

Keysight 82357B USB/GPIB Interface

Notices

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CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

Safety Notices

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or loss of life. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

Safety Symbols

The following symbols on the instrument and in the documentation indicate precautions which must be taken to maintain safe operation of the instrument.








Caution, risk of danger (refer to this manual for specific Warning or Caution information)



Direct current (DC)

Regulatory Markings

 <p>The CE mark is a registered trademark of the European Community. This CE mark shows that the product complies with all the relevant European Legal Directives.</p> <p>ISM-1-A indicates that the instrument is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4)</p>	<p>ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.</p>
 <p>The CSA mark is a registered trademark of the Canadian Standards Association. A CSA mark with the indicators “C” and “US” means that the product is certified for both the U.S. and Canadian markets, to the applicable American and Canadian standards.</p>	 <p>The RCM mark is a registered trademark of the Australian Communications and Media Authority.</p>
 <p>This symbol is a South Korean Class A EMC Declaration, with the product identification code “KCC-REM-ATI-WCIOP”.</p> <p>This is a Class A instrument suitable for professional use and in electromagnetic environment outside of the home.</p> <p>A급 기기 (업무용 방송통신기자재)</p> <p>이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.</p>	 <p>This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.</p>

South Korean Class A EMC Requirements

Information to the user:

This instrument has been conformity assessed for used in business environments. In a residential environment this equipment may caused radio interference.

This EMC statement applies to the equipment only for use in business environment.

사용자 안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성 평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파 간섭의 우려가 있습니다.

사용자 안내문은 "업무용 방송통신기자재"에만 적용한다.

Safety and EMC Requirements

This instrument is designed to comply with the following safety and EMC (Electromagnetic Compatibility) requirements:

- Low Voltage Directives 2014/35/EU
- EMC Directive 2014/30/EU

General Safety Information

WARNING

- DO NOT use the device if it appears damaged or defective.
 - Observe all markings on the device before connecting any wiring to the device.
 - DO NOT operate the device in the presence of flammable gases or fumes.
 - DO NOT install substitute parts or perform any unauthorized modification to the device.
 - USE THE DEVICE AS SPECIFIED. If the device is used in a manner not specified by manufacturer, the device protection may be impaired.
-

CAUTION

- Use the device with the cables provided.
 - Repair or service that is not covered in this manual should only be performed by qualified personnels.
-

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

Product category:

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit <http://about.keysight.com/en/companyinfo/environment/takeback.shtml> for more information.

Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

- www.keysight.com/find/gpib
(product-specific information and support, software and documentation updates)
- www.keysight.com/find/assist
(worldwide contact information for repair and service)

Environmental Conditions

This instrument is designed for indoor use only. The table below shows the general environmental requirements and general characteristics for the product.

Environmental Conditions	Requirements
Temperature	Operating condition: 0 °C to 55 °C Storage condition: -40 °C to +70 °C
Humidity	Operating condition: - up to 90% RH at 40 °C (non-condensing) - decrease to 40% RH for 41 °C to 55 °C (non-condensing) Storage condition: up to 90% at 65 °C (non-condensing)
Altitude	Up to 2000 m
Pollution degree	Pollution Degree 2

The electrical (power) requirements of the 82357B are summarized as below.

General Characteristics	Requirements
Power	USB bus-powered device, +5 V, 500 mA (maximum), 200 mA (typical)

WARNING

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE OR WET ENVIRONMENTS
Do not operate the instrument around flammable gases or fumes, vapor, or wet environments.

Product Regulatory and Compliance

The 82357B complies with safety and EMC requirements.

Refer to Declaration of Conformity at <http://www.keysight.com/go/conformity> for the latest revision.

General Maintenance

CAUTION**CLEAN WITH SLIGHTLY DAMPENED CLOTH**

Clean the outside of the instrument with a soft, lint-free, slightly dampened cloth. Do not use detergent, volatile liquids, or chemical solvents.

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1 Installing the Keysight 82357B

This chapter shows a suggested five-step process to install the 82357B and the Keysight IO Libraries Suite, to connect the 82357B to your PC and to program GPIB instruments via the 82357B.

Step 1: Checking Your Shipment

Your 82357B USB/GPIB Interface shipment should include the items shown in [Figure 1-1](#). If any item is missing or damaged, keep the shipping materials and contact Keysight Technologies. See [“Contacting Keysight”](#) on page 50 later in this guide for addresses and telephone numbers.

As you check the shipment items, verify that the 82357B serial number at the bottom of the 82357B matches the serial number shown on the serial number label of the 82357B Kit Box and on the 82357B Certificate of Calibration. If the Serial Numbers do not match, contact Keysight. If all Serial Numbers match, you may want to record the Serial Number for future reference.

- Keysight Technologies 82357B USB/GPIB Interface

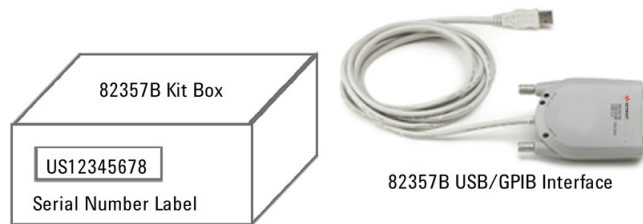


Figure 1-1 Contents of Keysight 82357B USB/GPIB Interface

Step 2: Installing Keysight IO Libraries Suite

NOTE

You must have Administrator privileges to install Keysight IO Libraries Suite Connection Expert.

This section describes how to install the Keysight IO Libraries Suite on your PC. The Keysight IO Libraries Suite is a collection of libraries and utilities that gives you the ability to use your instruments from instrument control software.

You should install the Keysight IO Libraries Suite as your first step before installing the hardware because it installs the necessary software and drivers to control your instruments.

If possible, always use the most recent version of the Keysight IO Libraries Suite. This version supports the newest interfaces and operating systems, and has the most advanced features.

- 1 Verify that your PC meets the minimum system requirements. Refer to the IO Libraries Web page at www.keysight.com/find/iosuite or the IO Libraries Suite Readme.
- 2 Download and install the IO Libraries software from www.keysight.com/find/iosuite.
- 3 Follow the instructions as prompted during the installation. You can select either a Typical or a Custom installation:
 - **Typical** - In most cases, you can select the Typical installation which installs the IO Libraries Suite using the recommended settings.
 - **Custom** - Select the Custom installation to:
 - a Install the IO Libraries Suite in another directory (for 32-bit operating systems only).
 - b Save disk space by not installing interface manuals.
 - c Use Keysight 32-bit VISA with another vendor's VISA on the same PC in side-by-side mode. Details on side-by-side mode are available at www.keysight.com/find/side-by-side-install or in the IO Libraries Suite help.
- 4 After the IO Libraries suite is successfully installed, you will see the IO icon on the Windows taskbar notification area.

1 Installing the Keysight 82357B

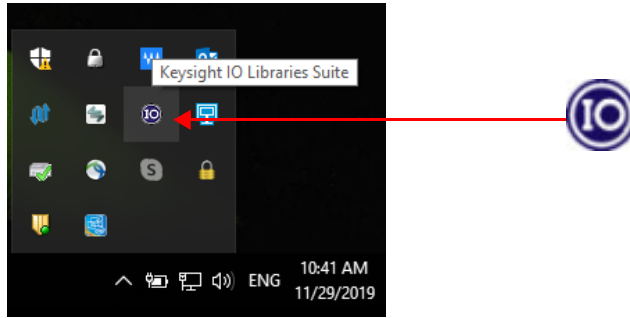


Figure 1-2 IO icon on the Windows taskbar notification area

Step 3: Connecting the 82357B

After the Keysight IO Libraries Suite software has been installed, you can connect the 82357B to any USB port on your PC or you can connect the 82357B via standard USB hubs.

NOTE

If the Keysight IO Libraries Suite software have not been installed on your PC, **STOP**. Install the libraries (see [Step 2: Installing Keysight IO Libraries Suite](#)).

82357B hardware description

The Keysight 82357B provides a direct interface connection from your PC USB port to GPIB instruments. The 82357B includes an attached USB cable that is USB 2.0 compliant. This cable is shielded and the connector is specified for up to 1,500 insertions. An 82357B can be directly connected to a single GPIB instrument or up to 14 GPIB instruments via GPIB cables. Up to four 82357B converters may be connected to your PC via standard USB hubs.

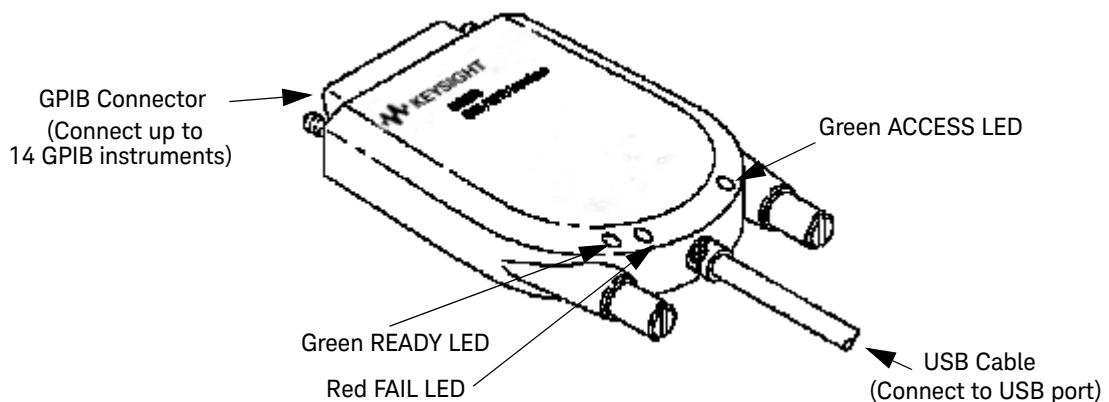


Figure 1-3 82357B Hardware Features

Connecting the 82357B to your PC

This section shows steps to connect the 82357B to a USB port on your PC or to your PC via a USB Hub.

- 1 Connect to a USB Port.** Make sure the PC is ON and plug the 82357B USB cable into any available USB port on your PC. Do not connect the 82357B to GPIB instruments at this time.

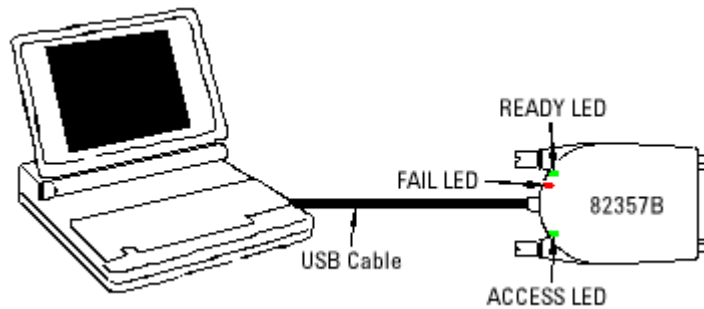


Figure 1-4 Connecting the 82357B to Your PC

- 2 Observe the LEDs.** Observe the LEDs on the 82357B for at least 10 seconds. See [Chapter 2, “Using the Keysight 82357B”](#) for a description of the normal LED sequence during an initial installation of the 82357B.
 - Initially, only the red FAIL LED should be ON. After a few seconds, all three LEDs should be ON. When all three LEDs are ON, this shows that the 82357B has been successfully installed.
 - If all three LEDs are not ON after 10 seconds and all Windows Plug-and-Play Manager activity has ceased, **STOP**. See [Chapter 3, “Troubleshooting the Keysight 82357B”](#) for diagnostics information.

Connecting the 82357B to a USB hub

This section shows steps to connect the 82357B to a USB port on your PC via a standard USB hub.

NOTE

Any USB hub used with the 82357B **MUST** be self-powered (must not be bus-powered or powered from the USB bus). Also, be sure to check the applicable USB hub documentation for hub operating parameters, such as power requirements and maximum length of USB cables.

- 1 Plug the power adapter into the hub and into an electrical outlet. Make sure the hub is operating in self-powered mode. [Figure 1-5](#) shows a 4-port self-powered USB hub with two 82357B USB/GPIB Interfaces connected.
- 2 Make sure your PC is ON. Connect the USB cable of the USB hub to any available USB port on your PC.
- 3 Plug at least one 82357B USB/GPIB Interface into the port of the USB hub. It is not necessary to connect GPIB instruments to any 82357B at this time.

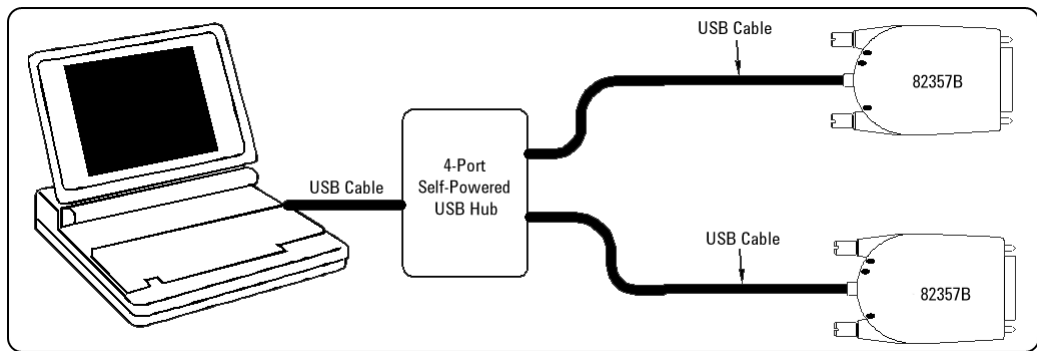


Figure 1-5 Connecting the 82357B to a USB Hub

1 Installing the Keysight 82357B

- 4 Observe the LEDs on the 82357B for at least 10 seconds. See [Chapter 2, “Using the Keysight 82357B”](#) for a description of the normal LED sequence during an initial installation of the 82357B.
 - a Initially, only the red FAIL LED should be ON. After a few seconds, all three LEDs should be ON. When all three LEDs are ON, this shows that the 82357B has been successfully installed.
 - b If all three LEDs are not ON after 10 seconds and all Windows Plug-and-Play Manager activity has ceased, **STOP**. See [Chapter 3, “Troubleshooting the Keysight 82357B”](#) for diagnostics information.

NOTE

For Windows Vista, Windows 7, Windows 8 and Windows 10, there will be no Windows Plug and Play Manager Sequence because once 82357B is initially plugged into a USB port it will automatically install the driver.

Step 4: Connecting GPIB Instruments

After the 82357B has been installed, the next step is to connect GPIB instruments to the 82357B. This step includes:

- Connecting a Single GPIB instrument OR ...
- Connecting Multiple GPIB Instruments

CAUTION

To avoid damage to the connectors, only finger-tighten the connectors.

Connecting a single GPIB instrument

Figure 1-6 shows connection from a single GPIB instrument to the GPIB port on an 82357B. When you have made the connection for your system, go to [Step 5: Programming via the 82357B](#). You may want to record the primary GPIB address of the attached instrument for future programming use.

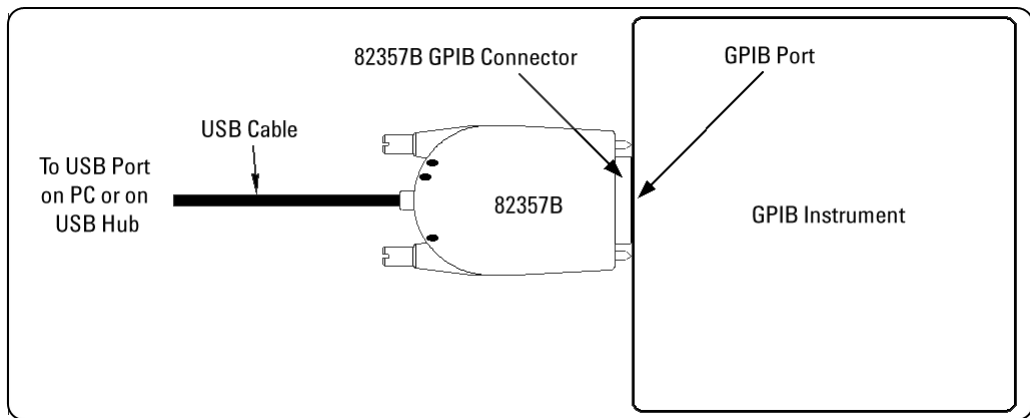


Figure 1-6 Connection from Single GPIB Instrument to the GPIB Port

Connecting multiple GPIB instruments

Figure 1-7 shows a typical way to connect three GPIB instruments to an 82357B. When you have made the connections for your system, go to [Step 5: Programming via the 82357B](#). You may want to record the primary GPIB address of each attached instrument for future programming use.

NOTE

Although Figure 1-7 shows the connection from 82357B to GPIB Instrument 1, the connection can be to any GPIB instrument in the system. Be sure to first connect the GPIB cable to the GPIB instrument and then “piggy-back” the 82357B GPIB connector to the GPIB cable.

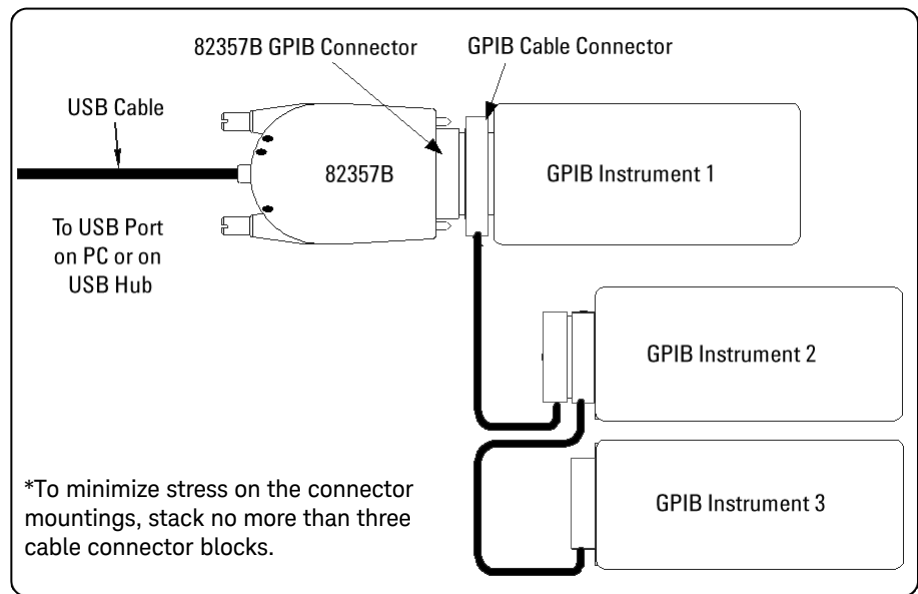


Figure 1-7 Typical Way of Connecting Three GPIB instruments to an 82357B

Step 5: Programming via the 82357B

After you have connected your GPIB instrument(s) to the 82357B, the next step is to establish communication between your PC and the instruments using *Interactive IO*. After communication has been established, you can begin programming the instruments using VISA, VISA COM, or SICL.

Establishing instrument communication

When the Keysight IO Libraries Suite is installed on your PC, an IO utility called *Interactive IO* is also installed. You can use Interactive IO to verify communication between your PC and the connected GPIB instrument(s). This section shows you how to use Interactive IO to verify instrument communication.

NOTE

Once your GPIB interface has been configured in Connection Expert, if you can see the attached GPIB instrument(s) in the Connection Expert explorer and see their IDN string information in the detail pane then communication has been verified. Interactive IO allows you to manually verify communication and send specific commands to your instruments.

- 1 Click the IO icon on the Windows taskbar notification area.
- 2 Right-click the instrument and click **Send Commands To This Instrument** to display the Interactive IO window. For information on Interactive IO, click **Help**.
- 3 ***IDN?** is the default command. Click **Send & Read** to send the identification query to the instrument and display its reply in the Interactive IO window.
- 4 To send other commands, click **Commands>** to select from a list of common commands, or type a command into the **Command:** field. If you experience timeout errors for some commands, click **Options** to change the timeout value.

1 Installing the Keysight 82357B

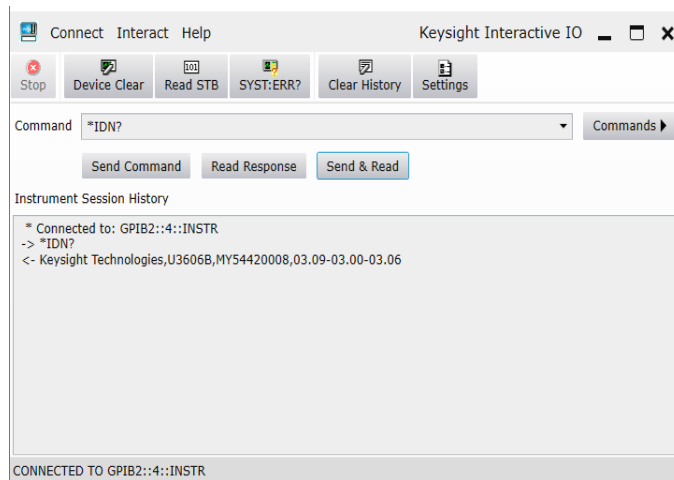


Figure 1-8 Keysight Interactive IO

- 5 When communication has been established to each GPIB instrument, you can begin to program the instruments using VISA, VISA COM, or SICL. See the next section, [Programming GPIB instruments](#).

Programming GPIB instruments

This section provides an introduction to programming GPIB instruments via the 82357B USB/GPIB interface using the Keysight VISA, VISA COM, and SICL IO Libraries. You can program in various languages/applications, including Visual Basic, Visual C++, Keysight VEE, and National Instruments LabVIEW.

See the applicable user's guide(s), such as the *Visual Basic User's Guide*, for programming guidelines. You can also find additional programming examples using various IO Libraries and instrument drivers in the instrument user's guide. After the 82357B is successfully installed, the interface acts as a transparent interface for programming GPIB instruments.

For information on programming using Keysight VISA, see the *Keysight VISA User's Guide*. For information on VISA COM and for function references for VISA, VISA COM, and SICL, see the *IO Libraries Suite Online Help*.

Accessing VISA and SICL manuals

You can access .pdf copies of the *Keysight VISA User's Guide* and the *Keysight SICL User's Guide for Windows* from the IO icon on the Windows taskbar. Adobe Reader is required to view these manuals.

To access the *Keysight VISA User's Guide*, click the IO icon then click **Documentation > VISA Users Guide**. To access the *Keysight SICL User's Guide for Windows*, click the IO icon then click **Documentation > SICL Users Guide**. To access VISA COM information, and function references for VISA, VISA COM, and SICL, click the IO icon, then click **Help Topics**.

Introduction to IO interface configuration

An *IO interface* consists of a hardware interface and a software interface. The *Connection Expert* utility is used to associate a unique software interface ID with a hardware interface.

The Keysight IO Libraries Suite uses an *Interface ID* or *Logical Unit (LU) Number* to identify an interface. This information is passed in the parameter string of the *viOpen* function call in a VISA program or in the *iopen* function call in an SICL program.

The *Connection Expert* assigns an Interface ID and Logical Unit (LU) Number to the interface hardware, as well as other necessary configurations. Typically, the LU Number is automatically assigned and you can ignore its setting. The LU Number is used internally as a unique identifier. When the IO interface is configured, you can use Keysight VISA, VISA COM, or SICL to program assigned instruments.

Example: IO interface configuration

For example, the GPIB interface system in the [Figure 1-9](#) consists of a Windows PC, an 82357B USB/GPIB interface, and three GPIB instruments with GPIB primary addresses of 3, 4, and 5, respectively. The instruments are connected via GPIB cables.

For this system, the *Connection Expert* utility has assigned a VISA name of “GPIB1” and a SICL name of “gpib1”. With these names assigned to the interfaces, the VISA/SICL addressing is as shown in [Figure 1-9](#).

Since unique names have been assigned by the *Connection Expert*, you can use the VISA *viOpen* command or the SICL *iopen* command to open the IO paths to the GPIB instruments as shown in the figure.

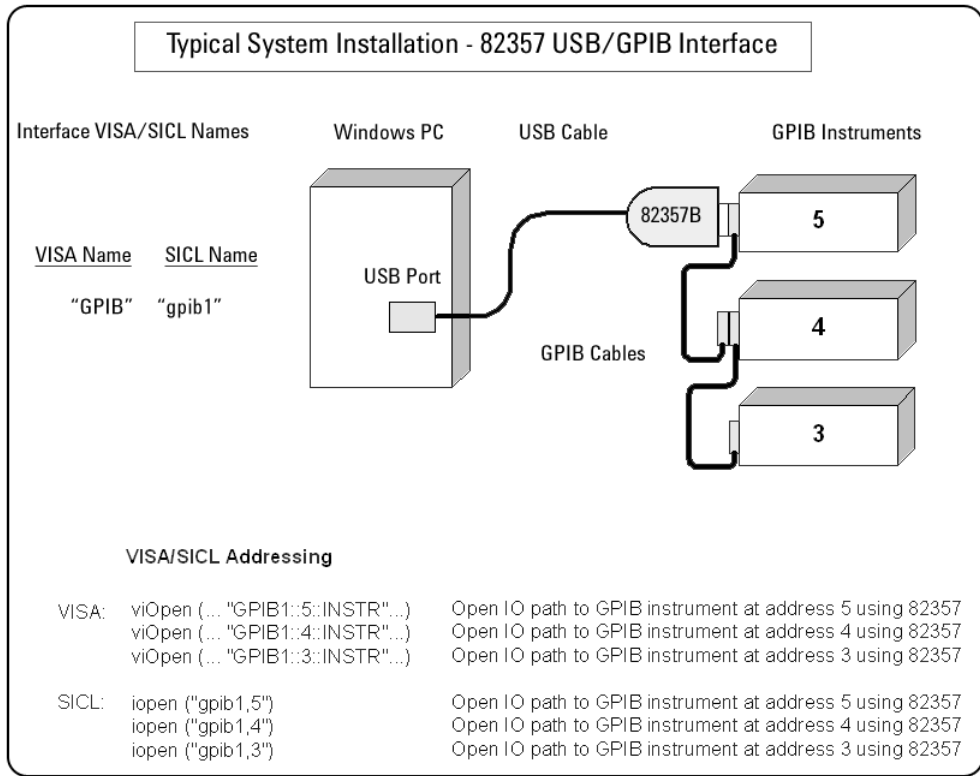


Figure 1-9 Typical System Installation - 82357B USB/GPIB Interface

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2 Using the Keysight 82357B

This chapter describes normal operating states and modes for the 82357B and provides the guidelines to use the 82357B, including:

- Initial 82357B operating states
- Introduction to 82357B operating modes
- Single 82357B operation
- Multiple 82357B operation
- SRQ operation

Initial 82357B Operating States

Figure 2-1 shows the sequence of initial operating states when the 82357B is first connected to a USB port on a PC or on a USB hub.

	State	Description	LED States		
			READY (Green)	FAIL (Red)	ACCESS (Green)
①	82357B Connected, No Power	82357B is connected to a USB port on the PC or on a USB hub, but no power is applied to the 82357B.	○	○	○
②	82357B Connected, Power Applied	Power is applied to the 82357B from the USB port, but startup firmware not yet downloaded.	○	●	○
③	82357B Installed but not Configured	Host computer has downloaded startup firmware to the 82357B. The 82357B has been installed but not yet configured	●	●	●
④	Normal Operation, Idle State	82357B has been configured for operation with the Agilent IO Libraries.	●	○	○
⑤	Normal Operation, GPIB Transfers	The ACCESS LED is ON for any GPIB transfers.	●	○	○

○ LED OFF ● LED ON ○ Intermittent

Figure 2-1 Sequence of Initial Operating States

Introduction to 82357B operating modes

The 82357B has two modes of operation. When only one 82357B is connected to a USB port within a system, we define the feature as the **Single Mode Features**. When up to four 82357Bs are connected at the same time to USB ports within a system, we define the feature as the **Multiple Mode Features**.

NOTE

All SICL/VISA applications are notified when their 82357B has been removed from the system by returning **VI_ERR_NOINFC** (for VISA) or **I_ERR_NCIC** (for SICL).

Single Mode Features

NOTE

This feature is only supported when use with IO Libraries Suite 16.3 Update 2 (16.3.17914.4) and below.

For single mode operation, the operating parameters (VISA Interface ID, SICL Interface ID, Logical Unit Number, and GPIB Address) are set when the 82357B is first installed.

If this 82357B is unplugged and replugged, or if the 82357B is replaced with a different 82357B, the previous configuration parameters are automatically assigned to the newly attached 82357B. Thus, you can exchange 82357Bs at any time without reconfiguring the interface. This allows exchanging 82357Bs among users, as long as only one 82357B is attached at any one time.

Multiple Mode Features

In contrast, when up to four 82357Bs are connected to the system at the same time, each 82357B must have its own specific set of operating parameters and each 82357B serial number is “bound” to its operating parameters. In multiple mode operation, if you add a new 82357B or if you unplug an 82357B and plug in a new 82357B in its place, the newly installed 82357B, will be assigned a new (unique) set of operating parameters.

Single 82357B operation

NOTE

This feature is only supported when use with IO Libraries Suite 16.3 Update 2 (16.3.17914.4) and below.

When an 82357B is first installed, a default VISA Interface ID, SICL Interface ID, Logical Unit (LU) number and GPIB Address are automatically assigned to the serial number associated with this specific 82357B.

For example, assume an 82357B with serial number MY12345678. When this 82357B is first installed, typical values as shown are automatically assigned to this serial number:

- VISA Interface ID: GPIB0
- SICL Interface ID: gpib0
- Logical Unit: 7
- GPIB Address: 21

NOTE

You can change the parameter values of the 82357B as required. See [“Changing configuration parameters”](#) on page 36 for details.

The first time an 82357B is attached to a system (assuming the Keysight IO Libraries Suite and 82357B driver are installed), the software recognizes that an 82357B is attached. If the *Connection Expert* is running, it automatically refreshes, displaying the 82357B as a USB/GPIB interface in its view. You can then change the properties of the interface via the *Connection Expert*.

The VISA and SICL Interface IDs, Logical Unit Number, and GPIB Address may be viewed at any time in the property pane of the *Connection Expert*. (To view this window, click the IO icon, then select **Keysight Connection Expert**.)

If you disconnect this 82357B and plug in another 82357B (with a different serial number), or if you re-plug the same 82357B, the new 82357B will assume the same VISA Interface ID, SICL Interface ID, LU number, and GPIB Address as the previous 82357B.

Multiple 82357B operation

When two or more 82357Bs are attached to a system at the same time, we define the mode as the multiple mode of operation. In multiple mode of operation, each 82357B is “bound” to its related IO Configuration for that Serial Number. This is a different mode of operation than the single mode of operation in that the configuration is not reused if you replace an 82357B with another 82357B.

As with single mode operation, the first time an 82357B is attached to a system (assuming the Keysight IO Libraries Suite and 82357B driver are installed), the software recognizes that an 82357B is attached. If the *Connection Expert* is running, it automatically refreshes, displaying the 82357B as a USB/GPIB interface in its view; you can then change the properties of the interface in the *Connection Expert*.

The VISA and SICL Interface IDs, Logical Unit Number, and GPIB Address may be viewed at any time in the property pane of the *Connection Expert*. (To view this window, click the IO icon, then select **Keysight Connection Expert**.)

If you plug in another 82357B (with a different Serial Number), the new 82357B will automatically be assigned a unique VISA Interface ID, SICL Interface ID, LU, and GPIB Address.

NOTE

- You can change the parameter values of the 82357B as required. See **“Changing configuration parameters”** on page 36 for details.
- You can also convert from multiple mode operation to single mode operation. See **“Changing modes of operation”** on page 37 for details.

SRQ operation

If your VISA/SICL application uses SRQ callbacks (**viEventHandler()** in VISA or **ionsrq()** in SICL) and your callback does not service the SRQ in a timely manner, your SRQ callback function may be triggered multiple times.

To avoid this possible situation, design your SRQ callback functions to be called only when an SRQ is no longer asserted on the GPIB bus.

Setting Configuration Parameters

This section gives guidelines to change or set various configuration parameters for the 82357B, including:

- Changing Configuration Parameters
- Changing Modes of Operation
- Setting Timeout Floor Value
- Setting High-Performance Operation

Changing configuration parameters

To change the VISA Interface ID, the Logical Unit or GPIB Address, or if you want to check the values of these configuration parameters, click on the **GPIB-USB (GPIB0)** in My Instruments list to display **Detail for GPIB0** dialog box. Click **Edit** and choose the setting as preferred then click **OK**. Clicking **Cancel** will cause the configuration set in the preceding dialog box to be used.

NOTE

Although you can change the Logical Unit (LU) Number and GPIB Address values for an 82357B, this is generally not necessary and may cause running applications to fail or stop running.

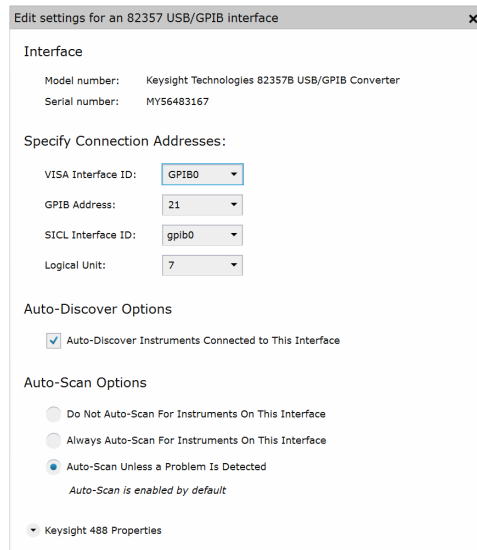


Figure 2-2 Edit settings for 82357 USB/GPIB interface

Changing modes of operation

If your system has multiple 82357Bs configured (multiple mode operation), the only way to change from multiple mode of operation to single mode operation is to perform the following:

- 1 Unplug all 82357Bs from the system.
- 2 Run *Connection Expert* (click the IO icon, then click **Keysight Connection Expert**).
- 3 Delete all 82357B configurations by selecting each USB/GPIB icon in the explorer view, then clicking **Delete** (or delete all except one configuration).
- 4 Re-attach and re-configure a single 82357B.

Setting timeout floor values

The 82357B has a default timeout “floor” value that is an internal requirement to ensure reliable USB communication. The 82357B will not allow timeouts less than the floor value. (By default, VISA/SICL timeouts are set to infinite time).

To programmatically determine the timeout floor, you can set the timeout to a very small value, such as 1 ms, then query for the actual timeout floor value. VISA and SICL examples are as follows:

Example: Query Timeout Floor (VISA)

```
tval = 1; // Try to set timeout to 1 msec
err = viSetAttribute(id, VI_ATTR_TMO_VALUE, tval_in);
...
err = viGetAttribute(id, VI_ATTR_TMO_VALUE, &tval_out);
...
printf("Set timeout to [%d], actual timeout that resulted
[%d]\n", tval_in, tval_out );
```

Example: Query Timeout Floor (SICL)

```
tval = 1; // Try to set timeout to 1 msec
err = itimeout(id, tval_in);
...
err = igettimeout(id, &tval_out);
...
printf("Set timeout to [%d], actual timeout that resulted
[%d]\n", tval_in, tval_out );
```

Setting 82357B high-performance operation

NOTE

Changing the T1 delay as described in this section is an advanced feature and also requires attention to cable lengths and other system features.

Introduction

The GPIB transfer rate for 82357B writes using large (>1000 bytes) buffer size is affected by the Data Available (T1) delay time. (The transfer rates are not noticeably affected when the buffer size is <1000 bytes). The default delay time used by the 82357B is 800 ns.

The maximum transfer rate for T1 = 357 ns is about 1.15 MB/s as compared to about 714 KB/s for the 82357B default value of 800 ns. Changing the T1 delay affects only the write performance of the 82357B.

Setting T1 Value With VISA

To set the T1 value with VISA, use the **VI_AGATTR_GPIB_T1_DELAY** attribute. The **VI_AGATTR_GPIB_T1_DELAY** value is the value of the T1 delay in nanoseconds, and should be no less than **VI_AG_GPIB_T1DELAY_MIN** and no greater than **VI_AG_GPIB_T1DELAY_MAX**. This value is defined in Keysight's 'visa.h' header file. To use this value, you must **#define AGVISA_ATTRIBUTES** before the **#include 'visa.h'** in your C or C++ source file.

The 82357B supports T1 delays from 357 ns to *<max_value>* in steps of 40 ns. You can find out the actual value by calling **viGetAttribute()**.

Attribute	Access Privilege	Data Type	Range (ns)	Used By
VI_AGATTR_GPIB_T1_DELAY	RW Global	ViInt32	VI_AG_GPIB_T1DELAY_MIN to VI_AG_GPIB_T1DELAY_MAX	GPIB INTFC resources

Setting T1 Value With SICL

To set T1 value with SICL, use the **igpibsett1delay()** command and modify the GPIB environment.

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3 Troubleshooting the Keysight 82357B

This chapter provides troubleshooting guidelines of the 82357B including hardware and software checks and also the service and support information for the 82357B.

Troubleshooting Flowchart

Figure 3-1 shows a suggested sequence of steps to diagnose and troubleshoot 82357B problems, based on the LED states.

You can use the LED states to help diagnose and troubleshoot the 82357B whenever the LED states do not match expected normal states. See Chapter 2, “Using the Keysight 82357B” for the normal LED sequence when the 82357B is initially connected to a USB port.

Observe the LED states

To begin troubleshooting, observe the LED states for at least 10 seconds after the 82357B is connected to a USB port and all Windows Plug-and-Play Manager activity has ceased. Do the following:

- If all LEDs are OFF, start with [Hardware Checks](#)
- If the red FAIL LED is ON, start with [Software Installation Checks](#)
- If all LEDs are ON, start with [Software Configuration Checks](#)

After taking the steps in the check sequence, use the boxes in Figure 3-1 to determine the next step. For example, if doing a hardware check results in only the red FAIL LED being ON, proceed with [Software Installation Checks](#), and so on.

NOTE

You do not have to do all the steps or do the steps in the order shown. If any action results in a change in LED states, go to the applicable check sequence to continue troubleshooting.

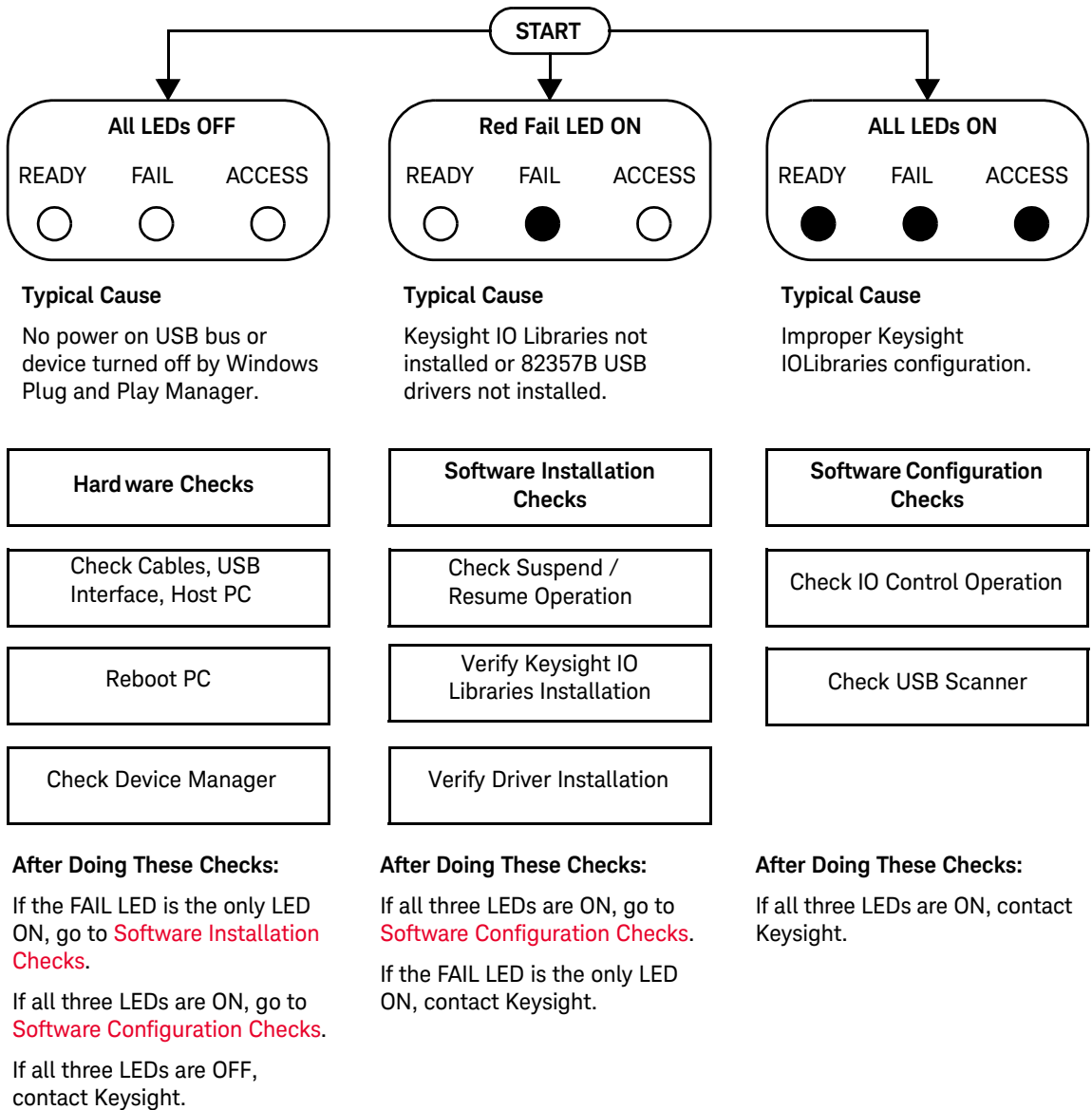


Figure 3-1 Troubleshooting Flowchart

Hardware Checks

If all LEDs are still off for 10 or more seconds after plugging the 82357B USB cable into a USB port, and all Windows Plug-and-Play Manager activity and the *Connection Expert* refreshes have ceased, start your troubleshooting sequence by performing hardware checks. If any action taken results in a change in the LED status, go to [Software Installation Checks](#) or [Software Configuration Checks](#).

Check USB cables, USB interface, host PC

Begin the hardware check by checking connections between the 82357B and PC (plus USB hubs, if used).

- 1 Check USB cable connections.** Check the 82357B USB cable for a good connection to the USB port on the PC or on the USB hub. If you are using a USB hub, verify that the hub is connected to the PC.
- 2 Unplug/replug the 82357B USB cable.** If this does not change the LED status, try plugging the 82357B into another USB port.
- 3 Check PC USB Port.** Verify that the PC USB port is functional and powered (you can check using another USB device).
- 4 Check PC state.** Verify that host computer is not in a suspended power management state.
- 5 Check USB hub.** Try disconnecting the 82357B from the hub and connecting it directly to a USB port on the PC. Some USB hubs are vulnerable to static shock.
- 6 Check USB cables for damage.** Check the USB cable for cuts/crashes. Since the end connectors are somewhat fragile, check for bent/misaligned/crushed connectors.

Reboot PC

If these steps do not change the LED status, reboot the PC.

Check Device Manager

You can use the Windows Device Manager to reinstall the 82357B, as required.

Go to **Device Manager** by selecting **Start > Control Panel > System > Hardware > Device Manager**.

For Windows 8, right-click the bottom-left corner of the Desktop and select **Device Manager**.

From the **Device Manager**, select **82357** and then **Properties**. Tab to **Driver** and click **Reinstall Driver**. This will allow the Windows Plug-and-Play Manager to begin searching for a driver for the 82357B. Since the Device Manager may have disabled the 82357B USB device, click **Enable** to restart the 82357B.

NOTE

If you are using a USB scanner, scanner conflicts are possible. See **Check USB scanner** in the “**Software Installation Checks**” on page 46.

Software Installation Checks

When only the red FAIL LED is still on after 10 seconds, the 82357B has been detected by the host computer.

Check suspend/resume operation

Some Windows operating systems support Power Management which can suspend the PC while the 82357B is in operation. After a Suspend/Resume cycle, the 82357B may not properly resume operation. In this case, you may need to unplug/replug the USB cable to restore 82357B operation. If this does not correct the problem, go to [Verify Keysight IO Libraries Suite installation](#).

NOTE

If your 82357B applications must not be preempted by a PC Suspend event, we recommend you to disable Power Management on your PC by using the **Control Panel > Power Options** dialog.

Verify Keysight IO Libraries Suite installation

When only the red LED is on after 10 seconds and all Windows Plug and Play Manager activity has ceased, start your troubleshooting sequence by verifying IO Libraries installation. If any action taken results in a change in the LED status, go to [Software Configuration Checks](#) or [Hardware Checks](#).

- 1 Check Keysight IO Libraries Version.** If a version of the IO Libraries Suite has been installed, the IO icon is normally displayed on the Windows taskbar notification area.

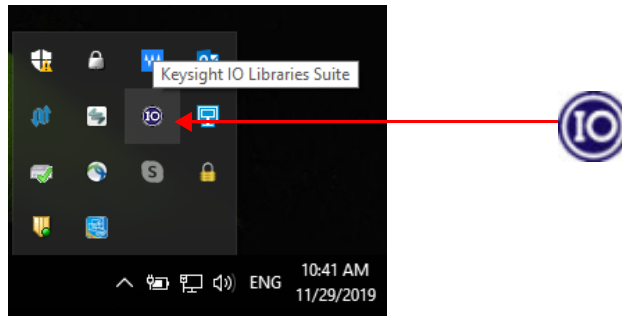


Figure 3-2 IO icon on the Windows taskbar notification area

- a If the IO icon is displayed, click the icon and select **About Keysight IO Control** to display the version. The version must be 15.0 or greater.
 - b If the IO icon is not displayed, a version of the IO Libraries Suite may still be installed. To verify this, check for Keysight Connection Expert in the Start menu, or the Start Screen (Windows 8 and 10).
 - c If found, launch the Keysight Connection Expert and select **View > Keysight IO Control** to place a check mark next to the Keysight IO Control selection.
 - d If Keysight Connection Expert is not found in the Start menu or the Start Screen (Windows 8 and 10), no version of Keysight IO Libraries is installed. In this case, or if the installed version is not 15.0 or greater, you must install the newer version (see Step 2).
- 2 Install Keysight IO Libraries (as required).** If Version 15.0 or greater of the Keysight IO Libraries Suite is not installed on your PC, perform this step.
- a Remove the 82357B USB cable from the USB port.
 - b Install the Keysight IO Libraries Suite by download the software from www.keysight.com/find/iosuite
 - c Re-attach the 82357B USB cable to the USB port and observe the LEDs for at least 10 seconds.
If all three LEDs remain ON, go to [Software Configuration Checks](#).

Software Configuration Checks

If all three LEDs remain on for more than 10 seconds after the 82357B is connected to a USB port, the 82357B has been installed.

Start your troubleshooting sequence by checking IO Control operation. If any action taken results in a change in the LED status, go to *Software Installation Checks* or *Hardware Checks*, where applicable.

Checking IO Control operation

When the Keysight IO Libraries Suite is installed, an IO Control is created. When the IO Control is active, it is displayed as an IO icon on the Windows taskbar. By default, the IO Control is always active after the libraries are installed and the IO icon is displayed. However, there may be times when the IO Control can get deactivated. When this happens, SICL/VISA applications that are running with the 82357B will malfunction. Any of the following symptoms may indicate the IO Control is not active:

- *Connection Expert* is not running, and the **Keysight 82357B USB/GPIB Interface Detected** dialog box does not appear when an 82357B is first connected to a USB port.
- *Connection Expert* is running, but does not automatically refresh when an 82357B is first connected to a USB port.
- SICL/VISA applications using the 82357B are unable to open sessions.
- Windows Task Manager shows that `iproc82357.exe` is not running or is non-responsive.

If any of these symptoms occur:

- 1 Unplug/Replug the 82357B.** If unplugging then replugging the 82357B causes the **Keysight 82357B USB/GPIB Interface Detected** dialog box to appear or the *Connection Expert* window to refresh, the problem is solved. If not, go to Step 2.
- 2** Shut down and restart IO Control. Take these steps to shut down and then restart the IO Control. Taking these actions should initialize all attached 82357Bs and display only the green Ready LED.
 - a** If the IO icon is displayed, click the icon and then click **Exit**. A dialog box explaining the consequences of removing the IO Control appears. Click **OK** to shut down the IO Control.
 - b** If the IO icon is not displayed, either the icon display has been turned off or the IO Control (and associated `iprocsvr.exe` and `iprocsrv.exe`) is not active. In this case, launch the Keysight Connection Expert and select **View > Keysight IO Control** to place a check mark next to the Keysight IO Control selection to restart the IO Control and display the IO icon.

NOTE

Rebooting your PC should ALWAYS restart the IO Control, and re-execute `iprocsvr.exe` and `iprocsrv.exe`.

Check USB scanner

In general, USB scanners do not cause problems with the 82357B. However, if you do have problems with 82357B operation and have a scanner installed on your system that uses a USB port, unplug the scanner and then plug the 82357B into the port.

If the 82357B is configured without your scanner attached to your system, the scanner will be locking the 82357B from using the USB bus. In this case, contact your scanner manufacturer to request for software or firmware updates for the scanner.

Service and Support Information

There are no user-serviceable parts for the Keysight 82357B USB/GPIB interface. If you suspect a hardware failure for the 82357B, contact Keysight for instructions to return the unit. See the following [Contacting Keysight](#) section for telephone numbers/website address.

Contacting Keysight

You can reach Keysight Technologies at this telephone number for the Americas:

Americas Call Center: 1-800-829-4444

For other countries, contact your country's Keysight support organization. A list of contact information for other countries is available on the Keysight website:

www.keysight.com/find/assist

4 Product Specifications

For the characteristics and specifications of the 82357B USB/GPIB Interface, refer to the datasheet at <http://literature.cdn.keysight.com/litweb/pdf/5989-1889EN.pdf>.

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