GPIB Interfaces for VMEbus

NI GPIB-1014 Series

DMA Interfaces

- Complete IEEE 488 Talker/Listener/Controller
- DMA transfers
  - More than 500 kbytes/s maximum transfer rate
  - Unlimited data block lengths
  - Full 24-bit addressing
  - GPIB synchronization detection
  - General-purpose DMA capability
- Programmable configuration
  - 1 of 4 bus request/grant lines
  - 1 of 7 interrupt request lines
- Supervisor or user access
- Red/green SYSFAIL LED indicator
- Local master reset
- Complies with IEEE 1014 (VMEbus) standard

Programmed I/O Interfaces

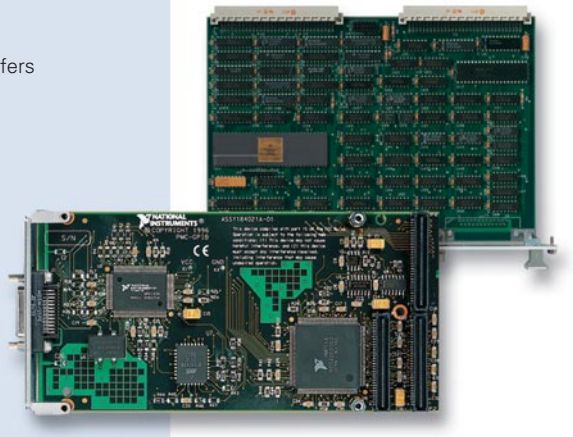
- Complete IEEE 488 Talker/Listener/Controller
- Polled or interrupt-driven transfers
- Transfer rates of more than 80 kbytes/s
- User-configurable parameters
  - Base address
  - Interrupt request line
  - Interrupt status/ID byte
  - Supervisor or user access
- Complies with IEEE 1014 (VMEbus) standard

NI PMC-GPIB

- Complete IEEE 488 interface on PMC daughter card

Driver Software

- ESP-488 (C source code development kit)



Overview

National Instruments offers two high-performance solutions for GPIB control in VME systems – the NI PMC-GPIB and the NI GPIB-1014 Series. Both solutions implement the full range of GPIB controller functions. Both solutions handle normal and extended talker and listener, serial and parallel poll, service request, and remote programming functions.

PMC-GPIB Daughtercard

The National Instruments PMC-GPIB is our highest-performance GPIB solution for VME systems. You can install the PMC-GPIB on any VME board with PMC slots. See page 670 for more information about the PMC-GPIB.

GPIB-1014 Series

The National Instruments GPIB-1014 Series consists of high-performance IEEE 488 interfaces for the VMEbus. The electrical, timing, and mechanical characteristics of the National Instruments GPIB interfaces for VMEbus conform to both IEEE 1014 VMEbus and IEEE 488 standards. See Tables 2 and 3 for IEEE 1014 compliance features of the GPIB-1014 Series.

Hardware Options

The series includes many different options to meet the needs of your particular application. Table 1 lists the different boards in the GPIB-1014 Series.

INFO CODES

For more information, or to order products online visit *ni.com/info* and enter:

pmcgpib
gpib1014

BUY ONLINE!

GPIB Ports

All GPIB-1014 boards use the NAT7210 to implement all IEEE 488 interface functions. The NAT7210 configures, controls, and monitors the GPIB, as well as transfers commands and data to and from other IEEE 488 devices. The GPIB-1014 boards use IEEE 488-compliant transceivers, which provide power-up/power-down bus protection (glitch free). The GPIB-1014DP provides two independent GPIB ports.

Controller Model	GPIB Ports	DMA	Programmed I/O	Size	GPIB Port on Front	GPIB Port on Rear (P2)	Ejector Handles
GPIB-1014-1	1	✓	-	6U	✓	✓	-
GPIB-1014-2	1	✓	-	6U	-	✓	-
GPIB-1014-EH	1	✓	-	6U	✓	✓	✓
GPIB-1014-1S-EH	1	✓	-	6U	✓	-	✓
GPIB-1014P-1	1	-	✓	3U	✓	-	-
GPIB-1014P-2	1	-	✓	3U with 6U front panel	✓	-	-
GPIB-1014DP	2	-	✓	6U	✓	✓	-

Table 1. GPIB-1014 Series Hardware Options

GPIB Interfaces for VMEbus

DMA

Using DMA, you can transfer data of unlimited block lengths at rates more than 500 kbytes/s. Other important features include two programmable transfer modes – cycle steal or cycle steal with hold – along with a programmable release-on-request feature, programmable selection of bus request/grant line, synchronization detection, carry-cycle functions that ensure complete data transfers, and 8, 16, or 32-bit memory-to-memory transfer capability.

The DMA controller provides transfers with full 24-bit addresses and programmable selection of the address modifier code. This capability eliminates artificial memory boundaries. In addition, the DMA controller can transfer data between the GPIB and data area, program area, or even devices located in the short I/O area. See Table 1 for a list of boards that support DMA.

Size

The GPIB-1014 Series includes both 6U and 3U height boards. See Table 1 for height options.

GPIB Port Location

The GPIB signals can be routed to a front panel connector and routed to pins on the VME P2 connector. See Table 1 for GPIB port location options.

Ejector Handle

Some GPIB-1014 models provide ejector handles for easier interface removal. See Table 1 for ejector handle options.

Software Options

All GPIB-1014 interfaces come with a complete technical reference manual with full register descriptions and programming examples. National Instruments also offers the ESP-488 C source-code package for rapid development of GPIB-1014 applications.

Compliance	Mode	Description
D8 (0)	Slave	Offers 8-bit data path to GPIB interface controller
D16 and D8 (E0)	Slave	Offers 8 or 16-bit data path to DMA Controller
A16	Slave	Responds to 16-bit short I/O addresses
AD0	Slave	Accommodates address-only (AD0) cycles
D8 (E0)	Master	Handles 8-bit DMA transfers to and from GPIB
D16 and D8 (E0)	Master	Handles 8 or 16-bit memory-to-memory DMA transfers
A24	Master	Provides full 24-bit addressing
ROR	Requester	Offers programmable release on request
D8 (0)	Interrupter	Provides 8-bit status/ID byte
RORA	Interrupter	Releases interrupt request line when onboard status register is accessed

Table 2. IEEE 1014 Compliance Levels

Compliance	Mode	Description
D8 (0)	Slave	Offers 8-bit data path to GPIB interface controller
A16	Slave	Responds to 16-bit short I/O addresses
D8 (0)	Interrupter	Provides 8-bit status/ID byte
ROAK	Interrupter	Releases interrupt line on acknowledge cycle

Table 3. IEEE 1014P Compliance Levels

Ordering Information

Hardware

GPIB-1014-1 776059-01
GPIB-1014-2 776060-01
GPIB-1014-EH 776059-51
GPIB-1014-1S-EH 776059-61
GPIB-1014P-1 776062-01
GPIB-1014P-2 776063-01
GPIB-1014DP 776093-01

Software

ESP-488 for GPIB-1014 written in C 778169-01
ESP-488 for GPIB-1014P/DP written in C 778116-03
Software provided on 1.4 MB 3.5 in. DOS disks.

Specifications

IEEE 488 Compatibility
Compatible with IEEE 488.1

IEEE 488 Transfer Rates
GPIB-1014 ..... More than 500 kbytes/s
GPIB-1014P/GPIB-1014DP ..... More than 80 kbytes/s
GPIB-1014DP ..... More than 80 kbytes/s

Power Requirement
+5VDC
GPIB-1014 ..... 1.6 A typical; 2.0 A maximum
GPIB-1014P ..... 0.6 A typical; 1.0 A maximum
GPIB-1014DP ..... 1.1 A typical; 2.0 A maximum

Physical Dimensions
GPIB-1014, GPIB-1014DP ..... 16.0 by 23.4 cm (6.3 by 9.2 in.)
GPIB-1014P ..... 9.9 by 16.0 cm (3.9 by 6.3 in.)

I/O Connectors
GPIB-1014-1/EH/IS ..... IEEE 488 standard 24 pin
GPIB-1014-2 ..... VME P2 connector
GPIB-1014P/DP ..... IEEE 488 standard 24 pin

Operating Environment
Temperature ..... 0 to 70 °C
Relative humidity ..... 10 to 90%, noncondensing

Storage Environment
Temperature ..... -20 to 70 °C
Relative humidity ..... 10 to 90%, noncondensing