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Requirements and Compatibility | Ordering Information | Detailed Specifications
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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

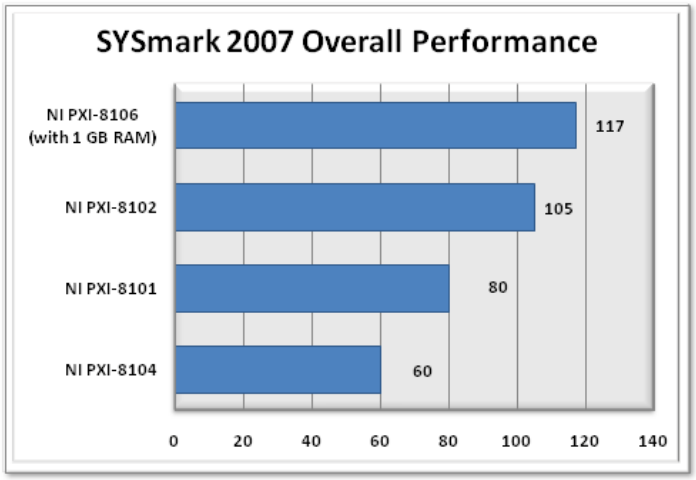

Figure 1. Embedded Controller Benchmarks

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.

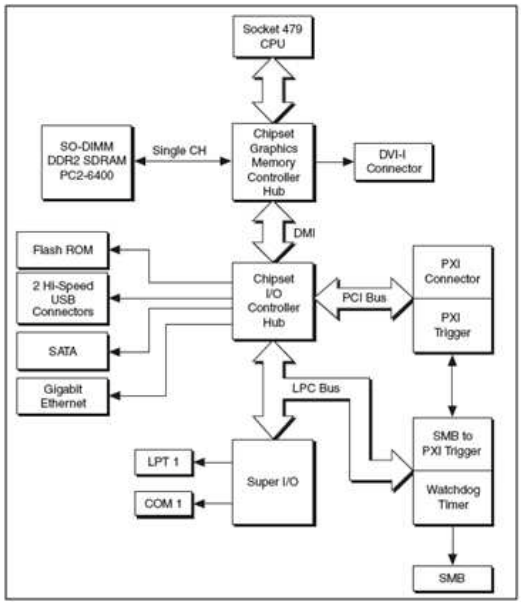

Figure 2. NI PXI-8101 Block Diagram

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

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.	

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

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.

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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

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

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.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户　National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。
关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。
(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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