

Agilent IO Libraries Suite

E2094P

Getting Started



Agilent Technologies

Notices

© Agilent Technologies, Inc. 2004-2005

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Agilent Technologies, Inc. as governed by United States and international copyright laws.

Manual Part Number

E2094-90007

Edition

Second edition, July 2005

Printed in Malaysia

Agilent Technologies, Inc.
815 14th St. SW
Loveland, CO 80537 USA

Trademark Information

Visual Studio is a registered trademark of Microsoft Corporation in the United States and other countries.

Windows NT is a U.S. registered trademark of Microsoft Corporation.

Windows and MS Windows are U.S. registered trademarks of Microsoft Corporation.

Software Revision

This guide is valid for Revisions 14.xx of the Agilent IO Libraries Suite software, where xx refers to minor revisions of the software that do not affect the technical accuracy of this guide.

Warranty

The material contained in this document is provided “as is,” and is subject to being changed, without notice, in future editions. Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied, with regard to this manual and any information contained herein, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or of any information contained herein. Should Agilent and the user have a separate written agreement with warranty terms covering the material in this document that conflict with these terms, the warranty terms in the separate agreement shall control.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as “Commercial computer software” as defined in DFAR 252.227-7014 (June 1995), or as a “commercial item” as defined in FAR 2.101(a) or as “Restricted computer software” as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies’ standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Safety Notices

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.

Agilent IO Libraries Suite Getting Started

1 Quick Start	5
Who Should Install the IO Libraries Suite?	5
IO Libraries Suite Quick Start Steps	6
Install IO Libraries Suite Software	6
Connect and Configure Interface and/or Instrument Hardware	7
Run Connection Expert to Verify I/O Configuration ..	7
Optional: Install additional software	9
2 Welcome to Agilent IO Libraries Suite	11
What is Agilent IO Libraries Suite?	12
Agilent IO Libraries	14
Agilent IO Libraries Suite Utilities	15
Where Can I Get More Information about Using Agilent IO Libraries Suite?	22
Agilent IO Libraries Suite Documentation	22
Web Resources	24
Contacting Agilent	25
3 Installing IO Libraries Suite	27
System Requirements	28
Installing the IO Libraries Suite Software	29
Installation Troubleshooting	36
Changing Your Installation or Removing IO Libraries Suite	36
Keeping Your Software Up To Date	37
Using Agilent VISA In Side-by-Side Mode	37

Appendix A: Agilent IO Libraries Revision History	41
Where to Find Information on Past IO Libraries Revisions	42
New Features of Agilent IO Libraries Suite 14.0 and 14.1	43
What Happened to IO Config?	45
Glossary	47



1

Quick Start

This chapter gives you the information you will need, in most cases, to configure connections to your instruments and interfaces and start using the Agilent IO Libraries to communicate with your instruments. The Quick Start steps detailed in this chapter are:

- 1 Install IO Libraries Suite Software
- 2 Connect and Configure Interface and/or Instrument Hardware
- 3 Run Connection Expert to Verify I/O Configuration

Who Should Install the IO Libraries Suite?

If you plan to connect your instrument(s) to a PC, you should install the Agilent IO Libraries Suite. This will help you configure your system in order to control your instruments from the PC and/or transfer data to the PC. If you are using Agilent instrument drivers, Agilent IntuiLink connectivity software, or other application software, you should first install the IO Libraries Suite to provide support for the application software and instrument drivers.

Some Agilent application software and some Agilent drivers install the Agilent IO Libraries, or a subset of the IO Libraries. In this case, you should still install the IO Libraries Suite to ensure that you have up-to-date software and all the IO Libraries Suite utilities for configuration and troubleshooting.

If you bought an Agilent instrument, and received the *Automation-Ready CD with Agilent IO Libraries Suite* along with an additional application CD-ROM (such as an IntuiLink CD), you should always install the *Automation-Ready CD* first.



IO Libraries Suite Quick Start Steps

1. Install IO Libraries Suite Software

a Perform pre-installation checks:

- Make sure your PC meets the minimum system requirements. (See “System Requirements” on page 28.)

b Install IO Libraries Suite:

- Close all other applications on your PC, insert the *Automation-Ready CD with Agilent IO Libraries Suite* into your CD-ROM drive, and follow the instructions on your screen.
- If the IO Libraries Suite installation does not start automatically, select **Start > Run** (on the Windows **Start** menu) and type <drive>:\autorun\auto.exe, where *drive* is your CD-ROM drive.
- After IO Libraries Suite has been successfully installed, you will see the IO Control (**IO** icon) in the taskbar notification area on your PC screen as in [Figure 1](#). (The taskbar notification area is where the clock is usually displayed.)
- If you have difficulty with the installation, see Chapter 3, “Installing IO Libraries Suite”.



Figure 1 IO Control icon in taskbar notification area

2. Connect and Configure Interface and/or Instrument Hardware

If you are not installing new hardware (interface cards, converters, or instruments), skip this section and proceed directly to step 3.

- a **Install hardware:** If you received the Agilent IO Libraries Suite when you purchased an instrument or an interface product (such as an Agilent GPIB card or USB/GPIB interface converter), it is time to install the hardware now. Consult the documentation for your hardware product for installation instructions and specific hardware configuration (for example, setting Ethernet or GPIB addresses). General instructions for hardware installation appear in the *Agilent Connectivity Guide*, which you can display (in PDF format) by clicking the IO Control and choosing **Documentation > Connectivity Guide**. The **Documentation** menu also includes manuals for Agilent interface hardware products that you have installed.
- b **Configure hardware; turn on the PC if necessary:** If you turned your PC off to install new hardware, turn it back on when the installation is complete, and wait for your PC to start up. Perform any necessary hardware configuration.

NOTE

When you connect a USB device, Windows will display a **Found New Hardware Wizard**. If your USB device is an Agilent USBTMC instrument or an Agilent USB/GPIB Interface Converter, you do not need to insert a CD when prompted by the wizard, because all the drivers you need have already been installed with the IO Libraries Suite. Simply click **Next** until the wizard completes. If a second **Found New Hardware Wizard** appears, continue to click **Next** until that wizard completes as well. These wizards place the installed USB drivers in the appropriate locations for Windows to recognize your device.

3. Run Connection Expert to Verify I/O Configuration

- a **Run Connection Expert:** If the Connection Expert utility does not run automatically at this time, click the


IO Control (**IO** icon in the Windows notification area) and then click **Agilent Connection Expert**.

b Change the I/O configuration if necessary: Connection Expert will automatically detect most interfaces and instruments, and will assign names and other default configuration settings. If you want to change these parameters, you can do so in the Connection Expert window.

- Select the instrument or interface in the explorer pane in the center of the Connection Expert window.
- The properties of the selected item appear in the properties pane on the right. When you right-click on an item in the explorer pane, you see a shortcut menu of actions that you may take on that item. These actions are also available from the menus at the top of the Connection Expert window. The most common actions are also listed in the Connection Expert's task guide (the left pane of the window).
- You may also add instruments or interfaces manually to your test system configuration if Connection Expert does not automatically detect the hardware (for example, if it is connected via Ethernet or via serial port).
- See the *Agilent IO Libraries Suite Online Help* for more information on Connection Expert and on configuration changes.

c Test instrument connections:

- Connection Expert will automatically send an identification query (*IDN?) to any instrument that has its auto-identify property set to **Yes**. (See the *Agilent IO Libraries Suite Online Help* if you want to turn this function off.)

- When you see a green check mark on the icon representing an instrument, this means that the instrument has responded as expected. (Note that some instruments do not support the *IDN? query and will not respond appropriately.) The instrument's identification information is displayed in the properties pane on the right side of the Connection Expert window. 
- You can explicitly test the connections to your instruments, and exercise more of their functionality, by selecting **Send commands to this instrument** in the task guide or shortcut menu. This starts the Interactive IO utility, which allows you to send commands to your instruments and see their responses. Note that some commands (such as *TST?, instrument self-test) may take longer than Interactive IO's default timeout; you can modify the timeout in the Interactive IO window by selecting **Interact > Options...**

4. Optional: Install additional software

If you received the *Automation-Ready CD* with an Agilent instrument or interface product, you may also have received a second CD-ROM containing additional software and information related to your product. This CD may contain software such as instrument drivers, specialized applications, or sample programs. Consult the documentation that came with your hardware for complete software descriptions and installation information.



2

Welcome to Agilent IO Libraries Suite

This chapter includes:

- What is Agilent IO Libraries Suite?
- Where Can I Get More Information about Using Agilent IO Libraries Suite?



What is Agilent IO Libraries Suite?

Agilent IO Libraries Suite is a collection of libraries that give you the ability to use your instruments from a test and measurement program, and utilities that help you quickly and easily connect your instruments to your PC.

Agilent IO Libraries Suite speeds your success with software utilities that let you quickly connect your instruments to your PC, configure and verify your connection, and get on with your job – whether that entails programming instruments or using pre-existing application software. For test and measurement programmers, Agilent IO Libraries Suite brings the power of the industry-standard VISA and VISA COM libraries, as well as SICL and Agilent 488, to your programming experience.

Below you will find an illustration and a list of the components (libraries and utilities) that make up the Agilent IO Libraries Suite product. You can find more information about each of these components in the *Agilent IO Libraries Suite Online Help*.

NOTE

To access the *Agilent IO Libraries Suite Online Help* from the Connection Expert window, click **Help > Help Topics** on the menu bar or press the **F1** key. To access the online Help without running Connection Expert, click the IO Control (**IO** icon in the taskbar notification area), click **Documentation** and then **IO Libraries Suite Help**.

NOTE

To find out where the Agilent IO Libraries Suite components listed below have been installed on your system, click the IO Control (**IO** icon in the Windows notification area), then click **Installation Information**.

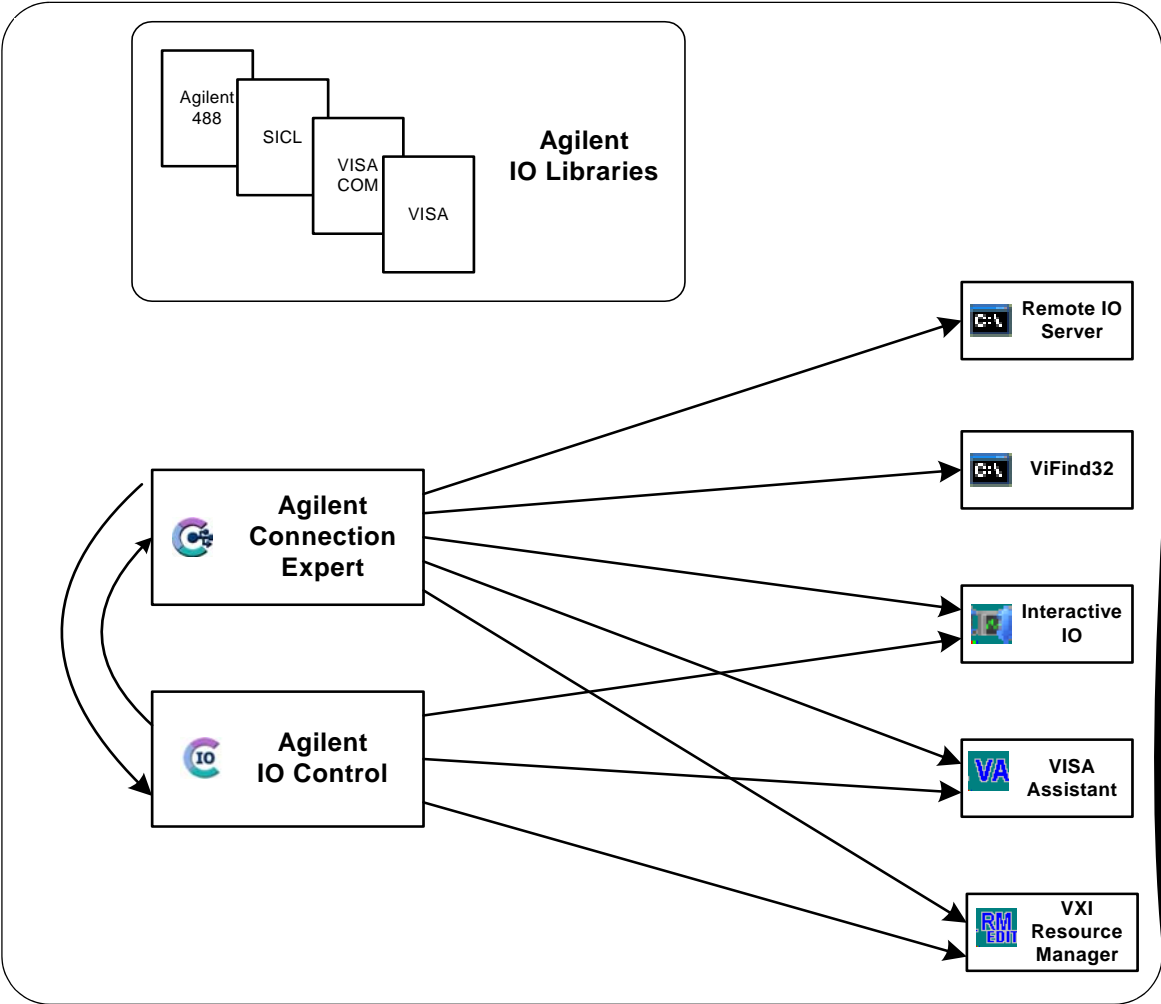


Figure 2 Libraries and utilities that make up Agilent IO Libraries Suite. The Agilent Connection Expert and Agilent IO Control provide access to the other IO Libraries Suite utilities, as shown by the arrows.

Agilent IO Libraries

There are four IO Libraries included in Agilent IO Libraries Suite; each of them allows you to programmatically control instruments, send commands to them, and receive responses and data. The *Agilent IO Libraries Suite Online Help* provides guidelines to help you choose among these libraries; in general, VISA and VISA COM are recommended for new development.

Agilent VISA

Agilent VISA (Virtual Instrument Software Architecture) can be used to develop I/O applications and instrument drivers that are interoperable with many other VISA applications from many vendors, and that comply with IVI Foundation standards (formerly *VXIplug&play* standards).

Agilent VISA COM

Agilent VISA COM is a COM (Microsoft Common Object Model) implementation based on the Agilent VISA architecture. Like VISA, VISA COM conforms to IVI Foundation standards.

Agilent SICL

Agilent SICL (Standard Instrument Control Library) is an I/O library developed by Agilent that is portable across many instrument I/O interfaces.

Agilent 488

Agilent 488 is a GPIB I/O library provided by Agilent for compatibility with existing test & measurement programs that were developed using National Instruments' NI-488 or other similar libraries.

Agilent IO Libraries Suite Utilities

The IO Libraries Suite includes a number of utilities to help you connect, configure, and troubleshoot your test system. These utilities, described on the next several pages, include:

- [Agilent Connection Expert](#)
- [Interactive IO](#)
- [IO Control](#)
- [Remote IO Server](#)
- [ViFind32](#)
- [VISA Assistant](#)
- [VXI Resource Manager](#)

Agilent Connection Expert

Connection Expert is a software utility that helps you quickly get your instruments connected to your PC and troubleshoot connectivity problems. You can use Connection Expert to:

- configure instrument I/O interfaces
- automatically discover instruments that are connected to your PC or to the local subnet of your local area network
- specify connections to instruments that are on your local area network beyond the local subnet
- browse the structure and connections of your test system (including your PC, instruments, and interfaces)
- detect and troubleshoot connectivity problems in your test system
- create programming aliases that you can use in place of addresses to improve portability and readability of your test program

Connection Expert includes a task guide (the left pane of the utility's window) that provides shortcuts to common tasks and information.

2 Welcome to Agilent IO Libraries Suite

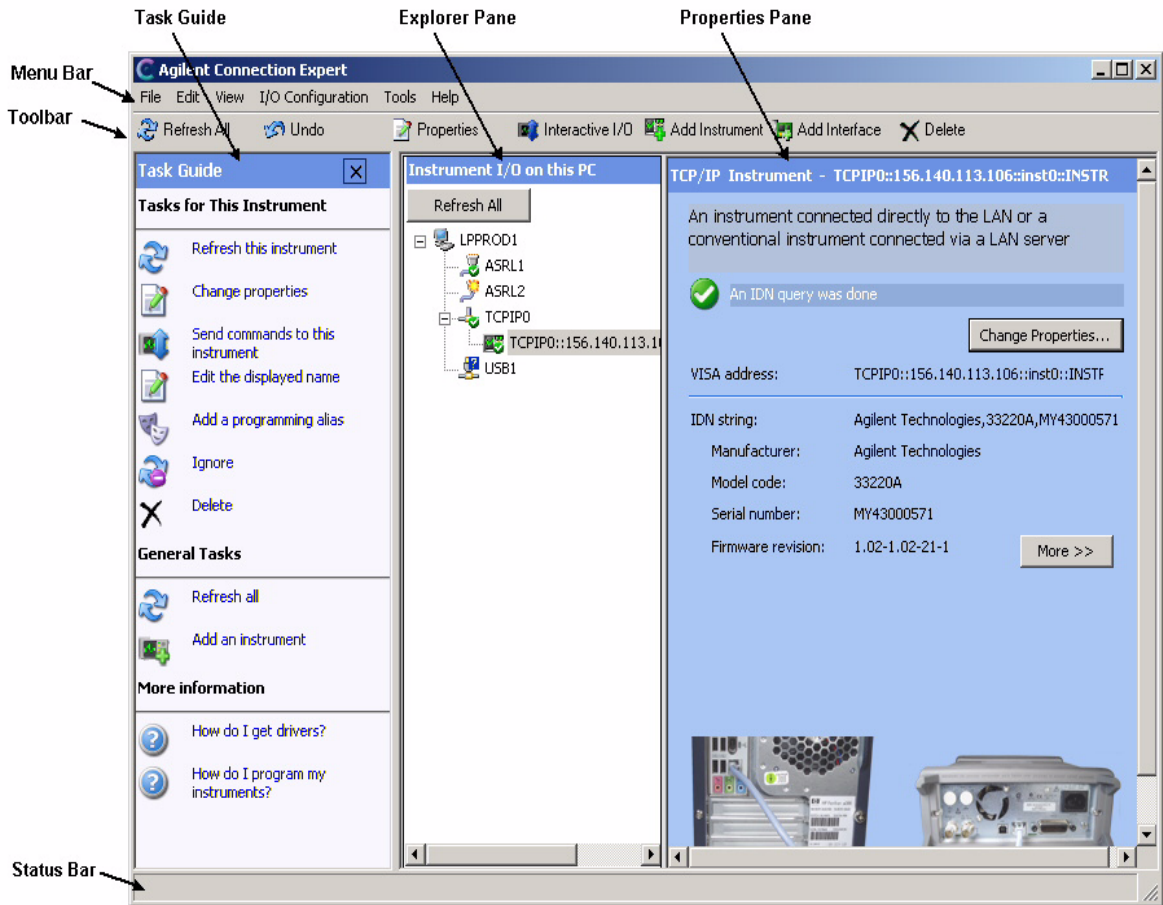


Figure 3 Agilent Connection Expert

To run Connection Expert, click the IO Control (IO icon in the Windows notification area), and click **Agilent Connection Expert**.

NOTE

You must have Administrator privileges to run Connection Expert.

Interactive IO

Agilent Interactive IO is a software utility that allows you to interact with an instrument by sending commands to the instrument and seeing the instrument's responses. You can use Interactive IO to:

- quickly verify connectivity to your instrument
- troubleshoot communication problems
- learn the instrument's command set
- rapidly prototype commands and check the instrument's responses before writing code

With Interactive IO, you can choose from a menu of common commands (listed in Table 1) or type in commands that are specific to your instrument.

To start Interactive IO from within Connection Expert, click **Tools > Interactive IO** from the Connection Expert menu bar or click **Send commands to this instrument** on the task guide. You can also start Interactive IO from the IO Control by clicking the **IO** icon in the Windows notification area and then selecting **Interactive IO**.

Note that some commands (such as *TST?, instrument self-test) may take longer than Interactive IO's default timeout; you can modify the timeout in the Interactive IO window by selecting **Interact > Options...**

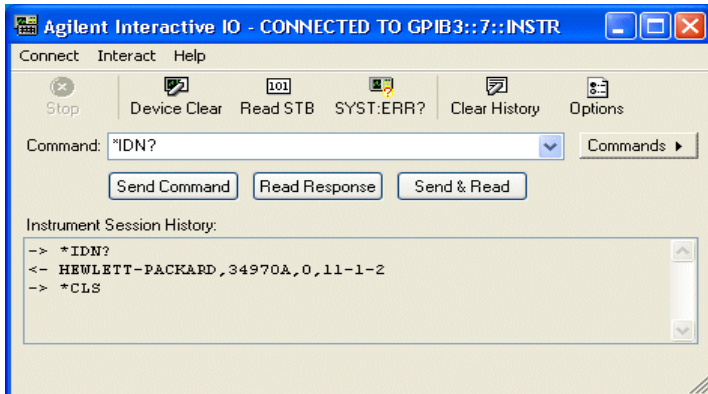


Figure 4 Interactive IO

Command	Description
*IDN?	The Identification query returns manufacturer, model, serial number, and firmware level or equivalent.
*CLS	The Clear Status command clears status data structures, and forces the device to the Operation Complete query idle state.
*OPC?	The Operation Complete query places an ASCII character "1" into the device's Output Queue when all pending selected device operations have been finished.
*RCL	The Recall command restores the current settings of a device from a copy stored in local memory.
*RST	The Reset command performs a device reset, which sets the device-specific functions to a known state that is independent of the past-use history of the device.
*SAV	The Save command stores the current settings of the device in local memory.
*STB?	The Read Status Byte query returns the status byte and master Summary Status bit.
*TRG	The Trigger command signals the transition of the Device Trigger (DT) function to the Device Trigger Active State (DTAS).
*TST?	The Self-test query returns zero to indicate the test completed with no errors. A return value not equal to zero indicates the test is not completed or completed with errors.

Table 1 Interactive IO Common Commands

IO Control

When you install Agilent IO Libraries Suite, the Agilent IO Control is displayed as a circled **IO** symbol in the Windows notification area. The IO Control provides easy access to the IO Libraries Suite utilities and documentation.

When you click the IO Control, you will see a menu that includes several types of commands:

- Commands to run each of the Agilent IO Libraries Suite utilities: Connection Expert, Interactive IO, VXI Resource Manager (if applicable to your system), ViFind32, and VISA Assistant
- An **Event Viewer** command to invoke the Microsoft Event Viewer, which can be useful in debugging I/O programs
- A **Documentation** submenu with commands to display:
 - online Help files for IO Libraries Suite and for specific IO Libraries
 - manuals for IO Libraries Suite, specific IO Libraries, and Agilent interface products
 - the Agilent IO Libraries Suite Read Me file
 - installation and path information, which includes paths for Agilent IO Libraries Suite and for Agilent VISA, and Windows registry entries used by Agilent IO Libraries Suite
- An **Agilent VISA Options** submenu with commands to set the Logging and LockWait options for the Agilent VISA library.

Figure 5 IO Control Menu

NOTE

If the IO Control icon is not visible, you can display the icon by clicking **Start > Programs > Agilent IO Libraries Suite > Utilities > IO Control** or, in Connection Expert, **View > IO Control**.

Remote IO Server

The Remote IO Server software provides a way to connect via local area network (Ethernet) to instruments that are physically connected to another PC on the network. When the Remote IO Server is running on one PC (the server), you can use instruments connected to that server from other PCs (the clients) by using the Connection Expert to create

remote interfaces on the client PCs. See the *Agilent IO Libraries Suite Online Help* for details.

ViFind32

ViFind32 is a console application that uses the **viFindRsrc** and **viFindNext** VISA functions to enumerate all resources visible to VISA. This application is useful for verifying that all expected interfaces have been configured by Connection Expert, and that the expected devices have been attached.

To run ViFind32, you can do any one of the following:

- Click **Start > Programs > Agilent IO Libraries Suite > Utilities > ViFind32**
- Click the IO Control, and then click **ViFind32**
- In Connection Expert, click **Tools > ViFind32**

VISA Assistant

The VISA Assistant utility is provided for your convenience, though most of its capabilities have been replaced by Interactive IO and Connection Expert.

VXI Resource Manager

The VXI Resource Manager is a software utility that initializes and prepares a VXI system for use. If your system includes an E8491 IEEE-1394 PC Link to VXI interface, you can use the VXI Resource Manager to determine whether your system is properly configured.

The VXI Resource Manager runs when any of the following conditions occurs:

- You start it from the Connection Expert's Tools menu (select **Tools > VXI Resource Manager > Edit Resources**, then click **Run** in the resulting Resource Manager dialog box)
- You start it from the Agilent IO Control
- You apply or cycle VXI mainframe power
- You press the E8491 Reset button

- You reboot your PC

In VXI systems with multiple E8491 interfaces, you can turn off individual VXI mainframes without affecting other mainframes in the system. When a mainframe is turned on, the VXI Resource Manager reconfigures that mainframe.

Where Can I Get More Information about Using Agilent IO Libraries Suite?

Agilent IO Libraries Suite Documentation

Online Help

Online Help is always easily available whenever you use the Connection Expert software. Just click **Help > Help Topics**. The online Help will appear on your screen in a new window.

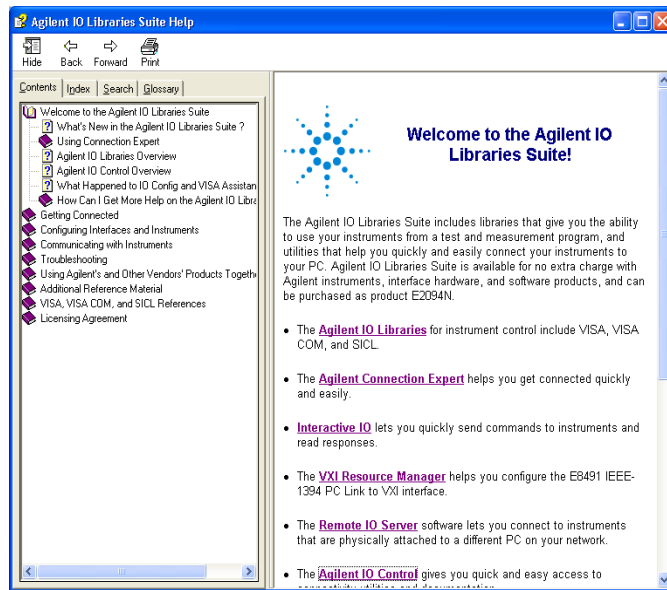


Figure 6 Agilent IO Libraries Suite Help

- Click any book icon to see the topics beneath it.



- When a book or chapter is open, it looks like this:



- Each topic is represented by a symbol like this:



- When Connection Expert is running, you can press F1 in any Connection Expert pane or dialog box to go directly to the most relevant help topic.
- When Connection Expert is not running, you can view the online Help by clicking the **IO** icon in the taskbar notification area (the IO Control) and then clicking **Documentation > IO Libraries Suite Help**.

The Task Guide

The Connection Expert task guide appears in the left-most pane of the Connection Expert window. The choices listed in the task guide are based on what you have selected in the explorer pane (the middle pane of the Connection Expert window). The purpose of the task guide is to point you to common tasks and useful information.

Other Documentation

The table below lists documentation that may be helpful to you as you connect and control your instruments.

Table 2 Agilent IO Libraries Suite and Related Documentation

Document or helpful information	Description
<i>Agilent IO Libraries Suite Getting Started</i>	This is the electronic manual you're now reading. It provides an introduction to IO Libraries Suite features and installation instructions.
<i>Agilent USB/LAN/GPIB Connectivity Guide</i>	This electronic manual provides step-by-step instructions on connecting instruments to PCs via USB, LAN, or GPIB, with troubleshooting techniques and programming information.
<i>Agilent IO Libraries Suite Online Help</i>	This Help file provides general Agilent IO Libraries Suite information and specific information on usage of the Connection Expert utility. Includes detailed troubleshooting techniques and high-level programming information. In Connection Expert, click Help > Help Topics , or use the IO Control Documentation menu.

Table 2 Agilent IO Libraries Suite and Related Documentation

<i>VISA Online Help</i> <i>VISA COM Online Help</i> <i>SICL Online Help</i> <i>Agilent 488 Online Help</i>	These Help files provide programming reference information in the form of Windows HTML Help. In Connection Expert, click Help > Help Topics , or use the IO Control Documentation menu.
<i>VISA Users' Guide</i> <i>SICL Users' Guide</i>	These electronic manuals provide introduction to I/O programming concepts, library details, and step-by-step instructions to build sample programs. In Connection Expert, click Help > Documentation , or use the IO Control Documentation menu.
<i>Agilent IO Libraries Suite Task Guide</i>	This guide appears in the left-most pane of the Connection Expert window. The task guide lists common tasks and helpful information; the choices are based on what you have selected in the explorer pane (middle pane).
Programming Samples	Agilent IO Libraries Suite provides sample programs online to help you develop VISA, VISA COM, and SICL applications. Access these samples from Connection Expert by clicking Help > Programming Samples . Additional sample code is available on the Agilent Developer Network (see below).

Web Resources

Agilent Developer Network (ADN)

The ADN Web site provides code samples, software downloads including IO Libraries Suite updates and instrument drivers, technical notes, white papers, and other resources for software developers. The URL for ADN is <http://www.agilent.com/find/adn>

Application Central

Application Central provides hundreds of application notes, technical notes, tutorials, and application hints. You can find Application Central at

<http://www.agilent.com/find/appcentral>

Test & Measurement Software and Connectivity Products

You can find product information on interface cards, converters, and connectivity software at

<http://www.agilent.com/find/connectivity>

Contacting Agilent

In the USA, you can reach Agilent Technologies at this telephone number:

USA: 1-800-829-4444

Outside the USA, contact your country's Agilent support organization. A list of contact information for other countries is available on the Agilent Web site:

<http://www.agilent.com/find/assist>

2 Welcome to Agilent IO Libraries Suite



3 Installing IO Libraries Suite

This chapter includes:

- System Requirements
- Installing the IO Libraries Suite Software
- Optional: Installing Additional Software For A New Instrument Or Interface
- Installation Troubleshooting
- Keeping Your Software Up To Date

NOTE

This chapter assumes that you are installing Agilent IO Libraries Suite from the *Automation-Ready CD*. If you are installing from the Web, double-click the downloaded executable to extract files and launch the setup program; then proceed with the software installation as documented in this chapter.



System Requirements

- **Processor:** 450 MHz Pentium II or higher required, 800 MHz recommended
- **Operating system:** One of the following Microsoft Windows versions:
 - Windows XP Professional or Home Edition, Service Pack 1 or later
 - Windows 2000 Professional, Service Pack 4 or later
- **Browser:** Microsoft Internet Explorer 5.01 or greater
- **Available memory:** 128 MB (256 MB or greater recommended)
- **Available disk space:**
 - 225 MB required for installation:
 - 160 MB for Microsoft .NET Framework
 - 65 MB for Agilent IO Libraries Suite
 - 175 MB required for operation:
 - 110 MB for Microsoft .NET Framework
 - 65 MB for Agilent IO Libraries Suite
- **Video:** Super VGA (800x600) 256 colors or more

If possible, you should use the current version of the Agilent IO Libraries Suite. This version supports the newest interfaces and operating systems, and has the most advanced features. However, you may need an earlier version of the IO Libraries Suite to support an older interface or operating system. For example, Agilent IO Libraries Suite 14.0 is needed to support Windows 98SE or Windows Me.

If you have the *Automation-Ready CD* with Agilent IO Libraries Suite 14.1, you can install version 14.0 directly from the CD-ROM. In Windows Explorer, navigate to the folder called **Previous Versions** on the CD-ROM. Double-click the file **IOLibSuite14_0.exe** to install version 14.0.

If you need a version earlier than 14.0, or if you do not have the Automation-Ready CD, go to:

<http://www.agilent.com/find/iolib>
to locate the version you need.

Installing the IO Libraries Suite Software

NOTE

You must have Administrator privileges to install Agilent IO Libraries Suite and to run Connection Expert.

NOTE**Every IO Libraries Suite installation is a “Full installation”**

In past versions of IO Libraries, there was an option to install IO Libraries as either a Full version or a Runtime version. Beginning with IO Libraries Suite 14.0, the installation process provides a **Full installation** for all users (i.e. there is no longer a Runtime installation option). This means that every installation now includes the development components of the Agilent IO Libraries Suite software, which allows you to develop your own I/O programs. If you wish to minimize the size of the installed software, select a **Custom** installation; when you get to the **Select Features** dialog, un-check the manuals and the sample programs.

This section describes how to install Agilent IO Libraries Suite on your PC. The process is as follows:

- 1 Verify that your PC meets the minimum system requirements. (See “System Requirements” on page 28.)
- 2 If you are upgrading to IO Libraries Suite from a previous version of IO Libraries, you must remove the instruments and interfaces listed below before you upgrade your software. This step is necessary in order for these devices to obtain the correct drivers to work with Agilent IO Libraries Suite.
 - a Disconnect any USB instruments from your PC.
 - b Disconnect any Agilent 82357 USB/GPIB interface converters from your PC.
 - c Disconnect any Agilent E8491 IEEE 1394 PC Link to VXI interfaces from your PC.
- 3 Close all other applications on your PC.
- 4 Insert the *Automation-Ready CD with Agilent IO Libraries Suite* into the CD-ROM drive of your PC.

- Wait a few seconds for the auto-run window to appear.
 - If the auto-run window does not appear automatically,
 - Click **Start > Run...**
 - Type `<drive>:autorun\auto.exe`, where `<drive>` is your CD drive letter.
- 5** When the auto-run window appears, click **Install Software** once, and wait for the InstallShield Wizard to appear.
- Optional: If you want more information before you begin the installation, click **Connect in 3 Steps** and/or **Readme**.
- The *Three-Step Connection Procedure* explains how to connect an instrument to your PC quickly and easily, using the IO Libraries Suite.
 - The Read Me file includes last-minute information about the IO Libraries Suite software.
- 6** When the InstallShield Wizard appears, click **Next >** to begin the IO Libraries Suite software installation.
- 7** Read the License Agreement(s). If you accept the terms, click the radio button labeled **I accept the terms of the license agreement** and then click **Next >** to continue.
- 8** If you are upgrading to this version of IO Libraries Suite from a previous version of IO Libraries or IO Libraries Suite, you may see a dialog box similar to [Figure 7](#). Notice that you *must* allow the previous version to be removed if you want to install the current version of IO Libraries Suite.
- a** If you are upgrading from Agilent IO Libraries version M or earlier, *and* you have created files in the IO Libraries installation folder or any subfolder (for example, if you modified IO Libraries sample code and saved it in the original samples folder) these files will be deleted when you proceed with the upgrade. *If you wish to keep these files, you must copy them to a safe location at this time.*
 - b** Select the check box if you want to save your current I/O configuration.

- If you select this option, interfaces and instruments that were either discovered by, or manually added to, either Connection Expert or the old IO Config utility will appear when you run Connection Expert.
 - If you do not select this option, Connection Expert will display only the interfaces and instruments that it discovers automatically. Serial and LAN instruments will not appear; you will have to add them manually.
- c Click **Next >** to proceed with the installation of IO Libraries Suite.

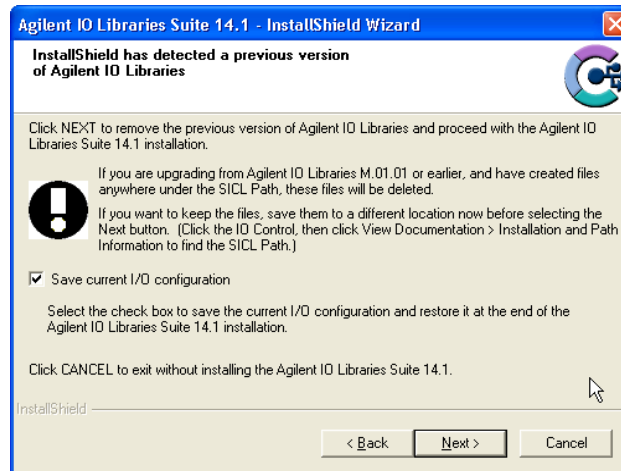


Figure 7 Upgrading from Previous Version of IO Libraries

- 9 When the InstallShield Wizard **Setup Type** dialog box appears, as shown, select **Typical** or **Custom**, then click **OK**. The **Typical** setup installs the recommended features for your configuration in standard locations on your PC. In a **Typical** setup, if another vendor's VISA software is already installed on this PC, Agilent VISA is installed as secondary. If no other vendor's VISA software is found on this PC, Agilent VISA is installed as primary. (See "Using Agilent VISA In Side-by-Side Mode" on page 37.)

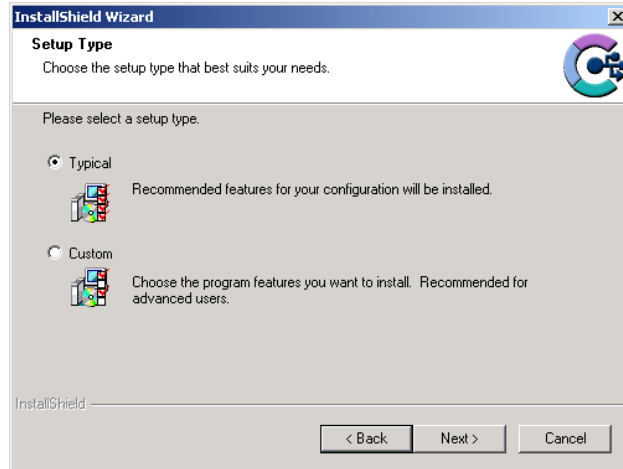


Figure 8 Choosing Setup Type

10 If you chose the **Custom** setup *and* you have another vendor's VISA implementation installed on your PC, then you will see the dialog box below, which asks whether you want to install Agilent VISA as the primary VISA.



Figure 9 Agilent VISA as Primary VISA

If you do not have another vendor's VISA installed, you will see a similar dialog box, but the check box will be selected, indicating that the default is to install Agilent VISA as primary.

For details on this topic, see “Using Agilent VISA In Side-by-Side Mode” on page 37.

- 11** If you chose a **Custom** setup, you will now see the **Choose Destination Location** dialog.

From this dialog, you may select specific destination folders for:

- The IO Libraries Suite software
- Agilent VISA (This choice is enabled only if you have not previously installed *VXIPlug&Play* drivers or other VISA components.)
- IVI shared components (This choice is enabled only if you have not previously installed IVI shared components or IVI drivers.)

NOTE

The Agilent VISA and IVI shared components folders chosen during this installation will affect the installation location of any related instrument drivers that you install later. If you have already installed such drivers, the related IO Libraries Suite components will be installed in the folders you chose at that time, and these choices will now be disabled.

- 12** If you chose a **Custom** setup, you will now see the **Select Features** dialog box.
- a** Click on any feature in the list to see the feature description and the space requirements for the selected set of features. It is recommended that you install the manuals and sample programs if you plan to program with the Agilent IO Libraries; however, you may omit them to save space.
 - b** Select the check box for each feature to be installed. Clear the check box for each feature to omit.
 - c** When you are done selecting features, click **Next >**.

13 The **Start Copying Files** dialog appears; click **Next >** to begin copying files.

- If the Microsoft .NET Framework version 1.1 has not previously been installed on your PC, you will see the .NET Framework files being copied onto your computer. The Microsoft .NET Framework provides necessary infrastructure for Agilent IO Libraries Suite utilities, as well as for .NET programming tools and many other applications. You will only need to install the .NET Framework once, even if you remove and reinstall or upgrade your IO Libraries Suite.
- If the Microsoft .NET Framework Service Pack 1 has not previously been installed on your PC, you will see the Service Pack files being copied onto your computer. This Service Pack is necessary for the proper operation of Agilent IO Libraries Suite.
- If the IVI (Interchangeable Virtual Instrument) Shared Components have not previously been installed on your PC, you will now see them being copied onto your computer. The IVI Shared Components provides necessary infrastructure for Agilent IO Libraries Suite utilities, as well as for IVI-COM instrument drivers.

14 After the files have been copied, you may see a dialog asking you to restart your PC. This occurs only if you have certain I/O hardware configurations. If you choose not to reboot at this time, you should reboot before running Connection Expert.

15 When the **InstallShield Wizard Complete** dialog appears,

- a Select the check boxes for the actions that you want to do next.
 - Select the **Read Me** file check box if you want to view the Read Me file.
 - Select the **Launch Agilent Connection Expert** check box if you want to run Connection Expert now. Run Connection Expert if you are ready to connect, configure, and verify your instruments. If you need to install hardware, such as a GPIB card, then wait to

run Connection Expert after you have done that installation.

- b** Click **Finish**.
- 16** If you are installing Agilent IO Libraries Suite along with another instrument, interface, or software product such as Agilent VEE or Agilent T&M Toolkit, there may be another CD with additional software (drivers, sample programs, etc.). If you want to install this additional software,
 - a** Insert the CD into the CD drive on your PC.
 - b** Follow the instructions that came with the CD or the hardware or software product.
- 17** Re-connect any USB instruments or E8491 IEEE-1394 FireWire to VXI interfaces that you may have disconnected in [step 2](#). Install any new hardware.
- 18** If Connection Expert is already running, click the **Refresh All** button to identify any hardware you have just installed or re-connected.

If Connection Expert is not already running, run it now to verify your I/O configuration: In the Windows taskbar notification area, click the **IO** icon (IO Control), then click **Run Connection Expert**.

- a** Locate your interfaces and instruments in the explorer pane. Click on them to see their properties (displayed in the right-hand pane). Observe their state, also displayed in the right-hand pane: if communication to the interface or instrument has been successfully established, it will be in the Verified state, denoted by a green check mark.
- b** Change the default I/O configuration (if necessary) by clicking **Change Properties...** in the property pane of the interface or instrument you wish to configure.
- c** If you would like to test your connections manually, select your instrument, right-click and choose **Send Commands To This Instrument**.

Installation Troubleshooting

If you encounter problems while installing the IO Libraries Suite, the following steps may help.

- 1 Close or Cancel all InstallShield Wizards and other Agilent IO Libraries Suite windows. Exit any other applications on your system.
- 2 Browse to the autorun folder of your *Automation-Ready CD* and double-click to run `auto.exe`. This restarts the installation process.
- 3 If you see the standard InstallShield Wizard, step through the installation process as described in this chapter.
- 4 If you see **Modify**, **Repair**, and **Remove** options, select **Repair**. This will reinstall all installed features of IO Libraries Suite. If this does not solve the problem, restart the installation again, select **Remove**, and then reinstall the product.

“Error 1935” When Installing Microsoft .NET Framework

The Agilent IO Libraries Suite utilities require the Microsoft .NET Framework; if the .NET Framework is not already installed on your PC, the IO Libraries Suite installation process will attempt to install it. There is a known issue that can cause you to receive an “Error 1935” error message during this .NET installation.

For steps to resolve this error, go to <http://www.microsoft.com> and search on “Error 1935”. Follow the instructions given by Microsoft to resolve the error.

Changing Your Installation or Removing IO Libraries Suite

- 1 Click **Start > [Settings] > Control Panel > Add or Remove Programs**
- 2 Select **Agilent IO Libraries Suite**
- 3 Click **Change/Remove**
- 4 Select the action you want to take:

- **Modify:** Adds, replaces, or removes selected features. You can change your installation from primary to side-by-side or from side-by-side to primary by using this option. You can also use this to install manuals or sample code if you did not initially install them.
- **Repair:** Reinstalls all features that are currently installed.
- **Remove:** Removes the product from your PC.

Keeping Your Software Up To Date

Web resource for the latest IO Libraries Suite software:

www.agilent.com/find/iolib

When you update the IO Libraries Suite software, you may choose to preserve your test system configuration. This includes the instruments, instrument aliases, interfaces, and all related properties.

Web resource for the latest instrument drivers:

www.agilent.com/find/drivers

This Web site includes many types of instrument drivers, including IVI-COM and *VXIplug&play* drivers.

Using Agilent VISA In Side-by-Side Mode

Agilent IO Libraries Suite includes an implementation of VISA (Virtual Instrument Software Architecture), one of three available application programming instruments for instrument control. The VISA standard requires that `visa32.dll`, the dynamic-link library that implements the VISA interface, be installed in a prescribed location; therefore, only one installed implementation (the **primary** implementation) can fully comply with the standard at any one time. Because of this, you must take special care if you want to use Agilent IO Libraries Suite alongside any other implementation of VISA, such as National Instruments' NI-VISA.

When you have both Agilent VISA and another vendor's VISA installed on the same system, you will need to decide whether to let your programs use the primary VISA or whether to explicitly direct them to use the Agilent VISA implementation.

NOTE

In general, you do not need to install NI-VISA to use National Instruments GPIB cards and devices. You can install National Instruments' NI-488.2 as a driver for these devices, and avoid the complications of side-by-side operations.

Agilent IO Libraries Suite supports the option to install Agilent VISA in side-by-side mode, which allows Agilent VISA to be used simultaneously with another vendor's VISA implementation. In side-by-side mode, Agilent VISA is installed only in a secondary location and therefore does not overwrite another vendor's VISA if it is present on the computer.

In general, non-Agilent VISA implementations do not support operation as the secondary VISA (in side-by-side mode). This means that you must operate Agilent VISA in side-by-side mode as the secondary VISA, and the other vendor's VISA as primary.

About primary and secondary VISA

- VISA programs normally use `visa32.dll`, which is installed in the Windows system directory. This is the primary VISA, as defined by the VISA standard.
- Agilent VISA is implemented in `agvisa32.dll`, which is also installed in the Windows system directory.
- If Agilent VISA is installed as primary, the Agilent version of `visa32.dll` is installed in the Windows system directory. It simply forwards all VISA calls to `agvisa32.dll`.

- If you install Agilent VISA as primary, all files needed to support side-by-side mode are also installed. This means that if you subsequently install another vendor's VISA as primary, you can still use Agilent VISA as secondary.

If Agilent VISA is installed in side-by-side mode (as the secondary VISA)

- `agvisa32.dll` is installed, but Agilent's `visa32.dll` is not. Thus, it will not overwrite another vendor's `visa32.dll` residing in the standard location.
- Agilent support files are not installed in the `bin`, `include`, and `lib` directories of the VISA path (e.g. `c:\program files\visa\winnt`), since they would overwrite the other vendor's support files. Copies of the Agilent versions of the VISA support files reside in the `agbin`, `include`, and `lib` subdirectories under `<VISA path>\agvisa`. (These files are installed even when Agilent VISA is primary.)
- The IO Control menu and the status bar at the bottom of the Connection Expert window will contain a message indicating whether Agilent VISA is installed as primary, installed as secondary, or installed as primary but overwritten by another vendor's VISA. In the latter case, Agilent VISA will operate identically to a secondary installation.

VISA programs that are linked to the standard VISA DLL (e.g. `C:\WINDOWS\system32\visa32.dll`) will use the primary VISA. However, if a VISA program is linked with `agvisa32.lib` or dynamically loads `agvisa32.dll`, it will always use Agilent VISA (regardless of whether Agilent VISA is primary or secondary). Addressing is identical regardless of whether you are using the primary or secondary VISA in your program.

See the *Agilent IO Libraries Online Help* for more information about side-by-side VISA operation.

3 Installing IO Libraries Suite



Appendix A: Agilent IO Libraries Revision History

This appendix includes:

- Pointers to specific information on IO Libraries revisions
- New features of Agilent IO Libraries Suite 14.0 and 14.1
- What happened to IO Config?



Where to Find Information on Past IO Libraries Revisions

A full matrix of information about past product revisions, including PC operating system support and physical interface support, is available in the *Agilent IO Libraries Suite Online Help* under **Additional Reference Material**. The most current information will always be provided on the Web at

`http://www.agilent.com/find/iolib_osmatrix`

for operating system support information, and

`http://www.agilent.com/find/iolib_revmatrix`

for general revision information.

If you need to download an older version of the IO Libraries or IO Libraries Suite, to support older operating systems or older interfaces, you can do so at

`http://www.agilent.com/find/iolib`

New Features of Agilent IO Libraries Suite 14.0 and 14.1

Agilent IO Libraries Suite provides a new and improved set of tools for establishing, verifying, and troubleshooting instrument-to-PC connections. Some of the new features of the Agilent IO Libraries Suite 14.1 product are described here. You can get more information on all these features in the *Agilent IO Libraries Suite Online Help*.

- Agilent IO Libraries Suite 14.1 introduces the **Agilent 488** I/O library, a library for GPIB instrument I/O that provides compatibility with existing test & measurement code developed using National Instruments' NI-488 or other similar libraries.
- Introduced in Agilent IO Libraries Suite 14.0, **Agilent Connection Expert** replaces the old IO Config utility with an integrated, task-oriented connectivity console. Connection Expert is designed for ease of use; it includes a task guide to help you quickly access important tasks and information, as well as an explorer view that lets you see and troubleshoot your connections and devices.
- Introduced in Agilent IO Libraries Suite 14.0, **Interactive IO** is a software utility that lets you interactively send commands to instruments and see their responses. It is integrated into Connection Expert, and can also be run separately from the IO Control. It provides improved ease of use over the older VISA Assistant utility.
- **LAN local-subnet device discovery** is a new feature (introduced in Agilent IO Libraries Suite 14.0) that allows Connection Expert to automatically discover devices that are connected directly, or via a LAN server or gateway, on the local subnet of your local area network. This means that you do not need to know the IP address or hostname of a local-subnet instrument in order to add it to your test system.

Appendix A: Agilent IO Libraries Revision History

- IO Libraries Suite provides extended support of **VISA aliases**. VISA aliases were introduced for USB devices only in Agilent IO Libraries M.01.01. Beginning with Agilent IO Libraries Suite 14.0, using Agilent Connection Expert, you can define VISA aliases for any device or interface in your test system. VISA aliases can make your test program simpler and more portable.
- IO Libraries Suite includes **improved versions of the Agilent IO Libraries** – VISA, VISA COM, & SICL – with module files to facilitate test programming in Microsoft .NET languages, and with various defect fixes and performance enhancements.

What Happened to IO Config?

The Agilent IO Libraries tool called IO Config has been replaced, in Agilent IO Libraries Suite, by Connection Expert. Connection Expert is an integrated utility that provides all the software you need to quickly establish and verify connections to your instruments.

Connection Expert provides an explorer view of your test system, as well as being the central console for instrument connectivity and interface configuration. All the functionality of IO Config is now available in Connection Expert.

The IO Config utility is provided in IO Libraries Suite for backward compatibility only. The supported configuration utility for IO Libraries Suite is Connection Expert. IO Libraries Suite installs the *unsupported* IO Config utility in the installation directory (by default, C:\Program Files\Agilent\IO Libraries Suite), as bin\iocfg32.exe.

VISA Assistant is still installed as part of Agilent IO Libraries Suite, but for most users, it has been replaced by the Interactive IO utility, which can be accessed from Connection Expert or from the IO Control. Interactive IO provides a simpler, more intuitive way to send commands to instruments and read the returned results. The discovery and tree view features of VISA Assistant are replaced and improved upon by Connection Expert.

Some capabilities of VISA Assistant are not yet available in the Interactive IO utility. These include:

- Memory I/O for VXI and GPIB-VXI interfaces
- Reading and writing of VISA attributes
- Association of *VXIplug&play* drivers to instruments

If you need these capabilities, you can start the VISA Assistant utility by clicking the IO Control and then **VISA Assistant**, or by clicking **Tools > VISA Assistant** on the Connection Expert menu.

Appendix A: Agilent IO Libraries Revision History



Glossary

access board

The GPIB interface to which a particular device is connected.

Active Controller

See “Controller in Charge”.

address

A string (or other language construct) that uniquely locates and identifies a resource. VISA defines an ASCII-based grammar that associates address strings with particular physical devices or interfaces and VISA resources.

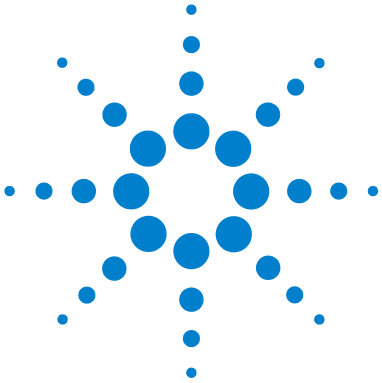
Agilent 488

An I/O library provided in Agilent IO Libraries Suite for compatibility with existing test & measurement programs that were developed using National Instruments’ NI-488 or other similar libraries. Agilent 488 supports communication with GPIB devices and interfaces, but does not support USB, LAN, RS-232, or VXI communications.

alias

See **VISA alias**.





API

Application Programming Interface. The interface that a programmer sees when creating an application. For example, the VISA API consists of the sum of all of the operations, attributes, and events of each of the VISA ResourceClasses.

attribute

In VISA and SICL, a value that indicates the operational state of a resource. Some attributes can be changed; others are read-only.

board

A GPIB interface. It may be a physical board, an adapter (such as the 82357 USB/GPIB adapter), or a remote GPIB interface.

board descriptor

A handle, returned from **ibfind**, that uniquely identifies a GPIB interface (board) in Agilent 488 original API calls. Also called an interface descriptor or board unit descriptor.

board-level

Refers to Agilent 488 functions that operate on an interface (board), rather than on a device.

bus error

An error that signals failure to access an address. Bus errors occur in conjunction with low-level accesses to memory, and usually involve hardware with bus mapping



capabilities. Bus errors may be caused by non-existent memory, a non-existent register, an incorrect device access, etc.

bus error handler

Software that runs when a bus error occurs.

CIC

Controller in Charge.

command bytes

GPIB commands encoded as individual bytes. Also called **GPIB commands** or **interface messages**.

commander

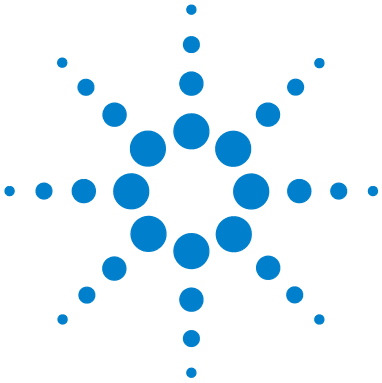
In test-system architectures, a device that has the ability to control another device. In a specialized case, a commander may also be the device that has sole control over another device (as with the VXI Commander/Servant hierarchy).

commander session

A session that communicates to the interface's commander. Commander sessions are used when an interface is in a non-Controller role.

communication channel

A communication path between a software element and a resource. In VISA, "communication channel" is synonymous with "session." Every communication channel in VISA is unique.



Connection Expert

An Agilent software utility that helps you quickly establish connections between your instruments and your PC. It also helps you troubleshoot connectivity problems. Connection Expert is part of the Agilent IO Libraries Suite product.

Controller

A device (typically a computer) used to communicate with another device or devices (typically instruments). The Controller is in charge of communications and device operation; it controls the flow of communication and performs addressing and other bus management functions.

Controller in Charge

The device currently in control of the GPIB.

device

A unit that receives commands from a Controller. A device is typically an instrument, but can also be a computer acting in a non-Controller role or another peripheral such as a printer or plotter. In VISA, a device is logically represented by the association of several VISA resources.

device descriptor

A handle, returned from **ibdev** or **ibfind**, that uniquely identifies a device in Agilent 488 original API calls. Also called a **device unit descriptor**.



device driver

Software code that communicates with a device: for example, a printer driver that communicates with a printer from a PC. A device driver may either communicate directly with a device by reading to and writing from registers, or it may communicate through an interface driver.

device session

A session that communicates as a Controller with a single, specific device such as an instrument.

device-level

Refers to Agilent 488 functions that operate on a device (instrument), rather than on an interface.

direct I/O

Programmatic communication with instruments not involving an instrument driver. Direct I/O may be accomplished by using an IO Library (VISA, VISA COM, SICL, or Agilent 488) or by using direct I/O tools such as those provided by Agilent VEE and Agilent T&M Toolkit.

driver

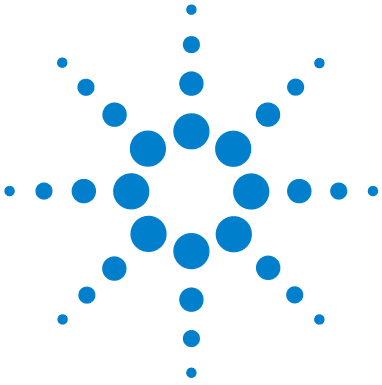
See **instrument driver** and **device driver**.

explorer view

The tree view within the Connection Expert window that shows all devices connected to a test system.

handler

A software routine that responds to an asynchronous event such as an SRQ or an interrupt.



instrument

A device that accepts commands and performs a test and measurement function.

instrument driver

Software that runs on a computer to allow an application to control a particular instrument.

Interactive IO

An Agilent application that allows you to interactively send commands to instruments and read the results. Interactive IO is part of the Agilent IO Libraries Suite product.

interface

A connection and medium of communication between devices and Controllers. Interfaces include mechanical, electrical, and protocol connections.

interface descriptor

A handle, returned from **ibfind**, that uniquely identifies a GPIB interface (board) in Agilent 488 original API calls. Also called a **board descriptor** or **board unit descriptor**.

interface driver

Software that communicates with an interface. The interface driver also handles commands used to perform communications on an interface.

interface messages

GPIB commands encoded as individual bytes. Also called **GPIB commands** or **command bytes**.



interface session

A session that communicates and controls parameters affecting an entire interface.

interrupt

An asynchronous event that requires attention and actions that are out of the normal flow of control of a program.

IO Control

The icon in the Windows notification area (usually the lower right corner of your screen). The IO Control gives you access to Agilent I/O utilities such as Connection Expert, Agilent I/O documentation, and VISA options.

IO Libraries

Application programming interfaces (APIs) for direct I/O communication between applications and devices. There are four Agilent IO Libraries in the Agilent IO Libraries Suite: VISA, VISA COM, SICL, and Agilent 488.

Listener

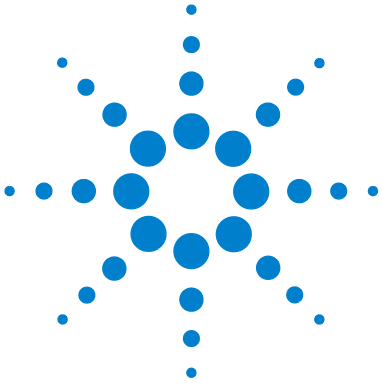
A device that can receive data from the bus when instructed (addressed to listen) by the System Controller.

lock

A state that prohibits other users from accessing a resource such as a device or interface.

logical unit

A number associated with an interface. A logical unit, in SICL and Agilent VEE, uniquely identifies an interface. Each interface on the Controller must have a unique logical unit.



mapping

An operation that returns a reference to a specified section of an address space and makes the specified range of addresses accessible to the requester. This function is independent of memory allocation.

non-Controller role

A computer is in a non-Controller role when it acts as a device communicating with a computer that is in a Controller role.

notification area

The area on the Windows taskbar where notifications are posted, typically in the lower right corner of the screen. Also called **taskbar notification area** or **Windows notification area**.

operation

A defined action that can be performed on a resource.

primary VISA

The VISA installation that controls the visa32.dll file. The primary VISA will be used by default in VISA applications. See also **secondary VISA**.

process

An operating system component that shares a system's resources. A single-process computer system allows only a single program to execute at any given time. A multi-process computer system allows multiple programs to execute simultaneously, each in a separate process environment.



programming alias

See **VISA alias**.

refresh

In Connection Expert, the action that invokes the discovery mechanism for detecting interfaces and instruments connected to your computer. The explorer view is then refreshed to show the current, discovered state of your test system.

register

An address location that contains a value that represents the state of hardware, or that can be written into to cause hardware to perform a specified action or to enter a specified state.

resource (or resource instance)

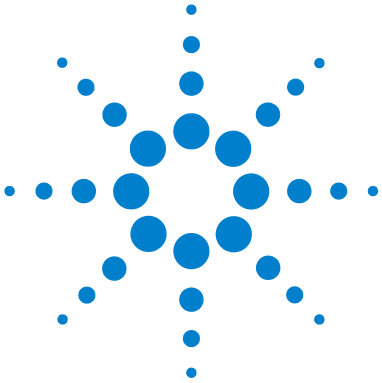
In VISA, an implementation of a resource class (in object-oriented terms, an instance of a resource class). For example, an instrument is represented by a resource instance.

resource class

The definition of a particular resource type (a class in object-oriented terms). For example, the VISA Instrument Control resource classes define how to create a resource to control a particular capability of a device.

resource descriptor

A string, such as a VISA resource descriptor, that specifies the I/O address of a device.



SCPI

Standard Commands for Programmable Instrumentation: a standard set of commands, defined by the SCPI Consortium, to control programmable test and measurement devices in instrumentation systems.

secondary VISA

A VISA installation that does not install visa32.dll in the standard VISA location. The secondary VISA installation names its VISA DLL with a different name (agvisa32.dll) so that it can be accessed programmatically. The primary VISA will be used by default in VISA applications. See also **primary VISA**.

session

VISA term for a communication channel. An instance of a communications path between a software element and a resource. Every communication channel in VISA is unique.

SICL

Standard Instrument Control Library. SICL is an Agilent-defined API for instrument I/O. Agilent SICL is one of the IO Libraries installed with Agilent IO Libraries Suite.

side-by-side

A side-by-side installation allows two vendors' implementations of VISA to be used on the same computer. See also **primary VISA** and **secondary VISA**.



SRQ

An IEEE-488 Service Request. This is an asynchronous request (an interrupt) from a remote device that requires service. In GPIB, an SRQ is implemented by asserting the SRQ line on the GPIB. In VXI, an SRQ is implemented by sending the Request for Service True event (REQT).

Standby Controller

A device or interface that has Controller capability, but is not currently the Active Controller.

status byte

A byte of information returned from a remote device that shows the current state and status of the device. If the device follows IEEE-488 (GPIB) conventions, bit 6 of the status byte indicates whether the device is currently requesting service.

symbolic name

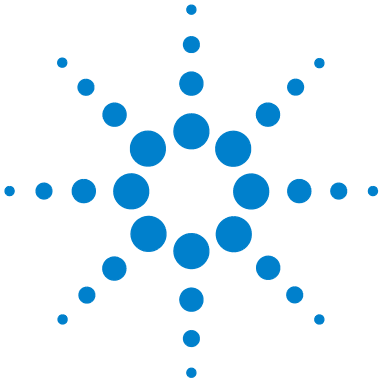
A name corresponding to a single interface. This name uniquely identifies the interface on this Controller or gateway. When there is more than one interface on the Controller or gateway, each interface must have a unique symbolic name.

System Controller

One Controller on a GPIB is the System Controller. This is a master Controller; it has the ability to demand control and to assert the IFC (Interface Clear) and REN (remote enable) lines.

system tray

See **notification area**.



Talker

A device that transmits data onto the bus when instructed (addressed to talk).

task guide

The information and logic represented in the left pane of the Connection Expert window. The task guide provides links to actions and information that help guide you through the most common I/O configuration tasks.

taskbar notification area

See **notification area**.

test system

An entire test setup including a Controller (often a PC), instruments, interfaces, software, and any remote Controllers, instruments, and interfaces that are configured to be used as part of the system.

thread

An operating system object that consists of a flow of control within a process. A single process may have multiple threads, each having access to the same data space within the process. Each thread has its own stack, and all threads may execute concurrently (either on multiple processors, or by time-sharing a single processor).

ViFind32

A console application that uses the viFindRsrc and viFindNext VISA functions to enumerate all resources visible to VISA. This application is useful for verifying that all expected interfaces have been configured by



Connection Expert, and that the expected devices have been attached. ViFind32 is part of the Agilent IO Libraries Suite.

virtual instrument

A name given to the grouping of software modules (such as VISA resources with any associated or required hardware) to give them the functionality of a traditional stand-alone instrument. Within VISA, a virtual instrument is the logical grouping of any of the VISA resources. The VISA Instrument Control Resources Organizer serves as a means to group any number of any type of VISA Instrument Control Resources within a VISA system.

VISA

Virtual Instrument Software Architecture. VISA is a standard I/O library that allows software from different vendors to run together on the same platform. Agilent VISA is part of the Agilent IO Libraries Suite.

VISA address

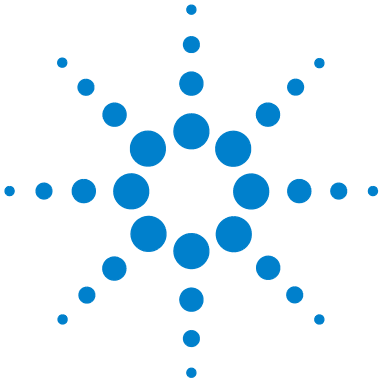
A resource descriptor that can be used to open a VISA session.

VISA alias

A string that can be used instead of a resource descriptor in VISA programs. Using VISA aliases rather than hard-coded resource descriptors makes your programs more portable. You can define VISA aliases for your instruments in Connection Expert.

VISA COM

The *VXIplug&play* specification for a COM-compliant VISA I/O library and its implementation. Agilent VISA COM is part of the Agilent IO Libraries Suite.



VISA Instrument Control Resources

The VISA definition of device-specific resource classes. VISA Instrument Control Resources include all VISA-defined device and interface capabilities for direct, low-level instrument control.

VISA name

The prefix of a VISA address, also called the **VISA interface ID**. The VISA name specifies the interface.

VISA resource manager

The part of VISA that manages resources. This management includes support for opening, closing, and finding resources, setting attributes, retrieving attributes, and generating events on resources.

VISA resource template

The part of VISA that defines the basic constraints and interface definition for the creation and use of a VISA resource. Each VISA resource must derive its interface from the VISA resource template.

VXI Resource Manager

A software utility that initializes and prepares a VXI system for use. The VXI Resource Manager is part of the Agilent IO Libraries Suite.

Windows notification area

See **notification area**.



Index

Symbols

.NET Framework, 36

Numerics

488.2 library, 14

A

Administrator privileges
 required to install IO Libraries Suite, 29
 required to run Connection Expert, 16
ADN (Agilent Developer Network), 24
Agilent 488, 14, 47
Agilent IO Libraries
 See IO Libraries
Agilent SICL
 See SICL
Agilent Technologies
 contacting, 25
Agilent VISA
 See VISA
Agilent VISA COM
 See VISA COM
Agilent Web site, 25
alias, VISA
 See VISA alias
application software, 9
Automation-Ready CD, 6, 29

B

browser, 28

C

CD-ROM
 installing from, 6
 instrument, 9, 35
configuration
 changing, 8
Connection Expert, 7, 8, 15, 16, 35, 43, 45
 running, 16, 34
 screen, 16

connections
 instrument, 5, 7
 testing, 8, 17, 20, 35

D

disk space
 required for IO Libraries Suite
 installation, 28
documentation
 function reference, 24
 IO Libraries, 24
 IO Libraries Suite, 7, 19, 22
drivers, 7
 See also instrument drivers

E

error 1935, 36
event viewer, 19
examples
 See sample programs

F

file locations
 IO Libraries Suite, 12
Found New Hardware Wizard, 7
Full version, 29

G

glossary, 47
GPIB card
 installing, 7

H

Help, online, 7, 12, 19, 22

I

icon
 IO Control, 6, 18
identification
 of instruments, 8

installation
 hardware, 7
 IO Libraries Suite, 6
 location, 12, 33
 software, 6
 upgrading, 30
installation error, 36
instrument
 learning commands, 17
 sending commands, 9
instrument drivers, 37
 IVI-COM, 14
 on Agilent Web site, 24
 on CD-ROM, 9
 VXIplug&play, 45
instruments
 commands, 18
 configuring, 7, 35
 connecting, 7
 connecting to PC, 5
 discovery on LAN, 43
 GPIB, 23
 LAN, 8, 23, 31
 RS-232, 8
 serial, 31
 USB, 7, 23
Interactive IO, 9, 17, 20, 43, 45
 commands, 18
 running, 17
 screen, 17
 timeout, 9, 17
interface
 configuring, 5
interfaces
 configuring, 7, 15, 35
 Ethernet, 19
 GPIB-VXI, 45
 hardware installation, 7
 LAN, 19, 43
 supported by IO Libraries Suite, 42
 VXI, 20, 45
introduction
 getting started with IO Libraries Suite, 5
IO Config, 31, 43, 45
 See also Connection Expert

IO Control, [6, 18](#)
displaying, [19](#)
IO Libraries, [14, 44](#)
versions, [42](#)
IO Libraries Suite
about, [12](#)
benefits, [12](#)
components, [12](#)
documentation, [19](#)
getting started, [5](#)
new features, [43](#)
utilities, [19](#)
IVI (Interchangeable Virtual Instrument)
Foundation, [14](#)
IVI (Interchangeable Virtual Instrument)
foundation, [14](#)
IVI components, [34](#)
location, [33](#)
IVI-COM drivers
See instrument drivers, IVI-COM

L

LAN
connecting instruments, [19](#)
LAN instruments, [8](#)
libraries, [12](#)
license, software, [30](#)

M

manuals, [33, 37](#)
IO Libraries Suite, [7, 23](#)
memory
required for IO Libraries Suite
installation, [28](#)
Microsoft .NET Framework, [34](#)
Microsoft Windows, [28](#)
Modify, Repair, or Remove, [36](#)

N

National Instrument VISA (NI-VISA), [37](#)
National Instruments VISA (NI-VISA), [31, 32](#)
NI-488, [14, 43, 47](#)
NI-488.2, [38](#)

O

online Help, [12, 19](#)
operating system, [28, 42](#)

P

path information, [12, 19](#)
paths
choosing, [33](#)
privileges
Administrator, [16](#)
privileges, Administrator
required to install IO Libraries Suite, [29](#)
processor, [28](#)
programming samples, [33](#)
properties
configuring, [8](#)

R

registry entries, [19](#)
removing IO Libraries Suite, [36](#)
Runtime, [29](#)
Runtime version, [29](#)

S

sample programs, [9, 24, 33, 37](#)
serial (RS-232) instruments, [8](#)
SICL, [14](#)
side-by-side mode, [37](#)
software
instrument-specific, [9](#)
Standard Instrument Control Library
See SICL

T

task guide, [8, 15, 23, 43](#)
technical support, [25](#)
timeout
Interactive IO, [9, 17](#)
troubleshooting, [15, 17, 20, 23, 36](#)

U

upgrading to IO Libraries Suite, [30](#)
USB device, [7](#)

USB devices, [29, 35](#)
utilities
IO Libraries Suite, [19](#)

V

video requirement, [28](#)
ViFind32, [20](#)
running, [20](#)
Virtual Instrument Software Architecture
See VISA
VISA, [12, 14](#)
alias, [44](#)
attributes, [45](#)
location, [33](#)
LockWait option, [19](#)
Logging option, [19](#)
National Instruments, [31, 37](#)
primary, [31, 32, 37](#)
secondary, [31, 32, 37](#)
side-by-side, [31, 32, 37](#)
VISA alias, [15](#)
VISA Assistant, [20, 43, 45](#)
See also Interactive IO
VISA COM, [12, 14](#)
VXI Resource Manager, [20](#)
running, [20](#)
VXIplug&play standards, [14](#)

W

Web site
Agilent, [25](#)
Agilent Developer Network (ADN), [24, 42](#)
installing from, [27, 33, 37](#)
instrument drivers, [37](#)
Windows version, [28](#)

© Agilent Technologies, Inc. 2004-2005

Printed in Malaysia 07/05
Second edition, July 2005



E2094-90007

