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For user manuals and dimensional drawings, visit the product page resources tab on ni.com.

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NI PXIe-8820 RT

- 2.2 GHz dual-core Intel Celeron 1020E processor
- Up to 40 percent higher performance than the NI PXI-8102 RT
- Up to 1 GB/s system bandwidth and 250 MB/s slot bandwidth (four x1 PCI Express links)
- 2 GB 1333 MHz DDR3L RAM standard, 8 GB maximum
- 1 Gigabit Ethernet, 4 Hi-Speed USB, serial, and other I/O
- Execution target for NI LabVIEW Real-Time Version 2012.1 or later
- Reliable and deterministic operation
- Complete PXI system configuration at ni.com/pxiadvisor

Overview

National Instruments RT Series PXI embedded controllers deliver a flexible, rugged platform for your deterministic, real-time measurement and control applications. NI PXIe-8820 RT controllers, featuring the latest Intel dual-core processor, 2 GB standard RAM, 1333 MHz DDR2 memory, and 1 GB/s total system bandwidth, offer an ideal balance of performance and value for real-time test and control applications. You develop your NI LabVIEW application with the LabVIEW Real-Time Module on Windows OS and download the program to your PXI real-time controller via Ethernet. LabVIEW Real-Time applications running on PXI systems achieve millisecond loop rates with only 3 µs to 4 µs of system jitter. These real-time measurement and control systems capitalize on Intel processors combined with the advanced timing, triggering, and I/O synchronization benefits of PXI. Furthermore, NI measurement services software extends the timing capabilities of PXI to deliver tight integration with LabVIEW Real-Time applications through operations such as hardware-timed software loops.

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Application and Technology

NI PXIe-8820 RT Features

CPU	Intel Celeron 1020E, 2.20 GHz dual-core processor
L2 Cache	2 MB
Single-channel 1333 MHz DDR3 RAM, standard	2 GB (1 x 2 GB)
Single-channel 1333 MHz DDR3 RAM, maximum	4 GB (1 x 4 GB)
Hard drive (standard option), minimum	250 GB SATA (5400 rpm)
Hard drive (extended temperature and 24/7 option), minimum	80 GB SATA (5400 rpm)
10/100/1000BASE-TX (Gigabit) Ethernet ports	1
USB ports	4
Serial port (RS232)	1
Parallel port	1

Table 1. NI PXIe-8820 RT Features

Run Parallel Tasks on Separate Processor Cores

The LabVIEW Real-Time Module takes advantage of the available cores on the Intel processor to increase performance and determinism for large real-time test and control applications. You can either explicitly assign certain tasks to run on specific cores of the processor or let the real-time OS manage this assignment for you.

In-ROM Memory and Hard-Drive Diagnostics

To improve the serviceability of the NI PXIe-8820 RT, you can quickly access in-ROM diagnostics for the hard drive and memory without requiring external third-party tools. By running these diagnostics, the results of analysis can determine if replacement of the hard drive or memory is required. The design of the controller allows for quick field replacement of critical components such as the hard drive and the memory without affecting the warranty. To ease the process of buying spare components, you can purchase hard drive and memory upgrades with the NI PXIe-8820 RT. The combination of this and the in-ROM diagnostics significantly improves NI PXIe-8820 RT serviceability.

Connect to Any I/O

The modularity of PXI and open development environment of LabVIEW make it easy to integrate a variety of I/O within your application. Create a custom real-time embedded solution using an NI PXIe-8115 RT with any number and combination of PXI/CompactPCI plug-in modules. With built-in LabVIEW libraries, you can create applications with DAQ, dynamic signal acquisition, motion control, image acquisition, reconfigurable I/O, and instrumentation. Communicate with peripheral devices through CAN, GPIB, Ethernet, or serial protocols. And use NI-VISA to integrate third-party PXI/CompactPCI modules into your application.

In addition, the NI PXIe-8820 RT controller includes an external SMB connection for use as a trigger input, output, or watchdog timer. Use the external SMB to pass trigger and timing signals into and out of the PXI trigger bus in your system.

Create Reliable Stand-Alone Systems

To ensure reliable operation, embedded LabVIEW Real-Time applications continue to run even if the host PC is interrupted or rebooted. Because the NI PXIe-8820 RT embedded controller runs in a separate chassis with a dedicated power supply, the operator can shut down the host computer entirely without disrupting the real-time program.

For stand-alone operation, you can embed code in the system so that it starts automatically when the system boots, requiring no human interaction. Use the LabVIEW Professional Development System and LabVIEW Real-Time Module to compile your LabVIEW application into an executable and download it to your NI PXIe-8820 RT controller.

Extended Temperature and 24/7 Operation Options

You can choose from several hard drive options for your NI PXIe-8820 RT to address different environmental and usage conditions. To achieve extended temperature and 24/7 operation, select a solid-state drive (SSD) that is designed for both reliability in low- and high-temperature environments and 24/7 operation. Rotating disk drives give the controller an operating temperature of 5 °C to 50 °C and a storage temperature of -40 °C to 65 °C. Controllers with extended temperature SSDs have an operating temperature of 0 °C to 55 °C and a storage temperature of -40 °C to 70 °C.

You can also use the extended temperature and 24/7 operation for applications that require continuous operation for up to 24 hours a day, seven days a week because the hard drive is rated for 24/7 operation. The hard drive in the standard version of the controller is designed to be powered on for eight hours a day, five days a week. Additionally, 24/7 operation applications may subject the hard drive to a high-duty cycle (the percentage of the maximum sustained throughput of the hard drive). The hard drive in the extended temperature and 24/7 operation version has a capacity of 80 GB (minimum). See specifications for further details.

Memory

The NI PXIe-8820 RT uses single-channel 1333 MHz DDR3 SDRAM, which makes the controller ideal for data-intensive applications requiring significant analysis. It features a single SO-DIMM socket for the DDR3 SDRAM and a standard 2 GB (1 x 2 GB DIMM) of RAM with upgrade options to 4 GB.

Memory Options	Configuration	Part Number	
		Included in Kit	Additional P/N Required
Standard - 2 GB	1 x 2 GB DIMM	1 x 2 GB DIMM	N/A
4 GB	1 x 4 GB DIMM	N/A	Add 1 x 781404-4096

Table 2. Memory Upgrade Options

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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.

Calibration

NI measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of your measurement hardware, NI offers basic or detailed recalibration service that provides ongoing ISO 9001 audit compliance and confidence in your measurements. To learn more about NI calibration services or to locate a qualified service center near you, contact your local sales office or visit ni.com/calibration.

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.

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