

# High-Bandwidth, 2.3 GHz Dual-Core Embedded Controller for PXI Express

## NI PXIe-8130 **NEW!**

- AMD Turion 64 X2 processor (2.3 GHz dual core)
- Up to 4 GB/s system bandwidth, up to 1 GB/s slot bandwidth
- 1 GB (1 x 1 GB DIMM) dual-channel 667 MHz DDR2 RAM standard, 2 GB (2 x 1 GB DIMMs) maximum
- 10/100/1000BaseTX Ethernet
- 4 Hi-Speed USB ports
- ExpressCard/34 slot
- DVI-I video connector
- GPIB (IEEE 488) controller
- RS232 serial port
- IEEE 1284 ECP/EPP parallel port
- Integrated hard drive
- Internal PXI trigger bus routing
- Watchdog timer

### Software

- OS and drivers already installed
- Hard-drive-based recovery image

### PXI System Configuration

- Complete PXI system configuration at [ni.com/pxiadvisor](http://ni.com/pxiadvisor)



## Overview

The National Instruments PXIe-8130 is a high-performance AMD Turion 64 X2 processor-based embedded controller for use in PXI Express systems. With the 2.3 GHz dual-core processor, dual-channel 667 MHz DDR2 memory, the NI PXIe-8130 is ideal for modular instrumentation and data acquisition applications.

CPU	AMD Turion 64 X2 Processor (2.3 GHz Dual Core)
L2 cache	512 KB x 2 (512 KB per core)
System bandwidth	Up to 4 GB/s
Slot bandwidth	Up to 1 GB/s
PXI Express 4-link configuration	4 x4 links
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)
Hard drive, minimum	60 GB SATA <sup>1</sup>
10/100/1000BaseTX (Gigabit) Ethernet	✓
GPIB (IEEE 488) controller	✓
Serial port (RS232)	✓
Parallel port	✓
Hi-Speed USB ports	✓
ExpressCard/34 slot	✓
Watchdog/trigger SMB	✓
Installed OS	Windows XP Professional <sup>2</sup>

<sup>1</sup>40 GB PATA hard drive for extended temperature, 24/7 operation option.

<sup>2</sup>Contact National Instruments or visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor) for information on other available operating systems.

Table 1. NI PXIe-8130 Features

## Dual-Core Processor

The NI PXIe-8130 includes the dual-core AMD Turion 64 X2 processor. Dual-core processors contain two cores, or computing engines, in one physical package. Dual-core processors can simultaneously execute two computing tasks, which is advantageous in multitasking environments,

such as Windows XP, where multiple applications run simultaneously. Two applications, such as National Instruments LabVIEW and Microsoft Excel, can each execute on a separate core at the same time, which improves overall system performance. Multithreaded applications, such as NI LabVIEW, take full advantage of dual-core processors because they automatically separate their tasks into independent threads. A dual-core processor can simultaneously execute two of these threads.

## High Bandwidth

The NI PXIe-8130 features an NVIDIA MCP55 Pro chipset. This chipset provides four x4 ("by four") PCI Express lanes that are forwarded to the PXI chassis backplane to create four x4 PXI Express slots. Each of these slots has up to 1 GB/s of dedicated bandwidth with the overall system bandwidth of up to 4 GB/s.



Figure 1. This NI PXIe-8130 controls an 8-slot PXI Express modular instrument and data acquisition system.

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## Hardware

With state-of-the-art packaging, the NI PXIe-8130 integrates the AMD Turion 64 X2 processor 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 modular design minimizes integration issues and eliminates the need for complex cabling to daughter boards. The NI PXIe-8130 block diagram is shown in Figure 2.

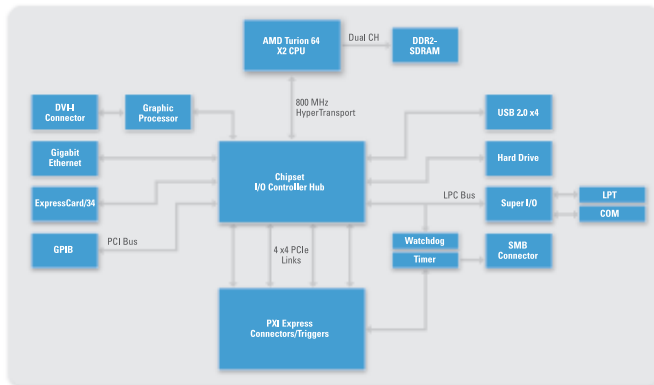


Figure 2. NI PXIe-8130 Block Diagram

## Peripheral I/O

The NI PXIe-8130 includes high-performance peripheral I/O such as 10/100/1000BaseTX (Gigabit) Ethernet and four 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. Additionally, the NI PXIe-8130 controller includes an integrated GPIB (IEEE 488) controller, which provides control of external instrumentation, saving additional cost and a slot.

## ExpressCard

The NI PXIe-8130 features an ExpressCard/34 slot. ExpressCard uses the PCI Express and Hi-Speed USB serial interfaces to provide up to 2.5 Gb/s of bidirectional throughput. Use the ExpressCard/34 slot to add a second Gigabit Ethernet port to your system or additional peripheral I/O such as external hard drives, RAID arrays, 802.11 wireless LAN, IEEE 1394, Bluetooth, or various memory adapters.

## Video

The NI PXIe-8130 includes an integrated ATI Radeon X300 graphics processing unit, which 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 NI PXIe-8130 features a DVI-I video connector, compatible with digital (DVI) and analog (VGA) monitors. A DVI-I to VGA adapter is included with the controller for use with VGA monitors.

## Memory

The NI PXIe-8130 uses dual-channel 667 MHz DDR2 SDRAM, which makes the controller ideal for data-intensive applications requiring significant analysis. The NI PXIe-8130 has two SO-DIMM sockets for the DDR2 SDRAM. 1 GB (1 x 1 GB DIMM) of RAM is standard with upgrade options to 2 GB.

## Extended Temperature and 24/7 Operation Option

The NI PXIe-8130 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 drive in the extended temperature and 24/7 operation version has a capacity of 40 GB (minimum) versus the 60 GB (minimum) hard drive used in the standard version of the controllers. See specifications for further details.

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## Software

The NI PXIe-8130 comes with the following minimum set of software already installed:

- Microsoft Windows XP Professional OS (contact National Instruments or visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor) for localized versions of Windows XP and for other available operating systems)
- Hard-drive-based recovery image
- NI-VISA and NI-488.2 drivers
- Drivers for all built-in I/O ports (Table 1)

With NI Factory Installation Services (FIS) added to a 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 LabVIEW and NI TestStand software, as well as data acquisition modules, a digitizer, an arbitrary waveform generator, and a digital multimeter (DMM). With FIS, 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 FIS, contact National Instruments or visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

## USB Peripherals

National Instruments offers a USB-to-dual-PS/2 keyboard/mouse adapter cable to connect a legacy PS/2 keyboard and mouse to a single USB port on your embedded controller. Additionally, NI offers external USB CD-ROM/DVD-ROM and USB floppy drives for use with your embedded controller. Connect these drives to your embedded controller for easy software installation and upgrades. Both are completely powered through the USB ports, so no external power connections are required. Additional USB peripherals, such as USB speakers to add audio or USB memory sticks to add easily removable memory, are widely available from PC peripheral manufacturers.

## Additional Peripheral I/O

With National Instruments FIS, you receive complete system-level assembly and functional testing of the PXI chassis, controller, and all peripheral devices, as well as installation of all device drivers and software programs (such as NI LabVIEW). For online configuration of a complete PXI system, including information about FIS, visit the PXI Advisor at [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

## Ordering Information

For online configuration of a complete PXI system, including Factory Installation Services, visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

### Step 1. Controller Model – select one of the following.

NI PXIe-8130	
Base .....	780031-xx
Extended Temperature and 24/7 Operation .....	780032-xx

### Step 2. Replace “xx” to select installed OS.

Windows XP Professional (English) <sup>1</sup> .....	01
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<sup>1</sup>Contact National Instruments or visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor) for the latest operating systems.

### Step 3. Memory upgrades – select the amount of upgrade memory.

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 RAM .....	780031-1024

### Step 4. Accessories<sup>2</sup>

60 GB (or greater) 2.5 in. SATA Blank HDD Spare/Replacement .....	779175-03
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40 GB (or greater) 2.5 in. PATA Ext Temp, 24/7 Blank HDD Spare/Replacement .....	779175-02
USB-to-dual-PS/2 keyboard/mouse adapter cable .....	778713-02
External USB CD-ROM/DVD-ROM drive .....	778492-01
External USB floppy drive.....	778492-02
USB English keyboard and optical mouse .....	779660-01
Parallel port adapter cable (6 in.).....	777169-01
Micro-GPIB to GPIB adapter cable (0.2 m) .....	183285-0R2
Micro-GPIB to GPIB cable (1 m) .....	183285-01
Micro-GPIB to GPIB cable (2 m) .....	183285-02
ExpressCard strain-relief accessory for embedded controllers.....	192524-01
NI MKD-1117 (rack-mount 1U LCD monitor, keyboard, mouse drawer).....	779872-01
NI FPM-1017 (17 in. flat panel monitor) .....	779559-01
NI FPT-1015 (flat panel touch screen with VGA interface and USB) .....	779560-01

<sup>2</sup>For additional peripheral I/O modules, including serial, IEEE 1394, and SCSI, visit [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

## BUY NOW!

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

# High-Bandwidth, 2.3 GHz Dual-Core Embedded Controller 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.....	10/100/1000BaseTX, RJ45 connector
Hard Drive	
Base .....	60 GB minimum, internal 2.5 in., 9.5 mm Serial ATA 1.0 interface
Extended Temperature and 24/7 Operation Option.....	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)
GPIOB .....	PCI-GPIB/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

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 <sub>Aux</sub>	0.35	0.70

### Physical

Board dimensions .....	4-slot 3U PXI Express module
Slot requirements .....	One system slot plus three controller expansion slots
Compatibility .....	Fully compatible with PXI Express Specification 1.0
Weight.....	0.98 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	
Base .....	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)
Extended 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	
Base .....	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)
Extended 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 <sub>rms</sub> (with solid-state hard drive)
Nonoperating.....	5 to 500 Hz, 2.4 g <sub>rms</sub> (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

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### CE Compliance

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

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; 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](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

### Waste Electrical and Electronic Equipment (WEEE)

EU Customers: At the end of their life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit [ni.com/environment/weee.htm](http://ni.com/environment/weee.htm).