GPIB RS-232/485 Controllers and RS-232 Converter

NI GPIB-232CT-A, NI GPIB-485CT-A
Overview
The National Instruments GPIB-232CT-A and GPIB-485CT-A can turn any computer or terminal with an RS-232 or RS-485 port into a full-function IEEE 488.2 controller. With the flip of a switch, the NI GPIB-232CT-A or NI GPIB-485CT-A can make any RS-232 or RS-485 device appear as a GPIB device. The small size of these controllers makes them ideal for use with laptop computers or other computers that have no internal I/O slots available.

The NAT4882 IEEE 488.2 ASIC implements the full range of GPIB controller functions, including those controller functions required and recommended by IEEE 488.2. All GPIB sequences and operations conform to IEEE 488.2. External DIP switches set the operating mode, the GPIB primary address, and serial port parameters.

Depending on the version, the GPIB-232CT-A and GPIB-485CT-A controllers can accept either AC or DC power input. You can connect either the GPIB-232CT-A or the GPIB-485CT-A to up to 14 GPIB instruments. In addition, when you pair the GPIB-485CT-A with an RS-485 board for the PC, such as the National Instruments PCI-485, you can use it as a cost-effective GPIB extender up to 1.2 km (4,000 ft).

Controller Capabilities
Data Buffer – A FIFO data buffer helps maximize performance. The GPIB-232CT-A and GPIB-485CT-A can continue to accept data from the serial or GPIB port while the other port is busy.

Complete Status Update – The GPIB-232CT-A and GPIB-485CT-A handle both continuous and requested status and error reporting in either symbolic or numeric form.

Symbolic status reporting is useful for direct viewing on a terminal (CMPL for complete, ERR for error, and so on). Numeric status reporting is useful for processing by an application.

Modes of Operation
You can use either controllers in either Serial (S) or GPIB (G) mode. These modes are described using the GPIB-232CT-A as an example.

S Mode – Figure 1 shows the GPIB-232CT-A used in the S mode. In S mode, the device on the serial side of the GPIB-232CT-A is a computer or similar intelligent device.

The GPIB-232CT-A acts as a protocol translator between the serial port and GPIB devices and has complete Talker/Listener/Controller capability. For S mode, you can use a full repertoire of GPIB-related commands and others that manage the serial interface and the GPIB-232CT-A itself.

G Mode – Figure 2 shows the GPIB-232CT-A used in the G mode.

In G mode, the GPIB-232CT-A makes a serial device appear as a GPIB Talker/Listener to the Controller. The GPIB-232CT-A recognizes two addresses in G mode – it treats one as its GPIB address and the other as the serial device address. When the GPIB-232CT-A receives its GPIB listen address, it treats the data it receives as a programming message. When the GPIB-232CT-A receives the serial device listen address, it sends out status information. When the GPIB-232CT-A receives the serial device talk address, it sends out the serial data received from the device. You can program the GPIB-232CT-A to assert SRQ under a variety of
conditions; for example, when it has received any data from the serial device, or when it has received an end-of-string byte from the serial device.

**Software – Win32 Compatibility**

Native 32-bit compatibility with board-level NI-488.2 functions is possible with a Win 32 operating system. For details, refer to the Application Note titled “Board-Level NI-488.2 Software for the GPIB-232CT-A and Windows NT/98/95” (Application Note 130, part number 341585A-01).

Under Windows Me/9x, you can install and use NI-488.2 for DOS to run DOS applications, NI-488.2 for Windows 3.1 to run Win16 applications, and NI-488.2 for Windows 3.1 along with the compatibility release to run Win32 applications.

**NI GPIB-232CV-A**

**Overview**

The National Instruments GPIB-232CV-A IEEE 488 to RS-232 protocol converter transparently converts data between the two ports without control codes or special commands. The NI GPIB-232CV-A also increases the efficiency of the interface system by isolating a slow device from the faster port using its built-in DMA controller and 256 kb RAM buffer. You can use the GPIB-232CV-A with virtually all PCs.

The GPIB-232CV-A links either a GPIB controller to an instrument with an RS-232 port or a GPIB device to a computer through the computer serial port. For example, the GPIB-232CV-A can interface a GPIB device, such as an IEEE 488 spectrum analyzer, to a computer with an RS-232 port; or it can connect an RS-232 device, such as a printer or plotter, to a GPIB network. Data transfers in either direction are possible at all times.

Depending on the version, the GPIB-232CV-A can accept either AC or DC power input.

**Modes of Operation**

You can configure the GPIB-232CV-A to run in one of two modes – device mode or controller mode. Device mode configures the GPIB-232CV-A to perform as a GPIB Talker/Listener controlled by another GPIB Controller. Controller mode configures the GPIB-232CV-A as a GPIB Controller that addresses a single GPIB device to talk or listen.
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and RS-232 Converter

Ordering Information
GPIB-232CT-A
GPIB-232CT-A hardware only
AC version .............................................. 776668-0P
DC version ............................................. 776899-Y1
GPIB-232CT-A and NI-488.2 for Windows 3.1/DOS
AC version .............................................. 776667-0P
DC version ............................................. 776900-Y1
GPIB-485CT-A
GPIB-485CT-A hardware only
AC version .............................................. 777146-0P
DC version ............................................. 777147-Y1
GPIB-485CT-A and NI-488.2 for Windows 3.1/DOS
AC version .............................................. 777148-0P
DC version ............................................. 777149-Y1
GPIB-232CV-A
GPIB-232CV-A hardware only
AC version .............................................. 776669-0P
DC version ............................................. 776898-Y1

P = Power cord type
1 = U.S. 120 V AC
2 = Swiss 220 V AC
3 = Australian 240 V AC
4 = Universal Euro 240 V AC
5 = North American 240 V AC
6 = United Kingdom 240 V AC

Y = Power supply type
0 = 115 V AC
3 = 230 V AC

Specifications

Power Requirements
AC version (50 to 60 Hz)
100 to 120 ±10% VAC ............................... 5 VA
220 to 240 ±10% VAC ............................... 5 VA
DC version
5 to 13 VDC ........................................... 700 mA

Physical
Dimensions
AC version .............................................. 7.6 by 4.4 by 11.8 cm (3.0 by 1.7 by 4.7 in.)
DC version .............................................. 7.6 by 2.8 by 11.8 cm (3.0 by 1.1 by 4.7 in.)
Weight ...................................................... 340.2 g (12 oz)

I/O Connectors
GPIB port ................................................ IEEE 488 standard 24 pin
Serial port .............................................. Standard 9-pin male D-Sub

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

Storage Environment
Temperature .......................................... -20 to 70 °C
Relative humidity ................................... 10 to 95%, noncondensing

Noise Emissions
FCC Class A verified (AC version)
FCC Class B verified (DC version)

Compliance
Online at ni.com/hardref.nsf

Cables
National Instruments recommends you use the following cables with the GPIB-232CV-A/GPIB-232CT-A.

Serial null modem cable (9-pin D-Sub to 9-pin D-Sub)
1 m ....................................................... 182238-01
2 m ....................................................... 182238-02
4 m ....................................................... 182238-04
RS1 cable (9-pin D-Sub to 25-pin D-Sub)
1 m ....................................................... 181074-10
GPIB-232CV-A/Mac cable (9-pin D-Sub to Macintosh port, 8-pin DIN)
1 m ....................................................... 182514-01

National Instruments recommends you use the following cables with the GPIB-485CT-A.
RS2 cable (9-pin female D-Sub to 9-pin female D-Sub)
1 m ....................................................... 183283-01
2 m ....................................................... 183283-02
4 m ....................................................... 183283-04

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Visit ni.com/info and enter gpib232cta, gpib485cta, and/or gpib232cva.

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