High-Performance GPIB Interfaces for PCI Express

NI PCIe-GPIB, NI PCIe-GPIB/Low-Profile (LP) *NEW!*

- Complete IEEE 488.1 and 488.2 compatibility
- FIFO buffers to decouple GPIB transfers from PCI Express transfers
- Maximum GPIB transfer rates
  - More than 1.5 MB/s (IEEE 488.1)
  - More than 7.9 MB/s (HS488)

Operating Systems

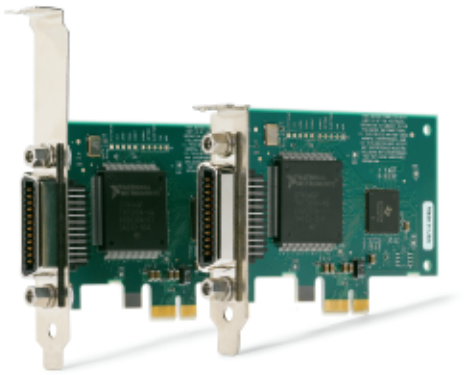
- Windows Vista (32- and 64-bit)/XP/2000
- Mac OS X
- Linux®
- Solaris (SPARC) and Solaris x86

Recommended Software

- LabVIEW
- LabWindows™/CVI
- Measurement Studio for Microsoft Visual Studio

Driver Software (included)

- NI-488.2



Overview

The NI PCIe-GPIB and PCIe-GPIB/LP are GPIB controller interfaces for PCI Express that combine high-performance hardware with a complete suite of development tools to get your applications up and running fast. The NI TNT ASIC makes these controllers maximum-performance IEEE 488.2 interfaces for PCI Express. The TNT ASIC performs the basic IEEE 488 talker, listener, and controller functions required by all versions of IEEE 488, including IEEE 488.2. NI PCIe-GPIB and PCIe-GPIB/LP controllers can sustain data transfer rates of more than 1.5 MB/s using the IEEE 488.1 three-wire interlocked handshake and implement the high-speed IEEE 488.1 noninterlocked handshake (HS488) for benchmarked data transfers at more than 7.9 MB/s.

HS488

These controllers can use HS488, the high-speed GPIB protocol originally patented by National Instruments and approved by the IEEE in ANSI/IEEE Standard 488.1-2003. HS488 increases the maximum data transfer rate of ANSI/IEEE Standard 488.1-1987 to 8 MB/s and is a superset of the IEEE 488.1 protocol that attempts to conduct data transfers with the new high-speed noninterlocked handshake. If any active listener is not capable of HS488 transfers, the protocol automatically uses the IEEE 488.1 three-wire interlocked handshake protocol. Maximum data transfer rates using HS488 depend on the host computer architecture and system configuration. NI PCIe-GPIB and PCIe-GPIB/LP controllers have transfer rates of more than 7.9 MB/s when using the HS488 protocol. The TNT family of ASICs completely and transparently handles the HS488 protocol without additional circuitry. Because HS488 is a superset of IEEE 488.1, you can mix existing GPIB devices with high-speed-capable devices without changing your application programs. The TNT ASICs can implement high-speed data transfers automatically. Thus, devices that have a TNT ASIC can transparently communicate using HS488 if the corresponding talker or listener can also use HS488.

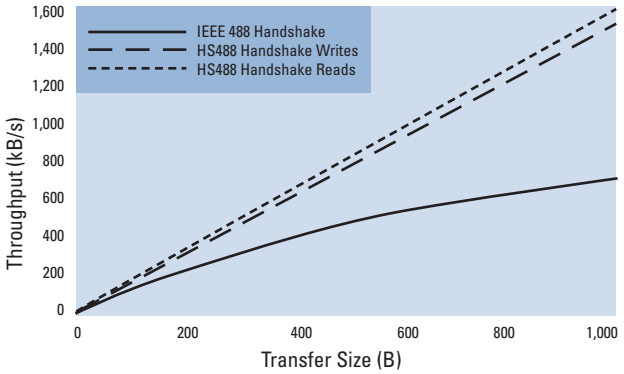


Figure 1. NI PCIe-GPIB and PCIe-GPIB/LP Controller Data Transfer Benchmarks (Small Data Blocks)

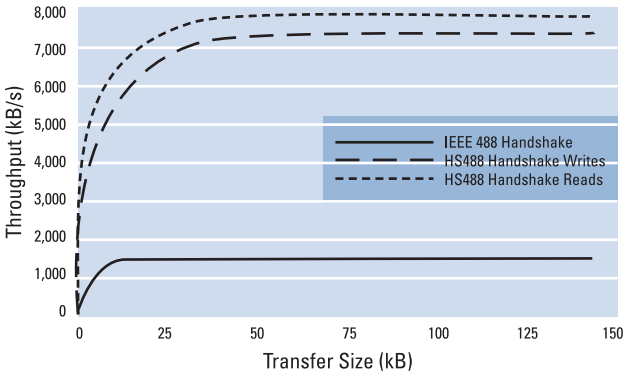


Figure 2. NI PCIe-GPIB and PCIe-GPIB/LP Controller Data Transfer Benchmarks

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Hardware

The key functional components of NI PCIe-GPIB and PCIe-GPIB/LP controllers include the TI XIO2000a PCI Express bridge and the NI TNT ASIC.

TI XIO2000a PCI Express Bridge

The TI XIO2000a has a x1 PCI Express interface that is fully compliant with the PCI Express Base Specification, Revision 1.0a.

TNT ASIC

The TNT ASIC comprises the first maximum performance single-chip IEEE 488.2 talker, listener, and controller interfaces with integrated IEEE 488.1-compatible transceivers. The TNT ASIC also implements the HS488 mode of operation for high-speed GPIB data transfers. The transfer functions implement automatic handshake hold-off on the last byte of a GPIB read and automatic END transmission on the last byte of a GPIB write. Because these functions are performed in hardware, you save significant CPU time relative to performing the same functions in software. The TNT ASIC implements all PCI-defined configuration registers and additional control and status registers. The TNT ASIC also provides bus mastering using a sophisticated DMA controller to enhance overall performance during data transfers.

Ordering Information

NI PCIe-GPIB and NI-488.2 for

Windows Vista/XP/2000	778930-01
Windows Vista/XP/2000 (with 2 m X2 cable)	778930-51
Mac OS X	779142-01
Linux	779779-01
Solaris (SPARC)	779885-01
Solaris x86	781023-01

NI PCIe-GPIB/LP and NI-488.2 for

Windows Vista/XP/2000	780575-01

BUY NOW!

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

Specifications

IEEE 488 Compatibility

IEEE 488.1 and IEEE 488.2

PCI Express Compatibility

PCI Express 1.0a

Maximum IEEE 488 Bus Transfer Rates

IEEE 488 interlocked handshake	1.5 MB/s
IEEE 488 noninterlocked (HS488) handshake	7.9 MB/s

(Actual rates depend on system configuration and instrument capabilities.)

Power Requirements

+3.3 VDC	1.1 W typical

Physical

Dimensions	9.8 by 6.9 cm (3.8 by 2.7 in.)

I/O Connectors

GPIB	IEEE 488 standard 24-pin
PCI Express	x1

Operating Environment

Ambient temperature	0 to 55 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2)
Relative humidity	10 to 90%, noncondensing (tested in accordance with IEC-60068-2-56)

Storage Environment

Ambient temperature	-20 to 70 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2)
Relative humidity	5 to 95%, noncondensing (tested in accordance with IEC-60068-2-56)

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Hardware Services

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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.

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