Ordering Information | Detailed Specifications
For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

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General-Purpose 8-Slot Chassis for PXI

NI PXI-1042, NI PXI-1042Q

- 0 to 55 °C extended temperature range (PXI-1042)
- 43 dBA acoustic emissions (PXI-1042Q)
- Accept both 3U PXI and CompactPCI modules
- Comply with all PXI and CompactPCI Specifications

- Low-jitter internal 10 MHz reference clock, with accuracy of 50 ppb using the PXI-6653 timing and synchronization module
- Remote power-inhibit control and voltage monitoring
- HALT tested for increased reliability
- AUTO/HIGH fan selector to optimize cooling and acoustic emissions

Overview

The NI PXI-1042/PXI-1042Q 8-slot chassis are designed to meet the needs of a wide range of test and measurement applications. The PXI-1042 operates in a temperature range extended to 55 °C. The PXI-1042Q offers quieter operation, with acoustic emissions as low as 43 dBA. These chassis incorporate all the features of the latest PXI specification, including the built-in 10 MHz reference clock, PXI trigger bus, star trigger, and local bus.

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Optional Features

- Front and rear rack-mount kits
- Replacement power supply and fan shuttle

- Slot blockers for improved cooling performance
- Factory installation services

Optimized Cooling and Acoustic Emissions

The PXI-1042/PXI-1042Q chassis integrate two system fans and a power supply fan to provide filtered, forced-air cooling that exceeds the cooling demands of PXI and CompactPCI modules. Both the PXI-1042 and PXI-1042Q offer a HIGH fan setting to maximize cooling and an AUTO fan setting to minimize acoustic emissions. The chassis monitor air intake temperature and adjust fan speed accordingly. With this technology, the PXI-1042Q achieves acoustic noise levels as low as 43 dBA (sound pressure level measured at operator position according to ISO 7779). The lower acoustic emissions make the PXI-1042Q ideally suited for office, laboratory, or benchtop applications (see Table 1).

PXI Timing and Synchronization

The PXI-1042 Series backplane provides a 10 MHz reference clock with an accuracy of 25 parts per million (ppm), less than 5 ps jitter, and a slot-to-slot skew of 250 ps. To extend the accuracy of the 10 MHz PXI reference clock, use the NI PXI-6653 slot 2 timing and synchronization module to achieve 50 parts per billion (ppb) accuracy, and less than 0.1 deg phase mismatch.

Acoustic Emissions

	PXI-1042Q 0 to 40 °C	PXI-1042 0 to 55 °C
Sound Pressure Level[1] (dBA) **(measured at operator position)**		
Auto Fan (25 °C ambient)	43.4	50.5
High Fan	52.9	58.7
Sound Power[1] (dBA)		
Auto Fan (25 °C ambient)	52.2	58.8
High Fan	62.4	67.7

[1]Tested in accordance with ISO 7779

Table 1. PXI-1042/PXI-1042Q Acoustic Emissions

Software System Configuration

PXI-1042/PXI-1042Qchassis are configured with NI Measurement & Automation Explorer (MAX).With this software configuration tool, users can easily configure PXI-1042 Series systems without time consuming manual installation of initialization files. MAX creates the pxisys.ini file that defines the layout and parameters of your PXI system including chassis, controller, and plug-in modules.
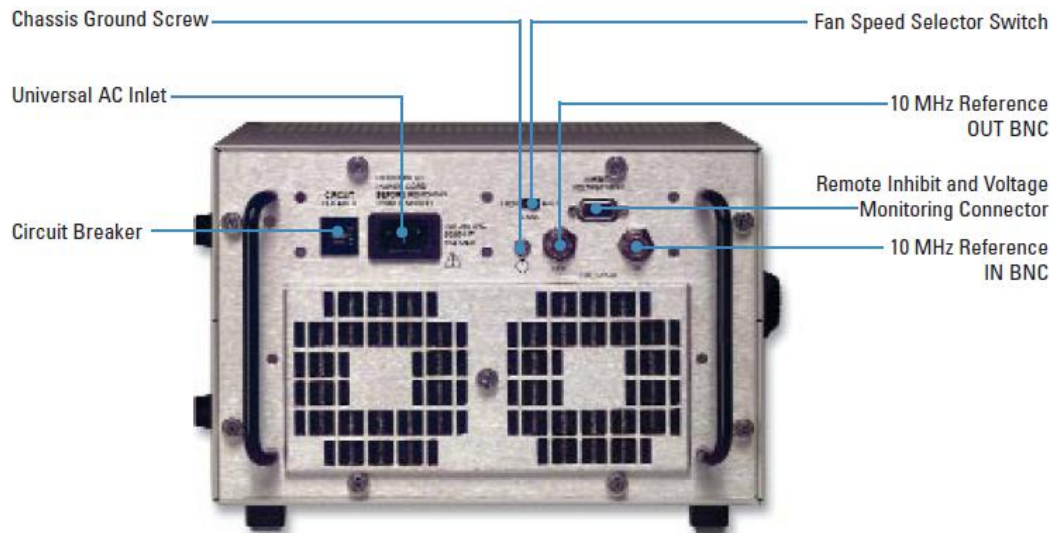

Figure 1. Rear View of the NI PXI-1042 Chassis

Power Supply

The PXI-1042/PXI-1042Q chassis include a removable high-performance universal AC power supply with built-in overcurrent protection. An isolated 12 VDC line provides power to the cooling fans, significantly reducing electrical noise on the chassis backplane. The PXI-1042/PXI-1042Q chassis incorporate the power supply and fans into a single modular unit that you can remove quickly for service, resulting in a mean time to repair (MTTR) of less than five minutes. External 10 MHz Reference Clock

I/O Connectors

The PXI-1042/PXI-1042Q chassis include IN/OUT BNC connectors for the 10 MHz reference clock on the rear of the chassis (see Figure 1). When the backplane detects a 10 MHz signal on the IN connector, it overrides the built-in 10 MHz clock and uses the external clock. The OUT connector provides a buffered, non-TTL version of the 10 MHz reference clock. To add synchronization for multiple chassis, incorporate the NI PXI-6653 slot 2 module to your system.

Remote Power Inhibit and Monitoring

The PXI-1042/PXI-1042Q chassis feature remote power inhibit and voltage monitoring through a DB-9 connector on the rear of the chassis (see Figure 1). The chassis also monitor power supply voltages; a flashing red LED in the power switch on the front of the chassis indicates a power supply error.

Chassis Installation

These chassis feature a flexible design for easy installation in a variety of applications. For bench top use, you can adjust the supporting feet to tilt the chassis for more comfortable access to module front panels. You can also set the feet to level the chassis, or completely remove them. Front and rear rack-mount kits are available for 19 in. rack-mounted systems.

Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part Number	Recommended Accessories	Part Number

Additional Accessories			
Slot blockers (2 single-slot)	778678-01	No accessories required.	
Filler panels (3 double-slot and 3 single-slot)	778679-01	No accessories required.	
EMC filler panels (6 single-slot)	778700-01	No accessories required.	
Front rack-mount kit (for 19 in. rack)	778643-01	No accessories required.	
Rear rack-mount kit (for 19 in. rack)	778643-02	No accessories required.	
NI PXI-1042 spare power supply and fan shuttle	778662-01	No accessories required.	
NI-PXI-1042Q1 spare power supply and fan shuttle	779021-01	No accessories required.	
NI PXI-6653 timing and synchronization Module	778715-01	No accessories required.	
Chassis			
NI PXI-1042 Requires: 1 Cable	778636-01	**Cable:** Shielded - Power Cord - U.S. 120 VAC	763000-01
NI PXI-1042Q Requires: 1 Cable	778636-02	**Cable:** Shielded - Power Cord - U.S. 120 VAC	763000-01

Support and Services

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

- **Classroom training in cities worldwide** - the most comprehensive hands-on training taught by engineers.
- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
- **Online instructor-led training** - lower-cost, remote training if classroom or on-site courses are not possible.
- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
- **Training memberships** and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

Detailed Specifications

This appendix contains specifications for the PXI-1042 Series chassis.

Electrical

AC Input

Input voltage range	100 to 240 VAC
Operating voltage range [1]	90 to 264 VAC
Input frequency	50/60 Hz
Operating frequency range [1]	47 to 63 Hz
Input current rating	8 A
Over-current protection	10 A circuit breaker
Line regulation	
3.3 V	<±0.2%
5 V	<±0.1%
±12 V	<±0.1%
Efficiency	70% typical
Power disconnect	The AC power cable provides main power disconnect. The front-panel power switch causes the internal chassis power supply to provide DC power to the CompactPCI/PXI backplane. You also can use the rear-panel D-SUB 9-pin connector to control the internal chassis power supply.

DC Output

DC current capacity (I_{MP})			
Voltage	PXI-1042		PXI-1042Q
	0–50 °C	0–55 °C	0–40 °C
+3.3 V	20 A	18 A	20 A
+5 V	29 A	25 A	29 A
+12 V Peripheral slots	3.5 A	3.5 A	3.5 A
+12 V System slot	0.5 A	0.5 A	0.5 A
−12 V	2 A	2 A	2 A

Load regulation	
Voltage	Load Regulation
+3.3 V	<5%
+12 V	<5%
+5 V	<5%
−12 V	<5%

Maximum ripple and noise (20 MHz bandwidth)	
Voltage	Maximum Ripple and Noise
+3.3 V	50 mV$_{pp}$
+12 V	120 mV$_{pp}$
+5 V	50 mV$_{pp}$
−12 V	120 mV$_{pp}$

Over-current protection	All outputs protected from short circuit and overload with automatic recovery
Over-voltage protection	
3.3 V and 5 V	Clamped at 20 to 30% above nominal output voltage
+12 V and −12 V	Clamped at 26 to 29 V difference between +12 and −12 V outputs
Power-supply shuttle MTTR	Replacement in under 5 minutes

Chassis Cooling

Per slot cooling capacity	25 W
Module cooling system	
PXI-1042	Forced air circulation (positive pressurization) through two 60 cfm fans with HIGH/AUTO speed selector
PXI-1042Q	Forced air circulation (positive pressurization) through two 51 cfm fans with HIGH/AUTO speed selector
Slot airflow direction	P1 to P2, bottom of module to top of module
Module cooling intake	Bottom rear of chassis
Module cooling exhaust	Along both sides and top of chassis
Power supply cooling system	Forced air circulation through integrated fan
Power supply cooling intake	Right side of chassis
Power supply cooling exhaust	Left side of chassis

Environmental

Operating location	Indoor use
Maximum altitude	2,000 m (at 25 °C ambient)
Installation Category	II
Pollution Degree	2
Operating Environment	
Ambient temperature range	
PXI-1042	0 to 55 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.)
PXI-1042Q	0 to 40 °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.)
Storage Environment	
Ambient temperature range	–20 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.)

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 to 500 Hz, 0.3 g_{rms}
Nonoperating	5 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.)

Acoustic Emissions

Sound Pressure Level (at Operator Position)	
(Tested in accordance with ISO 7779.)	
PXI-1042Q	
Auto fan (at 25 °C ambient)	43.4 dBA
High fan	52.9 dBA
PXI-1042	
Auto fan (at 25 °C ambient)	50.5 dBA
High fan	58.7 dBA

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Sound Power	
(Tested in accordance with ISO 7779.)	
PXI-1042Q	
Auto fan (at 25 °C ambient)	52.2 dBA
High fan	62.4 dBA
PXI-1042	
Auto fan (at 25 °C ambient)	58.8 dBA
High fan	67.7 dBA

Safety

The PXI-1042 Series chassis were evaluated using the criteria of EN 61010-1 and meets the requirements of the following standards for safety and electrical equipment for measurement, control, and laboratory use:

- EN 61010-1, IEC 61010-1
- UL 3111-1, UL 61010B-1
- CAN/CSA C22.2 No. 1010.1

Note For UL and other safety certifications, refer to the product label, or visit ni.com./hardref.nsf, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

Emissions	EN 55011 Class A at 10 m, FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 + A2:2001, Table 1
EMC/EMI	CE, C-Tick, and FCC Part 15 (Class A) Compliant
Harmonics/Flicker	EN 61000-3-2 and EN 61000-3-3

Note For EMC compliance, you *must* operate this device with shielded cabling. In addition, all covers and filler panels must be installed.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety)	73/23/EEC
Electromagnetic Compatibility Directive (EMC)	89/336/EEC

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/hardref.nsf, 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 seven peripheral slots. Compliant with IEEE 1101.10 mechanical packaging. PXI Specification Revision 2.0 compliant. Accepts both PXI 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, and are UL 94 V-0 rated
10 MHz System Reference Clock (PXI_CLK10)	
Maximum clock skew between slots	250 ps
Built-in 10 MHz clock	
Accuracy	±25 ppm (guaranteed over the operating temperature range)
Maximum jitter	5 ps RMS in 10 Hz to 1 MHz range
External clock sources	
Connectors	BNC on rear of chassis (ground referenced) or Slot 2 J2 (pin D17; refer to Table,)
Input frequency	10 MHz ±100 ppm or better
Input amplitude	

Rear connector	200 mV$_{pp}$ to 5 V$_{pp}$, 10 MHz squarewave or sinewave
Slot 2	5 V or 3.3 V, 10 MHz TTL signal
Input impedance	50 Ω ± 5 Ω (rear connector)
Maximum jitter introduced by backplane circuitry	1 ps RMS in 10 Hz to 1 MHz range

External clock output

Connector	BNC on rear of chassis (ground-referenced)
Output amplitude	1 V$_{pp}$ ±20% squarewave into 50 Ω 2 V$_{pp}$ into open circuit
Output impedance	50 Ω ± 5 Ω

Mechanical

Overall dimensions

Standard chassis

Height	6.97 in. (177 mm)
Width	10.68 in. (271.3 mm)
Depth	15.61 in. (396.5 mm)

> **Note** 0.57 in. (14.5 mm) is added to height when feet are installed. When tilted with front feet extended on table top, height is increased approximately 2.08 in. (52.8 mm) in front and 0.583 in. (14.8 mm) in rear.

|	
Weight	8.4 kg (18.6 lb)
Chassis materials	Sheet Aluminum (5052-H32, 3003-H14, and 6061-T6), Extruded Aluminum (6060-T6), and Cold Rolled Steel, PC-ABS, Santoprene, Nylon
Finish	Conductive Clear Iridite on Aluminum, Clear Chromate Zinc Plating on Cold Rolled Steel, Polyurethane Enamel

The following figures show the PXI-1042 Series chassis dimensions. The holes shown are for the installation of the optional rack mount kit. You can install this kit on the front or rear of the chassis, depending on which end of the chassis you want to face toward the front of the instrument cabinet. Notice that the front and rear chassis mounting holes (size M4) are symmetrical.

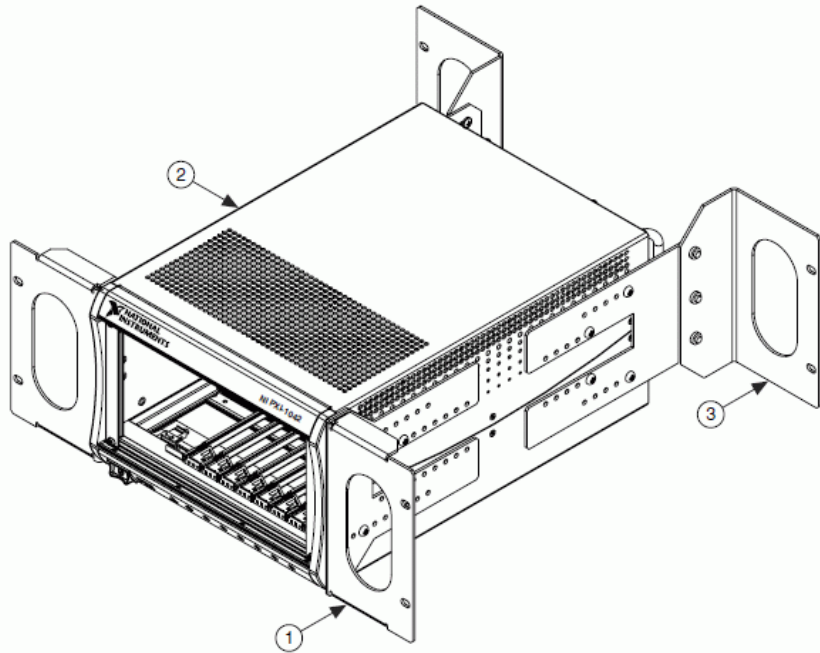**PXI-1042 Series Chassis Dimensions (Front and Side)**
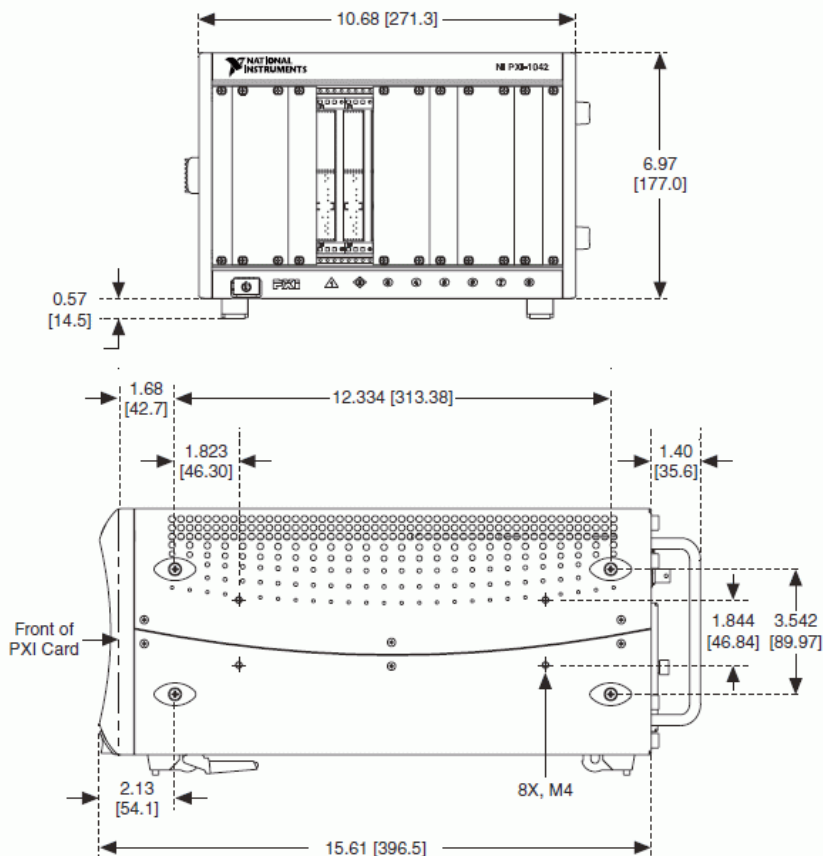
PXI-1042 Series Chassis Dimensions (Bottom)
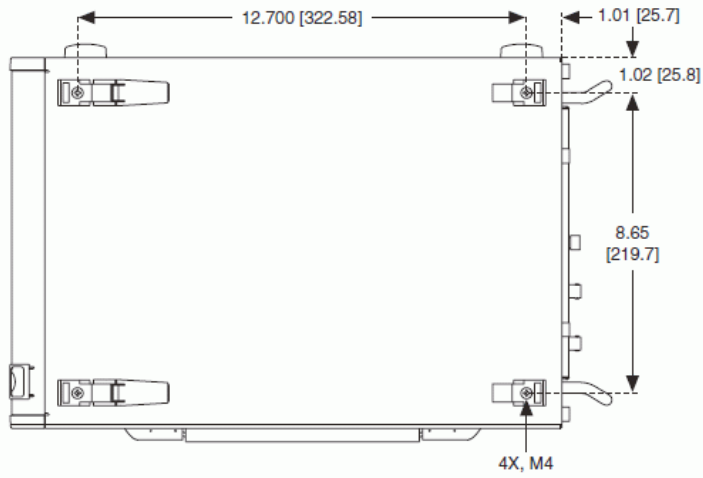
The following figure shows the PXI-1042 Series chassis rack mount kit components.

PXI-1042 Series Chassis Rack Mount Kit Components

1 Front Rack Mount Kit	2 PXI-1042 Series Chassis	3 Optional Rear Rack Mount Kit

[1] The operating range is guaranteed by design.

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