Installation and VXI Service Guide

Agilent Technologies 89600 Series

Agilent Technologies

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In this book

This book documents the Agilent 89600-Series installation and service procedures. It provides the following:

- software installation instructions
- hardware installation instructions
- PCI card and PCMCIA cardbus installation instructions
- hardware configuration information
- licensing information
- diagnostics, troubleshooting, and replaceable parts information for VXI hardware

This book does not contain operating information. All operating information is contained in the 89600 online help.

Other documentation

In addition to the *Installation Guide* (this book), the following documentation also comes with your software:

- *89600 Online Help* is available after you install the software on your computer. The help includes reference information, tutorials on making several kinds of measurements, and a video overview of the analyzer. Separate online help is available for the 89600 WLAN Test and 89604 Distortion Suite applications.
- If the analyzer includes VXI measurement hardware, the printed VXI mainframe *User and Service Manual* is shipped with your analyzer. (You can put the mainframe manual in the 89600-series binder.)
- The complete documentation (PDF files) for the Agilent I/O libraries is located in C:\Program Files\Agilent\IO Libraries\Manuals (if you install the I/O libraries).
- Agilent E1438 and Agilent E1439 operating information is documented in PDF files located in C:Program Files\Visa\Winnt\age1438\help and C:\Program Files\Visa\Winnt\age1439\help (only for VXI measurement hardware).
- Technical Specifications are available from the 89600 online help or the 89600 web page: http://www.agilent.com/find/89600.

Independent operation of the Agilent 89605, 89606, E2730, and E2731 modules is not supported at this time.

To read the PDF files, you must have Acrobat® Reader installed on your computer. You can install this application from the 89600 Installation CD.

We have allowed room in this binder so that you can put the VXI mainframe documentation in this binder. This way all the documentation you may need for troubleshooting or replacing parts will be in one location.

Safety summary

Important

Note that this manual contains only the safety information pertaining to installing VXI modules in the VXI mainframe and for installing the IEEE 1394 PCI interface card in your computer. For information on operating your VXI hardware and your computer safely, please refer to the user or service manuals for your VXI mainframe and computer.

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

GENERAL

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

BEFORE APPLYING POWER

Verify that the product is set to match the available line voltage, the correct fuse is installed, and all safety precautions are taken. Note the instrument's external markings described under Safety Symbols.

GROUND THE PRODUCT

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

FUSES

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes.

DO NOT REMOVE THE PRODUCT COVER

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

WARNING

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

Caution

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a CAUTION sign until the indicated conditions are fully understood and met.

Safety Symbols

	Caution, refer to accompanying documents		Alternating current
	Earth (ground) terminal		Direct current
	Frame or chassis terminal		Warning, risk of electric shock
	Terminal is at earth potential. Used for measurement and control circuits designed to be operated with one terminal at earth potential.		

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1 Installation Overview

89600 Series Software

The 89600 Series Software CD-ROM includes software for the following applications:

- 89600 Vector Signal Analyzers (89601 VSA software)
- 89604 Distortion Suite
- 89607 WLAN Test

89604A Distortion Suite

Before you install Agilent 89604 Distortion Suite software, you must install 89600 VSA software. (The 89604 application uses portions of the 89600 software.) If you purchased and licensed the 89600 software, you can use the 89600 application separately from Distortion Suite. If you did not purchase the 89600 software, it runs in the background when you use Distortion Suite, and you cannot use the 89600 application separately.

Note The 89604A Distortion Suite cannot be installed or co-reside on a PC with 89601A VSA version 3.xx or earlier.

89607 WLAN Test

WLAN Test is licensed in two ways:

- as part of option B7R (WLAN Modulation Analysis) with the 89601 software
- as a stand-alone application

Regardless of how you purchase or license WLAN Test, you must install the 89601 software before you install 89607 WLAN Test software. (The 89607 application uses portions of the 89600 software.) If you purchased and licensed the 89601 software, you can use the 89600 application separately from WLAN Test. If you did not purchase the 89601 software, it runs in the background when you use WLAN Test, and you cannot use the 89600 application separately.

Note The 89607A WLAN Test application cannot be installed or co-reside on a PC with 89601A VSA version 4.xx or earlier.

Before you start installation

The information in this section prepares you for installation.

Note

If you are installing only a floating license server, skip the rest of this chapter and go directly to "Setting Up a Floating License Server" on page 155.

To prepare for installation:

1. Be sure you have the documentation and media listed on "Documentation and media requirements for installation" (page 15).
2. Be sure your computer meets the minimum requirements:
   - "System requirements for a desktop PC" (page 16)
   - "System requirements for a laptop PC" (page 17)
   - "System requirements for a VXI embedded PC" (page 18)
3. Setup your computer and connect peripherals if required.
4. Determine what kind of interface is required for your measurement hardware, using the following table. Note that you may need to install and configure more than one interface. For example, if your measurement hardware includes VXI measurement hardware and an Agilent ESG source, you must configure both an IEEE-1394 interface and a GPIB interface.

Measurement Hardware	Computer Type	Interface
VXI (Agilent 89610, 89611, 89640, 89641)	Laptop or desktop PC	IEEE-1394 VXI to PC
	VXI embedded	none
Agilent E4406	Laptop or desktop PC	LAN, GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter
Agilent ESG-D, ESG-DP, or E4438C (source)	Laptop, desktop, or embedded VXI PC	LAN, GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter
Agilent PSA (used as ADC)*	Laptop or desktop PC	LAN, GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter *
Agilent PSA (used as a down-converter with 89611)*	Laptop, desktop, or VXI embedded PC	LAN, GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter
Agilent ESA	Laptop or desktop PC	GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter

Measurement Hardware	Computer Type	Interface
Agilent Infiniium Oscilloscope	Laptop or desktop PC or in an XP scope	LAN, GPIB, LAN/GPIB Gateway (portal), USB-to-GPIB adapter, or internal
Agilent N4010A Wireless Connectivity Test Set	Laptop or desktop PC	USB, LAN
Agilent ESA-E Series Analyzer	Laptop or desktop PC	GPIB or LAN-to-GPIB Gateway (portal)

* To use GPIB with the PSA, your PSA firmware must be version A.4.0 or later. With earlier firmware versions, you must use the LAN connection.

5. Go to “Installation” on page 19 for installation instructions.

Documentation and media requirements for installation

To perform installation and setup of your 89600 product, you need the following documentation and media:

- Agilent 89600 Series Software installation CD.
- *Installation and Service Guide* for Agilent 89600 Series (this manual).
- If your analyzer requires LAN, GPIB, or IEEE 1394 interfaces, you need your computer's documentation for installation of PCI adapters, PCMCIA cards, or GP-IB cards.
- If your analyzer includes an embedded VXI controller, you need its *User and Service Manual*.
- If your VXI measurement hardware includes an 89605, E2730, or E2731 module, you may need the Calibration disks for the module.
- Installation and setup information for a source or other measurement hardware you will be using with 89600 software.

System requirements for a desktop PC

For Agilent 89600-series software on a desktop PC, the PC must meet the following minimum requirements:

- 180 MHz Pentium®[1] or AMD-K6®[2] CPU (≥300 MHz recommended)
- One empty PCI-bus slot if your analyzer includes VXI measurement hardware (two empty slots recommended)
- 192 Mbytes RAM (256 Mbytes recommended)
- 4 Mbytes Video RAM (8 Mbytes recommended)
- Paging File Size 256 Mbytes (with option AYA, 350 Mbytes recommended)
- available space on the hard drive:
  - 150 Mbytes for 89600 VSA software installation
  - (optional) 60 Mbytes for .NET installation (required only for 89607 WLAN Test and 89604 Distortion Suite)
  - (optional) 4 Mbytes for 89607 WLAN Test installation
  - (optional) 4 Mbytes for 89604 Distortion Suite installation
- Microsoft Windows 2000 or Windows XP
- CD ROM drive for the installation media (can be provided via network access)
- For analyzers including an Agilent Technologies E2730 or E2731 tuner VXI module or an 89605 input module, a 3.5" floppy disk drive may be required (can be provided via network access)

1. Pentium is a U.S. registered trademark of Intel Corporation.
2. K6® is a U.S. registered trademark of Advanced Micro Devices, Inc.

System requirements for a laptop PC

For Agilent 89600-series software on a laptop PC, the PC must meet the following minimum requirements:

- ≥300 MHz Pentium or AMD-K6® CPU
- One empty Cardbus Type II slot if your analyzer includes measurement hardware (two empty slots recommended)
- 192 Mbytes of RAM (256 Mbytes recommended)
- 4 Mbytes of Video RAM (8 Mbytes recommended)
- Paging File Size 256 Mbytes (with option AYA, 350 Mbytes recommended)
- available space on the hard drive:
  - 150 Mbytes for 89600 VSA software installation
  - (optional) 60 Mbytes for .NET installation (required only for 89607 WLAN Test and 89604 Distortion Suite)
  - (optional) 4 Mbytes for 89607 WLAN Test installation
  - (optional) 4 Mbytes for 89604 Distortion Suite installation
- Microsoft Windows 2000 or Windows XP
- CD-ROM drive for the installation media (can be provided via network access)
- For analyzers including an Agilent Technologies E2730 or E2731 tuner VXI module or an 89605 input module, a 3.5" floppy disk drive may be required (can be provided via network access)

System requirements for a VXI embedded PC

To install and run the Agilent 89600-series software, you need a VXI embedded controller and the following:

- add 128 Mbytes of RAM
- A 6-slot or 13-slot VXI mainframe
- available space on the hard drive:
  - 150 Mbytes for 89600 VSA software installation
  - (optional) 60 Mbytes for .NET installation (required only for 89607 WLAN Test and 89604 Distortion Suite)
  - (optional) 4 Mbytes for 89607 WLAN Test installation
  - (optional) 4 Mbytes for 89604 Distortion Suite installation
- Microsoft Windows 2000
- CD ROM drive for the installation media (can be provided via network access)
- For analyzers including an Agilent Technologies E2730 or E2731 tuner VXI module or an 89605 input module, a 3.5" floppy disk drive may be required (can be provided via network access)

Installation Overview

Note **If you are installing only a floating license server, skip the rest of this chapter and go directly to Chapter 10, "Setting Up a Floating License Server" (page 155).**

89600-series installation consists of 2 to 6 basic steps: install software, set up measurement hardware, install I/O cards in your computer, configure I/O interfaces, and license your software. (If your analyzer does not include measurement hardware, you perform only the first and last steps.)

The details for each of these steps vary, depending on what kind of computer you are using, what type of interface connects your measurement hardware to the computer, and what operating system your computer uses. Details are included in various chapters in this book. You will not need to read and use every chapter. Most of the chapters are included in case you need more detailed instructions or encounter problems with installation.

Note If your 89600 order included VXI measurement hardware and either an embedded VXI computer or a laptop PC, all installation and licensing may have been done at the factory. If this is true, you only need to connect the hardware to the computer and start the analyzer.

Step 1 Install 89600-series software. See Chapter 2, "Installing 89600 software" (page 24).

Note If you are installing 89600 software in an Infiniium scope with a Windows XP operating system, go directly to Chapter 8, "Installing 89601 Software in Agilent Infiniium XP Scopes" (page 141).

If you are installing the 89607 WLAN Test or 89604 Distortion Suite software, you must first install the 89600 VSA software, even if you did not purchase the 89600 software. The installation CD includes 89601 Vector Signal Analyzer, 89607 WLAN Test, and 89604 Distortion Suite software. You can install all these applications and run them for two weeks on a trial license, but you must purchase and license the applications that you want to permanently enable.

If your analyzer does not include measurement hardware, skip to Step 5.

Step 2. Set up your measurement hardware.

a. For VXI measurement hardware, see: Chapter 3, "Introduction" (page 40). If the VXI modules are already installed in the mainframe, skip this step and continue with step b.

b. Set up and configure the LAN, USB, and/or GPIB interface in the instruments you plan to connect to the computer, referring to the instrument's user's guide for documentation on configuring I/O. (Look in the instrument user guide index under "GPIB" or "I/O configuration.").

   You probably can use the default settings. Just ensure that each instrument on the GPIB has a unique GPIB address; two instruments cannot use the same address.

Step 3. Install the necessary I/O interface cards in your computer.

a. For VXI measurement hardware, install the Agilent IEEE 1394 Host Adapter in your computer.

For desktop computer details, see: Chapter 4, "Installing the Agilent IEEE 1394 host adapter in your computer" (page 79). Use the instructions in this book rather than any installation instructions that came with the adapter. For laptop computer details, see: Chapter 4, "Installing the Agilent IEEE 1394 PCMCIA cardbus in your computer" (page 84).

b. If you require communication via GPIB, LAN, or USB and the interface has not been installed in your computer, install the interface card, following the instructions that came with the card. For details, see: Chapter 5, "Introduction" (page 88).

c. Connect all measurement hardware to the appropriate interface on your computer or to the LAN. Plug in and turn on all measurement hardware and your computer (if they are not already on).

Step 4. Configure I/O for your hardware interfaces.

a. If your measurement hardware is an Infiniium scope, see: Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

b. If your analyzer includes VXI measurement hardware, configure IEEE-1394. See: Chapter 6, "Configuring the VXI interface" (page 97) for details.

c. If you will be communicating with hardware via LAN, configure LAN. See: Chapter 6, "Configuring the LAN interface" (page 101) for details.

d. If you will be communicating with hardware via a LAN/GPIB Gateway, configure LAN-to-GPIB. See: Chapter 6, "Configuring the HP E5810 LAN/GPIB Gateway interface" (page 108) for details.

e. If you will be communicating with hardware via a USB/GPIB interface, configure LAN-to-GPIB. See: Chapter 6, "Configuring the USB/GPIB Interface" (page 111) for details.

f. If you will be communicating with hardware via GPIB, configure GPIB. See: Chapter 6, "Configuring the GPIB interface" (page 112) for details.

g. If you will be communicating with hardware via USB, configure USB. See: Chapter 6, "Configuring the USB Interface" (page 115) for details.

Step 5. License (obtain authorization for) your software. There are four types of licenses: trial (step a.), node-locked (step b.), network (step c.), or demo (step d.).

a. A trial license allows you to run the software for 14 days. During this 14-day period, all options are enabled. This allows you to try all the optional software and to use your analyzer while you obtain and install permanent authorization (license). To use the trial license, start the 89600 software. When you are asked if you want to obtain authorization, click **Yes,** then click the **Trial** tab and click **Accept Trial**.

b. For a node-locked license, follow these instructions:

1. Start the software as follows:

For an 89600 analyzer, double click the appropriate icon, or click **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer** or **Spectrum Analyzer**.

For Distortion Suite, click **Start > (All) Programs > Agilent Distortion Suite > Distortion Suite**. Continue with step 2.

For WLAN Test, click **Start > (All) Programs > Agilent WLAN Test > WLAN Test**. Continue with step 2.

2. Follow the instructions for obtaining and installing a site key. If you encounter problems or need more information, see "Installing a Node-Locked License," page 145.
3. Continue with Calibrate your analyzer, Step 6.

c. For a floating or network license, perform these steps:

1. Set up the license server as instructed in Chapter 10, "Setting Up a Floating License Server" (page 155).
2. Set up the license client as instructed in Chapter 11, "Setting Up a Floating License Client" (page 173).

d. For a demo license, perform these steps:

1. Start the analyzer by double clicking the Vector Signal Analyzer icon, or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer.**
2. Follow the instructions for accepting a Demo License.

Note Unlike other licenses, you must accept a Demo License each time you start the software. There is no limit to the number of times you can use a Demo License, but analyzer functionality is somewhat limited.

Step 6. Calibrate your analyzer.

Before making measurements, you should calibrate (or align) your analyzer to optimize measurement accuracy. Refer to the 89600 online help for details on calibration for your analyzer configuration.

- In the Agilent 89600 VSA (or Spectrum Analyzer) window, click **Utilities**. Position the pointer on **Calibration,** and press `F1` on the keyboard.
- In 89604 Distortion Suite, open help and look for Calibration in the Utilities menu or in the index.
- In 89607 WLAN Test, open help and look for Calibration in the Utilities menu or in the index.

Note For 2-RF-channel VXI measurement hardware, you can use the fixed equalization feature to better match the channels. See fixed equalization in the 89600 online help index.

2 Installing 89600 Software

Installing 89600 software

The Agilent 89600 Vector Signal Analyzer Installation Manager program guides you through software installation. If you have problems installing your software, see: Chapter 12, "Introduction to Diagnostics" (page 180) for assistance.

Note

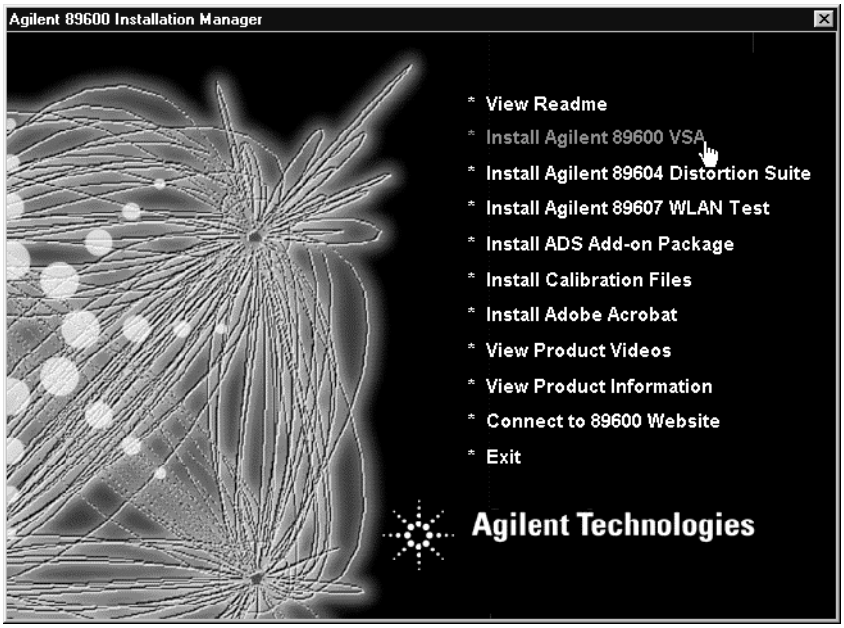
For Agilent Distortion Suite and WLAN Test applications, you must install 89600 VSA software before installing 89604 Distortion Suite or 89607 WLAN Test. The Distortion Suite and WLAN Test applications access 89600 VSA. However, if you did not purchase 89600 software, you will not be able to run 89600 VSA outside Distortion Suite or WLAN Test.

To install 89600 software:

1. Turn on the computer. If the computer is already on, close any applications you have open.
2. Insert the Agilent 89600 Series Software installation CD-ROM.
3. If the installation utility does not start automatically, click **Start > Run**, and type:

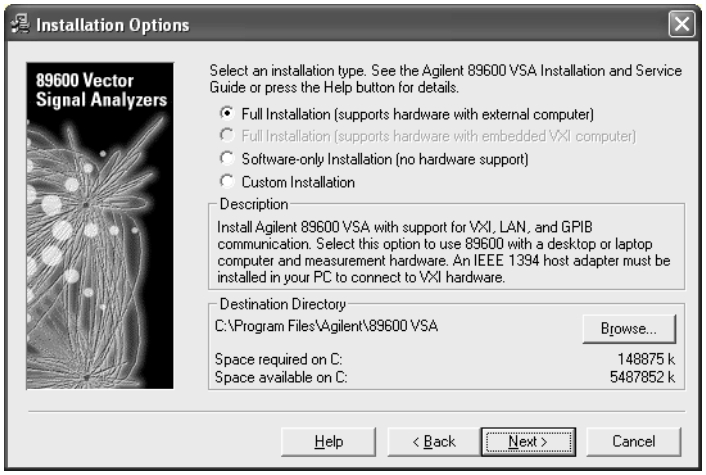
   drive:\autoplay.exe

   ...where *drive* represents the drive containing the installation CD-ROM. Click **OK.**
4. When the Agilent 89600 Installation Manager window opens, click **Install Agilent 89600 VSA**.



5. When the Welcome window opens, it is a good idea to read the ReadMe file.

6. After you read the ReadMe file, close it and click **Next** in the Welcome window.
7. Read the license agreement and warranty terms. Click **Yes** to accept the terms and continue installation. Click **No** if you do not accept the terms. If you click No, you will not be able to install the software.
8. In the Installation Options window, select the appropriate installation type.

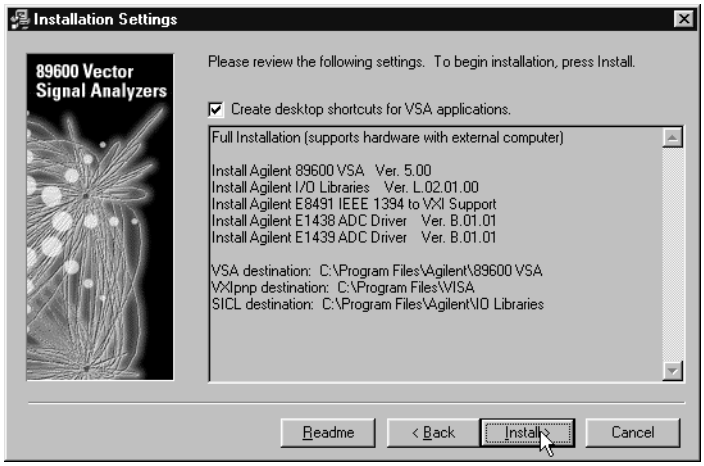


   - For a PC with measurement hardware, select **Full Installation (supports hardware with external computer).**
   - For a VXI embedded controller, select **Full Installation (supports hardware with embedded VXI computer).** This selection is available only if non-Agilent I/O libraries are detected on your computer. Agilent I/O libraries will not be installed with this selection.
   - For software only (no measurement hardware), select **Software-only Installation.**
   - **Custom Installation** is useful if you are installing 89600 license support, adding measurement hardware, or need to install drivers for new VXI hardware, but should not be used for first-time installation of 89600 VSA software.

9. If you want to install the software in a directory other than the default directory, click **Browse** to change the destination directory. The default directory (C:\Program Files\Agilent\89600 VSA) is recommended.

For a VXI embedded controller with an external hard disk, change the destination drive to match the hard disk.

10. After you have chosen the installation type and specified or accepted the destination directory, click **Next**. The Installation Settings screen appears. (This screen varies depending on the software installation type you chose.)



11. If you do not want desktop shortcuts (icons) created, click the checkbox to disable that option.

    Read any information that appears under the INFO, WARNING, or TO DO heading and perform whatever action is required (below).

INFO, WARNING, or TO DO Details

The information on this page explains what to do if there is information listed under INFO or TO Do in the Installation Settings window (step 10).

- **The resident Agilent IO libraries are the same as the bundled version, and will not be reinstalled.** The IO libraries currently installed on your computer are the same version as those on the 89600 installation CD. You can force a reinstall:
  1. Click **Back** and select **Custom Installation, Next.**
  2. Click **Select All**, then continue with step 12.
- **The resident Agilent IO libraries are older than the bundled version. Would you like to update them (recommended)?** The IO libraries currently installed on your computer are an older version than those on the 89600 installation CD. Click Yes if you want to update the IO libraries. If you click No, the 89600 software is not guaranteed to operate on your computer.

- **The resident Agilent IO libraries are newer than the bundled version, and will not be reinstalled.** If you want to install the IO libraries from the 89600 installation CD, you must remove the currently-installed libraries before proceeding"

  1. Exit installation.
  2. Click **Start > Settings > Control Panel > Add/Remove Programs**.
  3. Highlight Agilent IO libraries, click Add/Remove Programs, and follow the instructions.
  4. Rerun 89600 installation.

- **Any message about resident ADC drivers:** Follow the instructions in the message. If the message says you can force a reinstallation of the drivers for the E1438 or E1439 ADCs, follow these 2 steps:

  1. Click **Back** and select **Custom Installation > Next.**
  2. Click **Select All**, then return to step 12.

- **A third-party I/O Libraries has been detected on your computer. If you are using an embedded VXI PC, this is the only library you should install. If you are using an external PC, you must install the Agilent I/O Libraries.** Click the appropriate computer type (External PC or Embedded VXI PC.

  For an external PC, the Agilent I/O Libraries are installed in secondary mode. The third-party I/O Libraries remain installed.

  For an embedded VXI computer, the Agilent I/O Libraries are not installed. Finish software installation, then refer to the documentation for the resident I/O libraries for information on configuring the VXI hardware.

12. In the Installation Settings window, review the list of components that will be installed. If you want to change the list, click **Back**. Otherwise, click **Install**.

13. If you are reinstalling software and have an 89600 application running, you get an Installation Warning message, for example:

    Close the application referenced in the warning and click **Install** again. If you get the same Installation Warning message, exit installation, close all applications, reboot your computer, and start installation again.

14. The installation program preconfigures your system environment for 89600. If you are installing 89600-series software for the first time, the installation process may ask you to reboot your computer. Click **OK**.

Note

If you are installing from a remotely mounted CD-ROM drive, the remote drive must be configured to reconnect at logon so that the installation files can be found after the reboot.

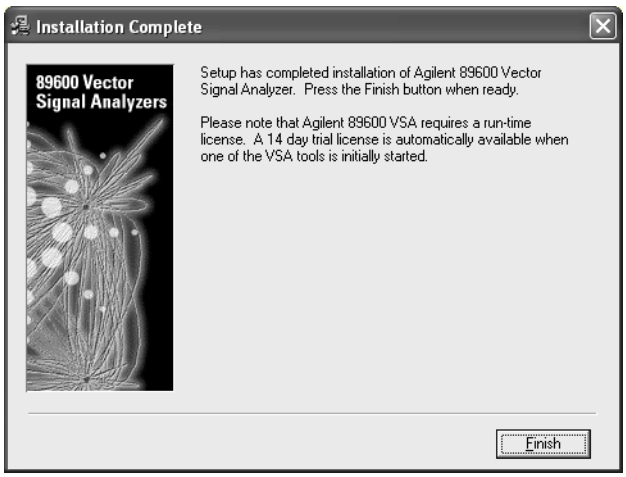
15. After the reboot, log on to your computer. Installation continues.

    If you are installing IO libraries, you will see messages advising you of this activity after the 89600 files are installed.

16. When the Installation Complete window appears, click **Finish**.

Note

If you have Agilent EEsof ADS software installed on your PC, the Installation Complete window includes a message saying you must install ADS add-ons. You will be told how to do this after 89600 software installation is complete.



17. The 89600 Installation Manager window reappears.

18. Your software has been installed. The Installation Manager includes the following utilities:

    If you want to install - - - - - - - - - - - - - - go to this page:

    Agilent WLAN Test - - - - - - - - - - - - - - page 30
    Agilent 89604 Distortion Suite - - - - - - - - - page 31
    89600 License Support for floating licenses - - page 32
    ADS Add-on Package - - - - - - - - - - - - - - page 35
    Calibration files (only for analyzers that include an Agilent E2730, E2731, or 89605 VXI module) - - - - - - - - - - - - - - - - - page 36
    Adobe Acrobat Reader - - - - - - - - - - - - - page 38.

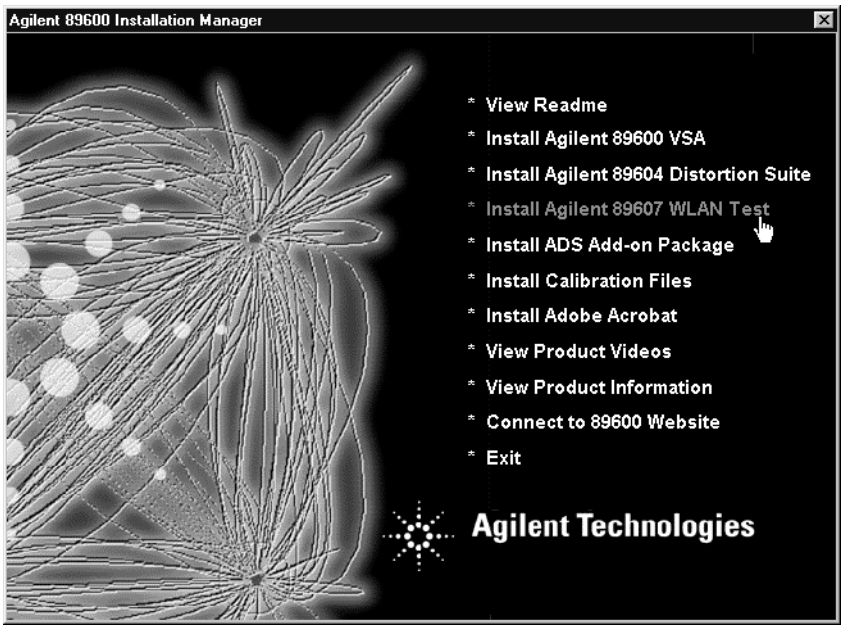
    If you do not need any of these utilities, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing Agilent 89607 WLAN Test software

Install the 89600 VSA software before the 89607 WLAN Test software, and install both from the same CD-ROM to ensure both applications are the same version.

To install Agilent 89607 WLAN test software:

1. Click **Install Agilent 89607 WLAN Test** in the Installation Manager window.



2. Follow the instructions in the installation wizard.

Note

This also installs the Microsoft .NET Framework if it is not already present on your PC and may require you to upgrade your browser or install a new service pack. In either case, detailed instructions are provided by the installation wizard.

3. After WLAN Test is installed, continue as follows:

   If you want to install - - - - - - - - - - - - - - go to this page:
   Agilent 89604 Distortion Suite - - - - - - - - - page 31
   89600 License Support- - - - - - - - - - - - - page 32
   ADS Add-on Package - - - - - - - - - - - - - - page 35
   Calibration files (only for analyzers that include an Agilent E2730, E2731, or 89605 VXI module)- - - - - - - - - - - - - - - - - page 36
   Adobe Acrobat Reader- - - - - - - - - - - - - page 38.

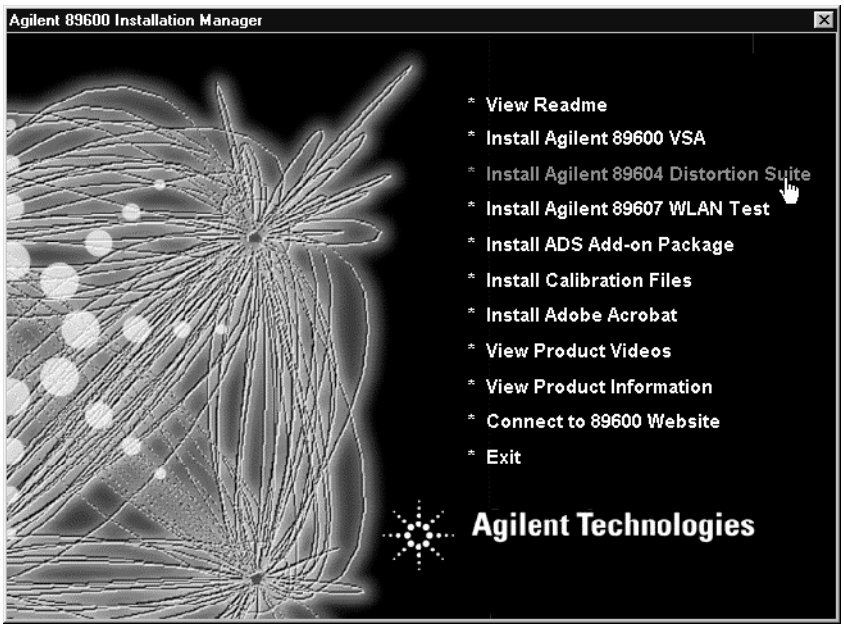
   If you do not need any of these utilities, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing Agilent 89604 Distortion Suite software

Install the 89600 VSA software before installing 89604 Distortion Suite software, and you install both from the same CD-ROM to ensure the same version.

To install Agilent 89604 Distortion Suite software:

1. To install Distortion Suite, click **Install Agilent 89604 Distortion Suite** in the Installation Manager window.



2. Follow the instructions in the installation wizard.

Note

This also installs the Microsoft .NET Framework if it is not already present and may require you to upgrade your browser or a new service pack.

3. After Distortion Suite is installed, continue as follows:

   If you want to install - - - - - - - - - - - - - go to this page:
   ADS Add-on Package - - - - - - - - - - - - - page 35
   Calibration files (only for analyzers that include an Agilent E2730, E2731, or 89605 VXI module) - - - - - - - - - - - - - - - - - page 36
   Adobe Acrobat Reader - - - - - - - - - - - - - page 38.

   If you do not need any of these utilities, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing 89600 license support

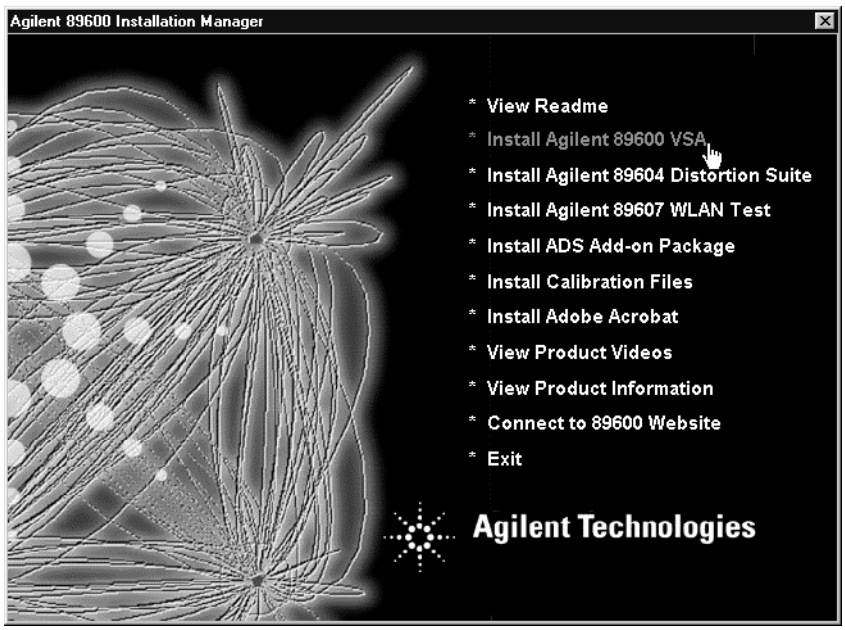
If you will be using a floating license for your software, you must install 89600 license support as follows.

Note

If you are installing 89600 license support for a license server (a PC on which you will *not* run the 89600 software), skip this section and see: Chapter 10, "Setting Up a Floating License Server."

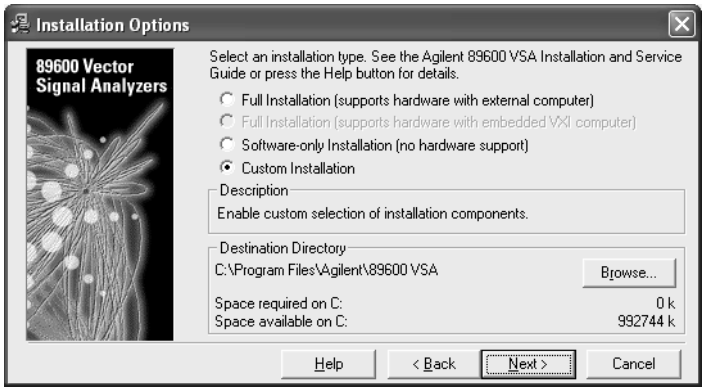
To install 89600 license support:

1. In the Installation Manager Window, click **Install Agilent 89600 VSA**.

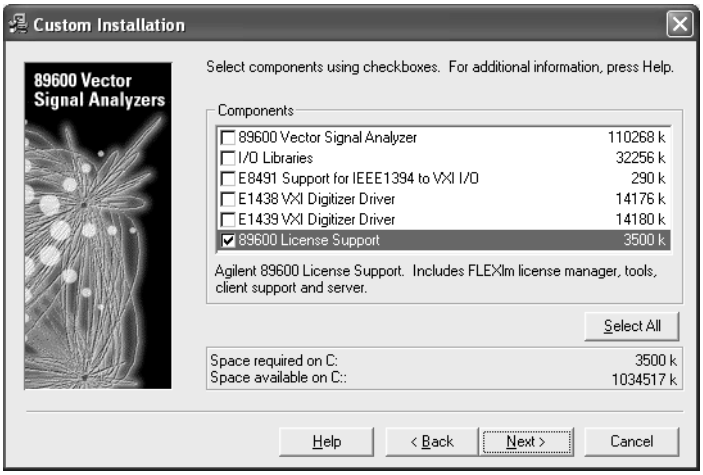


2. When the Welcome window opens, click **Next**.
3. Click **Yes** in the Software License and Warranty window.

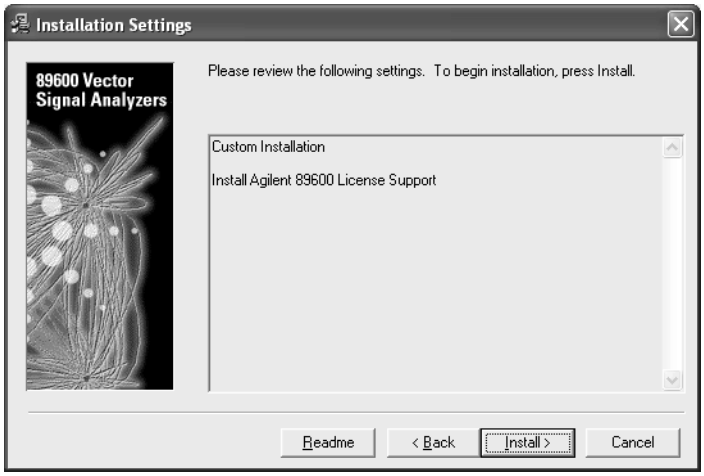
4. In the Installation Options window, click **Custom Installation**. Specify the same directory where you installed the 89600 software.



5. In the Installation Options window, check the **89600 License Support** check box.



6. Click **Next.** The Installation Settings screen appears.



7. In the Installation Settings window, review the list of components that will be installed. If you want to change the list, click **Back**. Otherwise, click **Install**.

8. After 89600 License Support is installed, continue as follows:

If you want to install - - - - - - - - - - - - - - - go to this page:

ADS Add-on Package - - - - - - - - - - - - - page 35
Calibration files (only for analyzers that include an Agilent E2730, E2731, or 89605 VXI module) - - - - - - - - - - - - - - - - - page 36
Adobe Acrobat Reader - - - - - - - - - - - - - page 38.

If you do not need any of these utilities, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing ADS add-on package

To use the analyzer with Agilent's EEsof Advanced Design System (ADS) program, you must have both programs installed on your computer. You must also integrate the two programs, following the instructions on this page.

If you have not yet installed your 89600 software, see: Chapter 1, "Installation Overview" (page 19).

The 89600 Installation program detects versions of ADS installed on your computer. If you have more than one ADS version installed, the installation program will select the latest version that the 89600 software supports.

ADS versions prior to 1.3 are not supported with the 89600 analyzer.

Note

To permanently enable the ADS integration, you must have purchased and licensed option 105 for your 89600 analyzer. If you did not purchase this option, you can integrate and use the 89600/ADS interface while your trial license is in effect but not after you install your permanent license.

To install ADS add-on package:

1. In the Installation Manager Window, click **Install ADS Add-on Package**.
   a. If the message in the window says an ADS version is installable, click the **Install** button at the bottom of the window.
   b. If the message says a version requires the ADS Add-on CD, use the ADS Add-on tools and documentation to install the add-on.
2. After you have installed the ADS Add-on Package, you can use other utilities in the Installation Manager Window:

   If you want to install - - - - - - - - - - - - - - go to this page:
   Calibration files (only for analyzers that include an Agilent E2730, E2731, or 89605 VXI module) - - - - - - - - - - - - - - - - - - page 36
   Adobe Acrobat Reader - - - - - - - - - - - - - - page 38.

   If you do not need any of these utilities, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing calibration files

The files contain factory calibration information unique to each 89605, E2730, and E2731 module. The files are required to ensure the accuracy of measurement results. When you make measurements, the analyzer will prompt you if the calibration files are not in the proper location. You will have the option of copying the files into the proper folder or running the measurement without calibration information. Measurement accuracy will be degraded if the calibration files are not in place.

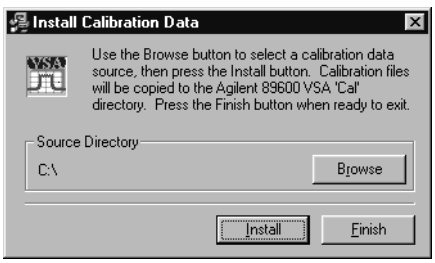
Note

Beginning with 89601A version 4.00, calibration files can be read directly from some modules. When calibration files are embedded in the module, the calibration disk for that module may not be included. For other modules, you must install the calibration files from the disks.

If the calibration files are not stored in your modules and you do not have the calibration disks, contact your sales and service office for information on getting the files.

To install the calibration files from disk:

1. If your computer can access both the CD-ROM drive and the 3.5” disk drive simultaneously, go to step 2. If your laptop computer requires you to swap the CD-ROM drive and the 3.5” disk drive:
   a. Click **Exit** in the Installation Manager window.
   b. Click **Start > (All) Programs > Agilent 89600 VSA > Install Calibration Files.**
   c. Go to step 3.
2. In the main Installation window, click **Install Calibration Files**.



3. Insert the calibration disk in the drive on your computer.
4. In the Install Calibration Data window, and if necessary, click **Browse** and specify the disk drive where you inserted the calibration disk.
5. Click **Install**. If no calibration files are found at the specified location, you get an error message. Verify that you specified the correct source drive. Click **OK**.
6. Insert another calibration disk (if you have more than one) and click **Install** again.
7. When you have installed all the calibration files, click **Exit**.

8. Put the calibration disks in the holder in the *89600 Installation Guide* binder. If you move the E2730, E2731, or 89605 module to another system or install a replacement module, you must copy the calibration files for the module. The file names are <module#_serial#.cal> (for example, 89605A_USXXXX0125.cal). To find the serial number of a module:

   a. Start the 89600 software. Click **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer.**

   b. Click **Utilities > Hardware**, and the appropriate tab for the module.

   c. Select the module from the list.

   d. Then click **Info...** The information window lists the module serial number, driver revision, and firmware revision.

9. To install new calibration files, you can click **Start > (All) Programs > Agilent 89600 VSA > Install Calibration Files**.

   If you want to install - - - - - - - - - - - - - - go to this page:
   Adobe Acrobat Reader - - - - - - - - - - - - - page 38.

   Otherwise, click Exit in the Installation Manager window and continue with step 2 on page 19.

Installing Adobe Acrobat Reader

You can install Adobe Acrobat Reader directly from the 89600 software installation CD, or you can download from the Adobe Web site: http://www.adobe.com. To install from the 89600 CD, click **Install Adobe Acrobat** in the Installation Manager Window, then follow the instructions in subsequent windows. When done, click **Exit** in the Installation Manager window.

If you are installing measurement hardware, continue with step 2 on page 19. Otherwise, continue with step 5 on page 20.

3 Setting Up VXI Hardware

Introduction

This chapter includes instructions on configuring your VXI measurement hardware, installing the VXI hardware modules into the VXI mainframe, and connecting front-panel cables. See: Chapter 1, "Installation Overview" (page 11) to learn which procedures you must perform to install your Agilent 89600-series product.

Note

If you purchased an Agilent 89610, 89611, 89640, or 89641, everything in this chapter was done at the factory except connecting the cables for an external down converter. If your analyzer uses an external down converter, see the appropriate illustration at the end of the chapter. Otherwise, continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

For information on configuring other measurement hardware, see 89600 online help under **Installation and Licensing > Hardware Setup**.

Inspecting Agilent 89600-series VXI modules

The Agilent 89600-series VXI modules were carefully inspected both mechanically and electrically before shipment. They should be free of marks or scratches upon receipt.

If a module was damaged in transit, do the following:

- Save all packing materials.
- File a claim with the carrier
- Call your Agilent Technologies sales and service office (phone numbers available at www.agilent.com/find/89600.

Note

If you ordered a 2-channel analyzer, the two E1438 or E1439 modules must have the same amount of memory.

Setting up Agilent 89600 series VXI mainframe and modules

Caution To protect circuits from static discharge, observe anti-static techniques whenever handling the Set logical addresses

Important For safety, environment, regulatory, and mains power specifications, see the user or service manual for your VXI mainframe.

Set logical addresses

This section includes information on setting logical addresses.

To set logical addresses:

1. Check the logical address switches for each VXI module. (See Figure 3-1 through Figure 3-5 on the following pages.) Except for the E2730 and E2731 modules, each module in the system must have a unique logical address. The following table lists the factory default settings (the addresses for second-channel 89605, E1438, AND E1439 modules must be different).

   For 2-channel systems, the addresses must be different for the two modules

VXI module	Default address	Figure showing address switch location
Agilent 89605	14 (0000 1110)	Figure 3-1 on page 343
Agilent E2730 or E2731	255 (1111 1111)	Figure 3-2 on page 343
Agilent E1439	194 (1100 0010)	Figure 3-3 on page 344
Agilent 89606	15 (0000 1111)	Figure 3-4 on page 345
Agilent E1438	192 (1100 0000)	Figure 3-5 on page 346

2. If you need to change the address setting for a module, use a small screwdriver or similar tool to move the switches to the correct position. The figures on the following pages show the location and default setting of the logical address switches for each module.

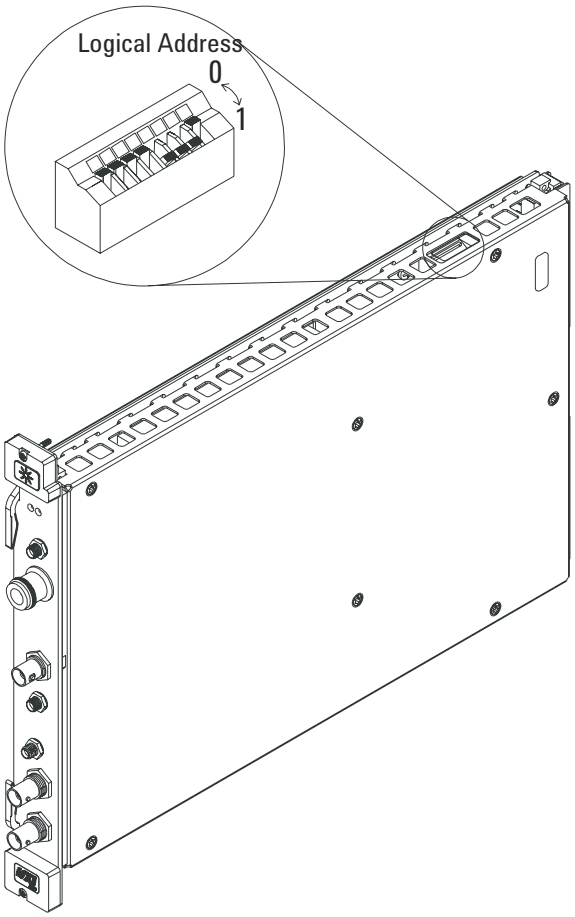


Figure 3-1 **89605 Input module -- address 14 (000 1110)**

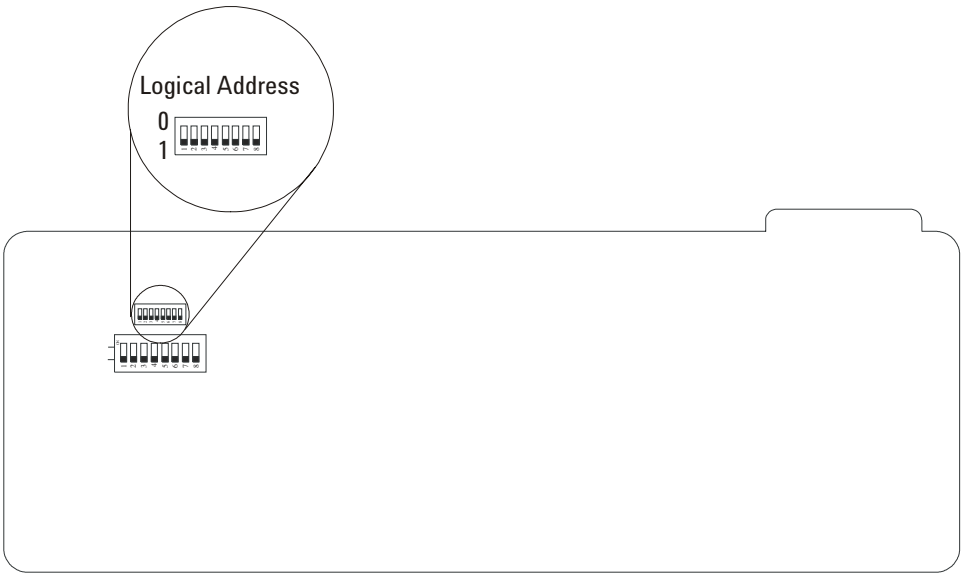


Figure 3-2 **E2730 or E2731 RF Tuner module -- address 255 (1111 1111) (This setting enables dynamic addressing, so that the address is automatically assigned.)**

For 2-channel systems, the addresses must be different for the two E1439 modules.

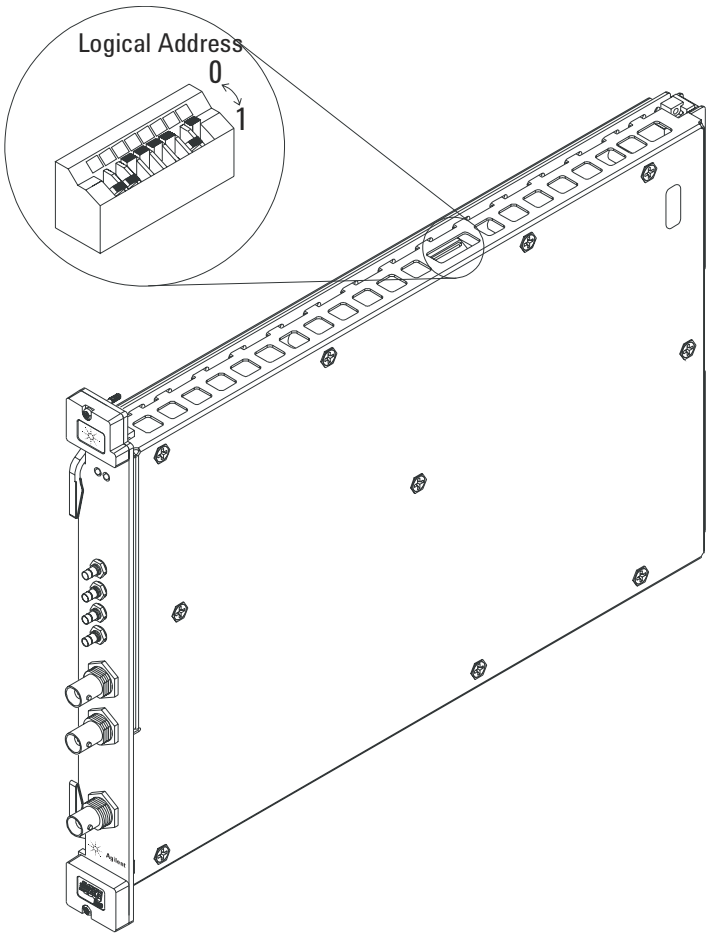


Figure 3-3 **E1439 ADC module -- address 194 (1100 0010)**

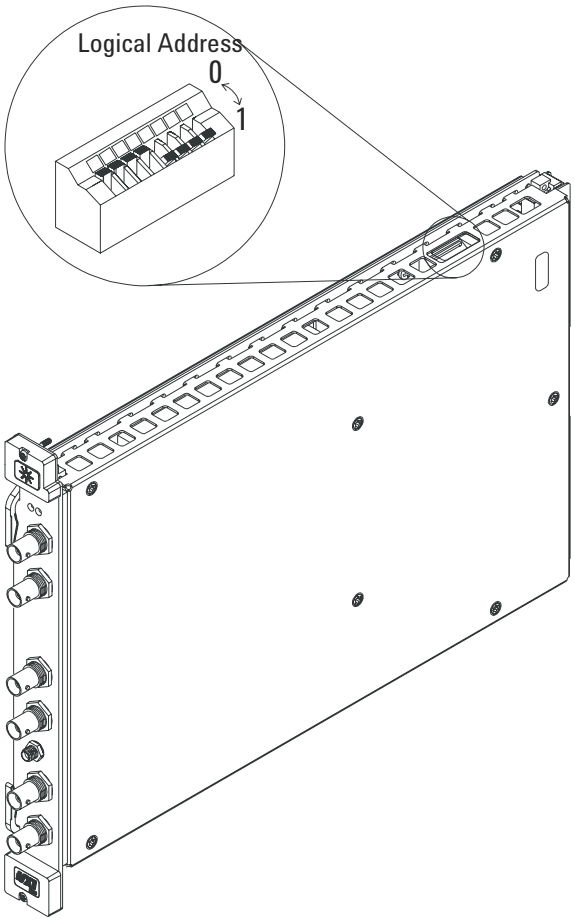


Figure 3-4 **89606 module -- address 15 (0000 1111)**

For 2-channel systems, the addresses must be different for the two E1438 modules.

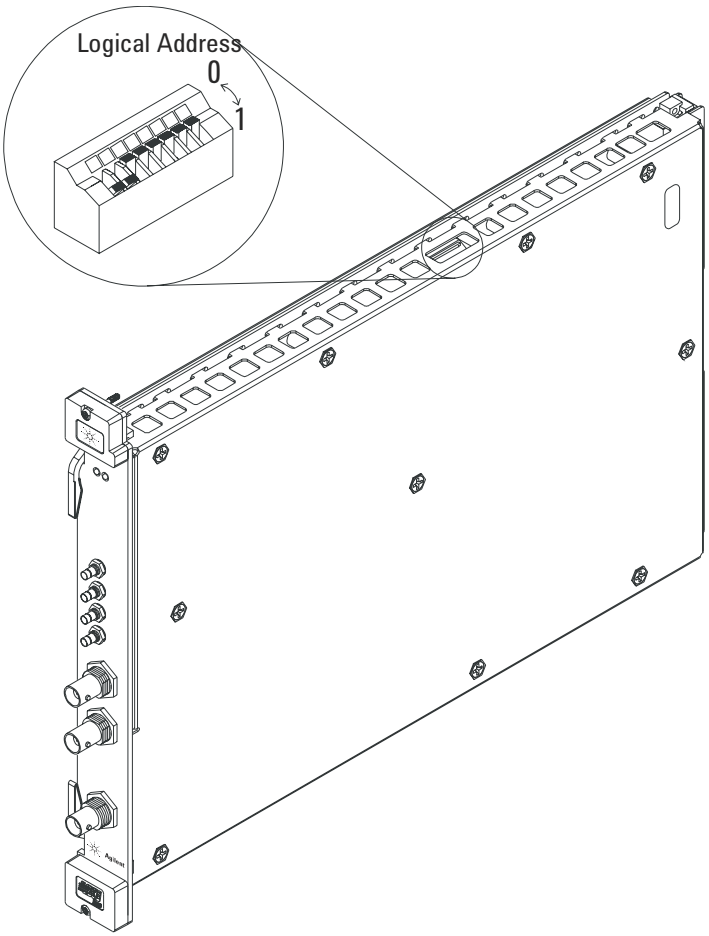


Figure 3-5 **E1438 ADC module -- address 192 (1100 0000)**

Installing modules in the mainframe

Refer to Figure 3-6 for installing modules in the mainframe.

To install modules in the mainframe:

1. Unpack your VXI mainframe.

Important

For safety, environment, regulatory, and mains power specifications, see the user or service manual for your VXI mainframe.

2. Set the mainframe's power switch to off (0).

Caution

Be sure the power is off before installing modules in the mainframe. Installing or removing a module with power on may damage components in the module.

3. Be sure to put each module in the correct slot (see "Configuring your VXI hardware" (page 48).
4. Place the module's card edges (top and bottom) into the module guides in the slot.
5. Install the module into the mainframe. (Note: the E2730 module does not have insertion/extraction levers.)

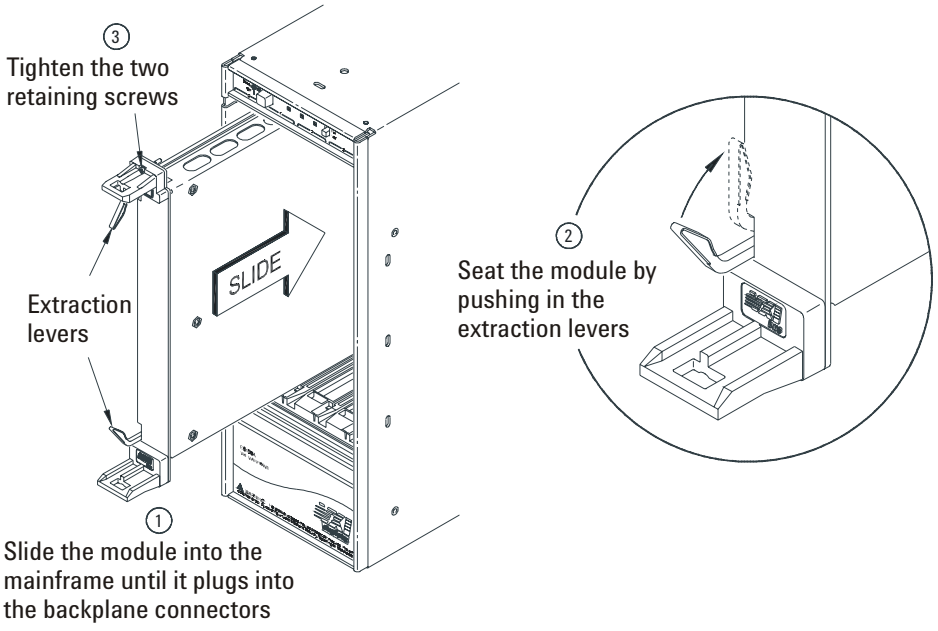


Figure 3-6 **Installing a VXI module in the mainframe**

Configuring your VXI hardware

Your Agilent 89600 series VXI modules must be installed in a specified order in the VXI mainframe. There are eight possible configurations:

- Agilent 89610 Single-channel DC-40 MHz analyzer (page 49)
- Agilent 89610 Two-channel DC-40 MHz analyzer (page 50)
- Agilent 89611 70 MHz IF analyzer (page 51)
- Agilent 89611 Two-channel 70 MHz IF analyzer (page 52)
- Agilent 89640 DC-2.7 GHz analyzer (page 53)
- Agilent 89640 DC-2.7 GHz analyzer with second IF/baseband channel (page 54)
- Agilent 89640 DC-2.7 GHz analyzer with second RF channel (page 55)
- Agilent 89641 DC-6 GHz analyzer (page 56)
- Agilent 89641 DC-6 GHz analyzer with second IF/baseband channel (page 57)
- Agilent 89641 DC-6 GHz analyzer with second RF channel (page 58)

Note

If you are using a VXI mainframe with more than 4 slots, the Agilent E8491 module or VXI imbedded PC must be installed in slot 0. The other 89600 series modules are not required to be installed in slots 1 through 3. However, the modules must be installed relative to each other in the order described in Figure 3-7 through Figure 3-16.

89610 Single-channel DC-40 MHz analyzer

This configuration includes 3 modules (Figure 3-7), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89606 Baseband Input
2	Agilent E1438 ADC

Note that this illustration shows an 89606B input module. Your analyzer might include an 89606A input; the configuration is the same for both modules.

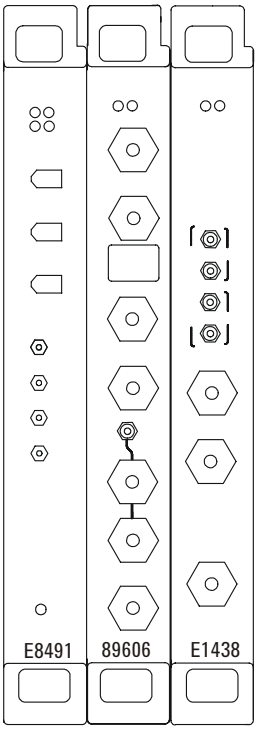


Figure 3-7 **89610 DC-40 MHz analyzer**

89610 Two-channel DC-40 MHz analyzer

This configuration includes 4 modules (Figure 3-8), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89606 Baseband Input
2	Agilent E1438 ADC
3	Agilent E1438 ADC

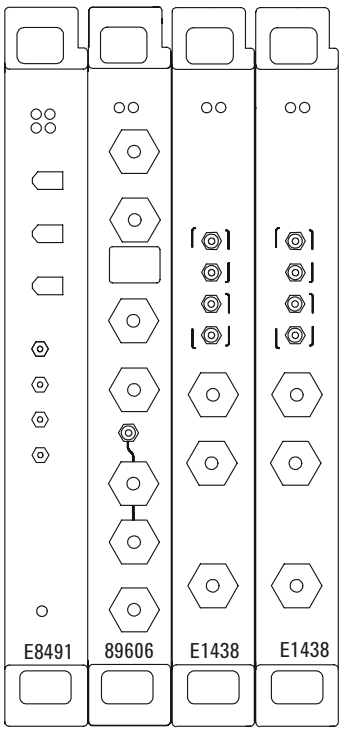


Figure 3-8 **89610 Two-channel DC-40 MHz analyzer**

89611 70 MHz IF analyzer

This configuration includes 3 modules (Figure 3-9), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E1439 RF ADC

Note that this illustration shows an 89605B input module. Your analyzer might include an 89605A input. The configuration is the same for both modules.

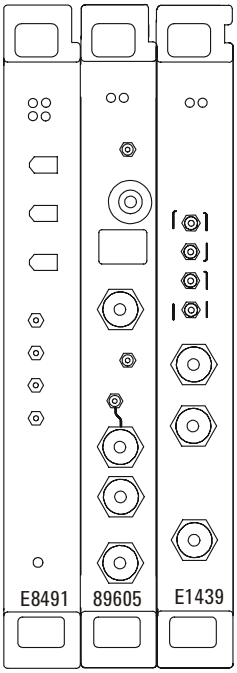


Figure 3-9 **89611 analyzer**

89611 Two-channel 70 MHz IF analyzer

This configuration includes 5 modules (Figure 3-10), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E1439 RF ADC
3	Agilent 89605B RF Input
4	Agilent E1439 RF ADC

Note

The 2-channel 89611 requires an 89605B module and an E1439C module for the second channel (slots 3 and 4 in Figure 3-10). The modules for channel 1 can be either 89605B or A and E1439 C or A.

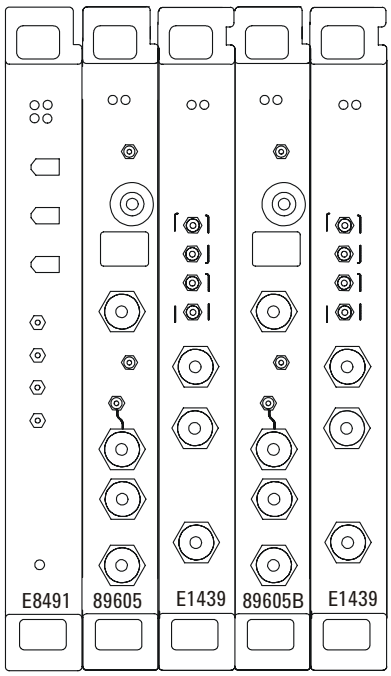


Figure 3-10 **2-channel 89611 analyzer**

89640 DC-2.7 GHz analyzer

This configuration includes 4 modules (Figure 3-11), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2730 RF Tuner
3	Agilent E1439 RF ADC

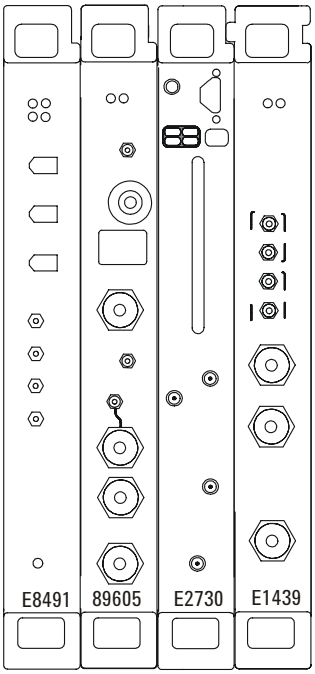


Figure 3-11 **89640 DC-2.7 GHz analyzer**

89640 DC-2.7 GHz analyzer with second IF/baseband channel

This configuration includes 6 modules (Figure 3-12), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2730 RF Tuner
3	Agilent E1439 RF ADC
4	Agilent 89605B RF Input
5	Agilent E1439 RF ADC

Note

The 2-channel 89640 requires an 89605B module and an E1439C module for the second channel (slots 3 and 4 in Figure 3-12). The modules for channel 1 can be either 89605B or A and E1439 C or A.

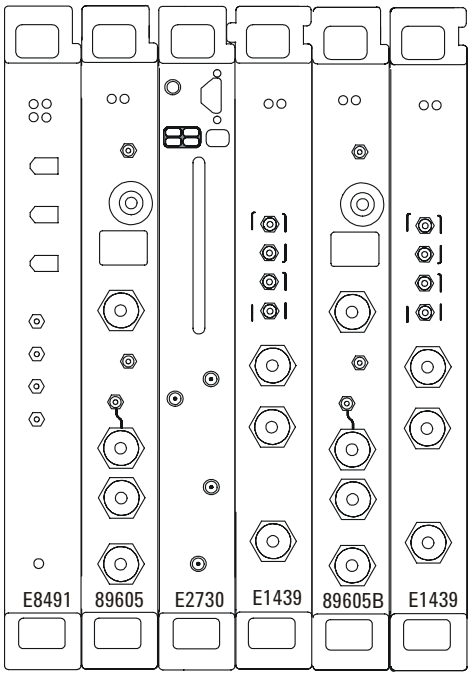


Figure 3-12 **89640 DC-2.7 GHz analyzer with second IF/baseband channel**

89640 DC-2.7 GHz analyzer with second RF channel

This configuration includes 7 modules (Figure 3-13), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2730 RF Tuner
3	Agilent E1439 RF ADC
4	Agilent 89605B RF Input
5	Agilent E2730 RF Tuner
6	Agilent E1439 RF ADC

Note

The 2-channel 89640 requires an E2730B modules for both channels and an 89605B module and an E1439C module for the second channel (slots 3 and 4 in Figure 3-13). The modules for channel 1 can be either 89605B or A and E1439C or A.

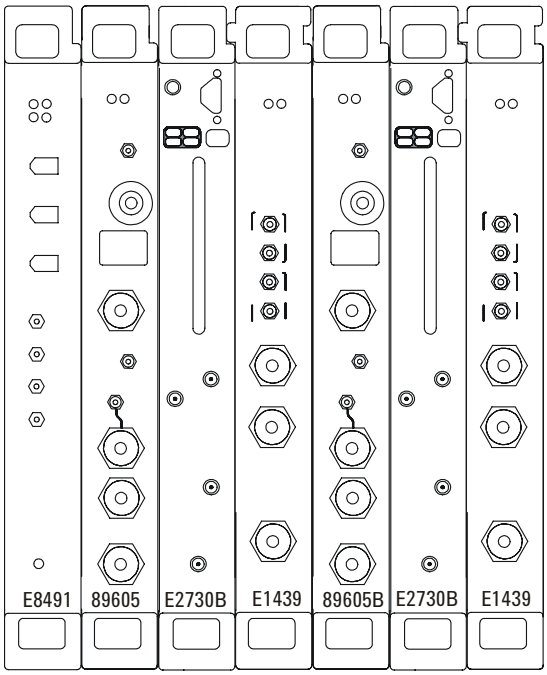


Figure 3-13 **89640 DC-2.7 GHz analyzer with second RF channel**

89641 DC-6 GHz analyzer

This configuration includes 4 modules (Figure 3-14), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2731 RF Tuner
3	Agilent E1439 RF ADC

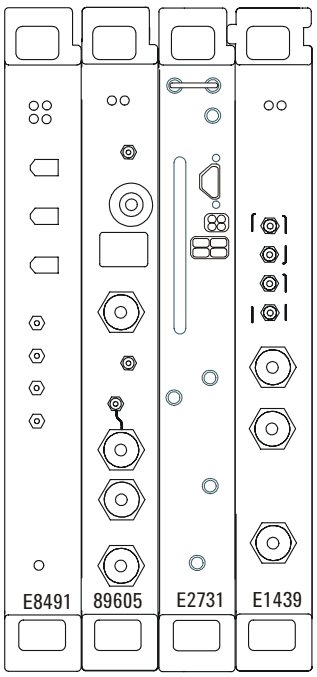


Figure 3-14 **89641 DC-6 GHz analyzer**

89641 DC-6 GHz analyzer with second IF/baseband channel

This configuration includes 6 modules (Figure 3-15), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2731 RF Tuner
3	Agilent E1439 RF ADC
4	Agilent 89605B RF Input
5	Agilent E1439 RF ADC

Note

The 2-channel 89641 requires an 89605B module and an E1439C module for the second channel (slots 3 and 4 in Figure 3-15). The modules for channel 1 can be either 89605 B or A and E1439 C or A.

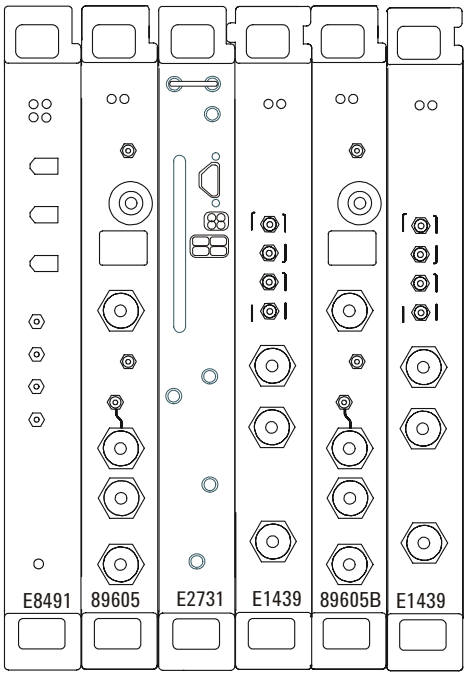


Figure 3-15 **89641 DC-6 GHz analyzer with second IF/baseband channel**

89641 DC-6 GHz analyzer with second RF channel

This configuration includes 7 modules (Figure 3-16), which must be installed in this order:

Mainframe slot	VXI module
0	Agilent E8491 Interconnect
1	Agilent 89605 RF Input
2	Agilent E2731 RF Tuner
3	Agilent E1439 RF ADC
4	Agilent 89605B RF Input
5	Agilent E2731 RF Tuner
6	Agilent E1439 RF ADC

Note

The 2-channel 89641 requires an 89605B module, an E2731B module, and an E1439C module for the second channel (slots 3 and 4 in Figure 3-16). The modules for channel 1 can be either 89605B or A, E2731B or A, and E1439C or A.

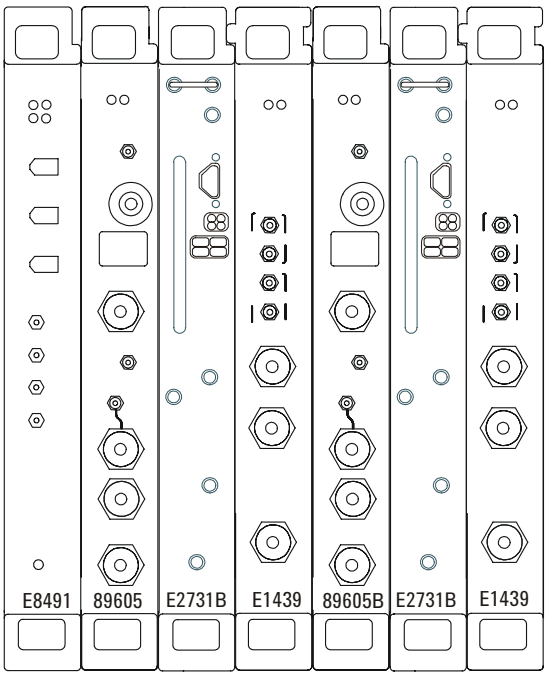


Figure 3-16 **89641 DC-6 GHz analyzer with second RF channel**

Connecting front panel cables

The illustrations on the following pages show the cable connections for 11 configurations of Agilent 89600 series analyzers. Below each illustration is a table listing each cable, termination, and adapter with a description and part number.

For a single-channel 89610A, see page 60.

For a two-channel 89610A, see page 61.

or an 89610A with external down converter, see page 62.

For a single-channel 89611A, see page 63.

For an 89611A with PSA option H70, see page 64

For a two-channel 89611A, see page 66.

For a single-channel 89640A, see page 67.

For an 89640A with second IF/baseband channel, see page 68.

For an 89640A with second RF channel, see page 69.

For an 89640A with external down converter, see page 70.

For a single-channel 89641A, see page 71.

For an 89641A with second IF/baseband channel, see page 72.

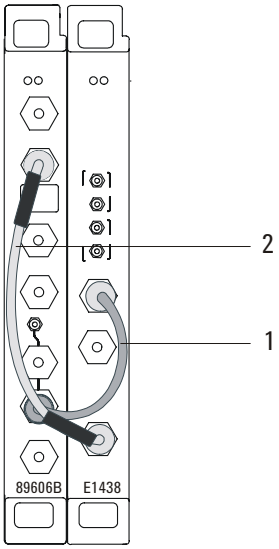
For an 89641A with second RF channel, see page 73.

For an 89641A with external down converter, see page 75.

Note

If you change or replace any cables, be sure to do a calibration to compensate for variance in cable characteristics before you make measurements.

Cable connections, 89610



	Description	Connection	Part number
1	black BNC-BNC cable (172 mm)	89606 *10 MHz Ref Out* to E1438A *Ext Clock/Ref*	8120-6237
2	black BNC-BNC cable (267mm)	89606 *To ADC Analog In* to E1438 *Analog In*	8121-0133

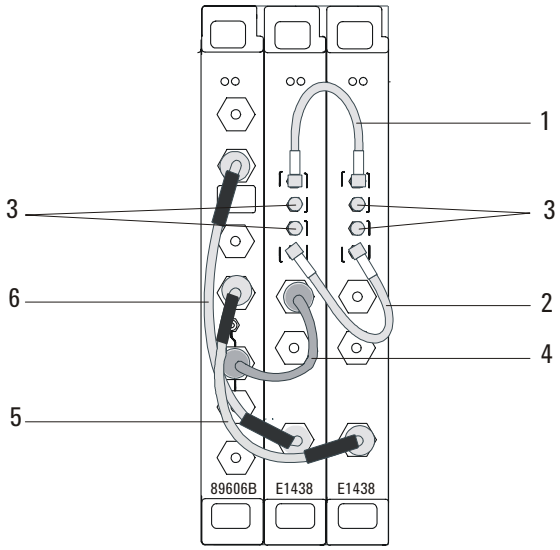
After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, two-channel 89610

The following cable connections for the 2-channel 89610 are especially important:

- You must connect one set of Clock connectors and one set of Sync connectors between the two E1438 modules. The two cables used for these connections must be exactly the same length to avoid timing and synchronization problems.
- You must connect the 10 MHz Ref Out from the 89606 module to the Ext Clock/Ref connector on the E1438 module adjacent to the 89606 module.
- If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1438) trigger input.

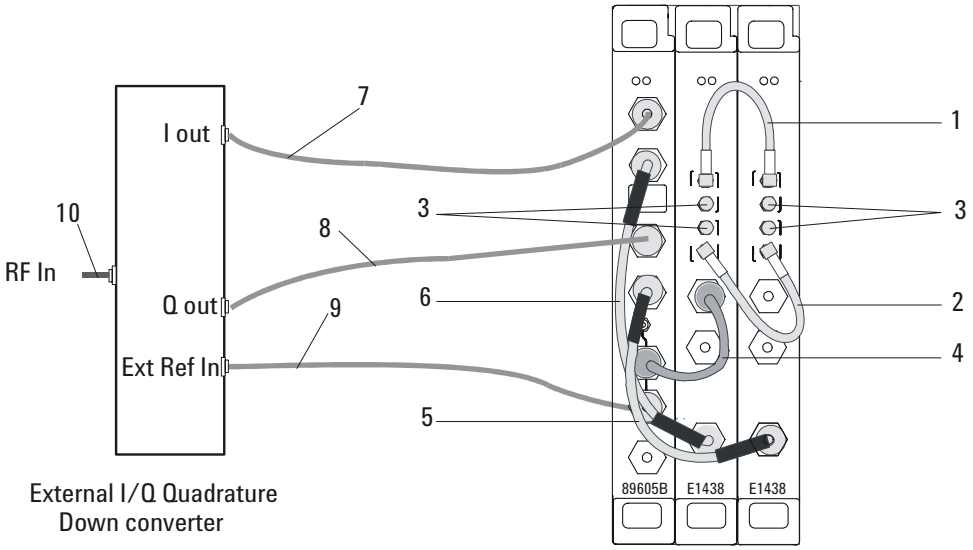


	Description	Connection	Part number
1	orange SMB-SMB cable (100 mm)	E1438 #1 *Clock* to E1438 #2 *Clock*	03585-61603
2	orange SMB-SMB cable (100 mm)	E1438 #1 *Sync* to E1438 #2 *Sync*	03585-61603
3	50 ohm SMB term (Qty 4)	Unused E1438 *Clock* & *Sync* connectors	1250-0676
4	black BNC-BNC cable (172 mm)	89606 *10 MHz Ref Out* to E1438A #1 *Ext Clock/Ref*	8120-6237
5	black BNC-BNC cable (215 mm)	89606 *To ADC 2 Analog In* to E1438A #2 *Analog In*	8121-0132
6	black BNC-BNC cable (267 mm)	89606 *To ADC 1 Analog In* to E1438A #1 *Analog In*	8121-0133

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89610 with external down converter

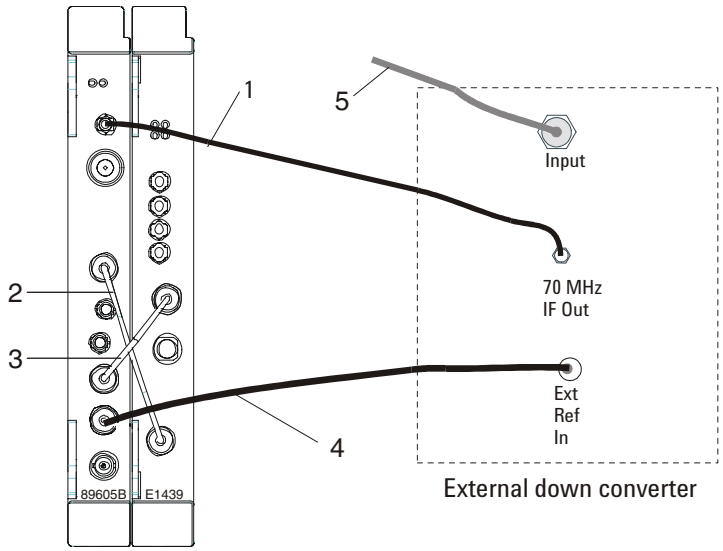


	Description	Connection	Part number
1	orange SMB-SMB cable (100 mm)	1438 #1 to E1438 #2 Clock	03585-61603
2	orange SMB-SMB cable (100 mm)	E1438 #1 to E1438 #2 Sync	03585-61603
3	50 ohm SMB term (Qty 4)	Unused E1438 Clock & Sync connectors	1250-0676
4	black BNC-BNC cable (172 mm)	89606 to E1438 Ext Clock/Ref	8120-6237
5	black BNC-BNC cable (215 mm)	89606 to E1438 #2 Analog In	8121-0132
6	black BNC-BNC cable (267mm)	89606 to E1438 #1 Analog In	8121-0133
7	varies	down converter I Out to 89606 Ch1 In	user supplied
8	varies	down converter Q Out to 89606 Ch2 In	user supplied
9	BNC	89606 10 MHz Ref Out to down converter Ext Ref In	user supplied
10	varies	down converter RF input	user supplied

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89611



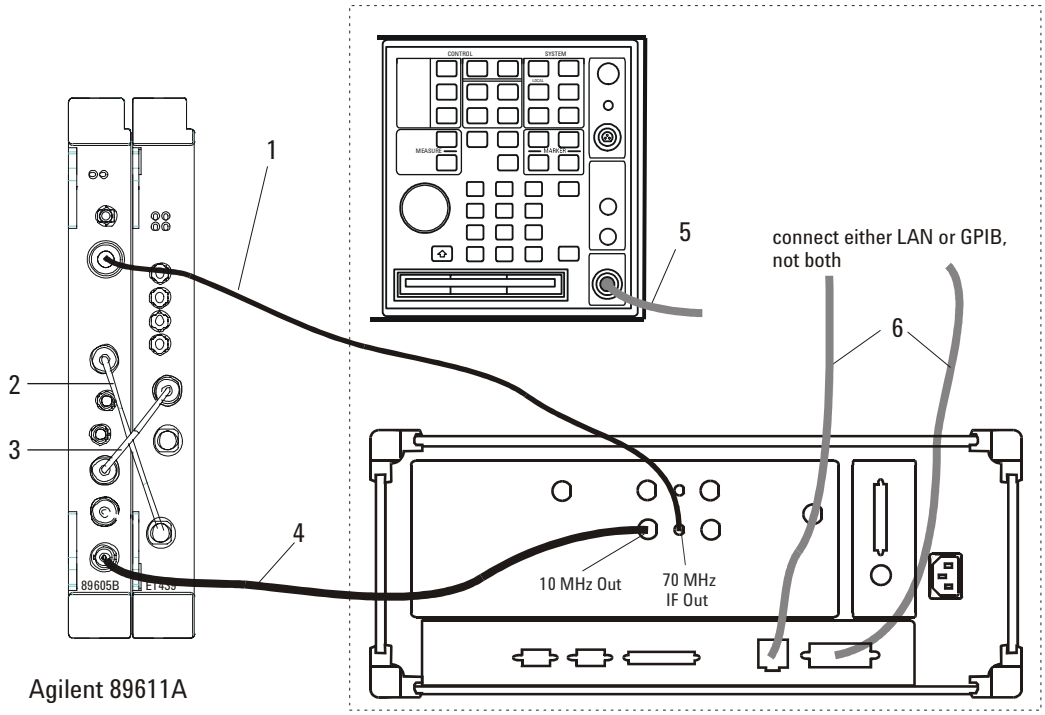
	Description	Connection	Part number
1	SMA-SMA cable (requires a type N-SMA adapter)	from external tuner IF output to 89605 *Ch 1 Input*	8121-0790 (cable) 1250-1250 (adapter)
2	black BNC-BNC cable (215 mm)	from 89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
3	black BNC-BNC cable (215 mm)	from 89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
4	BNC-BNC cable	from 89605 *10 MHz Ref Out* to external tuner *Ext Ref In* (or from external tuner *10 MHz Ref Out* to 89605 *Ext Ref In*)	user supplied
5	varied	input to down converter	user supplied

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89611 with PSA Option H70

This configuration replaces the VXI tuner module with an Agilent PSA option H70.



Agilent 89611A

Agilent PSA option H70

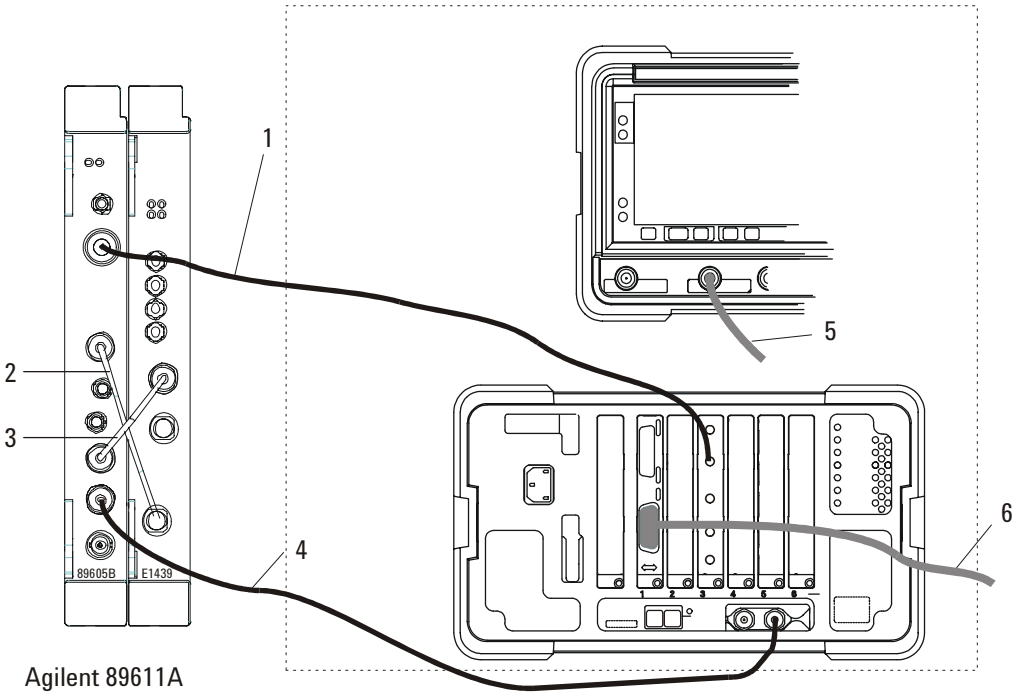
	Description	Connection	Part number
1	SMA-SMA cable with a type N-SMA adapter	from PSA 70 MHz IF output to 89605 *Ch 1 Input*	8121-0790 (cable) 1250-1250 (adapter)
2	black BNC-BNC cable (215 mm)	from 89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
3	black BNC-BNC cable (215 mm)	from 89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
4	BNC-BNC cable	from 89605 *10 MHz Ref Out* to PSA *Ext Ref In* (or from PSA *10 MHz Ref Out* to 89605 *Ext Ref In*)	user supplied
5	varies	PSA RF input	user supplied
6	LAN or GPIB cable	LAN or GPIB connector to PC (not both)	varies

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89611 with ESA Option H70

This configuration replaces the VXI tuner module with an Agilent ESA option H70.



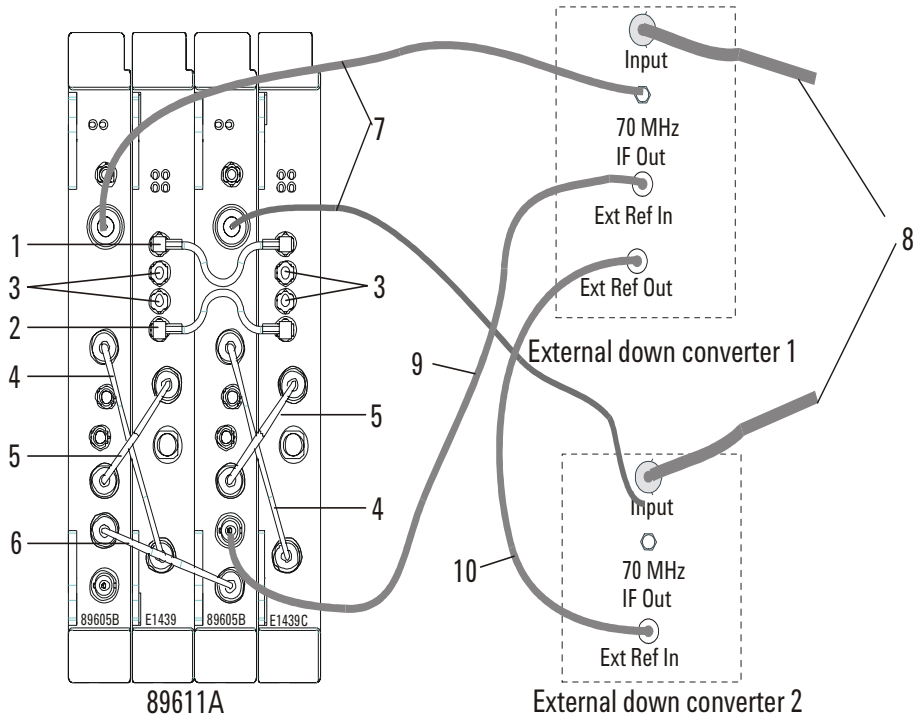
Note that the cards may be installed in a different order in the slots, so the GPIB connector and the 70 MHz Out connector may be in different locations on the rear panel.

	Description	Connection	Part number
1	SMA-SMA cable with a type N-SMA adapter	from ESA 70 MHz IF output to 89605 *Ch 1 Input*	8121-0790 (cable) 1250-1250 (adapter)
2	black BNC-BNC cable (215 mm)	from 89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
3	black BNC-BNC cable (215 mm)	from 89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
4	BNC-BNC cable	from 89605 *10 MHz Ref Out* to *E*SA *Ext Ref In* (or from ESA *10 MHz Ref Out* to 89605 *Ext Ref In*)	user supplied
5	varies	ESA RF input	user supplied
6	GPIB cable	ESA GPIB connector to PC	varies

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, two-channel 89611



Note

If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1439) trigger input.

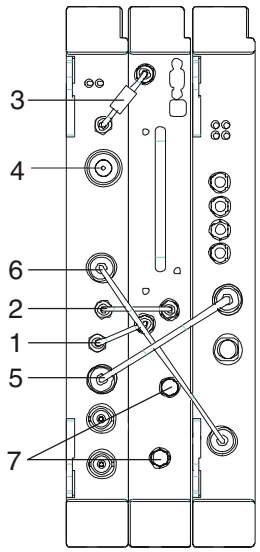
The interconnections for the 10 MHz reference signals can be different, but you must ensure that all the hardware is referenced to one signal.

	Description	Connection	Part number
1	orange SMB-SMB cable (100 mm)	E1439 #1 *Clock* to E1439 #2 *Clock*	03585-61603
2	orange SMB-SMB cable (100 mm)	E1439 #1 *Sync* to E1439 #2 *Sync*	03585-61603
3	50 ohm SMB term (Qty 4)	Unused E1438 *Clock* & *Sync* connectors	1250-0676
4	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
5	black BNC-BNC cable (215 mm)	from 89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
6	black BNC-BNC cable (215 mm)	from 89605 1 *10 MHz Ref Out* to89605 2 *Ext Ref In*	8121-0132
7	varies	external down converter *70 MHz IF Out* to *89605 Ch 1 Input*	user supplied
8	varies	input to down converter	user supplied
9	varies	from 89605 #2 *10 MHz Ref Out* to external down converter #1 *Ext Ref In*	user supplied
10	varies	from external down converter #1 *10 MHz Ref Out* to external down converter #2 *Ext Ref In*	user supplied

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89640



	Description	Connection	Part number
1	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2730 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
2	semi-rigid SMA cable	E2730 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
3	semi-rigid SMA cable	89605 *To RF In* to E2730 *RF In*	89605-61692
4	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
5	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
6	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
7	coax SMA cap	E2730 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

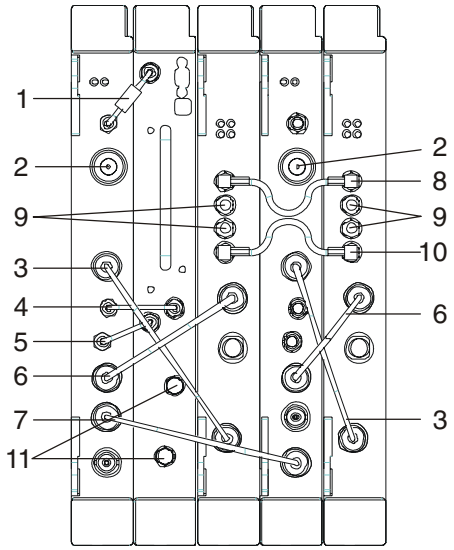
Note

It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89640 with second IF/baseband channel



Note

If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1439) trigger input.

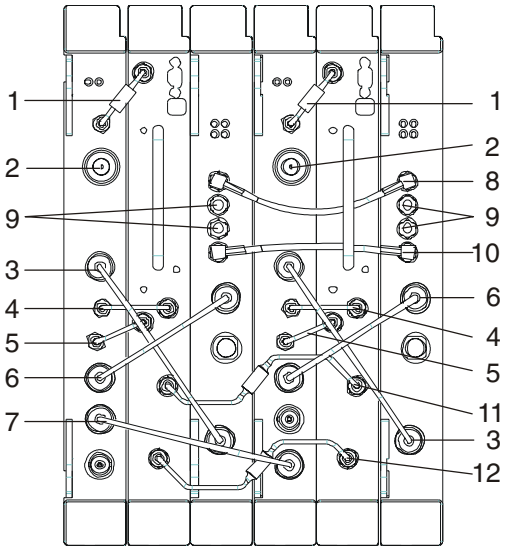
It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

	Description	Connection	Part number
1	semi-rigid SMA cable	89605 *To RF In* to E2730 *RF In*	89605-61692
2	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
3	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
4	semi-rigid SMA cable	E2730 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
5	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2730 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
6	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
7	black BNC-BNC cable (215 mm)	89605-1 *10 MHz Ext Ref Out* to 89605-2 *Ext Ref In*	8121-0132
8	orange SMB-SMB cable (100 mm)	E1439 #1 *Clock* to E1439 #2 *Clock*	03585-61603
9	50 ohm SMB term (Qty 4)	Unused E1438 *Clock* & *Sync* connectors	1250-0676
10	orange SMB-SMB cable (100 mm)	E1439 #1 *Sync* to E1439 #2 *Sync*	03585-61603
11	coax SMA cap	E2730 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89640 with second RF channel



Note If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1439) trigger input. It is important that you use the semi-rigid SMA cables shipped with the analyzer; using other cables could degrade measurement accuracy.

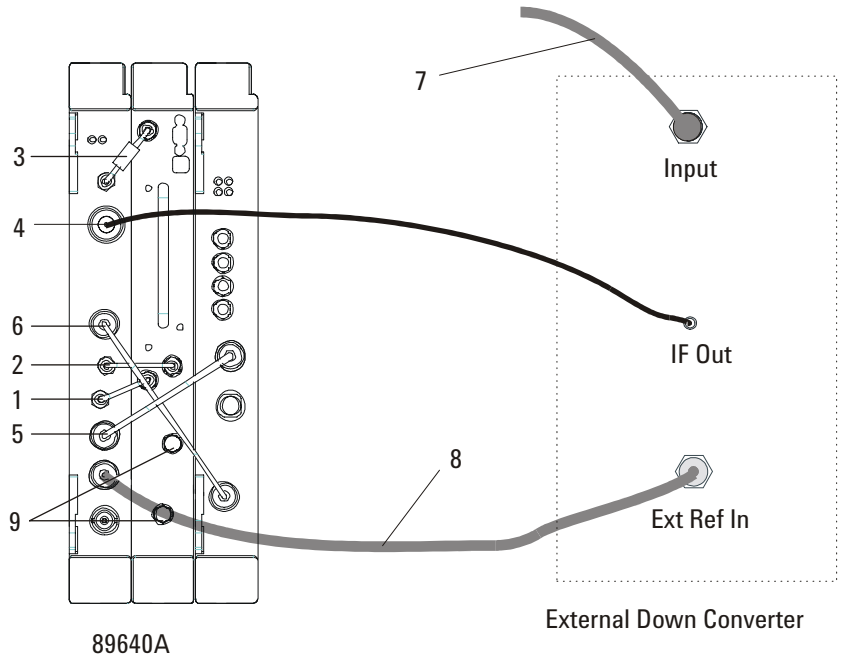
	Description	Connection	Part number
1	semi-rigid SMA cable	89605 *To RF In* to E2730 *RF In*	89605-61692
2	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
3	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
4	semi-rigid SMA cable	E2730 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
5	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2730 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
6	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
7	black BNC-BNC cable (215 mm)	89605-1 *10 MHz Ext Ref Out* to 89605-2 *Ext Ref In*	8121-0132
8	orange SMB-SMB cable (100 mm)	E1439 #1 *Clock* to E1439 #2 *Clock*	03585-61603
9	50 ohm SMB term (Qty 4)	Unused E1438 *Clock* & *Sync* connectors	1250-0676
10	orange SMB-SMB cable (100 mm)	E1439 #1 *Sync* to E1439 #2 *Sync*	03585-61603
11	semi-rigid SMA cable	E2730 #1 2nd LO In/Out to E2730 #2 2nd LO In/Out	89605-61696
12	semi-rigid SMA cable	E2730 #1 1st LO In/Out to E2730 #2 1st LO In/Out	89605-61696

After you install and configure the IEEE-1394 interface in your PC, you must connect an IEEE 1394 cable between the PC and an E8491 module IEEE ports.

Caution If you reconfigure a 2-RF-channel 89640 to a single-channel, you must connect coax SMA caps (Agilent pn 1250-0590) to the IF connectors on the E7230 module.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89640 with external down converter



	Description	Connection	Part number
1	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2730 *10 MHz Ext Ref*	for 89605A, 89605-61691 for 89605B, 89605-61693
2	semi-rigid SMA cable	E2730 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
3	semi-rigid SMA cable	89605 *To RF In* to E2730 *RF In*	89605-61692
4	varies	external down converter *IF Out* to 89605 *Ch1 Input*	varies
5	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
6	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
7	varies	input to external down converter	varies
8	BNC-BNC cable	89605 *10 MHz Ext Ref Out* to external down converter *Ext Ref In*	varies
9	coax SMA cap	E2730 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

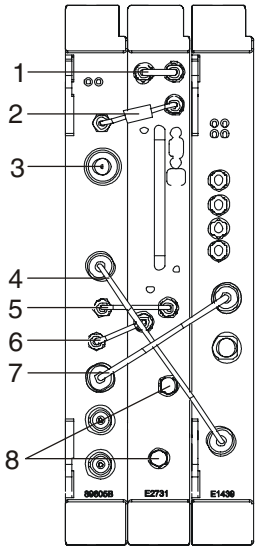
Note

It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89641



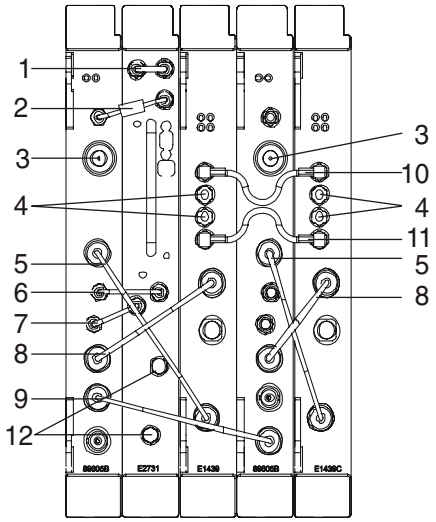
Note It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

	Description	Connection	Part number
1	semi-rigid SMA cable	E2731 *FE RF Out* to E2731 *2.7GHz RF In*	E2731-61601
2	semi-rigid SMA cable	89605 *To RF In* to E2731 *6 GHz In*	89605-61694
3	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
4	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
5	semi-rigid SMA cable	E2731 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
6	semi-rigid SMA cable	89605B *10 MHz Ext Ref Out* to E2731 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
7	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
8	coax SMA cap	E2731 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89641 with second IF/baseband channel



Note

If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1439) trigger input.

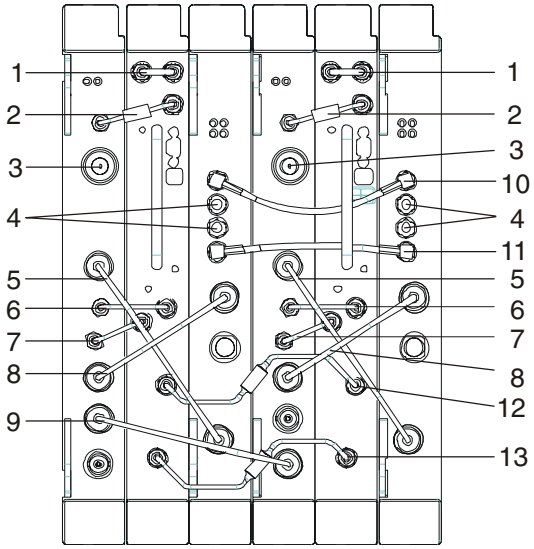
It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

	Description	Connection	Part number
1	semi-rigid SMA cable	E2731 *FE RF Out* to E2731 *2.7GHz RF In*	E2731-61601
2	semi-rigid SMA cable	89605 *To RF In* to E2731 *6 GHz In*	89605-61694
3	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
4	50 ohm SMB term (Qty 4)	Unused E1439 *Clock* & *Sync* connectors	1250-0676
5	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
6	semi-rigid SMA cable	E2731 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
7	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2731 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
8	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
9	black BNC-BNC cable (215 mm)	89605 #1 *10 MHz Ref Out* to 89605 #2 *Ext Ref In*	8121-0132
10	orange SMB-SMB cable (100 mm)	E1438 #1 *Clock* to E1438 #2 *Clock*	03585-61603
11	orange SMB-SMB cable (100 mm)	E1438 #1 *Sync* to E1438 #2 *Sync*	03585-61603
12	coax SMA cap	E2731 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89641 with second RF channel



Note

If you use external trigger, you must connect the trigger signal to the channel 1 ADC (E1439) trigger input.

It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

	Description	Connection	Part number
1	semi-rigid SMA cable	E2731 *FE RF Out* to E2731 *2.7GHz RF In*	E2731-61601
2	semi-rigid SMA cable	89605 *To RF In* to E2731 *6 GHz In*	89605-61694
3	N-to-BNC adapter	89605 *Ch 1 Input* (user signal)	1250-0780
4	50 ohm SMB term (Qty 4)	Unused E1439 *Clock* & *Sync* connectors	1250-0676
5	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
6	semi-rigid SMA cable	E2731 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
7	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2731 *10 MHz Ext Ref*	for 89605B, 89605-61693 for 89605A, 89605-61691
8	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
9	black BNC-BNC cable (215 mm)	89605 #1 *10 MHz Ref Out* to 89605 #2 *Ext Ref In*	8121-0132
10	orange SMB-SMB cable (100 mm)	E1438 #1 *Clock* to E1438 #2 *Clock*	03585-61603
11	orange SMB-SMB cable (100 mm)	E1438 #1 *Sync* to E1438 #2 *Sync*	03585-61603
12	semi-rigid SMA cable	E2731 #1 2nd LO In/Out to E2731 #2 2nd LO In/Out	89605-61696
13	semi-rigid SMA cable	E2731 #1 1st LO In/Out to E2731 #2 1st LO In/Out	89605-61696

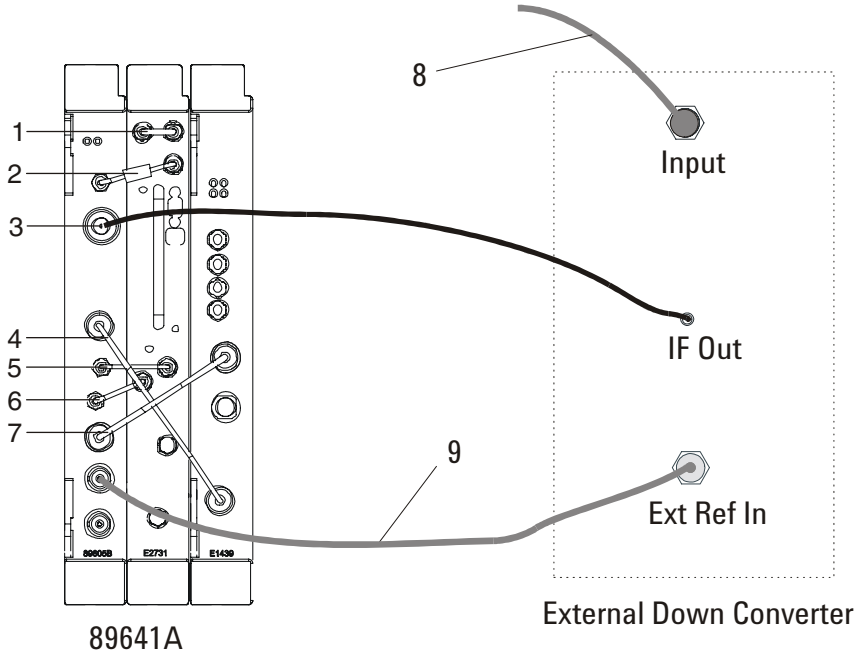
After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Caution

If you reconfigure a 2-RF-channel 89641 to a single-channel configuration, you must connect coax SMA caps (Agilent part number 1250-0590) to the IF connectors on the E7231 module.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Cable connections, 89641 with external down converter



	Description	Connection	Part number
1	semi-rigid SMA cable	E2731 *FE RF Out* to E2731 *2.7 GHz In*	E2731-61601
2	semi-rigid SMA cable	89605 *To RF In* to E2731 *RF In*	89605-61692
3	varies	external down converter *IF Out* to 89605 *Ch1 Input*	varies
4	black BNC-BNC cable (215 mm)	89605 *To ADC Analog In* to E1439 *Analog In*	8121-0132
5	semi-rigid SMA cable	E2731 *70 MHz IF Out* to 89605 *From 70 MHz IF Out*	89605-61691
6	semi-rigid SMA cable	89605 *10 MHz Ext Ref Out* to E2731 *10 MHz Ext Ref*	for 89605A, 89605-61691 for 89605B, 89605-61693
7	black BNC-BNC cable (215 mm)	89605 *10 MHz Ref Out* to E1439 *Ext Clock/Ref*	8121-0132
8	varies	input to external down converter	varies
9	BNC-BNC cable	89605 *10 MHz Ext Ref Out* to external down converter *Ext Ref In*	varies
9	coax SMA cap	E2731 *1st LO In/Out* and *2nd LO In/Out*	1250-0590

Note

It is important that you use the semi-rigid SMA cables shipped with the analyzer. Using other cables could degrade measurement accuracy.

After you have installed and configured the IEEE-1394 interface in your PC, you must connect the IEEE 1394 interface cable between the PC and one of the E8491 module IEEE ports.

Continue with step 2, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

4 Installing Agilent IEEE 1394 Interfaces in Computers

Introduction to installing IEEE 1394 interfaces

This chapter includes instructions on installing the IEEE 1394 to VXI interface card in your computer. See: Chapter 1, "Installation Overview" (page 19) to learn which procedures you must perform to install your Agilent 89600-series product.

For instructions on installing the Agilent IEEE 1394 Host Adapter in your desktop computer, go to "Installing the Agilent IEEE 1394 host adapter in your computer" (page 79).

For instructions on installing the Agilent IEEE 1394 PCMCIA Cardbus in your laptop computer, go to "Installing the Agilent IEEE 1394 PCMCIA cardbus in your computer" (page 84).

Otherwise, continue with step 3, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

Installing the Agilent IEEE 1394 host adapter in your computer

The IEEE 1394 adapter shipped as Option 001 to the E8491 is an OHCI-compatible PCI-to-IEEE 1394 Host Adapter. You must install the following components:

- Host adapter card (step 1 through step 7 on page 83)
- 8-wire power splitter cable between the adapter and the computer's internal power supply (step 6 on page 82)
- Gray 4.5 meter interface cable between the computer and the VXI mainframe

Caution **Refer to your computer's documentation for specific instructions about the installation of PCI adapters.**

Note If your personal computer (PC) currently has a Solectron OHCI403 PCI-to-IEEE 1394 host adapter (Figure 4-1), a later version OHCI0-compatible PCI-to-IEEE 1394 host adapter, or a built-in IEEE 1394 port, continue with step 3, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

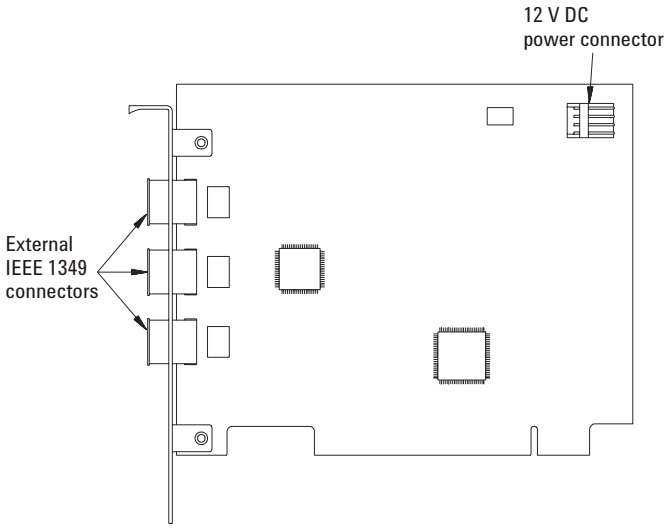


Figure 4-1 **Layout of a Typical OHCI-Compatible PCI-to-IEEE Host Adapter.**

WARNING **Shut down, turn off and disconnect the power to your computer and to any peripheral devices before installing the host adapter.**

AVERTISSEMENT **Il faut éteindre et déconnecter l'alimentation de votre ordinateur et tout autre périphériques avant d'installer l'adaptateur IEEE 1394.**

WARNUNG **Bevor der Host Adapter installiert wird, muß der Computer heruntergefahren und ausgeschaltet werden, sowie der Computer und alle Peripheriegeräte vom Stromnetz getrennt werden.**

注意 ホストアダプターをインストールする前に、コンピューターとすべての周辺機器の電源を切ってください。

Caution **To protect circuits from static discharge, observe anti-static techniques whenever handling the Agilent 89600-series VXI modules.**

To install the Agilent IEEE 1394 host adapter in your computer:

1. Remove the computer chassis cover to expose the expansion slots and external access covers.
2. Locate an unused, unobstructed PCI bus expansion slot (Figure 4-2) that supports bus mastering. (PCI slots are usually white or ivory.) See your computer documentation to determine if the PCI slot supports bus mastering.

Caution **It is very important that the slot supports bus mastering. If it does not, you will be unable to install the IO libraries that are necessary for communication between the computer and the VXI hardware.**

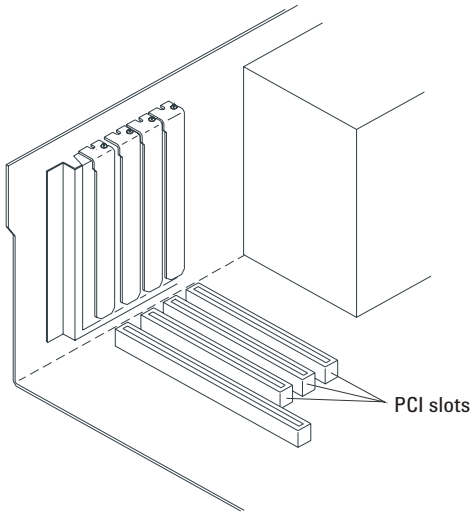


Figure 4-2 **Locating a PCI bus Expansion Slot.**

Note

Many computer PCI systems have one pair of ISA and PCI slots close to each other. This saves space and allows you to install either an ISA card or a PCI card in the slot pair.

3. Remove the corresponding expansion slot cover (Figure 4-3) from the computer chassis.

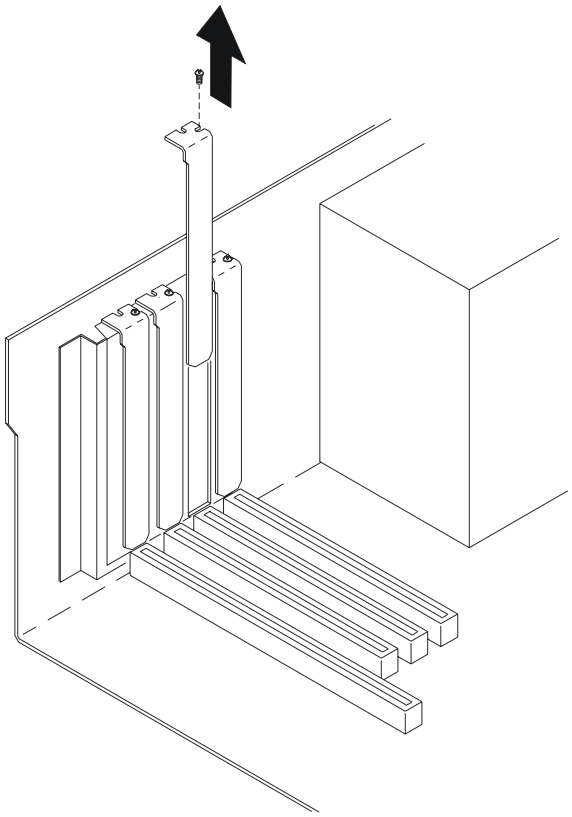


Figure 4-3 **Removing the PC Expansion Slot Cover.**

4. Align the bus contacts on the bottom of the host adapter with the PCI bus slot. Carefully, but firmly, press the adapter into the slot (Figure 4-4).

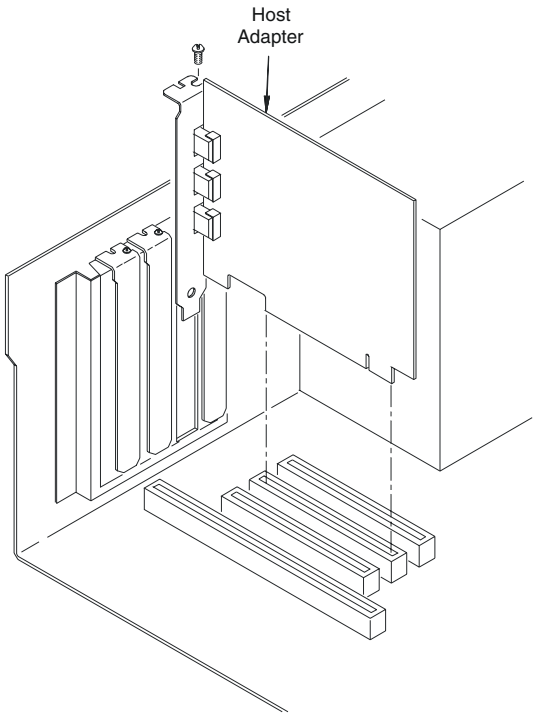


Figure 4-4 **Installing the Host Adapter.**

5. Secure the host adapter bracket to the computer chassis with the screw from the expansion slot cover removed in step 4.
6. Connect the power splitter cable between the adapter and the PC as shown in Figure 4-5. (Your computer may already contain a power cable you can connect to the PCI card. If this is the case, connect that cable and do not use the cable that was shipped with the 1394 PCI card.)

   The tab on the smaller connector goes away from the PC board. You may need to disconnect the cable from the power supply to one of the disk drives and insert the splitter cable. You can then connect the disk drive to the splitter cable. If you need more information, refer to your computer's documentation on installing PCI cards.

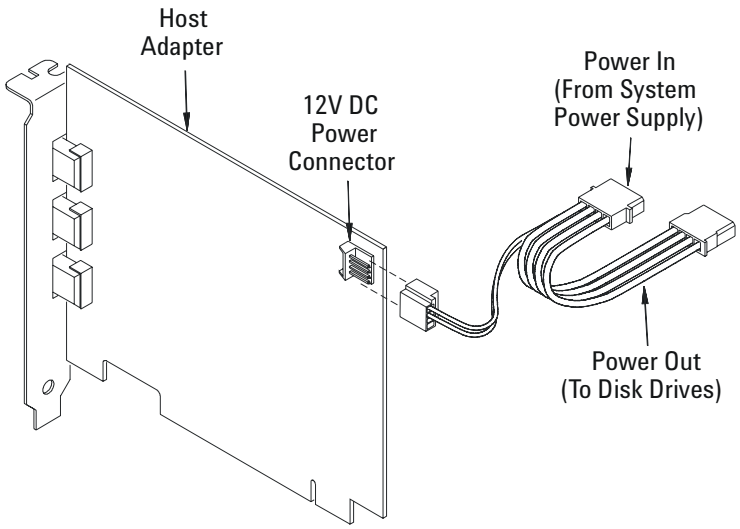


Figure 4-5 **Connecting the Power Cable Between the PC and the Host Adapter.**

7. If you need to install a GPIB or LAN interface in your PC, continue with step 3, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

   Otherwise, replace the computer cover. Reconnect the power cord and any other accessories you disconnected, then continue with step 3, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

   If you encounter problems installing the driver, examine the files on the Installation CD-ROM in the iolibs\readme directory for troubleshooting information.

Installing the Agilent IEEE 1394 PCMCIA cardbus in your computer

Note

For a list of supported IEEE 1394 interfaces, see: http://www.agilent.com/find/iolib or contact your local Test and Measurement Call Center or sales office.

You must have set up Windows 2000 on your laptop, installed 89600 software (Chapter 2, "Installing 89600 software" (page 24)), and setup your VXI measurement hardware (Chapter 3, "Introduction" (page 40)) before installing the IEEE 1394 card.

To install Agilent IEEE 1394 PCMCIA cardbus in your computer:

1. Shut down or turn off the computer.
2. Plug in the IEEE 1394 card, following the instructions that came with the card.
3. Continue to the next page.

Installing drivers for IEEE 1394 and E8491

Before following these steps, be sure that your VXI hardware is installed, the mainframe is connected to your computer, and the mainframe is on.

To install drivers for IEEE 1394 and E8491:

1. If the Found New Hardware Wizard appears and prompts you to install the driver for an "OHCI Compliant IEEE 1394 Host Controller", you must get and install the drivers for this card from the Windows 2000 CD that came with your computer (or from the CD that came with the IEEE Host Controller).

Note These drivers may already be installed on your computer, and in that case, the Found New Hardware Wizard for this device will not appear.

2. If the Found New Hardware Wizard does not prompt you to install a driver for the 8491, click **Start > Settings > Control Panel > Add/Remove Programs**. If the E8491 is listed, the driver has already been installed.
3. If the Found New Hardware Wizard prompts you to install a driver for the 8491, you can install this driver from the 89600 Installation CD. Click **Next**.
4. In the next dialog box, select **Search** for suitable driver. Click **Next**.
5. In the next dialog box, select **CD-ROM**. Insert the 89600 Installation CD in the CD drive. Click **Next**. The wizard searches for the driver and configures the hardware.

Note The file you need from the CD-ROM is iolibs\Windows 2000\1394ipt.inf.

6. If the 89600 Installation Manager window appears, close it. Return to the Found New Hardware Wizard and Click **Finish.**

   If you encounter problems installing the driver, examine the files on the Installation CD-ROM in the iolibs\readme directory for troubleshooting information.

Continue with step 3, part b, in Chapter 1, "Set up your measurement hardware." (page 19).

5 Installing GPIB, LAN, and USB Interface Cards

Introduction

This chapter includes general instructions for installing GPIB and LAN interface cards in your computer and connecting instruments to your computer.

Desktop computers require a PCI High-Performance GPIB card. Laptop computers require a GPIB Interface for PCMCIA. For a list of supported models, see the *89600 Series Vector Signal Analyzers Configuration Guide* on the 89600 web page: http://www.agilent.com/find/89600.

For a GPIB interface on a desktop computer, see to "Configuring GPIB on a desktop PC" (page 89).

For a GPIB interface on a laptop computer, see to "Configuring GPIB on a laptop PC" (page 90).

For a LAN interface, see to "Installing a LAN Interface" (page 91).

For a USB interface, see to "Installing a USB interface" (page 92).

For a LAN-to-GPIB gateway, see to "Configuring a LAN-to-GPIB gateway" (page 93).

Configuring GPIB on a desktop PC

If the GPIB interface card has not been installed in your PC, install it now, following the instructions that came with the card. If you need to install other interface cards, do not put the cover back on your computer until you have installed those cards.

Note

If you control other GPIB instruments or devices from this computer, see Chapter 12, "Troubleshooting interference with other devices or instruments" (page 190) for information on excluding those devices from the 89600 identification process.

If you will also be communicating with instruments via LAN, continue to "Installing a LAN Interface" (page 91). Otherwise, continue with step 3, part c, in Chapter 1, "Set up your measurement hardware." (page 19).

Configuring GPIB on a laptop PC

If the GPIB PCMCIA interface card has not been installed in your PC, install it now, following the instructions that came with the card. For a National Instruments GPIB card, be sure to install the NI 488.2 software first, then reboot your computer and install the interface card.

Note

If you control other GPIB instruments or devices from this computer, see page 190 for information on excluding those devices from the 89600 identification process.

If you will also be communicating with instruments via LAN, continue on page 91. Otherwise, continue with step 3, part c, in Chapter 1, "Set up your measurement hardware." (page 19).

Installing a LAN Interface

If the LAN interface is not already installed in your computer, install it now, following the instructions that came with the interface.

Note

If your computer and the instrument are connected to a building LAN, you may need to check with your network administrator to verify that the IP addresses for your computer and the instrument meet requirements.

Continue with step 3, part c, in Chapter 1, "Set up your measurement hardware." (page 19).

Installing a USB interface

If the USB interface is not already installed in your computer, install it now, following the instructions that came with the interface.

Continue with step 3, part c, in Chapter 1, "Set up your measurement hardware." (page 19).

Configuring a LAN-to-GPIB gateway

This section provides information on the LAN-to_GPIB gateway.

To make the LAN-to_GPIB gateway connection:

1. Connect the lan cable to the E2050 and a GPIB cable from the E2050 to your GPIB instrument. Connect power to the E2050.
2. Do not configure the E5810. You will be instructed to do this later.

Continue with step 3, part c, in Chapter 1, "Set up your measurement hardware." (page 19)

6 Configuring IO Interfaces

Introduction

This chapter includes instructions for configuring your computer to communicate with hardware via IEEE-1394, LAN, or GP-IB interfaces. See Chapter 1, "Installation Overview" (page 19) to learn which procedures you must perform to install your Agilent 89600 series product.

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.

If your measurement is an Agilent Infiniium oscilloscope, skip this chapter and follow the instructions in Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

For IEEE-1394 to VXI interface, start on "Configuring the VXI interface" (page 97).

For LAN interface, start on "Configuring the LAN interface" (page 101).

For LAN/GPIB gateway (portal) interface, start on "Configuring the HP E5810 LAN/GPIB Gateway interface" (page 108).

For USB/GPIB interface, start on "Configuring the USB/GPIB Interface" (page 111).

For GPIB interface, start on "Configuring the GPIB interface" (page 112).

For USB interface, start on "Configuring the USB Interface" (page 115).

Configuring the VXI interface

For more information about VXI interfaces, see **Configuring VXI Interfaces** in the "Configuring IO Interfaces" chapter of the *Agilent IO Libraries Installation and Configuration Guide for Windows*. You can find the PDF of this manual at: Program Files\Agilent\IO Libraries\Manuals\install.pdf.

To configure your VXI interface:

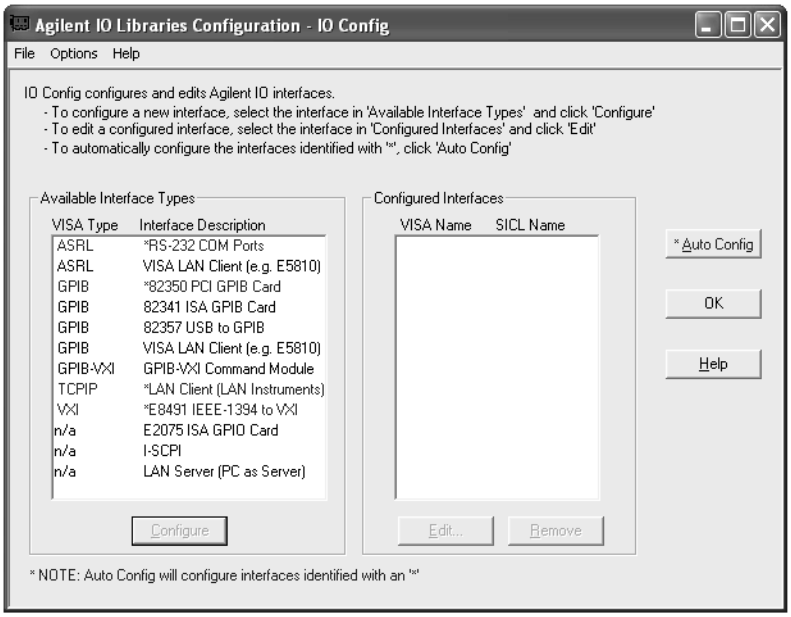
1. After you have installed the IEEE 1394 interface card in your PC, connect the IEEE 1394 cable from the computer to the E8491 module in the VXI mainframe. Power on the computer and the VXI mainframe.
2. The Found New Hardware Wizard opens. If it does not, check cable connections and power cord connections. If that does not solve the problem, verify that the power splitter cable to the 8491 board is connected as described in Step 6. (page 82).

   If the Found New Hardware Wizard does appear, check **Install the software automatically (Recommended)**, Click **Next.**

3. The Found New Hardware Wizard displays the message "Please wait while the wizard installs the software. When the software installation is done, the message "The wizard has finished installing the software..." appears. Click **Finish**.

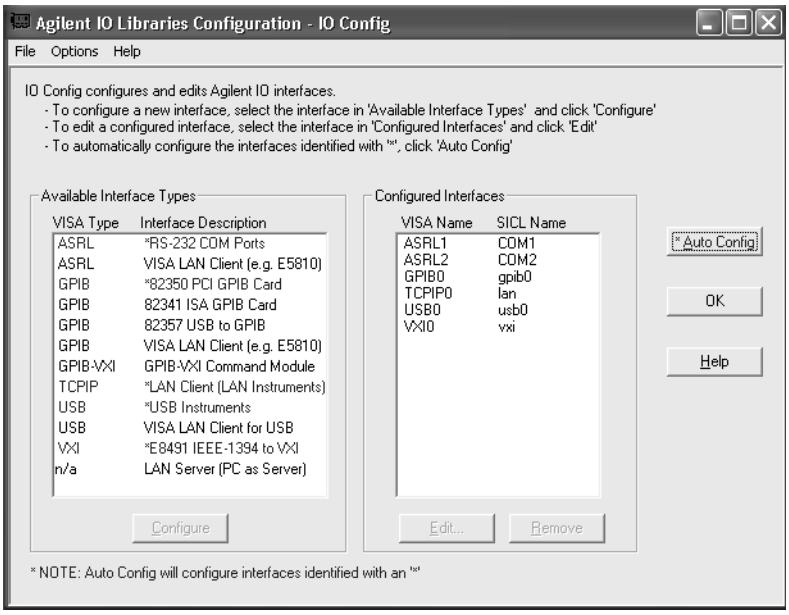
4. Run IO Config:

a. Click the IO icon in the task bar, then click **Run IO Config**. (Or click **Start > (All) Programs > Agilent IO Libraries > IO Config.)**



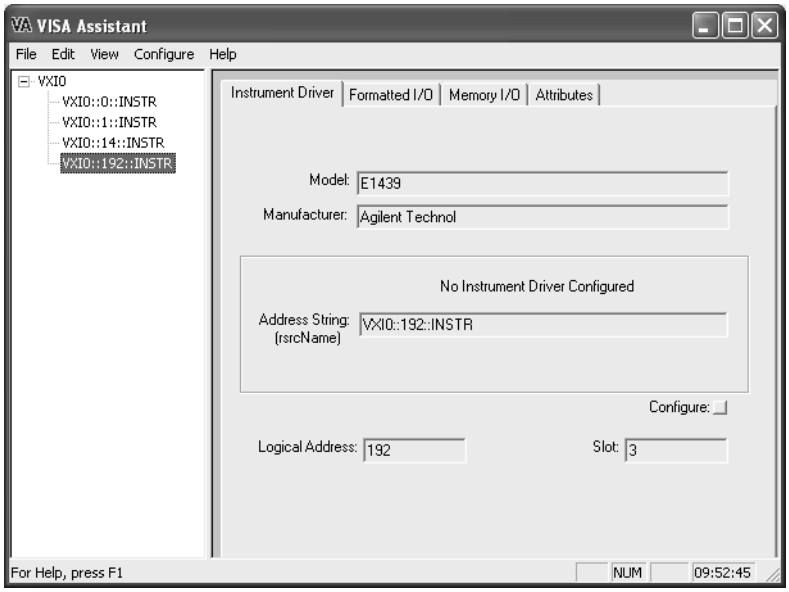
b. Click **Auto Config**.

The Configured Interfaces list includes the VXI mainframe, as well as other IO interfaces on your PC. (This example includes a GPIB interface, a LAN interface, and a USB interface, as well as the VXI interface).



5. If you want to verify that the computer recognized your VXI mainframe, run VISA Assistant:

a. Click the **IO** icon in the task bar and **Run VISA Assistant**, or click **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**.



b. VISA Assistant lists your VXI mainframe and the modules it contains. This example shows VXI mainframe VXI0, with 4 modules. The highlighted module is an Agilent E1439 in slot 3.

c. Close VISA Assistant (click the **X** in the upper right corner).

If you will also be communicating with measurement hardware via LAN, continue to "Configuring the LAN interface" (page 101).

If you will also be communicating with measurement hardware via a LAN-to-GPIB portal, continue to "Configuring the HP E5810 LAN/GPIB Gateway interface" (page 108).

If you will also be communicating with measurement hardware via GPIB, continue to "Configuring the GPIB interface" (page 112).

If you will not be using any other measurement hardware, continue with Step 5 (Page 20).

Configuring the LAN interface

Note

The purpose of this chapter is to guide 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 (click the IO icon, then select **View Documentation**).

If your measurement hardware is an Agilent Infiniium oscilloscope, skip this chapter and follow the instructions in Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

For more information about LAN interfaces, see **Configuring LAN Interfaces** in the "Configuring IO Interfaces" chapter of the *Agilent IO Libraries Installation and Configuration Guide for Windows*. You can find the PDF of this manual at Program Files\Agilent\IO Libraries\Manuals\install.pdf.

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 192.192.192.25).

To configure your LAN interface:

1. Set the IP address, using the appropriate set of instructions:
   - IP address for computer on Local Area network or IP address for computer cable (see: "IP address for computer on Local Area Network" (page 102)).

   or

   - IP address for computer with crossover cable (see: "IP address for computer with crossover cable" (page 103)).
2. Run IO Config ("Run IO Config" (page 105)).

IP address for computer on Local Area Network

This section provides information on the IP address for the computer on a Local Area Network.

To set the IP address for a computer on the LAN:

1. If your computer is connected to a Local Area Network, have your network administrator assign an IP address for your hardware that will work with your computer. (The network administrator can also tell you if you need to set Subnet Masks.)
   a. Set the IP address for the measurement hardware.

      For the E4406 or the PSA, press **System > Config IO > IP address,** type the new address using the number keypad, and press **Enter**.

   b. Click in the Subnet Mask box.

      For the E4406 only, if the IP address begins with “10.”, set the subnet mask to “255.0.0.0”. If the E4406 IP address begins with anything other than “10.”, set the subnet mask to “255.255.0.0”. (Press **System > Config I/O > Subnet Mask**, type the new address using the number keypad, and press **Enter**.)

      For all other instruments, 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 (such as the E4406 or PSA).
4. Continue with "Run IO Config" (page 105).

IP address for computer with crossover cable

This section provides information on setting the IP address for a computer with a crossover cable.

To set the IP address for a computer with a crossover cable:

1. If your computer is not on a Local Area Network and you will be connecting directly to the hardware using a crossover cable, perform these steps:

   a. Determine the IP address for your computer. Click **Start > Run.** Type `cmd` and click **OK**. At the DOS prompt, type `ipconfig` and press **Enter**. If an IP address is not listed, or if the address is 0.0.0.0, go to step d. If a non-zero IP address is listed, leave it and continue with step b.

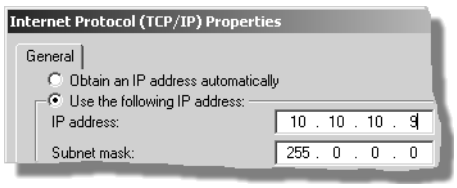
   b. Set the IP address on the hardware so that the first 3 sections of the IP address are the same as for the computer, and the last section is 1 greater than that for the computer. (For example, if the computer IP address is 192.192.192.25, set the hardware IP address to 192.192.192.26.)

      To change the E4406A or PSA IP address, press **System > Config I/O > IP address**, type the new address using the number keypad, and press **Enter**.

   c. Continue with step e.

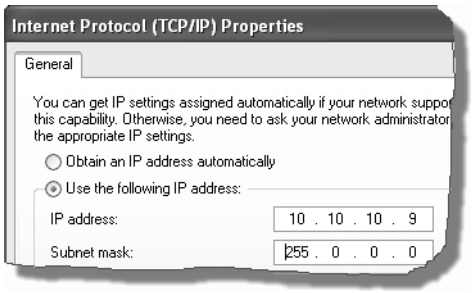
   d. Find the IP address for the hardware (for the E4406 or PSA, press **System > Config I/O > IP address**). Set the IP address for the computer so that the first 3 sections are the same as for the hardware, and the last section is 1 lower than for the hardware. (For example, if the hardware IP address is 10.10.10.10, set the computer address to 10.10.10.9.)

      For Windows 2000, right click **My Network Places**, click **Properties**, right click **Local Area Network**, click **Properties > Internet Protocol (TCP/IP) > Properties > Use the following IP address**.

      -or-

      For Windows XP, right click **My Network Places**, click **Properties**, right click **Local Area Connection**, click **Properties**, click **Internet Protocol (TCP/IP) > Properties > Use the following IP address**.

      Type the address in the box, using periods (.) to separate the sections.

   e. Click in the Subnet Mask box.

      For the E4406 only, if the IP address begins with "10.", set the subnet mask to "255.0.0.0". If the E4406 IP address begins with anything other than "10.", set the subnet mask to "255.255.0.0". (Press **System > Config I/O > Subnet Mask**, type the new address using the number keypad, and press **Enter**.)

For all other instruments, accept the default numbers that appear for the subnet mask.

Click **OK** and close all dialog boxes.

f. If you are prompted to reboot your computer, do so now.

2. Connect the crossover cable between the computer and the instrument.
3. Cycle power on the measurement hardware (such as the E4406 or PSA).
4. Continue with Run IO Config on the next page.

Run IO Config

This section shows you how to run the IO Config.

To run IO Config:

1. Run the Agilent IO Libraries IO Configuration tool.

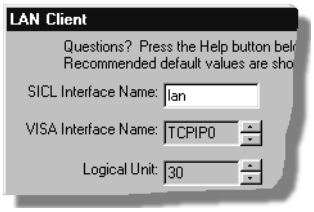
   Click the IO icon in the task bar (see right), then click **Run IO Config**. (Or click **Start > (All) Programs > Agilent IO Libraries > IO Config.)**

2. Setup the LAN Client.

   a. Click **TCPIP LAN Client > Configure**.

   b. Leave the default selections in the LAN Client dialogue box.

   c. Remember the name in the SICL Interface Name box.

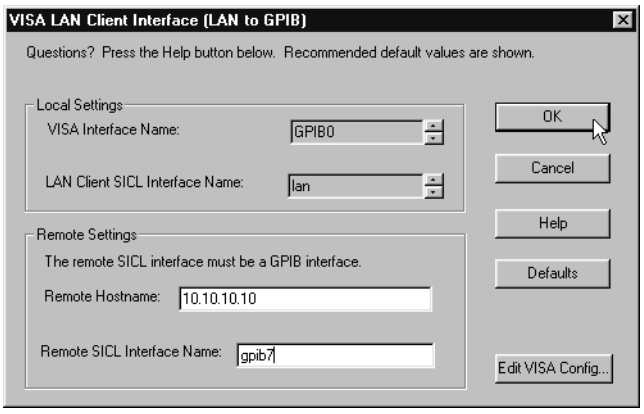


   d. Click **OK**.

3. For ESG and PSG sources you will control via LAN interface, go to step 5. For all other instruments, continue with step 4.

4. Setup the VISA LAN Client.

   a. Click **VISA LAN Client > Configure**.



   b. Enter the instrument host name or IP address in the Remote Hostname box. If you are using a crossover cable, you must use the IP address. (To find the host name and the IP address for the E4406 or the PSA, press **System > Config I/O.)**

Note

If you have problems, see your LAN system administrator about internet protocol (IP) addresses. Your LAN system administrator can also tell you if you must set the gateway address and subnet mask.

c. Set the Remote SICL Interface Name to **gpib7**. (This must be gpib7, not hpib7.)

d. Confirm that the entry in the SICL LAN Interface box matches the SICL Interface Name that you noted in step 2.

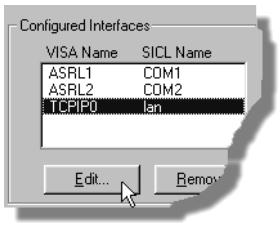
e. Remember the VISA Interface Name.

f. Click **OK > OK**.

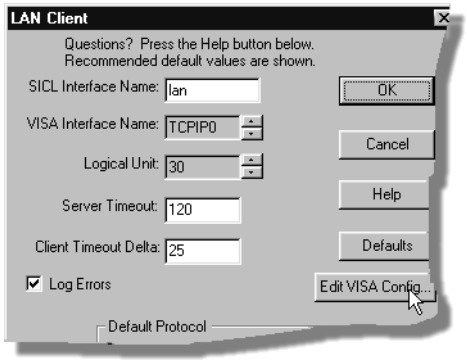
g. Continue with step 6.

5. For ESG and PSG sources with LAN connections, configure the TCPIP connection.

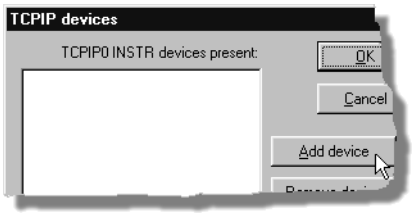
a. In the Configured Interfaces list, click **TCPIP0 lan**.



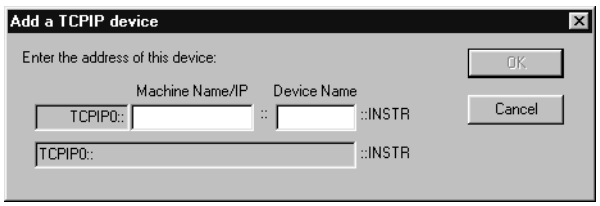
b. Click **Edit**.



c. Click **Edit VISA Config**…



d. Click **Add device**.



e. In the Machine Name/IP text box, type the IP address or Host Name for the ESG or PSG.

To find the IP address for the ESG or PSG, press **Utility > GPIB/RS-232/LAN > LAN Setup**.

f. Click **OK > OK > OK > OK** to close the dialog boxes.

6. Run VISA Assistant to confirm that the instrument shows up in the list of instruments.

   a. Click the IO icon or **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**. The instrument should show up as something like <VISA Interface Name>::18::INSTR. (The VISA Interface Name will be something like GPIB0.)

      If the instrument does not show up, verify that cables are connected and power is turned on. Then repeat step 1 through step 4, and run VISA assistant again.

   b. Close VISA Assistant.

Note

If you setup a lan connection, then turn off or disconnect the hardware, the 89600 looks for the hardware when started. This slows down startup. To speed up startup, use IO config to remove the lan setup.

If you will also be communicating with measurement hardware via a LAN-to-GPIB portal, continue on "Configuring the HP E5810 LAN/GPIB Gateway interface" (page 108).

If you will also be communicating with measurement hardware via GPIB, continue on "Configuring the GPIB interface" (page 112).

If you will not be using any other measurement hardware, continue with Step 5 (Page 20).

Configuring the HP E5810 LAN/GPIB Gateway interface

If your measurement hardware is an Agilent Infiniium oscilloscope, skip this chapter and follow the instructions in Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

To setup and use the E5810 with Microsoft Windows, you must have Internet Explorer 4.0 or higher or Netscape 4.7 or higher.

For details on setting up the E5810, you can download a *Getting Started Guide* for the E5810 from the Agilent web site. Go to www.agilent.com and search for E5810A. Select the E5810A from the list of Products, and click Manuals, Guides and Service Notes near the bottom of the page. Click the Getting Started Guide to open a PDF file on your PC.

Important

Before making network connections, contact your Information Technology (IT) department for policies concerning user connections, IP address, etc.

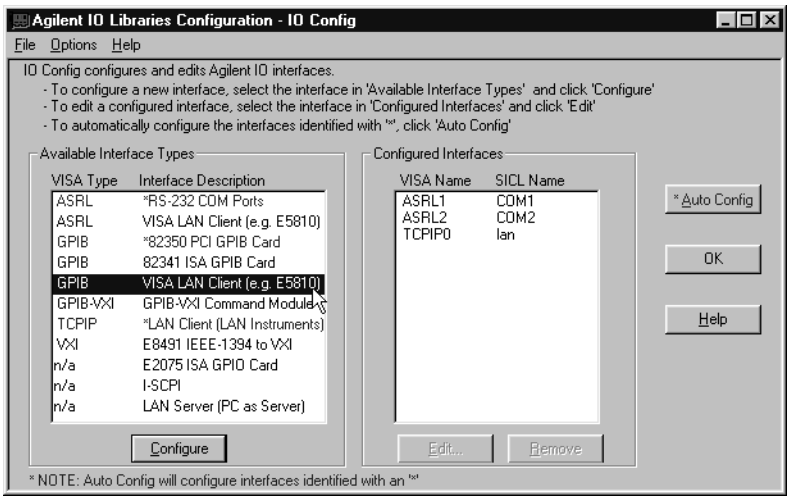
To configure the HP E5810 LAN/GPIB Gateway interface:

1. Connect the E5810 to the network and to instruments.
2. Plug in and power on the E5810 and any GPIB instruments. The IP address should be displayed in the display. If the address does not appear, see Troubleshooting Information in the *E5810 Getting Started Guide.*
3. Configure the E5810
   a. Display the E5810 Welcome Page. In your Web browser, type
   `'http://<IP address>'`
   where <IP address> is the current E5830A IP address (such as 169.254.58.10) shown on the E5810 display. Press **Enter**.
   b. Take note of the GPIB SICL Interface Name (something like “gpib0”). You will need to use this name in a later step.
   c. If you need to change any configuration information, such as the IP address, click *View & Modify Configuration*. (The default password is E5810.) After making changes, click **Save** and then **Reboot E5810** to make changes effective.
4. Verify communication from the E5810.
   a. From the E5810 Welcome page, click **Find & Query Instruments**. (The default password is E5810.)
   b. Click **Find**.
   c. In the list of SICL Addresses, highlight the instrument you want to query.
   d. Click **IDN?** The identification information for the information appears in the right pane.
5. Run the Agilent IO Libraries IO Configuration tool.

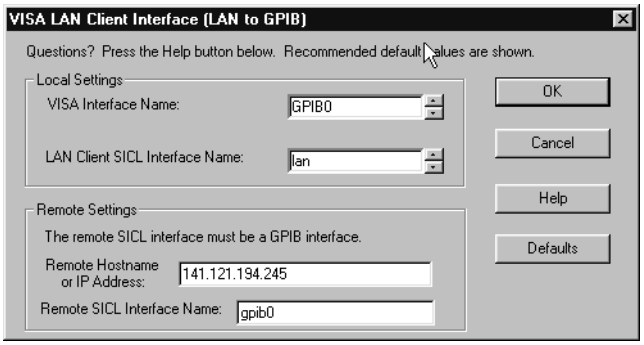
Click the IO icon in the task bar then click **Run IO Config**, or click **Start > (All) Programs > Agilent IO Libraries > IO Config**.

6. Setup the LAN Client. For more information about LAN Client interfaces, see **Configuring VISA LAN Client Interfaces** in the "Configuring IO Interfaces" chapter of the *Agilent IO Libraries Installation and Configuration Guide for Windows*. You can find the PDF of this manual at Program Files\Agilent\IO Libraries\Manuals\install.pdf.

   a. Under "Available Interface Type," click **GPIB VISA LAN Client) > Configure**.



7. In the "Remote Hostname or IP Address" box, type the IP address from the E5810 display.



8. In the "Remote SICL Interface Name" box, type the GPIB SICL Interface Name you noted in step 3b.
9. Click **OK > OK** to close the dialog boxes.
10. Run VISA Assistant to confirm that the instrument shows up in the list of instruments.

    a. Click the IO icon or **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**. The instrument should show up as something like <VISA Interface Name>::19::INSTR.

    b. Close VISA Assistant.

11. If the instrument is not listed, try the following steps.

    a. Verify that the cables are correctly connected between the PC, the E5810, and the hardware.

b. Cycle power on the hardware.

c. Then run VISA assistant again (step 10).

If you are not be using any other measurement hardware, continue with Step 5 (Page 20).

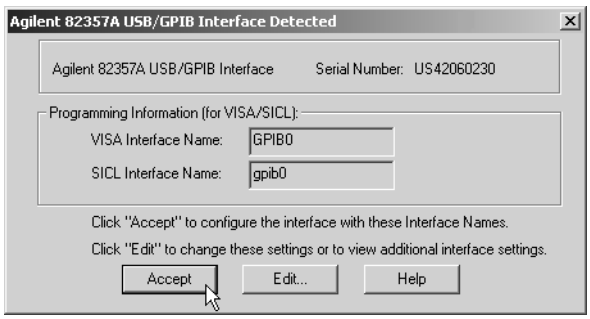
Configuring the USB/GPIB Interface

If your measurement hardware is an Agilent Infiniium oscilloscope, skip this chapter and follow the instructions in Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

For details on setting up the 82357A USB/GPIB Interface, you can download a *Getting Started Guide* for the Agilent web site. Go to www.agilent.com and search for 82357A. Select the 82357A from the list of Products, and click Manuals, Guides and Service Notes near the bottom of the page. Click the Getting Started Guide to open a PDF file on your PC. For even more information, click the User's Guide.

To configure the USB/GPIB interface:

1. Plug the 82357A 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 E8237A. 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 and refer to the *82357A USB/GPIB Interface for Windows User's Guide* for information.
3. When the **Agilent 82357A USB/GPIB Interface Detected** dialog box appears, click **Accept**. (If you want to change any of the settings, refer to the 82357A documentation for instructions.)



4. Connect one or more instruments to the GPIB connector on the 82357A.
5. Run VISA Assistant to confirm that the instrument shows up in the list of instruments.
   a. Click the IO icon or **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**. The instrument should show up as something like <VISA Interface Name>::19::INSTR.
   b. Close VISA Assistant.
6. If problems, refer to the Troubleshooting chapter in the 82357A User's Guide.

If you will not be using any other measurement hardware, continue with Step 5 (Page 20).

Configuring the GPIB interface

If your measurement hardware is an Agilent Infiniium oscilloscope, skip this chapter and follow the instructions in Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

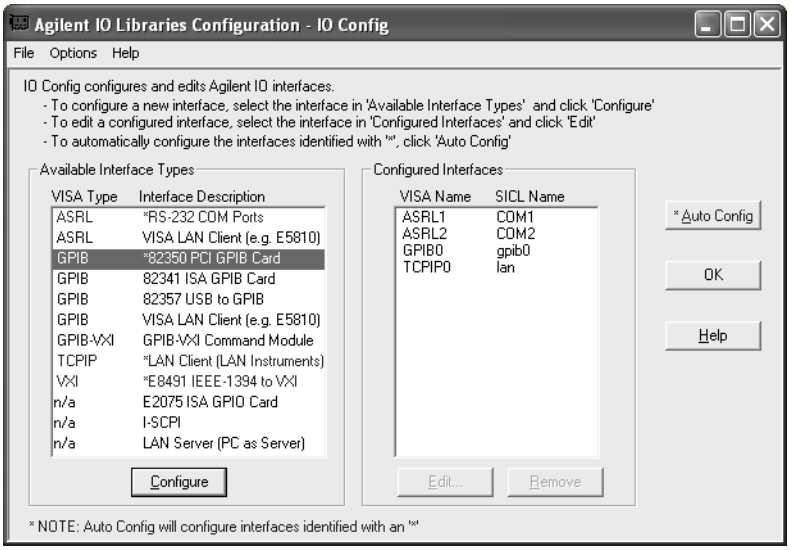
Note

The purpose of this chapter is to guide 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 (click the IO icon, then select **View Documentation**).

For more information about GPIB interfaces, see **Configuring GPIB Interfaces** in the "Configuring IO Interfaces" chapter of the *Agilent IO Libraries Installation and Configuration Guide for Windows*. You can find the PDF of this manual at Program Files\Agilent\IO Libraries\Manuals\install.pdf.

To configure the GPIB interface:

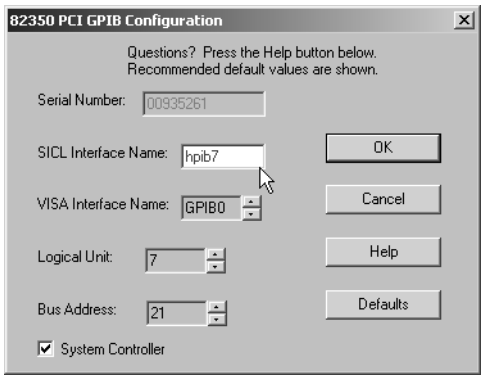
1. If you are configuring a GPIB connection for measurement hardware that is currently configured as a LAN connection on this computer, you must first remove the LAN configuration. Then cycle power on the hardware before continuing with the GPIB configuration.
2. Connect your GPIB instruments to the GPIB interface in the computer. Power on the PC and the instruments.
3. Configure IO.
   a. Click the **IO** icon in the task bar and **Run IO Config**, or click **Start > (All) Programs > Agilent IO Libraries > IO Config**.



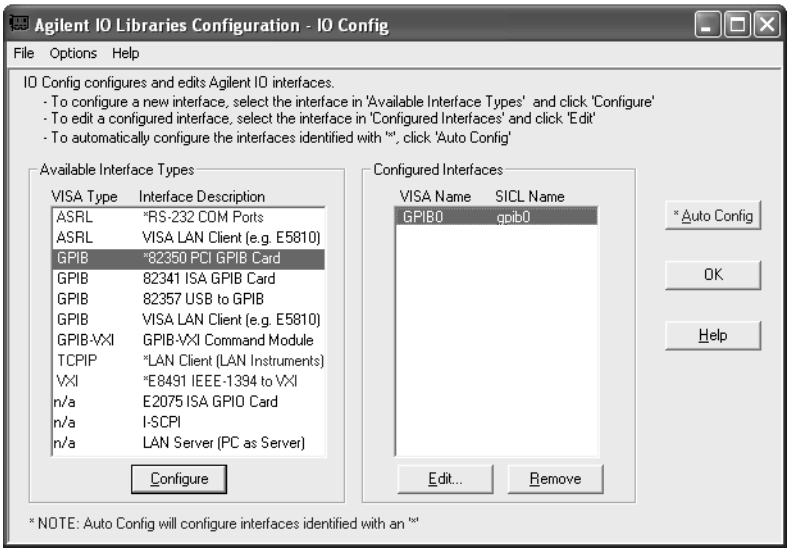
b. Look at the list in the Available Interface Types column. If your GPIB interface is listed in blue and has an asterisk (*) next to it, click **Auto Config**. Continue with step 4 on page 113.

c. If your GPIB interface does not have an asterisk (*) next to it, you must configure it yourself. Click the entry the corresponds to your GPIB interface ("82350 PCI GPIB" in this example), then click **Configure**.

(For the NI PCMCIA GPIB interface in a laptop, the interface is "SICL on NI GPIB.)



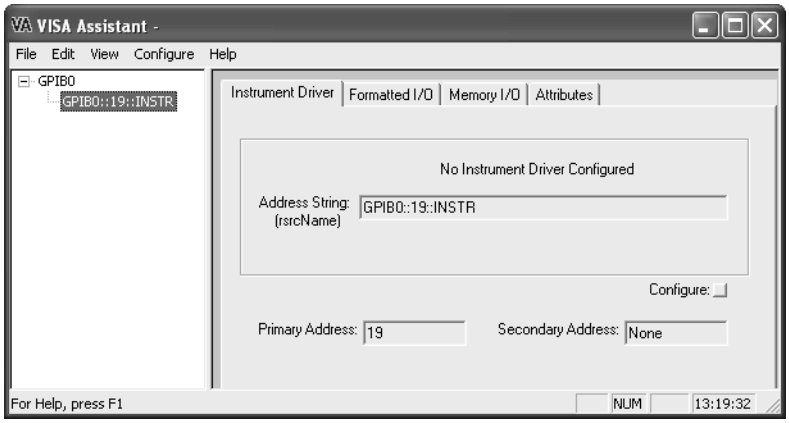
d. Accept all the defaults, click **OK**.



e. Click **OK.**

4. If you want to verify that the computer recognized your GPIB instrument, run VISA Assistant.

a. Click the **IO** icon in the task bar and **Run VISA Assistant**, or click **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**.



b. VISA Assistant should list your GPIB instrument. In this example, the instrument GPIB address is 19.

c. Close VISA Assistant (click the **X** in the upper right corner).

If you will not be using any other measurement hardware, continue with Step 5 (Page 20).

Configuring the USB Interface

This section covers configuring a USB interface to interact with your measurement hardware. If you are using a Agilent 82357 USB/GPIB Interface, go to "Configuring the USB/GPIB Interface" (page 111). The instructions in this chapter assume that the USB interface is installed in your PC and is working.

Note

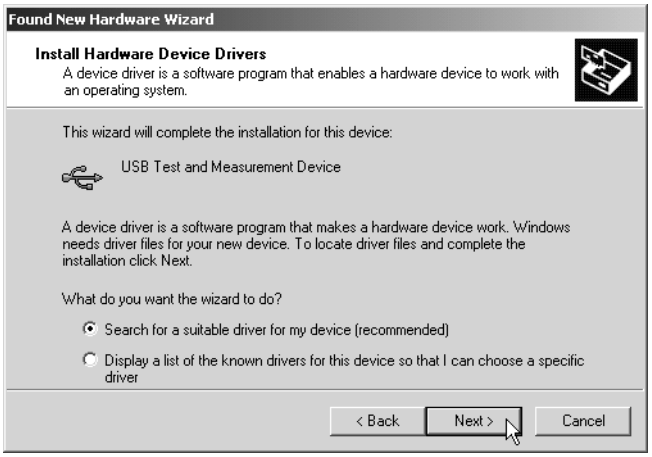
The purpose of this chapter is to guide you through the specific setup required to get your computer and instrument configured properly. For more detailed information on IO configuration, refer to the documentation for the IO libraries (click the IO icon, then select **View Documentation**).

To configure the USB interface:

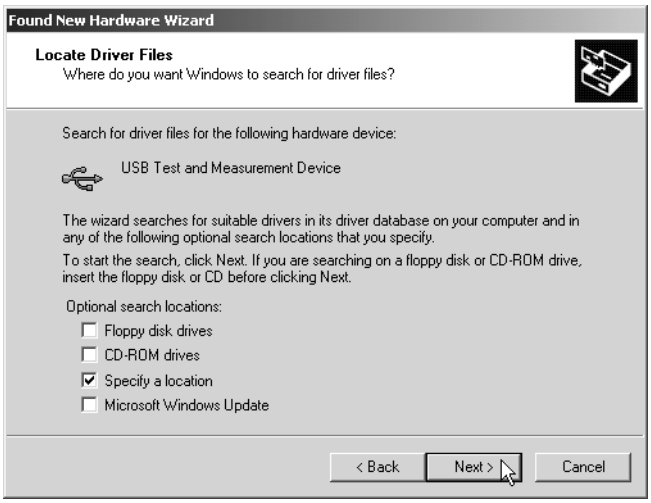
1. Connect your USB instruments to the USB interface in the computer. Power on the PC and the instruments.

   a. If the Found New Hardware Wizard tells you that installation failed, click **Finish.**

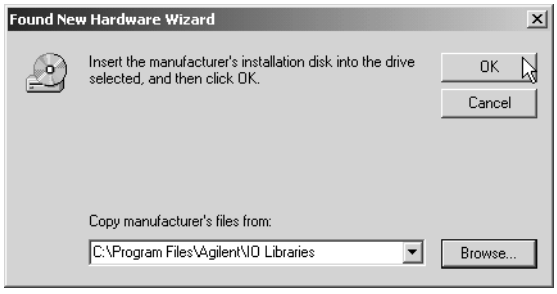
b. Click **Next**.



c. Select **Search for a suitable driver for my device (recommended)** and click **Next**.



d. Check **Specify a location** and uncheck all other check boxes. Click Next.

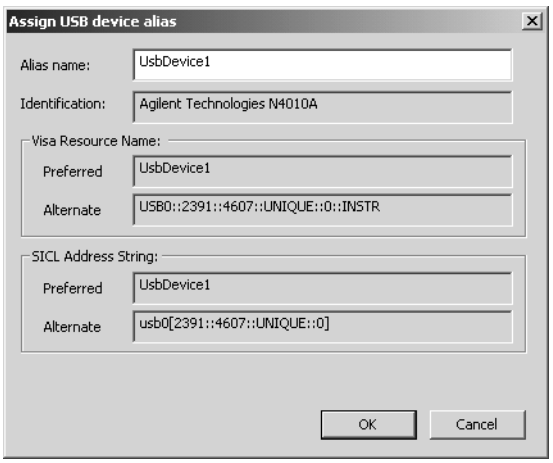


e. Type `C:\Program Files\Agilent\IO Libraries in` the text box (or browse to that location) Click **OK**.

Note If you installed the IO Libraries on a drive other then C, specify that drive rather than the C drive.

f. Click **Next**.

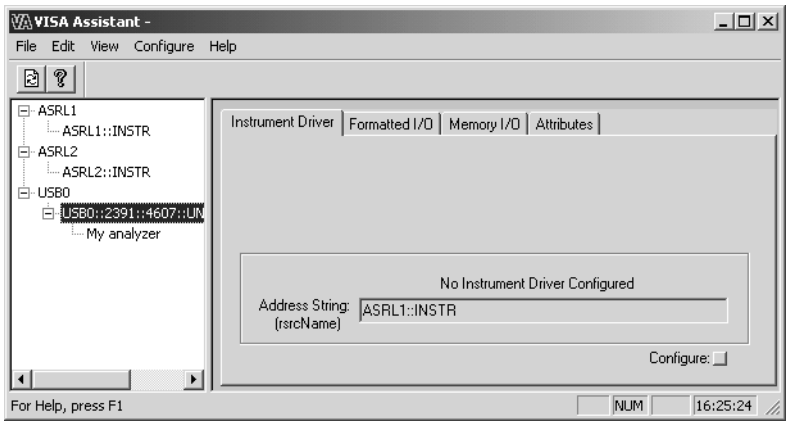
g. Click **Finish**.



h. You can accept the default alias name or change it by typing the new name in the text entry box. Click **OK**. (For this example, we used the alias “My analyzer.”)

2. If you want to verify that the computer recognized your USB instrument, run VISA Assistant.

a. Click the **IO** icon in the task bar and **Run VISA Assistant**, or click **Start > (All) Programs > Agilent IO Libraries > VISA Assistant**.



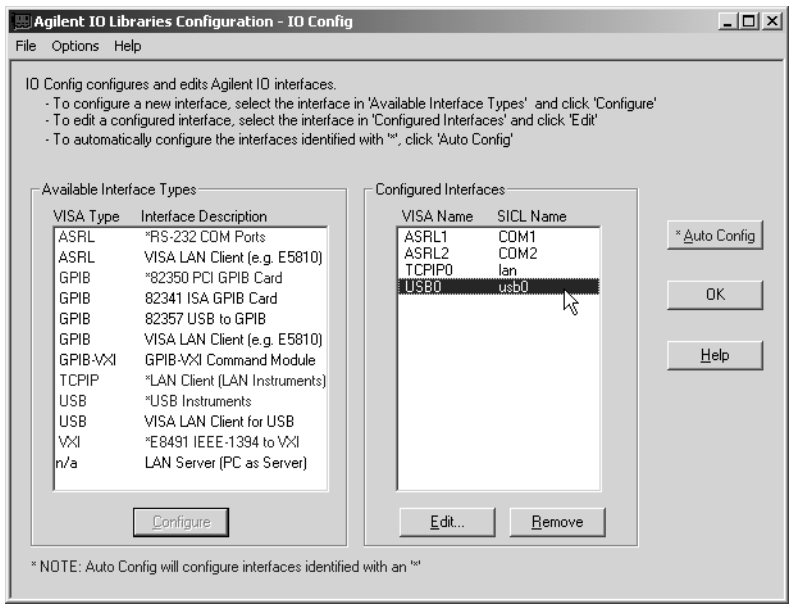
b. VISA Assistant should list your USB instrument. In this example, the USB instrument is My analyzer.

c. Close VISA Assistant (click **X** in the upper right corner).

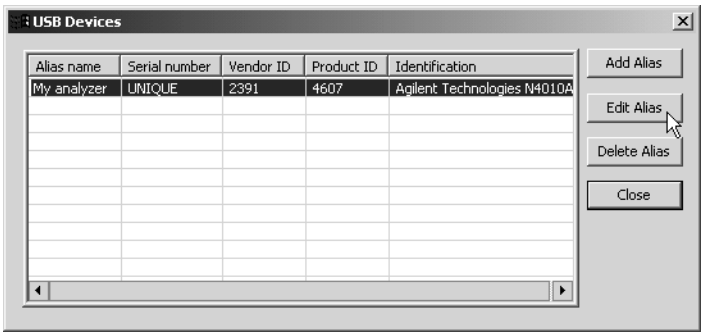
d. If you are satisfied with the alias name for your USB instrument, continue with Step 5 (Page 20).

3. If you want to change the alias name for your USB instrument, run Configure IO.

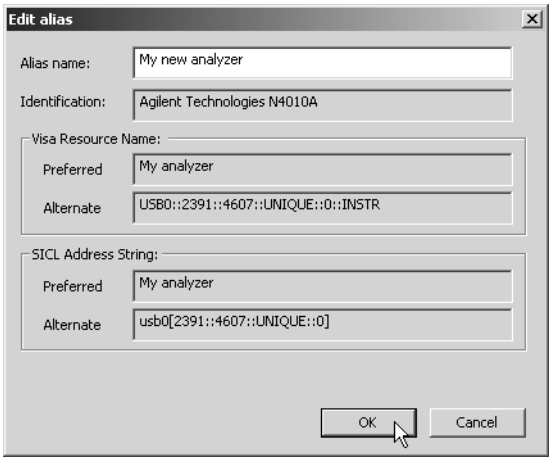
a. Click the **IO** icon in the task bar and **Run IO Config**, or click **Start > (All) Programs > Agilent IO Libraries > IO Config**.



b. In the list of Configured Interfaces, select **USB0** and click **Edit...**.



c. Highlight the row for your USB instrument and click **Edit Alias...**.



d. Type the new instrument alias name in the text box ("My new analyzer" in this example). Click **OK, Close, OK**.

If you will not be using any other measurement hardware, continue with Step 5 (Page 20).

7 Configuring Infiniium Windows 98 and XP Scopes

Introduction

This chapter includes networking information for configuring Agilent Infiniium scopes, running either the Windows 98 or XP operating system, and a corresponding PC running the 80601 software.

Note

If you are installing the 80601 software directly in the Agilent Infiniium scope (Windows XP only), see: Chapter 8, "Installing 89601 Software in Agilent Infiniium XP Scopes" (page 141).

Before configuring your Infiniium scope, be sure you have installed the 89601 software on the PC you are using in conjunction with the scope.

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

1. Configure Infiniium Networking
   - "Configuring Windows 98 Infiniium Networking for non-DHCP Network" (page 124)
   - "Configuring Windows XP Infiniium Networking for non-DHCP Network" (page 126)
   - "Configuring Windows Infiniium Networking for DHCP Network" (page 129)
   - "Configuring Windows 98 Infiniium Networking for Crossover Cable Network" (page 130)
   - "Configuring Windows XP Infiniium Networking for a Crossover Cable Network" (page 131)
2. Configure PC Networking
   - "Configuring PC Networking for a Crossover Cable Network" (page 134)
3. Configure Agilent IO Config Software for GPIB and LAN
   - "Configuring PC Agilent IO Config for GPIB connection" (page 136)
   - "Configuring PC Agilent IO Config for LAN connection" (page 138)
4. Verify the VISA Interface Connection
   - "Verifying Instrument Connection" (page 140)

See Table 7-1, “Summary of Connection Types,” on page 123 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.

Table 7-1 Summary of Connection Types

Connection Type	Infiniium Networking	PC Networking	PC Agilent IO Config Software
GPIB to GPIB	N/A	N/A	"Configuring PC Agilent IO Config for GPIB connection" on page 136
USB to GPIB	N/A	N/A	"Configuring PC Agilent IO Config for GPIB connection" on page 136
LAN/GPIB Gateway	N/A	N/A	"Configuring PC Agilent IO Config for LAN connection" on page 138
LAN using a crossover cable	"Configuring Windows 98 Infiniium Networking for Crossover Cable Network" on page 130 -or- "Configuring Windows XP Infiniium Networking for a Crossover Cable Network" on page 131	"Configuring PC Networking for a Crossover Cable Network" on page 134	"Configuring PC Agilent IO Config for LAN connection" on page 138
LAN with DHCP	"Configuring Windows Infiniium Networking for DHCP Network" on page 129	N/A	"Configuring PC Agilent IO Config for LAN connection" on page 138
LAN without DHCP	"Configuring Windows 98 Infiniium Networking for non-DHCP Network" on page 124 -or- "Configuring Windows XP Infiniium Networking for non-DHCP Network" on page 126	N/A	"Configuring PC Agilent IO Config for LAN connection" on page 138

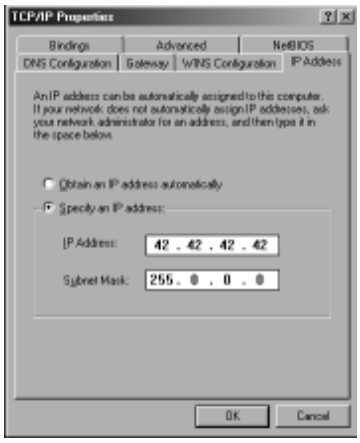
Configuring Windows 98 Infiniium Networking for non-DHCP Network

Complete the following procedure to configure your Windows 98 Infiniium scope for networking via a non-DHCP (Dynamic Host Configuration Protocol) network.

To configure Windows 98 Infiniium Networking for a non-DHCP network:

1. Obtain an IP Address, Gateway Address and a Subnet Mask from your Network Administrator.
2. From the scope front panel Infiniium File menu, go to the Network submenu, then select **Properties**.

3. In the Network Properties dialog box, select **TCP/IP**, then click **Properties**.



4. Select **Specify an IP address**.

5. Enter the IP Address and Subnet Mask provided by your Network Administrator in the "IP Address" tab page.
6. Go to the Gateway tab page. Enter the Gateway address then Click **Add**.

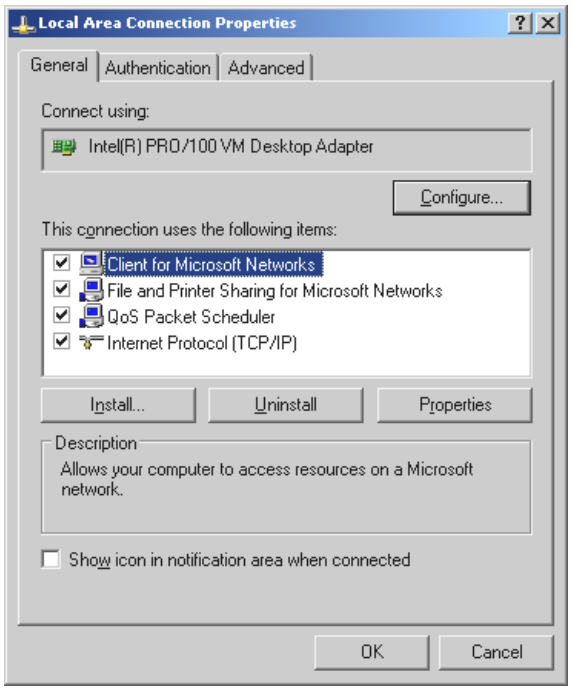
7. Click **OK** in the TCP/IP Properties dialog box .
8. Click **OK** in the Network Properties dialog box. Windows 98 will prompt you to reboot the Infiniium. Click **Yes**.
9. After the Infiniium reboots, the instrument is ready for GPIB control over the LAN interface. Go to "Configuring PC Agilent IO Config for LAN connection" on page 138.

Configuring Windows XP Infiniium Networking for non-DHCP Network

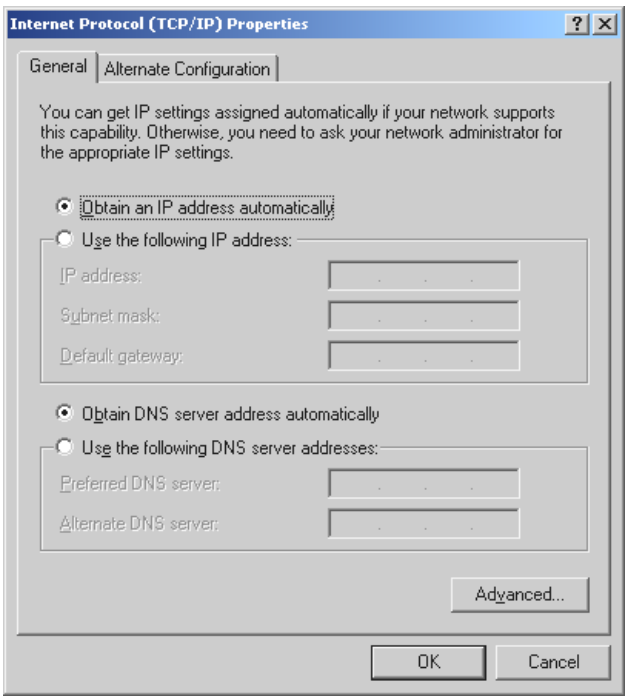
Complete the following procedure to configure your Windows XP Infiniium scope for networking via a non-DHCP (Dynamic Host Configuration Protocol) network.

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

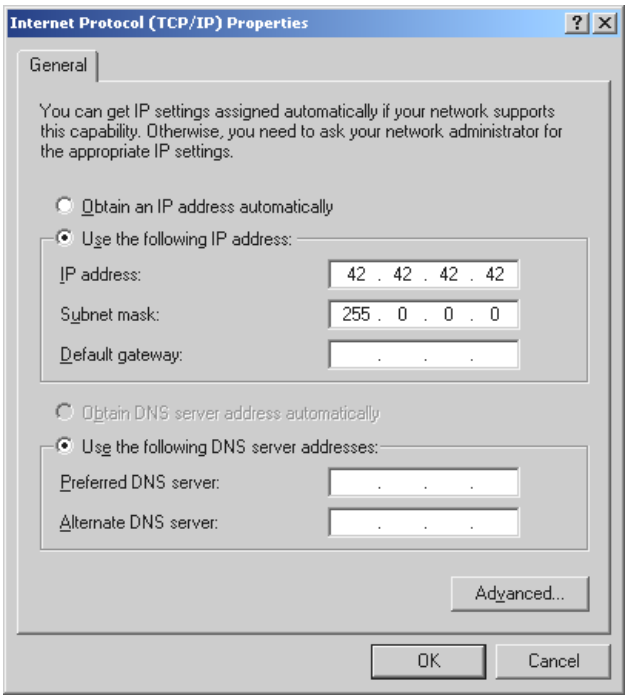
1. You will need an IP Address, Gateway Address and a Subnet Mask from your Network Administrator.
2. On your Infiniium, quit the Scope application if it is running.
3. Open the Control Panel. Open the Network Connections control panel. If you are in Category view, click Network and Internet Connections. Then select Network Connection control panel icon.
4. Right-click **Local Area Connection** and select **Properties** from the popup menu 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 type 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. Windows will prompt you to reboot your Infiniium. Click **Yes**.

9. After the Infiniium reboots, the instrument is ready for GPIB control over the LAN interface. Go to "Configuring PC Agilent IO Config for LAN connection" on page 138.

Configuring Windows Infiniium Networking for DHCP Network

If your network provider uses DHCP, Windows 98 or Windows XP will automatically retrieve a dynamic IP Address from the DHCP server. No configuration for the Infiniium is necessary. Continue to "Configuring PC Agilent IO Config for LAN connection" (page 138).

Configuring Windows 98 Infiniium Networking for Crossover Cable Network

Complete the following procedure to configure Windows 98 Infiniium Networking for a Crossover Cable Network.

To configure Windows 98 Infiniium networking for a crossover cable network:

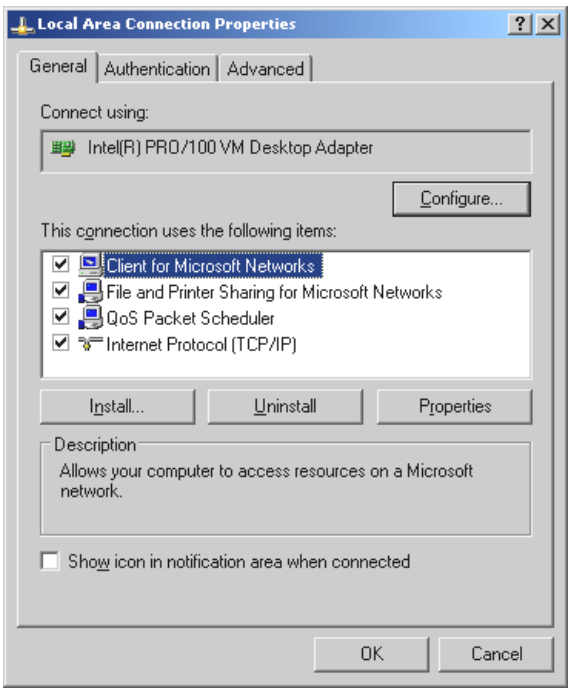
1. You will need to create IP Addresses for both the Infiniium and your PC. Both addresses must have the first 3 sections the same. For example, the PC IP address can be 42.42.42.43 and the Infiniium IP address 42.42.42.42.
2. From the Infiniium File menu, go to the Network submenu, then select **Properties**.
3. In the Network Properties dialog box, select **TCP/IP**, then click **Properties**.
4. Select **Specify an IP address**.
5. Type the IP Address for the Infiniium you created in step 1. (42.42.42.42 in this example)
6. Type a subnet mask of 255.0.0.0.
7. Click **OK** in the TCP/IP Properties dialog box.
8. Click **OK** in the Network Properties dialog box. Windows 98 will prompt you to reboot the Infiniium. Click **Yes**.
9. After the Infiniium reboots, the instrument is ready for GPIB control over the LAN interface. Continue to "Configuring PC Networking for a Crossover Cable Network" (page 134).

Configuring Windows XP Infiniium Networking for a Crossover Cable Network

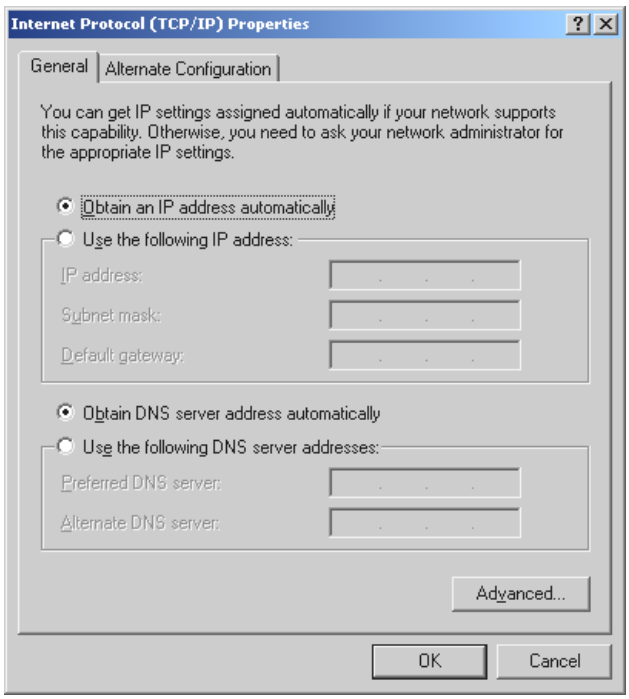
Complete the following procedure to configure Windows XP Infiniium Networking for a Crossover Cable.

To configure Windows XP Infiniium networking for a crossover cable:

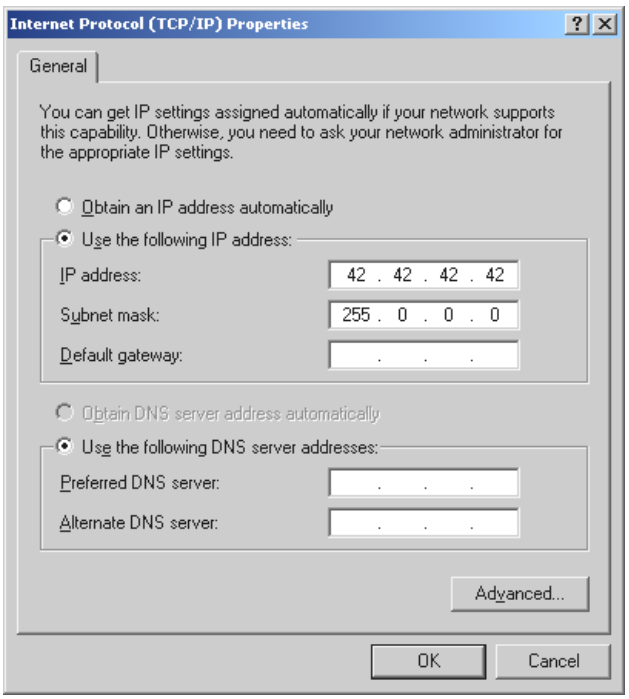
1. You need to create IP Addresses for both the Infiniium and your PC. Both addresses must have the first 3 sections the same. For example, the PC IP address can be 42.42.42.43 and the Infiniium IP address 42.42.42.42.
2. On your Infiniium, quit the Scope application if it is running.
3. Open the Control Panel. Open the Network Connections control panel applet. If you are in Category view, click **Network and Internet Connections**. Then select Network Connection control panel icon.
4. Right-click **Local Area Connection**. Select **Properties** from the popup menu to display the Local Area Connection Properties dialog screen.



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 **Use the following IP address** and type the IP Address for the Infiniium you created in step 1 (42.42.42.42 in this example), and type a subnet mask of 255.0.0.0.



7. Click **OK** in the Internet Protocol (TCP/IP) Properties dialog box.
8. Click **OK** in the Local Area Connection Properties dialog box. Windows will prompt you to reboot your Infiniium. Click **Yes**.

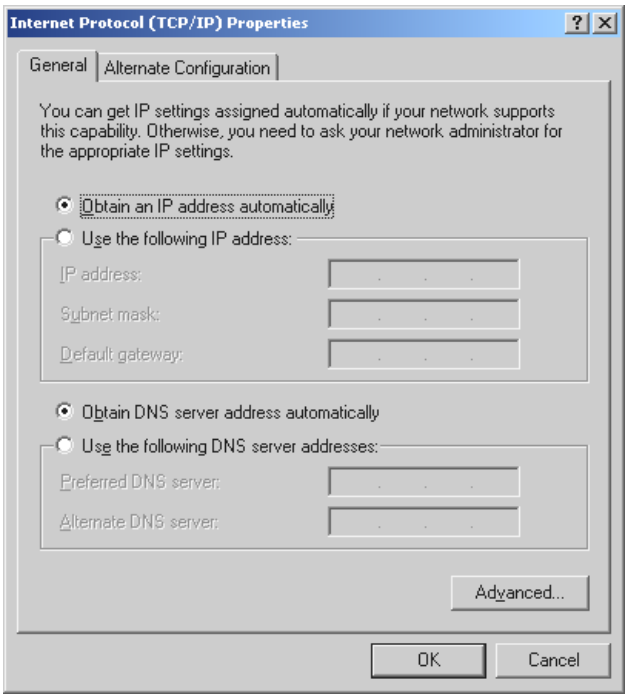
9. After the Infiniium reboots, the instrument is ready for GPIB control over the LAN interface. Continue to "Configuring PC Networking for a Crossover Cable Network" (page 134).

Configuring PC Networking for a Crossover Cable Network

Complete the following procedure to configure PC networking for a Crossover Cable network.

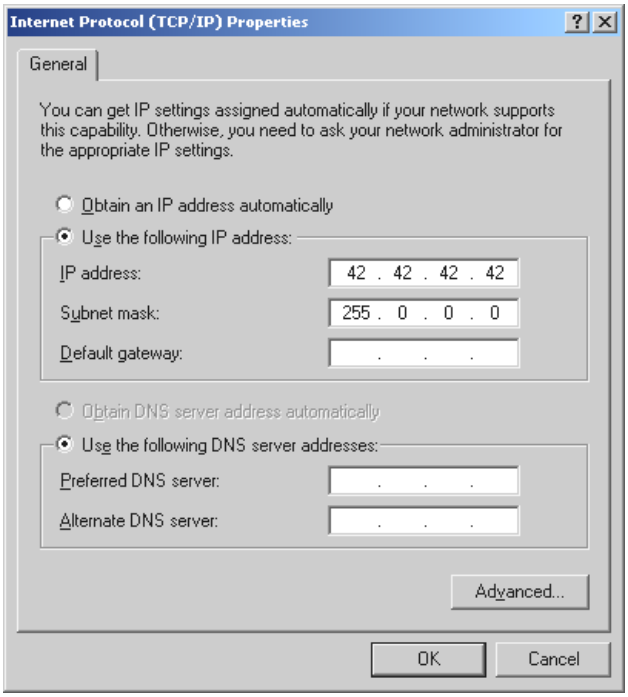
To configure PC networking for a crossover cable network:

1. On your PC, open the Control Panel. For Windows XP, lick **Network and Internet Connections**. For Windows 2000, click **Network and Dial-up Connections**.
2. Click **Network Connections**, right-click your network adapter and then select **Properties** from the popup menu.
3. Select **Internet Protocol (TCP/IP)** and click **Properties** to display the Internet Protocol (TCP/IP) Properties dialog screen.



4. Select **Use the following IP address** and type the IP Address for the PC you created in step 1 of "Configuring Windows 98 Infiniium Networking for Crossover Cable Network" (page 130) or "Configuring Windows XP Infiniium Networking for a

Crossover Cable Network" (page 131) (this example uses 42.42.42.43.), and type a subnet mask of 255.0.0.0.



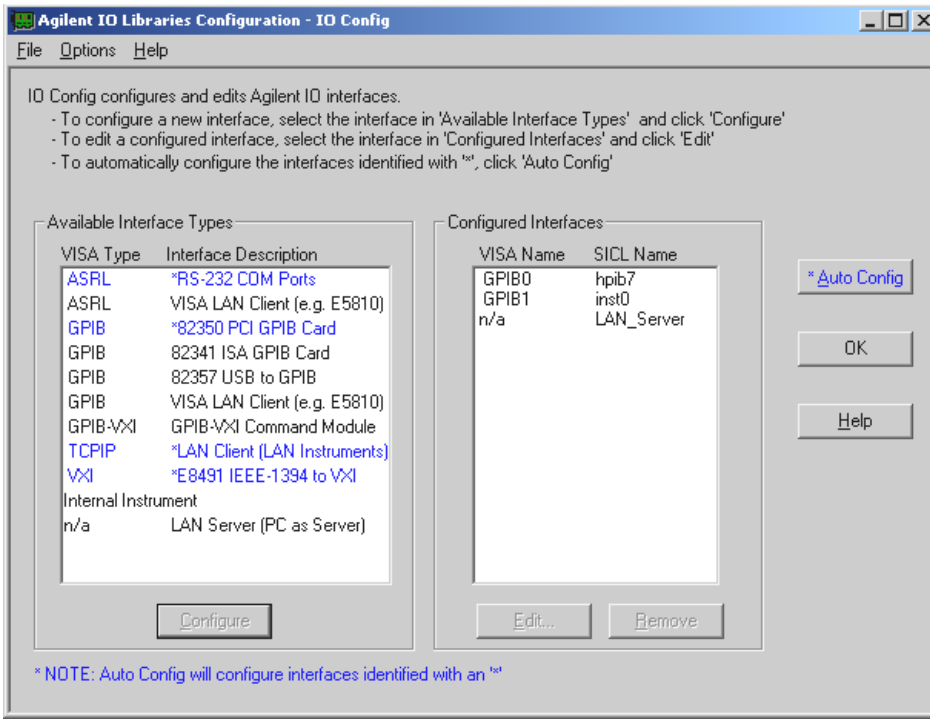
5. Click **OK** in the Internet Protocol (TCP/IP) Properties dialog box.
6. Click **OK** or **Close** in the Local Area Connection Properties dialog box. Windows will prompt you to reboot your PC. Click **Yes**.
7. After your PC reboots, the PC is ready for setting up the Agilent IO Config software. Go to "Configuring PC Agilent IO Config for LAN connection" (page 138).

Configuring PC Agilent IO Config for GPIB connection

The 89601A Software will automatically install the Agilent IO Libraries on your PC if they are not already installed. These instructions assume that your computer has a GPIB card installed and operable.

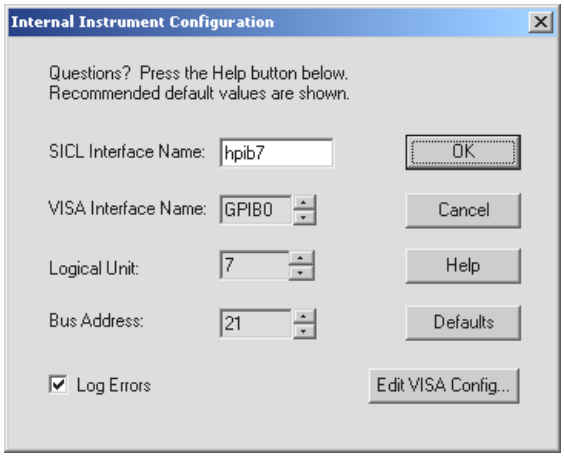
To configure PC Agilent IP Config for a GPIB connection:

1. On the PC with the 89601A software, select: **Start > Programs > Agilent IO Libraries > IO Config** to display the Agilent IO Libraries Configuration - IP Config screen.



2. Verify that the GPIB PCI card (82350) or the USB Adapter (82357) are in the **Configured Interfaces** list. To view the interface properties and interface type, select

the interface then click **Edit**…. If the device is missing, select it in the Available Interface Types list and click **Configure > OK**.



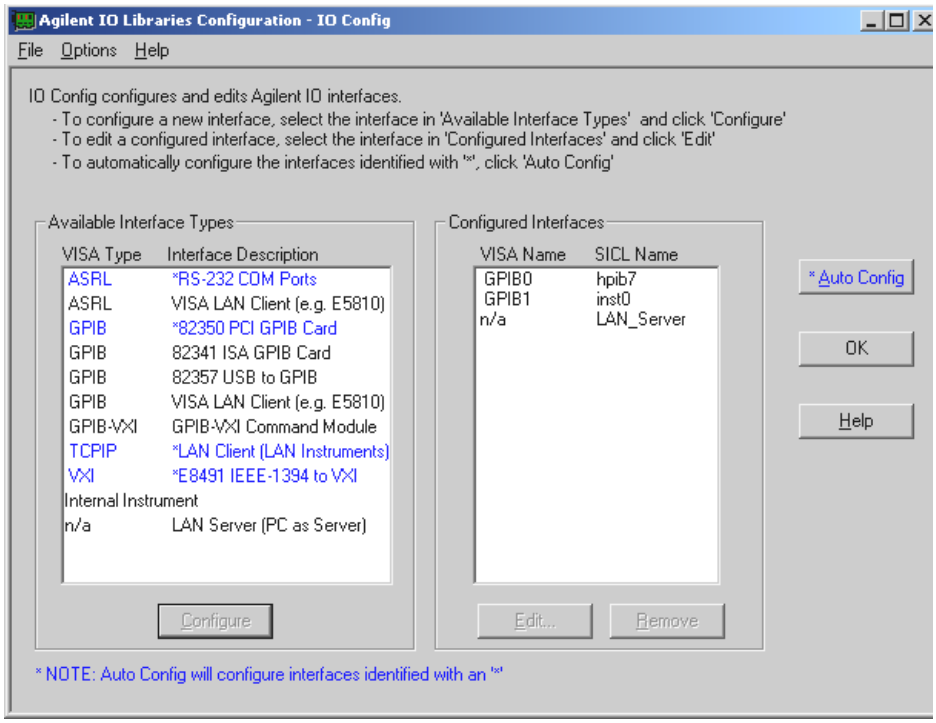
3. Click **OK** to exit the IO Config application.
4. Continue to "Verifying Instrument Connection" (page 140).

Configuring PC Agilent IO Config for LAN connection

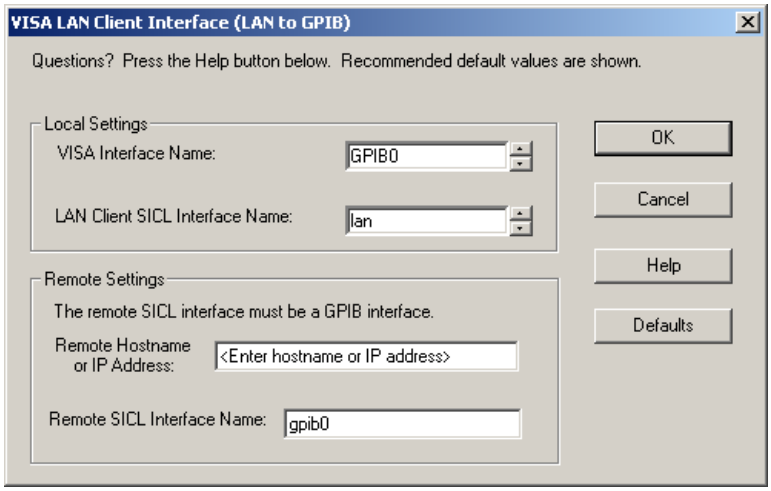
The 89601A Software will automatically install the Agilent IO Libraries on your PC if they are not already installed.

To configure PC Agilent IO Config for a LAN connection:

1. On the PC with the 89601A software, select: **Start > Programs > Agilent IO Libraries > IO Config** to display the Agilent IO Libraries Configuration - IP Config screen.



2. Select **VISA LAN Client** in “Available Interface Types” list. Click **Configure**.



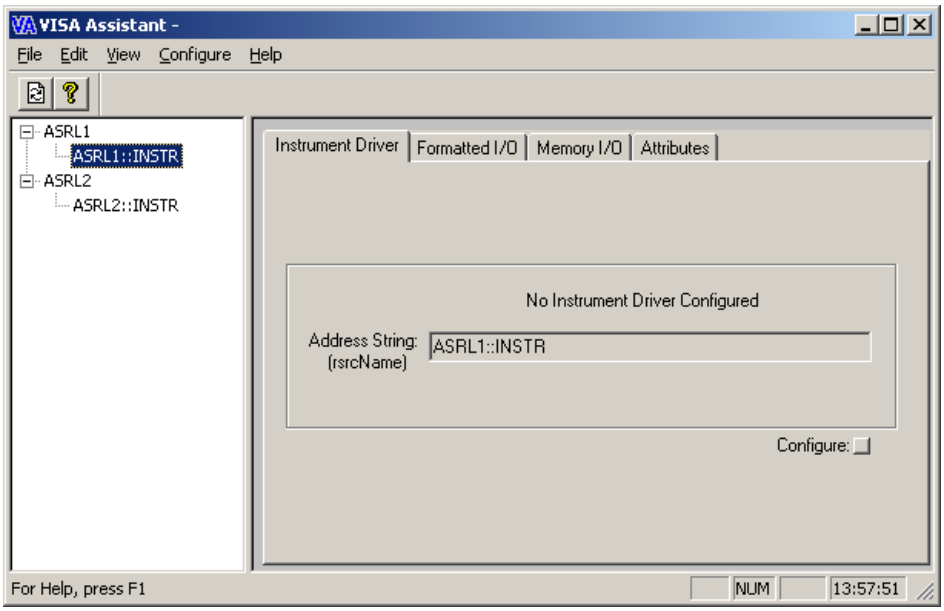
3. In the “Hostname:” field, type the IP address of your Infiniium or LAN/GPIB Gateway. You can find the IP address in the GPIB Setup dialog box on your Infiniium. The GPIB Setup dialog is located in the Utilities menu.
4. In the “Remote SICL Interface Name” field, type `hpib7` for Infiniium. If using an E5810 LAN/GPIB Gateway enter “gpib0”.
5. Click **OK** to exit the interface configuration dialog. IO Config will automatically add the TCPIP0 interface to the Configured Interfaces list in addition to the VISA LAN Client if it has not already been added previously.
6. Click **OK** to exit the IO Config application.
7. Go to "Verifying Instrument Connection" (page 140).

Verifying Instrument Connection

This section provides information on verifying the instrument connection.

To verify the instrument connection:

1. On the PC with the 89601A software, select: **Start > Programs > Agilent IO Libraries > VISA Assistant** to display the VISA Assistant dialog screen.



2. If VISA Assistant does not find any devices, check all connections and verify the Infiniium instrument is running. Try running VISA Assistant again.
3. Select the interface you configured for "Configuring PC Agilent IO Config for LAN connection" (page 138) or "Configuring PC Agilent IO Config for GPIB connection" (page 136).
4. Select **Formatted I/O tab**, select **SCPI**, and then click ***IDN?** The center text box shows the Infiniium GPIB identity string. This shows the VISA interface between your PC and Infiniium is working, and the Agilent 89601A Software is ready for use.
5. Close VISA Assistant.
6. If you are unable to correctly identify an Infiniium in VISA Assistant, verify that the scope application in running in the Infiniium, and verify your connections and Agilent IO Config setup.

8 Installing 89601 Software in Agilent Infiniium XP Scopes

Introduction

This chapter includes information for installing 89601 software in Agilent Infiniium scopes running Windows XP.

The 54853A, 54854A and 54855A Infiniium oscilloscopes provide an open Microsoft Windows® XP[1] Pro operating system that allows you to install other applications. You can install and operate the 89601A Vector Signal Analyzer software on these scopes.

If you are installing 89600 software on a PC connected to your Infiniium scope, skip this chapter and see: Chapter 7, "Configuring Infiniium Windows 98 and XP Scopes" (page 121).

1. Windows is a registered trademark of Microsoft Corporation.

Installing the 89600 software

This section provides information on installing the 89600 software in your scope.

To install the 89600 software embedded in your scope:

1. Increase the scope's virtual memory to at least 1 GByte as follows:
   a. Minimize the scope application.
   b. Navigate to: **Start > Settings > Control Panel > Administrative Tools (double-click) > Computer Management (double-click) > Computer Management (Local) (right-click) > Properties > Advanced (tab)> Performance Options (button) > Virtual Memory - Change** 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 (reboot message - no) > OK** and close remaining screens. Remember, this change does not take effect until you reboot.
2. Install the 89601A software as follows:
   a. Insert the Agilent Technologies 89600 Series Software CD into the scope's CD drive and follow the instructions in the installation wizard.
   b. When the Installation Manager window opens, select **Install Agilent 89600 VSA.**

Caution **Do not install any of the other 89600-Series software in your Infiniium scope; only the 89601 software is currently supported.**

   c. Click **Next** until the Installation Options window opens.
   d. Select **Software-only Installation (no hardware support)**

Caution **Do not select either of the *Full Installation* choices or the hardware drivers under Custom Installation. Performing either of these installations overwrites your Agilent IO libraries and may prevent your scope from proper operation.**

   e. Follow the Installation Wizard instructions to complete the software installation.
   f. After installation is done, delete the Spectrum Analyzer icon (right-click the icon and select **Delete**) from the scope desktop. The Spectrum Analyzer application is not supported with Infiniium scopes.

3. Start the 89600 VSA. Double-click the Vector Signal Analyzer icon or click **Start > Programs > Agilent 89600 VSA > Vector Signal Analyzer.**

Verifying correct operation

If a “Simulated Hardware” watermark does *not* appear in the trace area of the VSA, the installation is complete and the VSA is operating properly. If the watermark Simulated Hardware does appear in the 89600 display, follow these steps to solve the problem.

To verify correction operation:

1. Exit the 89600 VSA application.
2. If the Infiniium application is not running, start the Infiniium application and restart the 89600 VSA application (click **Start > Programs > Agilent 89600 VSA > Vector Signal Analyzer**).
3. If the “Simulated Hardware” water mark still appears, check the hardware configuration as follows:
    a. in the 89600 VSA window click **Utilities > Hardware**.
    b. Check the **Default Hardware** check box and click **OK**.
4. If the Infiniium application is running, then there is a VISA configuration problem, which you can fix as follows:
    a. Stop the VSA application
    b. Minimize the Infiniium application
    c. Start the IO Config application by clicking **Start > All Programs > Agilent IO Libraries > IO Config**.
    d. Make sure that the GPIB0 (VISA Name), hipb7 (SICL Name) interface appears in the Configured Interfaces list.
    e. If it does not appear then highlight “Internal Instrument” in the Available Interface Type list and click **Configure** then **OK** until the configuration is complete.
    f. Restart the VSA application.

    Continue with Step 5 (Page 20).

9 Installing a Node-Locked License

Introduction

This chapter documents installing and setting up a node-locked license for your 89600 analyzer. This allows you to run the 89601 software only on this PC. You can move the license to another PC, but then you cannot run the software on this PC.

If you purchased a floating license for your 89601 software, see installation instructions in Chapter 10, "Setting Up a Floating License Server" (page 155) or Chapter 11, "Setting Up a Floating License Client" (page 173).

If you are using a demo license, start the 89601 software and follow the instructions for accepting a demo license.

Starting the analyzer

Start the analyzer by double-clicking the appropriate icon on your desktop or by clicking:

Start > Programs > Agilent 89600 VSA > Spectrum Analyzer

Start > Programs > Agilent 89600 VSA > Vector Signal Analyzer,

Start > Programs > Agilent Distortion Suite > Distortion Suite

Start > Programs > Agilent WLAN Test > WLAN Test

You must accept a trial or demo license, or install a permanent license (authorization) before you can run the applications. See instructions that follow. You can also transfer a license from another computer ("Transferring a license from another computer" (page 153)).

Note

If your analyzer includes measurement hardware and the analyzer does not find it, see: Chapter 12, "Troubleshooting a VXI IO configuration problem" (page 185).

Licensing your software

When you first run your application, you will be prompted to license (or authorize) your software. You must obtain and install a valid software Site Key (a unique hexadecimal code) to permanently enable the 89600-series software on your computer.

- The license for the 89600 software includes both the Vector Signal Analyzer and the Spectrum Analyzer applications, as well as the 89607 WLAN Test application.
- The license for 89604 includes only the Distortion Suite application. If you did not purchase the 89600 software, you cannot access the Vector Signal Analyzer or Spectrum Analyzer applications independent of Distortion Suite.
- The license for 89607 includes only the Distortion Suite application. If you did not purchase the 89600 software, you cannot access the Vector Signal Analyzer or Spectrum Analyzer applications independent of WLAN Test.
- If you purchased both 89604 Distortion Suite and an 89600 analyzer, you must license both applications.

The Trial License enables all software options for the analyzer for fourteen days. When you install the permanent Site Key (license), only the options you purchased will be enabled.

The Demo License lets you run the software with limited functionality. You cannot use measurement hardware, and you can analyze only the recordings provided with the software. You must accept a demo license each time you start the 89600 software, but there is not limit to the number of times you can use a demo license.

Caution

When you accept the trial license, you can run your analyzer without the Site Key for fourteen days. You must install the Site Key before the trial license expires, or you will have to obtain a new Site Key and the analyzer will stop working.

You do not need to accept the trial license if you will be transferring in a license from another computer rather than obtaining a new license. For instructions on transferring in a license, see "Transferring a license from another computer" (page 153).

Continue with "Obtaining a site key (license)" (page 149).

Obtaining a site key (license)

Follow these steps to obtain your software Site Key:

To find the materials and information you need:

1. Locate the Site Key Request Form in one of these ways:
   a. *(Preferred)* Go to the 89600Web page at www.agilent.com/find/89600 and click **Request Site Key** near the bottom of the page. You can paste or type in your Site Code, complete the rest of the form, and submit your request.
   b. Locate the printed Site Key Request Form. This sheet of paper is in the Installation Materials envelope shipped with your analyzer. You can fill in the requested information and return the form by fax.
2. Collect the *License Certificates* for all copies of the 89600 software and each software option that you purchased. The License Certificates are printed on gray parchment and are shipped in the Installation Materials envelope.

Note

If you are installing a software update, you need an Update Certificate rather than a License Certificate. One Upgrade Certificate covers all the software and options installed on one computer.

3. Obtain the site code for your computer. The site code is a 30-character hexadecimal code created by the 89600 installation process to identify your computer. Each computer has a different site code. There are two ways to find the site code:

   If you are starting the analyzer for the first time and have not already accepted a trial license, follow these steps:

   a. Start the analyzer by double clicking the icon or by clicking:

      Start > (All) Programs > Agilent 89600 VSA > Spectrum Analyzer | Vector Signal Analyzer
      -or-

      Start > (All) Programs > Agilent Distortion Suite > Distortion Suite

      If you get an error message saying that the analyzer “cannot find VXI hardware,” see: Chapter 12, "Introduction to Diagnostics" (page 180).

   b. When a dialog box asks if you want to obtain authorization, click **Yes**.
   c. Click the **New License** tab in the Authorization dialog box.
   d. Click **Generate Site Code.** The Site Code appears in the Site Code box. This also accepts a trial license, so that you can operate the analyzer for 14 days while you obtain and install your permanent license.

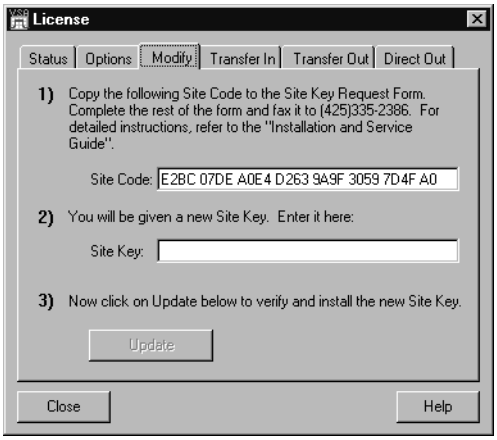
      Be sure to obtain and install your Site Key within 14 days. At the end of the 14-day trial period, the trial license expires, and your Site Code changes. If you have not installed your Site Key before this happens, you must obtain a new Site Key.

      If you previously accepted a trial license, follow these steps:

e. Start the analyzer by double clicking the icon or by clicking
Start > (All) Programs > Agilent 89600 VSA > Spectrum Analyzer or **Vector Signal Analyzer**
or **Start > (All) Programs > Agilent Distortion Suite > Distortion Suite**.

f. Click **Utilities > License > Modify**.
The Site Code is displayed in the Site Code box.

Note that you cannot use the site code displayed in the following figure; you must enter the site code for your computer, which is unique.



Caution

Be sure to obtain and install your Site Key within 14 days. At the end of the 14-day trial period, the trial license expires, and your Site Code changes. If you have not installed your Site Key before this happens, you must obtain a new Site Key. When the trial license expires, you cannot run the software until you install the correct Site Key.

To complete the Site Key Request Form:

1. Copy the site code onto the *Site Key Request Form.* The site code contains 30 hexadecimal characters (digits 0 through 9 and letters A through F). The code is not case sensitive, and spaces are optional. (You can copy and paste the site code into the Web or ASCII text version of the Site Key Request Form.)
2. (optional) Fill in the Customer's Computer ID. This is the name or code that you use to identify the computer. It might be the name of the person who uses the computer (such as "John Doe's PC"), or it might be an identifier that your company has assigned to the computer (such as "lab214").

   The Customer's Computer Name is optional and is included for your convenience. If you provide the information, we include it in any correspondence we send to you. This is useful for you if you are installing licenses on more than one computer, so you can identify which license file goes on which computer.
3. Below the Site Code, list the License Certificate Number for each piece of software and software option you installed on that computer. You can get this number from the gray parchment *License Certificate* that was shipped with the analyzer.

   If you are installing a software update, list one Update Certificate Number. It covers all software options enabled on the computer.
4. If you ordered software for more than one computer, use separate tables to list the site code and license certificate numbers for each computer. You can photocopy the form or copy the e-mail form.
5. Fill in the customer name and address information on the *Site Key Request Form.* The fields marked with an asterisk (*) must be completed.
6. Return the *Site Key Request Form* to Agilent Technologies using one of these methods:
   a. Submit the form from the Web page.
   b. e-mail the requested information to *89600_SWL@agilent.com*. Your Site Key will be sent via e-mail to the address you specify on the request form.
   c. If you do not have access to e-mail, send the Site Key Request Form via fax to (425) 356-6250. Your Site Key will be returned by fax to the number you provided on the form.
7. Close the Authorization or License window.

Installing a site key

When you receive your Site Key, install it on the computer.

Caution Be sure to install your Site Key before your trial license expires. If the trial license expires, the Site Code for your computer changes and you must obtain a new Site Key.

To install a site key (if your Trial License is still active):

1. Start the analyzer by double-clicking the desktop icon or by clicking:

   Start > (All) Programs > Agilent 89600 VSA > Spectrum Analyzer | Vector Signal Analyzer

   -or-

   Start > (All) Programs > Agilent Distortion Suite > Distortion Suite.

2. Click **Utilities > License > Modify**.

3. Copy and paste the Site Key in the space provided and click **Update**. (The Site Key is a hexadecimal number, containing only the numerals 0 through 9 and letters A through F. The Site Key is not case sensitive, and spaces are optional.) If you received your Site Key via fax, you must type the 26-character Site Key in the space.

Caution If your trial license has expired, the Site Code for your computer has changed and you must obtain a new Site Key. The Site Key you just received will not work.

You can now run your Agilent 89600-series software permanently on this computer only. If you want to move the software to another computer, follow the instructions for "Transferring a License" under the "Licensing" topic in the application Online Help.

When you install the Site Key, the site code for your computer changes. In addition to identifying your computer, the site code also identifies which Agilent 89600-series software is installed and enabled on your computer.

Transferring a license from another computer

Via floppy disk

The Transfer In and Transfer Out tabs of the License dialog box provide the mechanism to transfer a single license from one computer to another, using a floppy disk. To begin such a transfer, the software must be installed on two different computers, and at least one valid license installed. Once these preconditions exist, take the following steps to transfer the license.

To transfer a license from another computer:

1. Perform the following steps on the target computer (the computer to which you want to move the license):
   a. Start the analyzer by double clicking on the icon or by clicking **Start > (All) Programs > Agilent 89600 VSA > Spectrum Analyzer** or **Vector Signal Analyzer** or **Start > (All) Programs > Agilent Distortion Suite > Distortion Suite**.
   b. During startup, no license is detected, so the software asks if you wish to obtain a license. Click **Yes**.
   c. In the Authorization dialog box, click **Transfer In** and **Register Transfer**.
   d. Enter the path to your floppy disk drive and click **OK**. The register transfer function writes a license imprint file to the drive whose path you supply.
2. Remove the floppy disk and insert it in the source computer (the computer that currently has the license).
3. Perform the following steps at the source computer:
   a. Start the analyzer.
   b. Click **Utilities > License > Transfer Out.**
   c. Provide the path to the location of the floppy disk and click **OK**. The licensing software moves the license to the imprint file on the floppy disk. At this time, the license on the source computer is discontinued, or decremented by one in the case of multiple licenses.

Caution Do not lose the floppy disk--it now contains your license for the 89600 analyzer. If you lose the disk you lose your license.

4. Return the floppy disk to the target computer.
5. Perform the following steps at the target computer:
   a. If the Authorization dialog box is still open, go to the next step. Otherwise, start the analyzer. In the Invalid Authorization question box, click **Yes**.
   b. In the Authorization dialog box, click the **Transfer In** tab, then the **Transfer In** button.
   c. Provide the path to the location of the license (the floppy disk) and click **OK**.
6. The software is now enabled on the target computer.

Via network drive

A license can never be shared - that is, it must always be assigned to a particular computer. In those rare cases when two computers on the same network need to run the software sequentially or alternately, the Direct Out license transfer can provide a kind of sharing without the need to carry floppy disks from one system to another.

To share a license:

1. Install the software on both computers
2. Obtain a license for one of the computers in the usual way and install the license.
3. When you want to run the application on the other computer, click **Utilities > License** on the licensed (source) computer and click **Direct Out**.
4. A dialog box will open asking you for the path to the license destination directory on shared network drive. Type or browse to it and click OK. This transfers the license to the destination computer and disables the license on the source computer.

Now when you open the application on the destination computer, the licensing software recognizes that the license has been transferred. The application will no longer open on the source computer.

10 Setting Up a Floating License Server

Introduction

This chapter documents installing and setting up a floating license server for your 89600 analyzer. If you purchased a node-locked license for your 89600 software, installation instructions are in Chapter 9, "Installing a Node-Locked License" (page 145). If you are using a demo license, start the software and follow the instructions for accepting a demo license.

Floating License Overview

Use the information in this chapter to set up a floating license server for the 89600 software. You must set up the license server and your 89600 license (.lic) file before you can run any of the 89600 Series Software that require floating licenses. The FLEXlm floating licenses require a server computer (to manage license control) and client computers (to obtain a license from the server computer) for running the 89600-series software. Note that the server computer and client computer can be the same PC.

Note

If you are not be running 89600 application software on this PC, install only the 89600 License Support and no other part of the 89600 software.

These are the basic steps for setting up your FLEXlm server, which are described in detail in the rest of this chapter.

1. "Installing Floating License Support" (page 158).
2. "Obtaining your Floating License File" (page 161)
   a. Read Host ID
   b. Submit request form
3. "Installing your Floating License File" (page 163)
   a. Place Floating License File
   b. Enter hostname (optional)
4. "Starting Your License Server" (page 164)

Redundant license servers

If you will be setting up redundant license servers, see: "Setting up Redundant License Servers" (page 166).

Setting up client PCs

To set up FLEXlm on your client PC (the computer where you will run the 89600 software), see: Chapter 11, "Setting Up a Floating License Client" (page 173).

Adding license files

If you are adding licenses to an existing server, see: "Adding License (.lic) Files" (page 168).

Installing Floating License Support

The 89600 Series Software uses Macrovision's Flexible License Manager (FLEXlm) software for all floating software security configurations. The 89600 setup program installs the FLEXlm software at *%SystemRoot%*\vsa\licenses\bin, where *%SystemRoot%* is typically c:\WINDOWS.

Installing floating license support does the following:

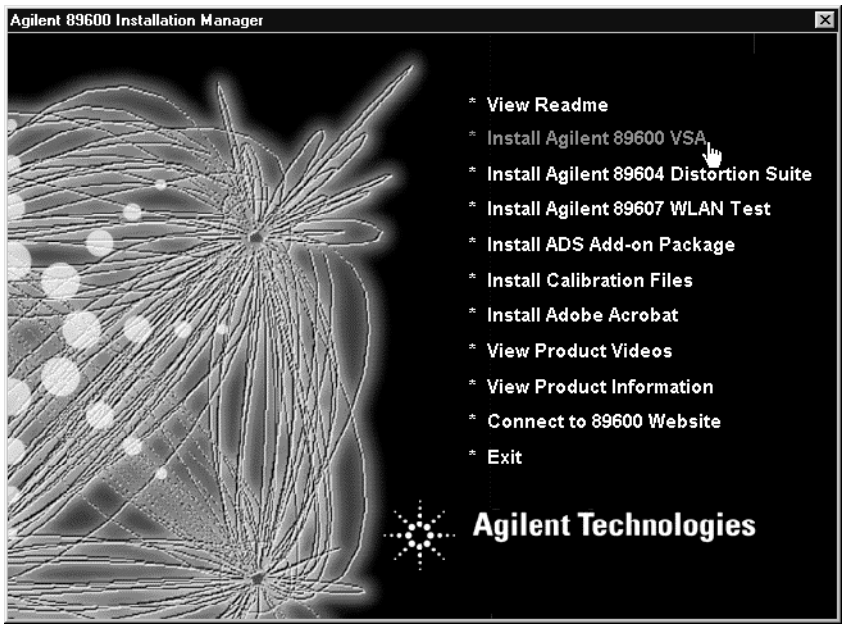
- Creates the *%SystemRoot%*\vsa\licenses folder to contain your License File(s).
- Installs the FLEXlm libraries in the *%SystemRoot%*\vsa\licenses\bin folder.
- Installs the license daemon in the *%SystemRoot%*\vsa\licenses\vendors folder.
- Installs help files in the *%SystemRoot%*\vsa\licenses\util folder
- Installs tools and batch files in the *%SystemRoot%*\vsa\licenses\help folder

To install floating license support:

1. Insert the Agilent 89600 Series Software installation CD-ROM.
2. If the installation utility does not start automatically, click **Start > Run**, and type:

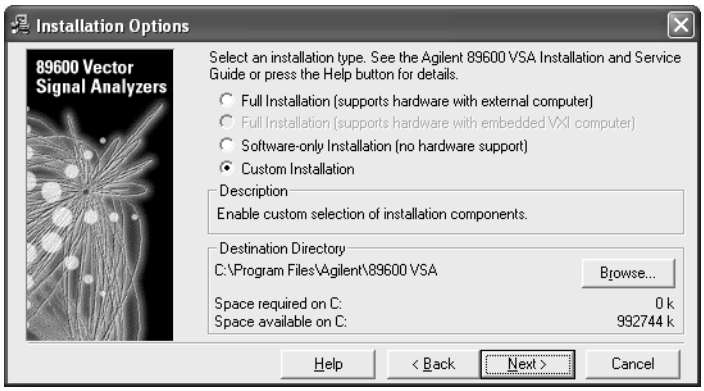
   drive`:\autoplay.exe`

   ...where *drive* represents the drive with the installation CD-ROM. Click **OK.**
3. In the Installation Manager Window, click **Install Agilent 89600 VSA**.

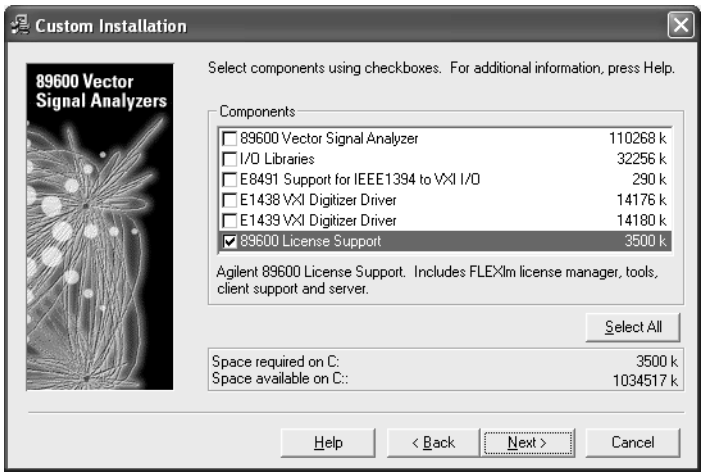


4. When the Welcome window opens, click **Next**.

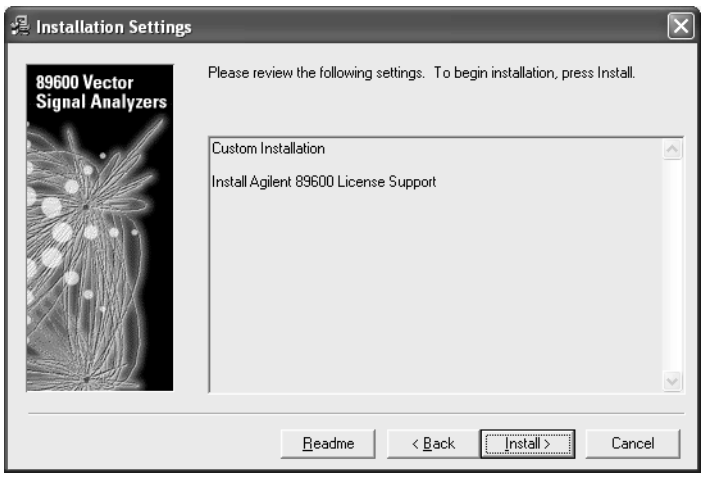
5. Read the license agreement and warranty terms. Click **Yes** to accept the terms and continue installation. Click **No** if you do not accept the terms. If you click No, you will not be able to install the license support.
6. In the Installation Options window, select **Custom Installation**. Click **Next**.



7. In the Custom Installation window, check the **89600 License Support** check box. Click **Next.**



8. In the Installation Settings window, click **Install**.



9. Reboot if requested.
10. After installation is complete, click **Finish, OK,** or **Exit** to close all the installation windows.
11. Continue to: "Obtaining your Floating License File" (page 161).

Obtaining your Floating License File

Before performing these steps, you must have installed the 89600 License Support as described in "Installing Floating License Support" (page 158).

Find the materials and information you need:

1. Locate the *Floating License File Request Form* in one of these ways:
   a. *(Preferred)* Go to the 89600 Web page at www.agilent.com/find/89600 and click **Request Floating License File**. You can paste or type in your Host ID, complete the rest of the form, and submit your request.
   b. Locate the printed *Floating License File Request Form.* This sheet of paper is in the Read Me First envelope shipped with your software. You can fill in the requested information and return the form by fax.
2. Collect the *License Certificates* for all copies of the 89600 software and each software option that you purchased. The License Certificates are printed on gray parchment and are shipped in the Read Me First envelope.

Note If you are installing a software update, you need Update Certificates rather than License Certificates.

3. Obtain the Host ID for your computer.
   a. Click **Start > (All) Programs > Agilent 89600 License Support > Server > Host ID**.

Note If more than one Host ID is listed, use the first one from the list.

   b. Copy the line displayed in the Notepad window or print the file. This is the Host ID that you will need to obtain a License File .
   c. Paste or write the Host ID in the space provided in the License File Request Form.
   d. Close the Notepad window.

To complete the License File Request Form:

1. Copy the Host ID (from step 3 on the previous page) onto the *Floating License File Request Form.* (You can copy and paste the Host ID into the Web version of the License File Request Form.)
2. (optional) Fill in the Customer's Computer Name. This is the name or code that you use to identify the computer. It might be the name of the person who uses the computer (such as "John Doe's PC"), or it might be an identifier that your company has assigned to the computer (such as "lab214").

   The Customer's Computer Name is optional and is included for your convenience. If you provide the information, we include it in any correspondence we send to you. This is useful for you if you are installing licenses on more than one computer, so you can identify which license file goes on which computer.
3. Below the Host ID, list the License Certificate Number for each piece of software you installed on that computer. You can get this number from the gray parchment *License Certificate* that was shipped with the software.

   If you are installing a software update, list your Update Certificate Numbers rather than your License Certificate Numbers.

Note

If you are running 89600 software using several independent license servers, submit a separate License File Request for each license server. Each License Certificate can only be used once, and is intended to provide a license file for a single server. If you need to allocate the licenses within a License Certificate across multiple servers, please make a special note of this in your request.

4. Fill in the customer name and address information on the *Floating License File Request Form.* The fields marked with an asterisk (*) must be completed.
5. Return the *Floating License File Request Form* to Agilent Technologies using one of the following methods. Your License File will be sent to you by e-mail or fax, depending on whether you provided a fax number or e-mail address on the request form.

   a. Submit the form from the Web page (www.agilent.com/find/89600).

      -or-

   b. Submit the requested information via e-mail to *89600_SWL@agilent.com.*

      -or-

   c. If you do not have access to e-mail, send the *Floating License File Request Form* via fax to (425) 356-6250.

Installing your Floating License File

When you receive your license (.lic) file, you must install it on the server PC. If your licenses will be served by a central server, have your system administrator install the license (.lic) file on the license server computer.

To install your floating license file:

1. If you receive your license file via e-mail, open the message in e-mail.
   a. Click **Start > (All) Programs > Agilent 89600 License Support > Server > License Files Directory.** This opens an Explorer window in the *%SystemRoot%*\vsa\licenses directory.
   b. Drag the license file from the e-mail message and drop it in the licenses directory.
2. If you receive your license file via fax, you must type the file and save it under the name specified in the fax. The file must go in the directory described in the previous step.
3. If you are adding a license file to a previously-installed license server, go to: "Adding License (.lic) Files" (page 168).

   If you are setting up a redundant license server, go to: "Setting up Redundant License Servers" (page 166).

   Otherwise, continue to: "Starting Your License Server" (page 164).

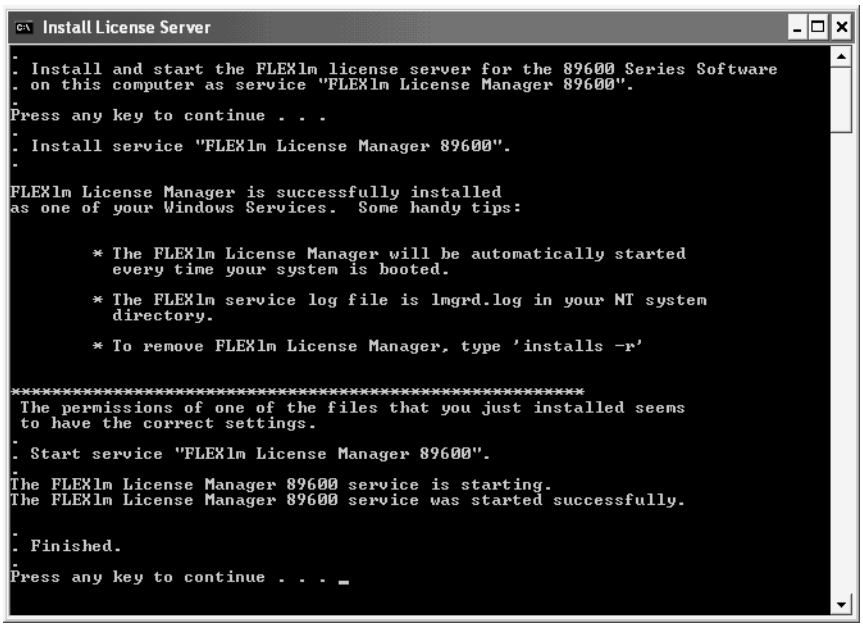
Starting Your License Server

The information in this section shows you how to start your license server.

To start your license server:

1. Start FLEXlm by clicking **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Install.**

   a. When the Install License Server window appears, press any key on the keyboard.

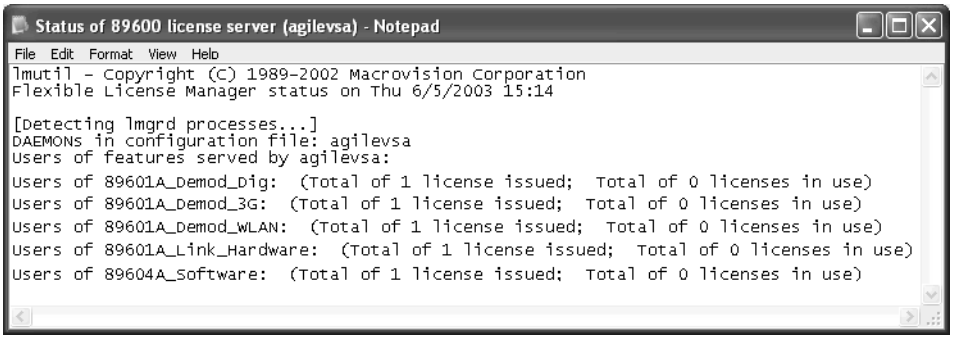


   b. When the installation is finished and reads “Finished. Press any key to continue . . .”, press any key on the keyboard.

2. Verify that the license server is working.

   a. Click **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Status**.

The window appears in something like this.



When you install the server, if no license files are found, then the file empty.lic is installed in the vsa\license directory. This file does not enable any licenses. It merely allows the FLEXlm license program to work properly.

b. Close the window.

3. Inform your clients of the computer name or names and port number (if required) for the server PC.

   To find the computer name, click **Start > (All) Programs > Agilent 89600 License Support > LMTOOLS > System Settings.** The computer name is listed in the Computer/Hostname box.

   Clients must add an environment variable called `AGILEVSA_LICENSE_FILE`. The value for the variable is the computer name and, optionally, the port number, in this form:

   `@mike` (if the computer name is “mike” and no port number is required).

   `2110@mike` (if the computer name is “mike” and a port number of 2110 is required).

   You need to specify a port only if it is specified on the SERVER line of the license file or files and it is not in the range of 27000 to 27009.The following table shows the possible formats for the variable value.

Single server - no port number assigned	@mike
Single server - port number assigned	2100@mike
Redundant server - no port number assigned	@mike;@mike2;@mike3
Redundant server - port number assigned	2100@mike2110;@mike2;2120@mike3

Note

You must install the 89600 Series Software on each client PC. Rather than installing the software from individual CDs, you can copy the CD to a shared drive. Then clients can run autoplay.exe from the shared drive to install the software on their PCs.

Setting up Redundant License Servers

FLEXlm lets you set up a redundant license server configuration. This involves configuring three license servers with one of the three servers functioning as the master server. If the master server goes down, one of the other two servers becomes the new master server, and the licenses remain available on the network.

Note

Setting up redundant servers requires extra system administration and is not recommended unless you absolutely need it.

To set up redundant license servers, use the same FLEXlm procedures on all three servers. All three servers must be up and running before your licenses are available.

To setup redundant license servers:

1. Install the 89600 License Support on all three computers (see: "Installing Floating License Support" (page 158)).
2. Obtain your floating license file (see: "Obtaining your Floating License File" (page 161)). You must provide the host ID for all three computers.
3. Install your license file (see: "Installing your Floating License File" (page 163)) with the following exceptions:

   a. Using an ASCII editor, change the default hostname settings in your license (.lic) file to the actual hostnames of your license servers. The license servers are the machines that will serve the licenses on the network, and whose ethernet addresses appears on the SERVER lines:

   ```
   SERVER <hostname1> <hostid1> <tcp_port>
   SERVER <hostname2> <hostid2> <tcp_port>
   SERVER <hostname3> <hostid3> <tcp_port>
   ```

   To find the hostname and hostid, click **Start > (All) Programs > Agilent 89600 License Support > LMTOOLS > System Settings.** The computer name is listed in the Computer/Hostname box. The hostid is listed in the Ethernet Address box.

   <tcp_port> is the port number for the server, such as “2100”

   For these examples, one SERVER line would read:

   ```
   SERVER mike1 0060b05768ee 2100
   ```

Note

Be sure the hostname and hostid in the same line (such as “hostname1” and “hostid1”) are for the same computer.

You must also specify a TCP port number for license requests. The license file includes a default port number. If this conflicts with other FLEXlm licenses on your server, change the port number.

b. Save the license file.

c. Copy the license file to the licenses directory on each of the other two server PCs.

4. Start the license server on each of the PCs. See: "Starting Your License Server" (page 164).

5. Verify that the license servers are installed properly. Click **Start > (All) Programs > Agilent 89600 License Support > LMTOOLS > Server Status > Perform Status Enquiry**.

   The status should include 3 lines similar to these:

```
  vsa: license server UP v8.3
 vsa2: license server UP (MASTER) v8.3
vsaxp: license server UP v8.3
```

   In this example, the hostnames of the three servers are vsa, vsa2, and vsaxp. All three servers should be listed as UP, and only one server should be indicated as MASTER.

Adding License (.lic) Files

If you have been running FLEXlm and receive updated License Files from Agilent, you can add the new licenses to the FLEXlm environment as below.

To add license (.lic) files:

1. Install the new file, following the instructions in "Installing your Floating License File" (page 163).
2. On the server, click **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Refresh** . This causes the *lmgrd* on the primary server to re-read the license (.lic) files and update all of the other lmgrd processes on the network.
3. After you have done this, you can verify that the license servers have received the new license information by clicking **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Status**.

If this does not work, you may need to stop and restart the license servers on your network.

To stop and restart the license servers:

1. Click **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Uninstall**.
2. When instructed to “Press any key to continue,” do so.
3. Click **Start > (All) Programs > Agilent 89600 License Support > Server > License Server Install.**
4. When instructed to “Press any key to continue,” do so.

Managing Multiple Application License Servers on One Computer

When you are running multiple FLEXlm-licensed applications, the recommended configuration is to run multiple license servers, each running one *lmgrd* and accessing one or more license (.lic) files. This allows you to keep the other application's licensing separate from the 89600 licensing.

To manage multiple application license servers on one computer:

1. Each *lmgrd* uses a different TCP/IP port. If you specify port numbers in your License File(s), then each license server (*lmgrd*) must use a different port number as specified on the SERVER lines of the license (.lic) files. You can use a standard text editor to change the port number in each license (.lic) file.
2. You must make sure that you are using a compatible version of *lmgrd* when you start it up for a particular license (.lic) file.

   When you have license (.lic) files for two different FLEXlm-licensed products, the products may ship with the different versions of FLEXlm. FLEXlm is designed to handle this situation.

   If you install an application that provides a newer version of FLEXlm than was installed for your 89600 program, the easiest way to ensure compatibility is to copy three files from the newer version into the directory *%SystemRoot%*\vsa\licenses\bin. The files you should copy are lmgrd.exe, lmtools.exe, and lmutil.exe.

   To determine the version of FLEXlm currently in use by the 89600 license, click Start > (All) Programs > Agilent 89600 License Support > Server > FLEXlm Version.

   If the version of FLEXlm you install with your 89600 program is newer than FLEXlm versions installed for other applications, see the documentation for those applications to determine what you need to do.

Removing 89600 License Support

If you have a node-locked 89600 license installed or have accepted a trial 89600 license, then you install 89600 License Support on that PC, you “hide” the other licenses. To use either the trial license or node-locked license, you must remove 89600 License Support.

To remove 89600 license support:

1. Click Start > Control Panel > Add or Remove Programs.
2. Select 89600 License Support and click Change/Remove.
3. Select Automatic and click Next.
4. Click Finish.
5. When the removal is finished, close all the Control Panel dialog boxes and windows.

You can now run your 89600 software with the node-locked or trial license. When your trial license expires, you must reinstall 89600 License Support and install your license file before you can run the 89600 software.

Tools and Batch Files

The FLEXlm support includes several batch files to simplify setting up and checking your licenses. You can run these batch files by clicking **Start > (All) Programs > Agilent 89600 License Support** and either **Server** or **LMTOOLS.**

FLEXlm Version Run this file to check which versions of FLEXlm and 89600 License Support are used for the 89600 license manager.

Host ID Run this file to display the host ID of this computer. If the list includes more than one line, use the host ID from the first line.

If you are setting up redundant servers (see page 166), you must provide the host ID of all three servers. If more than one host ID is listed for a server, use the first host ID listed.

License Files Directory Run this file to open an explorer window in the licenses directory.

License Server Install Run this file to install FLEXlm as a service and start FLEXlm.

License Server Refresh Run this file after you have installed a new license file or modified an existing license file. This forces a currently running FLEXlm server to reread the license files.

License Server Status Run this file to display the number of licenses available and used.

License Server Uninstall Run this file to shut down FLEXlm and remove FLEXlm as a service.

LMTOOLS This file provides a shortcut to the LMTOOLS utility. LMTOOLS is a graphical user interface to the FLEXlm license manager tools. For details on using the tools, see the FLEXlm end user document, click **Start > (All) Programs > Agilent 89600 License Support > Help > FLEXlm Ed Users Guide.**

11 Setting Up a Floating License Client

Introduction

This chapter documents installing and setting up a floating license client for your 89600 analyzer. If you purchased a node-locked license for your 89600 software, see: Chapter 9, "Installing a Node-Locked License" (page 145). If you are using a demo license, start the software and follow the instructions for accepting a demo license.

Floating License Overview

The 89600 Series Software uses Macrovision's Flexible License Manager (FLEXlm) software for floating (network) software security configurations. When you run the 89600 Series Software setup program, the FLEXlm software is installed at *%SystemRoot%*\vsa\licenses\bin where *%SystemRoot%* is typically c:\WINDOWS.

The FLEXlm floating licenses require a server computer, to manage license control, and client computers, those on which you obtain a license from the server and run the 89600 series software.

This chapter covers setting up FLEXlm licensing on a client PC:

1. Install 89600 Series Software and license support as instructed in Chapter 2, "Installing 89600 Software" (page 23).
2. Set system environment variables: "Setting the System Environment Variables" (page 176).
3. Start the 89600 software: "Starting the 89600 software" (page 178).

Note

If you install 89600 License Support on a PC that also has a node-locked or trial license, you will not be able to use the node-locked or trial license unless you use Add/Remove Programs to remove 89600 License Support.

Setting the System Environment Variables

To run 89600 Series Software and check out a license from the license server, you must set the AGILEVSA_LICENSE_FILE environment variable.

The environment variable specifies the name of the license server computer (or computers) from which you will get a license to run 89600 software. You specify a name for the environment variable (AGILEVSA_LICENSE_FILE) and assign a value. The value is the license computer name and, optionally, the TCP port number assigned. Your license administrator will provide you with the computer name and, if required, the port number.

To set the system environment variables:

1. Get the name of the server computer (or computers) from your license administrator.
2. For Windows XP, click **Start > Control Panel > Performance and Maintenance > System > Advanced > Environment Variables**.

   For Windows 2000, click **Start > Settings > Control Panel > System > Advanced > Environment Variables**.
3. Add a new variable named AGILEVSA_LICENSE_FILE that points to the license server computer.

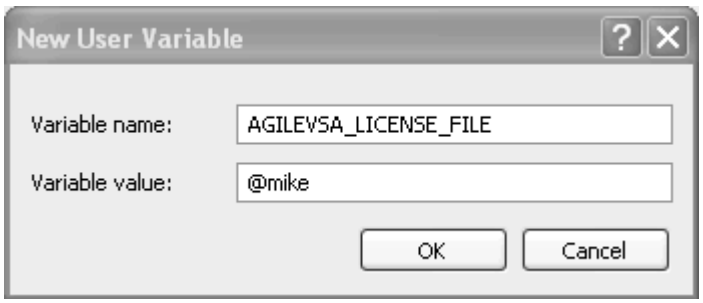
   a. Click **New** under the User variables or System variables list.

Note

You can enter the `AGILEVSA_LICENSE_FILE` environment variable either as a user variable or as a system variable. The user variable affects only the currently logged-in user; the system variable affects all users.

b. In the Variable name box, type `AGILEVSA_LICENSE_FILE`

c. In the Variable value box, type @ and the name of the server computer (mike, in this example). Your license administrator can provide you with this information.



d. Click **OK, OK, OK,** and close the Control Panel window.

Important

The AGILEVSA_LICENSE_FILE environment variable takes precedence over any LM_LICENSE_FILE settings you might have set up for other applications that use FLEXlm licensing. AGILEVSA_LICENSE_FILE is searched first for a valid license before LM_LICENSE_FILE. As a result, using the AGILEVSA_LICENSE_FILE variable will isolate your 89600 Series Software license configurations from other applications that use the LM_LICENSE_FILE variable.

Starting the 89600 software

Start the application by double-clicking the appropriate icon on your desktop or by using the Start menu:

Start > (All) Programs > Agilent 89600 VSA > Spectrum Analyzer | Vector Signal Analyzer

Start > (All) Programs > Agilent Distortion Suite > Distortion Suite

Start > (All) Programs > Agilent WLAN Test > WLAN Test.

12 Diagnostics

Introduction to Diagnostics

This chapter includes procedures for troubleshooting and isolating hardware problems.

Note

For additional troubleshooting information, in the Agilent 89600 window, click **Help > Roadmap > Troubleshooting**.

Before you run diagnostics on VXI analyzers, check the front-panel cable connections described in Chapter 3 (Table 12-1).

Table 12-1 Front-Panel Cable Connections for VXI Analyzers

Analyzer configuration	Cable connections
1-channel 89610A	"Cable connections, 89610" (page 60)
2-channel 89610A	"Cable connections, two-channel 89610" (page 61)
1-channel 89611A	"Cable connections, 89611" (page 63)
2-channel 89611A	"Cable connections, two-channel 89611" (page 66)
1-channel 89640A	"Cable connections, 89640" (page 67)
89640A, second IF/BB channel	"Cable connections, 89640 with second IF/baseband channel" (page 68)
2-RF-channel 89640A	"Cable connections, 89640 with second RF channel" (page 69)
1-channel 89641A	"Cable connections, 89641" (page 71)
89641A second IF/BB channel	"Cable connections, 89641 with second IF/baseband channel" (page 72)
2-RF-channel 89641A	"Cable connections, 89641 with second RF channel" (page 73)

Refer to Table 12-2 for a summary of diagnostic procedures in this chapter.

Table 12-2 Summary of Diagnostic Procedures

Issue	Discussion
Your analyzer includes VXI hardware and when you start the 89600 software you get a message saying the hardware wasn't found (or "Simulated Hardware" is displayed on the trace grid)	Troubleshoot Installation problems: "Troubleshooting a VXI installation problem" (page 184).
	Troubleshoot a VXI IO problem: "Troubleshooting a VXI IO configuration problem" (page 185).
	Troubleshoot an IEEE-1394 interface problem: "Troubleshooting an IEEE-1394 interface failure" (page 186).
Problem is not VXI hardware and you suspect a defective module	E1438 ADC module: "Troubleshooting an E1438 ADC module" (page 191)
	E1439 ADC module: "Troubleshooting an E1439 ADC module" (page 192)
	E2730 or E2731 RF Tuner module: "Troubleshooting the E2730/E2731 module" (page 193)

Issue	Discussion
Problem is in signal path and you suspect a defective module	2.7 GHz RF signal path: "Troubleshooting the 2.7 GHz RF signal path" (page 194)
	6.0 GHz RF signal path: "Troubleshooting the 6.0 GHz RF signal path" (page 196)
	0 to 36 MHz baseband signal path: "Troubleshooting the 0 to 36 MHz baseband signal path" (page 198)
	70 MHz IF signal path: "Troubleshooting the 70 MHz IF signal path" (page 199)
	0 to 40 MHz signal path: "Troubleshooting the 0-to-40 MHz baseband signal path" (page 200)
Your analyzer uses non-VXI measurement hardware and when you start the 89600 software you get a message saying the hardware wasn't found (or "Simulated Hardware" appears on the trace grid,")	"Troubleshooting a LAN interface problem" (page 188)
Other instruments or devices connected to the same computer reset or experience errors when you start an 89600 analyzer	"Troubleshooting interference with other devices or instruments" (page 190)

Recommended Test Equipment

Table 12-3 shows you the recommended test equipment.

Table 12-3 Recommended Test Equipment

Instrument	Specifications (50 Ω In/Out Impedance)	Model
Digital Signal Generator	Frequency: 500 kHz to 3 GHz Amplitude range: -40 to +16 dBm Amplitude resolution: 0.1 dB Harmonic level: < -30 dBc Spurious: < -90 dBc, < 40 MHz Spurious: < -78 dBc, < 2.56 GHz SWR: < 1.5 Frequency Reference Out: 10 MHz Amplitude: ~ 7 dBm SSB Phase Noise: < -140 dBc/Hz at 100,1 k, 10MHz offsets RF: 1 GHz SSB Phase Noise: ≤ -109 dBc/Hz at 20 kHz ≤ -122 dBc/Hz at 100 kHz offset External Reference Input	E4433B
Spectrum Analyzer	Frequency 3 to 7 GHz Amplitude Range –20 to +15 dBm	E4407B
Power Meter	Dual Channel Absolute Accuracy: ±0.5% Power Reference Accuracy: ±0.9%	E4419B Alternate: E4419A
Power Sensor (2)	Frequency Range: 10 MHz to 6 GHz Amplitude Range: -30 to +20 dBm SWR (varies): ≤1.1 10 MHz to 2 GHz ≤1.15 2GHz to 6 GHz	E9301A

Troubleshooting a VXI mainframe failure

Using the mainframe service guide, verify that all power supplies and fan(s) are operational.

Troubleshooting a VXI installation problem

When you first start either Vector Signal Analyzer or Spectrum Analyzer application, if you get a message saying that the analyzer cannot find VXI hardware, there may have been a problem in installing the PCI card in your computer.

To troubleshoot a VXI installation problem:

1. It is very important that you upgrade the PC BIOS to the latest version your PC manufacturer provides whether your PC is new or old. Upgrading to the latest version of BIOS will eliminate those bugs fixed by the new BIOS. A BIOS upgrade and a video driver upgrade may be required to fix PCI-related problems even on a new PC.
2. You may also need to upgrade the drivers for other PCI devices in the PC (video, IDE, LAN, SCSI, sound, modem, etc.).
3. Verify that the power supply splitter cable is connected between the PC power supply and the PCI card.
4. Make sure the PCI BIOS is correctly configured. New PCs have a BIOS flag that usually reads “Plug&Play OS” or “running Windows 95”. This flag must be set to NO for Windows 2000.
5. The E8491B requires installation of the PCI-to-IEEE 1394 host adapter in a bus-mastering PCI slot. Consult your PC’s user manual to determine which slots are bus-mastering (it is possible that all slots are bus-mastering).
6. In addition to the above, you may need to move the E8491B to separate IRQ line in the PC. PCI allows up to four devices sharing an IRQ line. However, this doesn’t always work, and you may need to have one IRQ per card. Moving the IRQ is not easy, and whether it can be done will depend on the details of the BIOS implementation of your PC.
7. Go to Control Panel, Devices and change the Startup mode for the wn1394 to “System.” This starts the 1394 PCI card driver sooner and prevent problems.

   If you suspect such a problem, refer to PDF: *HP E8491B IEEE 1394 PC Link to VXI Configuration and User’s Guide.* Locate this PDF as follows:

   PC: **Start > Programs > Agilent IO Libraries > Manuals** (e8491.pdf)

   PDF: http://we.home.agilent.com/upload/cmc_upload/All/EPSG084330.pdf

   HTML: http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html

Troubleshooting a VXI IO configuration problem

The information in this section shows you how to troubleshoot a VXI IO configuration problem when the 89600 software cannot find VXI measurement hardware.

If you replace the E8491 card in the mainframe or connect a different VXI mainframe to your computer, the 89600 software will not be able to find the hardware. The PCI interface in the computer looks for the specific E8491 card that was previously connected and cannot find it.

To troubleshoot a VXI IO configuration problem:

1. If you are running Vector Signal Analyzer or Spectrum Analyzer, close the application.
2. Click **Start > (All) Programs > Agilent IO Libraries > IO Config**.
3. In the right column, select **VXI** in list and click **Remove**.
4. In the left column, select **E8491 IEEE 1394 to VXI**, then click **Configure > OK.**
5. If E8491 IEEE to VXI is not listed, you may need to install a driver for the E8491. See instructions on the next page. The 89600 software should find the hardware. If not, you can find E8491 troubleshooting information in PDF and HTML as follows:

   PDF http://www.tm.agilent.com. Click on **Technical Support** and Search for E8491B. Select *E8491B Configuration and User's Guide* from the search results.

   HTML http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html

Troubleshooting an IEEE-1394 interface failure

If you are running Vector Signal Analyzer or Spectrum Analyzer, close the application before troubleshooting this problem.

To troubleshoot an IEEE-1394 interface failure:

1. Verify that Agilent IO Libraries Control is running.

   If this program is running, the icon shown to the right will appear in the task bar. If the icon is there, go to step 2.

   If the icon is not there, reinstall the IO libraries from the 89600 Installation CD as follows:

   a. Insert the 89600 Installation CD ROM.

   b. If the installation utility does not start automatically, click **Start > Run**, and type:

      drive:\setup.exe

      ...where *drive* represents the drive containing the setup CD-ROM.

   c. When the Installation Manager window opens, select **Install Agilent 89600 VSA**.

   d. Click **Next** in the Welcome window and **Yes** in the Software License and Warranty window.

   e. In the Installation Options window, select **Custom Installation and** click **Next.**

   f. In the Custom Installation Window, select **IO Libraries** from the list. Click **Next**.

   g. In the Installation Settings Window, click **Install**.

2. If the Agilent IO Libraries Control is running, verify that the version is M.01 or greater.

   a. Click the IO Libraries Control icon (shown above).

   b. Click **About Agilent IO Libraries Control**.

      If the version is lower than L.02.01, reinstall the IO libraries as instructed in step 1.

3. Verify that the IEEE-1394 drivers are loaded and running.

   a. Click **Start > Settings > Control Panel > System > Hardware > Device Manager.**

   b. If “IEEE 1394 Bus host controllers” is not present then the IEEE-1394 drivers were not loaded properly. Reload the IO libraries as instructed in step 1.

      If “IEEE 1394 Bus host controllers” is on the list, then the PCI interface card is most likely faulty.

4. Verify the E8491B slot zero VXI controller card.

   a. Click on the Agilent IO Libraries Control icon and click **Edit VXI Resource Manager**, then click the **Run** button.

b. If an error is reported, click **Start > (All) Programs > IO Libraries > IO Config.**

If IO config is unable to find the E8491B, then the E8491B is most likely faulty.

Troubleshooting a LAN interface problem

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

To verify the correct ADC.

1. Click **Utilities > Hardware.**
2. If your measurement hardware is not included in the list for ADC1, continue with "Troubleshoot the LAN interface."
3. If your measurement hardware is included in the list for ADC1, click to highlight it.
4. Make sure that the **Default Hardware** and **Simulate Hardware** checkboxes are cleared.
5. Click **OK.**
6. If the analyzer still does not use your hardware, continue with "Troubleshoot 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 "AgtVSAVector" or "AgtVSAScalar" applications listed, highlight them and click **End Task.**
   d. Click the **Processes** tab.
   e. If there are any "VSAVEC*.EXE" or "VSASCA*.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: for Windows2000, click **Start > (All) Programs > Accessories > Command Prompt**; for Windows XP, 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 Chapter 6, "IP address for computer with crossover cable" (page 102).))

      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. Cycle power on the instrument.

f. Verify that the subnet mask is set appropriately. For detailed instructions, see: Chapter 6, "IP address for computer with crossover cable" (page 102).

3. Confirm that VISA Assistant can find and communicate with the LAN instrument. Follow the instructions in: step 10 in Chapter 6, "Configuring the HP E5810 LAN/GPIB Gateway interface" (page 107).

4. After you have confirmed that VISA Assistant can find the instrument, verify that VISA Assistant can send a SCPI query (if the instrument supports SCPI).

   a. Restart VISA Assistant if necessary.

   b. Click the instrument VISA address on the left side of the VISA Assistant dialog box.

   c. Click the **Formatted I/O** tab, the **SCPI** radio button in the lower right corner, and the **IDN?** button.

   d. If there is an error or an incorrect response, try sending a device clear first. Click the **Device Clear** button. 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 ADC 1 list under **Utilities > Hardware.**

Troubleshooting interference with other devices or instruments

When you start an 89600 analyzer, 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 analyzer 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 analyzer.

To eliminate these problems, you can instruct the 89600 software to exclude specific devices from the identification process. To do this, edit the file:

C:/Program Files/Agilent/89600 VSA/VsaVisaTemplate.txt

List the addresses of the devices you want to exclude, then save the file as:

C:/Program Files/Agilent/89600 VSA/VsaVisaConfig.txt

Troubleshooting an E1438 ADC module

This section provides information on troubleshooting an E1438 ADC module.

To verify the E1438 module using the self test:

1. If you have either the Vector Signal Analyzer or Spectrum Analyzer running, close the application.
2. Click **Start > (All) Programs > Vxipnp > Age1438 > E1438 Front Panel**.
3. If the factory default address has been changed you must enter it into the dialog box that will be presented.

   There are two ways to find the E1438 address:

   a. Click on the Agilent IO Libraries Control icon and click **Edit VXI Resource Manager**, highlight Add/delete symbolic names of VXI devices, and click **RM Output**. The LADD column in the VXI device table lists the logical address for each module.

   b. Open the Vector Signal Analyzer or Spectrum Analyzer, click **Utilities > Hardware,** and the ADC tab for the module. The logical address is listed in the first column with the VXI mainframe number.

   c. On the menu bar of the front panel program select **Control > Self Test.**

      If errors are reported, then the E1438 module is faulty.
4. Repeat this procedure for a second E1438 if necessary.

   The E1438 front panel test always looks for a module at logical address 192. If it finds one, it automatically opens the soft front panel for that module. To test another E1438 module, power-off the mainframe and pull the module with address 192 out of the mainframe (you don't have to remove the module completely--just slide it forward an inch or so). Repeat steps 1-3 above.

Troubleshooting an E1439 ADC module

This section provides troubleshooting information for an E1439 ADC module.

To verify the E1439 module using the self test:

1. If you have either the Vector Signal Analyzer or Spectrum Analyzer running, close the application.
2. Click **Start > (All) Programs > Vxipnp > Age1439 > E1439 Front Panel.**
3. If the factory default address has been changed you must enter it into the dialog box that will be presented.

   There are two ways to find the E1439 address:

   a. Click on the Agilent IO Libraries Control icon and click **Edit VXI Resource Manager**, highlight Add/delete symbolic names of VXI devices, and click **RM Output**. The LADD column in the VXI device table lists the logical address for each module.

   b. Open the Vector Signal Analyzer or Spectrum Analyzer, click **Utilities, Hardware,** and the ADC tab for the module. The logical address is listed in the first column with the VXI mainframe number.
4. On the menu bar of the front panel program select **Control > Self Test.**

   If errors are reported, then the E1439 module is faulty.
5. Repeat this procedure for a second E1439 if necessary.

   The E1439 front panel test always looks for a module at logical address 194. If it finds one, it automatically opens the soft front panel for that module. To test another E1439 module, power-off the mainframe and pull the module with address 194 out of the mainframe (you don't have to remove the module completely--just slide it forward an inch or so). Repeat steps 1-3 above.

Troubleshooting the E2730/E2731 module

You can use VISA Assistant to isolate problems to the E2730/E2731 module.

To troubleshoot the E2730/E2731 module:

1. Numbered1Start VISA Assistant by clicking **Start > (All) Programs > Vxipnp > VISA Assistant**.
2. Under VXIO, locate the E273xA module's address. You can determine what the address is by running the 89600 analyzer, then clicking **Utilities > Hardware > Down Converter**. The address is listed in the first column, and the slot number in the second column.
3. Click on the E273xA's address under VXIO in VISA Assistant. Then click the **Formatted IO** tab. From this tab you can query the module to identify problems.
   a. If the red LED on the E273xA front panel is lit, type **CDE?** in the query box at the bottom of the tab and click **viQueryf**. (CDE? reads the module's current device Error Register contents.) If the response ends in 32768, the 10 MHz Reference signal is probably not connected properly. Check the semi-rigid cable from the 10 MHz Ref Out connector on the 89605 module to the 10 MHz Ext Ref connector on the E273xA module. Tighten the connectors, and the red LED should turn off. If the query returns any number other than 32768 or 00000, the E273xA module is most likely faulty.
   b. If the red LED on the E273xA front panel flickers or turns on and off, type **DDE?** in the query box and click **viQueryf**. (DDE? reads the module's latched error status. Reading this register clears it until the fault reoccurs.) If the query returns 32768, check the 10 MHz Ref connections as described in the previous paragraph. If the query returns any number other than 32768 or 00000, the E273xA module is most likely faulty.
4. Repeat for a second E2730/E2731 module if necessary.

Troubleshooting the 2.7 GHz RF signal path

The following procedures direct you through inserting a signal at various points in the analyzer's signal path to isolate problems to a specific module. Perform the steps in the order listed.

This test requires a signal generator. See "Recommended Test Equipment" (page 182).)

To troubleshoot the 2.7 GHz RF signal path:

1. Set up the analyzer as follows:
   a. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
   b. Click **File > Preset > Preset Setup.**
   c. Click **Utilities > Calibration,** and clear the **Apply Corrections to Data** checkbox.
   d. Click **MeasSetup > Frequency Bands > 36 MHz – 2.7 GHz**.
   e. Disconnect the BNC cable from the E1439 "Analog In" connector and connect a signal generator to E1439 Analog Input.
   f. Set the signal generator for 70 MHz, –10 dBm output.
   g. Set the analyzer's marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

      The marker reading should be 20 dBm ± 1.5 dB.
   h. Verify the other settings in the following table.

Input Range	Signal Generator Level	Marker Level
+20 dBm	–10 dBm	+20 dBm ± 1.5 dB
–35 dBm	–20 dBm	–40 dBm ± 1.5 dB
–40 dBm	–20 dBm	–40 dBm ± 1.5 dB
–45 dBm	–20 dBm	–40 dBm ± 1.5 dB

      If any of the readings are incorrect, the E1439 module is most likely faulty.
2. Reconnect the BNC cable to the E1439 "Analog In" and disconnect the SMA cable from the 89605 "From 70 MHz IF Out" connector. Connect the signal generator output to 89605 "From 70 MHz IF Out".
   a. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   b. The marker reading should be –40 dBm ± 1.5 dB. If this reading is incorrect, the 89605 module is most likely faulty.
3. Set the signal generator to 1 GHz, –40 dBm.

a. Reconnect the SMA cable to the 89605 “From 70 MHz IF Out” connector. Disconnect the SMA cable from the E2730 “RF IN” connector. Connect the signal generator output to the E2730 “RF In” connector.

b. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

c. The marker reading should be –40 dBm ± 3.5 dB

d. Change the signal generator and 89600 center frequency to 950 MHz.

e. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

f. The marker reading should be –40 dBm ± 3.5 dB.

If either reading is incorrect, the E2730 module is most likely faulty. If this module is channel 2 in a 2-channel analyzer, see “Verifying Channel 1 LO outputs in a 2-channel RF system” on page 202.

4. Set the signal generator to 1 GHz, –30 dBm. Set the 89600 center frequency to 16 Hz.

a. Reconnect the SMA cable to E2730 “RF In” connector. Connect the signal generator output to the 89605 Ch1 Input connector.

b. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

c. Change the analyzer input range and the signal generator output level in 5 dB steps, verifying the marker readings in the following table.

Input Range	Signal Generator Level	Marker Level
–30 dBm	–30 dBm	–30 dBm ± 3.5 dB
–25 dBm	–25 dBm	–25 dBm ± 3.5 dB
–20 dBm	–20 dBm	–20 dBm ± 3.5 dB
–15 dBm	–15 dBm	–15 dBm ± 3.5 dB
–10 dBm	–10 dBm	–10 dBm ± 3.5 dB
–5 dBm	–5 dBm	–5 dBm ± 3.5 dB
0 dBm	0 dBm	0 dBm ± 3.5 dB
+5 dBm	+5 dBm	+5 dBm ± 3.5 dB
+10 dBm	+10 dBm	+10 dBm ± 3.5 dB
+15 dBm	+15 dBm	+15 dBm ± 3.5 dB
+20 dBm	+20 dBm	+20 dBm ± 3.5 dB

If any of these readings are incorrect, the 89605 module is most likely faulty.

5. Repeat steps 1 through 4 for a second channel if required.

Troubleshooting the 6.0 GHz RF signal path

The following procedures direct you through inserting a signal at various points in the analyzer's signal path to isolate problems to a specific module. Perform the steps in the order listed. This test requires a signal generator. See "Recommended Test Equipment" (page 182).

To troubleshoot the 6.0 GHz RF signal path:

1. Set up the analyzer as follows:
   a. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
   b. Click **File > Preset > Preset Setup.**
   c. Click **Utilities > Calibration,** and clear the **Apply Corrections to Data** checkbox.
   d. Click **MeasSetup > Frequency Bands > 36 MHz – 6 GHz**.
   e. Disconnect the BNC cable from the E1439 "Analog In" connector and connect a signal generator to E1439 Analog Input.
   f. Set the signal generator for 70 MHz, –10 dBm output.
   g. Set the analyzer's marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**. The marker reading should be 20 dBm ± 1.5 dB
   h. Verify the other settings in the following table.

Input Range	Signal Generator Level	Marker Level
+20 dBm	–10 dBm	+20 dBm ± 1.5 dB
–35 dBm	–20 dBm	–40 dBm ± 1.5 dB
–40 dBm	–20 dBm	–40 dBm ± 1.5 dB
–45 dBm	–20 dBm	–40 dBm ± 1.5 dB

   If any of the readings are incorrect, the E1439 module is most likely faulty.
2. Reconnect the BNC cable to the E1439 "Analog In" and disconnect the SMA cable from the 89605 "From 70 MHz IF Out" connector. Connect the signal generator output to 89605 "From 70 MHz IF Out".
   a. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   b. The marker reading should be –40 dBm ± 1.5 dB.

      If this reading is incorrect, the 89605 module is most likely faulty.
3. Set the signal generator to 1 GHz, –40 dBm.

a. Reconnect the SMA cable to the 89605 “From 70 MHz IF Out” connector. Disconnect the SMA cable from the E2731 “6 GHz IN” connector. Connect the signal generator output to the E2731 “6 GHz IN” connector.

b. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

c. The marker reading should be –40 dBm ± 4.5 dB

d. Change the signal generator and 89600 center frequency to the frequencies in the table and repeat steps b and c.

Frequency
950 MHz
3.5 GHz
4.0 Ghz
4.5 Ghz
5.5 Ghz

If any of these readings are incorrect, the E2731 module is most likely faulty. If this module is channel 2 in a 2-channel analyzer, see “Verifying Channel 1 LO outputs in a 2-channel RF system” on page 202.

4. Set the signal generator to 1 GHz, –30 dBm. Set the 89600 center frequency to 16 Hz.

a. Reconnect the SMA cable to E2731 “6 GHz In” connector. Connect the signal generator output to the 89605 Ch1 Input connector.

b. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.

c. Change the analyzer input range and the signal generator output level in 5 dB steps, verifying the marker readings in the following table.

Input Range	Signal Generator Level	Marker Level
–30 dBm	–30 dBm	–30 dBm ± 5 dB
–25 dBm	–25 dBm	–25 dBm ± 5 dB
–20 dBm	–20 dBm	–20 dBm ± 5 dB
–15 dBm	–15 dBm	–15 dBm ± 5 dB
–10 dBm	–10 dBm	–10 dBm ± 5 dB
–5 dBm	–5 dBm	–5 dBm ± 5 dB
0 dBm	0 dBm	0 dBm ± 5 dB
+5 dBm	+5 dBm	+5 dBm ± 5 dB
+10 dBm	+10 dBm	+10 dBm ± 5 dB
+15 dBm	+15 dBm	+15 dBm ± 5 dB
+20 dBm	+20 dBm	+20 dBm ± 5 dB

If any of these readings are incorrect, the 89605 module is most likely faulty.

5. Repeat steps 1-4 for channel 2 if required.

Troubleshooting the 0 to 36 MHz baseband signal path

Perform the following procedures in the order listed to troubleshoot the 89640 baseband signal path.

This test requires a signal generator. See "Recommended Test Equipment" (page 182).

1. Set up the 896xxA as follows:
   a. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
   b. Click **File > Preset > Preset Setup.**
   c. Click **Utilities > Calibration,** and clear the Apply **Corrections to Data** checkbox.
   d. Click **MeasSetup > Frequency Bands > 0 - 36 MHz.**
   e. Disconnect the BNC cable from the E1439 “Analog In” connector and connect a signal generator to E1439 “Analog In.”
   f. Set the signal generator for 20 MHz, -30 dBm output.
   g. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   h. The marker reading should be 20 dBm ± 1.7 dB.

      If this reading is incorrect, the E1439 module is most likely faulty.
2. Connect the signal generator output to 89605 “Ch 1 Input”.
   a. Reconnect the BNC cable from 89605 “To ADC” to E1439 “Analog In.”
   b. Set the center frequency to 20 MHz and the frequency span to 100 kHz.
   c. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   d. The marker reading should be -30 dBm ± 3.5 dB.
   e. Change the 89640A input range in 5 dB steps while verifying that the marker reading at each step is -30 dBm ± 3.5 dB.

      If any of these readings are incorrect, the 89605 module is most likely faulty.
3. Repeat steps 1 and 2 for a second channel if required.

Troubleshooting the 70 MHz IF signal path

The following procedures direct you through inserting a signal at various points in the analyzer's signal path to isolate problems to a specific module. Perform the steps in the order listed. This test requires a signal generator. See "Recommended Test Equipment" (page 182).

1. Set up the analyzer as follows:
   a. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
   b. Click **File > Preset > Preset Setup.**
   c. Click **Utilities > Calibration,** and clear the **Apply Corrections to Data** checkbox.
   d. Click **MeasSetup > Frequency Bands > 52 MHz – 88 MHz**.
   e. Click **MeasSetup > Freq > Span,** and enter **100kHz.**
   f. Click **Input > Range,** and enter **-45 dBm.**
   g. Click **Control > Restart**.
   h. Disconnect the BNC cable from the E1439 "Analog In" connector and connect a signal generator to E1439 Analog Input.
   i. Set the signal generator for 70 MHz, –45 dBm output.
   j. Set the 89600 marker to peak: right click on the spectrum trace and click ↑**Peak**. The marker reading should be -39 dBm ± 1.5 dB
   k. Click **Markers > Copy Marker to > Move Offset to Mkr**.
   l. Change the Input Range in 5 dB increments from -45 dBm to -25 dBm. The Marker Level for all ranges should read 0 dB ± 0.5 dB.

      If any of the readings are incorrect, the E1439 module is most likely faulty.
2. Reconnect the BNC cable to the E1439 "Analog In." Connect the signal generator output to 89605 "Ch 1 Input".
   a. Set the marker to peak: right click on the spectrum trace and click ↑**Peak**.
   b. Click **Input > Range,** and enter **-25 dBm.**
   c. Click **Markers > Copy Marker to > Move Offset to Mkr**.
   d. Change the Input Range in 5 dB increments from -25 dBm to +20 dBm. The Marker Level for all ranges should read 0 dB ± 0.5 dB.

      If any of these readings is incorrect, the 89605 module is most likely faulty.
3. For a two-channel IF analyzer, repeat this procedure for the second channel.

Troubleshooting the 0-to-40 MHz baseband signal path

Perform the following procedures in the order listed to troubleshoot the 89610A signal path. This test requires a signal generator. See "Recommended Test Equipment" (page 182).

To troubleshoot the 0-to-40MHz baseband signal path:

1. Set up the analyzer as follows:
   a. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
   b. Click **File > Preset > Preset Setup.**
   c. Click **Utilities > Calibration,** and clear the **Apply Corrections to Data** checkbox.
   d. Disconnect the BNC cable from the E1438 “Analog In” connector and connect a signal generator to E1438 “Analog In.”
   e. Set the signal generator for 20 MHz, -31 dBm output.
   f. Set the analyzer input range to -31 dBm.
   g. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   h. The marker reading should be -31 dBm ± 1.7 dB.

      If this reading is incorrect, the E1438 module is most likely faulty.

i. Change the analyzer input range and the signal generator output level in 3 dB steps, verifying the marker readings in the table on the next page.

Input Range	Signal Generator Level	Marker Level
–31 dBm	–31 dBm	–31 dBm ± 1.7 dB
–28 dBm	–28 dBm	–28 dBm ± 1.7 dB
–25 dBm	–25 dBm	–25 dBm ± 1.7 dB
–22 dBm	–22 dBm	–22 dBm ± 1.7 dB
–19 dBm	–19 dBm	–19 dBm ± 1.7 dB
–16 dBm	–16 dBm	–16 dBm ± 1.7 dB
–13 dBm	–13 dBm	–13 dBm ± 1.7 dB
–10 dBm	–10 dBm	–10 dBm ± 1.7 dB
–7 dBm	–7 dBm	–7 dBm ± 1.7 dB
–4 dBm	–4 dBm	–4 dBm ± 1.7 dB
–1 dBm	–1 dBm	–1 dBm ± 1.7 dB
+ 2 dBm	+ 2 dBm	+ 2 dBm ± 1.7 dB
+5 dBm	+5 dBm	+5 dBm ± 1.7 dB
+8 dBm	+8 dBm	+8 dBm ± 1.7 dB
+11 dBm	+11 dBm	+11 dBm ± 1.7 dB
+14 dBm	+14 dBm	+14 dBm ± 1.7 dB
+17 dBm	+17 dBm	+17 dBm ± 1.7 dB
+20 dBm	+20 dBm	+20 dBm ± 1.7 dB

If any readings are incorrect, the E1438 module is most likely faulty.

2. For a two-channel 89610A, repeat this procedure for the second E1438.
3. Connect the signal generator output to 89606/B “Ch 1 Input”.
   a. Reconnect the BNC cable from 89606/B “To ADC” to E1438 “Analog In.”
   b. Set the signal generator to -31 dBm output level.
   c. Set the analyzer center frequency to 20 MHz, frequency span to 100 kHz, and input range to -31 dBm.
   d. Set the marker to peak by right clicking on the spectrum trace and clicking ↑**Peak**.
   e. The marker reading should be -31 dBm ± 1.7 dB.
   f. Change the analyzer input range and the signal generator output level in 3 dB steps, verifying the marker readings in the table in above.

      If any of these readings are incorrect the 89606/B module is most likely faulty.

Verifying Channel 1 LO outputs in a 2-channel RF system

Perform the following procedures to verify the channel 1 LO output on an E2730 or E2731 module in a 2-channel analyzer. This test requires a spectrum analyzer and a power meter. See "Recommended Test Equipment" (page 182).

To verify Channel 1 LO outputs in a 2-channel RF system, 1st LO:

1. Disconnect the cable connected to E273x 1st LO In/Out.
2. Connect Channel 1 1st LO In/Out to the spectrum analyzer RF Input.
3. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
4. Set up the 89600 Vector Signal Analyzer:
   a. Click **File > Preset > Preset Setup.**
   b. Click **Input > Channels > 2 Channels**.
5. Set up the spectrum analyzer:
   a. Preset.
   b. Set the reference level to 12 dBm.
   c. Set the span to 100 MHz.
6. For each frequency listed below verify that the amplitude is <6.5 dBm. If the signal level is marginal, verify with a power meter.

89600 center frequency	Spectrum analyzer center frequency
36 MHz	3.8175 GHz
1 GHz	4.7825 GHz
2.7 GHz	6.4825 GHz

   If any reading is incorrect then the E273x is most likely faulty.

To verify Channel 1 LO outputs in a 2-channel RF system, 2nd LO

1. Disconnect the cable connected to E273x 2nd LO In/Out.
2. Connect Channel 1 2nd LO In/Out to the spectrum analyzer RF Input.
3. If it is not already running, start the Vector Signal Analyzer by double clicking the icon or clicking **Start > (All) Programs > Agilent 89600 VSA > Vector Signal Analyzer**.
4. Set up the 89600 Vector Signal Analyzer:
   a. Click **File > Preset > Preset Setup.**

b. Click **Input > Channels > 2 Channels**.

5. Set up the spectrum analyzer:
   a. Preset.
   b. Set the reference level to 15 dBm.
   c. Set the center frequency to 3.711 GHz.
   d. Set the span to 5 MHz.
6. For each frequency listed below verify that the amplitude is <10.0 dBm. If the signal level is marginal, verify with a power meter.

89600 center frequency	Spectrum analyzer center frequency
252.4 MHz	3710 MHz
252.5 MHz	3712.5 MHz
254 MHz	3711 MHz

If any reading is incorrect then the E273x is most likely faulty.

13 Circuit Descriptions

Introduction

This chapter contains block diagrams and circuit descriptions of the 89600 series VXI measurement hardware. This information is provided to help you understand system operation and identify and isolate problems to a specific module.

These products consist of VXI measurement hardware and Vector Signal Analysis (VSA) software running on a standard Windows 2000 or Windows XP workstation. The 89600 series includes three analyzer configurations with VXI measurement hardware:

- 89611 70 MHz IF Analyzer, see: "Agilent 89611 70 MHz IF Analyzer circuit description" (page 215)
- 89610 DC - 40 MHz Analyzer (with optional second input channel), see: "Agilent 89610 circuit description" (page 207)
- 89640 DC - 2.7 GHz Analyzer and 89641 DC - 6.0GHz Analyzer, see: "Agilent 89640/89641 circuit description" (page 211)

Agilent 89610 circuit description

The Agilent 89610 Vector Signal Analyzer VXI hardware includes the following VXI modules:

- Agilent E8491 Option 001 IEEE 1394 PC Link to VXI (Firewire)
- Agilent 89606 Input module
- Agilent E1438 ADC module
- Option 002, 102, 145, and 289 include a second E1438 module.

For module descriptions in this section, refer to Figure 13-1 on page 208.

E8491 PC Link to VXI

The E8491 module provides the link between the computer and the VXI measurement hardware. No signal acquisition or processing happens in this module. For detailed information on this module and the IEEE 1394 interface, refer to the PDF document: *HP E8491B IEEE 1394 PC Link to VXI Configuration and User's Guide.* Locate this PDF as follows:

PC: **Start > Programs > Agilent IO Libraries > Manuals** (e8491.pdf)

PDF: http://we.home.agilent.com/upload/cmc_upload/All/EPSG084330.pdf

HTML: http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html

89606/B Input Module

The 89606 Input module accepts the input signal and passes it to the E1438 ADC module. During calibration, the input signal path is interrupted. The calibrator in the 89606 module inserts a calibration signal into the signal path to the E1438 ADC module. The calibration signal is taken from the 10 MHz reference and multiplied by 10 to match the E1438 sampling rate of 100 MSa per second. The E1438 ADC uses the same 10 MHz reference, so the calibration source is phase locked to the sample clock.

The 89606 also provides a 10 MHz reference signal to the Agilent E1438 module. An additional 10 MHz Ref output is available on the module front panel to connect to other instruments in your measurement setup. For the 89606B only, you can connect a 10MHz or 13 MHz reference signal to the Ext Reference In connector.

Use of this module outside the 89600-series of analyzers is not supported.

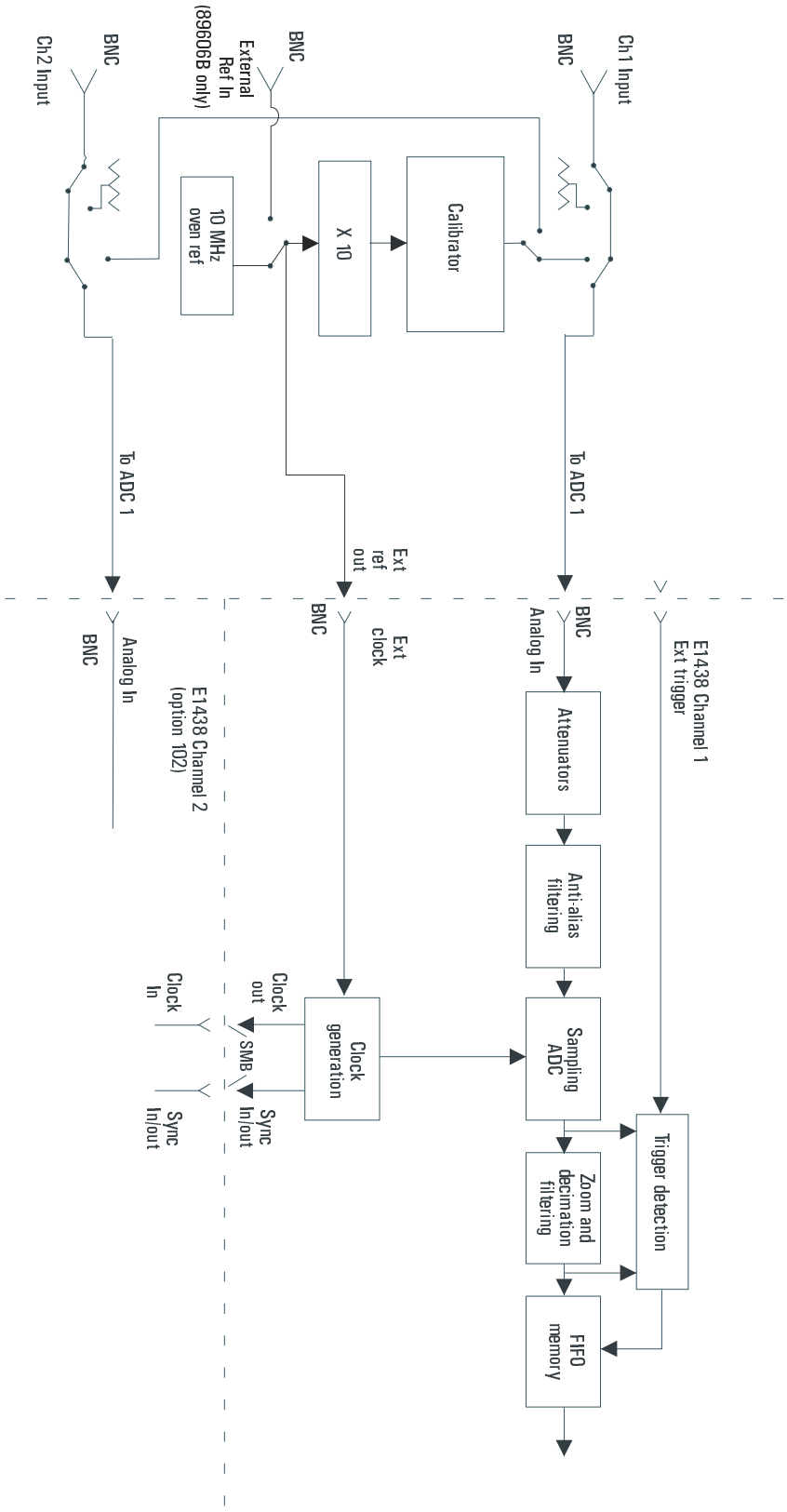


Figure 13-1 **89610 block diagram**

E1438 ADC Module

All signal processing happens in the Agilent E1438A 100 MSa/s ADC + Filter + FIFO (attenuation, anti-alias filtering, etc.). Detailed information about this module is available in a PDF file: *Agilent E1438 VXI 100 MSa/s ADC with filters and memory User's Guide*. This guide is installed on your computer, however, you may have to use the Search function to find the exact location. Typical locations include the following:

C:/Vxi/Vxipnp/Winnt/age1438/help/e1438_Users_Guide.pdf

C:/Program Files/Visa/Winnt/age1438\help/e1438_Users_Guide.pdf

Triggering

For external trigger mode, a trigger signal must be supplied at the "Ext Trigger" connector on the front panel. This input is AC coupled with an impedance of 1 K ohm so any signal with a sharp rising or falling transition greater than 100 mV (for example, TTL or ECL logic) can be used as an external trigger source. Minimum pulse width is 300 ns.

If your system includes two E1438 modules, you can use the external trigger connector on either module. The bi-directional Intermodule Sync connectors on the module front panels connect the trigger signal between the modules. This synchronizes the two modules so that they receive the trigger signal simultaneously.

Coupling

The input can be either AC or DC coupled. AC coupling allows the system to measure low level AC signals in the presence of a large DC offset.

Ranging

Attenuation is the first step in the E1438 module. The module provides 0 to 51 dB of attenuation in 3 dB steps, resulting in analyzer input ranges between -31 dBm and 20 dBm in 3 dB steps.

Anti-alias filtering

Since the normal ADC sample rate is 100 MHz, a complete representation of the input signal can be achieved only for bandwidths up to 50 MHz. Frequency components above 50 MHz can cause ambiguous results (aliasing).

The anti-alias filter attenuates these high frequency components to reduce aliasing. The anti-alias filter in the Agilent E1438 is flat to 40 MHz and rejects signals above 60 MHz by at least 90 dB. Thus the 0-40 MHz frequency range of the sampled signal is –90 dB alias free. The filter's transition band from 40 MHz to 60 MHz affects flatness and allow some aliasing in the sampled signal frequency range of 40 MHz to 50 MHz.

Analog-to-digital (ADC) signal conversion

The central part of the E1438 is a precision sampling ADC. The ADC samples the signal at a rates up to 100 MSa/sec and converts the analog signal to a digital signal.

Zoom and decimation filtering

This section uses digital circuitry to allow programmable changes in the center frequency and signal bandwidth of the 89610 analyzer (zoom). Bandwidth is controlled by a chain of digital low-pass filters. Each of the filters reduces the bandwidth by a factor of 2 (decimation).

Memory

Digitized data is stored in memory in the E1438 module and read out after a block of data has been taken. The digitized data passes through the E8491 interface to the measurement software in the computer.

For information on how the signal is processed by the measurement software, see the 89600 online help for”System Block Diagram” under Tutorial, Theory of Operation. Typically, this help file is in location:

C:/Program Files/Agilent/89600 VSA/Help\tasks.hlp

Agilent 89640/89641 circuit description

The Agilent 89640 Vector Signal Analyzer VXI hardware includes the following VXI modules:

- Agilent E8491 Option 001 IEEE 1394 PC Link to VXI
- Agilent 89605 Input module
- Agilent E1439 ADC module
- Agilent E2730 RF Tuner module
- optional second IF/baseband channel, including an additional E1439 and E2730 modules

The Agilent 89641 Vector Signal Analyzer VXI hardware includes the following VXI modules:

- Agilent E8491 Option 001 IEEE 1394 PC Link to VXI
- Agilent 89605 Input module
- Agilent E1439 ADC module
- Agilent E2731 RF Tuner module
- optional second IF/baseband channel, including an additional E1439 and E2731 modules

The module descriptions in this section apply to the 89640/889641 block diagram: "89640/89641 block diagram" (page 212). Your analyzer may include a second IF/baseband channel, which is not shown in the block diagram.

E8491 PC Link to VXI

The E8491 module provides the link between the computer and the VXI measurement hardware. No signal acquisition or processing happens in this module. For detailed information on this module and the IEEE 1394 interface, refer to the PDF document: *HP E8491B IEEE 1394 PC Link to VXI Configuration and User's Guide.* Locate this PDF as follows:

PC: **Start > Programs > Agilent IO Libraries > Manuals** (e8491.pdf)

PDF: http://we.home.agilent.com/upload/cmc_upload/All/EPSG084330.pdf

HTML: http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html

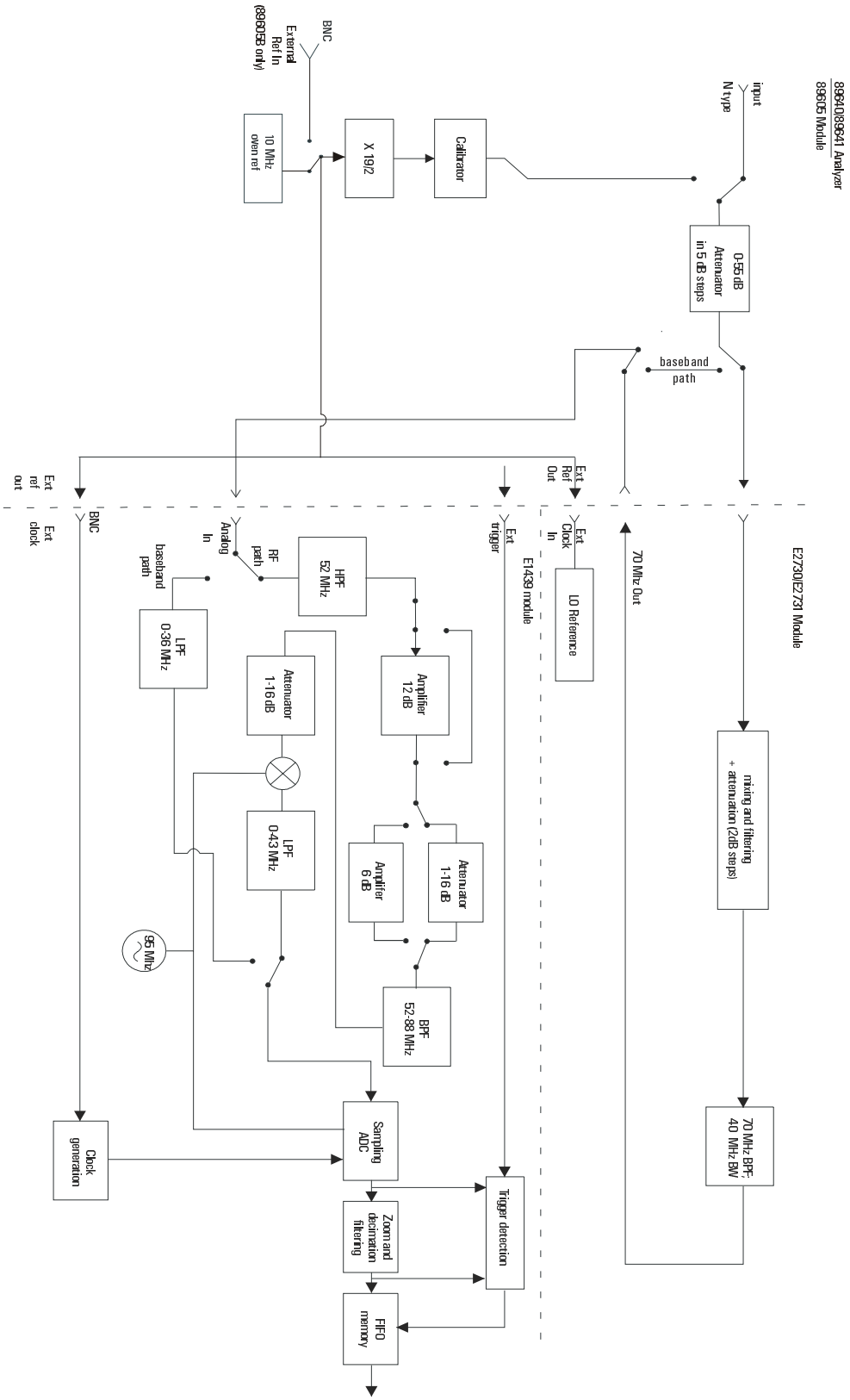


Figure 13-2 **89640/89641 block diagram**

89605 Input Module

The 89605 Input module accepts the input signal and passes it through a 0-to-50 dB attenuator (5 dB steps). In baseband mode (0 to 36 MHz), the signal is routed directly to the E1439 module, by-passing the E2730/E2731 module. In RF mode (36 MHz to 2.7 GHz or 6 GHz), the signal is routed to the E2730/E2731 RF Tuner. The down-converted signal from the E2730/E2731 comes back to the 89605 and is routed to the E1439 module.

During calibration, the input signal path is interrupted. The calibrator in the 89605 module inserts a calibration signal into the signal path to the E1439 ADC module. The calibration signal is taken from the 10 MHz reference and multiplied by 19/2 to match the E1439 sampling rate of 95 MSa per second. The E1439 ADC uses the same 10 MHz reference, so the calibration source is phase locked to the sample clock.

The 89605 also provides a 10 MHz reference signal to the E2730/E2731 and E1439 modules. An additional 10 MHz Ref output is available on the module front panel to connect to other instruments in your measurement setup. For the 89605B only, you can connect a 10MHz or 13 MHz reference signal to the Ext Reference In connector.

Use of this module outside the 89600-series of analyzers is not supported.

E2730/E2731 RF Tuner module

The E2730 RF Tuner has a frequency tuning range of 20 to 2700 MHz in 1 kHz steps. The E2731 RF Tuner has a frequency tuning range of 20 to 6000 MHz. Each tuner converts the input signal in multiple stages of local oscillators, amplifiers, attenuators, and filters. The 70 MHz output has a bandwidth of 36 MHz, resulting in an output signal to the ADC between 52 MHz and 88 MHz.

Use of this module outside the 89600-series of analyzers is not supported.

E1439 ADC module

The input signal passes to the E1439 ADC module in one of two ways. If the input frequency band is 0 Hz to 36 MHz, the signal goes directly to the E1439 module. If the input frequency band is 36 MHz to 2.7 GHz or 6 GHz, the signal goes to the RF Tuner module to be down converted. From the RF Tuner module, the signal goes back through the 89605 module to the Agilent E1439 95 MSa/s ADC + Filter + FIFO + 70 MHz IF Input module.

Detailed information about this module is available in a PDF file: *Agilent E1439 VXI 70 MHz IF ADC with filters and memory User's Guide*. This guide is installed on your computer, however, you may have to use the Search function to find the exact location. Typical locations include the following:

C:/Vxi/Vxipnp/Winnt/age1439/help/e1439_Users_Guide.pdf

C:/Program Files/Visa/Winnt/age1439/help/e1439_Users_Guide.pdf

Triggering

For external trigger mode, a trigger signal must be supplied at the “Ext Trigger” connector on the front panel. This input is AC-coupled with an impedance of 1K ohm so any signal with a sharp rising or falling transition greater than 100 mV (for example, TTL or ECL logic) can be used as an external trigger source. Minimum pulse width is 300 ns.

Coupling

The input can be either AC or DC coupled. AC coupling allows the system to measure low level AC signals in the presence of a large DC offset.

Signal conditioning

In 0-36 MHz mode, the input signal goes through the lower path in the block diagram. In this mode, no attenuation occurs in the E1439 module.

In 36 MHz-2.7 GHz (or 6 GHz) mode, the input signal goes through the upper path in the block diagram. This path includes 0 to 32 dB of attenuation in 1 dB steps. The signal is band-pass filtered, mixed with 95 MHz, and low-pass filtered. This inverts and translates the frequency spectrum from 52-88 MHz at the input to 43-7 MHz at the ADC. The ADC samples the signal at a 95 MHz sample rate.

Analog-to-digital (ADC) signal conversion

The central part of the E1439 is a precision sampling ADC. The ADC samples the signal at a rate of up to 95 MSa/sec and converts the analog signal to a digital signal.

Memory

Digitized data is stored in memory in the E1439 module and read out after a block of data has been taken. The digitized data passes through the E8491 interface to the measurement software in the computer.

For information on how the signal is processed by the measurement software, see the 89600 online help for “System Block Diagram” under Tutorial, Theory of Operation. Typically, this help file is in location:

C:/Program Files/Agilent/89600 VSA/Help/tasks.hlp

Agilent 89611 70 MHz IF Analyzer circuit description

The Agilent 89610 Vector Signal Analyzer VXI hardware includes the following VXI modules:

- Agilent E8491 Option 001 IEEE 1394 PC Link to VXI
- Agilent 89605 Input module
- Agilent E1439 ADC module
- an optional second channel, including an additional 89605 and E1439 module

In addition, the 89611 requires an external down converter that provides a 70 MHz IF out signal. If you use an Agilent PSA option H70 as the down converter, the 89600 software controls the down converter. Otherwise, you must control the down converter separately from the 89600 interface.

The module descriptions in this section apply to: "89611 block diagram" (page 216). This block diagram does not include the optional second channel.

E8491 PC Link to VXI

The E8491 module provides the link between the computer and the VXI measurement hardware. No signal acquisition or processing happens in this module. For detailed information on this module and the IEEE 1394 interface, refer to the PDF document: *HP E8491B IEEE 1394 PC Link to VXI Configuration and User's Guide.* Your 89600 software installation includes this PDF manual. Locate this PDF as follows:

PC: **Start > Programs > Agilent IO Libraries > Manuals** (e8491.pdf)

PDF: http://we.home.agilent.com/upload/cmc_upload/All/EPSG084330.pdf

HTML: http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html

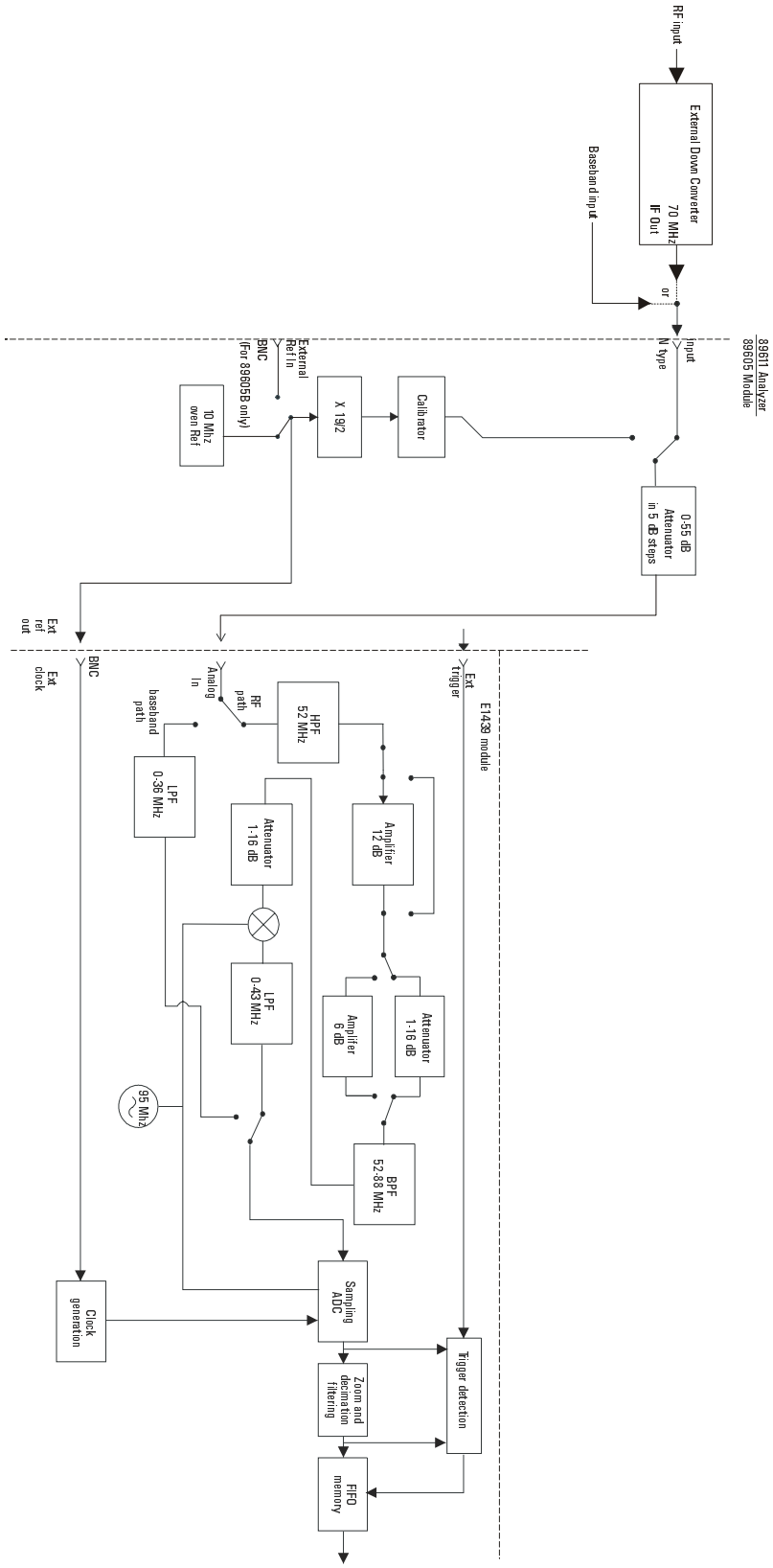


Figure 13-3 **89611 block diagram**

89605 Input Module

The 89605 Input module accepts the baseband input signal and passes it through a 0-to-50 dB attenuator (5 dB steps). In baseband mode (0 to 36 MHz), the signal from the Ch 1 Input connector is routed to the E1439 module. For the upper frequency band (frequencies determined by the down converter used), the signal is routed from the "From 70 MHz IF Out" connector to the E1439 module (via the "To ADC Analog In" connector).

During calibration, the input signal path is interrupted. The calibrator in the 89605 module inserts a calibration signal into the signal path to the E1439 ADC module. The calibration signal is taken from the 10 MHz reference and multiplied by 19/2 to match the E1439 sampling rate of 95 MSa per second. The E1439 ADC uses the same 10 MHz reference, so the calibration source is phase locked to the sample clock.

The 89605 also provides a 10 MHz reference signal to the E1439 module. An additional 10 MHz Ref output is available on the module front panel to connect to other instruments in your measurement setup. For the 89605B only, you can connect a 10MHz or 13 MHz reference signal to the Ext Reference In connector.

Use of this module outside the 89600 series analyzers is not supported.

E1439 ADC Module

The input signal passes to the E1439 ADC module in one of two ways. If the input frequency band is 0 Hz to 36 MHz, the signal at the 89605 input is passed directly to the E1439 module. If the input frequency band is 20 MHz to 2.7 GHz, the signal comes from the external down converter through the 89605 module to the E1439 95 MSa/s ADC + Filter + FIFO + 70 MHz IF Input module.

Detailed information about this module is available in a PDF file: *Agilent E1439 VXI 70 MHz IF ADC with filters and memory User's Guide*. This guide is installed on your computer, however, you may have to use the Search function to find the exact location. Typical locations include the following:

C:/Vxi/Vxipnp/Winnt/age1439/help/e1439_Users_Guide.pdf

C:/Program Files/Visa/Winnt/age1439/help/e1439_Users_Guide.pdf

Triggering

For external trigger mode, a trigger signal must be supplied at the "Ext Trigger" connector on the front panel. This input is AC coupled with an impedance of 1 K ohm so any signal with a sharp rising or falling transition greater than 100 mV (for example, TTL or ECL logic) can be used as an external trigger source. Minimum pulse width is 300 ns.

Coupling

The input can be either AC or DC coupled. AC coupling allows the system to measure low level AC signals in the presence of a large DC offset.

Signal conditioning

In 0-36 MHz mode, the input signal goes through the lower path in the block diagram. In this mode, no attenuation occurs in the E1439 module.

In 36 MHz-2.7 GHz mode, the input signal goes through the upper path in the block diagram. This path includes 0 to 32 dB of attenuation in 1 dB steps. The signal is band-pass filtered, mixed with 95 MHz, and low-pass filtered. This inverts and translates the frequency spectrum from 52-88 MHz at the input to 43-7 MHz at the ADC. The ADC samples the signal at a 95 MHz sample rate.

Analog-to-digital (ADC) signal conversion

The central part of the E1439 is a precision sampling ADC. The ADC samples the signal at a rate of up to 95 MSa/sec and converts the analog signal to a digital signal.

Memory

Digitized data is stored in memory in the E1439 module and read out after a block of data has been taken. The digitized data passes through the E8491 interface to the measurement software in the computer.

For information on how the signal is processed by the measurement software, see the 89600 online help for “System Block Diagram” under Tutorial, Theory of Operation. Typically, this help file is in location:

C:/Program Files/Agilent/89600 VSA/Help/tasks.hlp

14 Replacing VXI Hardware

This section provides information on obtaining replaceable parts for the Agilent 89600-series VXI modules.

Replaceable parts for VXI hardware

Note

This chapter contains information only for VXI measurement hardware modules. If your analyzer uses other measurement hardware, such as an Agilent E4406 or Agilent E4440, refer to the service document shipped with that product.

For VXI mainframes, refer to the mainframe documentation on replaceable parts.

For information on upgrading your analyzer or replacing parts, contact your local Agilent Technologies sales and service office. See the list of office locations and addresses in the back of this manual.

Ordering Information

To order Agilent parts in the U.S., call Agilent Technologies Support Parts at (877) 447-7278. Outside the U.S., please contact your local Agilent Technologies parts center.

See the following pages for replaceable parts lists:

System cables and connectors

- "Agilent 89610A parts" (page 221)
- "Agilent 89611A parts" (page 221)
- "Agilent 89640A parts" (page 222)
- "Agilent 89641A parts" (page 222)

Modules

- "89605 parts" (page 223)
- "89606 parts" (page 223)
- "E1438 parts" (page 224)
- "E1439 parts" (page 224)
- "E2730 parts" (page 224)
- "E2731 parts" (page 225)
- "E8491B parts" (page 225)

Agilent 89610A parts

Cables, connectors, and terminations. References for illustrations showing cable connections:

- Chapter 3, "Cable connections, 89610" (page 60)
- Chapter 3, "Cable connections, two-channel 89610" (page 61)

Part Number	Description	Qty
8121-0133	flex BNC (m) to BNC (m) cable 267 mm, black	1
8120-6237	flex BNC (m) to BNC (m) cable 172 mm, black	1

Additional cables and connectors for second input channel

Part Number	Description	Qty
8121-0132	BNC (m) to BNC (m) cable 215 mm, black	1
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
1250-0676	50 ohm SMB termination	4

Agilent 89611A parts

Cables, connectors, and terminations (double the quantities for 2-channel configurations). References for illustrations showing cable connections:

- Chapter 3, "Cable connections, 89611" (page 63)
- Chapter 3, "Cable connections, 89611 with PSA Option H70" (page 64)
- Chapter 3, "Cable connections, two-channel 89611" (page 66)

Part Number	Description	Qty
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	2
1250-0780	N (m) to BNC (f) Adapter	1
8121-0790	SMA(m) to SMA(m) cable 1,219 mm	1
1250-1250	Type N(m) to SMA(f) adapter	1
1250-1700	BNC(m) to SMA(f) adapter	1
1250-0590	coax SMA cap	2

Additional cables and connectors for second input channel:

Part Number	Description	Qty
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	1
1250-0676	50 ohm SMB termination	4
1250-0590	coax SMA cap	2

Agilent 89640A parts

Cables, connectors, and terminations. (Double the quantities for 2-channel configurations.) References for illustrations showing cable connections:

- Chapter 3, "Cable connections, 89640" (page 67)
- Chapter 3, "Cable connections, 89640 with second IF/baseband channel" (page 68)
- Chapter 3, "Cable connections, 89640 with second RF channel" (page 69)
- Chapter 3, "Cable connections, 89640 with external down converter" (page 70)

Part Number	Description	Qty
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	2
1250-0780	N (m) to BNC (f) Adapter	1
89605-61691	SMA (m) to SMA (m) Semi-rigid cable	1-2*
89605-61692	SMA (m) to SMA (m) Semi-rigid cable with toroid	1
89605-61693	SMA (m) to SMA (m) Semi-rigid cable	0-1*
1250-0590	coax SMA cap	2

* With an 89605A, you need two 89605-61691 cables. With an 89605B, you need one 89605-61691 cable and one 89605-61693 cable.

Additional cables and connectors for second IF channel:

Part Number	Description	Qty
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
1250-0676	50 ohm SMB termination	4
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	1

Additional cables and connectors for second RF channel:

Part Number	Description	Qty
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
1250-0676	50 ohm SMB termination	4
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	1
89605-61696	semi-rigid SMA cable	2
1250-0590	coax SMA cap	2

Agilent 89641A parts

Cables, connectors, and terminations. References for illustrations showing cable connections:

- Chapter 3, "Cable connections, 89641" (page 71)
- Chapter 3, “Cable connections, 89641 with second IF/baseband channel,”
- Chapter 3, "Cable connections, 89641 with second RF channel" (page 73)

- Chapter 3, "Cable connections, 89641 with external down converter" (page 75)

Part Number	Description	Qty
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	2
1250-0780	N (m) to BNC (f) Adapter	1
89605-61691	SMA (m) to SMA (m) Semi-rigid cable	1-2*
89605-61694	SMA (m) to SMA (m) Semi-rigid cable with toroid	1
89605-61693	SMA (m) to SMA (m) Semi-rigid cable	0-1*
1250-0590	coax SMA cap	2

* With an 89605A, you need two 89605-61691 cables; with an 89605B, you need one 89605-61691 cable and one 89605-61693 cable.

Additional cables and connectors for second IF channel:

Part Number	Description	Qty
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
1250-0676	50 ohm SMB termination	4
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	1

Additional cables and connectors for second RF channel:

Part Number	Description	Qty
03585-61603	SMB (f) to SMB (f) cable, 100 mm, orange	2
1250-0676	50 ohm SMB termination	4
8121-0132	flex BNC (m) to BNC (m) cable 215 mm, black	1
89605-61696	semi-rigid SMA cable	2
1250-0590	coax SMA cap	2

89605 parts

The following lists 89605 parts.

Part Number	Description	Qty
89605-69201	Exchange 89605A module	1
89605-69211	Exchange 89605B module	1

89606 parts

The following lists 89606 parts.

Part Number	Description	Qty
89606-69201	Exchange 89606 module	1
89606-69211	Exchange 89606B module	1

E1438 parts

For information in installing SDRAM, see the *Replacing Assemblies* chapter in the *Agilent E1438 VXI 100 MSa/s ADC with filters and memory User's Guide*. This guide is installed in your computer, however, you may have to use the Search function to find the exact location. Typical locations include the following:

C:/Vxi/Vxipnp/Winnt/age1438/help/e1438_Users_Guide.pdf

C:/Program Files/Visa/Winnt/age1438\help/e1438_Users_Guide.pdf

Part Number	Description	Qty
E1438-69202	Exchange E1438 module	1-2
1818-7901	ICM SDRAM 128 MB	0-2
1818-7889	ICM SDIMM 16 MB	0-2
1818-8606	IC SDRAM 64MX7	0-2

E1439 parts

For information in installing SDRAM, see the *Replacing Assemblies* chapter in the *Agilent E1439 VXI 70 MHz IF ADC with filters and memory User's Guide*. This guide is installed in your computer, however, you may have to use the Search function to find the exact location. Typical locations include the following:

C:/Vxi/Vxipnp/Winnt/age1439/help/e1439_Users_Guide.pdf

C:/Program Files/Visa/Winnt/age1439/help/e1439_Users_Guide.pdf.

Part Number	Description	Qty
E1439-69202	Exchange E1439 module	1-2
1818-7901	ICM SDRAM 128 MB	0-2
1818-8606	IC SDRAM 64MX7	0-2
1818-7889	IC SDIMM 16 MB	0-2

E2730 parts

The following lists E2730 parts.

Part Number	Description	Qty
E2730-69201	Exchange E2730A module	1
E2730-69211	Exchange E2730B module	1-2
1250-0590	coax SMA cap	2

E2731 parts

The followings lists E2731 parts.

Part Number	Description	Qty
E2731-69201	Exchange E2731A module	1
E2731-69211	Exchange E2731B module	1
E2731-61601	SMA (m) to SMA (m) Semi-rigid cable	1
1250-0590	coax SMA cap	2

E8491B parts

See E8941B service manual for installation instructions. You can also find this PDF guide using: http://www.tm.agilent.com. Click on **Technical Support** and Search for E8491B. Select *E8491B Configuration and User's Guide* from the results. You can view this guide as HTML using the link: http://ftp.agilent.com/pub/mpusup/pc/iop/E8491B_Troubleshooting.html.

Part Number	Description	Qty
E8491-66202	Module, Service Replaceable E8491B	1
8121-0078	E8491B to IEEE-1394/PCI card cable	1
E8491-61613	IEEE-1394/PCI card power adapter cable	1
E8491-66204	IEEE-1394/PCI Card	1

Transporting VXI modules

Caution The VXI modules are static sensitive; use appropriate precautions when removing, handling, and installing to avoid damage.

- Package the module using the original factory packaging or packaging identical to the factory packaging.
- If returning the module to Agilent Technologies for service, attach a tag describing the following:
  - Type of service required
  - Return address
  - Model number
  - Full serial number

In any correspondence, refer to the module by model number and full serial number.

- Mark the container FRAGILE to ensure careful handling.
- If necessary to package the module in a container other than original packaging, observe the following (use of other packaging is not recommended):
  - Wrap the module in heavy paper or anti-static plastic.
  - Protect the front panel with cardboard.
  - Use a double-wall carton made of at least 200-pound test (32 ECT) material.
  - Cushion the module to prevent damage. For example, several layers of plastic bubble wrap is usually sufficient.

Caution Do not use pellets in any shape as packing material for the module. The pellets do not adequately cushion the module and do not prevent the module from shifting in the carton. In addition, some pellets create static electricity which can damage electronic components.

Storing VXI modules

Store modules in a clean, dry, and static free environment.

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Contact Agilent

By internet, phone, or fax, get assistance with all your test and measurement needs

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