

High-Value Embedded Controllers for PXI Express

NI PXIe-8101, NI PXIe-8102 **NEW!**

- 2.0 GHz single-core for NI PXIe-8101, 1.9 GHz dual-core for NI PXIe-8102
- 1 GB (1 x 1 GB DIMM) 800 MHz DDR2 RAM standard, 4 GB (1 x 4 GB DIMMs) maximum
- 80 GB integrated hard drive standard
- 10/100/1000BASE-TX Ethernet
- Up to 1 GB/s maximum system bandwidth and 250 MB/s maximum slot bandwidth (four x1 PCI Express links)
- 2 Hi-Speed USB ports
- DVI-I video connector
- IEEE 1284 ECP/EPP parallel port
- RS232 serial port
- Internal PXI trigger bus routing
- Watchdog timer

Software

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

PXI System Configuration

- Complete PXI system configuration at ni.com/pxiadvisor



Overview

The NI PXIe-8101 and PXIe-8102 are high-value embedded controllers designed for use in PXI Express and CompactPCI Express systems. The NI PXIe-8102 features a dual-core 1.9 GHz Intel Celeron T3100 processor, and the NI PXIe-8101 includes a single-core 2.0 GHz Intel Celeron 575 processor. Integrating these controllers into a PXI Express chassis, such as the NI PXIe-1062 or PXIe-1082, provides a compact, high-value platform that delivers up to 1 GB/s of total system bandwidth and up to 250 GB/s of single-slot bandwidth. This combination of high system and slot bandwidth, the latest Intel processors, and a lower price point makes these controllers ideal for value-based test, measurement, and control applications.

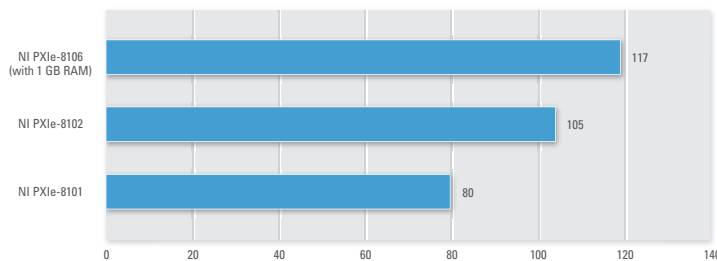


Figure 1. Embedded Controller Benchmarks

Hardware

With state-of-the-art packaging, the NI PXIe-8101 and PXIe-8102 integrate Intel 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 one-piece controller design minimizes integration issues and eliminates the need for complex cabling to daughter boards. The NI PXIe-8102 block diagram is shown in Figure 2.

	NI PXIe-8101	NI PXIe-8102
CPU	Intel Celeron 575	Intel Celeron T3100
CPU frequency	2.0 GHz	1.9 GHz
CPU cores	1	2
Front-side bus	667 MHz	800 MHz
PCI Express bandwidth	Four x1 PCI Express Gen1	
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 SATA (5400 rpm)	
10/100/1000BASE-TX (Gigabit) Ethernet		✓
Serial port (RS232)		✓
Parallel port		✓
Hi-Speed USB ports	2	
Watchdog/trigger SMB		✓
Installed OS	Windows Vista Business, Windows Vista Business (Downgraded to Windows XP Professional) ¹	

¹Contact National Instruments or visit ni.com/pxiadvisor for information on other available operating systems.

Table 1. NI PXIe-8101 and PXIe-8102 Features

High-Value Embedded Controllers for PXI Express

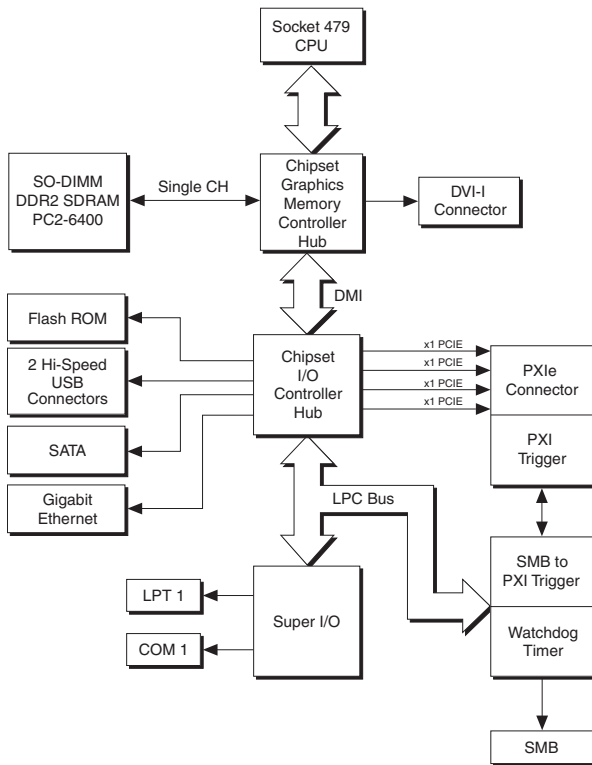


Figure 2. NI PXIe-8102 Block Diagram

Peripheral I/O

The NI PXIe-8101 and PXIe-8102 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, mouse, 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 NI PXIe-8101 and PXIe-8102 use 800 MHz DDR2 SDRAM, which makes these 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.

Video

The NI PXIe-8101 and PXIe-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 NI PXIe-8101 and PXIe-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 NI PXIe-8101 and PXIe-8102 is capable of supporting simultaneous DVI and VGA output. 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

NI PXIe-8101 and PXIe-8102 embedded controllers are shipped with a factory image of the software installation stored on a separate partition of their hard drives. In the case of software corruption, you can invoke a recovery tool during the controllers' boot-up process that can use this backup image to restore the controllers to their shipping software configurations. 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 2ZKC020K.

Software

The NI PXIe-8101 and PXIe-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 (Table 1)

High-Value Embedded Controllers for PXI Express

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 reinstalled. 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.

Ordering Information

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

Step 1. Select controller model.

NI PXIe-8101	781182-xx
NI PXIe-8102	781184-xx

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

Windows Vista Business (English).....	-02
Windows Vista – downgraded to Windows XP Professional (English).....	-01
Localized Windows XP or Other OS ¹	-00

¹Contact National Instruments or visit ni.com/pxiadvisor for the latest operating systems.

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

Standard:

1 GB MB (1 x 1 GB DIMM)

Recommended upgraded memory configurations:

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

4 GB (1 x 4 GB DIMM must be purchased)

2 GB DDR2 RAM	780446-2048
4 GB DDR2 RAM	780446-4096

Step 4. Select Accessories²

80 GB (or greater) 2.5 in. SATA HDD spare/replacement.....	779175-03
32 GB 2.5 in. SATA solid-state hard-drive upgrade	779175-08
250 GB (or greater) 2.5 in. SATA hard-drive upgrade	779175-06
DVI-I (male) to DVI-D (female) and VGA (female) splitter	780868-01
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
NI MKD-1117 (rack-mount 1U LCD monitor, keyboard, mouse drawer).....	779872-01
NI FPM-1019 (19 in. flat panel monitor)	781002-01
NI FPM-1017 (17 in. flat panel monitor)	779559-01
NI FPT-1015 (flat panel touch screen with VGA interface and USB).....	779560-01

²For additional peripheral I/O modules, including serial, IEEE 1394, and SCSI, visit 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.

High-Value Embedded Controllers for PXI Express

Specifications

Specifications subject to change without notice.

Features

Processor	
NI PXIe-8101	Intel Celeron 575 2.0 GHz
NI PXIe-8102	Intel Celeron T3100 1.9 GHz (dual-core)
Chipset	Mobile Intel GM45 Express Chipset
Front-Side Bus	
NI PXIe-8101	667 MHz
NI PXIe-8102	800 MHz
System Memory (RAM)	
Standard	1 GB 800 MHz DDR2 RAM PC2 6400
Maximum	4 GB 800 MHz DDR2 RAM PC2 6400
Hard Drive	80 GB minimum, 5400 rpm, internal 2.5 in., 9.5 mm Serial ATA interface
PXI Express 4 Link Configuration	x1, x1, x1, x1
Video	Integrated Graphics (Mobile Intel GM45 Express Chipset)
Serial	1 (RS232)
Parallel	IEEE 1284 Type C miniature connector (adapter cable not included)
Hi-Speed USB	2
PXI Trigger Bus Input/Output	Yes
Installed Operating System	Windows Vista Business, Windows Vista Business downgraded to Windows XP Professional

Power Requirements

Voltage (V)	Current (A)			
	Typical		Maximum	
	NI PXIe-8101	NI PXIe-8102	NI PXIe-8101	NI PXIe-8102
+3.3	2.25	2.25	4.75	4.75
+5	1.25	1.25	2.25	2.25
+12	1.50	1.75	2.25	2.50
-12	0.00	0.00	0.00	0.00
+5 Aux	.330	.330	.400	.400

Physical

Board dimensions	2-slot 3U PXI module 4.0 by 13 by 21.6 cm (1.59 by 5.1 by 8.5 in.)
Slot requirements	One system slot plus three controller expansion slots
Compatibility	Fully compatible with PXI Specification
Weight	0.645 kg (1.42 lb) typical

Environment

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

Operating Environment

Ambient temperature range ¹	5 to 50 °C ¹ (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2)
Relative humidity range	10 to 90% noncondensing (tested in accordance with IEC-60068-2-56)

¹Processor should not throttle CPU frequency under reasonable, worst case processor workloads in high operating temperatures.

Storage Environment

Ambient temperature range	-40 to 65 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2)
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; 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)

High-Value Embedded Controllers for PXI Express

Safety Compliance

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

Electromagnetic Compatibility

- 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

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)

Note: 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.

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.

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Hardware Services

System Assurance Programs

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