Technical Sales

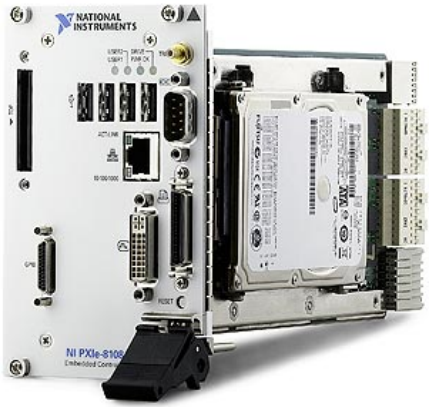
(866) 531-6285
orders@ni.com

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

Last Revised: 2014-11-06 07:14:09.0

2.53 GHz Intel Core 2 Duo Real-Time Embedded Controllers for PXI Express

NI PXIe-8108 RT



- Intel Core 2 Duo T9400 processor (2.53 GHz dual core)
- 1 GB (1 x 1 GB DIMM) dual-channel 800 MHz DDR2 RAM standard, 4 GB (1 x 4 GB DIMM) maximum
- Up to 30 percent faster PID performance than NI PXIe-8130 RT
- Execution target for NI LabWindows/CVI Real-Time 9.0 or later applications
- Execution target for NI LabVIEW Real-Time Version 8.6.1 or later applications
- Execution target for NI LabVIEW Real-Time or LabWindows™/CVI Real-Time applications
- Reliable and deterministic operation and Ethernet control of PXI
- Watchdog timer
- 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. The NI PXIe-8108 RT controller with its 2.53 GHz dual-core processor offers a high-performance platform that is ideal for real-time test and control applications. You develop your LabVIEW application with the LabVIEW Real-Time Module on Windows and download the program to your NI PXIe-8108 RT controller via Ethernet. The embedded code executes on a real-time OS. Thus, you use the powerful and flexible development tools of LabVIEW to build reliable, real-time solutions.

LabVIEW Real-Time applications running on PXI systems achieve millisecond loop rates with only 3 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.

Back to Top

Requirements and Compatibility

Software Compatibility

- LabVIEW Real-Time Module
- LabWindows/CVI Real-Time Module

Back to Top

Application and Technology

NI PXIe-8108 RT Features

CPU	Intel Core 2 Duo T9400 processor (2.53 GHz dual core)
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)
PXI Express 4-link configuration	Four x1 links
Hard drive (standard option), minimum	80 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
Hi-Speed USB ports	4
GPIB (IEEE 488) controller	
Serial port (RS232)	
Parallel port	
ExpressCard/34 slot	
Watchdog/trigger SMB	

Table 1. NI PXIe-8108 RT Features

Run Parallel Tasks on Separate Processor Cores
The LabVIEW Real-Time Module takes advantage of the dual 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 operating system manage this assignment for you.

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-8108 RT embedded controller with any number and combination of PXI/CompactPCI plug-in modules. Built-in LabVIEW libraries help you create applications with data acquisition, dynamic signal acquisition, motion control, image acquisition, reconfigurable I/O, and instrumentation. Communicate with peripheral devices through CAN, GPIB, Ethernet, or serial protocols. Use NI-VISA to integrate third-party PXI/CompactPCI modules in your application. In addition, the NI PXIe-8108 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-8108 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-8108 RT controller.

Dual-Boot Option
You can configure NI PXI embedded controllers to boot into Windows or the real-time OS. NI Measurement & Automation Explorer (MAX) includes features for installing and configuring PXI embedded controllers as LabVIEW Real-Time targets. The controllers use a hardware switch or BIOS setting to boot into the desired OS.

The result is a PXI embedded controller that can run embedded LabVIEW Real-Time or Windows applications. When the controller is in real-time mode, you need another Windows computer to develop and debug the LabVIEW Real-Time code for the PXI controller. To enable a Windows PXI embedded controller to dual boot with the real-time OS, you must purchase the LabVIEW Real-Time embedded deployment software for the controller.

Extended Temperature and 24/7 Operation Option
The NI PXIe-8108 RT embedded controller is available in two versions to address different environmental and usage conditions. The primary difference is that the version for extended temperature and 24/7 operation uses a different hard drive, designed for both reliability in low and high temperature extremes and 24/7 operation. The standard version of the controllers has an operating temperature of 5 to 50 °C and a storage temperature of -40 to 65 °C. The extended temperature and 24/7 operation version has an operating temperature of 0 to 55 °C and a storage temperature of -40 to 71 °C.

You can also use the extended temperature and 24/7 operation version for applications that require continuous operation for up to 24 hours/day, seven days/week because the hard drive is rated for 24/7 operation. The hard drive in the standard version of the controllers is designed to be powered on for eight hours/day, five days/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 standard version of the controllers is designed for a 20 percent duty cycle. The hard drives that are used in the extended temperature and 24/7 operation version and the standard version have a capacity of 80 GB (minimum) with a SATA interface.

				Loop Rate (kHz)	
Benchmark	**Processing**	**Channels**	**DAQ I/O Mode**	**NI PXIe-8108 RT**	**NI PXIe-8130 RT**
Analog I/O	PID	1	Polling	104	93
Analog I/O	PID	1	Interrupt	33	28
Analog I/O	PID	4	Polling	63	64
Analog I/O	PID	4	Interrupt	26	16
Analog I/O	PID	16	Polling	31	30
Analog I/O	PID	16	Interrupt	24	14

Table 2. Maximum loop rates for LabVIEW Real-Time PXI systems are shown. All benchmarks use the LabVIEW Real-Time Module Version 8.6 with NI-DAQmx Version 8.9. Benchmarks were revised to adhere to the architecture recommended by NI for symmetric multiprocessing-enabled systems. Benchmarks that do not test network performance run on a headless target without a direct Ethernet connection for maximum performance. Benchmarks that do test network performance use interrupt-mode Ethernet via a direct connection between the host PC and real-time target with a crossover cable. Visit ni.com or contact National Instruments for additional benchmarks.

Back to Top

Ordering Information

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

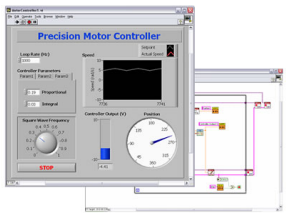
Products	Part Number	Recommended Accessories	Part Number
Hard-Drive Spare/Replacement and Upgrades			
500 GB 2.5 in SATA Hard Drive Upgrade	781946-01	No accessories required.	
250 GB 2.5 in MLC SATA Solid State Hard Drive Upgrade	781945-01	No accessories required.	

60 GB (or Greater) 2.5 in SATA Blank HDD Spare/Replacement	779175-03	No accessories required.
32 GB 2.5 in SATA Solid State Hard Drive Upgrade	779175-08	No accessories required.
80 GB (or Greater) 2.5 in SATA Ext. Temp, 24/7 Hard Drive Upgrade	779175-07	No accessories required.
Other Accessories		
IEEE 1284 Parallel Port Cable Adapter, 6 in.	777169-01	No accessories required.
X13 GPIB Cable, MicroD25 to Shielded cable/Standard connector, 2M	183285-02	No accessories required.
USB to Dual PS2 Keyboard/Mouse Adapter Cable	778713-02	No accessories required.
USB English Keyboard and Optical USB Mouse	779660-01	No accessories required.
NI PXIe-8108 RT Products		
NI PXIe-8108 Core 2 Duo 2.53 GHz, Real-Time Embedded SW	781033-33	No accessories required.
NI PXIe-8108 Core 2 Duo 2.53 GHz, Real-Time Emb SW, ExTemp, 24/7	781034-33	No accessories required.

Back to Top

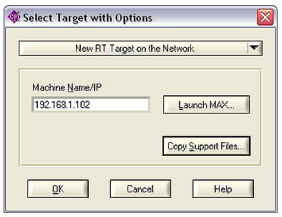
Software Recommendations

NI LabVIEW Real-Time Module



- Design deterministic real-time applications with LabVIEW graphical programming
- Download to dedicated NI or third-party hardware for reliable execution and a wide selection of I/O
- Take advantage of built-in PID control, signal processing, and analysis functions
- Automatically take advantage of multicore CPUs or set processor affinity manually
- Includes real-time OS, development and debugging support, and board support
- Purchase individually or as part of a LabVIEW suite

NI LabWindows™/CVI Real-Time Module



- Develop real-time applications in the LabWindows/CVI integrated development environment
- Deploy to dedicated real-time hardware for reliable, deterministic performance
- Use built-in PID control functions or create your own control algorithms
- Remotely debug real-time applications
- Use commercial off-the-shelf I/O, including data acquisition, modular instruments, and CAN

Back to Top

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.

- **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.

Back to Top

Detailed Specifications

This topic lists the electrical, mechanical, and environmental specifications of the NI PXIe-8108 embedded controller.

Features

NI PXIe-8108	
CPU	Intel® Core™ 2 Duo processor T9400 (2.53 GHz dual core processor), 1066 MHz FSB
On-die L2 cache	6 MB
Single-Channel DDR2 RAM, PC2 6400	1 GB Standard, 4 GB Maximum
Hard Drive	80 GB Serial ATA, minimum [1] [2]
Ethernet	10/100/1000 BaseTX
PXI Express 4 Link Configuration	x1, x1, x1, x1
PXI Express 2 Link Configuration	x1, x1
GPIB (IEEE 488 Controller)	Yes
Serial Ports (RS-232)	Yes (1)
Parallel Port	Yes (1)
Hi-Speed USB (2.0) Ports	Yes (4)
ExpressCard/34 Slot	Yes
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

Voltage (V)	Current (Amps)	
	Typical	Maximum
+3.3 V	2.25 A	3 A
+5 V	1.25 A	1.8 A
+12 V	2 A	2.8 A
–12 V	0 A	0 A
+5 V Aux	.330 A	.400 A

Note Does not include any attached USB devices or ExpressCard.

Physical

Board dimensions	Four-wide 3U PXI Express module
Slot requirements	One system slot plus three controller expansion slots
Compatibility	Fully compatible with *PXI Express Specification* 1.0
Weight	0.983 Kg (2.17 lb) typical

Environment

Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

Caution Clean the NI PXIe-8108 with a soft nonmetallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

Operating Environment

NI PXIe-8108	
Ambient temperature range	5 to 50 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 high temperature limit.)
NI PXIe-8108 Extended Temperature Option	
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.)
Relative humidity range	10% to 90%, noncondensing (Tested in accordance with IEC-60068-2-56.)

Caution The operating temperature must not be exceeded, even when used in a chassis with a higher temperature range.

Storage Environment

NI PXIe-8108	
Ambient temperature range	–40 to 65 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit.)
NI PXIe-8108 Extended Temperature Option	
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

Operating 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} (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

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] Extended-temperature 24/7 option provides 80 GB minimum SATA hard drive.

[2] Controllers configured for LabVIEW RT provide a 80 GB (minimum) SATA hard drive.

Back to Top

©2010 National Instruments. All rights reserved. CompactRIO, CVI, FieldPoint, LabVIEW, National Instruments, National Instruments Alliance Partner, NI, ni.com, NI-DAQ, and NI TestStand are trademarks of National Instruments. The mark LabWindows is used under a license from Microsoft Corporation. Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Other product and company names listed are trademarks or trade names of their respective companies. A National Instruments Alliance Partner is a business entity independent from National Instruments and has no agency, partnership, or joint-venture relationship with National Instruments.

My Profile | RSS | Privacy | Legal | Contact NI © 2014 National Instruments Corporation. All rights reserved.