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

*Last Revised: 2014-09-24 22:51:42.0*

# High-Value PXI Embedded Controller for Windows

## NI PXI-8101, NI PXI-8102





- 2.0 GHz single-core for PXI-8101, 1.9 GHz dual-core for PXI-8102
- 1 GB (1 x 1 GB DIMM) 800 MHz DDR2 RAM standard, 4 GB (1 x 4 GB DIMMs) maximum
- 80 GB (or greater) integrated hard-drive standard
- Up to 132 MB/s system and slot bandwidth
- 10/100/1000BASE-TX Ethernet
- 2 Hi-Speed USB ports
- DVI-I video connector
- IEEE 1284 ECP/EPP parallel port

### Overview

The NI PXI-8101 and PXI-8102 high-value embedded controllers featuring Intel Celeron 575 and dual-core Celeron T3100 processors, respectively, are designed for use in PXI and CompactPCI systems. With their 2.0 GHz single-core and 1.9 GHz dual-core processors and 800 MHz DDR2 standard memory, these embedded controllers offer an ideal balance of performance and value. The PXI-8101 or PXI-8102 in a PXI chassis, such as the NI PXI-1036, provides a compact, high-value, PC-based platform for test, measurement, and control applications.

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### Requirements and Compatibility

#### OS Information

- Windows 7
- Windows Vista
- Windows XP

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### Application and Technology

#### NI PXI-8101 and NI PXI-8102 Features

| | NI PXI-8101 | NI PXI-8102 |
|---|---|---|
| CPU | Intel Celeron 575 (2.0 GHz) | Intel Celeron T3100 (1.9 GHz) |
| CPU cores | 1 | 2 |
| L2 cache | 1 MB | |
| Dual-channel 800 MHz DDR2 RAM, standard | 1 GB (1 x 1 GB) | |
| Dual-channel 800 MHz DDR2 RAM, maximum | 4 GB (1 x 4 GB) | |
| Hard drive (standard option), minimum | 80 GB (or Greater) SATA (5400 rpm) | |

| | |
|---|---|
| 10/100/1000BASE-TX (Gigabit) Ethernet ports | 1 |
| Hi-Speed USB ports | 2 |
| Serial port (RS232) | |
| Parallel port | |
| Watchdog/trigger SMB | |
| Installed OS [1] | Windows 7 Professional, Windows Vista Business, Windows XP Professional for Embedded Systems[2] |

[1]Contact National Instruments or visit ni.com/pxiadvisor for information on other available operating systems.

[2]Due to the Microsoft support life cycle for Windows XP, National Instruments will be unable to provide PXI embedded controllers with Windows XP preinstalled after 2015. View the Microsoft support life cycle for full details about Windows XP end of life for OEM partners.

*Table 1. NI PXI-8101 and NI PXI-8102 Features*

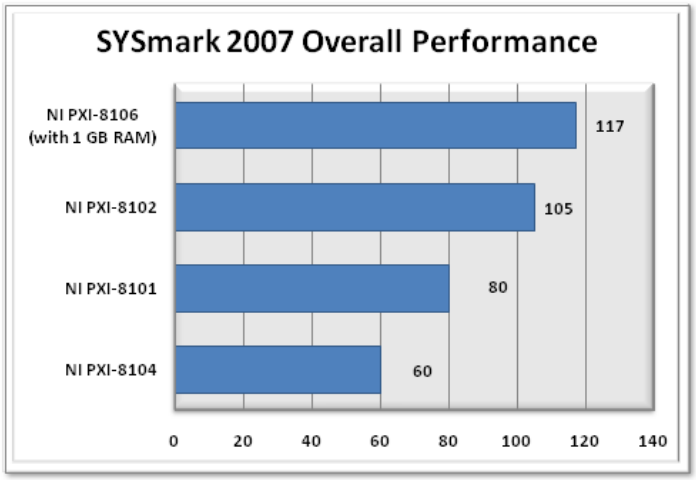



*Figure 1. Embedded Controller Benchmarks*

### Hardware

With state-of-the-art packaging, the PXI-8101 and PXI-8102 integrate Intel processors and all standard and extended PC I/O ports into a single unit. By integrating many I/O ports on the controller, all active slots in the chassis remain available for measurement and control modules. This rugged one-piece controller design minimizes integration issues and eliminates the need for complex cabling to daughter boards. The PXI-8101 block diagram is shown in Figure 2.

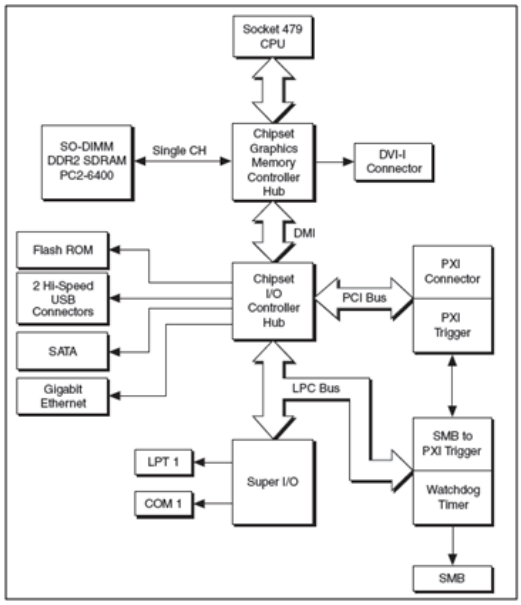



*Figure 2. NI PXI-8101 Block Diagram*

### Peripheral I/O

These controllers include high-performance peripheral I/O such as 10/100/1000BASE-TX (Gigabit) Ethernet and two Hi-Speed USB ports for connection to a keyboard, a mouse, a CD-ROM/DVD-ROM drive for software installation, or other standard PC peripherals such as speakers, printers, or memory sticks. Use the IEEE 1284 ECP/EPP parallel port to connect to a wide variety of devices, including tape backup drives, printers, and scanners. An RS232 port is available for connecting to serial devices.

### Memory

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The PXI-8101 and PXI-8102 use 800 MHz DDR2 SDRAM, which makes the controllers ideal for data-intensive applications requiring significant analysis. They have a single SO-DIMM socket for the DDR2 SDRAM. 1 GB (1 x 1 GB DIMM) of RAM is standard with upgrade options to 4 GB.

| Memory Options | Configuration | Part Number |
|---|---|---|
| Standard - 1 GB | 1 x 1 GB DIMM | N/A |
| 2 GB | 1 x 2 GB DIMM | 780446-2048 |
| Recommended - 4 GB | 1 x 4 GB DIMM | 780446-4096 |

*Table 2. Memory Upgrade Options*

### Video

The PXI-8101 and PXI-8102 include a Mobile Intel GM45 Express Chipset (Graphics and Memory Controller Hub) that has an integrated graphics processing unit. It delivers intense, realistic 3D graphics with sharp images, fast rendering, smooth motion, and high detail, without the need for an additional video card or peripheral. This unique architecture provides balanced memory usage between graphics and the system for optimal performance. Additionally, the PXI-8101 and PXI-8102 feature a DVI-I video connector that is compatible with digital (DVI) and analog video (VGA) monitors. A DVI-I to VGA adapter is included with the controller for use with VGA monitors.

### Dual Monitor Support

The DVI-I video port on the PXI-8101 and PXI-8102 is capable of supporting simultaneous DVI and VGA outputs. With this built-in capability, you can connect a digital and an analog monitor to your PXI system at the same time with independent displays. This negates the need for a separate PXI or CompactPCI video module to connect two monitors to your PXI system. A DVI-I (male) to DVI-D (female) and VGA (female) splitter is required for connecting the two monitors.

### Hard-Drive-Based Recovery Image

PXI-8101 and PXI-8102 embedded controllers are shipped with a factory image of the software installation stored on a separate partition of the hard drive. In the case of software corruption, you can invoke a recovery tool during the controller's boot-up process that can use this backup image to restore the controller to its shipping software configuration. You also can use this recovery tool to create custom images that you can store on external mass storage devices such as a USB memory stick, USB hard drives, and USB CD/DVD drives. With this ability, you can create custom backup images that you can use to either recover the specific embedded controller or replicate the installation on other similar controllers. For more information on this tool, refer to KnowledgeBase 2ZKC02OK.

### Software

The PXI-8101 and PXI-8102 come with the following minimum set of software already installed:

- Microsoft Windows OS (contact National Instruments or visit ni.com/pxiadvisor for a list of available Microsoft OSs and for localized versions)
- NI-VISA and NI-488.2 drivers
- Drivers for all built-in I/O ports

With an NI system assurance program (base or standard) added to your PXI system order, your embedded controller is shipped already configured with all software and drivers applicable for your system. For example, assume you order a PXI system that includes NI LabVIEW and NI TestStand software, as well as data acquisition modules, a digitizer, an arbitrary waveform generator, and a digital multimeter (DMM). With an NI system assurance program, NI not only assembles and tests your system but also fully configures the embedded controller with the appropriate NI-DAQmx, NI-SCOPE, NI-FGEN, and NI-DMM drivers, as well as LabVIEW and NI TestStand.

Additionally, your embedded controller is configured with a customized hard-drive-based recovery image, so you can restore your controller to the as-shipped configuration at any time. This combination of software configuration and recovery tools provides both a productive and reliable development experience with your PXI system out of the box. To configure a complete PXI system with an NI system assurance program, contact National Instruments or visit ni.com/pxiadvisor.

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## Ordering Information

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

| Products | Part Number | Recommended Accessories | Part Number |
|---|---|---|---|
| **Hard-Drive Spare/Replacement and Upgrades** | | | |
| **250 GB 2.5 in MLC SATA Solid State Hard Drive Upgrade** | 781945-01 | No accessories required. | |
| **32 GB 2.5 in SATA Solid State Hard Drive Upgrade** | 779175-08 | No accessories required. | |
| **500 GB 2.5 in SATA Hard Drive Upgrade** | 781946-01 | No accessories required. | |
| **60 GB (or Greater) 2.5 in SATA Blank HDD Spare/Replacement** | 779175-03 | No accessories required. | |
| **NI PXI-8102** | | | |
| **NI PXI-8102 Windows Vista** | 781149-02 | No accessories required. | |
| **NI PXI-8102 Windows XP** | 781149-01 | No accessories required. | |
| **NI PXI-8101** | | | |
| **NI PXI-8101 Windows XP** | 780955-01 | No accessories required. | |
| **NI PXI-8101 Windows Vista** | 780955-02 | No accessories required. | |
| **Other Accessories** | | | |
| **USB English keyboard and optical mouse** | 779660-01 | No accessories required. | |
| **NI PMA-1115: Portable PXI Monitor and English Keyboard Accessory** | 780215-01 | No accessories required. | |

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| | | |
|---|---|---|
| **NI FPT-1015 (flat panel touch screen with VGA interface and USB)** | 779560-01 | No accessories required. |
| **NI FPM-1019 (19 in. widescreen flat panel monitor, DVI input)** | 781002-01 | No accessories required. |
| **NI FPM-1017 (17 in. flat panel monitor)** | 779559-01 | No accessories required. |
| **NI MKD-1117 (rack-mount 1U LCD monitor, keyboard, mouse drawer)** | 779872-01 | No accessories required. |
| **ExpressCard strain-relief accessory for embedded controllers** | 192524-01 | No accessories required. |
| **Micro-GPIB to GPIB cable (2 m)** | 183285-02 | No accessories required. |
| **Micro-GPIB to GPIB cable (1 m)** | 183285-01 | No accessories required. |
| **External USB floppy drive** | 778492-02 | No accessories required. |
| **USB-to-dual-PS/2 keyboard/mouse adapter cable** | 778713-02 | No accessories required. |
| **DVI-I (male) to DVI-D (female) and VGA (female) splitter** | 780868-01 | No accessories required. |
| **External USB CD-ROM/DVD-ROM drive** | 778492-01 | No accessories required. |
| **Micro-GPIB to GPIB adapter cable (0.2 m)** | 183285-0R2 | No accessories required. |
| **Parallel port adapter cable (6 in.)** | 777169-01 | No accessories required. |

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## 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

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- **Course kits** - lowest-cost, self-paced training that you can use as reference guides.
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### 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.

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## Detailed Specifications

This topic lists the electrical, mechanical, and environmental specifications of the NI PXI-8101/8102 embedded computer.

### Features

| NI PXI-8101/8102 | |
|---|---|
| CPU—NI PXI-8101 | Intel® Celeron® Processor 575 (2.00 GHz single core processor), 667 MHz FSB |
| CPU—NI PXI-8102 | Intel® Dual-Core Celeron® T3100 (1.9 GHz dual core processor), 800 MHz FSB |
| On-die L2 cache | 1 MB |
| DDR2 RAM, PC2 6400 | 1 GB Standard, 4 GB Maximum |
| Hard Drive | 80 GB Serial ATA, minimum |
| Ethernet | 10/100/1000 BaseTX |
| Serial Ports (RS-232) | Yes (1) |
| Parallel Port | Yes (1) |
| Hi-Speed USB (2.0) Ports | Yes (2) |
| PS/2 Keyboard/Mouse Connector | No |
| PXI Trigger Bus Input/Output | Yes |
| Installed Operating System | Windows Vista Business, Windows Vista Business downgraded to Windows XP Professional |

### Electrical

| NI PXI-8101 | | |
|---|---|---|
| **Voltage (V)** | **Current (Amps)** | |
| | **Typical** | **Maximum** |
| +3.3 V | 2.25 A | 3.60 A |
| +5 V | 3.50 A | 6.60 A |
| +12 V | 0.001 A | 0.075 A |
| –12 V | 0 A | 0 A |
| **Note** Does not include any attached USB devices. | | |

| NI PXI-8102 | | |
|---|---|---|
| **Voltage (V)** | **Current (Amps)** | |
| | **Typical** | **Maximum** |
| +3.3 V | 2.50 A | 4.80 A |
| +5 V | 4.00 A | 7.80 A |
| +12 V | 0.001 A | 0.075 A |
| –12 V | 0 A | 0 A |
| **Note** Does not include any attached USB devices. | | |

### Physical

| | |
|---|---|
| Board dimensions | 2-slot 3U PXI module 4.0 cm × 13.0 cm × 21.6 cm (1.59 in. × 5.14 in. × 8.51 in.) |
| Slot requirements | One system slot plus one controller expansion slot |
| Compatibility | Fully compatible with PXI specification |
| Weight | 0.645 kg (1.42 lb) typical |

### Environment

| | |
|---|---|
| Maximum altitude | 2,000 m (at 25 °C ambient temperature) |
| Pollution Degree | 2 |

Indoor use only.

### Operating Environment

| | |
|---|---|
| Ambient temperature [1] | 5 to 50 °C [2], [3] (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.) |
| Relative humidity | 10% to 90%, noncondensing (Tested in accordance with IEC-60068-2-56.) |

**Caution** Clean the NI PXI-8101/8102 with a soft nonmetallic brush. Make sure that the device is completely dry and free from contaminants before powering-on the controller again.

### Storage Environment

| | |
|---|---|
| Ambient temperature | –40 to 65 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2.) |
| Relative humidity | 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 $g_{rms}$ (with solid-state hard drive) |
| 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.) |

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

### Safety Standards

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

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 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 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

**Note** For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.

**Note** For EMC compliance, operate this device with shielded cables.

### CE Compliance CE

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

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; 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, search by module number or product line, and click the appropriate link in the Certification column.

### Environmental Management

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For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

#### Waste Electrical and Electronic Equipment (WEEE)

**EU Customers** At the end of the product life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.htm.


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(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

### Battery Replacement and Disposal



**Battery Directive** This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit ni.com/environment/batterydirective.

[1] For chassis that are not available in the online catalog at ni.com, contact National Instruments for supported operating temperatures.

[2] 5 to 40 °C for the PXI-1000B DC.

[3] Processor should not throttle CPU frequency under reasonable, worst case processor work loads in high operating temperatures.

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