

2.3 GHz Dual-Core Real-Time Embedded Controller for PXI Express

NI PXIe-8130 RT **NEW!**

- AMD Turion 64 X2 processor (2.3 GHz dual core)
- 1 GB (1 x 1 GB DIMM) dual-channel RAM standard
- Extended temperature and 24/7 operation mode, standard
- Execution target for NI LabVIEW Real-Time or LabWindows™/CVI Real-Time applications
- Reliable and deterministic operation
- Ethernet control of PXI
- Multicore enabled
- About 10 percent slower PID loop rates than PXI-8106 RT
- 82 kHz single PID loop rate, maximum

Development System Requirements (Windows)

- LabVIEW
- LabVIEW Real-Time Module
- LabWindows/CVI (contact NI)

Deployment Software (included)

- LabVIEW Real-Time embedded software

PXI System Configuration

- 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 high-performance NI PXIe-8130 RT is the first National Instruments embedded controller based on PXI Express. You can develop your LabVIEW application with the LabVIEW Real-Time Module on Windows and download the program to your NI PXIe-8130 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 microsecond loop rates with only 3 to 4 ns of system jitter. These real-time measurement and control systems capitalize on the latest 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.

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-8130 RT with any number and combination of PXI/CompactPCI plug-in modules. With built-in LabVIEW libraries, you can 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. And use NI-VISA to integrate third-party PXI/CompactPCI modules into your application.

In addition, the NI PXIe-8130 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.

Run Parallel Tasks on Separate Processor Cores

The LabVIEW Real-Time Module takes advantage of the available dual cores on the AMD 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.

CPU	AMD Turion 64 X2 Processor (2.3 GHz Dual Core)
Dual-channel 667 MHz DDR2 RAM, standard	1 GB (1 x 1 GB)
Dual-channel 667 MHz DDR2 RAM, maximum	2 GB (2 x 1 GB)
Storage, hard drive	40 GB PATA ¹
Storage, solid state	Optional ²
PXI Express 4-link configuration	4 x 4 links
10/100/1000BASE-TX (Gigabit) Ethernet	✓
GPIB (IEEE 488) controller	✓
Serial port (RS232)	✓
Parallel port	✓
Hi-Speed USB ports	4
ExpressCard/34 slot	✓
Watchdog/trigger SMB	✓

¹40 GB PATA hard drive for extended temperature and 24/7 operation.

²Optional 512 or 128 MB solid-state drive can replace the hard drive.

Table 1. NI PXIe-8130 RT Features

2.3 GHz Dual-Core Real-Time Embedded Controllers for PXI Express

Benchmark	Processing	Channels	DAQ I/O Mode	Loop Rates (kHz)	
				NI PXIe-8130	NI PXI-8106
Analog Input and Output	None	1	Polling	82.0	86.6
	PID	1	Polling	74.6	85.5
	PID	1	Interrupt	34.7	37.5
	Local Logging	1	Interrupt	66.9	76.9
	Host Communication	1	Interrupt	72.2	67.3
	None	16	Polling	24.4	28.9
	PID	16	Polling	22.5	26.4
	PID	16	Interrupt	26.4	15.7
	Local Logging	16	Interrupt	25.1	28.2
	Host Communication	16	Interrupt	22.0	25.3

Table 2. Maximum loop rates for LabVIEW Real-Time PXI/PXI Express systems are shown. (All benchmarks use LabVIEW 8.5 Real-Time Module with NI-DAQmx 8.5. Processors for both the controllers were used in the dual-core mode. 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.

Create Reliable Stand-Alone Systems

To ensure reliable operation, embedded LabVIEW applications continue to run even if the host PC is interrupted or rebooted. Because the NI PXIe-8130 RT embedded controller runs in a separate chassis with a dedicated power supply, you 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-8130 RT controller.

Dual-Boot Option

You can configure NI PXI embedded controllers to boot into Windows or the LabVIEW 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

An NI 8130 embedded controller comes standard with the extended temperature and 24/7 operation mode. It uses a rugged hard drive designed for both reliability in low- and high-temperature extremes and continuous operation. An NI 8130 has an operating temperature of 0 to 55 °C and a storage temperature of -40 to 71 °C.

You can also use the NI PXIe-8130 RT for applications that require continuous operation for up to 24 hours/day, seven days/week because the hard drive is rated for such operation. Standard hard drives are designed to be powered on for eight hours/day, five days/week. The hard drive used in the NI PXIe-8130 RT controller is rated for continuous operation and exposure to high duty cycles (the percentage of the maximum sustained throughput of the hard drive). This makes the controller suitable for a large variety of applications and deployment conditions.

Ordering Information

To order a complete PXI system based on a LabVIEW Real-Time embedded controller, visit ni.com/pxiadvisor.

Controller Model

NI PXIe-8130 RT

Extended Temperature and 24/7 Operation (standard)780032-33

Memory Upgrades

Standard: 1 GB (1 x 1 GB DIMM)

Recommended upgraded memory configurations:

2 GB (1 x 1 GB DIMM must be purchased)

1 GB DDR2 DIMM RAM.....780031-1024

Select Solid-State Storage Options

Solid-state HDD, 128 M.....779175-128

Solid-state HDD, 512 M.....779175-512

Select Accessories

Micro-GPIB to GPIB cable, 0.2 m183285-0R2

Micro-GPIB to GPIB cable, 1 m183285-01

Micro-GPIB to GPIB cable, 2 m183285-02

NI PXI-8252 IEEE 1394 interface module.....778925-01

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to ni.com/pxi.

2.3 GHz Dual-Core Real-Time Embedded Controllers for PXI Express

Specifications

Specifications subject to change without notice.

Features

Processor	AMD 2.3 GHz Turion 64 X2
Chipset	nVIDIA MCP55 Pro
System Memory (RAM).....	1 GB dual-channel DDR2 RAM PC2 5300 (standard) 2 GB dual-channel DDR2 RAM PC2 5300 (maximum)
Ethernet.....	10/100/1000BASE-TX, RJ45 connector
Hard Drive	
Extended Temperature and 24/7 Operation.....	40 GB minimum, internal 2.5 in., 9.5 mm Fast Ultra ATA100 interface
Video	ATI Radeon X300 Embedded GPU
Serial	1 (RS232)
Parallel	IEEE 1284 Type C miniature connector (adapter cable not included)
GPIO	PCI-GPIO/TNT, micro D25 connector IEEE 488 and HS488 transfers
Hi-Speed USB	4

PXI Express Link Configurations

PXI Express 4-link configuration 4 x4 links

Power Requirements

Voltage (V)	Current (A)	
	Typical	Maximum
+3.3 V	1.80	3.90
+5 V	3.50	4.70
+12 V	2.75	4.00
-12 V	0.00	0.00
+5 V _{Aux}	0.35	0.70

Physical

Board dimensions	4-slot 3U PXI Express module
Slot requirements	1 system slot plus 3 controller expansion slots
Compatibility	Fully compatible with PXI Express Specification 1.0
Weight.....	0.98 kg (2.15 lb) typical

Environment

Maximum altitude.....	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution degree	2
For indoor use only.	

Operating Environment

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)

Storage Environment

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)

Safety Compliance

- IEC 61010-1, EN 61010-1
- UL 61010-01, CSA 61010-1

Electromagnetic Compatibility

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

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)

Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.

Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit ni.com/training.

Professional Services

Our NI Professional Services team is composed of NI applications and systems engineers and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and

integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.



OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit ni.com/ssp.

Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with ni.com/pxiadvisor.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit ni.com/calibration.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit ni.com/services.



ni.com • 800 813 3693

National Instruments • info@ni.com



351508C-01

2008-9745-501-101-D