

18-Slot PXI Express Chassis for PXI and PXI Express Modules

NI PXIe-1065

- Accepts 3U PXI, PXI Express, CompactPCI, and CompactPCI Express modules

High Performance for Instrumentation Requirements

- Up to 1 GB/s per-slot dedicated bandwidth (x4 PCI Express)
- 700 W available power for 0 to 55 °C
- Low-jitter internal 10 MHz reference clock for PXI slots with 25 ppm stability
- Low-jitter internal 100 MHz reference clock for PXI Express slots with 25 ppm stability
- Quiet operation for 0 to 30 °C at 45.0 dBA
- Variable speed fan controller optimizes cooling and acoustic emissions
- Remote power-inhibit control
- Complies with PXI and CompactPCI specifications

High Reliability

- 0 to 55 °C extended temperature range
- Power supply, temperature, and fan monitoring
- HALT tested for increased reliability
- Field-replaceable power supply

Multichassis Support

- PXI Express system timing slot for tight synchronization across chassis
- Rear CLK10 I/O connector
- Switchless CLK10 routing

Optional Features

- Front and rear rack-mount kits
- Replacement power supply and fan shuttle
- Filler panels
- Slot blockers for improved cooling performance
- Factory Installation Services



Slot Type	PXI Express System	PXI Express Peripheral	Hybrid	PXI
Bus Signaling	PCI Express	PCI Express (x4)	PCI (32/33) PCI Express (x4)	PCI (32/33)
Bandwidth	3 GB/s dedicated for PXI Express (3 x4 links) 132 MB/s shared for PXI	1 GB/s dedicated	132 MB/s shared (PXI) or 1 GB/s dedicated (PXI Express)	132 MB/s shared
Number of Slots	1	4 ¹	4	9

¹Includes one system timing slot.

Table 1. Bus Bandwidth and Signaling for the NI PXIe-1065 Slot Types

Overview

The National Instruments PXIe-1065 18-slot chassis features a high-bandwidth backplane to meet a wide range of high-performance test and measurement application needs. The higher slot count of the NI PXIe-1065 provides a solution for higher-channel-density systems. The chassis operates in a temperature range extended to 55 °C for applications needing cooling performance. It also incorporates all the features of the latest PXI specification including support for both PXI and PXI Express modules with a built-in 10 MHz reference clock, PXI trigger bus, and PXI star trigger for PXI modules and a built-in 100 MHz reference clock, SYNC 100, and PXI differential star trigger for PXI Express modules.

Slot Types Accept PXI and PXI Express Modules

The NI PXIe-1065 enables higher-bandwidth systems and provides the flexibility to work with both PXI and PXI Express modules. The

PXI Express system slot offers three x4 PCI Express links (1 GB/s single direction per link) and a x1 PCI Express link to a PCI Express-to-PCI translation bridge on the backplane. The PXI Express slots feature up to a 1 GB/s per-slot, per-direction dedicated bandwidth through a x4 PCI Express link connection. The PXI Express system timing slot provides a x4 PCI Express link to the system slot and accepts a PXI Express module or a PXI Express system timing controller for advanced timing and synchronization. The four PXI Express hybrid slots deliver connectivity to either a x4 PCI Express link to the system slot or to the 32-bit, 33 MHz PCI bus on the backplane. The nine remaining PXI slots provide connectivity to the 32-bit, 33 MHz PCI bus on the backplane.

Optimized Cooling and Acoustic Emissions

The NI PXIe-1065 chassis integrates three pulse-width modulation (PWM) system fans to provide filtered, forced-air cooling that exceeds the cooling demands of PXI Express and CompactPCI Express as well as PXI and CompactPCI modules. The NI PXIe-1065 offers a HIGH fan setting to maximize cooling at any ambient temperature and an

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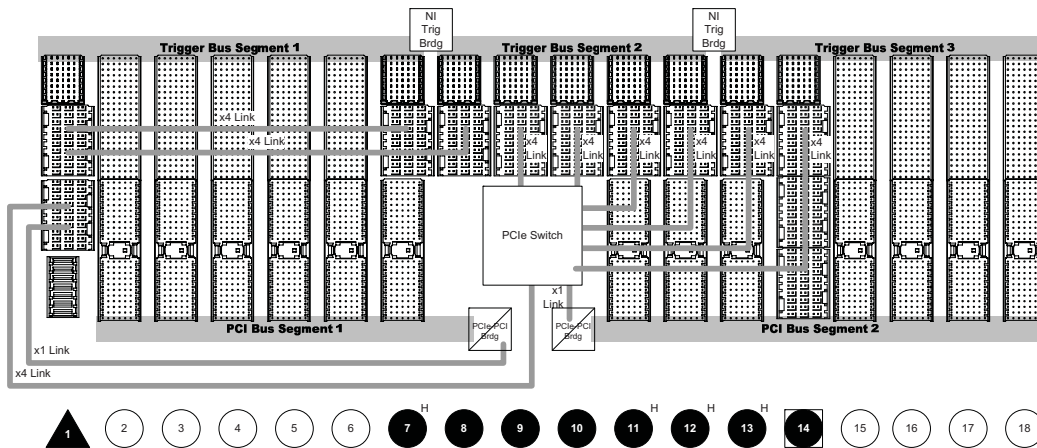


Figure 1. NI PXIe-1065 Backplane

AUTO fan setting to minimize acoustic emissions at lower ambient temperatures. The chassis monitors air intake temperature and adjusts fan speed accordingly. With this technology, the NI PXIe-1065 achieves acoustic noise levels as low as 45.0 dBA (sound pressure level measured at operator position according to ISO 7779).

PXI Timing and Synchronization

For PXI modules, the NI PXIe-1065 backplane provides the standard PXI timing and synchronization features. The chassis includes 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 up to 250 ps. For triggering and handshaking needs, the NI PXIe-1065 provides the PXI trigger bus and PXI star trigger. For PXI Express modules, in addition to PXI timing and synchronization features, the NI PXIe-1065 backplane supplies a differential 100 MHz reference clock with an accuracy of 25 ppm, less than 5 ps jitter, and a slot-to-slot skew of 150 ps. The chassis also provides differential star trigger to the PXI Express slots to offer less than 200 ps intermodule skew. With the SYNC 100, the NI PXIe-1065 can generate its own CLK10 signal, deriving it from the 100 MHz reference clock.

Software System Configuration

The NI PXIe-1065 chassis is configured with NI Measurement & Automation Explorer (MAX). With this software configuration tool, you can easily configure NI PXIe-1065 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.

Replaceable Power Supply Shuttle

The NI PXIe-1065 chassis includes 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 NI PXIe-1065 incorporates 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

An NI PXIe-1065 chassis includes IN/OUT BNC connectors for the 10 MHz reference clock on the rear of the chassis. When the backplane detects a 10 MHz signal on the IN connector, it phase locks to the external clock. The OUT connector provides a buffered, non-TTL version of the 10 MHz reference clock.

Remote Power Inhibit and Monitoring

The NI PXIe-1065 chassis features remote power inhibit and monitoring through a DB-9 connector on the rear of the chassis. Use this connector to switch off power or monitor the power remotely in the chassis.

Power Supply, Temperature, and Fan Monitoring

The NI PXIe-1065 chassis monitors power supply voltages, air intake temperature, and fan speeds and provides feedback to the user via a bicolor LED in the power switch on the front of the chassis.

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NI PXIe-1065 Options

The NI PXIe-1065 has several optional accessories for complete system integration and optimized chassis functionality. Front and rear rack-mount kits are available for 19 in. rack-mounted systems. You can easily replace spare power supplies with little system downtime because of the modular nature of the NI PXIe-1065 power supply and fan shuttle. You can use slot blockers to improve the overall cooling performance of the chassis.

Ordering Information

Step 1. Select your chassis.

NI PXIe-1065.....779730-01

Step 2. Select one or more power cords.

U.S. 120 AC763000-01

Japan 100 VAC763634-01

United Kingdom 240 VAC763064-01

Swiss 220 VAC763065-01

Australian 240 VAC763066-01

Universal Euro 240 VAC763067-01

North American 240 VAC763068-01

Step 3. Select additional accessories.

Front rack-mount kit (for 19 in. rack)778644-01

Rear rack-mount kit (for 19 in. rack)778644-02

NI PXIe-1065¹ spare power shuttle779731-01

EMC filler panels (6 single-slot).....778700-01

PXI Factory Installation Services

With National Instruments Factory Installation Services (FIS), you receive complete system-level assembly and functional testing of the PXI chassis, controller, and all peripheral devices, as well as installation of all device drivers and software programs (such as NI LabVIEW). For online configuration of a complete PXI system, including information about FIS, visit the PXI Advisor at ni.com/advisor.

Filler panel kit (7 single-slot, 1 double-slot,

and 2 quadruple-slot)²778646-01

Slot blockers (2 single-slot)³778678-01

¹NI PXIe-1065 power shuttles are not compatible with previous generations of NI 18-slot chassis.

²Every NI PXIe-1065 comes with a filler panel kit.

³Slot blockers are optional for improved thermal performance of your NI PXIe-1065. Please refer to the National Instruments KnowledgeBase entry on slot blocker usage criteria on ni.com/support for additional information on this optional system feature.

Step 4. Select system setup and installation services.

If you are ordering this chassis as part of a system, select NI Factory Installation Services to have your hardware/software installed and receive your new PXI system ready to use right out of the box.

NI Factory Installation Services – PXI Systems.....960597-18

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to ni.com/pxi.

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Specifications

This appendix contains specifications for the NI PXIe-1065 chassis.

Caution: Specifications are subject to change without notice.

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	10 A - 5 A maximum
Overcurrent protection.....	12 A circuit breaker
Line regulation	
3.3 V	<±0.2%
5 V	<±0.1%
±12 V	<±0.1%
Efficiency.....	70% typical

¹The operating range is guaranteed by design.

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 Express backplane. You also can use the rear-panel D-Sub 9-pin connector and power mode switch to control the internal chassis power supply.

DC Output

DC current capacity (I_{MP})

Voltage	Maximum Current (A)
+3.3 V	61
+5 V	56
+12 V	45
-12 V	4
5 V _{AUX}	1.5

Notes: Maximum combined +3.3 V, +5 V, and +12 V power is 699 W. Maximum total power is 701.5 W.

The maximum power dissipated in the system slot should not exceed 140 W.

Backplane pin current capacity

Slot	+5 V	V (I/O)	+3.3 V	+12 V	-12 V	5 V _{AUX}
System controller slot	9 A	0 A	9 A	11 A	0 A	1 A
System timing slot	0 A	0 A	3 A	2 A	0 A	1 A
Hybrid peripheral slot with PXI peripheral	6 A	5 A	6 A	1 A	1 A	0 A
Hybrid peripheral slot with PXI Express peripheral	0 A	0 A	3 A	3 A	0 A	1 A
PXI peripheral slots	6 A	11 A	6 A	1 A	1 A	0 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}

Overcurrent protection..... All outputs protected from short circuit and overload with automatic recovery

Overvoltage protection
3.3 V and 5 V Clamped at 20 to 30% above nominal output voltage

Power supply shuttle MTTR Replacement in less than 5 minutes

Chassis Cooling

Module cooling system

NI PXIe-1065 Forced air circulation (positive pressurization) through three 165 cfm fans with HIGH/AUTO speed selector

Slot airflow direction 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 two integrated fans

Power supply cooling intake..... Right side of chassis

Power supply cooling exhaust..... Left side of chassis

Environmental

Maximum altitude..... 2,000 m (800 mbar) (at 25 °C ambient)

Pollution degree 2

For indoor use only.

Operating Environment

Ambient temperature range 0 to 55 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2; meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit)

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Relative humidity range..... 10 to 90%, noncondensing
(tested in accordance with
IEC-60068-2-56)

Storage Environment

Ambient temperature range -40 to 71 °C (tested in
accordance with IEC-60068-2-1
and IEC-60068-2-2; meets
MIL-PRF-28800F Class 3 limits)

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; meets
MIL-PRF-28800F Class 2 limits)

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;
meets MIL-PRF-28800F requirements)

Auto fan (up to ~30 °C ambient) 45.0 dBA
High fan..... 63.3 dBA

Sound Power

Auto fan (up to ~30 °C ambient) 55.5 dBA
High fan..... 76.2 dBA

Safety

This product is designed to meet the requirements of the following
standards of safety for electrical equipment for measurement, control,
and laboratory use:

- EN 61010-1, IEC 61010-1
- UL 61010-1, CSA 61010-1

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

Electromagnetic Compatibility

This product is designed to meet the requirements of the following
standards of EMC for electrical equipment for measurement, control, and
laboratory use:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note: For EMC compliance, operate this device according to
printed documentation.

CE Compliance

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

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

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/certification, search by model number or
product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers: At the end of their life cycle, all products *must* be sent
to a WEEE recycling center. For more information about WEEE recycling
centers and National Instruments WEEE initiatives, visit
ni.com/environment/weee.htm.

Backplane

Size 3U; 1 system slot (with 3 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, and are
UL 94 V-0 rated

System Synchronization Clocks (PXI_CLK10, PXIe_CLK100, PXIe_SYNC100)

10 MHz System Reference Clock: PXI_CLK10

Maximum slot-to-slot skew 1 ns
Accuracy ±25 ppm max.
(guaranteed over the operating
temperature range)
Maximum jitter 5 ps RMS phase-jitter
(10 Hz to 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)

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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
Single-ended V _{OH}	2.0 to 2.5 V

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

External 10 MHz Reference Out (BNC on rear panel of chassis)

Accuracy	±25 ppm max (guaranteed over the operating temperature range)
Maximum jitter	5 ps RMS phase-jitter (10 Hz to 1 MHz range)
Output amplitude	1 V _{PP} ±20% square-wave into 50 Ω
2 V _{PP} unloaded Output impedance	50 Ω ±5 Ω

External Clock Source

Frequency	10 MHz ±100 PPM
Input amplitude	
Rear panel BNC	200 mV _{PP} to 5 V _{PP} square-wave or sine-wave
System timing slot PXI_CLK10_IN	5 V or 3.3 V TTL signal
Rear panel BNC input impedance	50 Ω ±5 Ω
Maximum jitter introduced by backplane	1 ps RMS phase-jitter (10 Hz to 1 MHz range)

PXIe_SYNC_CTRL

V _{IH}	2.0 to 5.5 V
V _{IL}	0 to 0.8 V

PXI Star Trigger

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

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%

Mechanical

Overall dimensions	
Standard chassis	
Height	6.97 in. (177.1 mm)
Width	18.30 in (464.8 mm)
Depth	18.40 in (467.4 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	12.8 kg (28.2 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

NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.

Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit ni.com/training.

Professional Services

Our Professional Services Team is composed of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and

integrators. Services range from start-up assistance to turnkey system integration.

Visit ni.com/alliance.



OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit ni.com/ssp.

Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with ni.com/pxiadvisor.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit ni.com/calibration.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit ni.com/services.



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