Keysight PathWave 89600 VSA Software

KEYSIGHT

INSTALLATION GUIDE

Notices

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Additional Documentation

In addition to this *Installation Guide* (InstallationGuide.pdf), which is available online, during installation by clicking **More Installation Choices > View Installation Guide**, or after you install the software in **C:\Program Files\Keysight\89600 Software *<ReleaseVersion>*\89600 VSA Software\Help**, the following documentation is included with your software:

- 89600 VSA Online Help is available after you install the software on your computer. The help includes reference information and tutorials on making several kinds of measurements.
- If you install the IO libraries, the complete documentation for the Keysight IO libraries is available by right-clicking the **Keysight IO Libraries Suite** icon in the Windows task bar's Hidden Icons panel and selecting **Documentation**.
- Specifications are available from the *Document Library* section of the 89600 VSA web page: http://www.keysight.com/find/89600

NOTE To read the PDF files, you must have Acrobat Reader installed on your computer. To install the latest Acrobat Reader, go to: http://get.adobe.com/reader/

Contents

Getting Started

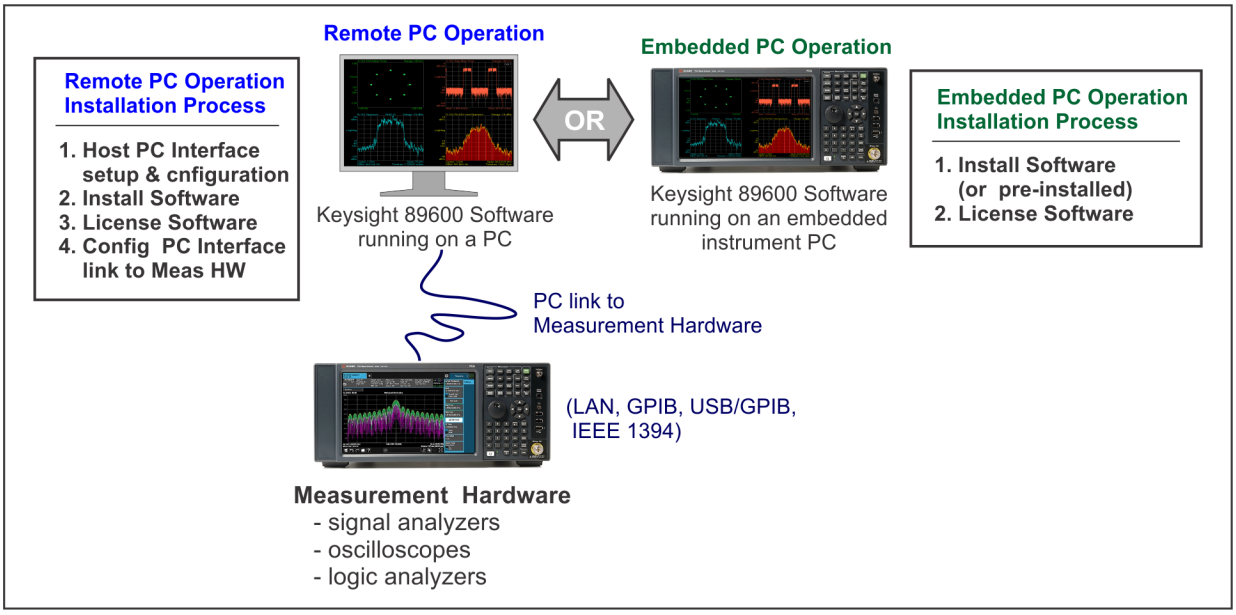
Introduction

The Keysight 89600 VSA Software Installation Guide provides all necessary instructions to install the Keysight 89600 software, to license the software, and to configure the host PC's measurement hardware I/O Interfaces.

The Keysight 89600 VSA software includes two applications: the Keysight 89600 VSA *Vector Signal Analysis* software. The software installation wizard guides you though the installation process.

Keysight 89600 VSA Software Operating Configurations

The Host PC is the computer that will run the Keysight 89600 software. There are two 89600 software operating configurations: Remote PC Operation and Embedded PC Operation (also referred to as Embedded Instrument Operation). In a Remote PC Operation, the software runs on a standalone host PC linked to the measurement hardware via the I/O interface, such as LAN, GPIB, USB, and IEEE 1394. In an Embedded PC Operation, the 89600 software runs on a PC embedded in the measurement hardware platform such as the Keysight X-Series Analyzer, Keysight Infiniium Scope, and Keysight Logic Analyzer.



Installation and Configuration Process

The Keysight 89600 software installation process includes the following primary steps:

1. **Setup and configure the remote PC.**

   Make sure that the host PC satisfies the 89600 software minimum PC system requirements and that the PC includes one of the supported I/O interfaces (LAN, GPIB, etc.).

   NOTE This step is not required for Embedded PC Operation installations.

   Go to Chapter 2 Remote PC Setup and Configuration (page 15) to setup and configure the host PC hardware including:

   a. Verify that the host PC meets the minimum hardware and software requirements.

   b. Verify that the host PC supports one of the 89600 software I/O interfaces for your measurement hardware configuration. If it does not, you must install and configure the necessary PC I/O interface hardware.

2. **Install the 89600 software.**

   The 89600 software's installation wizard will guide you through the installation process. The Keysight 89600 software can be downloaded from the Keysight 89600 software Website.

   Go to Chapter 3 Installing 89600 Software (page 21) and follow the instructions to install the Keysight 89600 software.

   IMPORTANT If you are upgrading an existing version 14 or earlier 89600 VSA software installation that uses a Floating network license type to software version 15 or later, you must first stop the CDF server service before installing the upgrade software release, see Chapter 5, "Stopping the FlexNet License Manager CDF Service" on page 1.

3. **License the Keysight 89600 VSA software.**

   After installing the 89600 software you must license the software and any purchased options. The license types are:

   a. **Demo License**: The Demo license is provided with the 89600 software installation and allows you to use the 89600 software with limited functionality. To learn more about Demo license, go to Chapter 4 Installing Licenses (page 31).

   b. **Trial License**: The Trial license lets you immediately start using a fully licensed 89600 software application for a temporary trail period. When the trial period expires, you will need to purchase a valid license for continued use. To learn more about Trial license, go to Chapter 4 Installing Licenses (page 31).

   c. **Node-locked License**: The node-locked license is used to license the Keysight 89600 software plus options to only run on one specified host PC.

   d. **Transportable License**: The Transportable license is used to license the Keysight 89600 software plus options to only run on the host PC. However, you do have the capability to transport the license to a different PC, making it the new host PC. To learn more about and install a Transportable license, go to Chapter 4 Installing Licenses (page 31).

   e. **Floating License**: The Floating or Network license provides the ability for different PC's to use a license that is stored on a network PC (or server). This provides the capability to quickly transfer a license between different PCs to run the 89600 software. You're still limited to running the 89600 software on a one PC per license basis. To learn more about and install a Floating network license, go to Chapter 5 "Floating License Installation" on page 1.

   f. **USB Portable License**: The USB portable license is used to license 89600 VSA software with options to only run on one host PC with certified USB dongle, which needs be purchased separately.

      You can move the USB portable license together with the certified USB dongle from one Host PC to another Host PC.

4. **Configure the 89600 Software I/O interface.**

   If you are running the 89600 software in the Remote PC Operation configuration, use this procedure to setup and configure the 89600 software to Measurement Hardware interface link (LAN, GPIB, etc.).

   NOTE This step is not required for Embedded PC Operation installations.

The Measurement Hardware Interface setup and configuration procedure is not the same for all types of measurement hardware. Go to the procedure that applies to your particular 89600 software measurement hardware configuration:

a. **Configuring the 89600 software I/O Interface**:

   This procedure applies to most measurement hardware configurations. Go to Chapter 7 Configuring IO Interfaces (page 39).

   NOTE If your installation measurement hardware is a Keysight Infiniium Scope or Keysight Logic Analyzer, skip this procedure and use the measurement hardware specific procedure.

b. **Configuring the Keysight Infiniium Windows Scope.**

   When the 89600 software is connected to a Keysight Infiniium scope, go to Chapter 8 Configuring Infiniium Windows Scopes (page 55).

c. **Configuring Keysight Logic Analyzers.**

   When the 89600 software is connected to a Keysight Logic Analyzer, go to Chapter 10 Configuring Logic Analyzers (page 69).

5. **Calibrate the analyzer.**

   Before making measurements, you should calibrate (or align) your 89600 VSA measurement hardware configuration. Calibrating the measurement hardware will optimize measurement result accuracy. Calibration procedures are not included in this manual, refer to the 89600 VSA online help for use and operation instructions. Go to the "Calibration" help topic for information about calibrating your 89600 VSA configuration.

6. **Troubleshooting any licensing problems.**

   If you encounter problems with the installation or licensing process, refer to Chapter 11 Troubleshooting (page 85).

Remote PC Setup and Configuration

Introduction

This chapter only applies to the remote PC operation configuration. This contains information to setup and configure the PC including system requirements, I/O interface requirements, and the PC interface installation and setup procedure.

NOTE If you are going to install the software in an embedded PC operation, skip this chapter and go directly to Installing 89600 Software (page 21).

- Verify your PC meets the system requirements listed in the table System Requirements (page 16).
- Verify that your PC's I/O interface meets the requirements listed in the table Required Measurement Hardware Interfaces (page 17).
- Install and configure your PC's I/O interface as directed in the procedure Install and Configure the PC I/O Interface (page 18).

System Requirements

Make sure your PC meets or exceeds the following minimum requirements, refer to the 89600 VSA Software Requirements web page.

Characteristic	Requirement
Operating system	Microsoft Windows 11 Professional or Enterprise Microsoft Windows 10 Professional, Enterprise or Education (64 bit)
CPU	1 GHz (>2 GHz recommended)
RAM	2 GB (16 GB recommended)
Video RAM	128 MB (1 GB recommended)
Graphics support	OpenGL version of 2.1 or higher required for rendering of 3D trace data in some measurement options
Hard disk	3 GB minimum available
Additional drives	Network access or a USB memory device required for installation and license transfer
Interface support	LAN, GPIB, USB. For Option SSA, PCIe Express card interface to PXI mainframe or an embedded PC M9036A/M9037A to be used

Required Measurement Hardware Interfaces

Use this table to determine what type of PC and I/O interface is required for your measurement hardware. Note that you may need to install and configure more than one interface.

Measurement Hardware	Computer Type	Interface
Keysight ESA	Laptop or desktop PC	GPIB, or USB/GPIB adapter
Keysight ESA-E Series Analyzer	Laptop or desktop PC	GPIB or USB/GPIB
Keysight FieldFox Handheld Analyzer	Laptop, desktop PC, or embedded PC	LAN
Keysight InfiniiVision Oscilloscope	Laptop or desktop PC	LAN, GPIB, or USB/GPIB
Keysight Infiniium Oscilloscope	Laptop or desktop PC or embedded Windows scope	LAN, GPIB, USB/GPIB, or internal
Keysight Logic Analyzer	Laptop, desktop PC, or embedded PC	LAN, IEEE-1394 (only for 1690 Series), or internal
Keysight X-Series Signal Analyzer	Laptop, desktop PC, or embedded PC	LAN or internal*
Keysight Handheld RF and Microwave Analyzer	Laptop or desktop PC	LAN
Keysight modular products	Laptop, desktop PC, or embedded PC	LAN, GPIB, USB/GPIB or internal

* The Keysight X-Series Signal Analyzer embedded PC configuration (89600 analyzer running in the analyzer) only supports a LAN interface between the analyzer and a Keysight Source; GPIB is not supported.

I/O interface hardware

The 89600 VSA software supports many I/O interface types including LAN, USB. GPIB, IEEE 1394, etc. However, the 89600 VSA software does not support all interface types for each of the available supported measurement hardware platforms. To use a specific type of interface, first verify that the 89600 VSA software supports the measurement hardware I/O interface. If it does support that interface and the PC does not currently support the interface, use the following procedure to install and configure the interface on the PC.

Install and Configure the PC I/O Interface

If you are using simulated measurement hardware, signal simulation software, or an embedded instrument PC installation, you do not need to install/configure an I/O interface. You can skip the remainder of this chapter and go directly to Installing 89600 Software (page 21).

1. Verify that the 89600 VSA software supports the measurement hardware I/O Interface.

   Go to Required Measurement Hardware Interfaces (page 17) table and make sure that the 89600 VSA software supports the measurement hardware I/O interface,

   - If the PC already supports the I/O interface, skip the remainder of this chapter and install the 89600 VSA software—go to Installing 89600 Software (page 21).
   - If the PC supports the I/O interface, but it is not currently installed, you will need to install and configure the I/O interface hardware on the PC—go to the next step.
   - If the 89600 VSA software does not support the measurement hardware I/O interface, you can not use the 89600 VSA software with your measurement hardware.

2. Install I/O Interface Card(s) in the PC.

   Install all necessary I/O interface card(s) in the PC per the instructions that came with the I/O interface card vendor documentation.

   National Instruments GPIB card: For a National Instruments GPIB card, be sure to install the NI 488.2 software first, then reboot your PC and install the interface card.

   NOTE Exclude Multiple GPIB Devices:
   If this PC controls other GPIB measurement hardware or devices, you need to exclude those devices from the 89600 identification process, see Troubleshooting Interference With Other Devices or Instruments (page 88).

3. Configure the PC I/O Interface.

   Configure the I/O interface card(s) in the PC per the instructions that came with the I/O interface card vendor documentation.

TIP You can typically use the default I/O interface hardware settings.

NOTE GPIB: For GPIB interfaces, make sure that each measurement hardware has a unique GPIB address; multiple GPIB devices cannot use the same GPIB address.

NOTE If the PC and measurement hardware are connected to a local internal LAN, you may need to check with your network administrator to verify that the IP addresses for the PC and measurement hardware satisfy requirements.

4. Cycle power OFF/ON on all system hardware.

   After completing the hardware I/O connections, cycle the power OFF/ON on the PC and all connected measurement hardware.
5. Next install the 89600 VSA software. Go to Installing 89600 Software (page 21).

Installing 89600 Software

Keysight 89600 Software Installation

The 89600 software installation includes software for the following applications:

- Keysight 89600 VSA software
- Keysight License Service
- Keysight Software Manager Utility

Installing the 89600 VSA Software

The 89600 VSA Software installation program has several different installation options. Which installation option you will select depends upon where you need to install the 89600 software and how you need it to operate. The two major ways that the 89600 software can operate are in Remote Operation or Embedded Operation.

For Remote Operation, install the 89600 software on a PC which connects to a measurement instrument. For Embedded Operation, install the 89600 software on an embedded PC instrument such as a Keysight X-series Analyzer, a Keysight Infiniium Oscilloscope, or a Keysight Logic Analyzer.

To install the software, use one of the following procedures:

- Installing 89600 Software in a PC (page 22)
- Installing 89600 Software in a Keysight X-Series Signal Analyzer (page 25)
- Installing 89600 Software in a Keysight Infiniium Scope (page 27)
- Installing 89600 Software in a Keysight Logic Analyzer (page 29)

Installing 89600 Software in a PC

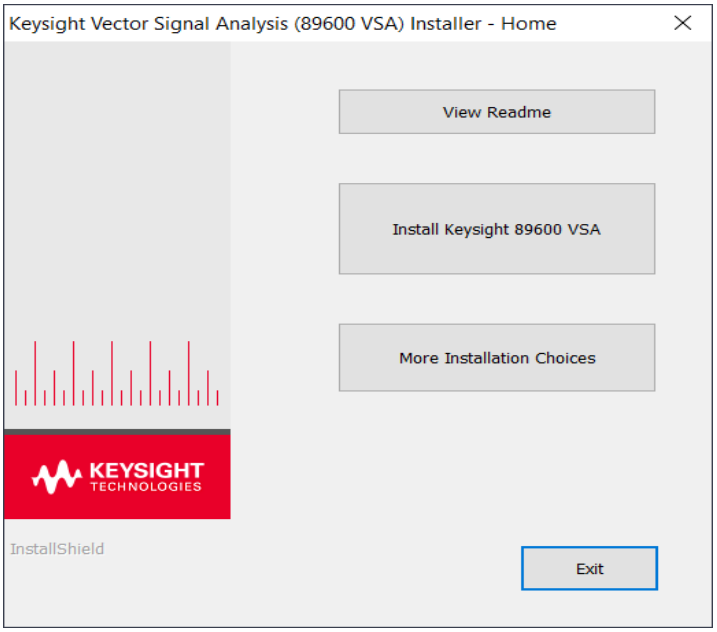
To install the Keysight 89600 software in a PC:

IMPORTANT If you are upgrading an existing version 14 or earlier 89600 VSA software installation that uses a Floating license scheme to software version 15 or later, you must first stop the CDF server service before installing the upgrade software release, see Chapter 5, "Stopping the FlexNet License Manager CDF Service" on page 1.

1. Download the 89600 VSA Software at www.keysight.com\find\89600_VSA_sw_download.
2. Close any applications you have open.

   NOTE To install the Keysight 89600 software, you must have administrator privileges on the computer you are installing the Keysight 89600 software on.

3. Launch the 89600 VSA Installer as administrator. When the Keysight 89600 VSA Installer window opens, open and review the following sections of the Readme file (click **View Readme**).
   - Required Minimum License Version
   - Installation Information



4. After reviewing the Readme file, start the software installation by clicking **Install Keysight 89600 VSA**. Step through the InstallShield Wizard and stop at the "**Select Products and Features**" window.
5. Select the Products and Features you want to install, click **Next** and continue through the InstallShield Wizard to complete the installation.
6. If you will be using connected hardware, see Installing or Updating Keysight IO Libraries for Keysight 89600 VSA (page 23).
7. The installation process configures your system environment for the 89600 software applications. Some installations may required a system PC reboot. If this is the case, when asked click **OK** to reboot.

   IMPORTANT After rebooting you will need to be logged on with administrative privileges to complete the installation.

8. The 89600 software installation is now complete and the software can be run. However, the software and options need to be licensed. To learn how to obtain a license, see Installing Licenses (page 31).

Installing or Updating Keysight IO Libraries for Keysight 89600 VSA

Keysight 89600 VSA Uses IO Libraries for SCPI API support and Hardware Connectivity. If these features are not required for anticipated usage, then IO Libraries does not need to be installed.

Known issues that may affect VSA users when Updating Keysight IO Libraries from a previous version

- DO NOT update Keysight IO Libraries on a Keysight instrument. Please refer to instrument specific update instructions.
- Updating from a version of Keysight IO Libraries version 2024 or older will remove connection definitions from Keysight Connection Expert. Please make note of any VISA addresses and alias names for connections (using Keysight Connection Expert), and manually reconfigure these connections after installation is complete (using Keysight Connection Expert).
- Updating from a version of Keysight IO Libraries version 2024 or older will disregard settings, or previously chosen installation options. Please make note of this and choose installation options consistent with what is required for the installation environment, and update any settings after installation.

Installing or Updating Keysight IO Libraries

To learn about, download, install, and configure the most up-to-date version of Keysight IO Libraries, please visit and follow the instructions provided at: https://www.keysight.com/find/iolibs.

Installing 89600 Software in a Keysight X-Series Signal Analyzer

NOTE Verify that the Instrument software revision (**System** hardkey > **Show** softkey > **System** softkey) is A.19.05 or greater.

You can install 89600 software on your Keysight X-Series Signal Analyzer one of two different ways.

If you have an Internet connection to the X-series analyzer, you can download the Keysight 89600 VSA Installer from the Keysight 89600 software download page (www.keysight.com\find\89600_VSA_sw_download).

If the Keysight X-Series Analyzer does not have an Internet connection, you can use a PC to download the 89600 VSA Installer to a USB drive, then install directly from the USB drive.

NOTE This procedure assumes that a USB Flash Drive is being used. Other USB storage devices such as a USB hard drive could also be used.

To install the 89600 VSA software in a Keysight X-Series Signal Analyzer using a USB Flash drive:

1. On an Internet-connected PC, download the 89600 VSA Software at www.keysight.com\find\89600_VSA_sw_download.
2. Insert a USB Flash Drive into a USB port on the PC.
3. Use Windows Explorer to copy the Keysight 89600 VSA Installer onto the USB Flash Drive.
4. Connect a USB keyboard and mouse to the analyzer.

   NOTE To install the Keysight 89600 software on the analyzer, you need to have administrator privileges. Press **Ctrl - Alt - Delete**, then click **Log Off...**. Log back in as the Administrator. Depending on your instrument's installed Windows OS image version, the default administrator password is either `agilent4u` or `Keysight4u!`.

5. Insert the USB Flash Drive into an available USB port on the analyzer.
6. Open Windows Explorer and navigate to the USB drive.
7. Double-click the 89600 VSA Installer to launch it.
8. When the Keysight Vector Signal Analysis (89600 VSA) Installer window opens, read the Readme information.
9. After you read the Readme file, close it, then click **Install Keysight 89600 VSA**. Continue through the InstallShield Wizard until you reach the **Select Products and Features** window.
10. Select the features you want to install, then continue through the InstallShield Wizard to complete the installation.

11. When the installation is complete, exit the installer.
12. Start the X-Series analyzer application: Double-click the **LaunchXSA** icon on the Windows desktop.
13. After the X-Series analyzer finishes booting up, start the Keysight 89600 software:
    - Press the Mode Hardkey, then there is Launch VSA button on the left bottom of the window. You can choose from the menu below the "Launch VSA" button to specify the launched 89600 VSA version which has already been installed inside this signal analyzer.

Next, the software and options need to be licensed. To learn how to obtain a license, see Installing Licenses (page 31).

Installing 89600 Software in a Keysight Infiniium Scope

Many Infiniium oscilloscopes provide an open Microsoft Windows operating system that enables you to install other applications. You can install and operate the 89600 Vector Signal Analysis software on these scopes.

If you have an Internet connection to the Keysight Infiniium scope, you can download the Keysight 89600 VSA Installer from the Keysight 89600 software download page (www.keysight.com\find\89600_VSA_sw_download).

If the Keysight Infiniium scope does not have an Internet connection, you can use a PC to download the 89600 VSA Installer to a USB drive, then install directly from the USB drive.

NOTE This procedure assumes that a USB Flash Drive is being used. Other USB storage devices such as a USB hard drive could also be used.

To install the 89600 VSA software in a Windows scope:

1. Increase the scope's virtual memory to at least 1 GB as follows:
   a. Minimize the scope application.
   b. Navigate to: **Control Panel > Administrative Tools** (double-click) **> Computer Management** (double-click) > **Computer Management (Local)** (right-click) **> Properties > Advanced** (tab)> **Performance Settings** (button) **> Virtual Memory - Change** (button) to display the Virtual Memory dialog screen.
   c. Set Initial Size (MB) and Maximum Size (MB) to 1000 MB (or more if you have sufficient Space Available), then click **Set > OK > OK** (reboot message) **> OK > OK**.
   d. When the *System Settings Change* dialog appears, click **Yes** to restart the computer.
2. On an Internet-connected PC, download the 89600 VSA Software at www.keysight.com\find\89600_VSA_sw_download.
3. Insert a USB Flash Drive into a USB port on the PC.
4. Use Windows Explorer to copy the Keysight 89600 VSA Installer onto the USB Flash Drive.
5. Connect a USB keyboard and mouse to the scope.

   NOTE To install the Keysight 89600 software on the scope, you need to have administrator privileges. Press **Ctrl - Alt - Delete**, then click **Log Off...**and log back in as the Administrator.

6. Insert the USB Flash Drive into an available USB port on the scope.
7. Open Windows Explorer and navigate to the USB drive.
8. Double-click the 89600 VSA Installer to launch it.
9. When the Keysight Vector Signal Analysis (89600 VSA) Installer window opens, read the Readme information.

10. After you read the Readme file, close it, then click **Install Keysight 89600 VSA**. Continue through the InstallShield Wizard until you reach the **Select Products and Features** window.
11. Select the features you want to install, then continue through the InstallShield Wizard to complete the installation.
12. When the installation is complete, exit the installer.
13. Start the 89600 VSA. Click **Start > Keysight 89600 VSA *<ReleaseVersion>* > Keysight 89600 VSA *<ReleaseVersion>***.

Next the software and options need to be licensed. To learn how to obtain a license, see Installing Licenses (page 31).

Installing 89600 Software in a Keysight Logic Analyzer

The first step is to decide where you want to install the 89600 VSA software. For information on logic analyzer configurations, see Configurations (page 70).

If the logic analyzer has an Internet connection, you can download the Keysight 89600 VSA Installer from the Keysight 89600 software download page (www.keysight.com\find\89600_VSA_sw_download).

If the Keysight logic analyzer does not have an Internet connection, you can use a PC to download the 89600 VSA Installer to a USB drive, then install directly from the USB drive.

NOTE This procedure assumes that a USB Flash Drive is being used. Other USB storage devices such as a USB hard drive could also be used.

To install the 89600 VSA software in a logic analyzer:

1. On an Internet-connected PC, download the 89600 VSA Software at www.keysight.com\find\89600_VSA_sw_download.
2. Insert a USB Flash Drive into a USB port on the PC.
3. Use Windows Explorer to copy the Keysight 89600 VSA Installer onto the USB Flash Drive.
4. Connect a USB keyboard and mouse to the analyzer.

   NOTE To install the Keysight 89600 software on the logic analyzer, you need to log on with administrator privileges.

5. Insert the USB Flash Drive into an available USB port on the analyzer.
6. Open Windows Explorer and navigate to the USB drive.
7. Double-click the 89600 VSA Installer to launch it.
8. When the Keysight Vector Signal Analysis (89600 VSA) Installer window opens, read the Readme information.
9. After you read the Readme file, close it then click **Install 89600 VSA**. Continue through the InstallShield Wizard until you reach the *Select Products and Features* window.
10. Select the features you want to install, then continue through the InstallShield Wizard to complete the installation.
11. When the installation is complete, exit the installer.

    NOTE When installing the 89600 VSA in a logic analyzer mainframe, **Hardware support** is disabled. This prevents using disk space for unnecessary components that are not needed when the 89600 VSA software is installed in a logic analyzer.

12. Start the 89600 VSA. Click **Start > Keysight 89600 VSA *<ReleaseVersion>* > Keysight 89600 VSA *<ReleaseVersion>***.

Next, the software and its options must be licensed. To learn how to obtain a license, see Installing Licenses (page 31).

Installing Licenses

License Overview

The 89600 VSA software must be licensed to operate in a useful manner. The 89600 software has four types of licenses: Demo, Trial, Transportable, and Floating. The Demo license is installed with the 89600 software; installing all other licenses requires three general steps:

1. Run the Keysight Software Manager Utility version 7.7.0 or later to obtain information about the PC or instrument on which the 89600 is installed.
2. Contact Keysight Technologies, Inc., to receive a license file.
3. Install the license file using the Keysight Software Manager Utility.

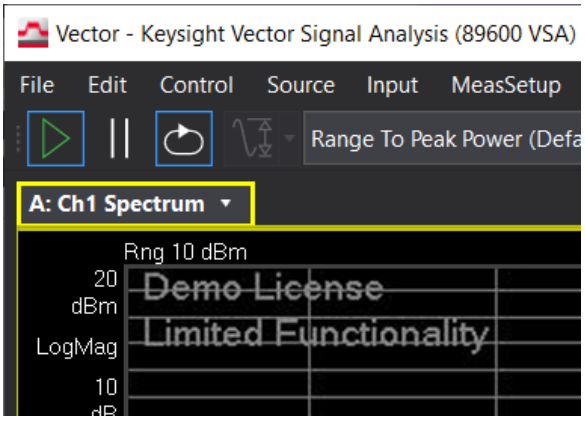
Transferring an Installed License

There are additional steps required to transfer an installed license from one PC or instrument to another.

- **Demo**:
  The Demo license is automatically installed when the VSA software is installed. Using the Demo license, the VSA accepts signals only from the simulated input or from the example time capture signals (recordings) provided with the product. Example signal files are located in the following directory:

  C:\Program Files\Keysight\89600 Software *<ReleaseVersion>*\89600 VSA Software\Help\Signals.

  When you are using a Demo license, the trace shows a "Demo License, Limited Functionality" message:



  NOTE If you have an Option 20x license installed and only the Demo license is being used, see Troubleshooting Licensing Problems (page 85).

- **Trial**:
  The Trial license enables all 89600 VSA software options for a temporary 30 day trial period. This license provides time for you to purchase, redeem, and install a permanent license (either a Transportable or Floating license) while continuing to use a fully licensed VSA. It also allows users who have not purchased the software to use "try out" the VSA for the temporary trial period. To install a Trial license, perform the steps in Trial License (page 33).
- **Transportable**:
  The Transportable license must be installed on the same PC that runs the 89600 software. However, the license can be moved from one PC to another. To install a Transportable license, perform the steps in Transportable License (page 34).
- **Floating or Network**:
  Floating licenses provide the ability for multiple client PCs to use a common license that is stored on a network license server. This is in contrast to the

Transportable license that is a PC based license, one license per PC.
Also called a concurrent license, floating licenses are bound to the host ID of the license server, but are used by any Client PC running the 89600 software with network access to the server (as long as the number of concurrent client users does not exceed the number of granted licenses.)
See Floating License for more information.

Trial License

This section documents how to obtain and install a Trial license for your 89600 software. The Trial License provides a fully licensed 89600 VSA software for a temporary 30 day trial period. This gives you time to purchase, redeem, and install a permanent license, either a Transportable license or a Floating license, while continuing to use the 89600 VSA software.

When the Trial period expires, the 89600 Software license either reverts back to a Demo license or to any prior installed valid license; either a Transportable license or a Floating license.

NOTE You will only be granted one Trial license per license Host ID.

Obtaining a Trial License

To enable a Trial license, you must obtain your PC's Host ID, then go to Keysight's online License Manager and redeem the trial license.

1. Obtain the license Host ID (Model Number, Serial Number) from the PC that you installed the VSA software on.
   a. Launch the Keysight Software Manager Utility. Within the VSA software, click **Utilities > Licenses > Status > Keysight Software Manager Utility...**, or from the Windows desktop, click **Start > Keysight Software Manager Utility**.
   b. Copy the Keysight Host ID at the top of the **Add License** tab.

      NOTE For Measurement Hardware (instruments), the Keysight Host IDs consist of an Keysight instrument model number and serial number. On a desktop or laptop PC, the default model number is PCSERNO.

2. Go to the Keysight 89601B VSA website at www.keysight.com/find/89601B, select the *Software Trials & Licenses* tab, then follow the instructions to obtain a trial license.
   - You will need to provide contact information.
   - The requested Host ID is from the Keysight Software Manager Utility in step 1 above. If you are accessing the website from the same PC that the VSA software was installed on, you can simply copy and paste the Host ID into the website form.
   - You will only be granted one trial license per Host ID.
3. After you finish using the Keysight Software Licensing website, check your email for your license file, then go to Installing a Trial License.

Installing a Trial License

To install the license file:

1. Place the license file either on a network-connected drive or on a drive that is directly connected to the PC.
2. Start the Keysight Software Manager Utility by clicking **Utilities > Licenses > Status > Keysight Software Manager Utility...**.
3. In the Keysight Software Manager Utility, click **Add License > Install License File**.
4. Browse to the location where you saved the license file. Select the license file and click the **Open > Add Now**.
5. Restart the VSA software to activate the license.

See the *Add a License File* section of the Keysight Software Manager Utility Help for more information.

When the license file is successfully installed, the installed licenses that are available are listed in the Keysight Software Manager Utility. Make sure your licensed options and features are shown.

Transportable License

This section describes the steps to obtain and install a Transportable license. The Transportable license enables the 89600 software and options that you have purchased. The license must be installed on the same PC that runs the 89600 software. However, the license can be transferred from one PC to another PC. Transferring the license requires the Keysight Software Manager Utility to communicate with the Keysight Software Manager website. See the Keysight Software Manager Utility Help for more information on installing and transporting licenses.

To obtain and install a Transportable license:

1. Purchase an 89600 Software Transportable License.
2. Receive a Software License Entitlement Certificate.
   After purchasing a Transportable License, you will receive a Software License Entitlement Certificate.
3. Redeem the License.
   As described in Redeeming a Transportable License (page 35), the *Software License Entitlement Certificate* provides instructions to redeem your license.
4. Install the License file.
   As described in Installing a Transportable License (page 35), after providing the required information, the Keysight Software Manager website will email a License file (*.lic*) to you. Install the license file on the same PC that runs the 89600 software.
5. Activate the License.
   After installing the license, you need to restart the VSA software to activate the license.

NOTE The term PC refers to any computer or instrument (such as analyzers and oscilloscopes) running the 89600 software.

Redeeming a Transportable License

After purchasing a Transportable License, you will receive a Software License Entitlement Certificate. You will need information from the certificate to redeem and activate a license. To redeem a Transportable license, follow these steps:

1. Collect the Software License Entitlement Certificates for all 89600 VSA software options that you have purchased. The Software License Entitlement Certificates are either emailed to you or are included with the *89600 VSA Software Installation Materials* envelope (printed on gray parchment).
2. Obtain the license Host ID (Model Number, Serial Number) from the PC that you installed the VSA software on.
   a. Launch the Keysight Software Manager Utility. Within the VSA software, click **Utilities > Licenses > Status > Keysight Software Manager Utility...**, or from the Windows desktop, click **Start > Keysight Software Manager Utility**.
   b. Copy the Keysight Host ID at the top of the **Add License** tab.

      NOTE For Measurement Hardware (instruments), the Keysight Host IDs consist of an Keysight instrument model number and serial number. On a desktop or laptop PC, the default model number is PCSERNO.

3. Redeem your licenses and obtain the license files.

   Follow the instructions included on the *Software License Entitlement Certificate* to redeem your licenses and obtain the license files. Go to the *Keysight Software Manager* website:

   http://www.keysight.com/find/softwaremanager

   - First time access will require you to register.

     IMPORTANT Remember your user password. The password is required for future access to manage your licenses.

   - You will need the *Keysight Order Number* and *Keysight Certificate Number* located on the top of your *Software License Entitlement Certificate*.
4. Install License File(s): Check your email for the license file(s) and then install the license file(s) on the PC – go to Installing a Transportable License (page 35).

Installing a Transportable License

Installing the license file is necessary to license the 89600 VSA software. After completing Redeeming a Transportable License (page 35), you will receive a Keysight email containing your license file for the redeemed Entitlement Certificates. Follow these steps to install the license files on the PC:

To install the license file:

1. Copy the email attachment with the *.lic* file extension to a folder on your PC, connected hard drive, or USB storage device.
2. Start the Keysight Software Manager Utility by clicking **Utilities > Licenses > Status > Keysight Software Manager Utility...**.
3. In the Keysight Software Manager Utility, click **Add License > Install License File**.
4. Browse to the location where you saved the license file. Select the license file and click the **Open > Add Now**.

   NOTE The install operation can take up to 40 seconds to complete.

   When the license file is successfully installed, the installed licenses that are available are listed in the Keysight Software Manager Utility. Make sure your licensed options and features are shown.
5. Restart the VSA software to activate the license.
6. After installing the license file, verify that the options are licensed for use by the Keysight VSA software. Start the Keysight 89600 software, then open **Utilities > Licenses > Features** (or **Utilities > Licenses > Legacy Options** for legacy licenses) and verify the options are correctly licensed (*Yes* in the On column)

"On" Column	License Status
Yes	Option is licensed for use.
--	Dash indicates that the license option has not been selected for use by the VSA. To include an option, open the "Select License Options" system utility and select (check) the options that you want to include in the VSA measurement capability (click **Start > Keysight 89600 VSA *<ReleaseVersion>* > Select License Options**. The VSA must be closed and restarted to incorporate the changes.
No	Option is not licensed for use.

See the *Add a License File* section of the Keysight Software Manager Utility Help for more information.

Transporting a Transportable License

The Transportable license is a license that can be moved from one PC to different PC. This allows you to use one license to run the 89600 Software on different PC's. However, only one PC at a time can use a single license.

There are four steps required to transport a license (Deactivate, Synchronize, Assign and Install). See the *Transport Licenses* section of the Keysight Software Manager Utility Help for detailed instructions.

Floating License

Floating licenses are installed and managed using the Keysight Software Manager Utility. To install floating licenses, specify remote floating license servers or learn about borrowing licenses, see the Keysight Software Manager Utility documentation by running the utility and clicking **Help > Help Contents**.

Configuring IO Interfaces

Introduction

This chapter provides instructions for configuring your computer to communicate with hardware via IEEE-1394, LAN, USB/GPIB, USB, or GPIB interfaces.

If your measurement hardware is one of the following, skip this chapter and follow the instructions specific for your measurement hardware:

- Configuring Infiniium Windows Scopes (page 55)
- Configuring Logic Analyzers (page 69)

NOTE Do not configure more than one interface to point to a single instrument, either from a single computer or from multiple computers. For example, if your instrument is on a LAN, do not point to it from two computers simultaneously.

Perform the procedures for each interface type as directed below:

- **LAN**: For LAN interface, start on Configuring the LAN interface (page 40).
- **USB/GPIB**: For USB/GPIB interface, start on Configuring the USB/GPIB Interface (page 48).
- **GPIB**: For GPIB interface, start on Configuring the GPIB Interface (page 50).
- **USB**: For USB interface, start on Configuring the USB Interface (page 52).
- **Remote Interfaces (IO Libraries 2017 and later Connection Expert only)**: See Remote Interfaces (Connection Expert version 2017 or later only) (page 54).

Configuring the LAN interface

Use this procedure to configure the LAN interface for all instruments except the following:

- **Keysight Infiniium oscilloscope**: If your measurement hardware is a Keysight Infiniium oscilloscope, skip this chapter and follow the instructions in the Configuring Infiniium Windows Scopes (page 55).
- **Keysight Logic Analyzer**: If your measurement hardware is a Keysight Logic Analyzer, skip this chapter and follow the instructions in Connecting to a Network (page 72) and 89600 VSA Instrument Manager (page 73).

For more information about LAN interfaces, see the *Connectivity Guide* section in the Keysight IO Libraries Suite Help. You can find this when you click on the**Keysight IO Libraries Suite** icon in the task bar and then select **Documentation > IO Libraries Suite Help**.

You must ensure that the IP addresses for your computer and measurement hardware are compatible, then configure the LAN interface. The IP address consists of 4 groups of numbers separated by periods (for example, 192.168.0.10).

NOTE To configure the IP addresses on the PC and instrument, you must be logged in as Administrator.

The instrument can be accessed over your Local Area Network or by directly connecting it to your PC using a LAN cable. The preferred connection configuration is to place the instrument on your Local Area Network. Use the direct connection configuration if you do not have a Local Area Network or if you need to operate in isolation.

To configure your LAN interface:

1. Set the IP address on the instrument, using the appropriate set of instructions:
   - Instrument IP address when your computer is connected to a Local Area Network (see: Instrument IP Address for a Local Area Network Configuration (page 41)).

     or:
   - Instrument IP address for an instrument that is directly connected to the computer (see: Configuring IO Interfaces (page 39)).
2. Run Connection Expert (see: Configuring IO Interfaces (page 39)). You can also use the VSA software's integrated Instrument Manager (see: 89600 VSA Instrument Manager (page 47)) to configure LAN interface connections.

Instrument IP Address for a Local Area Network Configuration

This section provides information on setting the instrument IP address when your computer is on a Local Area Network.

To set the instrument IP address for a LAN configuration:

1. If your computer is connected to a Local Area Network, have your network administrator assign an IP address for your instrument hardware that will work with your computer. (The network administrator can also tell you if you need to set Subnet Masks.)
   If your Local Area Network is DNS/DHCP based, you do not need to set an IP address since it will be automatically assigned. If this is the case, skip to step 2.
   a. Set the IP address on the measurement hardware.
   b. Click in the Subnet Mask box.
      Accept the default numbers that appear for the subnet mask.
      Click **OK** and close all dialog boxes.
   c. If you are prompted to reboot your computer, do so now.
2. Be sure that both the instrument and your computer are connected to the LAN.
3. Cycle power on the measurement hardware.
4. Continue with Run Connection Expert (version 2017 or later) (page 43) or Run Connection Expert (previous versions) (page 46). You can also use the VSA software's integrated Instrument Manager (see: 89600 VSA Instrument Manager (page 47)) to configure LAN interface connections.

Instrument IP Address for a Direct Cable Connection

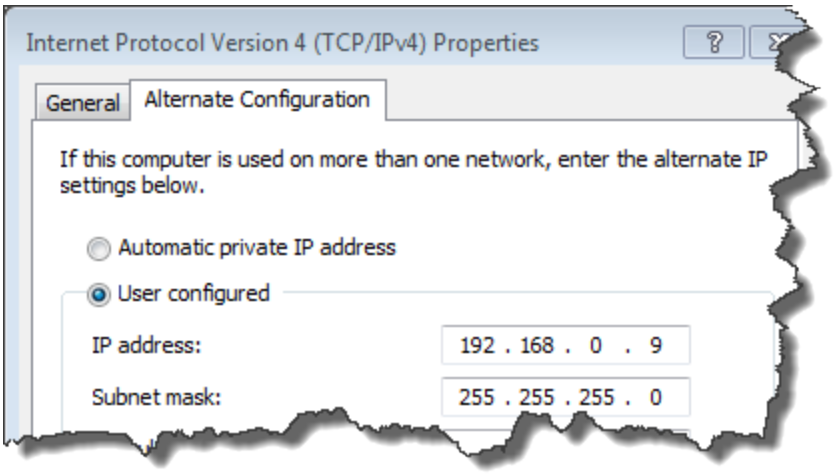
This section provides information on setting the instrument IP address when your computer is connected to the instrument using a direct cable connection.

To set the IP address for a direct cable connection

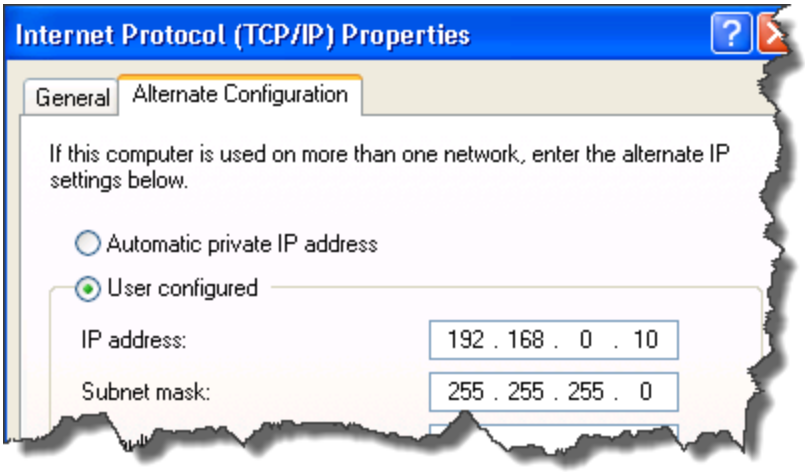
NOTE For X-Series Analyzers with software version A.11.xx or earlier, you cannot directly connect the analyzer and PC. You can either put the analyzer and PC on a DNS/DHCP-based LAN or update the software on the analyzer to A.12.00 or newer.

1. On the PC running the Keysight 89600 VSA software, set the Alternate Configuration for the appropriate LAN port to a user configured IP address and mask (for example, 192.168.0.9/255.255.255.0):
   a. From the Control Panel, click **View network status and tasks**, click the connection that needs an alternate IP address configuration (e.g., Local Area Connection), then select **Properties**.
   b. In the **Properties** dialog box, on the **Networking** tab, scroll down and select **Internet Protocol Version 4 (TCP/IP v4)** then click the **Properties** button.
   c. Select the **Alternate Configuration** tab, then select **User configured**, enter a fixed IP address and Subnet mask (for example,

192.168.0.9/255.255.255.0). Click **OK** then click **Close**.



2. Set the instrument's Alternate Configuration for the LAN port to a user configured IP address and subnet mask (for example, 192.168.0.10/255.255.255.0):
   a. From the Control Panel, click **View network status and tasks**, click the connection that needs an alternate IP address configuration (e.g., Local Area Connection), then select **Properties**.
   b. In the **Properties** dialog box, on the **Networking** tab, scroll down and select **Internet Protocol Version 4 (TCP/IP v4)** then click the **Properties** button.
   c. Select the **Alternate Configuration** tab, then select **User configured**, set the IP address on the instrument so that the first 3 sections of the IP address are the same as the PC's IP address and the last section is different than the PC's. (For example, if the computer IP address is 192.168.0.9, set the hardware IP address to 192.168.0.10.) enter an IP address and Subnet mask (for example, 192.168.0.10/255.255.255.0). Click **OK** then click **Close**.



3. For X-Series analyzers, if the instrument is currently connected to a network with a DNS server, release the DNS entry by executing the following commands on the instrument (from a command prompt window):

   ipconfig /release *

   ipconfig /flushdns
4. Disconnect the instrument from the corporate LAN cable and connect a LAN cable between the instrument and the PC running the Keysight 89600 VSA software.
5. For X-Series analyzers, execute the following command:

   ipconfig /renew

   (this may take a while until it times out trying to talk to the DNS/DHCP servers)
6. For X-Series analyzers, enter the following command (from a command prompt window) on the PC running the Keysight 89600 VSA software:

   ipconfig /flushdns
7. Cycle power on the measurement hardware.
8. Continue with Run Connection Expert (version 2017 or later) (page 43) or Run Connection Expert (previous versions) (page 46). You can also use the VSA software's integrated Instrument Manager (see: 89600 VSA Instrument Manager (page 47)) to configure LAN interface connections.

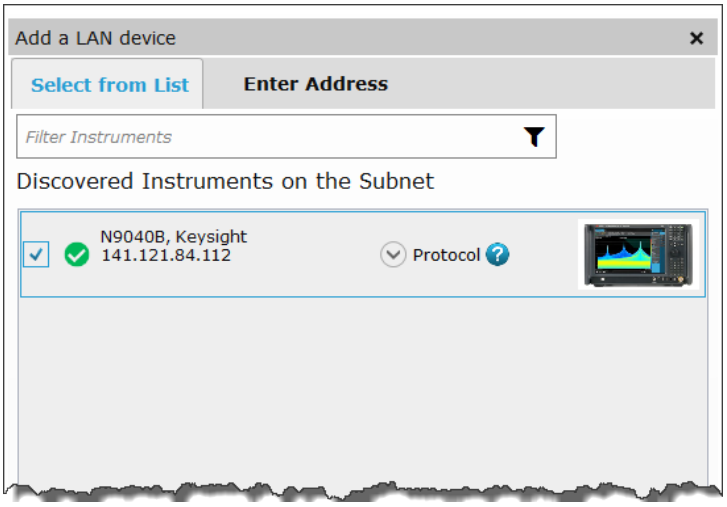
Run Connection Expert (version 2017 or later)

1. Run the Keysight IO Libraries Suite 2017 Connection Expert.

   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.

   a. Select **Add > LAN instrument**. Connection Expert will automatically detect LAN instruments on your local LAN subnet.

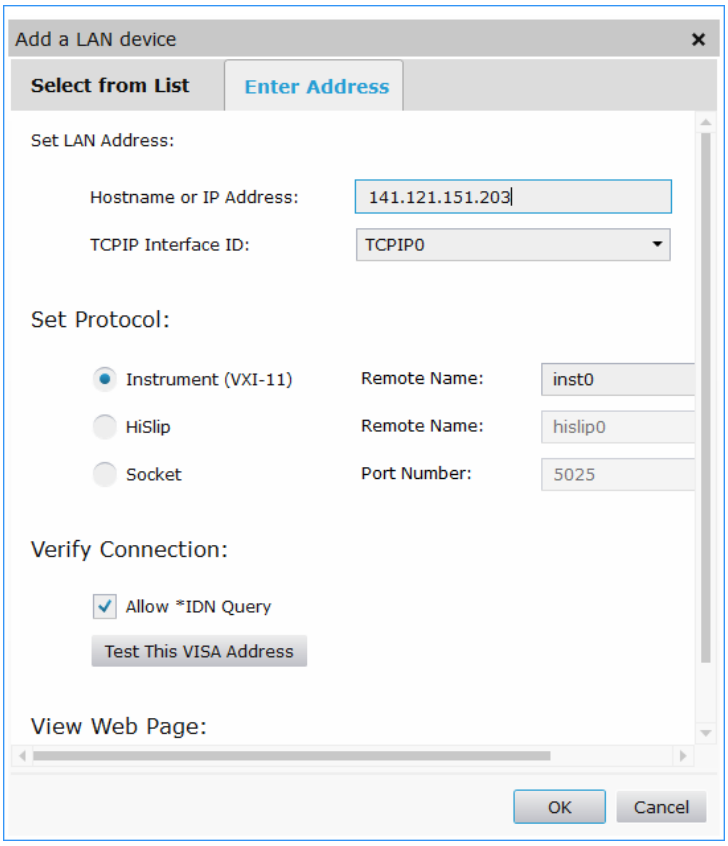
      If your desired instrument appears in the list of discovered instruments, add it to your My Instruments list by clicking the checkbox to the left of the discovered instrument.



   b. If an instrument is not automatically discovered, you must manually add the instrument:

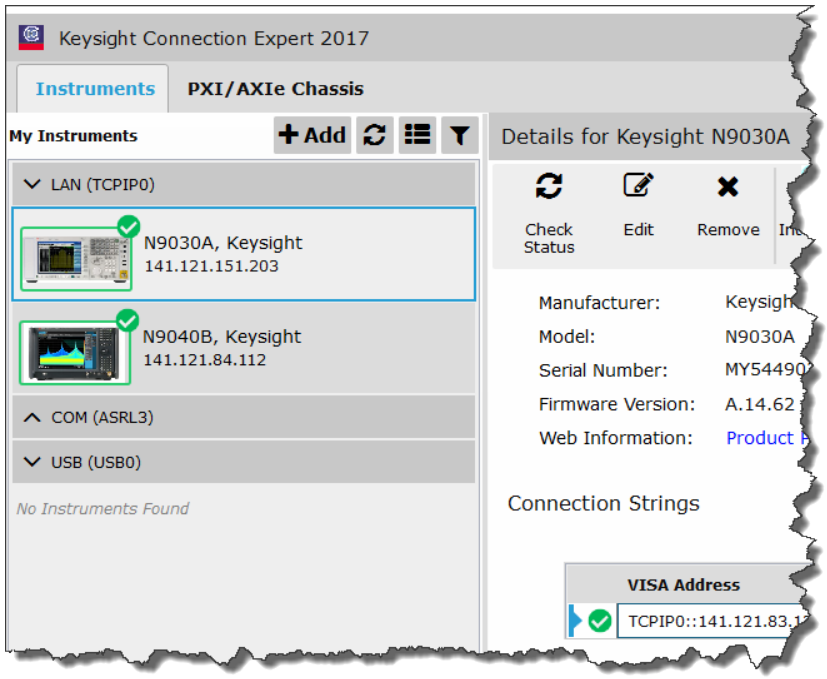
i. Click on **Enter Address** at the top of the **Add a LAN Device** dialog.

ii. Enter the instrument's hostname or IP address and protocol type. See the Keysight IO Libraries Help or your instrument's documentation for information on configuring your instrument's LAN address.



iii. Click **OK**. Connection Expert will automatically configure the interface and instruments and assign names and other default configuration settings.

iv. Verify that desired instrument was added to the **My Instruments** list.

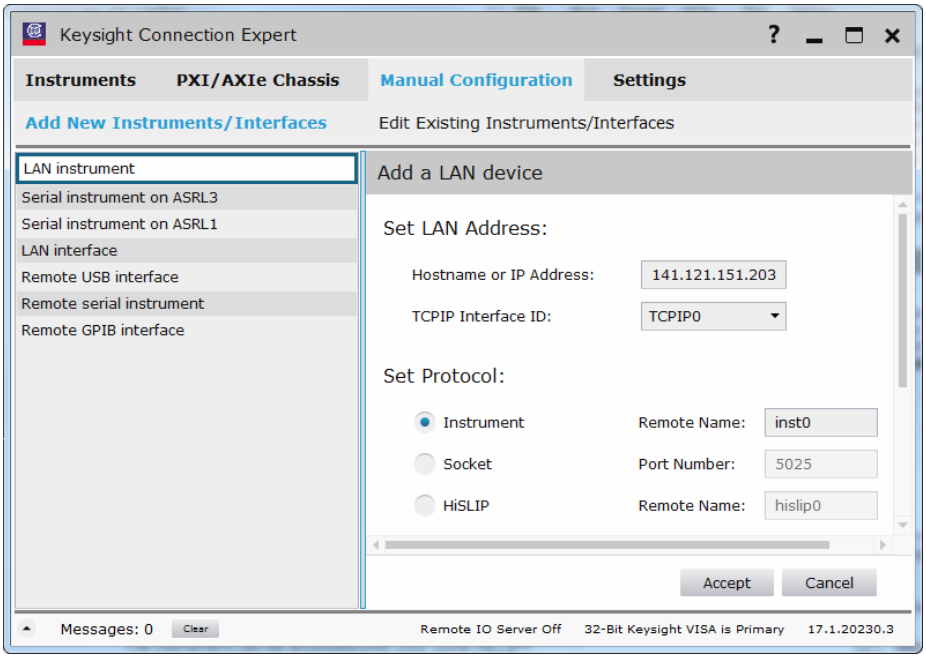


NOTE If you set up a LAN connection then switch off or disconnect the hardware, the 89600 software looks for the hardware when it is started. This slows down startup. To speed up the 89600 software startup, use Connection Expert to remove the LAN setup or choose to ignore the instrument.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

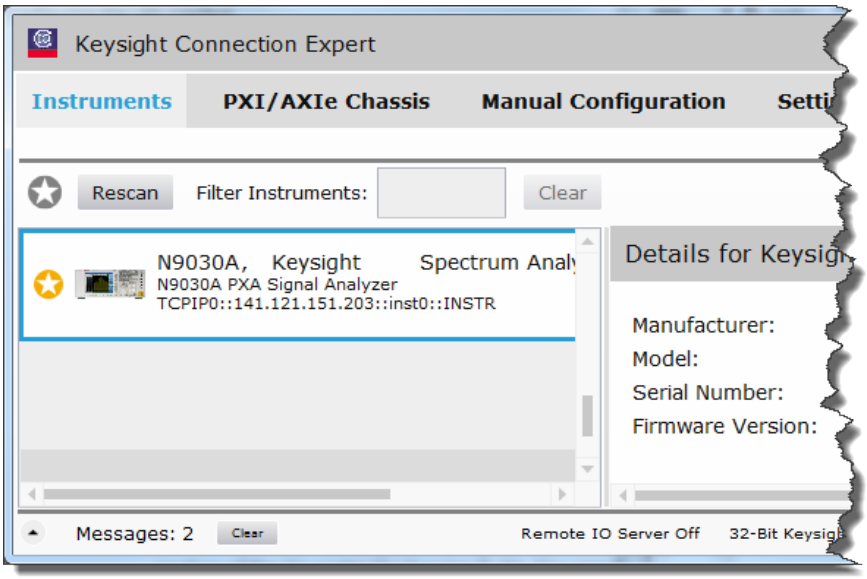
Run Connection Expert (previous versions)

1. Run the Keysight IO Libraries Suite Connection Expert tool.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically detect many (but not all) LAN instruments on your local LAN subnet. If an instrument is not automatically discovered, you must manually add the instrument:
   a. Click on the **Manual Configuration** tab (**Add New Instruments/Interfaces** and **Lan instrument** are selected by default).
   b. In the Add a LAN device panel, enter the instrument's hostname or IP address and protocol type. See the Keysight IO Libraries Help or your instrument's documentation for information on configuring your instrument's LAN address.



   c. Click **Accept**. Connection Expert will automatically configure the interface and instruments and assign names and other default configuration settings.
3. To verify that the computer recognized the instrument, click the **Instruments**

tab. Connection Expert will list all instruments and their addresses.



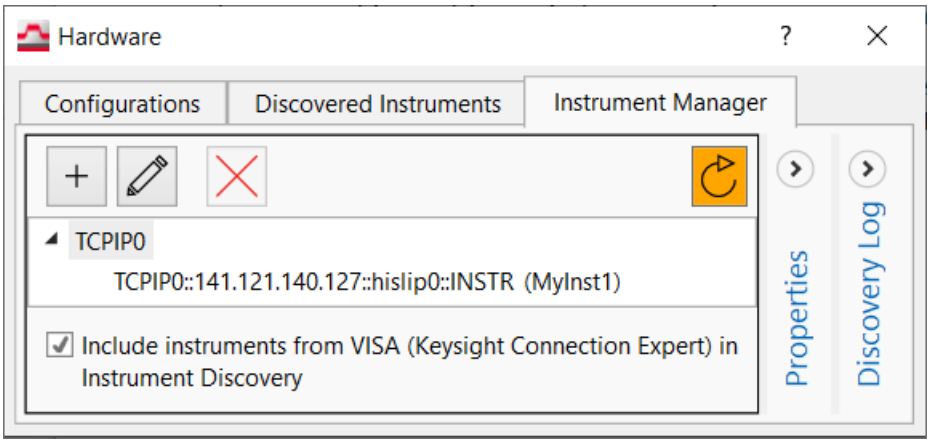
NOTE The VSA software will only look for instruments that are marked as favorite in Connection Expert, indicated by a gold star. If a LAN instrument is found via Auto-scan/Rescan, the instrument will not be marked as a favorite. If you add the instrument manually, the instrument will be marked as a favorite. You can change the favorite status by clicking on the star.

NOTE If you set up a LAN connection then switch off or disconnect the hardware, the 89600 software looks for the hardware when it is started. This slows down startup. To speed up the 89600 software startup, use Connection Expert to remove the LAN setup or choose to ignore the instrument.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

89600 VSA Instrument Manager

The integrated 89600 VSA Instrument Manager enables you quickly add, delete, and even ignore instrument connections without having to leave the VSA software. The Instrument Manager replaces the VSA IO Connections utility, but it also enables users to make LAN instrument connections that previously had to be made with the Keysight Connection Expert. To run the VSA Instrument Manager, launch the 89600 VSA software and click **Utilities > Hardware > Instrument Manager**.



You can use the Keysight 89600 I/O Connections utility to add an instrument as follows:

- Click the "Add new instrument" button to open the **Add/Edit New Instrument Address** dialog box.
- Select the appropriate protocol (**VXI-11** or **HiSLIP**) and enter the **Remote Name** if different from the default Remote Name.
- Enter the **Hostname or IP Address** of the instrument and an optional **Name**, and click **OK**.
- The new instrument connection should appear in the Instrument Manager list.
- On the **Instrument Manager** tab, click the "Rediscover Instruments" button so the VSA software discovers the new instrument.

For additional information on the VSA Instrument Manager, refer to the 89600 VSA online help. To get access to the online help, start the 89600 VSA application, then click **Help > Show Help** or click **Utilities > Hardware > Instrument Manager** and press **F1** on your keyboard.

Configuring the USB/GPIB Interface

Use this procedure is to configure the USB/GPIB interface for all measurement hardware except the Keysight Infiniium oscilloscope. If your measurement hardware is a Keysight Infiniium oscilloscope, skip this chapter and follow the instructions in the Configuring Infiniium Windows Scopes (page 55).

For details on setting up the 82357 USB/GPIB Interface, see the *82357 USB/GPIB User's Guide*.

To configure the USB/GPIB interface:

1. Plug the 82357 USB cable into a USB port on your PC. Do not connect to your GPIB instrument at this time.
2. Observe the 3 LEDs on the E82357. Initially, only the red FAIL LED should be on. After the Found New Hardware Wizard runs, all 3 LEDs should be ON. If any LED is off after 20 seconds, stop this procedure and refer to the *82357 USB/GPIB User's Guide* for information.

3. If the **Keysight 82357 USB/GPIB Interface Detected** dialog box appears, click **OK** or **Accept**. (If you want to change any of the settings, refer to the *82357 USB/GPIB User's Guide* for instructions.)
4. Connect one or more instruments to the GPIB connector on the 82357.
5. Continue with Run Connection Expert (version 2017 or later) (page 49) or Run Connection Expert (previous versions) (page 49).

Run Connection Expert (version 2017 or later)

1. Run the Keysight IO Libraries Suite 2017 Connection Expert.

   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert will detect your PC's USB/GPIB interface and auto-discover any instruments that are connected and turned on.

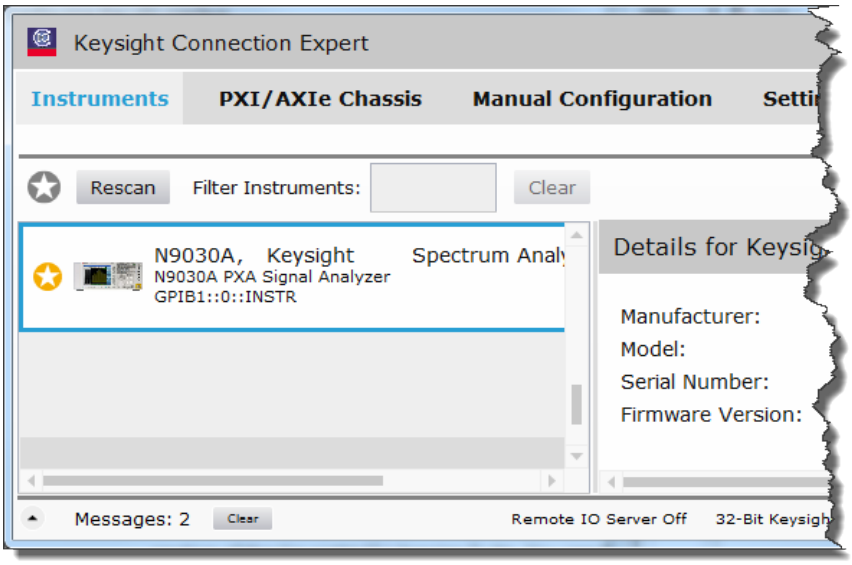
NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

Run Connection Expert (previous versions)

1. Run the Keysight IO Libraries Suite Connection Expert tool.

   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically discover all connected GPIB instruments. If an instrument is not automatically discovered, you may manually add the instrument by clicking **Manual Configuration > GPIB instrument** and entering the GPIB ID and address information.
3. To verify that the computer recognized the instrument, click the **Instruments**

tab. Connection Expert will list all instruments and their addresses.



NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

Configuring the GPIB Interface

Use this procedure to configure the GPIB interface for all measurement hardware except the Keysight Infiniium oscilloscope. If your measurement hardware is a Keysight Infiniium oscilloscope, skip this chapter and follow the instructions in Configuring Infiniium Windows Scopes (page 55).

NOTE This chapter guides you through the specific setup required to get your computer and instrument configured properly. For more detailed information on IO configuration, refer to the documentation for the IO Libraries Suite (click the **Keysight IO Libraries Suite** icon in the task bar and then select **Documentation > IO Libraries Help**).

For more information about GPIB interfaces, see the *Connectivity Guide* section in the Keysight IO Libraries Suite Help. You can find this when you click on the**Keysight IO Libraries Suite** icon in the task bar and then select **Documentation > IO Libraries Help**.

To configure the GPIB interface:

1. If you are configuring a GPIB connection for measurement hardware that is currently configured as a LAN connection on this computer, you must first

remove the LAN configuration. After you have removed the LAN configuration, cycle the power on the hardware before continuing with the GPIB configuration.

2. Connect your GPIB instruments to the computer's GPIB interface. Power on the PC and the instruments.
3. Continue with Run Connection Expert (version 2017 or later) (page 51) or Run Connection Expert (previous versions) (page 51).

Run Connection Expert (version 2017 or later)

1. Run the Keysight IO Libraries Suite 2017 Connection Expert.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert will detect your PC's GPIB interface and auto-discover any instruments that are connected and turned on.

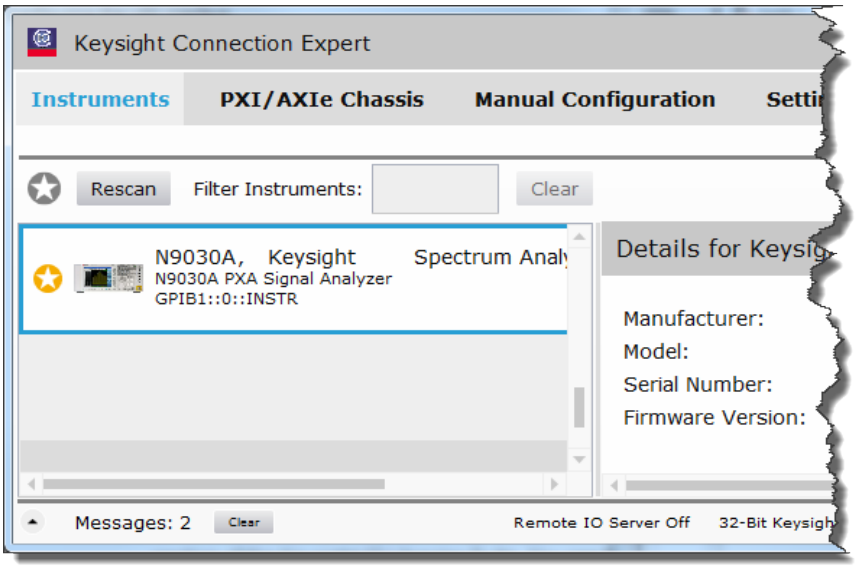
NOTE

When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

Run Connection Expert (previous versions)

1. Run the Keysight IO Libraries Suite Connection Expert tool.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically discover all connected GPIB instruments. If an instrument is not automatically discovered, you may manually add the instrument by clicking **Manual Configuration > GPIB instrument** and entering the GPIB ID and address information.
3. To verify that the computer recognized the instrument, click the **Instruments**

tab. Connection Expert will list all instruments and their addresses.



NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

Configuring the USB Interface

Use this procedure to configure USB interfaces except the Keysight 82357 USB/GPIB Interface. If you are using the Keysight 82357 USB/GPIB Interface, go to Configuring the USB/GPIB Interface (page 48).

The instructions in this section assume that the USB interface is installed in your PC and is working.

NOTE This chapter guides you through the specific setup required to get your computer and instrument configured properly. For more detailed information on IO configuration, refer to the documentation for the IO Libraries Suite (click the **Keysight IO Libraries Suite** icon in the task bar and then select **Documentation > IO Libraries Help**).

To configure the USB interface:

1. Connect your USB instruments to the USB interface in the computer. Power on the PC and the instruments.
2. Continue with Run Connection Expert (version 2017 or later) (page 51) or Run Connection Expert (previous versions) (page 51).

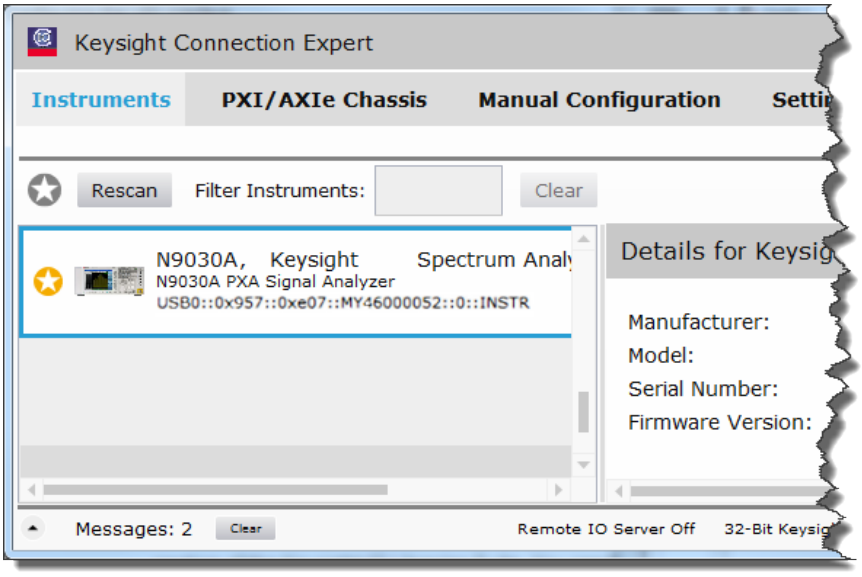
Run Connection Expert (version 2017 or later)

1. Run the Keysight IO Libraries Suite 2017 Connection Expert.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert will detect your PC's USB interface and auto-discover any instruments that are connected and turned on.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

Run Connection Expert (previous versions)

1. Run the Keysight IO Libraries Suite Connection Expert tool.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically discover all connected USB instruments. Because there are no configurable parameters on a USB interface, a USB instrument is not manually configurable. You can, however, configure a remote USB interface, which is a device on a LAN that provides connectivity to instruments via USB. To manually add a remote USB interface, click **Manual Configuration > Remote USB interface** and enter the USB information and remote device's hostname or IP address.
3. To verify that the computer recognized the instrument, click the **Instruments** tab. Connection Expert will list all instruments and their addresses.



NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

Remote Interfaces (Connection Expert version 2017 or later only)

If an instrument is connected to a remote host, you may manually add the remote GPIB, USB or serial interface for the Connection Expert to discover the instrument. See "Adding New Instruments and Interfaces" in the *Keysight IO Libraries Suite Help* (**Windows Task Bar > Keysight IO Libraries Suite > Documentation > IO Libraries Suite Help**) for details.

Configuring Infiniium Windows Scopes

Introduction

This chapter describes how to configure Keysight Infiniium scopes. The chapter includes networking information for configuring Keysight Infiniium scopes and a corresponding PC running the VSA software.

NOTE If you are installing the VSA software directly in the Keysight Infiniium scope, see: Installing 89600 Software in a Keysight Infiniium Scope (page 27).

Before configuring your Infiniium scope, be sure you have installed the VSA software on the PC you are using with the scope.

For any connection type, there are up to three possible steps:

1. Configure Infiniium Networking
   - Configuring Windows Infiniium Networking for Non-DHCP Network (page 57)
   - Configuring Windows Infiniium Networking for DHCP Network (page 57)
   - Configuring Windows Infiniium Networking with a Direct Cable Connection (page 58)
2. Configure PC Networking
   - Configuring PC Networking for a Direct Cable Connection (page 59)
3. Configure Keysight IO Config Software for GPIB and LAN
   - Configuring PC Keysight IO Config for GPIB Connection (page 59)
   - Configuring PC's Keysight IO Config for LAN Connection (page 60)

   See Summary of Connection Types (page 56) for additional information in determining the sections you need to complete based on your connection type. Check with your network administrator to determine your network type.

Summary of Connection Types

Connection Type	Infiniium Networking	PC Networking	PC Keysight IO Config Software
GPIB to GPIB	N/A	N/A	Configuring PC Keysight IO Config for GPIB Connection (page 59)
USB to GPIB	N/A	N/A	Configuring the USB/GPIB Interface (page 66)
LAN using a direct cable connection	Configuring Windows Infiniium Networking with a Direct Cable Connection (page 58)	Configuring PC Networking for a Direct Cable Connection (page 59)	Configuring PC's Keysight IO Config for LAN Connection (page 60)
LAN with DHCP	Configuring Windows Infiniium Networking for DHCP Network (page 57)	N/A	Configuring PC's Keysight IO Config for LAN Connection (page 60)
LAN without DHCP	Configuring Windows Infiniium Networking for Non-DHCP Network (page 57)	N/A	Configuring PC's Keysight IO Config for LAN Connection (page 60)

Configuring Windows Infiniium Networking for Non-DHCP Network

Complete the following procedure to configure your Windows-based Infiniium scope for networking via a non-DHCP (Dynamic Host Configuration Protocol) network.

To configure Windows Infiniium networking for a non-DHCP network:

1. You will need an IP Address, Gateway Address and a Subnet Mask from your Network Administrator.
2. On your Infiniium, quit the scope application if it is running.
3. Open the **Control Panel**. Open **Network Connections**. (If you are in Category view, click Network and Internet Connections and then select Network Connections.)
4. Click **Local Area Connection** and then **Properties** to display the Local Area Connection Properties dialog box.
5. Select **Internet Protocol (TCP/IP)** on the connection list and click **Properties** to display the Internet Protocol (TCP/IP) Properties dialog box.
6. Select **Use the following IP address** and enter the IP Address, Subnet mask, and Default gateway address provided by your Network Administrator.
7. Click **OK** in the Internet Protocol (TCP/IP) Properties dialog box.
8. Click **OK** in the Local Area Connection Properties dialog box. If Windows prompts you to reboot your Infiniium, click **Yes**. If not, close all open dialog boxes.
9. After the Infiniium reboots, the instrument is ready for LAN control over the LAN interface. Go to Configuring PC's Keysight IO Config for LAN Connection (page 60).

Configuring Windows Infiniium Networking for DHCP Network

If your network provider uses DHCP Windows will automatically retrieve a dynamic IP Address from the DHCP server. No configuration for the Infiniium is necessary. Continue to Configuring PC's Keysight IO Config for LAN Connection (page 60).

Configuring Windows Infiniium Networking with a Direct Cable Connection

Complete the following procedure to configure Windows Infiniium Networking with a direct cable connection.

NOTE If you are using an older PC that does not have Auto-MDIX capability, you will need to use a crossover cable.

To configure Windows Infiniium networking with a direct cable connection:

1. You need to create IP Addresses for both the Infiniium and your PC. Both addresses must have the first 3 sections the same and the last one different. For example, the PC IP address can be 192.168.0.9 and the Infiniium IP address 192.168.0.10.
2. On your Infiniium, quit the scope application if it is running.
3. Open the **Control Panel**. Open **Network Connections.** (If you are in Category view, click **Network and Internet Connections** and then select **Network Connection**.)
4. Right-click **Local Area Connection** and then **Properties** to display the Local Area Connection Properties dialog box.
5. Select **Internet Protocol (TCP/IP)** from the connection list and click **Properties** to display the Internet Protocol (TCP/IP) Properties dialog screen.
6. Select the Alternate Configuration tab, then select **User configured** and enter the IP address for the Infiniium you created in step 1 (192.168.0.10 in this example), and type a subnet mask of 255.255.255.0.
7. Click **OK** in the Internet Protocol (TCP/IP) Properties dialog box.
8. Click **OK** in the Local Area Connection Properties dialog box. If Windows prompts you to reboot your Infiniium, click **Yes**. If not, close all open dialog boxes.
9. After the Infiniium reboots, the instrument is ready for LAN control over the LAN interface. Continue to Configuring PC Networking for a Direct Cable Connection (page 59).

Configuring PC Networking for a Direct Cable Connection

Complete the following procedure to configure a PC for a direct cable connection.

To configure PC networking for a direct cable connection:

1. On your PC, open the **Control Panel**.
2. Click **View network status and tasks > Connections: >** ***(your network connection)*** **> Properties**.

   This displays the Local Area Connection Properties dialog box.
3. Select **Internet Protocol Version 4** and click **Properties**.

   This displays the Internet Protocol (TCP/IP or Version 4) Properties dialog screen.
4. Select the *Alternate Configuration* tab, then select **User configured** and enter the IP Address for the PC you created in step 1 of Configuring Windows Infiniium Networking with a Direct Cable Connection (page 58) (this example uses 192.168.0.9.), and enter a subnet mask of 255.255.255.0.
5. Click **OK** in the Internet Protocol (TCP/IP or Version 4) Properties dialog box.
6. Click **OK** or **Close** in the Connection Properties dialog box. If Windows prompts you to reboot your PC, click **Yes**. If not, close any open dialog boxes.
7. After your PC reboots, the PC is ready for setting up the Keysight IO Config software. Go to Configuring PC's Keysight IO Config for LAN Connection (page 60).

Configuring PC Keysight IO Config for GPIB Connection

The VSA Software will automatically install the Keysight IO Libraries Suite on your PC if they are not already installed. These instructions assume that your computer has a GPIB card installed and operable.

To configure PC Keysight IO Config for a GPIB connection, go to Run Connection Expert (version 2017 or later) (page 59) or Run Connection Expert (previous versions) (page 60).

Run Connection Expert (version 2017 or later)

1. On the PC with the 89600 software, run the Keysight IO Libraries Suite 2017 Connection Expert.

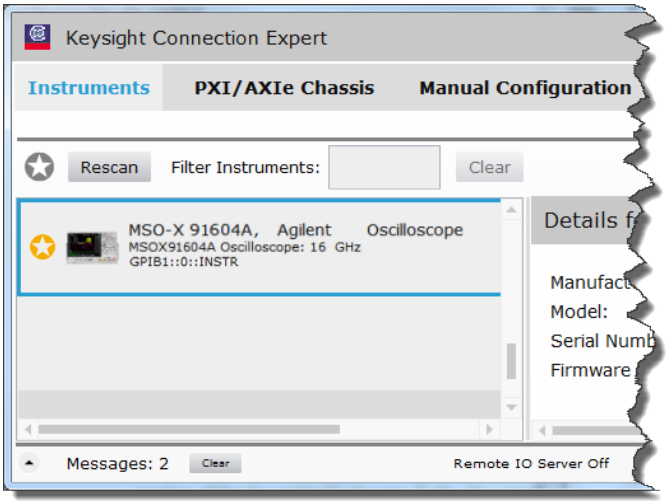
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert will detect your PC's GPIB interface and auto-discover any instruments that are connected and turned on.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by

NOTE selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

Run Connection Expert (previous versions)

1. On the PC with the 89600 software, click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert's auto-scan feature will automatically discover all connected GPIB instruments. If an instrument is not automatically discovered, you may manually add the instrument by clicking **Manual Configuration > GPIB instrument** and entering the GPIB ID and address information.
3. To verify that the computer recognized the instrument, click the **Instruments** tab. Connection Expert will list all instruments and their addresses.



NOTE Connection Expert will not find the Infiniium scope if the scope application is not running.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

Configuring PC's Keysight IO Config for LAN Connection

The VSA Software automatically installs the Keysight IO Libraries Suite on your PC if they are not already installed.

To configure PC Keysight IO Config for a LAN connection, go to Run Connection Expert (version 2017 or later) (page 61) or Run Connection Expert (previous

versions) (page 64). You can also use the VSA software's integrated Instrument Manager (see: 89600 VSA Instrument Manager (page 65)) to configure LAN interface connections.

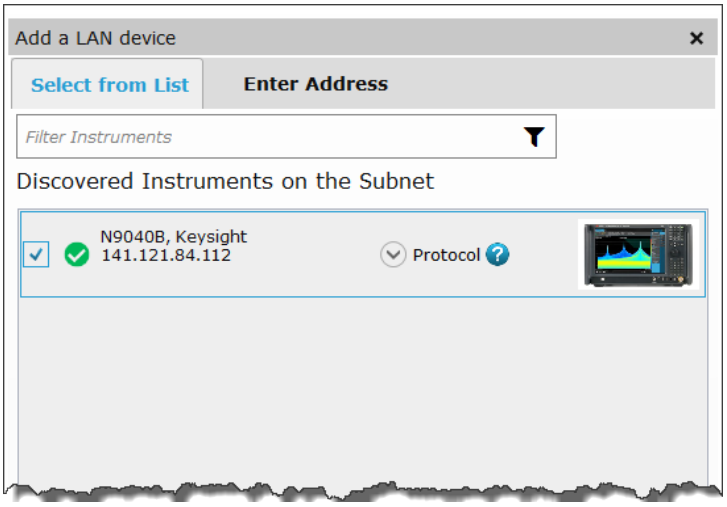
Run Connection Expert (version 2017 or later)

1. On the PC with the 89600 software, run the Keysight IO Libraries Suite 2017 Connection Expert.

   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.

   a. Select **Add > LAN instrument**. Connection Expert will automatically detect LAN instruments on your local LAN subnet.

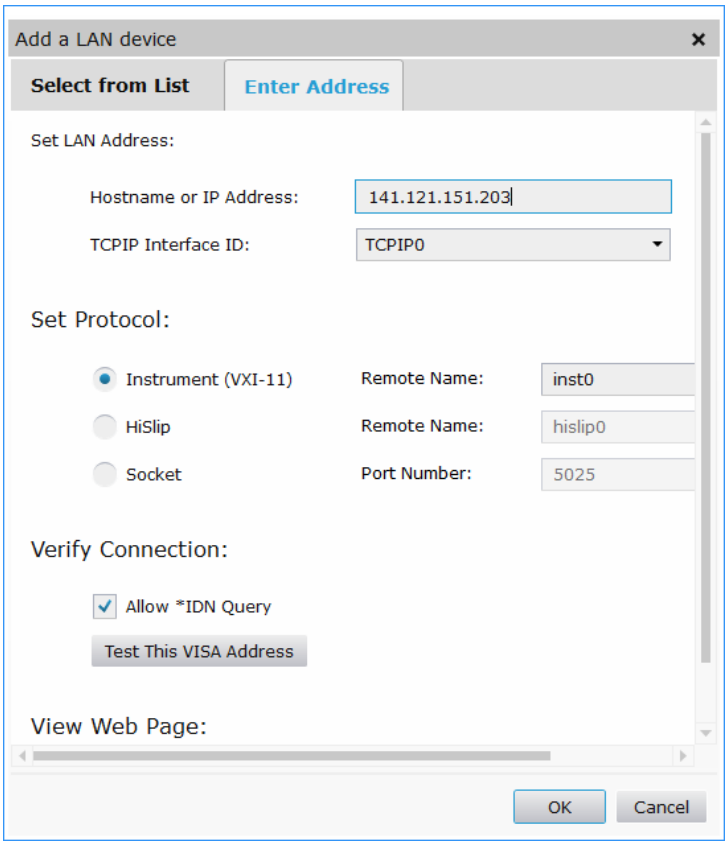
      If your desired instrument appears in the list of discovered instruments, add it to your My Instruments list by clicking the checkbox to the left of the discovered instrument.



   b. If an instrument is not automatically discovered, you must manually add the instrument:

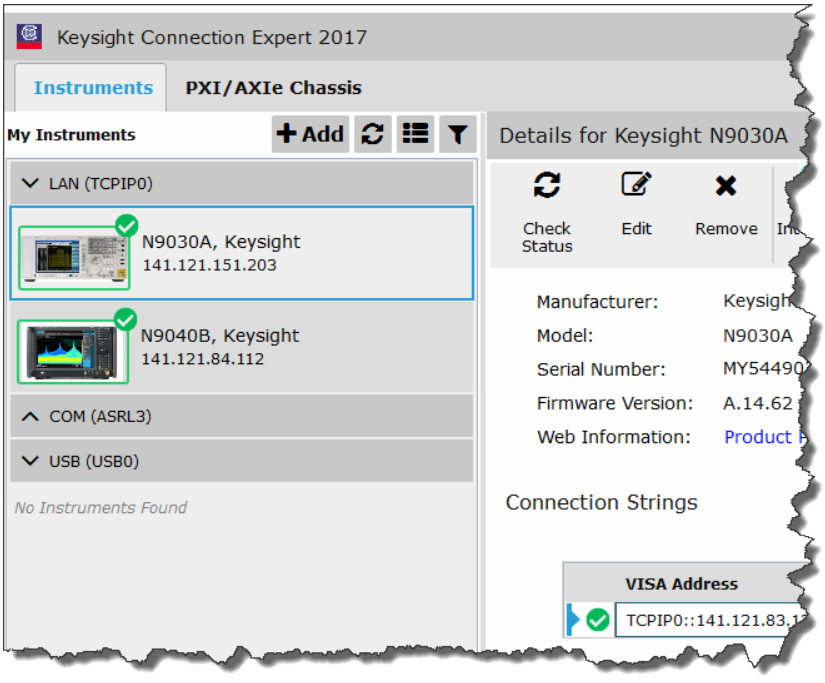
      i. Click on **Enter Address** at the top of the **Add a LAN Device** dialog.

      ii. Enter the instrument's hostname or IP address and protocol type. See the Keysight IO Libraries Help or your instrument's documentation for information on configuring your instrument's LAN address.



iii. Click **OK**. Connection Expert will automatically configure the interface and instruments and assign names and other default configuration settings.

iv. Verify that desired instrument was added to the **My Instruments** list.

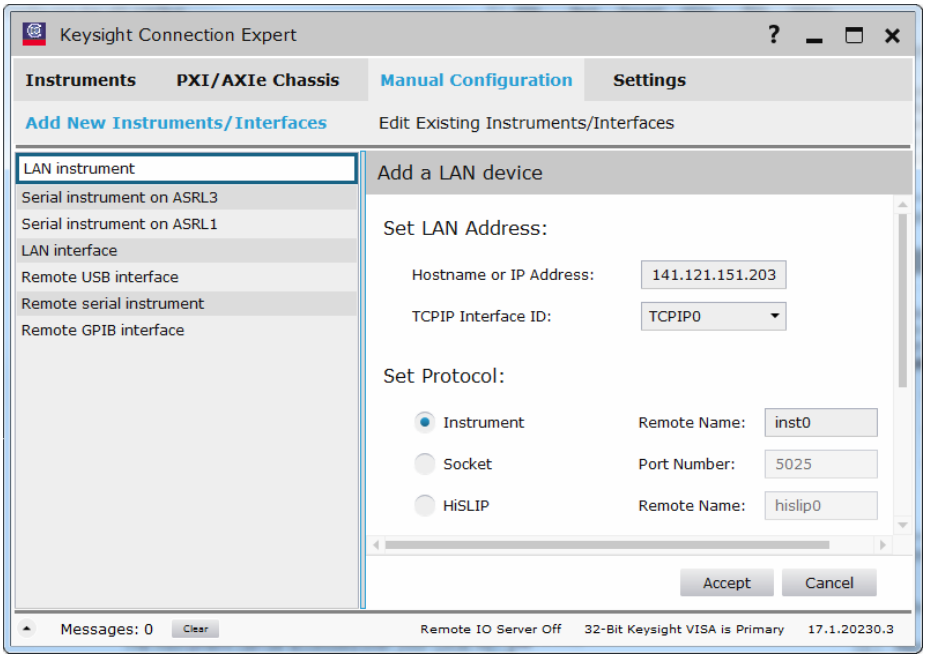


NOTE If you set up a LAN connection then switch off or disconnect the hardware, the 89600 software looks for the hardware when it is started. This slows down startup. To speed up the 89600 software startup, use Connection Expert to remove the LAN setup or choose to ignore the instrument.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

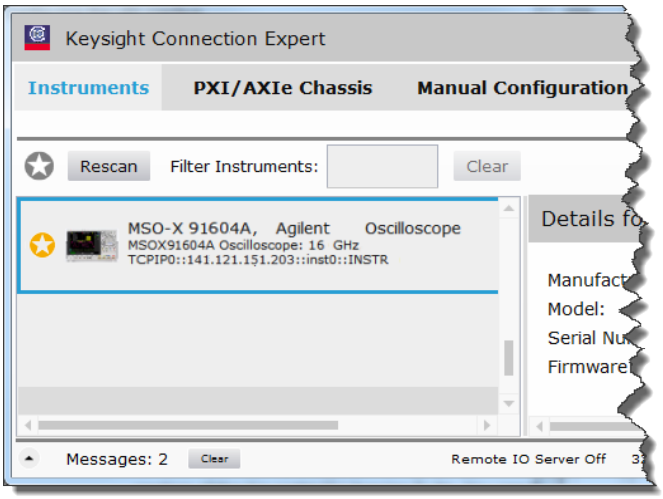
Run Connection Expert (previous versions)

1. On the PC with the 89600 software, click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically detect many (but not all) LAN instruments on your local LAN subnet. If an instrument is not automatically discovered, you must manually add the instrument:
   a. Click on the **Manual Configuration** tab (**Add New Instruments/Interfaces** and **Lan instrument** are selected by default).
   b. In the Add a LAN device panel, enter the instrument's hostname or IP address and protocol type. See the Keysight IO Libraries Help or your instrument's documentation for information on configuring your instrument's LAN address.



   c. Click **Accept**. Connection Expert will automatically configure the interface and instruments and assign names and other default configuration settings.
3. To verify that the computer recognized the instrument, click the **Instruments**

tab. Connection Expert will list all instruments and their addresses.



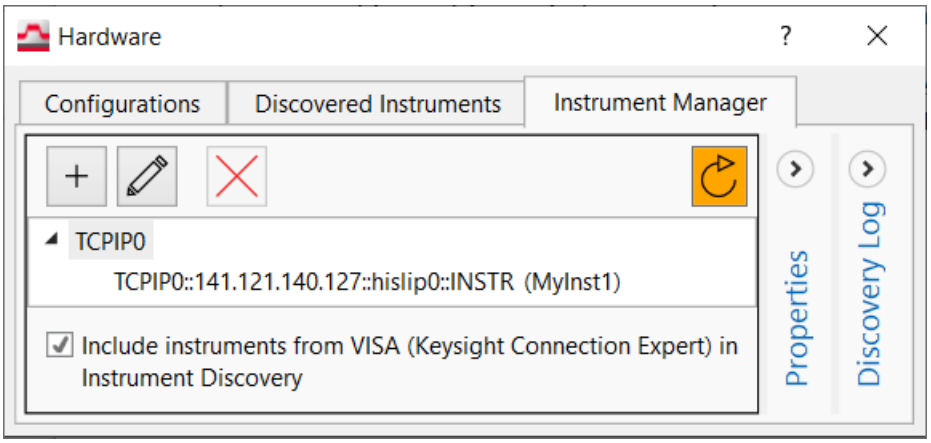
NOTE The VSA software will only look for instruments that are marked as favorite in Connection Expert, indicated by a gold star. If a LAN instrument is found via Auto-scan/Rescan, the instrument will not be marked as a favorite. If you add the instrument manually, the instrument will be marked as a favorite. You can change the favorite status by clicking on the star.

NOTE Connection Expert can not find the Infiniium scope if the scope application is not running.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

89600 VSA Instrument Manager

The integrated 89600 VSA Instrument Manager enables you quickly add, delete, and even ignore instrument connections without having to leave the VSA software. The Instrument Manager replaces the VSA IO Connections utility, but it also enables users to make LAN instrument connections that previously had to be made with the Keysight Connection Expert. To run the VSA Instrument Manager, launch the 89600 VSA software and click **Utilities > Hardware > Instrument Manager**.



You can use the Keysight 89600 I/O Connections utility to add an instrument as follows:

- Click the "Add new instrument" button to open the **Add/Edit New Instrument Address** dialog box.
- Select the appropriate protocol (**VXI-11** or **HiSLIP**) and enter the **Remote Name** if different from the default Remote Name.
- Enter the **Hostname or IP Address** of the instrument and an optional **Name**, and click **OK**.
- The new instrument connection should appear in the Instrument Manager list.
- On the **Instrument Manager** tab, click the "Rediscover Instruments" button so the VSA software discovers the new instrument.

For additional information on the VSA Instrument Manager, refer to the 89600 VSA online help. To get access to the online help, start the 89600 VSA application, then click **Help > Show Help** or click **Utilities > Hardware > Instrument Manager** and press **F1** on your keyboard.

Configuring the USB/GPIB Interface

Use this procedure is to configure the USB/GPIB interface for the Keysight Infiniium oscilloscope. For details on setting up the 82357 USB/GPIB Interface, see the *82357 USB/GPIB User's Guide*.

To configure the USB/GPIB interface:

1. Plug the 82357 USB cable into a USB port on your PC. Do not connect to your GPIB instrument at this time.
2. Observe the 3 LEDs on the E8237. Initially, only the red FAIL LED should be on. After the Found New Hardware Wizard runs, all 3 LEDs should be ON. If any LED is off after 20 seconds, stop this procedure and refer to the *82357 USB/GPIB User's Guide* for information.
3. If the **Keysight 82357 USB/GPIB Interface Detected** dialog box appears, click **OK** or **Accept**. (If you want to change any of the settings, refer to the *82357 USB/GPIB User's Guide* for instructions.)
4. Connect one or more instruments to the GPIB connector on the 82357.

5. Continue with Run Connection Expert (version 2017 or later) (page 67) or Run Connection Expert (previous versions) (page 67).

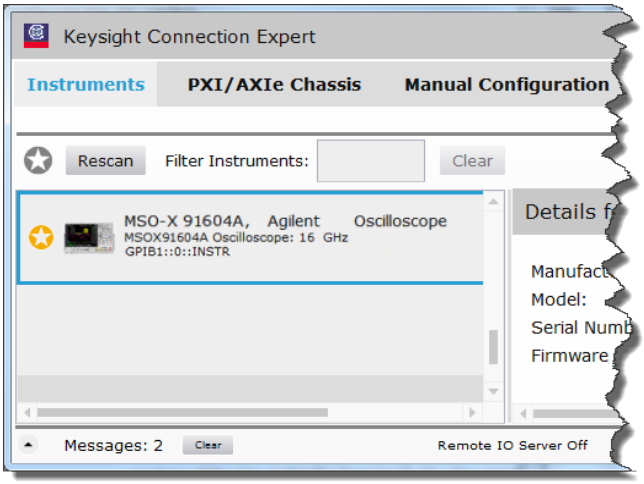
Run Connection Expert (version 2017 or later)

1. Run the Keysight IO Libraries Suite 2017 Connection Expert.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Connection Expert will detect your PC's USB/GPIB interface and auto-discover any instruments that are connected and turned on.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Check Status in Connection Expert to restore communication between Connection Expert and the instrument.

Run Connection Expert (previous versions)

1. Run the Keysight IO Libraries Suite Connection Expert tool.
   Click the **Keysight IO Libraries Suite** icon in the Windows application task bar, then click **Connection Expert**.
2. Auto-scan/Rescan will automatically discover all connected GPIB instruments. If an instrument is not automatically discovered, you may manually add the instrument by clicking **Manual Configuration > GPIB instrument** and entering the GPIB ID and address information.
3. To verify that the computer recognized the instrument, click the **Instruments** tab. Connection Expert will list all instruments and their addresses.



NOTE Connection Expert will not find the Infiniium scope if the scope application is not running.

NOTE When the 89600 software locates an instrument, it locks onto the instrument so only the 89600 software can communicate with it. This prevents Keysight IO Libraries from any communication with these instruments. You can disconnect the instrument by selecting **Control > Disconnect** in the VSA software. Select Rescan in Connection Expert to restore communication between Connection Expert and the instrument.

Configuring Logic Analyzers

Introduction

This chapter contains information related to the Keysight 89600 VSA's link to selected Keysight Logic Analyzers.

The 89600 VSA can capture and analyze time series data on a digital bus using either a Keysight 1680, 1690, 16800, or 16900 series Logic Analyzer as a data source. The Keysight 1680, 1690, 16800, and 16900 series Logic Analyzers all use the same Logic Analyzer software. The Logic Analyzer link to the 89600 VSA is available with Logic Analyzer software revision 5.51 and higher.

Configurations

16900 Series Logic Analyzers

The 16900 series Logic Analyzer application runs on a Windows PC. The PC can be embedded in the 16900 series Logic Analyzer mainframe, or the PC can be connected to the Logic Analyzer mainframe via a LAN.

The 16900 series Logic Analyzer application can be configured to run online or offline. The online configuration acquires data from a digital device using the measurement hardware in the Logic Analyzer mainframe. The offline configuration uses data previously recorded and saved by the Logic Analyzer. Offline analysis does not require a connection to the Logic Analyzer mainframe.

The 89600 VSA application runs on either the 16900 series Logic Analyzer mainframe or on a separate Windows PC. The 89600 VSA works with the 16900 series Logic Analyzer whether the 16900 series Logic Analyzer is online or offline.

Configurations for linking the Keysight 16900 series Logic Analyzer to the Keysight 89600 VSA are:

- Logic Analyzer application and VSA application both running on the Logic Analyzer mainframe. From a speed standpoint, this is generally the highest performance configuration.
- Logic Analyzer application running on the Logic Analyzer mainframe. VSA application running on a separate PC. The VSA application communicates with the Logic Analyzer via the LAN interface.

  NOTE The PC and the Logic Analyzer mainframe must both be members of the same domain or workgroup. If the PC and the Logic Analyzer are members of the same workgroup, you must log on to both the PC and the Logic Analyzer using the same user name.

- Logic Analyzer application and VSA application both running on the same PC. The Logic Analyzer application communicates with the Logic Analyzer mainframe via the LAN interface.

1680 and 16800 Series Logic Analyzers

The 1680 and 16800 series Logic Analyzer application runs on a Windows PC. The PC can be embedded in the 1680 or 16800 series Logic Analyzer mainframe, or the PC can be connected to the Logic Analyzer mainframe via a LAN.

The 1680 and 16800 series Logic Analyzer application can be configured to run online or offline. The online configuration acquires data from a digital device using the measurement hardware in the Logic Analyzer mainframe. The offline configuration uses data previously recorded and saved by the Logic Analyzer. Offline analysis does not require a connection to the Logic Analyzer mainframe.

The 89600 VSA application runs on either the 1680 or 16800 series Logic Analyzer mainframe or on a separate Windows PC. The 89600 VSA works with the 1680 or

16800 series Logic Analyzer whether the 1680 or 16800 series Logic Analyzer is online or offline.

Configurations for linking the Keysight 1680 or 16800 series Logic Analyzer to the Keysight 89600 VSA are:

- Logic Analyzer application and VSA application both running on the Logic Analyzer mainframe. From a speed standpoint, this is generally the highest performance configuration.
- Logic Analyzer application running on the Logic Analyzer mainframe. VSA application running on a separate PC. The VSA application communicates with the Logic Analyzer via a LAN interface.

  NOTE The PC and the Logic Analyzer mainframe must both be members of the same domain or workgroup. If the PC and the Logic Analyzer are members of the same workgroup, you must log on to both the PC and the Logic Analyzer using the same user name.

- Logic Analyzer application and VSA application both running on the same PC. The Logic Analyzer application communicates with the Logic Analyzer mainframe via a LAN interface.

1690 Series Logic Analyzers

The 1690 series Logic Analyzer application runs on a Windows PC.

NOTE Unlike the 1680, 16800, and 16900 series Logic Analyzers, the 1690 series Logic Analyzer does not have an embedded PC in the Logic Analyzer mainframe.

The 1690 series Logic Analyzer mainframe must be connected to a PC via an IEEE 1394 Firewire interface.

The 1690 series Logic Analyzer application can be configured to run online or offline. The online configuration acquires data from a digital device using the measurement hardware in the Logic Analyzer mainframe. The offline configuration uses data previously recorded and saved by the Logic Analyzer. Offline analysis does not require a connection to the Logic Analyzer mainframe.

The 89600 VSA application runs on a Windows PC. The 89600 VSA application works with the 1690 series Logic Analyzer whether it is online or offline.

Configurations for linking a Keysight 1690 series Logic Analyzer to a Keysight 89600 VSA are:

- Logic Analyzer application and VSA application both running on the same PC. The Logic Analyzer application communicates with the Logic Analyzer mainframe via the IEEE 1394 interface. From a speed standpoint, this is generally the highest performance configuration.
- Logic Analyzer application and VSA application running on separate PCs. The Logic Analyzer application communicates with the Logic Analyzer mainframe via the IEEE 1394 interface. The VSA application communicates with the Logic Analyzer application via the LAN interface.

NOTE The two PC's must be members of the same domain or workgroup. If the PC's are members of the same workgroup, you must log on to both PC's using the same user name.

Connecting to a Network

If either the Logic Analyzer application or the VSA application requires access to the Logic Analyzer mainframe via a LAN, you must:

- Configure the Logic Analyzer mainframe firewall to enable applications to access it.
- Set up a direct LAN connection between the host computer and the Logic Analyzer mainframe using a LAN cable or set up the Logic Analyzer mainframe to communicate via your intranet.

  NOTE If you are using an older PC that does not have Auto-MDIX capability, you will need to use a crossover cable when setting up a direct LAN connections.

- Install the Logic Analyzer COM Automation client software on your remote computer.

  NOTE The PC and the Logic Analyzer mainframe must both be members of the same domain or workgroup. If the PC and the Logic Analyzer are members of the same workgroup, you must log on to both the PC and the Logic Analyzer using the same user name.

Follow the instructions in the Logic Analyzer help topic "Setting Up for COM Automation" to properly set up your network connection and configure the firewall. To access the "Setting Up for COM Automation" information, start the Logic Analyzer application and click **Help > Help Topics > COM Automation > Setting Up for COM Automation**.

The preferred method for installing the Logic Analyzer COM Automation client software is to install the Logic Analyzer software on the remote computer. Installing the Logic Analyzer software automatically installs the COM Automation client. This gives you the benefit of having Logic Analyzer offline analysis capability and the COM Automation client set up on each computer you use to link to the Logic Analyzer. For a free copy of the latest Logic Analyzer software, go to *http://www.keysight.com/find/logic*.

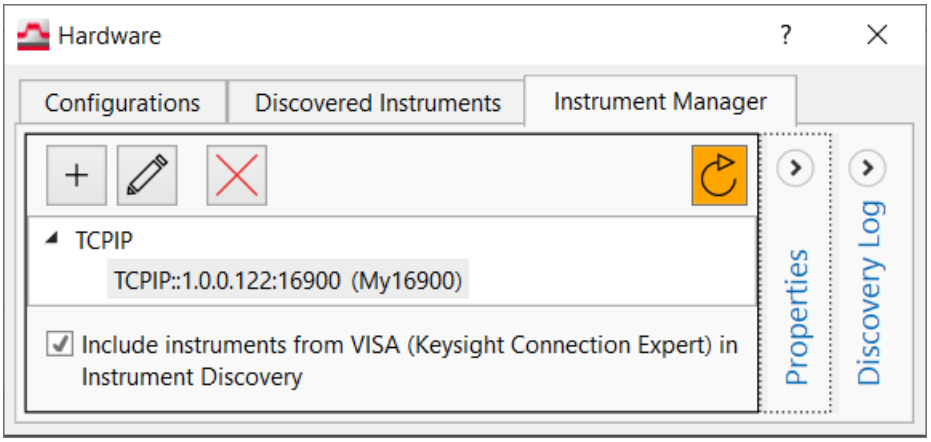
If you would prefer to not install the Logic Analyzer software on your remote computer, you can install just the Logic Analyzer COM Automation client software. The Logic Analyzer COM Automation client software is available on any system that has the Logic Analyzer software installed. The file name is SetupLACOM.exe. The file is located at `C:\Program Files\Agilent Technologies\Logic Analyzer\SetupLACOM.exe`. For additional information on installing the Logic

Analyzer COM Automation client software, refer to "Setting Up for COM Automation" in the Logic Analyzer online help.

For information on configuring the 89600 VSA LAN interface, see Configuring the LAN interface (page 40).

89600 VSA Instrument Manager

The integrated 89600 VSA Instrument Manager enables you quickly add, delete, and even ignore instrument connections without having to leave the VSA software. The Instrument Manager replaces the VSA IO Connections utility, but it also enables users to make LAN instrument connections that previously had to be made with the Keysight Connection Expert. To run the VSA Instrument Manager, launch the 89600 VSA software and click **Utilities > Hardware > Instrument Manager**.



You can use the Keysight 89600 I/O Connections utility to add an instrument as follows:

- Click the "Add new instrument" button to open the **Add/Edit New Instrument Address** dialog box.
- Click **Custom LAN** and select *AgtDigital* from the **Custom Model** drop-down menu.
- Enter the **Hostname or IP Address** of the logic analyzer and an optional **Name**, and click **OK**.
- The new logic analyzer connection should appear in the Instrument Manager list.
- On the **Instrument Manager** tab, click the "Rediscover Instruments" button so the VSA software discovers the new logic analyzer.

For additional information on the VSA Instrument Manager, refer to the 89600 VSA online help. To get access to the online help, start the 89600 VSA application, then click **Help > Show Help** or click **Utilities > Hardware > Instrument Manager** and press **F1** on your keyboard.

Configuring M9391A & M9393A PXIe Analyzers

Introduction

Included in the installation software for the M9391A and M9393A PXIe Vector Signal Analyzer is the Keysight 89600 VSA software role specific to those instruments. A role is a set of DLL files that operate as an interface between the 89600 VSA software and acquisition hardware and is also referred to as the hardware extension.

NOTE You must purchase 89600 VSA Software Option SSA to use the 89600 VSA software's "Power Spectrum" measurement with the M9391A or M9393A PXIe analyzer.

NOTE Installation software and product documentation for the M9391A and M9393A is available online at http://www.keysight.com/find/M9391A and http://www.keysight.com/find/M9393A.

The M9391A/M9393A role files, as well as an integration utility, are installed along with other M9391A/M9393A program files. The M9391A/M9393A installer runs the integration utility which detects if 89600 VSA software is installed and, if so, copies the role files into the program files for each compatible version of 89600 VSA.

IMPORTANT If you install the 89600 VSA software AFTER you install the M9391A/M9393A drivers, you must run the 89600 VSA Integration utility to install the M9391A/M9393A role into the 89600 VSA Program Files. You can access the 89600 VSA Integration utility from the Windows Start menu by clicking **Start > All Programs > Keysight > M9391 (or M9393) > 89600 VSA Integration**.

A role DLL implements several software interfaces. The interfaces have methods for acquiring measurement hardware, setting acquisition parameters, querying data and querying hardware status. Presence of the role allows 89600 VSA software to detect and configure modules for an M9391A and M9393A receiver. The 89600 VSA's Hardware Configurations dialog is used to specify which PXI modules form an instrument.

Installing 89600 VSA Software and Instrument Drivers

To use the Keysight 89600 Series VSA Software, you must install the software and then create a connection between the software and the hardware configuration that is your M9391A or M9393A PXI Vector Signal Analyzer. The steps below show you how to install the 89600 VSA software. The section that follows shows you how to create the connection between software and hardware.

1. Follow the instructions provided with your M9391A/M9393A instrument to install the 89600 VSA software in the instrument's embedded controller or on an external PC connected to the instrument via a PCIe cable.

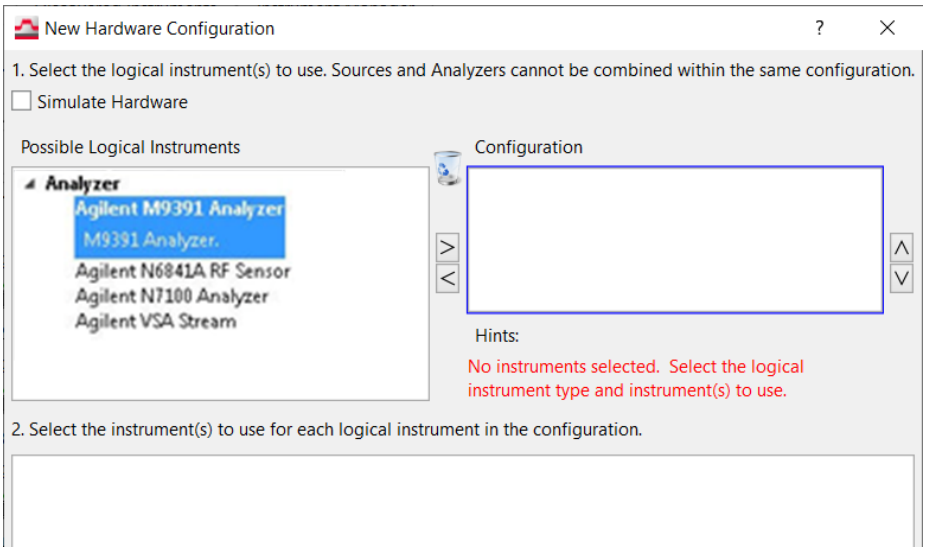
   When installing the 89600 VSA software, make sure you also install the Keysight IO Libraries. For details, see *Adding Hardware Support* in Installing 89600 Software (page 21).
2. Run the M9391A/M9393A installer to install the M9391A/M9393A hardware driver.

NOTE The M9391A/M9393A installer detects the 89600 VSA software and installs the appropriate role files.

Creating a New PXIe VSA Instrument

To create a new M9391A or M9393A PXIe VSA instrument, perform the following steps:

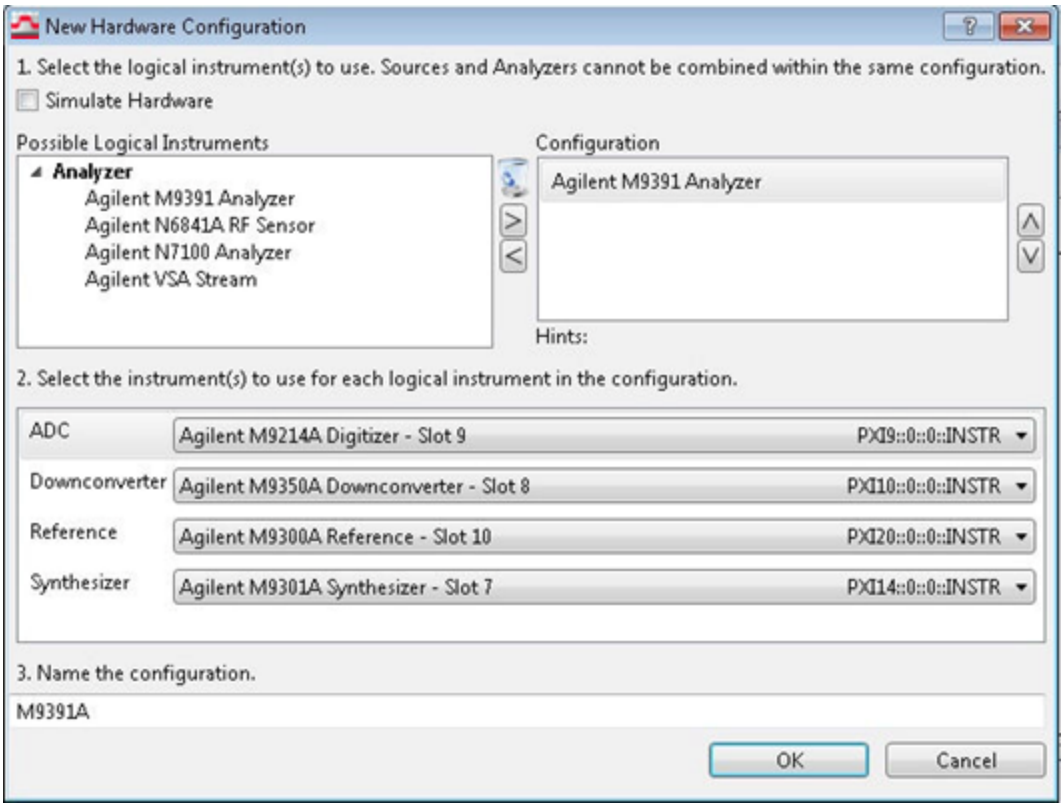
1. Run the 89600 VSA Software.
2. Open the "New Hardware Configuration" window.
   a. Click **Utilities > Hardware > Configurations**.
   b. Click  to display the **New Hardware Configuration** dialog box.
3. In the **New Hardware Configuration** window:
   a. Under the first section, **1. Select the logical instruments to use.**, select the Keysight M9391A or M9393A Analyzer entry and click  to copy the entry to the "Configuration" window.



TIP If you don't see the M9391A or M9393A in this menu, run the 89600 VSA Integration utility as described earlier in this topic. If, after running that utility you still don't see the M9391A or M9393A, run the Keysight Connection Expert and click Refresh All or click the Scan button .

b. Under the next section, **2. Select the instrument(s) to use for each logical instrument in the configuration,** select the modules that make up your M9391A or M9393A PXI VSA instrument, as demonstrated in the image below.

   If you have more than one instrument in your PXIe mainframe, be careful to select the correct modules for your instrument. You may need to click the drop-down arrows and select modules different than those selected for you.

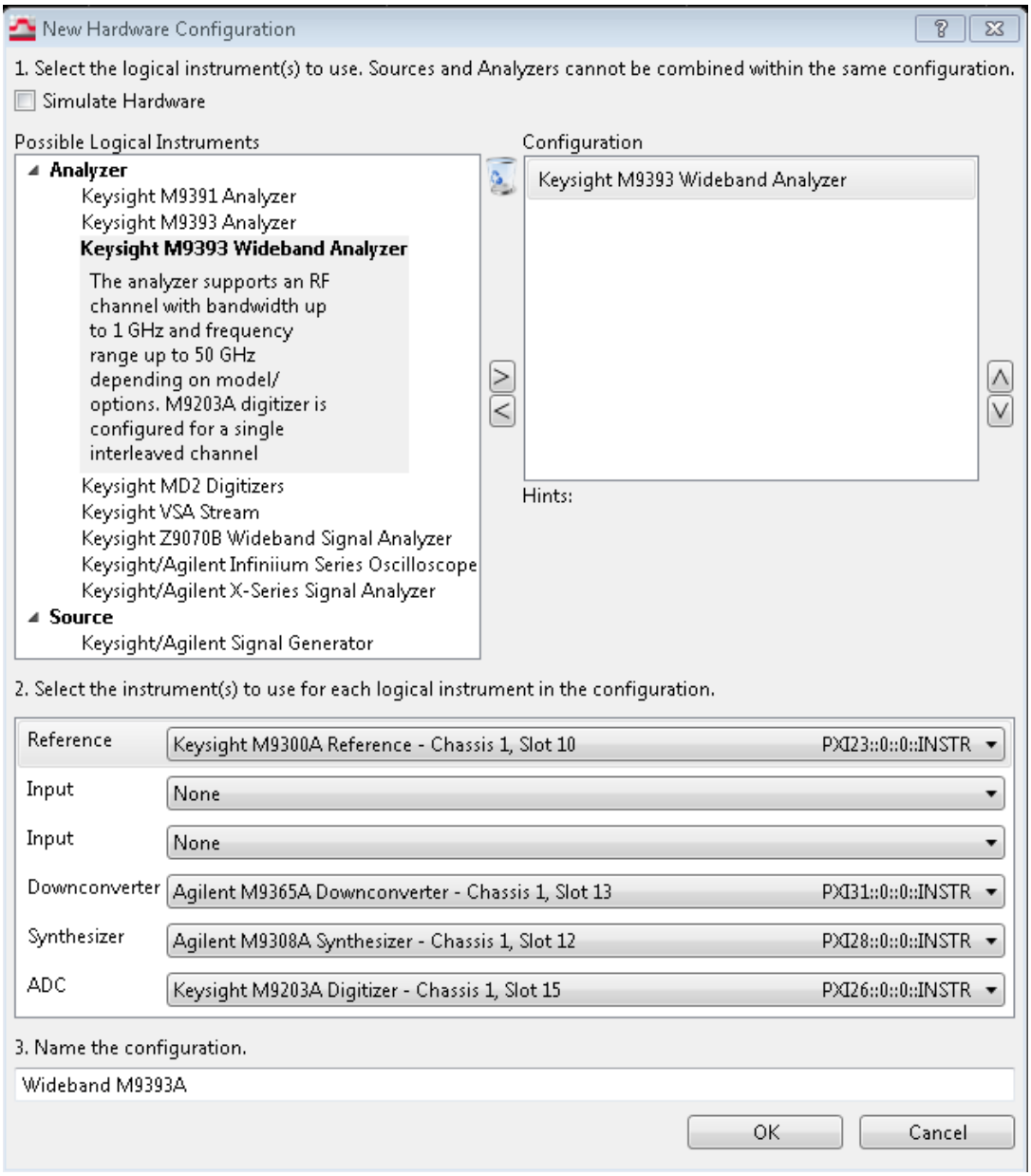


c. In the final section, **3. Name the configuration**, enter a name for your new configuration.
d. Click **OK** to save your new configuration.

4. If you have more than one instrument configured to run with your 89600 VSA software, click **Utilities > Hardware > Analyzer** and select the instrument you want to use for your measurement.
5. Click **Current Analyzer Configuration** and select your new configuration.
6. Begin making measurements

Configuring M9393A + M9203A Wideband Analyzer

Starting with M9393A software version 2.1.xxx.3, the M9393A instrument driver installation includes an additional 89600 VSA hardware extension, Keysight M9393 Wideband Analyzer. The M9393 Wideband Analyzer replaces the M9214A digitizer with a M9203A high-speed digitizer. To achieve maximum bandwidth, the M9203A digitizer should have option M9203A-INT Interleaved Sampling Enabled. When this option is present, the module is used with interleaved sampling enabled. The M9393 Wideband Analyzer provides a single input channel, regardless of whether or not interleaved sampling is enabled.



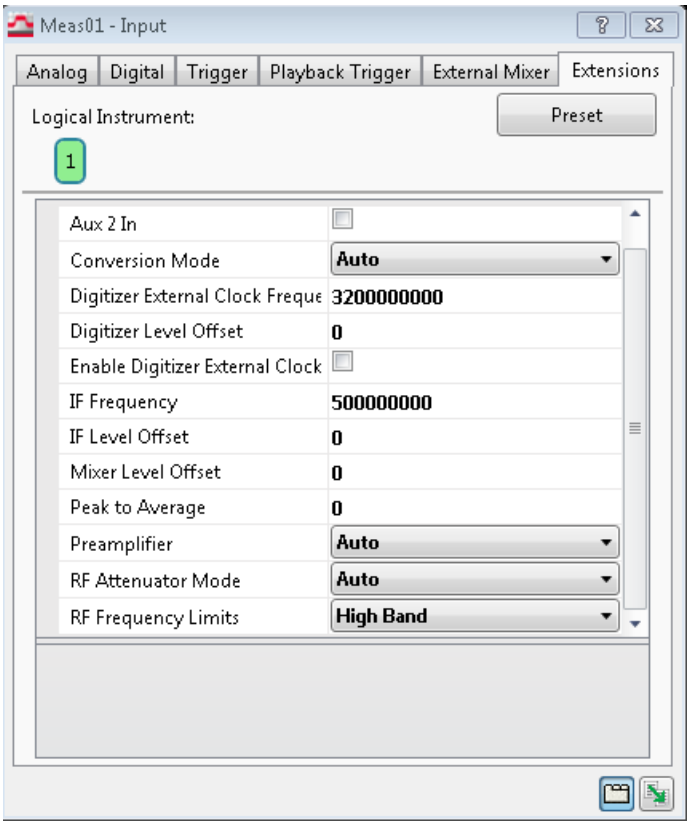
The Keysight M9393 Wideband Analyzer also requires installation of the MD2 High-Speed Digitizer Instrument Drivers and MD2 Digitizers Hardware Extension for 89600 VSA Software:

- MD2 High-Speed Digitizer Instrument Drivers
- MD2 Digitizers Hardware Extension for 89600 VSA Software

Each of these software components must be installed for Possible Logical Instruments to include Keysight M9393 Wideband Analyzer. When a new version of 89600 VSA Software is installed it will be necessary to run the 89600VSAIntegration.exe utility for M9393A and the 89600VSAIntegration.exe utility for MD2.

The M9393A is used to produce a wideband IF signal which is digitized by the M9203A digitizer module. The frequency of the IF signal is specified by the IF

Frequency input extension. Keysight M9393 Wideband Analyzer includes input extensions that are a combination of relevant input extensions from Keysight M9393 Analyzer and Keysight MD2 Digitizers:



VSA Security, Advisories and Vulnerabilities

This section contains important information relating to keeping test environments secure while using the 89600 VSA Software.

Product Information, Advisories and Reporting Vulnerabilities

Keysight Corporate Information

https://www.keysight.com/us/en/contact.html

Keysight 89600 VSA Product Information

Use the following product information to identify product updates and security advisories, or when reporting a vulnerability:

- *Product name*: Keysight Vector Signal Analysis Software
- *Model*: 89601C
- *Version*: 2025
- *URL on Keysight.com*: https://www.keysight.com/us/en/products/software/pathwave-test-software/89600-vsa-software.html

Keysight Responsible Disclosure Program

https://www.keysight.com/us/en/contact/responsible-disclosure-program.html

Keysight Security Advisories

https://www.keysight.com/us/en/about/quality-and-security/security/product-and-solution-cyber-security.html

Reporting Security Vulnerabilities

https://www.keysight.com/us/en/about/quality-and-security/security/product-and-solution-cyber-security/report-a-product-cybersecurity-issue.html

Securing the VSA Software

Agilent.SA.Vsa.Vector-x64.exe may host many services listening on various ports and bound to various interfaces. The user should take necessary means to implement firewall rules to secure these services.

SCPI Services

The user may enable a SCPI service using HiSLIP, Telnet, or Socket protocols; HiSLIP connections go through *HppSupportService.exe* but Telnet and Socket

services are hosted by *Agilent.SA.Vsa.Vector-x64.exe*.

The Telnet and Socket services listen on configurable ports defaulting to 5024 and 5025 respectively, bound to all IPv4 and IPv6 interfaces. Access configuration through VSA's SCPI Preferences: **Utilities → SCPI Preferences**.

.NET API Services

VSA's API is accessible to both .NET Framework clients through VSA's .NET Remoting service as well as modern .NET clients through VSA's .NET Client access service.

The .NET Remoting service listens on the first available port from the range 60189, 60190, … or a configured port number. The service is bound to all IPv4 interfaces. Configure using command line argument: *-port:<port>*; the service supports core functionality and cannot be disabled. See the VSA Help for more information.

The .NET Client access service listens on the first available port from the range 59189, 59190, … or a configured port number. The service is bound to all IPv4 and IPv6 interfaces or a configured host address. Configure using command line argument: *-serveraddress:<host[:port]>*; enable and disable through VSA's Startup Preferences: **Utilities → Startup Preferences**. See the VSA Help for more information.

Hardware Connectivity Services

Some hardware connectivity features enable connectivity services upon utilizing the feature.

A Vita49 stream listener service listens on any port and interface specified. The service is hosted by *Agilent.SA.Vsa.Vector-x64.exe*. Add a stream listener through VSA's Instrument Manager: **Utilities → Hardware → Instrument Manager → Add new instrument → Custom LAN → Custom Model: Vita49**.

Other VSA Services

VSA listens on port 8070 bound to the IPv4 loopback interface for core functionality.

Other Keysight Components' Services

Agilent.SA.Vsa.Vector-x64.exe installs with, or is likely to be installed with other Keysight components which may host their own services. Users are likely to use port 4880, a HiSLIP service hosted by **HppSupportService.exe** and bound to all IPv4 and IPv6 interfaces. Other components include:

- *agileesofd.exe*
- *AgilentLicenseService.exe*
- *HppSupportService.exe*
- *KeysightCommunicationsFabric.exe*
- *LxiMdnsResponder.exe*

Securing VSA – Other Considerations

VSA is not intended to run as administrator or with elevated privileges; run VSA under an ordinary user account.

Troubleshooting

Troubleshooting Licensing Problems

Installing Incorrect License Version Level

If you have an option 20x license installed but only the Demo license is being used, you should check that your license meets the minimum license version that is required by the software.

To check that your license meets the minimum license version requirement:

1. Start the 89600 VSA. Click **Start > Keysight 89600 VSA *<ReleaseVersion>* > Keysight 89600 VSA *<ReleaseVersion>***
2. Click **Utilities > Licenses > Status**.
3. View the Version number of your installed Option 20x license that is shown in the *Version:* field.
4. If the number in the *Version:* field is less than the number shown in the *Minimum License Version Required:* field, then you need a new license to run this software. For example, if the installed license version is 2024.0101 and the minimum license version required is 2025.0101, then you need to order a subscription renewal product.

Common Floating License Failures

This is a list of common causes of floating license failures.

- Attempting to redeem a granted floating license option being used by another Client PC.
- Attempting to connect to a floating license server that is not operational, or to which you have lost connectivity.
- Attempting to use a floating license server that is improperly configured. For example, the floating license file does not match the server host ID in use.

Troubleshooting a Lost Connection to the Network License Server

This information only applies to systems that use a floating license server and a floating license Client.

If, two to three minutes after starting the 89600 VSA software, a License Warning message window appears that says that the VSA software is about to lose, or has lost, its connection to the network license server, the licensing software may have encountered a firewall incompatibility. Every two to three minutes, the 89600 VSA software connects to the license server to check the Floating license status. Some third party firewall applications treat this as a port scan attack and will lock out the Client. This problem can be fixed by turning off any third party firewall software that resides on the server. This is not an issue with the Windows firewall.

Troubleshooting LAN Interface Problems

If the 89600 software cannot find your measurement hardware, the problem may be in the LAN interface.

To troubleshoot the LAN interface:

1. Close all 89600 applications. To verify that all applications are closed, run Task Manager.
   a. Right click an empty space in the task bar or press Alt-Ctrl-Delete.
   b. Click **Task Manager > Applications.**
   c. If there are any *89600* applications listed, highlight them and click **End Task.**
   d. Click the **Processes** tab.
   e. If there are any *Agilent.SA.Vsa.*.EXE* processes in the list, highlight them and click **End Task.**
2. Confirm that your PC can communicate with the instrument.
   a. Open a Command Prompt window: click **Start > (All) Programs > Accessories > Command Prompt.**
   b. Type **ping** *hostname* and press **Enter**, where *hostname* is the IP address or hostname for the instrument. (For instructions on finding the IP address or hostname, see Configuring IO Interfaces (page 39).)

If you are successful, continue with step 3 If you are not successful, continue with the next sub-step.

c. Make sure that the PC is on and the LAN cable is connected to the PC and the instrument.
d. If you are connecting directly from the PC to the instrument, verify that you are using a crossover LAN cable.
e. Turn the instrument power off, then back on.
f. Verify that the subnet mask is set appropriately. For detailed instructions, see: Configuring IO Interfaces (page 39).

3. Confirm that VISA Assistant can find and communicate with the LAN instrument.
4. After you have confirmed that Interactive IO can find the instrument, verify that Interactive IO can send a SCPI query (if the instrument supports SCPI).
   a. Restart Interactive IO if necessary.
   b. Click **Connect** and check the resource name.
   c. Click **Send & Read**.
   d. If there is an error or an incorrect response, try sending a device clear first. Click **Device Clear**. If this does not help, cycle power on the instrument and try step c. again.
5. Start an 89600 application. Look for any error dialog boxes at startup stating that the instrument does not have the proper options or firmware.
6. Verify that the instrument is in the list under **Utilities > Hardware > Configurations.**

LAN Interface Problem With an Infiniium Oscilloscope

If you are having trouble communicating directly over the LAN with an Infiniium Oscilloscope, check that the M libraries on the scope are configured correctly (Click **Start > (All) Programs > Keysight Connection Expert**).

M libraries configuration

VISA Name	SICL Name
GPIB0	hpib7
GPIB1	inst0
TCPIP0	lan

To configure the M libraries (Windows firewall must be off):

1. On the Infiniium scope, minimize the scope application. Click **Start > (All) Programs > Keysight Connection Expert**.
2. Select Internal Instrument in the *Instrument I/O on this PC* and click **Change properties**. Set the following parameters: SICL Interface ID - hpib7, VISA Interface ID - GPIB0, and Logical unit - 7. Press **OK**.
3. Select Internal Instrument in the *Instrument I/O on this PC* and click **Change properties** again. Set the following parameters: SICL Interface ID - inst0, VISA Interface ID - GPIB1, and Logical unit - 8. Press **OK**.

4. Select TCPIP in the *Instrument I/O on this PC* and click **Change properties**. Set the following parameters: SICL Interface ID - lan, VISA Interface ID - TCPIP0, Logical unit - 30 and Default Protocol - Auto. Press **OK**.
5. Select n/a LAN Server in the *Instrument I/O on this PC* and click **Change properties**. Click the **Defaults** button and press **OK**.
6. Close the Connection Expert dialog box.

You must reboot the scope after closing the Connection Expert dialog box.

Troubleshooting Interference With Other Devices or Instruments

When you start an 89600 VSA, the software attempts to identify other instruments and devices connected to the computer. This can cause the following problems:

- Instruments and devices get reset when you start the 89600 VSA even if the instrument/device is not controlled by 89600.
- Errors occur on instruments or devices not controlled by 89600 when you start the 89600 VSA.

To eliminate these problems, instruct the 89600 software to exclude specific devices from the identification process by creating VsaVisaConfig.txt file. To do this, edit the VsaVisaTemplate.txt file and save as a VsaVisaConfig.txt file.

1. Open the VsaVisaConfig.txt file:
   `C:\Program Files\Keysight\89600 Software <ReleaseVersion>\89600 VSA Software\VsaComponents\x64\VsaVisaTemplate.txt`
2. Modify the file to list the addresses of the devices you want to exclude, then save the file as VsaVisaConfig.txt file in the same folder location.

Troubleshooting the Display Driver

This section provides display driver troubleshooting information.

Symptom

The symbol location shape, such as the dots, on the constellation trace displays do not show properly.

Possible Cause

The display driver may not be functioning properly.

Solution

Use this procedure to correct the display driver:

1. Update the display driver:
   Contact your PC manufacturer to see if a newer version of the display driver is available. If there is, update the driver and verify if the problem is fixed.
2. Reconfigure the display driver settings:
   If the latest display driver does not fix the problem, try decreasing the hardware acceleration.

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