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

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2.16 GHz Dual-Core Embedded Controller

NI VXIpc-882



- Intel Core 2 Duo processor T7400 (2.16 GHz dual core)
- 1 GB (1 x 1 GB DIMM) dual-channel 667 MHz DDR2 RAM standard, 4 GB (2 x 2 GB DIMMs) maximum
- 10/100/1000BASE-TX Ethernet ports and four Hi-Speed USB ports
- Other peripherals (ExpressCard/34 slot, DVI-I video connector, IEEE 1284 ECP/EPP parallel port, GPIB (IEEE 488) controller, and RS232 serial port)
- 8 TTL backplane triggers and CLK10 available through front panel connectors
- VXIplug&play compliance
- Watchdog timer
- VXI Slot 0 Resource Manager

Overview

The NI VXIpc-882 is a high-performance Intel Core 2 Duo processor T7400-based embedded controller for VXI systems. This 2-slot embedded controller gives you direct control of VXI registers, memory, interrupts, and triggers while helping you maintain compatibility with numerous software packages and tools for general-market desktop computers.

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Requirements and Compatibility

OS Information

- Windows 7 32-bit
- Windows Vista
- Windows XP

Driver Information

- NI-VXI

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Application and Technology

NI VXIpc-882 Features

CPU	Intel Core 2 Duo Processor T7400 (2.16 GHz dual core)
L2 cache	667 MHz
Front-side bus	8 MB shared Intel smart cache
Dual-channel 667 MHz DDR2 RAM, standard	1 GB (1 x 1 GB)
Dual-channel 667 MHz DDR2 RAM, maximum	4 GB (2 x 2 GB)
Hard drive, minimum	80 GB SATA
10/100/1000BASE-TX (Gigabit) Ethernet ports	2

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Hi-Speed USB ports	4
GPIB (IEEE 488) controller	
Serial port (RS232)	
Parallel port	
ExpressCard/34 slot	
Watchdog/trigger SMB	
Installed OS	Windows 7 Professional, Windows Vista, Windows Vista Downgraded to Windows XP Professional

Table 1. NI VXIpc-882 Features

Dual-Core Processor

The VXIpc-882 features the dual-core Intel Core 2 Duo processor T7400. Dual-core processors contain two cores, or computing engines, in one physical package. These 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 NI LabVIEW and Microsoft Excel, can each execute on a separate core at the same time, which improves overall system performance. Multithreaded applications such as LabVIEW take full advantage of dual-core processors because they separate their tasks into independent threads. A dual-core processor can simultaneously execute two of these threads.

Hardware

With state-of-the-art packaging, the VXIpc-882 embedded controller integrates the Intel Core 2 Duo processor T7400 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 daughterboards. The VXIpc-882 controller also uses the Mobile Intel 945GM Express chipset to deliver maximum performance, flexibility, and stability.

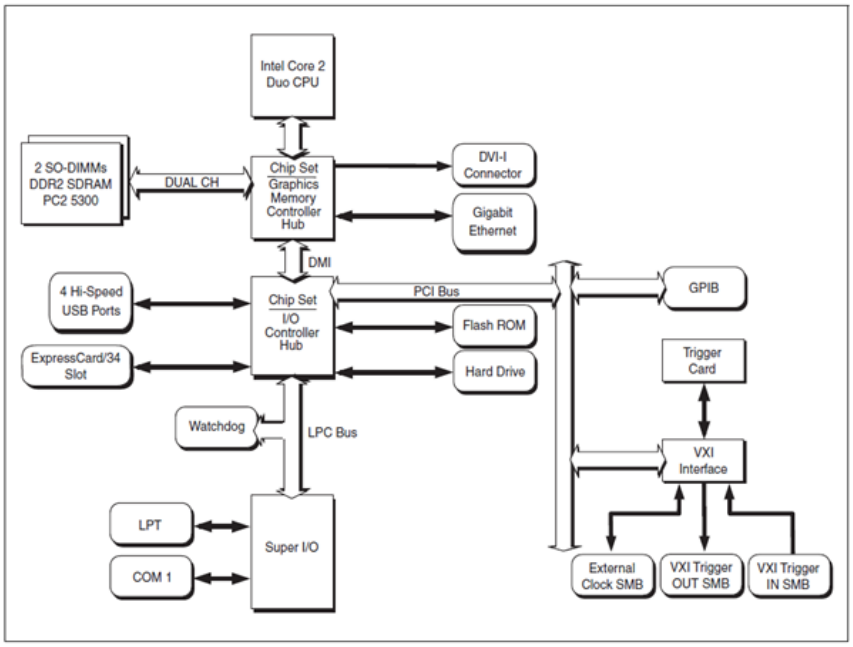


Figure 2. NI VXIpc-882 Block Diagram

Peripheral I/O

The VXIpc-882 embedded controller includes high-performance peripheral I/O such as 10/100/1000BASE-TX (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 VXIpc-882 features an integrated GPIB (IEEE 488) controller, which controls external instrumentation, saving additional cost and a slot.

ExpressCard

This embedded controller also includes an ExpressCard/34 slot. ExpressCard uses the PCI Express and Hi-Speed USB serial interfaces to provide up to 2.5 Gbit/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 VXIpc-882 features the integrated Intel GMA 950 graphics media accelerator, 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 offers balanced memory usage between graphics and the system for optimal performance. Additionally, this controller includes 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 VXIpc-882 uses dual-channel 667 MHz DDR2 SDRAM, which makes the controller ideal for data-intensive applications requiring significant analysis. It features two SO-DIMM sockets for the DDR2 SDRAM and offers 1 GB (1 x 1 GB DIMM) of RAM with upgrade options to 2 or 4 GB.

Software

The VXIpc-882 comes with the following minimum set of software already installed:

- Windows 7, Windows Vista, Windows Vista with downgrade rights to Windows XP Professional OS (contact National Instruments for localized versions of Windows)

- Hard-drive-based recovery image
- NI-VXI and NI-VISA drivers
- Drivers for all built-in I/O ports

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 VXIpc-882. Additionally, NI provides external USB CD-ROM/DVD-ROM and USB floppy drives for use with your controller. Connect these drives to your VXIpc-882 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.

VXIbus

VXI Addressing
The VXIpc-882 features custom ASICs for accessing the VXI backplane resources. To access VXI memory or VXI devices, the controller uses a multiple windowing scheme, so you can access all of the VXI address space. Independent VXI address windows are exported, providing you with three completely user-configurable windows. You can also set each window size and location. This multiple windowing scheme alleviates the performance penalty related to the context switching of one window that you must constantly move between the different address spaces.

DMA Transfers to and from VXI
Using the VXIpc-882, you can perform block-mode transfers with one of the two on-chip DMA controllers. Controlling external VXI devices often takes valuable CPU time because the microprocessor typically shoulders the burden of transferring data to and from devices. However, the custom ASIC on the VXIpc-882 frees up CPU processing time by moving the burden of block data transfers to one of the DMA controllers. Instead of the computer microprocessor transferring the data and/or commands, NI-VXI/NI-VISA software uses the custom ASIC to execute the block data transfers. While the custom ASIC transfers the data, the processor can perform application-specific tasks, such as data presentation and analysis.

VXI Slot 0 Functionality
The VXIpc-882 has full VXI Slot 0 capability, including a MODID register and a CLK10 source, as required by the VXIbus specification. You can also install a VXIpc-882 in another slot and use it in the non-Slot 0 mode. No matter your configuration needs, this controller can automatically detect whether it is inserted into Slot 0 and automatically enable or disable the Slot 0 onboard circuitry without switches and jumpers.

External VXI CLK10 Synchronization
The VXIpc-882 has an SMB connector on the front panel for an external clock. With onboard programmable logic, you can configure your controller to drive its 10 MHz VXI CLK10 signal to this connector as an output or to use this connector as an input for the 10 MHz VXI CLK10 signal. In this way, you can configure multiple mainframes to operate from a single 10 MHz system clock.

Advanced Trigger/Timing
With this embedded controller, you have full software and hardware control of the VXI trigger lines. The VXIpc-882 has two SMB trigger I/O connectors on the front panel for routing any TTL trigger lines between the backplane and external devices. It can respond to all VXI-defined protocols on all P2 TTL and ECL trigger lines at the same time. The hardware also includes an internal counter, which provides sophisticated counting of events and interrupting on trigger edges and pulses, as well as the generation of pulse trains, variable length pulses, and pulse stretching.

VXI Interrupts
The VXIpc-882 can function as an interrupter and an interrupt handler for any or all of the VXIbus interrupt lines in a VXI mainframe. Using NI-VXI/NI-VISA software, your application can be notified when any interrupt is asserted, and can assert any interrupt level with a programmable status. You can use NI-VXI configuration software to assign which interrupt levels should be handled by each device in the system.

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Ordering Information

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

Products	Part Number	Recommended Accessories	Part Number
Other Accessories			
FPM-1017 17in. Flat Panel Monitor with VGA Input for PC's	779559-01	No accessories required.	
USB to Dual PS2 Keyboard/Mouse Adapter Cable	778713-02	No accessories required.	
External USB CD/DVD-ROM for Use with PXI & VXI Emb Controllers	778492-01	No accessories required.	
External USB Floppy Drive, for PXI & VXI Embedded Controllers	778492-02	No accessories required.	
USB English Keyboard and Optical USB Mouse	779660-01	No accessories required.	
IEEE 1284 Parallel Port Cable Adapter, 6 in.	777169-01	No accessories required.	
X13 GPIB Cable, MicroD25 to Shielded cable/Standard connector, 1M	183285-01	No accessories required.	
ExpressCard Strain Relief Accessory for PXI Embedded Controllers	192524-01	No accessories required.	
NI MKD-1117 Rackmount 1U LCD Monitor, Keyboard, Mouse Drawer	779872-01	No accessories required.	
X13 GPIB Cable, MicroD25 to Shielded cable/Standard connector, 2M	183285-02	No accessories required.	
FPT-1015 15in. Flat Panel Touch Screen with VGA Interface and USB	779560-01	No accessories required.	
Memory Options			
2 GB DDR2 RAM for VXIpc-882 Controllers	780031-2048	No accessories required.	
1 GB DDR2 RAM for VXIpc-882 Controllers	779302-1024	No accessories required.	
Hard-Drive Upgrades			
32 GB 2.5 in SATA Solid State Hard Drive Upgrade	779175-08	No accessories required.	
NI VXIpc-882			

NI VXIpc-882 Core 2 Duo 2.16 GHz Controller with Windows 7 32-bit	780531-04	No accessories required.
NI VXIpc-882 Core 2 Duo 2.16 GHz Controller Downgraded to Win XP	780531-01	No accessories required.
NI VXIpc-882 Core 2 Duo 2.16 GHz Controller with Windows Vista	780531-02	No accessories required.

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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.

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.

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- **On-site training at your facility** - an excellent option to train multiple employees at the same time.
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- **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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Detailed Specifications

Electrical

Voltage (V)	Current (A)	
	Peak	Dynamic
+24	3.1 A	±1.26 A
+12	0.225 A	±0 A
+5	10.6 A	±1.21 A
–2	0.251 A	±0.04 A

Voltage (V)	Current (A)	
	Peak	Dynamic
–5.2	0.318 A	±0.06 A
–12	0.265 A	±0 A

Note Power usage depends on peripherals connected to the controller. For example, connecting four high power USB devices will draw more current from the +5 V rail than just connecting a USB keyboard and mouse.

Physical

Board dimensions	Two-slot VXI C-size module 233.35 × 340 × 60.96 mm (9.187 × 13.386 × 2.4 in.)
Slot requirements	Two system slots
Compatibility	Fully compatible with VXI-6, *VXIbus Mainframe Extender Specification*, Rev. 2.0
MTBF	Contact NI for MTBF
Weight	2.58 kg (5.69 lb)

Operating Environment

Ambient temperature range	5 to 50 °C (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.)
Altitude	2,000 m
Pollution Degree	2
For indoor or enclosed area use only.	
Module cooling requirements	For 18 °C temperature rise, 2.6 liters/sec airflow, 0.03 mm H_2O pressure across module, per VXI-8, *Cooling Characterization Methodology Specification*

Caution Clean the NI VXIpc-882 with a soft nonmetallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

Storage Environment

Ambient temperature range	–20 to 70 °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

Operational shock [1]	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 [1]	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 B.)

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 61326-1 (IEC 61326-1): 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 EMC declarations and certifications, refer to the *Online Product Certification* section.

Note For EMC compliance, operate this device with shielded cables and accessories.

CE Compliance CE

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

To obtain product certifications and 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.

Environmental Management

NI 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.

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.

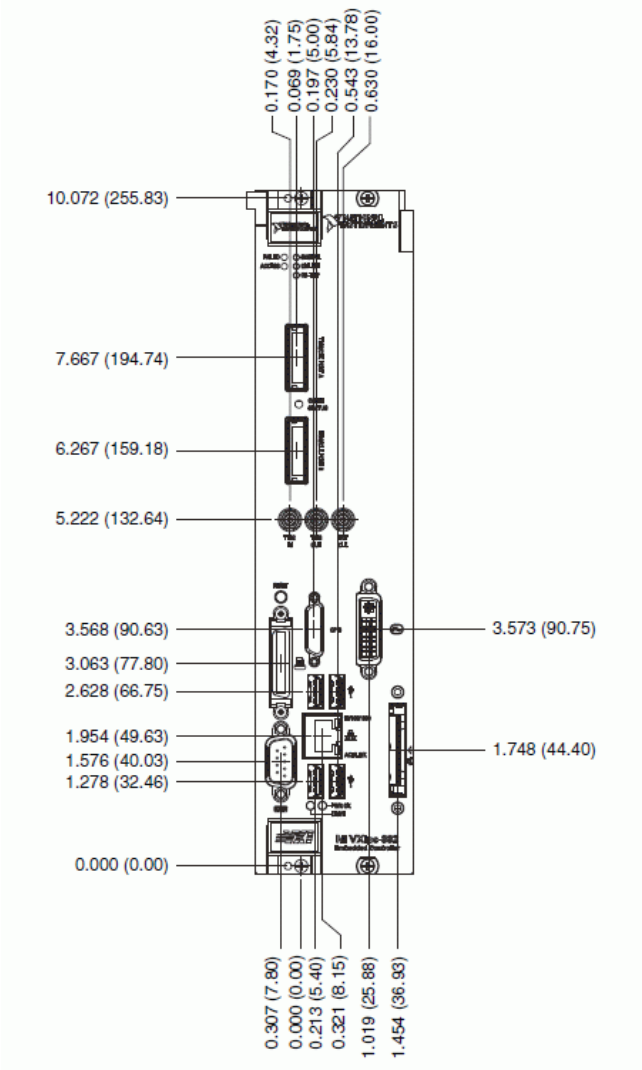
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(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

Front Panel Layout and Dimensions

The following figure shows the front panel layout and dimensions for the NI VXIpc-882. Dimensions are in inches (millimeters).

NI VXIpc-882 Front Panel Layout and Dimensions



[1] Only valid with an NI VXIpc-882 using a solid-state drive, not with the shipping configuration, which contains a hard drive.

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