BROCHURE

GPIB, USB and Instrument Control Products

for Easy PC-to-Instrument Connection

- Choose the best way to connect your PC to GPIB, USB and RS-232 instruments
- Take advantage of PC-standard interfaces (USB, LAN, PCI, PCIe®)
- Protect your investment with industry-standard I/O software



KEYSIGHT TECHNOLOGIES

Introduction

The Keysight Technologies, Inc. GPIB, USB and Instrument Control Products

Keysight instrument control hardware family benefits

- Easy connection to GPIB, USB and RS-232 instruments — Keysight instrument control hardware offer simple "plug-and-go" set up and configuration.
- Use PC-standard interfaces — Connect via your computer PCI/PCIe® slot or use the built-in USB or LAN ports on your PC to connect to your instruments.
- Choice of interfaces (GPIB, RS-232, USB, LAN, PCI, PCIe® — Keysight offers you a selection of products to meet your I/O needs. We work where you do!
- Use industry-standard I/O libraries — The included industry-standard VISA I/O libraries make it easy for you to use your existing software programs and let you mix and match test instruments and software from different vendors in a single system.

Easily mix instruments from different vendors

Keysight IO Libraries Suite eliminates the headaches associated with trying to combine hardware and software from different vendors. The software is compatible with GPIB, USB, LAN and RS-232 test instruments that adhere to the supported interface standards, no matter who makes them.

When you install the IO Libraries Suite, the software checks for the presence of other I/O software on your computer. If it finds another vendor's VISA libraries (such as National Instruments), it automatically installs in a side-by-side mode that allows you to use your existing I/O software and the Keysight software together in multi-vendor systems without you being concerned with the behind-the-scenes details.

Works with millions of existing instruments from hundreds of vendors

Use the most trusted and reliable technology for your connections. The IO Libraries Suite ships with more than 150 instruments from Keysight. It works with literally millions of existing instruments—helping you minimize the number of software packages you need. You won't have to switch between packages as you use a mix of existing and new instruments in the future.

Work in the environment comfortable to you

In addition, the IO Libraries are compatible with a variety of application development environments and programming APIs including Keysight or NI VISA, VISA COM, SICL, and Keysight 488 (compatible with NI-488.2), giving you even more flexibility to choose the software and hardware from any vendor to get your job done.

Connecting is as easy as 1-2-3

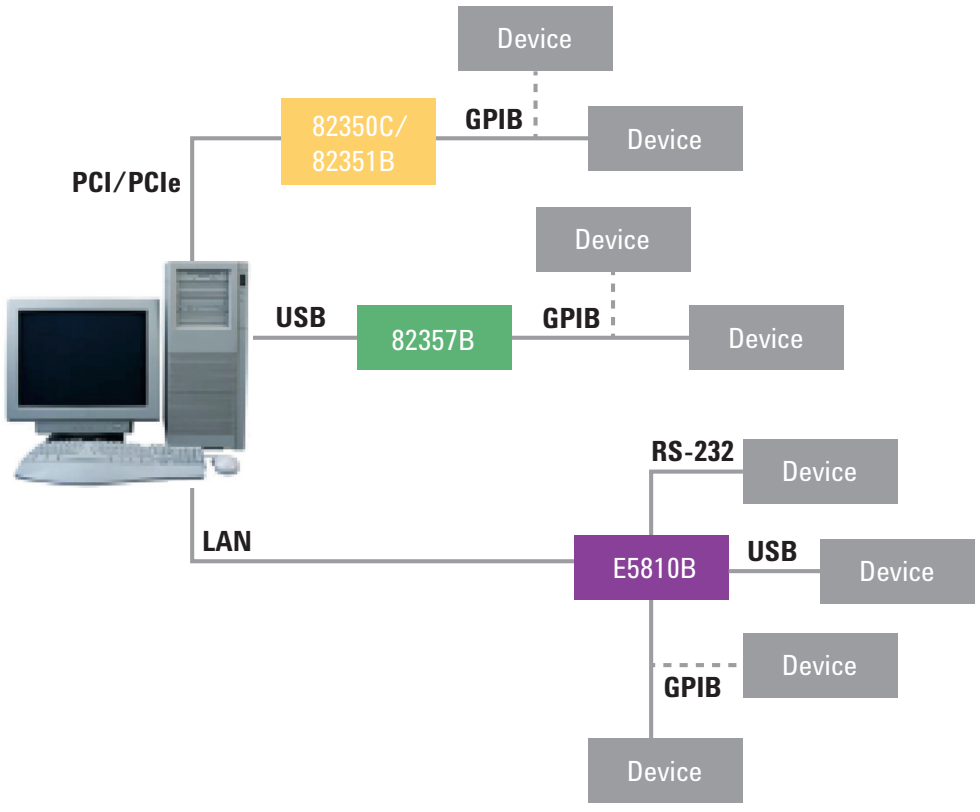
1. **Install** Keysight IO Libraries Suite software on your PC
2. **Hook up** the instrument control hardware (USB, LAN, RS-232 or GPIB cables) between your instruments and your PC
3. **Detect instruments** and devices, then configure interfaces with Connection Expert

Select the Right Connectivity for your Need

	Model	Description	Recommended use	Page
	82350C	High Performance PCI-GPIB Interface Card	– Maximum GPIB throughput for all configurations – Standard and low-profile brackets allow flexible connection	4
	82351B	High Performance PCIe/GPIB card Interface Card	– Bandwidth-intensive test applications – Standard and low-profile brackets allow flexible connection	6
USB Converters	82357B	USB/GPIB Interface	– Easiest GPIB connectivity – Notebook computer GPIB connections	8
LAN Converters	E5810B	LAN/GPIB/USB Gateway	– One-box connectivity – remote GPIB, RS-232 and USB connections – Sharing of instruments in a distributed system	10
Cables and Adapter	10833x	GPIB Cables	– 10833A – 1 m – 10833B – 2 m – 10833C – 4 m – 10833D – 0.5 m – 10833F – 6 m – 10833G – 8 m	12
	10834A	GPIB-to-GPIB Adapter	– Extends the first cable 2.3 cm away from the rear panel to provide clearance for other connectors, switches, and cables.	12

System topology

Keysight instrument control products help connect your instruments to PC easily, reliably and affordably. From legendary GPIB cables to the the one-box connectivity gateway, see how each provides seamless integration of your instruments no matter where they are placed in your system.



Keysight 82350C High Performance PCI-GPIB Interface Card

The 82350C PCI-GPIB interface card converts any PCI bus computer into an instrumentation control and data acquisition system. It comes with direct PCI computer connection, and transaction overhead is minimized for the best overall operating performance.

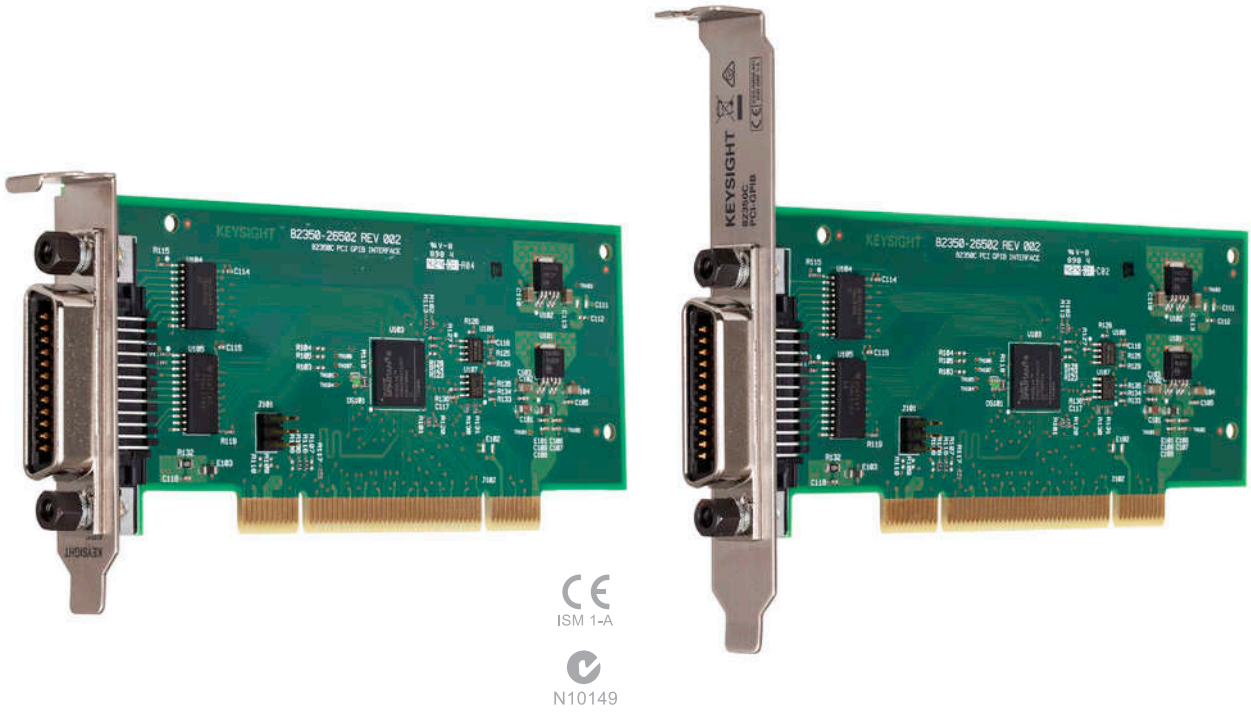
The 82350C interface card is fully compatible with IEEE-488 control and communication standard, de-couples GPIB transfers from PCI bus transfers. Buffering provides I/O and system performance that is superior to direct memory access (DMA). The hardware is software configurable and compatible with the plug-and-play standard for easy installation. The GPIB interface card offers high flexibility to plug into standard or low profile PC with a bracket change.

Features

- PCI IEEE-488 interface for PCs
- Transfer rates up to 900 KB/s
- Dual processor support on the latest Windows operating system

Recommended use

- Maximum GPIB throughput for all configurations
- Standard and low-profile brackets allow flexible connection



82350C with standard (right) and low-profile (left) brackets

82350C Technical Specifications

General requirements	
Minimum system requirements	Refer to page 12 for requirements in using the Keysight IO Libraries software (included with the instrument control hardware)
Software requirements	Keysight IO Libraries Suite
PCI bus slot	Universal 3.3 V and 5 V PCI slot, 32 bits
Supported standards	PCI rev 2.1, IEEE 488.1 and IEEE 488.2 compatible
General characteristics	
Power	Backplane +3.3 V or +5 V PCI
Connectors	Standard 24-pin IEEE-488 (GPIB)
	Universal +3.3 V and +5 V PCI
Maximum data rate	900 KB/s
Maximum instrument connection	14 instruments - daisy chain via GPIB
Buffering	Built-in
Configuration	Plug and play
EMC	IEC 61326-1:2005/EN61326-1:2006
Dimension	
Length, width and height	156 mm (L) X 121 mm (W) X 21.6 mm (H)
Weight	0.072 kg
Environmental specifications	
Operating environment	–5 °C to 60 °C
Operating humidity	Up to 90% at 40 °C non condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non condensing
Ordering information	
Includes	Low profile bracket, Quick start poster

Keysight 82351B High Performance PCIe-GPIB Interface Card

Faster data transfer speed for high-throughput test application

The 82351B PCIe-GPIB interface card offers the fast data transfer rate associated with PCIe to support high-bandwidth PC applications, ensuring that data is consistently retained without being overwritten during the transfer to memory.

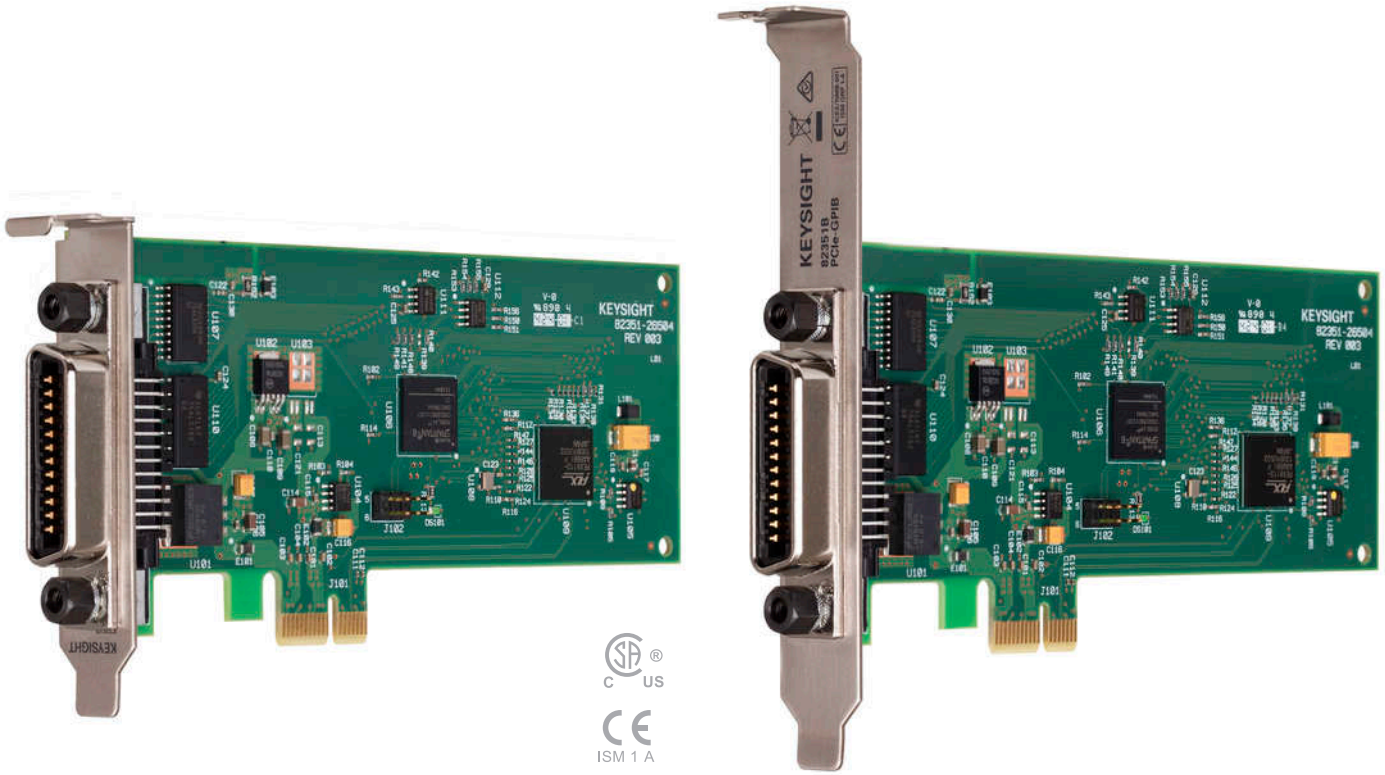
PCIe is the next generation of PCI and offers unsurpassed speed and performance, making PCIe cards an ideal choice for many computer platforms and automation applications. It is full backward compatible with PCI-configured software or coding, removing the need to reconfigure any code. The 82351B is highly flexible with plug-and-play configuration and enables usage in a low-profile PC with a bracket change.

Features

- High transfer rate of 1.4 MB/s
- High flexibility via up-plugging (to x4 or x8 PCIe slots)
- 3.3 V signal level for lower power consumption

Recommended use

- Bandwidth-intensive test applications
- Standard and low-profile brackets allow flexible connection



C US

ISM 1 A

N10149

ES/NMB-001

82351B with standard (right) and low-profile (left) brackets

82351B Technical Specifications

General requirements	
Minimum system requirements	Refer to page 12 for requirements in using the Keysight IO Libraries software (included with the instrument control hardware)
Software requirements	Keysight IO Libraries Suite
PCI bus slot	3.3 V PCI slot, 32 bits
Supported standards	PCIe rev 1.0a
	IEEE-488.1 and IEEE-488.2 compatible
General characteristics	
Power	Backplane +3.3 V PCIe
Connectors	Standard 24-pin IEEE-488 (GPIB)
	+3.3 V PCIe
Maximum data rate	1.4 MB/s
Maximum instrument connection	14 instruments - daisy chain via GPIB
Buffering	Built-in
Configuration	Plug and play
EMC	IEC 61326-1:2005/EN61326-1:2006
Dimension	
Length, width and height	156 mm (L) X 121 mm (W) X 21.6 mm (H)
Weight	0.074 kg
Environmental specifications	
Operating environment	–5 °C to 60 °C
Operating humidity	Up to 90% at 40°C non condensing
Storage environment	–40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C non condensing
Ordering information	
Includes	Low profile bracket, Quick start poster

Keysight 82357B USB/GPIB Interface

Connect GPIB instruments quickly and easily to your computer's USB port

The Keysight 82357B USB/GPIB interface provides a direct connection from the USB port on your desktop and laptop computers to GPIB instruments. Once the software is loaded, your computer automatically detects the 82357B when it is connected to the computer USB port.

With the 82357B USB/GPIB interface and its convenient plug-and-play feature, you just plug and go. It is also hot pluggable, making it easy to connect and disconnect without having to shut down the computer. No external power supplies are necessary.

The 82357B USB/GPIB interface implements USB 2.0 and is backward compatible with USB 1.1. The 82357B USB/GPIB interface uses a thin, flexible, high-quality USB cable that is USB 2.0-compliant. The USB cable is shielded, and the connector is specified to 1,500 insertions, ensuring a durable connection and reliable data transfer.

Features

- Fast and easy connection to GPIB instruments
- Uses standard USB and IEEE-488 interfaces
- Maximum GPIB transfer rate of up to 1.15 MB/s
- Use industry-standard software
- Parallel polling capability

Recommended use

- Easiest GPIB connectivity
- Notebook computer GPIB connections



Boosting performance with the simplest connectivity

82357B Technical Specifications

General requirements	
Minimum system requirements	Refer to page 12 for requirements in using the Keysight IO Libraries software (included with the instrument control hardware)
Software requirements [1]	Keysight IO Libraries Suite
Supported standards	USB 2.0 high speed
	Standard USB endpoints supported
	IEEE-488.1 and IEEE-488.2 compatible
	SICL and VISA 2.2
Unsupported GPIB modes of operation	Pass control
	Non-system controller mode
General characteristics	
Power	USB bus-powered device, +5 V, 500 mA (max), 200 mA (typ)
GPIB transfer rate	1.15 MB/s or better
Connectors	Standard 24-pin IEEE-488 (GPIB)
	Standard USB A
USB hubs	Self-powered hubs
Parallel polling	A single parallel poll can easily check up to eight individual devices at once, corresponding to the number of data lines on the GPIB
Cable	2.5-meter, shielded connector rated for 1500 insertions
LED indicators	READY, ACCESS, FAIL
Maximum connections	Maximum of 4 converters can be connected to the PC
Instrument connections	14 instruments—daisy chain via GPIB
Configuration	Plug-and-play
EMC and safety	IEC 61010-1:2001/EN 61010-1:2001
	Canada: CSA C22.2 No. 61010-1:2004
	USA: UL 61010-1:2004
Dimensions	
Length, width, and height	105 mm (L) x 64 mm (W) x 30 mm (H) (includes connectors)
Weight	215 grams
Environmental specifications	
Operating environment	0 °C to 55 °C
Operating humidity	–40 °C to +70 °C
Storage environment	Up to 90% at 40 °C non-condensing
Storage humidity	Up to 90% at 65 °C non-condensing

1. If you're using Keysight IO Libraries Suite 15.0 or higher, you're not required to install the driver separately as it would come built into the Suite.

Keysight E5810B LAN/GPIB/USB Gateway

One-box connectivity solution for easy GPIB, USB and RS-232 instrument control via standard LAN

The E5810B allows users to control various instrument interfaces remotely over wired or wireless LAN (with a wireless router). Now with USB capability, the E5810B connects up to 14 GPIB instruments, four USB instruments via a self-powered hub and an RS-232 instrument, giving test engineers a fast and efficient one-box solution. The E5810B is ideal for system integrators, automated testing and other applications requiring unlimited connection range and simultaneous connectivity to multiple instruments. It can be used during design verification, where the gateway makes it easy for engineers to share a rack of test equipment. For manufacturing, users can easily connect several test systems via a local LAN and control them with a single, centrally located PC; these systems can be accessed remotely for troubleshooting and debug.

Greater ease of use

The E5810B comes with an improved GPIB transfer rate of 1.2 MB/s and 1000BASE-T (1 Gigabit) LAN/Ethernet compatibility in addition to existing 100BASE-TX and 10BASE-T supportability.

With the built-in LCD display, users can quickly retrieve the IP address of the gateway and other system messages without needing to install additional software.

The E5810B also comes with LED indicators on the front panel display, allowing users to determine connection statuses of the gateway box at a glance.

Features

- Remote access and control of GPIB, USB and RS-232 instruments
- Faster GPIB transfer rate of up to 1.2 MB/s
- Supports 1000BASE-T (1 Gigabit)/ 100BASE-TX/10BASE-T LAN/ Ethernet connection
- Power switch for hard reset
- Password-protected web interface for configuration
- LCD display for easy setup and use

Recommended use

- One-box connectivity – remote GPIB, RS-232 and USB connections
- Sharing of instruments in a distributed system

Security functions

- With the E5810B, a secure password is required to access and modify all web configuration pages. The gateway comes with the secure erase feature, which will erase the systems preset and data information securely.

ISM 1-A

N10149

ICES/NMB-001



Make LAN to GPIB, USB and RS-232 connections with greater ease

E5810B Technical Specifications

General requirements	
Minimum system requirements	Refer to page 12 for requirements in using the Keysight IO Libraries software (included with the instrument control hardware)
Supported Web browsers	Internet Explorer 7.0 or greater
Software requirements	Web browser
	Keysight IO Libraries Suite
Supported standards	GPIB Standard IEEE 488.1, 488.2
	USB 2.0 or lower (with the USBTMC-USB488 protocol)
	LAN/Ethernet: 10BASE-T/100BASE-TX/1000BASE-T networks
	RS-232
	VXI-11 Protocol
	VISA 2.2 and Keysight SICL
General characteristics	
Power consumption	+12 VDC, 2 A
	Isolated ELV supply source
Connectors	Standard 24-pin IEEE-488 (GPIB), USB 2.0, RS-232 (9-pin), LAN RJ-45
Maximum data rates	1.2 MB/s for GPIB
	115 Kb/s for RS-232
	480 Mb/s for USB
Maximum instrument connection	14 GPIB instruments
	1 USB connection (supports up to 4 USB instruments via self-powered hub)
	1 RS-232 instrument
	Up to 16 simultaneous connectivity connections
LED indicators	Power, LAN, GPIB, USB, RS-232, FAULT
EMC and safety	IEC61326-1:2005/EN61326-1:2006
	Canada: ICES/NMB-001: Issue 4, June 2006
	Australia/New Zealand: AS/NZS CISPR11:2004
	IEC 61010-1:2010/EN 61010-1:2010 (3rd Edition)
Dimensions	
Length, width, and height	226.5 mm (8.92 in) × 238 mm (9.37 in) × 61 mm (2.36 in)
Weight	1.3 kg
Environmental specifications	
Operating environment	Operating temperature from 0 °C to 55 °C
	Relative humidity up to 95% RH at 40 °C
	Altitude up to 2000 m
	Pollution Degree 2
	Installation Category II (through an AC/DC adapter)
Storage environment	Storage temperature from –40 °C to 70 °C
	Relative humidity up to 90% RH at 65 °C
Recommended accessories	
	GPIB cables/adapter (see page 12)
	Option 300 – Rack mount kit

GPIB Cables and Adapter

Keysight connectivity software

Keysight connectivity software helps you establish a connection in less than 15 minutes.

Keysight IO Libraries Suite eliminates the hours of effort it takes to connect and configure PC-controlled test systems. This connectivity software ships with each Keysight instrument control hardware and over 150 Keysight test and measurement instruments. Connecting your instruments to a PC is as easy as connecting a PC to a printer – even if you use multiple instruments from different vendors.

Now, Keysight IO Libraries Suite comes with expanded compatibility with other vendors' IO software. You can now use any programming API with any standard T&M software development environment. Simply install Keysight's IO libraries Suite on your PC, then cable the interfaces and instruments to your PC. The IO Libraries Connection Expert utility will find the interfaces and instruments connected to your computer and configure them properly.

System Requirements

Keysight IO Libraries version 2019.

Windows PC software: Operating system

- Windows 10 (32-bit and 64-bit), Home, Pro, Enterprise
- Windows 8 and 8.1 (32-bit and 64-bit), Pro, Enterprise
- Windows 7 SP1 (32-bit and 64-bit), Starter, Home Basic, Home Premium, Professional, Ultimate, Enterprise
- Windows Server 2008 R2 SP1 (64-bit), Standard and Enterprise
- Windows Server 2012 (64-bit), Standard

Linux PC software: Operating system

- 64-bit Red Hat Enterprise Linux Desktop Workstation 7.1 to 7.5
- 64-bit CentOS Desktop Workstation 7.1 to 7.5

PC hardware

- **Processor:** 1 GHz, no support for Itanium64
- **RAM:** 1 GB minimum
- **Hard disk space required:** 2 GB
- **Display:** 1024 x 768 96 or 120 DPI
- Web connection for Internet download

If you already own an Keysight I/O product or instrument, you can download the latest version of Keysight IO Libraries Suite at no cost.

For more information, visit: www.keysight.com/find/iosuite

Cables

Keysight also offers a variety of cables that provide easy and reliable connections. Keysight cables are engineered for high reliability and durability, even under harsh conditions.

Cable	Length
10833D GPIB cable	0.5 m
10833A GPIB cable	1.0 m
10833B GPIB cable	2.0 m
10833C GPIB cable	4.0 m
10833F GPIB cable	6.0 m
10833G GPIB cable	8.0 m

Adapter

The 10834A GPIB-to-GPIB adapter can help when limited rear-panel space and other design considerations make cabling difficult. The 10834A adapter extends the first cable to 2.3 cm away from the rear panel to provide clearance for other connectors, switches, and cables.





Measurement Automation—Quick and Easy

Whatever instrument you're programming—whether a signal analyzer, oscilloscope, power supply or DMM—Keysight VEE graphical language software and instrument control hardware provide you the ease and flexibility to set up and automate the way you want for your application need. Make measurements quickly, easily and affordably today.



Related Literature

Publication name	Publication number
Modern Connectivity – Using USB and LAN I/O Converters – Application Note	5989-0123EN
Simplified PC Connections for GPIB Instruments - Application Note	5988-5897EN
System Developer Guide Using LAN in Test Systems: The Basics - Application Note	5989-1412EN
Using LAN in Test Systems: Network Configuration - Application Note	5989-1413EN
System Developer Guide – Application Note	5989-1417EN
Test-System Development Guide Computer I/O Considerations - Application Note	5988-9818EN
Tips and Tricks for Using USB, LAN, and GPIB - Application Note	5989-3312EN
GPIB, USB and Instrument Control for Easy PC-to-Instrument Connections - Data Sheet	5989-1889EN

www.keysight.com/find/gpib

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

KEYSIGHT TECHNOLOGIES

This information is subject to change without notice. © Keysight Technologies, 2015 - 2020, Published in USA, August 31, 2020, 5989-7374EN