General-Purpose 8-Slot Chassis for PXI

Overview
The National Instruments PXI-1042 chassis combines a high-performance 8-slot backplane with high-output power supply, integrated cooling, and compact structural design providing a versatile platform for a wide range of measurement and automation applications. The NI PXI-1042, which incorporates all features of the latest PXI specification, provides an excellent platform for benchtop or rack-mounted test and control systems. With its modular compact design, the PXI-1042 also provides an excellent platform for portable test and data acquisition applications.

Low-Jitter Internal 10 MHz Reference Clock
The backplane for the PXI-1042 incorporates all of the timing and triggering features defined in the latest PXI specification, including the built-in 10 MHz reference clock, trigger bus, star trigger, and module-to-module local bus. An added feature in the PXI-1042 chassis is the improved performance of the internal 10 MHz reference clock. The backplane oscillator provides the 10 MHz reference clock with an accuracy of 25 parts per million (ppm), jitter less than 5 ps, and a slot-to-slot skew of less than 250 ps. With this highly accurate, stable clock source, the PXI-1042 offers an ideal platform for test or control systems that require precision synchronization and timing. If this internal reference clock does not provide adequate synchronization, the PXI-1042 automatically senses and sources alternate external or Slot 2 clock sources (refer to the NI PXI-6608).

External 10 MHz Reference Clock I/O Connectors
The PXI-1042 incorporates two BNC connectors on the rear of the chassis for the 10 MHz reference clock, labeled IN and OUT (see Figure 1). Through the IN connector, you can provide an external 10 MHz clock to the backplane. When the backplane detects a 10 MHz signal present on the IN connector, it automatically 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. You can use this signal to synchronize two or more PXI chassis to the same 10 MHz clock.

Filtered, Forced-Air Cooling and Enhanced Fan Control
The National Instruments PXI-1042 offers superior cooling with improved airflow for all controller and peripheral module slots. Integrated fans provide filtered, forced-air cooling for the PXI slots, separate and independent of power supply cooling. NI integrated the power supply and fans into a single modular unit that you can remove quickly for service, resulting in an MTTR of less than five minutes. To accommodate the wide range of applications and application environments for the PXI-1042, two user-selectable fan speed settings are available. Select the HIGH fan speed setting for maximum cooling effectiveness or the AUTO fan speed setting to employ the new temperature sensing module that controls fan speed based on ambient air temperature. The chassis monitors the ambient air temperature and indicates elevated temperatures above 55 °C by a flashing green LED in the power switch on the front of the chassis.
Power Supply
The PXI-1042 chassis incorporates a 300 W universal AC power supply with built-in overcurrent protection via a push-reset circuit breaker. The cooling fans are fed from a separate, isolated 12 VDC power supply line, significantly reducing fan electrical noise on the +12 VDC backplane bus.

Remote Power Inhibit and Monitoring
The PXI-1042 incorporates remote power inhibit and monitoring through a DB-9 connector on the rear of the chassis (see Figure 1). Use this connector to switch power off remotely or monitor the power in your chassis. The chassis also monitors power supply voltages and a flashing red LED in the power switch on the front of the chassis indicates a power supply error.

Installation
The PXI-1042 has 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 up for more comfortable access to module front panels. You can also set the feet to level the chassis with the bench top, or completely remove them. Add the optional rack mount kits (see Figure 2) to install the PXI-1042 in a 19 in. rack. You can install a rack-mount kit on the front or the rear of the chassis, and you can use them to recess the PXI-1042 in your instrument cabinet. For portable applications, the PXI-1042 comes with a built-in carrying handle. For custom or embedded applications, use the mounting points located on each side of the chassis (see Figure 3). You can assemble or disassemble all these configurations without having to disturb the interior of the chassis.
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Ordering Information

Step 1. Select your chassis.
NI PXI-1042 ..........................................................778636-01

Step 2. Select one or more power cords.
U.S. 120 VAC .........................................................763000-01
Japan 100 VAC .......................................................763000-01
United Kingdom 240 VAC ........................................763064-01
Swiss 220 VAC ........................................................763065-01
Australian 240 VAC ...............................................763066-01
Universal Euro 240 VAC .........................................763067-01
North American 240 VAC .......................................763068-01

Step 3. Select additional accessories.
Front rack-mount kit (for 19 in. rack) ......................778643-01
Rear rack-mount kit (for 19 in. rack) .......................778643-02
Spare Power Supply and Fan Shuttle ......................778662-01
EMC filler panels (6 single-slot) .........................778700-01
Filler panels (3 double-slot and 3 single-slot)* ...........778679-01
Slot blockers (2 single-slot)** .....................................778678-01

*Every NI PXI-1042 chassis comes with 3 double-slot and 3 single-slot filler panels.
**Slot blockers are optional for improved thermal performance of your NI PXI-1042 system. Please refer to 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 ........960596-01

Figure 3. Front and Side Dimensions of the PXI-1042 Chassis
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### Specifications

**Complies with PXI Specification**
Accepts modules compliant with CompactPCI, PICMG 2.0 specification

**Electrical**

**AC Input**
- Input voltage range: 100 to 240 VAC
- Operating voltage range: 90 to 264 VAC
- Operating frequency: 50/60 Hz
- Input current rating: 8 A
- Over-current protection: 10 A circuit breaker

**DC Output**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Load Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>+3.3 V</td>
<td>+5 V</td>
</tr>
<tr>
<td>+12 V</td>
<td>+5 V</td>
</tr>
<tr>
<td>-12 V</td>
<td>+5 V</td>
</tr>
</tbody>
</table>

**Efficiency**
70% typical

**Cooling**
- Fans: 2 @ 60 cfm, with filters
- Per-slot capacity: 31 W worst-case, fan speed HIGH

**Physical**
- Number of PXI slots: 8 (1 controller, 7 peripheral)
- Number of controller expansion slots: 3 (left of controller slot)
- Dimensions: 177 by 271.3 by 396.5 mm (6.97 by 10.68 by 15.61 in.)
- Height for rack-mount installation: 4U
- Weight: 8.4 kg (18.6 lb)

**Operating Environment**
- Ambient temperature range: 0 to 50 °C (Meets IEC-60068-2-1 and IEC-60068-2-2)
- Relative humidity range: 10 to 90% noncondensing
- Altitude: 2000 m (at 25 °C ambient temperature)

**Storage Environment**
- Ambient temperature range: -20 to 70 °C (Meets IEC-60068-2-1 and IEC-60068-2-2)
- Relative humidity range: 5 to 95% noncondensing

**Backplane**
- Backplane bare-board material: UL 94 V-0 recognized
- Backplane connectors: Conform to IEC 917 and IEC 1076-4-101, 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 B-4, P2 (U) Connector Pinout for the Star Trigger Slot)
  - Input frequency: 10 MHz ±100 ppm or better
  - Input amplitude: 200 mVpp to 5 Vpp, 10 MHz squarewave or sinewave
  - Slot 2: 5 or ±3.3 V, 10 MHz TTL signal
  - Input impedance: 50 Ω ± 5 Ω (rear connector)

**External clock output**
- Connector: BNC on rear of chassis (ground-referenced)
- Output amplitude: 1 Vpp ±20% square wave into 50 Ω
- Nonoperating: 2 Vpp into open circuit

**Shock and Vibration**
- Functional shock: 30 g peak, half-sine, 11 ms pulse
  (Tested in accordance with IEC 60068-2-27, Test profile developed in accordance with MIL-T-28800E.)
- Random Vibration
  - Operating: 5 to 500 Hz, 0.31 g rms
  - Nonoperating: 5 to 500 Hz, 2.46 g rms
  (Tested in accordance with IEC 60068-2-64, Nonoperating test profile developed in accordance with MIL-T-28800E and MIL-STD-810E Method 614.)

**Safety**
- This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
  - Low-Voltage Directive (safety): EN 61010-1, EN 61010-1
  - Low-Voltage Directive (safety): UL 3111-1
  - Low-Voltage Directive (safety): CAN/CSA C22.2 No. 1010.1
- Electromagnetic Compatibility
  - Emissions: EN 55011 Class A
  - Immunity: EN 61326-1:1997 + A1:1998, Table 1
- CE Compliance
  - This product meets the essential requirements of applicable European Directives, as amended for CE Marking, as follows:
    - NOTE: Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, click Declarations of Conformity Information at ni.com/hardref/nl/