

GPIB Interface for PCMCIA

PCMCIA-GPIB

TNT4882C ASIC
Integrated IEEE 488.2,
performance enhancements,
and transceivers in a single chip
Low power consumption
Increased performance, especially
for programmed I/O transfers
Maximum transfer rates
1.3 Mbytes/s using IEEE 488.1
2.2 Mbytes/s using HS488
PCMCIA Type II card
PC Card Standard 2.1 compliant
Low power draw for battery-
powered applications
Plug and Play compatible
Latching PCMCIA-GPIB cable

Driver Software

NI-488.2
Windows 2000/NT/Me/9x/3.1
Mac OS
DOS

Application Software

LabVIEW
Measurement Studio
Measure



Overview

The National Instruments PCMCIA-GPIB is a low-cost, high-performance IEEE 488 interface for computers with PC Card (PCMCIA) slots, such as laptop and notebook computers. You can use the PCMCIA-GPIB with Intel-based PCs and Macintosh PowerBook computers.

The PCMCIA-GPIB, a Type II PCMCIA card, is compliant with PCMCIA PC Card Standard Version 2.1 and above. The PCMCIA-GPIB is also compatible with the Plug and Play standard and is automatically configured by the system on startup or when you insert the card. The National Instruments TNT4882C ASIC makes the PCMCIA-GPIB a maximum-performance IEEE 488.2 interface. The TNT4882C chip performs the basic IEEE 488 Talker, Listener, and Controller functions and those functions required by IEEE 488.2. We designed the PCMCIA-GPIB for low power consumption and portability, a feature especially important in battery-powered mobile applications. Typical power consumption is only 65 mA.

PC Card Compatibility


The PC Card (PCMCIA) standard includes cards of several thicknesses. The Type I card is 3.3 mm thick, the Type II card is 5 mm thick, and the Type III card is 10 mm thick. You can insert, remove, or even swap PC Cards on-the-fly without powering down or rebooting the system – a capability called “hot insertion.” The two layers of PCMCIA-defined system software, are Socket Services and Card Services. The Socket Services layer, the lowest level of software, provides a universal software interface to the hardware that controls sockets for PC Cards. It masks the details of the hardware used to implement PCMCIA sockets, giving higher-level software the ability to control and use PC Cards without information about the hardware interface. Above Socket Services is the Card Services layer, which provides management of PCMCIA card and system resources. Card and Socket

Services are either provided by the computer manufacturer or embedded in the operating system. Under Windows 2000/Me/9x, which are Plug and Play operating systems, the PCMCIA-GPIB card is completely “hot swappable.” Resources are automatically assigned on insertion and deleted on removal of a PCMCIA-GPIB. Under Windows NT, the PCMCIA-GPIB card is not hot swappable, and you must insert it before starting the system; resources are assigned using the NI-488.2 Configuration Utility. Under DOS and Windows 3.1, you must have card services installed to use the PCMCIA-GPIB, but the card is completely hot swappable.

The Mac OS implementation of PC Cards has the hot insertion feature and the standard Plug and Play features for which the Macintosh is known. The Mac OS PCMCIA implementation also includes software PC Card eject, as well as complete integration of PC Cards into the Macintosh desktop.

Transfer Rates

The PCMCIA-GPIB hardware and software provide maximum performance, even when the data block is small. Figure 1 illustrates the maximum data transfer performance of the PCMCIA-GPIB at transfers below 1 kbyte in size. Figure 2 extends the plot up to 35 kbytes/s data transfers. Actual obtainable data transfers depend on host computer, system configuration, and device capability.

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GPIB Interface for PCMCIA

Hardware

PCMCIA Bus Interface Logic

The PCMCIA bus interface logic decodes the control signals of the PCMCIA bus to provide access to the internal registers of the PCMCIA-GPIB and the TNT4882C. It also contains the PCMCIA Card Information Structure that contains all the information needed for autoconfiguration.

TNT4882C

The TNT4882C ASIC, the first single-chip IEEE 488.2 Talker, Listener, and Controller interface, combines the circuitry of the NAT4882 IEEE 488.2 Controller ASIC and Turbo488 performance-enhancing ASIC from National Instruments, along with built-in IEEE 488.1-compatible transceivers. The TNT4882C also implements the HS488 transfers for high-speed GPIB data transmission. The TNT4882C implements Automatic Handshake Holdoff on the last byte of a GPIB read and Automatic END transmission on the last byte of a GPIB write. Because the PCMCIA-GPIB performs these functions in hardware, you save significant CPU time relative to performing the same functions in software.



Figure 3. PCMCIA Cable Strain Relief Kit

FIFO

A 16-bit by 16-deep FIFO buffer on the PCMCIA-GPIB buffers data sent to or received from the GPIB. By buffering the data, the PCMCIA bus and the GPIB can overlap their respective accesses to the FIFO, rather than one bus waiting for the other to complete a cycle. This process increases the data transfer rate. The FIFO also provides byte-to-word packing and unpacking. This byte packing requires only one bus cycle on the PCMCIA bus for every two bytes transferred on the GPIB, thus using less PCMCIA bus bandwidth.

GPIB Monitor

You can monitor and control the IEEE 488 bus through a 16-bit read/write port independent of the IEEE 488 interface functions. The port outputs are disabled at system reset and do not interfere with normal IEEE 488 operations. The NI-488.2 function `ibLines` gives you direct access to this port from any programming language.

GPIB Transceivers

Transceivers interface the PCMCIA-GPIB to the IEEE 488 bus, which provide power-up/power-down bus protection (glitch free). The transceivers are built into the TNT4882C circuitry.

Robust Cabling

The PCMCIA-GPIB Controllers and cables have latching connectors that provide a robust mechanical setup. We also offer a PCMCIA cable strain relief kit (Figure 3) for those applications that require an even more robust setup.

Analyzer Option

The National Instruments PCMCIA-GPIB+ combines a PCMCIA-GPIB Controller and a complete GPIB Analyzer on a single board. The PCMCIA-GPIB+ is a low-cost, high-speed alternative to separate GPIB Controller and Analyzer products. The GPIB Analyzer portion of the PCMCIA-GPIB+ can capture and monitor GPIB activity up to 8 Mbytes/s rate, ideal for troubleshooting GPIB applications. For more information, see page 759.

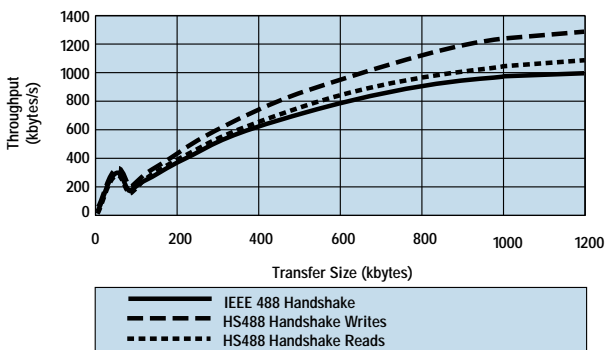


Figure 1. PCMCIA-GPIB Data Transfer Benchmarks (Small Data Blocks)

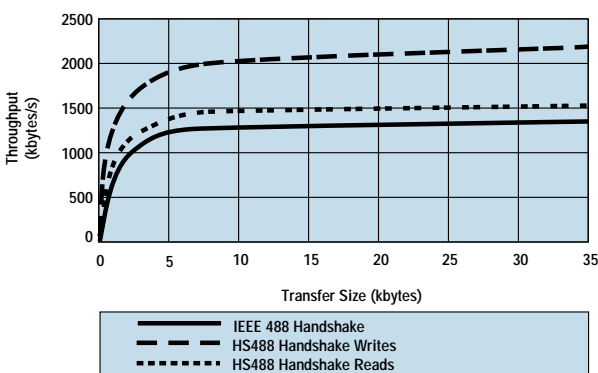


Figure 2. PCMCIA-GPIB Data Transfer Benchmarks

GPIB Interface for PCMCIA

Ordering Information

PCMCIA-GPIB, NI-488.2, and PCMCIA-GPIB Cable

Windows 2000 (2 m cable)	778034-02
Windows 2000 (4 m cable)	778034-04
Windows NT (2 m cable)	777332-02
Windows NT (4 m cable)	777332-04
Windows Me/9x (2 m cable)	777156-02
Windows Me/9x (4 m cable)	777156-04
Windows 3.1/DOS (2 m cable)	776857-01
Windows 3.1/DOS (4 m cable)	776857-04
Mac OS (2 m cable)	776960-02

Accessories

PCMCIA-GPIB cable (25-pin PCMCIA to shielded GPIB cable)	
1 m	186557-01
2 m	186557-02
4 m	186557-04
PCMCIA cable strain relief kit	777550-01

PCMCIA cable strain relief kit attaches to the bottom of your notebook computer and provides adjustable strain relief for one or two PCMCIA cables. The strain relief kit works with most PCMCIA cards. See page 757 for more information on the strain relief kit.

Specifications

IEEE 488 Compatibility

Compatible with IEEE 488.1 and IEEE 488.2

IEEE 488 Bus Transfer Rates

IEEE 488 3-wire handshake	1.3 Mbytes/s
HS488	2.2 Mbytes/s

(actual rates depend on system configuration and instrument capabilities)

Power Requirement from PCMCIA Slot

+5 VDC	65 mA typical
	85 mA maximum

Physical

Dimensions	Type II PC Card
I/O connector	Cable with IEEE 488 standard
	24-pin

Operating Environment

Component temperature	0 to 55 °C
Relative humidity	10 to 90%, noncondensing

Storage Environment

Ambient temperature	-20 to 70 °C
Relative humidity	5 to 90%, noncondensing

Electrostatic Discharge Protection (GPIB I/O pins)

By Mil 883C Section 3015C	1500 V
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