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Find the *National Instruments GPIB-SCSI-A* at our website: ***Click HERE***

High-Performance GPIB SCSI Controllers

GPIB-SCSI-A, GPIB-SG-S, GPIB-SPRC-S, GPIB-SCSI/Mac-A

NAT4882 ASIC
- Completely IEEE 488.2 compatible
- Reduced software overhead
- Increased reliability

Built-in 256 KB RAM buffer
Double-buffered operation for simultaneous block transfers
Two shielded 50-pin SCSI-1 connectors
Internal power supply
All-metal case and shielded connectors minimize EMI

NI-488.2M Software
Solaris

NI-488M Software
IRIX 5.3
IRIX 6.x

NI-488.2 Software
Mac OS

Application Software
LabVIEW
LabWindows/CVI

Applications
IEEE 488.2 control from SCSI port of
- Silicon Graphics
  - Personal IRIS
  - Indigo
  - Indigo²
  - Indy
- SPARCstation
- Macintosh or compatible

Interfacing between SCSI-based systems and GPIB-based systems
Integrating SCSI devices, such as disk-storage systems, into a GPIB system



Overview

With the GPIB-SCSI-A, you can use a computer with a SCSI port to control and communicate with up to 14 GPIB devices or a computer with a GPIB port to control and communicate with up to seven SCSI devices. A double-buffering scheme has been implemented so that you can conduct SCSI and GPIB transfers simultaneously. (The maximum transfer rate into the SCSI port and the GPIB port is 1 Mbytes/s.)

The GPIB-SCSI-A has two modes. SCSI (S) mode is used to transform any computer with a SCSI port to a GPIB Controller. In GPIB (G) mode, you can use the GPIB-SCSI-A to incorporate a SCSI device into a GPIB system. The GPIB-SCSI-A has two SCSI-1 ports on the rear panel, in addition to a standard GPIB port, to make daisy-chaining and termination less complicated in SCSI systems. National Instruments also offers a variety of SCSI conversion cables to connect to the various SCSI connectors commonly used on SCSI devices.

The National Instruments NAT4882 ASIC performs the full range of GPIB Controller and Talker/Listener functions, including those Controller functions required by the most recent GPIB standard, IEEE 488.2. In G mode, the GPIB-SCSI-A implements all of the standard SCSI bus phases, including arbitration and selection/reselection, asynchronous data transfers, and parity generation with optional checking.

The GPIB-SCSI-A has a built-in 256 KB RAM buffer used to buffer data transferred on the GPIB and the SCSI. With this configuration, you can disconnect from the SCSI bus while communicating with a GPIB instrument, freeing the SCSI bus for other tasks while the GPIB-SCSI-A communicates with the GPIB instrument.

GPIB-SCSI-A Capabilities

The GPIB-SCSI-A can run in either two modes – SCSI or GPIB mode, depending on the application.

SCSI (S) Mode Features

When operating in S mode, you can program the GPIB-SCSI-A from any operating system and language that has access to a SCSI port. Figure 1 shows the GPIB-SCSI-A in S mode, controlling a GPIB device as a GPIB Controller from the SCSI port.

SCSI Disconnect/Reconnect

Using its 256 KB RAM buffer, the GPIB-SCSI-A can disconnect from the SCSI bus while it communicates with GPIB devices and reconnect when completed. Thus, SCSI operations do not have to wait for GPIB operations to end. Disconnect/reconnect can occur at any time during a GPIB data transfer.

Double Buffering

With double buffering, transfers on the GPIB and transfers on the SCSI can proceed concurrently. SCSI disconnect/reconnect is

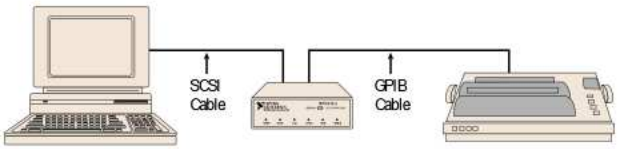


Figure 1. S Mode Application Example

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used if the SCSI transfer finishes before the GPIB transfer. The GPIB transfer will continue while the GPIB-SCSI-A disconnects from the SCSI bus. Double buffering is a software-configurable option.

Straight-Through

When disconnect/reconnect is not required in order to ensure SCSI bus integrity in your system, you can enable straight-through transfers. With straight-through transfers, maximum throughput is achieved by transferring data from one port to the other without making use of the 256 KB RAM buffer.

Programmable Timeouts

In S mode, the GPIB-SCSI-A has programmable timeouts on I/O operations so that transfers do not hang up the GPIB indefinitely.

Protocol Translator

The GPIB-SCSI-A is programmed by sending SCSI Command Descriptor Blocks of six bytes that contain command data. It converts the Command Descriptor Blocks from the computer into the appropriate GPIB management and communication messages and acts as a protocol translator between the SCSI port and the GPIB devices. Table 1 lists the S mode commands.

GPIB (G) Mode Features

When operating in G mode, you can program the GPIB-SCSI-A from any GPIB controller. Figure 2 shows the GPIB-SCSI-A used in G mode. The controller is a computer with a GPIB port.

Addressing

The GPIB-SCSI-A recognizes two addresses in G mode. One address is used as a Command/Message/Status channel to send command strings to the GPIB-SCSI-A or to retrieve status and message information from the SCSI bus or the GPIB-SCSI-A. The other address is used for a data channel where all data is sent to or received from the selected SCSI target device.

Complete Status Update

Updated status information is continuously maintained by the GPIB-SCSI-A after every programming message. You can obtain this status information continuously or by request in either symbolic, numeric, or binary form.

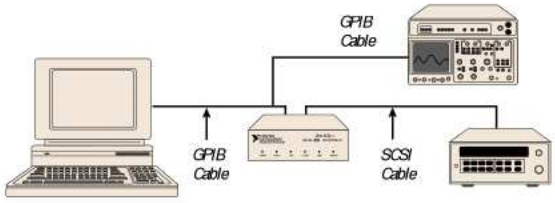


Figure 2. G Mode Application Example

GPIB Programming Messages	
brd	Read data, no GPIB addressing performed
bwrt	Write data, no GPIB addressing performed
cac	Become Active Controller
caddr	Change the GPIB address of the GPIB-SCSI-A
clr	Clear specified device
cmd	Send GPIB commands (ATN True)
eos	Change or disable GPIB end-of-string termination mode
eot	Enable or disable END termination on GPIB write
gts	Go from Active Controller to standby
ist	Set or clear individual status bit for use in parallel polls
lines	Returns the status of the GPIB control lines
ln	Checks for the presence of a device on the GPIB
loc	Go to local
onl	Place the GPIB-SCSI-A online/offline
ppc	Parallel poll configure
ppu	Parallel poll unconfigure
pct	Pass control
rd	Read data, all GPIB addressing performed
rpp	Conduct (request) a parallel poll
rsc	Request/release system control
rsp	Conduct (request) a serial poll
rsv	Request service and/or set the serial poll status byte
sic	Send interface clear
sre	Set/clear remote enable
trg	Trigger selected device
tmo	Change or disable time limit
wrt	Write data, all GPIB addressing performed
SCSI Programming Messages	
inquiry	Get inquiry data from GPIB-SCSI-A
rqsns	Request sense data from GPIB-SCSI-A
General Use Commands	
config	Change the buffering method and/or the buffer size
id	Identify GPIB-SCSI-A
stat	Receive GPIB-SCSI-A internal status
wait	Wait for selected condition to occur

Table 1. GPIB-SCSI-A S Mode Commands

High or Low-Level I/O

In G mode, the GPIB-SCSI-A can accept either high or low-level programming messages. High-level commands typically execute common SCSI operations, such as those contained in the common command set. For example, the read command can arbitrate for the SCSI bus, select a specified target, build the Command Descriptor Block required for the command, issue the command, read the data, and get the status and message bytes from the SCSI target. Low-level programming messages can process every phase of SCSI bus activity if the particular high-level message does not perform the required SCSI command. Some G mode commands can also be used to return current settings and parameters of the GPIB-SCSI-A if the command is followed by a question mark. There are four types of G mode programming messages – SCSI, SCSI Configuration, GPIB Configuration, and General Use.

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High-Performance GPIB SCSI Controllers



Figure 3. GPIB-SCSI-A Rear Panel

Ordering Information

Hardware and Software Kits

Silicon Graphics Personal IRIS, Indigo, Indigo2, Indy

GPIB-SG-S

U.S. 120 VAC	776613-01
Swiss 220 VAC	776613-02
Australian 240 VAC	776613-03
Universal Europe 240 VAC	776613-04
North American 240 VAC	776613-05
United Kingdom 240 VAC	776613-06

GPIB-SG-S with 2 m X2 GPIB cable

U.S. 120 VAC	776613-51
Swiss 220 VAC	776613-52
Australian 240 VAC	776613-53
Universal Euro 240 VAC	776613-54
North American 240 VAC	776613-55
United Kingdom 240 VAC	776613-56

Includes NI-488M software for IRX on 4 mm DAT.

Sun SPARCstation

GPIB-SPRC-S

U.S. 120 VAC	776584-01
Swiss 220 VAC	776584-02
Australian 240 VAC	776584-03
Universal Euro 240 VAC	776584-04
North American 240 VAC	776584-05
United Kingdom 240 VAC	776584-06

Mac OS Computers

GPIB-SCSI/Mac-A

U.S. 120 VAC	776585-01
Swiss 220 VAC	776585-02
Australian 240 VAC	776585-03
Universal Euro 240 VAC	776585-04
North American 240 VAC	776585-05
United Kingdom 240 VAC	776585-06

Hardware

GPIB-SCSI-A

U.S. 120 VAC	776569-01
Swiss 220 VAC	776569-02
Australian 240 VAC	776569-03
Universal Euro 240 VAC	776569-04
North American 240 VAC	776569-05
United Kingdom 240 VAC	776569-06

GPIB Cables

X2 cable (double-shielded)

1 m	763061-01
2 m	763061-02
4 m	763061-03
5 m	763061-04

For SCSI cables, see page 773.

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High-Performance GPIB SCSI Controllers

Specifications

SCSI Port
Asynchronous data transfers
Automatic parity generation and optional checking
External termination provided
Single-ended drivers/receivers
SCSI ID is switch selectable
Compliance with X3T9.2

GPIB Port
Full-function Talker, Listener, and Controller
Compatible with IEEE 488.1 and IEEE 488.2
Handles all primary and secondary addresses
Address is switch or program selectable

Maximum Transfer Rates

SCSI reads into buffer memory	1 Mbytes/s
SCSI writes from buffer memory	800 kbytes/s
GPIB reads into buffer memory	1 Mbytes/s
GPIB writes from buffer memory	600 kbytes/s

Straight-through transfers (no buffering)

SCSI writes/GPIB reads	800 kbytes/s
SCSI reads/GPIB writes	600 kbytes/s

(actual rates depend upon system configuration and instrument capabilities)

Front Panel Indications
Power, ready, talk, listen, send, and receive

RAM Buffer	256 KB

Power Requirement (50-60 Hz)

100-120 ±10% VAC	90 mA
220-240 ±10% VAC	45 mA

Physical

Dimensions	25.1 by 19.0 by 7.5 cm (9.9 by 7.5 by 2.9 in.)
Weight	1.8 kg (4 lb)

I/O Connectors

GPIB port	IEEE 488 standard 24-pin
SCSI port	Two shielded 50-pin SCSI-1

Operating Environment

Temperature	0 to 40 °C
Relative humidity	10% to 90%, noncondensing

Storage Environment

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

Noise and Emissions
FCC Class A verified

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