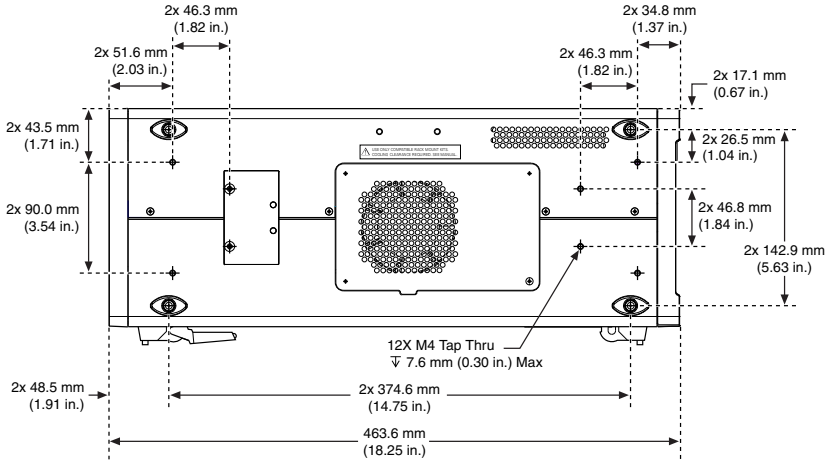
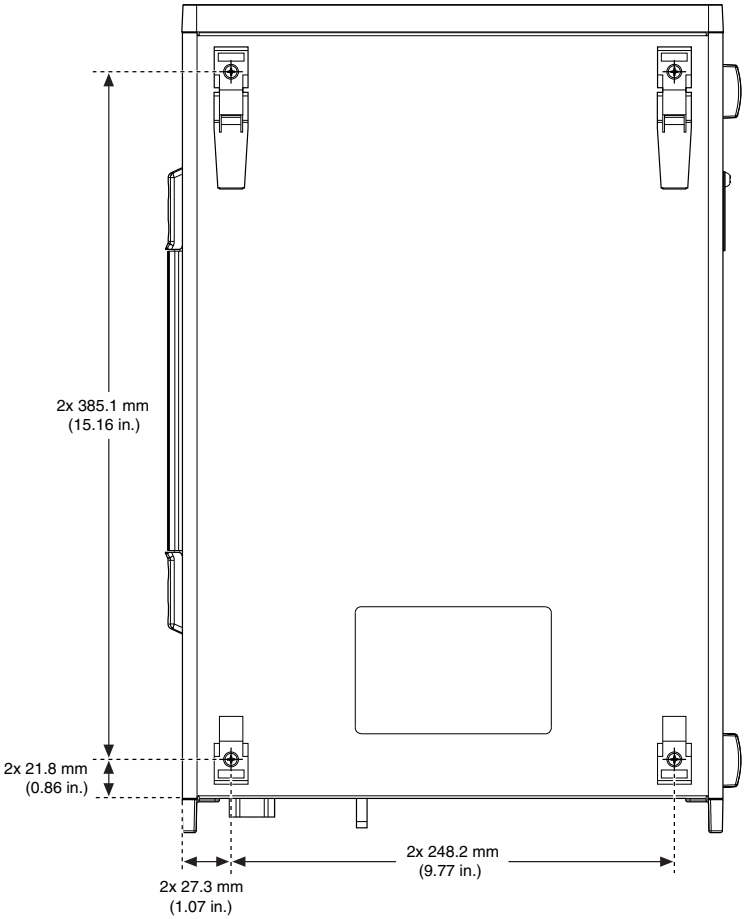


**Figure 3.** PXIe-1092 Chassis Dimensions (Bottom)




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