
Agilent Technologies E5500A Phase Noise Measurement System

Installation Guide

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What You'll Find in This Manual...

- Chapter 1**
- E5500A Installation

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Contents

Notice	ii
U.S. Government Restricted Rights	ii
Trademarks	ii
AGILENT TECHNOLOGIES SOFTWARE LICENSE TERMS	iii
License Grant	iii
Ownership	iii
Copies and Adaptations	iii
No Disassembly or Decryption	iii
Transfer	iii
Third Party Software	iii
Termination	iv
Export Requirements	iv
What You'll Find in This Manual.....	v
Limited Warranty	vi
Software	vi
Media	vi
Notice of Warranty Claims	vi
Limitation of Warranty	vi
Exclusive Remedies	vi
Assistance	vi
Service and Support	vii
1. Welcome to the E5500A Phase Noise Measurement System Series of Solutions	
What You'll Find in This Section.....	1-2
Introduction	1-3
System Requirements	1-4
Step 1. Unpacking Your System	1-5
Step 2. Installing the Hardware	1-6
Step 2a - Removing your Computer's Cover	1-7
Step 2b - Accessing your Computer's ISA Slots	1-8
Step 2c - Taking ESD Precautions	1-9
Step 2d- Installing the Interface Cards	1-10
Installing the GPIB Interface.....	1-10
Installing the PCI-MIX-2 Digitizer Interface Card	1-11
Step 2e - Replacing the Computer Cover	1-12
E5500A Connect Diagram Example	1-13
Step 3. Installing the I/O Libraries	1-14
Step 3a - Installing the Agilent/HP I/O Libraries	1-14
Step 3b - Installing the Agilent/HP I/O Library Upgrade	1-15
Step 4. Installing the VXI-Digitizer Software	1-17

Step 5. Installing the Windows NT 4.0 Service Pack	1-19
Step 6. Installing the Measurement Software	1-20
Step 7. Using the Asset Manager to Configure your System	1-21
Configuring the Agilent/HP 70420A Test Set	1-22
Configuring the VXI Digitizer	1-26
Step 8. Entering the License Key for the Phase Noise Test Set	1-32
Step 9. Starting the Measurement Software	1-35
Step 10. Using Server Hardware Connections to Specify Assets for the Confidence Test	1-36
Step 11. Running the System Confidence Test	1-38
Beginning the Measurement	1-39
Making the Measurement	1-40
Congratulations	1-40

A Connect Diagrams

Connect Diagrams You'll Find in This Chapter	A-1
E5501A Standard Connect Diagram	A-2
E5501A Opt. 001 Connect Diagram	A-3
E5501A Opt. 201, 430, 440 Connect Diagram	A-4
E5501A Opt. 201 Connect Diagram	A-5
E5502A Standard Connect Diagram	A-6
E5502A Opt. 001 Connect Diagram	A-7
E5502A Opt. 201 Connect Diagram	A-8
E5503A Standard Connect Diagram	A-9
E5503A Opt. 001 Connect Diagram	A-10
E5503A Opt. 201 Connect Diagram	A-11
E5504A Standard Connect Diagram	A-12
E5504A Opt. 001 Connect Diagram	A-13
E5504A Opt. 201 Connect Diagram	A-14

Index

1

Welcome to the E5500A Phase Noise Measurement System Series of Solutions

What You'll Find in This Section...

- “Introduction” on page 1-3
- “System Requirements” on page 1-4
- “Step 1. Unpacking Your System” on page 1-5
- “Step 2. Installing the Hardware” on page 1-6
- “Step 3. Installing the I/O Libraries” on page 1-14
- “Step 4. Installing the VXI-Digitizer Software” on page 1-17
- “Step 5. Installing the Windows NT 4.0 Service Pack” on page 1-19
- “Step 6. Installing the Measurement Software” on page 1-20
- “Step 7. Using the Asset Manager to Configure your System” on page 1-21
- “Step 8. Entering the License Key for the Phase Noise Test Set” on page 1-32
- “Step 9. Starting the Measurement Software” on page 1-35
- “Step 10. Using Server Hardware Connections to Specify Assets for the Confidence Test” on page 1-36
- “Step 11. Running the System Confidence Test” on page 1-38

Introduction

Preconfigured System

A preconfigured system includes a computer shipped from Agilent Technologies with the hardware and software preinstalled.

This installation guide will take you through the process of installing both the hardware and the E5500 Phase Noise Software. If you ordered a **preconfigured system** from Agilent Technologies, follow the alternate steps in the right column of [Table 1-1](#).

A confidence test is also included as the last step in the installation procedure.

Table 1-1 *Installation Steps*

If you ordered a standard E5500 “A” system (without a computer), do the following steps:	If you ordered a preconfigured E5500A system, do the following steps:
Read “ System Requirements ” on page 1-4	Skip “ System Requirements ” on page 1-4
“ Step 1. Unpacking Your System ” on page 1-5	“ Step 1. Unpacking Your System ” on page 1-5
“ Step 2. Installing the Hardware ” on page 1-6	Skip Steps 2 to 8
“ Step 3. Installing the I/O Libraries ” on page 1-14	
“ Step 4. Installing the VXI-Digitizer Software ” on page 1-17	
“ Step 5. Installing the Windows NT 4.0 Service Pack ” on page 1-19	
“ Step 6. Installing the Measurement Software ” on page 1-20	
“ Step 7. Using the Asset Manager to Configure your System ” on page 1-21	
“ Step 8. Entering the License Key for the Phase Noise Test Set ” on page 1-32	
“ Step 9. Starting the Measurement Software ” on page 1-35	“ Step 9. Starting the Measurement Software ” on page 1-35
“ Step 10. Using Server Hardware Connections to Specify Assets for the Confidence Test ” on page 1-36	“ Step 10. Using Server Hardware Connections to Specify Assets for the Confidence Test ” on page 1-36
“ Step 11. Running the System Confidence Test ” on page 1-38	“ Step 11. Running the System Confidence Test ” on page 1-38

System Requirements

The setup program in the E5500 Phase Noise Measurement Software makes installation easy. In case you want a quick review of the system requirements, we have listed them first.

NOTE

E5500 Standard “A” (without a computer supplied by Agilent Technologies) users are required to supply an Agilent/HP 82341C GPIB Interface Card for their computer.

The system requirements for the phase noise measurement software are:

- Pentium® microprocessor (100 MHz or higher recommended)
- 32 megabytes (MB) of memory (RAM)
- 1 gigabyte (GB) hard disk
- Super Video Graphics Array (SVGA)
- 2 additional 16-bit ISA slots available for the phase noise system hardware.
 - 1 for VXI-Digitizer Card
 - 1 for GPIB Interface Card
- Windows NT 4.0
- Windows NT 4.0 Service Pack 3
- PCI/MIX-2 PC Board (included)
- Agilent/HP 82341C GPIB Interface Card (Required)

Table 1-2 Connectors and Adapters

Part Number	Description	Agilent/HP 70420A	Agilent/HP 70420A Option 001	Agilent/HP 70420A Option 201	Agilent/HP 70422A
1250-0207	BNC, 50 ohm Termination	1	1	1	
1250-0780	Adapter, N(m) - BMC(f)	3	2	3	1
1250-1250	Adapter, N(m) - SMA(f)		1		2
1250-2015	Adapter, SMA(f) - BNC(m)				1
5061-5311	Adapter/Saver, 3.5mm(f) - 3.5mm(f)		2	2	
1250-1200	Adapter, SMA(m) - BNC(f)		2		

Step 1. Unpacking Your System

1. Unpack and inspect the shipping container and its contents thoroughly to ensure that nothing was damaged during shipment.

If the container or packing material is damaged, the contents should be checked both mechanically and electrically. If the contents are damaged or defective, contact your nearest Agilent Technologies Sales and Service office. Keep the shipping materials for the carrier's inspection.

2. Verify that all parts and materials were included in the shipping container:

- E5500 Phase Noise Measurement System CD-ROM
- E5500 Software Keyword Licence Certificate
- E5500 User's Guide
- E5500A Installation Guide
- 9300-1408 Disposable Grounding Strap (Option 1FF)
- 5957-4369 Electrostatic Discharge (ESD) Warning Pamphlet
- 0960-1280 VXI-Digitizer PC Interface Card

Step 2. Installing the Hardware

NOTE

If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

Installing the phase noise hardware into your computer involves the following steps:

Step 2a - Removing your Computer's Cover, [page 1-7](#)

Step 2b - Accessing your Computer's ISA Slots, [page 1-8](#)

Step 2c - Taking ESD Precautions, [page 1-9](#)

Step 2d- Installing the Interface Cards, [page 1-10](#)

Step 2e - Replacing the Computer Cover, [page 1-12](#)

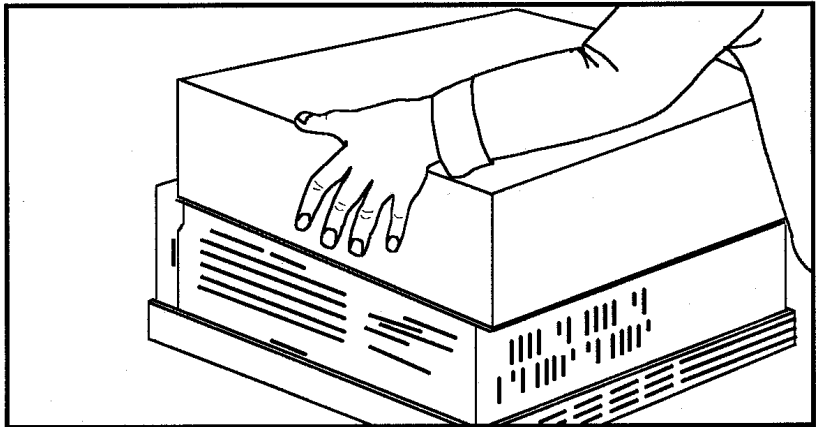
Step 2a - Removing your Computer's Cover

CAUTION

Refer to your computer's documentation for installation safety instructions and specific instructions for opening your computer.

Use the following steps to install the GPIB and VXI-Digitizer cards in your computer:

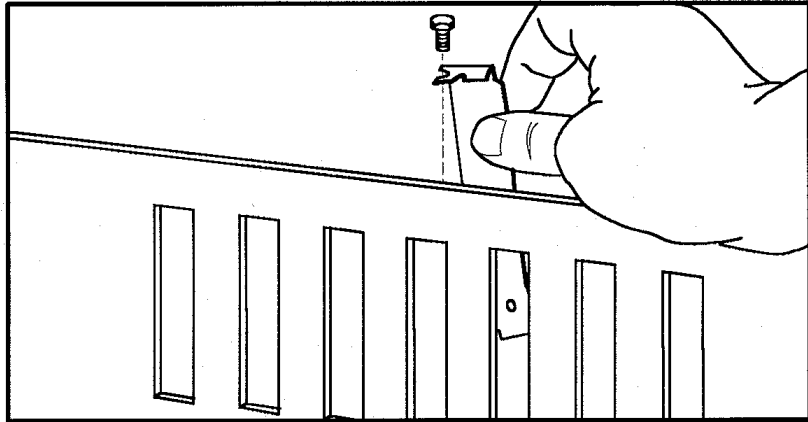
3. Power down the computer and all its peripherals
4. Disconnect the power cord from the computer
5. Unlock and remove the cover from the computer. This gives access to the I/O slots. (See your computer documentation for detailed instructions.)



Step 2b - Accessing your Computer's ISA Slots

6. Look for suitable ISA expansion slots for both the GPIB and VXI-Digitizer cards and remove the back panel's cover plates. Choose slots that give good access to the GPIB and VXI-Digitizer connectors.

The following drawing shows a view of the ISA slots vertically mounted; your computer's ISA slots may be horizontally mounted, but the process is the same.



Step 2c - Taking ESD Precautions

CAUTION

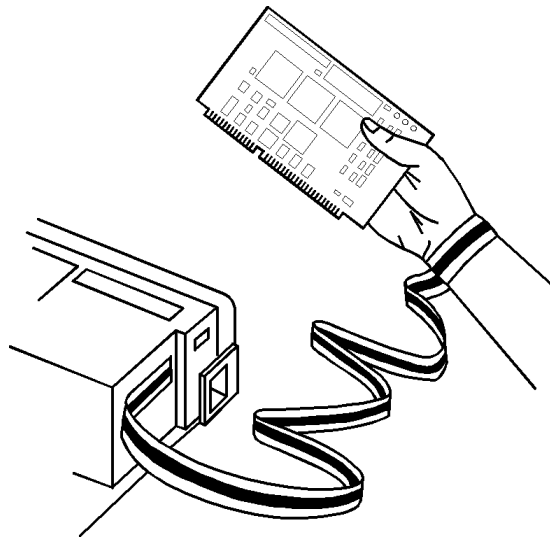
To prevent possible ESD damage, you must be properly grounded with a grounding wrist strap before touching the VXI-Digitizer or GPIB Interface Cards. While inserting the cards, be sure to hold the cards by their edges.

7. Using the disposable grounding strap, supplied with the VXI-Digitizer interface card, unwrap the first two folds of the wrist strap and wrap the exposed adhesive side firmly around your wrist.

CAUTION

Wear this grounding wrist strap before unpacking or touching the VXI-Digitizer or GPIB interface cards; it is provided for control of static electricity. Failure to use the grounding wrist strap properly can result in damage to electronic devices and assemblies

8. Unroll the rest of the wrist strap and peel the liner from the copper foil at the opposite end.
9. Attach the copper foil to a convenient and exposed electrical ground somewhere on the computer's chassis. This should be an unpainted surface of the computer cabinet.

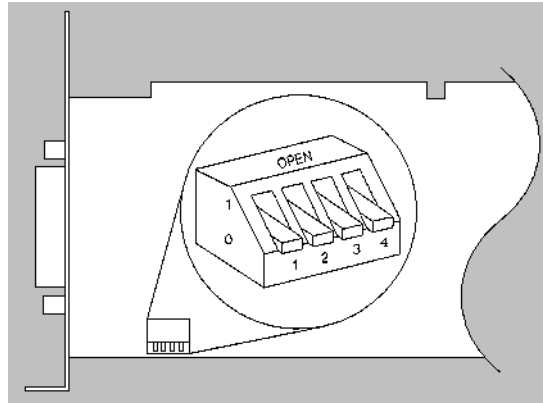


Step 2d- Installing the Interface Cards

Installing the GPIB Interface Card

10. Verify that the GPIB (Agilent/HP 82341C GPIB) Interface card is set to the following settings:

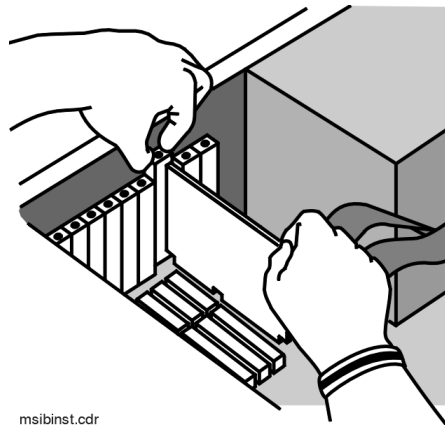
- switches 1-2-3 set the base port address
 - 0-0-0: 0x250-0x257 (default)
- switch 4 is not used



11. Insert the GPIB interface edge connector into the expansion slot connector of the computer. Make sure the interface is fully seated by pushing firmly on the edge of the card with the palm of your hand. The GPIB connector should extend through the back panel opening to allow cable installation.

NOTE

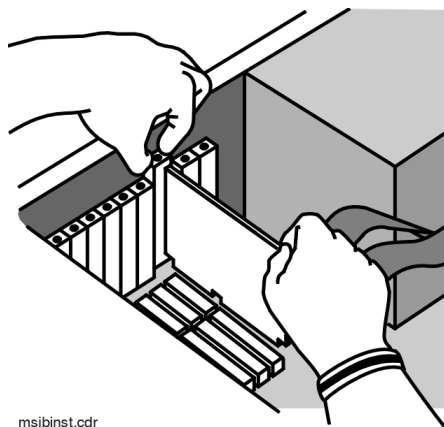
Use of a GPIB connector extender may be necessary for adequate clearance between the GPIB cable and the computer chassis.



12. Replace the GPIB back-panel cover plate screw to hold the interface in place. (Save the blank cover plate for use if the interface is removed later.)

Installing the PCI-MIX-2 Digitizer Interface Card

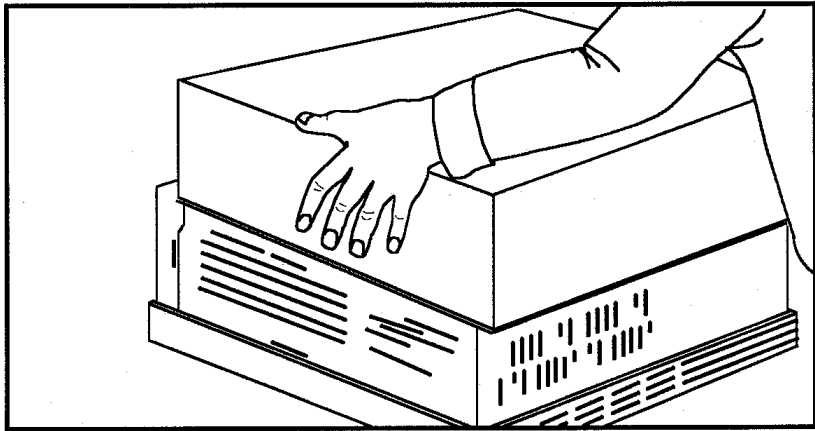
13. Insert the PCI-MIX-2 Digitizer interface edge connector into the expansion slot connector of the computer. Make sure the interface is fully seated by pushing firmly on the edge of the card with the palm of your hand.



14. Replace the PCI-MIX-2 Digitizer back-panel cover plate screw to hold the interface in place. (Save the blank cover plate for use if the interface is removed later.)

Step 2e - Replacing the Computer Cover

15. Replace the computer cover as described in your computer's documentation.



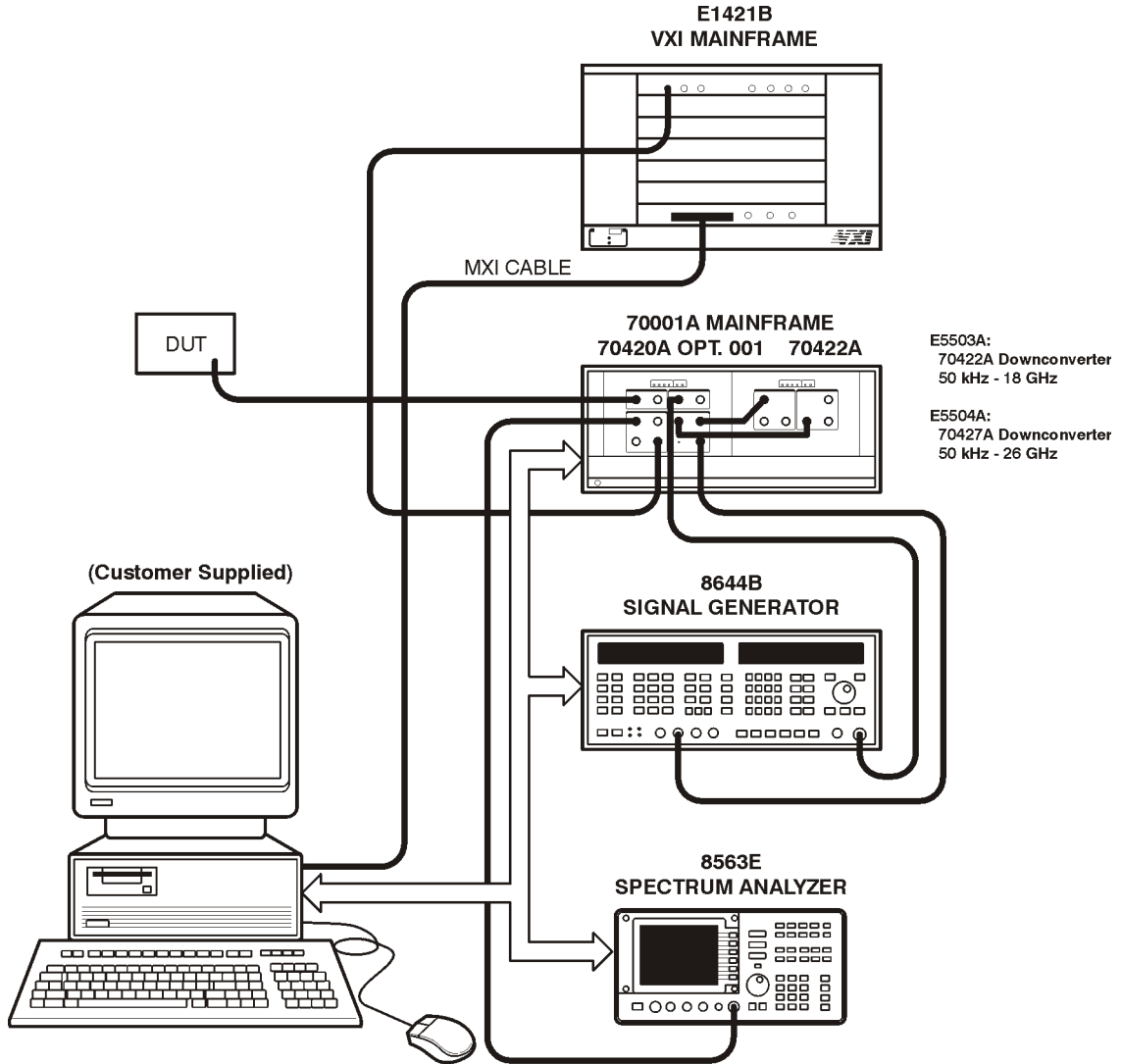
16. Connect the double cable between the VXI-Digitizer PC interface card and the Agilent/HP E1421B VXI mainframe.
17. Connect a BNC to BNC cable between the Agilent/HP E1430A VXI card's Analog in connector and the Agilent/HP 70420A Test Set's <100 MHz output connector.
18. Refer to the following system connect diagram example for more information about system interconnections:
 - o [“E5500A Connect Diagram Example” on page 1-13](#)

NOTE

For additional examples, refer to [A, “Connect Diagrams”](#).

E5500A Connect Diagram Example

E5500A Phase Noise System



e5500/90004/art/ts1.pcx

Step 3. Installing the I/O Libraries

Installing the I/O libraries involves the following steps:

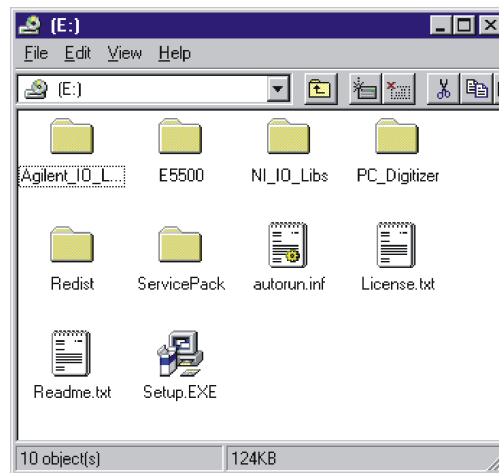
- **Step 3a - Installing the Agilent/HP I/O Libraries**, [page 1-14](#)
- **Step 3b - Installing the Agilent/HP I/O Library Upgrade**, [page 1-15](#)

NOTE

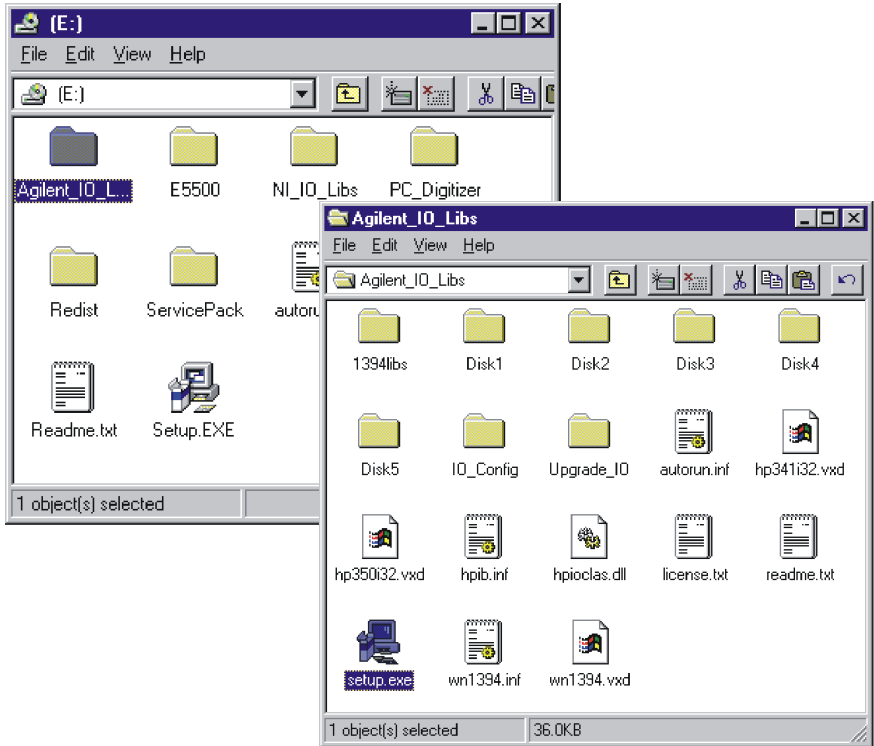
If, for any reason, the Agilent/HP I/O Libraries must be re-installed at a later date, the E5500 Measurement Software (Step 6.) must also be re-installed **after** the I/O Library installation.

Step 3a - Installing the Agilent/HP I/O Libraries

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. The following dialog box will appear.



4. Double-click on **Agilent_IO_Libs**, then on **Setup.exe** and follow the instructions (accept the default settings).

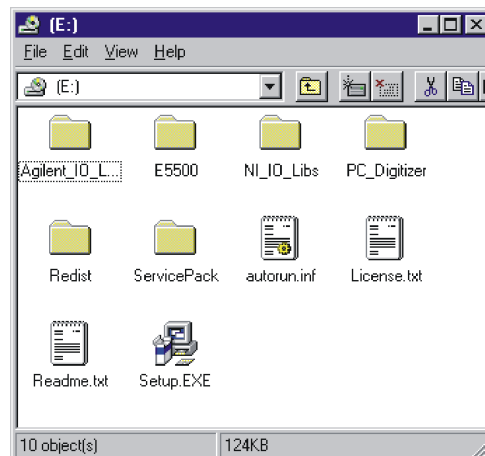


NOTE

Do **not** restart your computer at this time.

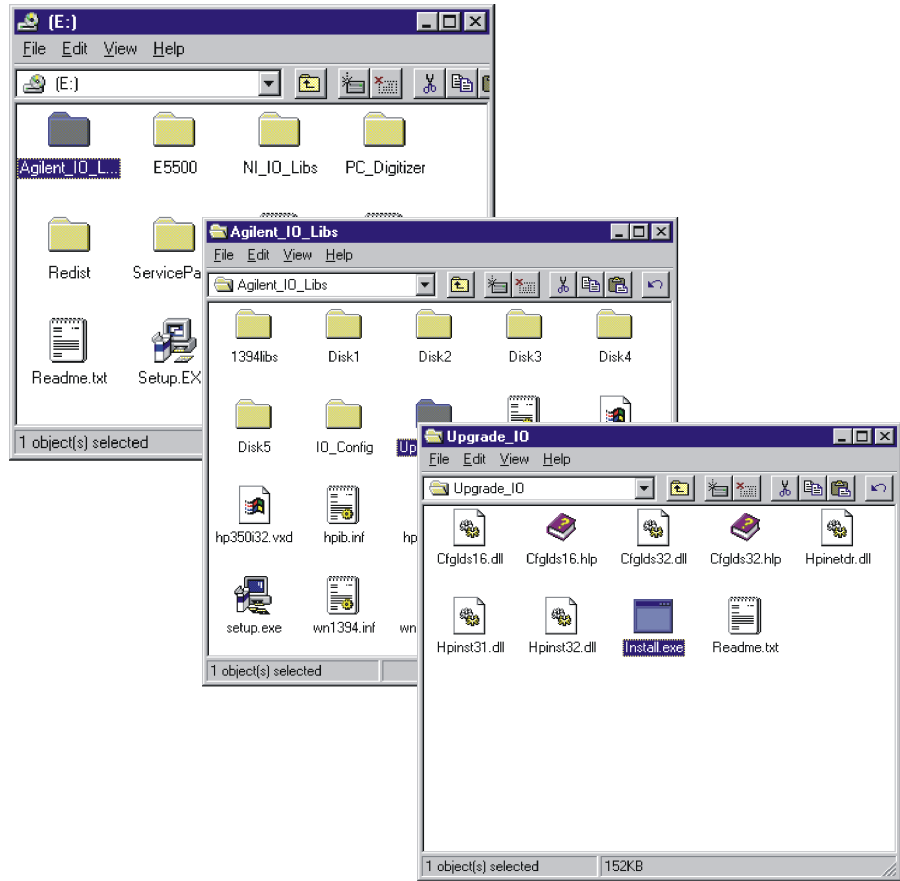
Step 3b - Installing the Agilent/HP I/O Library Upgrade

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. The following dialog box will appear.



Welcome to the E5500A Phase Noise Measurement System Series of Solutions

4. Double-click on **Agilent_IO_libs**, **Upgrade_IO**, then on **Install.exe**.



NOTE

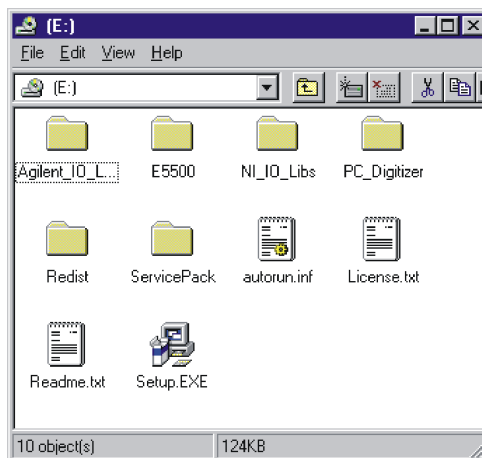
Do **not** restart your computer at this time.

Step 4. Installing the VXI-Digitizer Software

NOTE

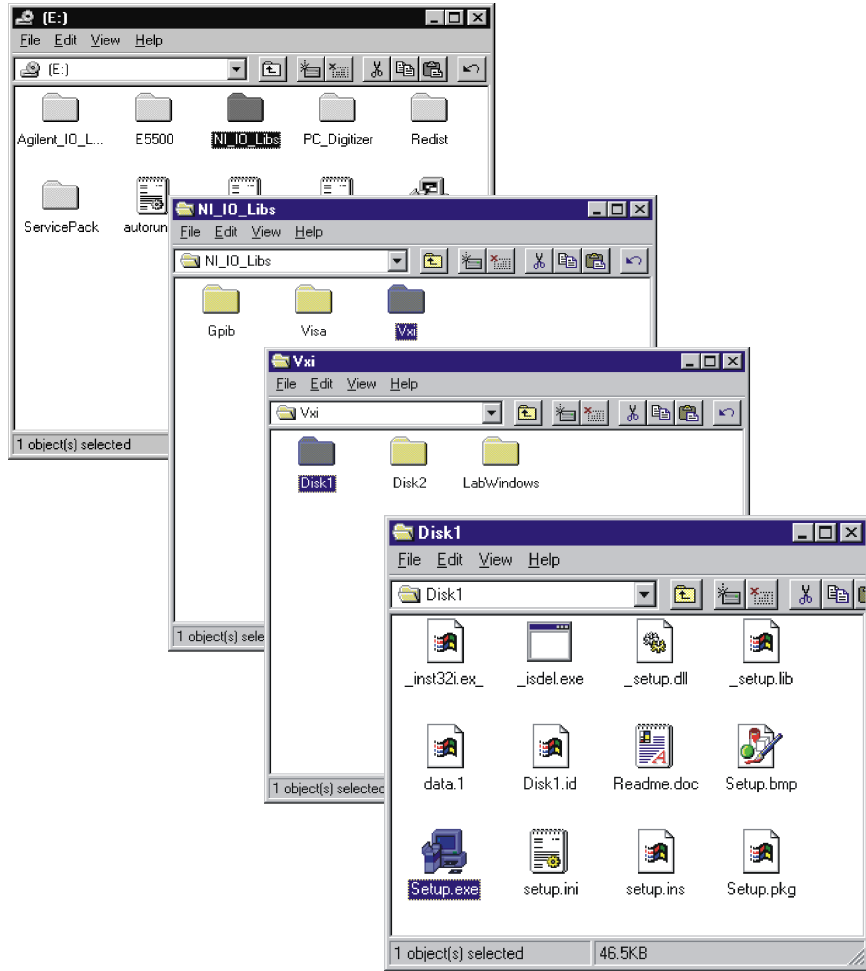
If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. The following dialog box will appear.



Welcome to the E5500A Phase Noise Measurement System Series of Solutions

4. Double-click on **NI_IO_Libs**, **Vxi**, **Disk 1**, then on **Setup.exe** and follow the instructions (accept the default settings).



NOTE

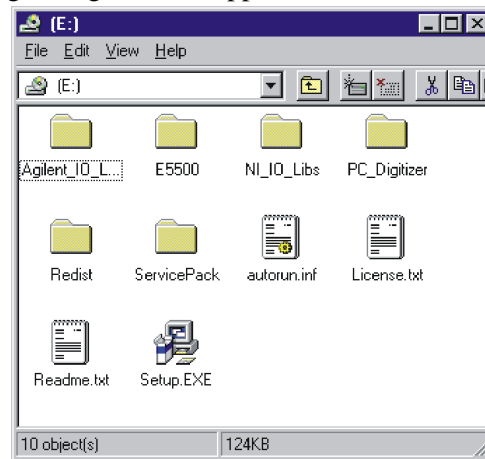
When offered the choice, do **not** restart your computer at this time.

Step 5. Installing the Windows NT 4.0 Service Pack

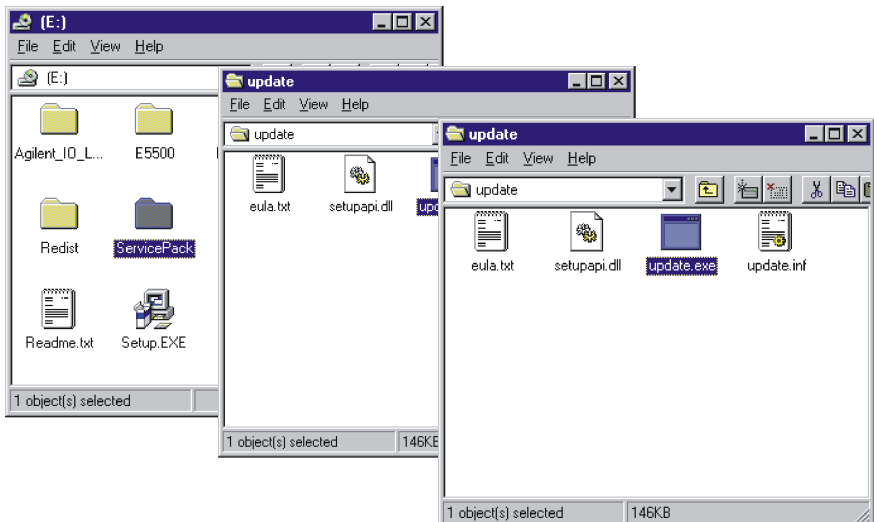
NOTE

If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. The following dialog box will appear.



4. Double-click on **Service Pack**, then on **Update**, then on **Update.exe** and follow the instructions (accept the default settings).



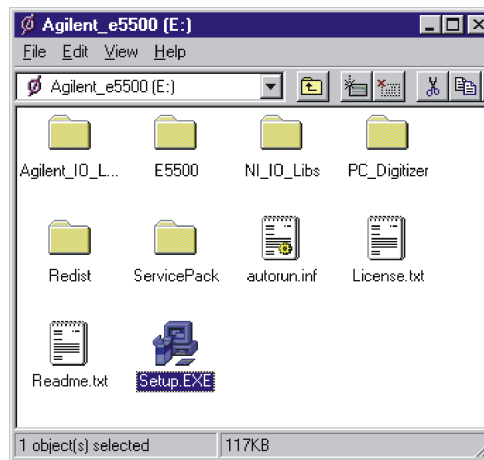
5. **Reboot** your computer at this time.

Step 6. Installing the Measurement Software

NOTE

If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. The following dialog box will appear. Double click on **Setup.exe** and follow the instructions (**accept the default settings**).



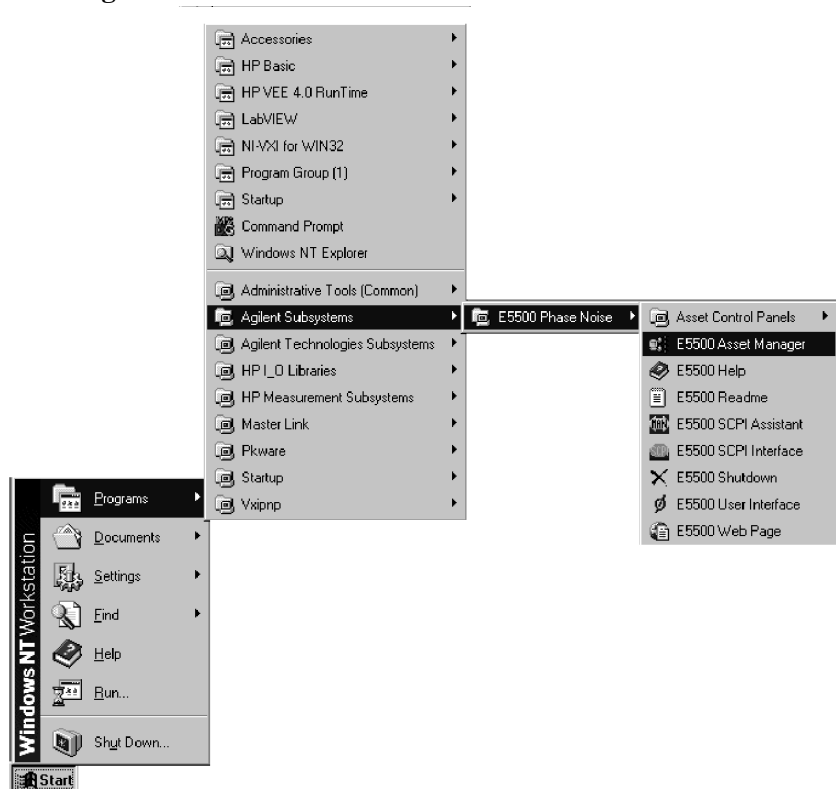
Step 7. Using the Asset Manager to Configure your System

The following procedure will configure both the Agilent/HP 70420A Phase Noise Test Set and VXI-Digitizer so they can be used in the E5500A Phase Noise Measurement System to make measurements.

NOTE

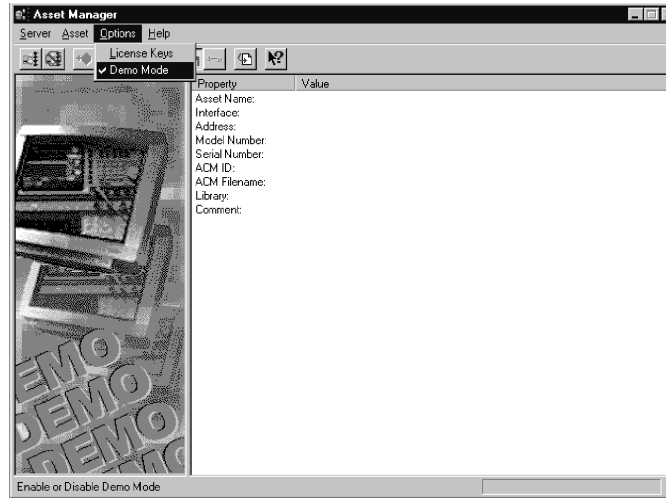
If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

1. Make sure your computer and monitor are turned on.
2. Place the E5500 Phase Noise Measurement Software CD-ROM in the CD-ROM drive.
3. Click the **Start** button, point to **Programs**, point to **Agilent Subsystems**, point to **E5500 Phase Noise**, and then click **E5500 Asset Manager**.

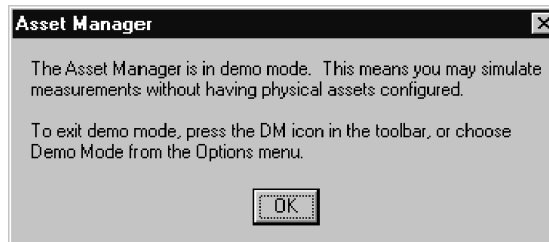


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- To place the Asset Manager in non-demo mode, click **Options**, and then click **Demo Mode** to unselect Demo Mode.



- Click **OK**. The Asset Manager can be invoked from within the phase noise measurement software, and if that were the case you would need to restart the software for any changes made in the Asset Manager to take effect.



Configuring the Agilent/HP 70420A Test Set

- Click the **Asset Wizard** button to start configuring the Agilent/HP 70420A Phase Noise Test Set using the Asset Manager Asset Wizard.

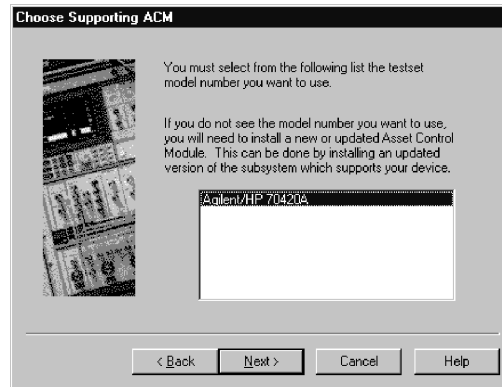


Welcome to the E5500A Phase Noise Measurement System Series of Solutions

- From the **Asset Type** pull-down list, select **Test Set**, then click the **Next** button.



- Click on **Agilent/HP 70420**, then click the **Next** button.



- From the **Interface** pull-down list, select **GPIB0**.
- In the **Address** box, type **20**. 20 is the default address for the Agilent/HP 70420A phase noise test set.

The following are default device addresses used by Agilent Technologies.

Table 1-3 *Default Device Addresses*

Instrument	Address
Agilent/HP 70420A Test Set	20
Agilent/HP 70421A Downconverter	28
Agilent/HP 70422A Downconverter	28
Agilent/HP 70427A Downconverter	28
RF Analyzer	17
FFT Analyzer	18
Source # 1	19

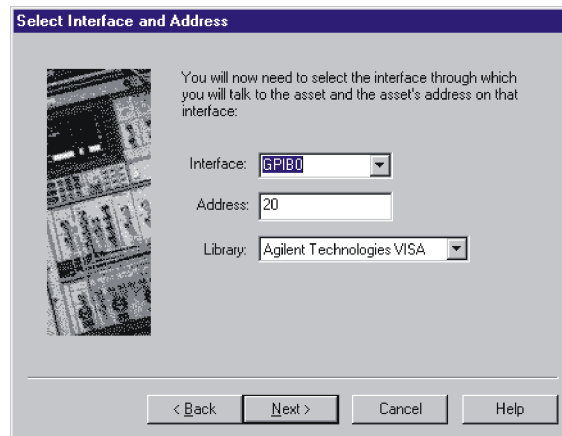
Table 1-3 *Default Device Addresses*

Instrument	Address
Source # 2	23
Counter	3
Agilent/HP E1430 VXI Digitizer	129
Agilent/HP E1437 VXI Digitizer	192
Agilent/HP E1420B VXI Counter	48
Agilent/HP E1441 VXI Arb	80

CAUTION

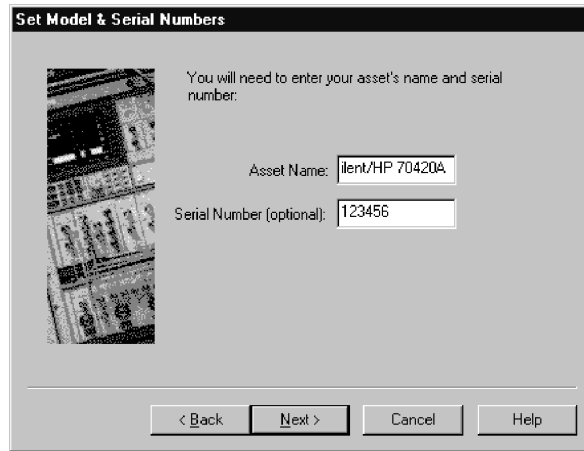
If an address is a single digit address, for example the counter at address 3, do not add a leading zero (03) to the address. The phase noise software treats 3 and 03 as different addresses.

11. The **Library** pull-down list does not apply to this example. It applies specifically to either the Agilent Technologies GPIB or the National GPIB interface cards.
12. Click the **Next** button.



13. In the **Asset Name** box, type **Agilent/HP 70420A**.

14. In the **Serial Number (optional)** box, type the serial number for your Agilent/HP 70420A test set. Click the **Next** button.



15. You may type a comment in this dialog box. The comment will associate itself with the asset you have just configured. Click the **Finish** button.

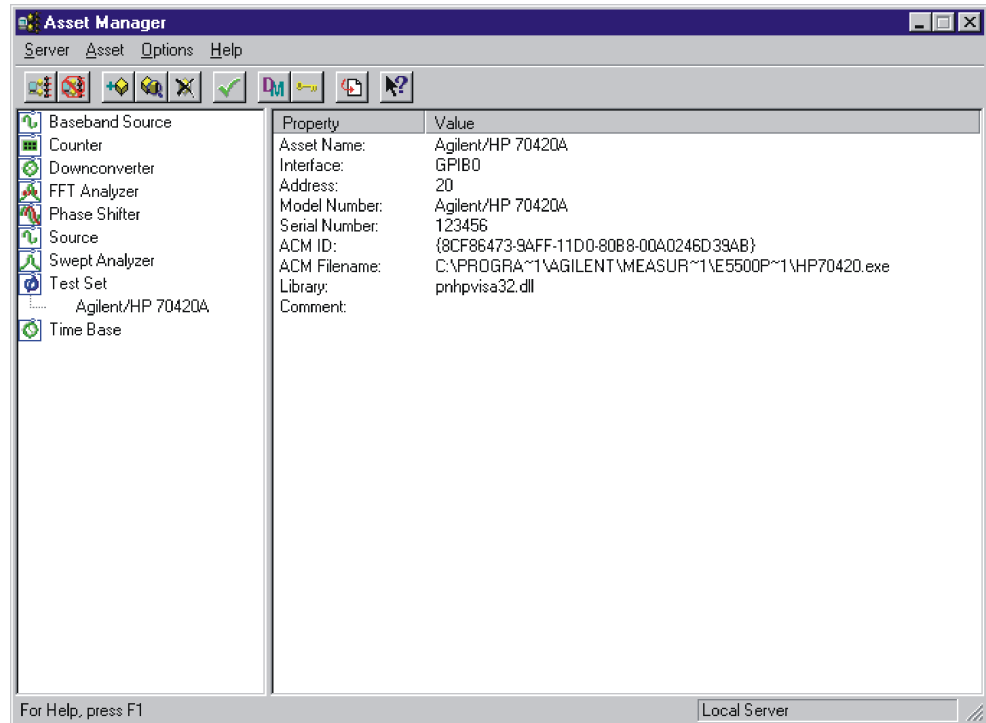


16. The following dialog box will appear.

The left pane shows either the demo mode, or in this case, a list of assets or asset roles. An asset is any piece of hardware (Agilent/HP 70420A) that you want configured for system use. An asset role is the general category for hardware (test sets, downconverters, counters, for

Welcome to the E5500A Phase Noise Measurement System Series of Solutions

example). The right pane is information only. The information can be changed by double-clicking a specific asset.



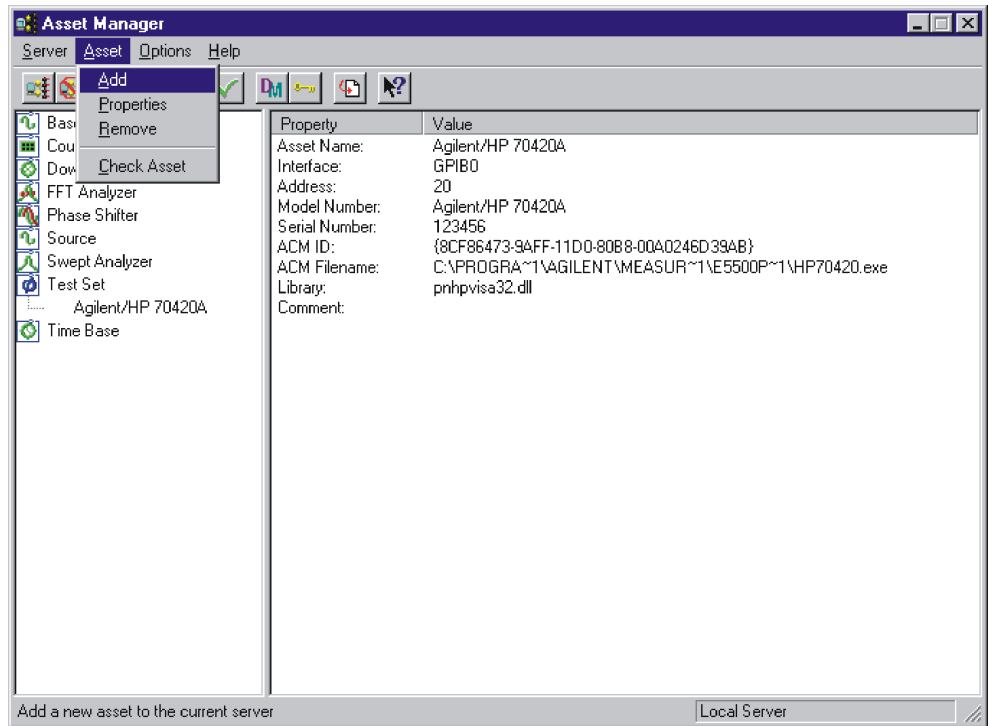
You have just used the Asset Manager to configure the Agilent/HP 70420A test set. The process for configuring any asset is essentially the same. As a second example, we will now configure the VXI-Digitizer. Both the test set and VXI-digitizer are required to perform the confidence test at the end of this chapter.

Configuring the VXI Digitizer

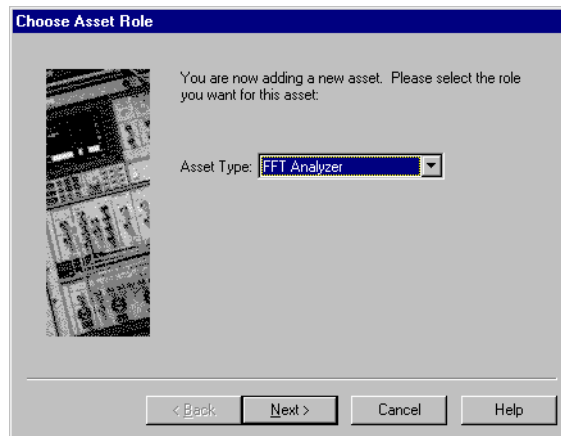
For this example we will use invoke the Asset Manager Wizard from within the Asset Manager. This is the most common way to add assets.

Welcome to the E5500A Phase Noise Measurement System Series of Solutions

17. Click **Asset**, and then click **Add**.

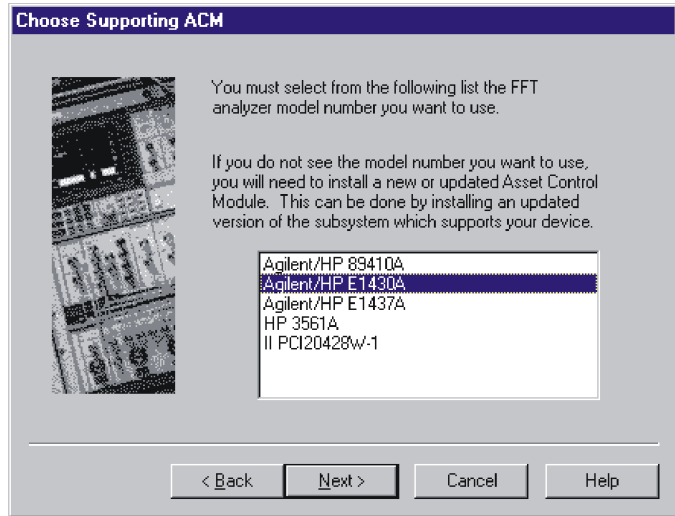


18. From the **Asset Type** pull-down list, select **FFT Analyzer**, then click the **Next** button.

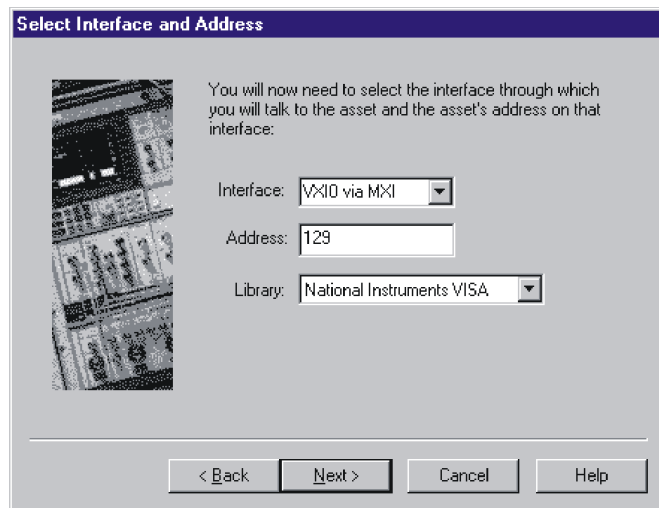


Welcome to the E5500A Phase Noise Measurement System Series of Solutions

19. Click on **Agilent/HP E1430A**, then click the **Next** button



20. From the **Interface** pull-down list, select **VXI0 via MXI**.



21. In the **Address** box, type **129**. 129 is the default address for the Agilent/HP E1430 VXI-Digitizer.

The following are default device addresses used by Agilent Technologies.

Table 1-4 *Default Device Addresses*

Instrument	Address
Agilent/HP 70420A Test Set	20
Agilent/HP 70422A Downconverter	28
RF Analyzer	18
Source	19
Counter	3
Agilent/HP E1430 VXI Digitizer	129
Agilent/HP E1420B VXI Counter	48
Agilent/HP E1441A VXI Arb	80

CAUTION

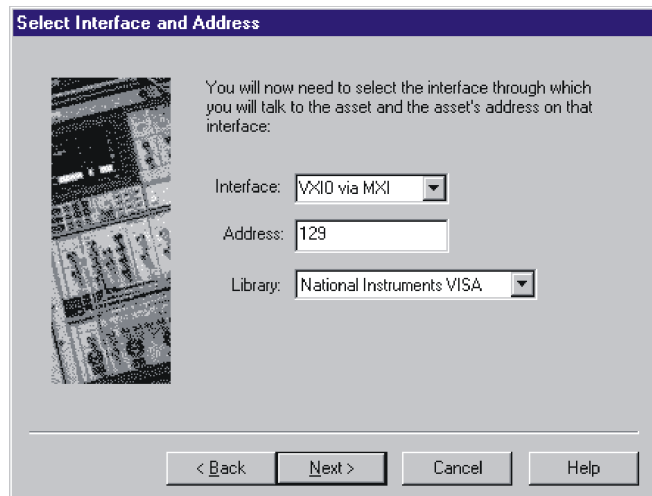
If an address is a single digit address, for example the counter at address 3, do not add a leading zero (03) to the address. The phase noise software treats 3 and 03 as different addresses.

22. In the **Library** pull-down list, select the **National Instruments VISA**

NOTE

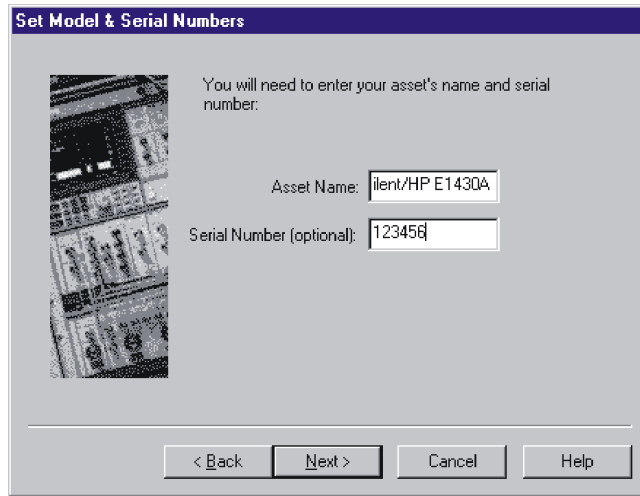
All VXI devices require the National Instruments VISA library.

23. Click the **Next** button.



Welcome to the E5500A Phase Noise Measurement System Series of Solutions

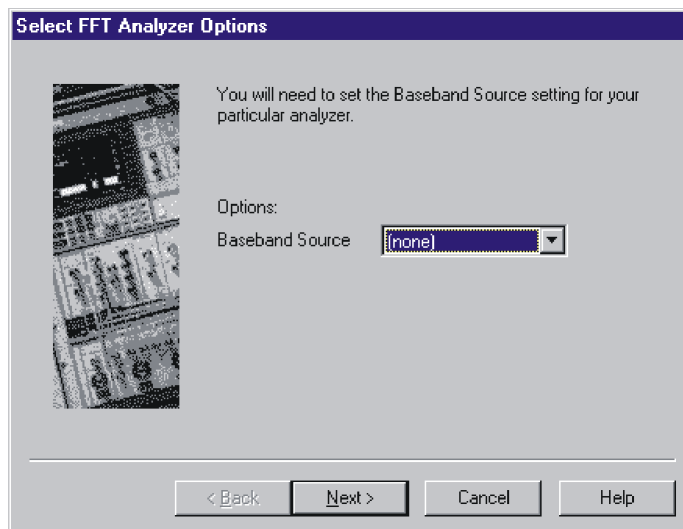
24. In the **Asset Name** box, type **Agilent/HP E1430A**.
25. In the **Serial Number (optional)** box, type the serial number for your VXI-digitizer. Click the **Next** button.



26. From the **Baseband Source** pull-down list, select **(none)**.

NOTE

If you had previously configured an Agilent/HP E1441A VXI Arb into the Asset Manager for use as a baseband noise source for PLL loop suppression verification, that option would also be available and you would select it here.



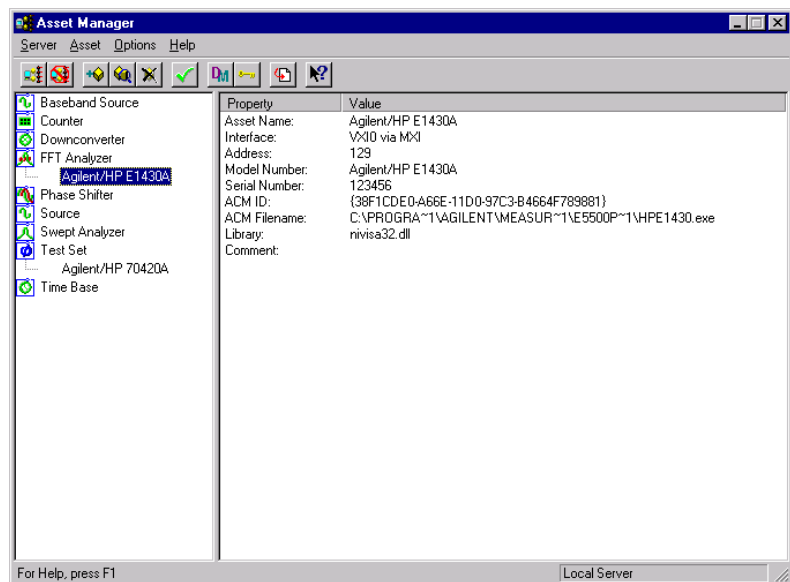
27. Click the **Next** button.

Welcome to the E5500A Phase Noise Measurement System Series of Solutions

28. You may type a comment in this dialog box. The comment will associate itself with the asset you have just configured. Click the **Finish** button.



29. You have just used the Asset Manager to configure the VXI-digitizer. The process you have used to configure both the Agilent/HP 70420A and VXI-digitizer is the same process you will use to add software controlled assets to the phase noise measurement software.



30. Click **Server**, and then click **Exit** to exit the Asset Manager. Next we will enter the license key for the software.

Step 8. Entering the License Key for the Phase Noise Test Set

Use the following procedure to enter your keyword for your Agilent/HP 70420A Phase Noise Test Set.

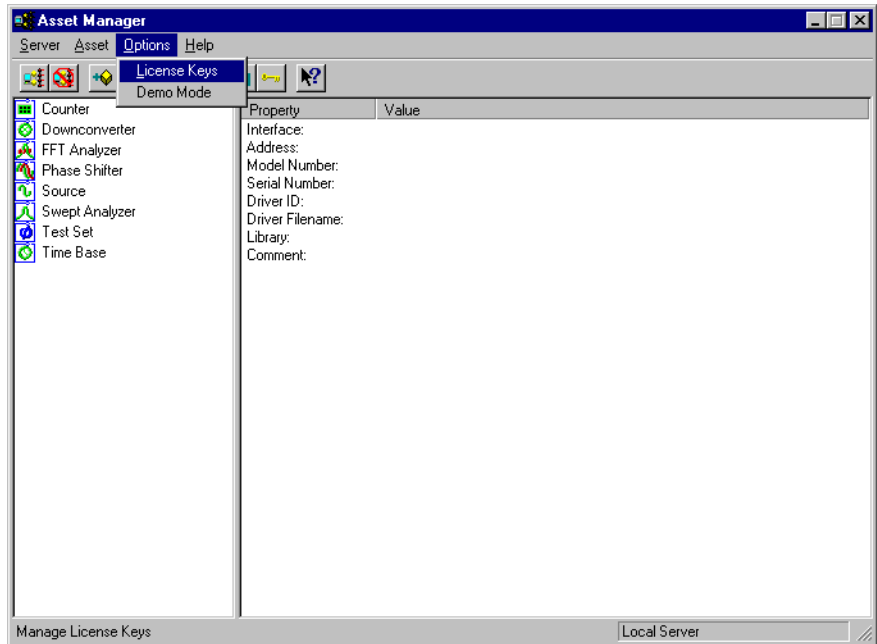
NOTE

If you have ordered a preconfigured phase noise system from Agilent Technologies, skip this step and proceed to [“Step 9. Starting the Measurement Software”](#) on page 1-35.

1. Make sure your computer and monitor are turned on.
2. Click the **Start** button, point to **Programs**, point to **Agilent Subsystems**, point to **E5500 Phase Noise**, and then click **E5500 Asset Manager**.



3. Click **Options**, and then click **License Keys**.

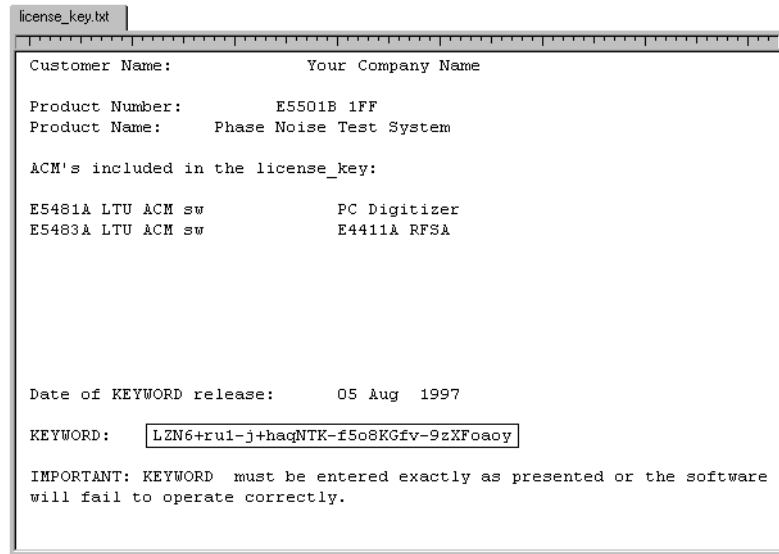


NOTE

The license key for your system is unique and may only be used with a specific Agilent/HP 70420A Test Set serial number. The license key may be found both on your license-key document and in the file "license_key.txt" on the License_key floppy disk provided with your system.

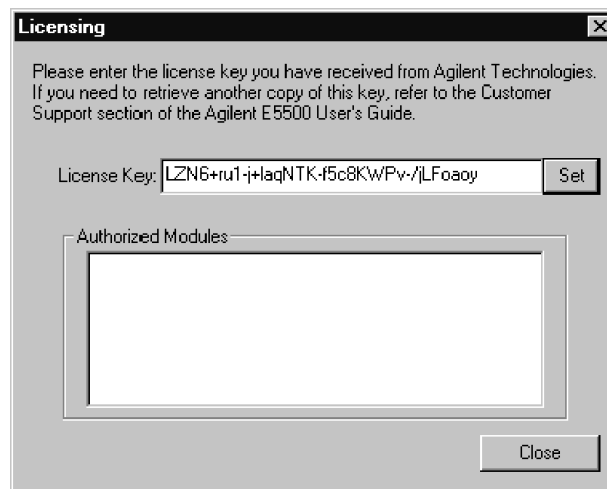
Welcome to the E5500A Phase Noise Measurement System Series of Solutions

4. Enter the license key for your Agilent/HP 70420A Test Set and click the **Set** button. Use the Licence_key.txt file described in the next step to facilitate entering your license key into the licensing dialog box.
 - a. Insert the E5500 License Key disk in the computer.
 - b. Using Notepad, load **License_key.txt**.



- c. Highlight the keyword in the License_key.txt file and copy it to the dialog box shown below, then click the **Set** button.

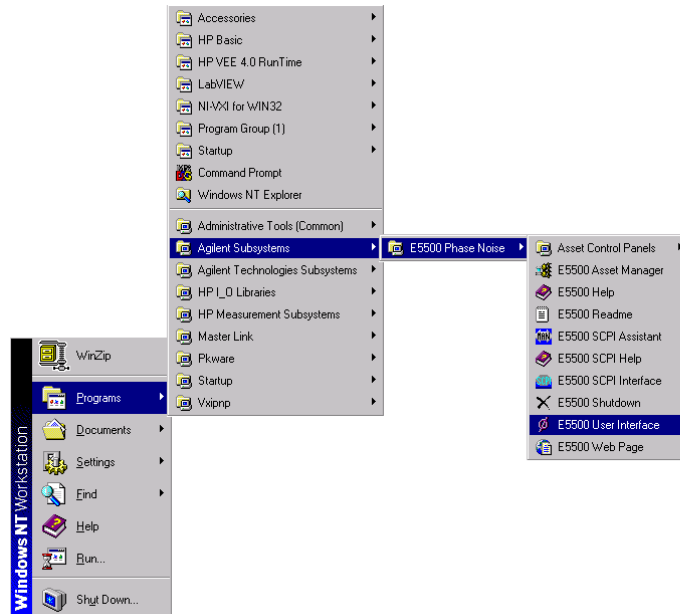
For information about how to copy and paste information in Windows, refer to the Windows documentation or On-Line Help.



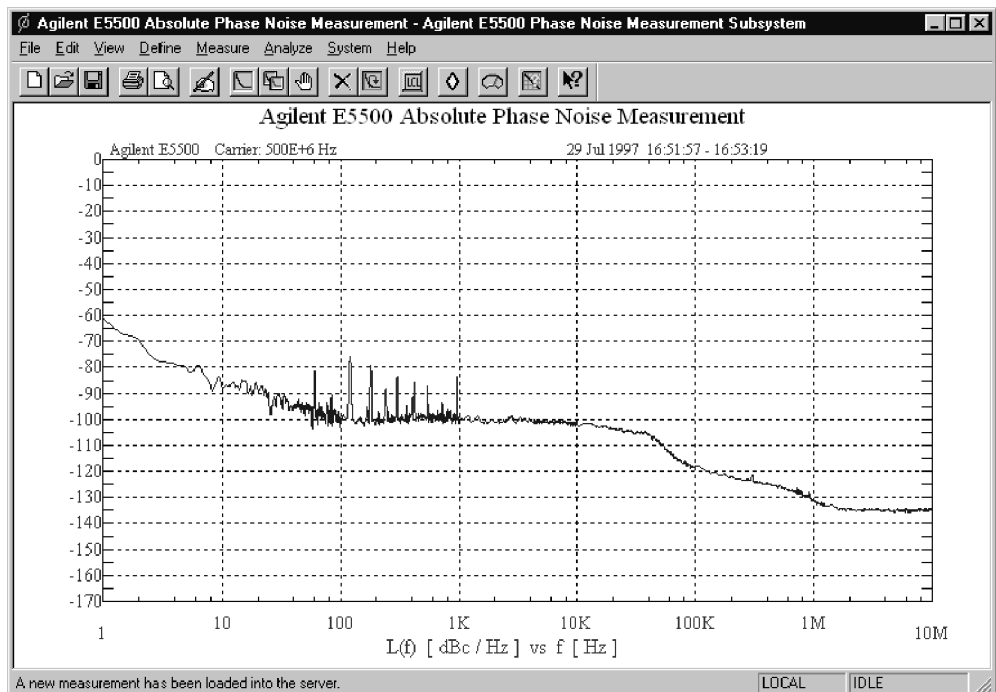
5. The next step is to start the measurement software.

Step 9. Starting the Measurement Software

1. Click the **Start** button, point to **Programs**, point to **Agilent Subsystems**, point to **E5500 Phase Noise**, and then click **E5500 User Interface**.

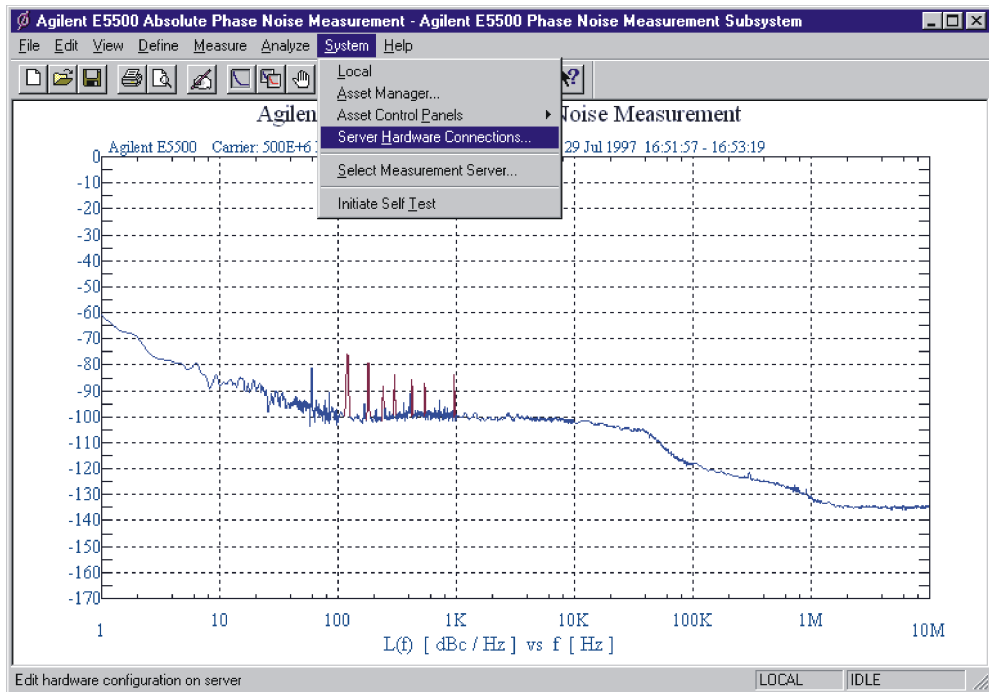


2. The following dialog box appears.

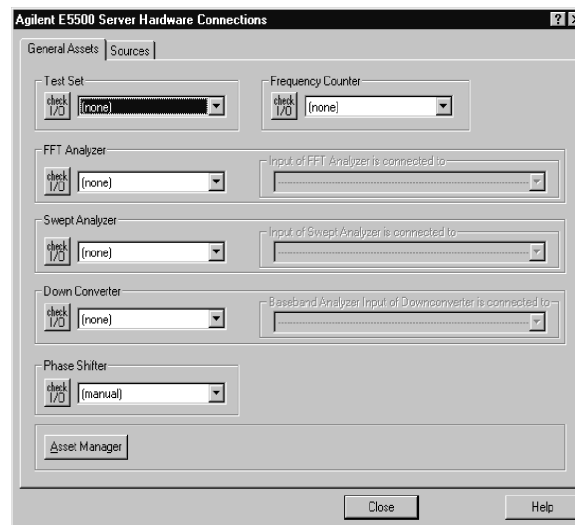


Step 10. Using Server Hardware Connections to Specify Assets for the Confidence Test

1. From the **System** menu, choose **Server Hardware Connections**.

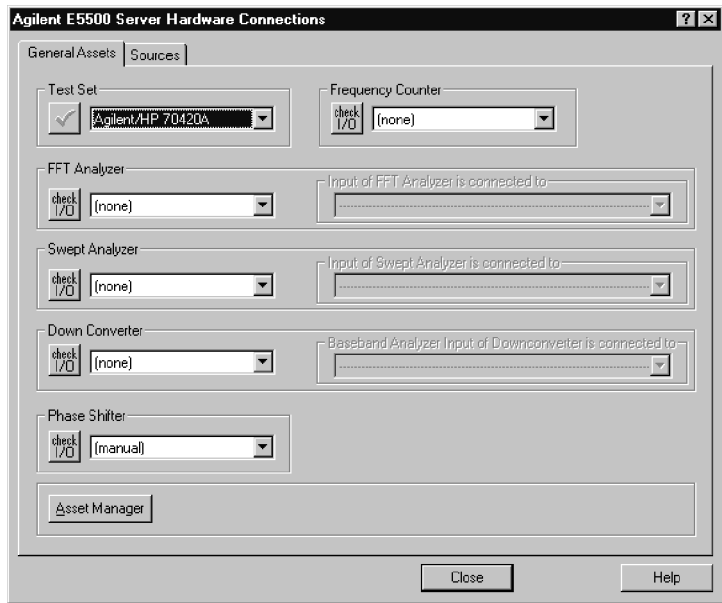


2. The following dialog box will appear.

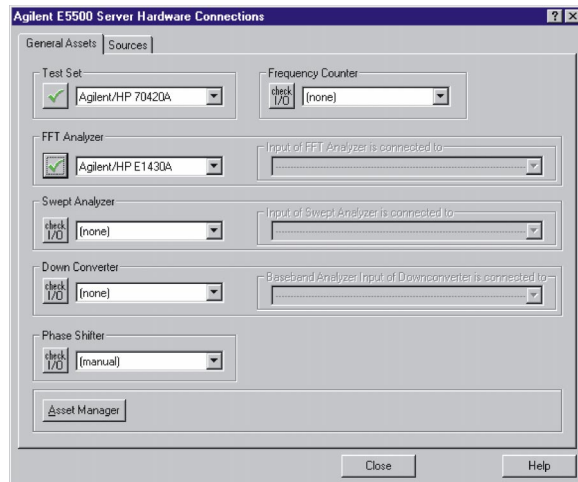


Welcome to the E5500A Phase Noise Measurement System Series of Solutions

- From the **Test Set** pull-down list, select **Agilent/HP 70420A**. Click the **Check I/O** button. A green check-mark will appear after the I/O check has been performed by the software. If a red circle with a slash appears, return to the Asset Manager (click the **Asset Manager** button) and verify that the Agilent/HP 70420A and VXI-Digitizer are configured correctly (check that the license key has been entered correctly). Also check your system hardware connections. Click the **Check I/O** button for a re-check.



- From the **FFT Analyzer** pull-down list, select **Agilent/HP E1430A**. Click the **Check I/O** button. A green check-mark will appear after the I/O check has been performed by the software.



Selecting both the Agilent/HP 70420A test set and the Agilent/HP E1430A FFT Analyzer (VXI digitizer) will tie both assets to the confidence test we will be performing in the next step.

Step 11. Running the System Confidence Test

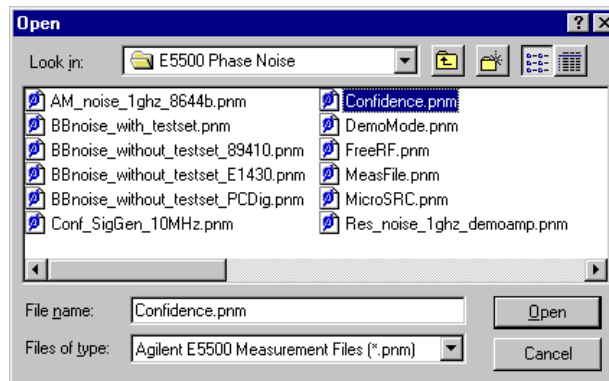
This measurement demonstration will introduce you to the system's operation by guiding you through an actual phase noise measurement.

This first measurement tests the Agilent/HP 70420A Test Set's low-noise amplifier circuitry. The phase detectors are not tested. This measurement will also confirm that the PC and phase noise test set are communicating with each other.

1. From the **File** menu, choose **Open**.



2. If necessary, choose the drive or directory where the file you want is stored.
3. In the **File Name** box, choose **Confidence.pnm**.

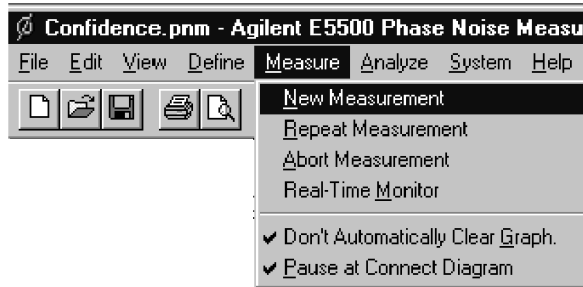


4. Click the **Open** button.

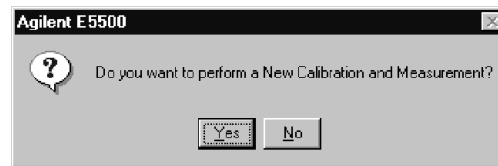
The appropriate measurement definition parameters for this example have been pre-stored in this file. [Table 1-5 on page 1-41](#) lists the parameter data that has been entered for the Agilent/HP 70420A Confidence Test example.

Beginning the Measurement

1. From the **Measure** menu, choose **New Measurement**.



2. When the **Perform a New Calibration and Measurement** dialog box appears, click **OK**.



3. When the **Connect Diagram** dialog box appears, connect the 50 Ω termination provided with your system to the Agilent/HP 70420A Test Set's Noise Input connector. (See Figure 1-1.)

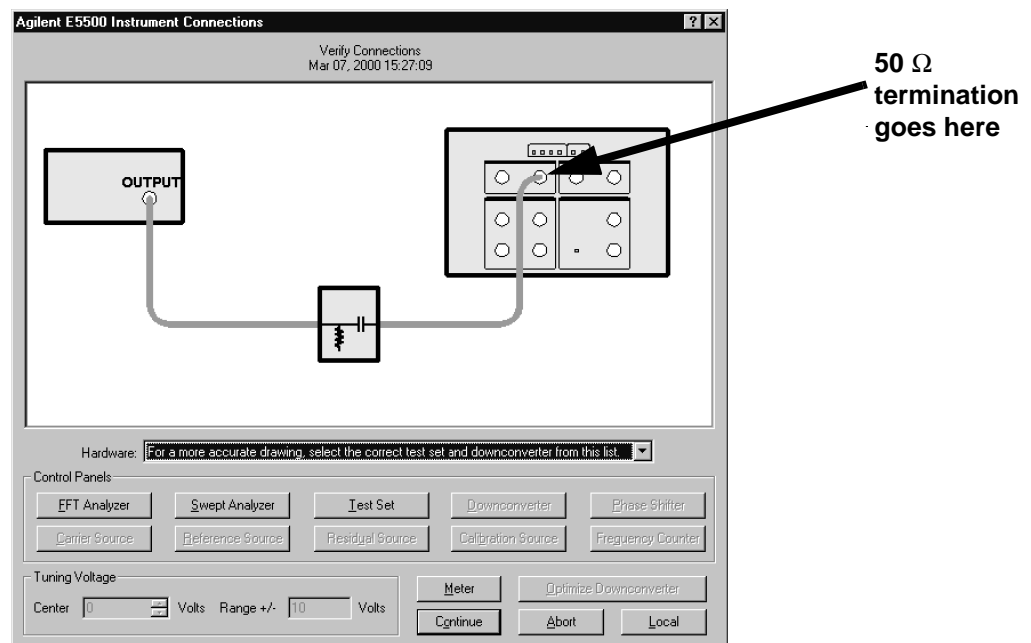


Figure 1-1 System Confidence Test Setup Diagram.

Making the Measurement

1. Press the **Continue** key. Because you selected New Measurement to begin this measurement, the System starts by running the routines required to calibrate the current measurement setup.

Figure 1-2 shows a typical baseband phase noise plot for an Agilent/HP 70420A Phase Noise Test Set.

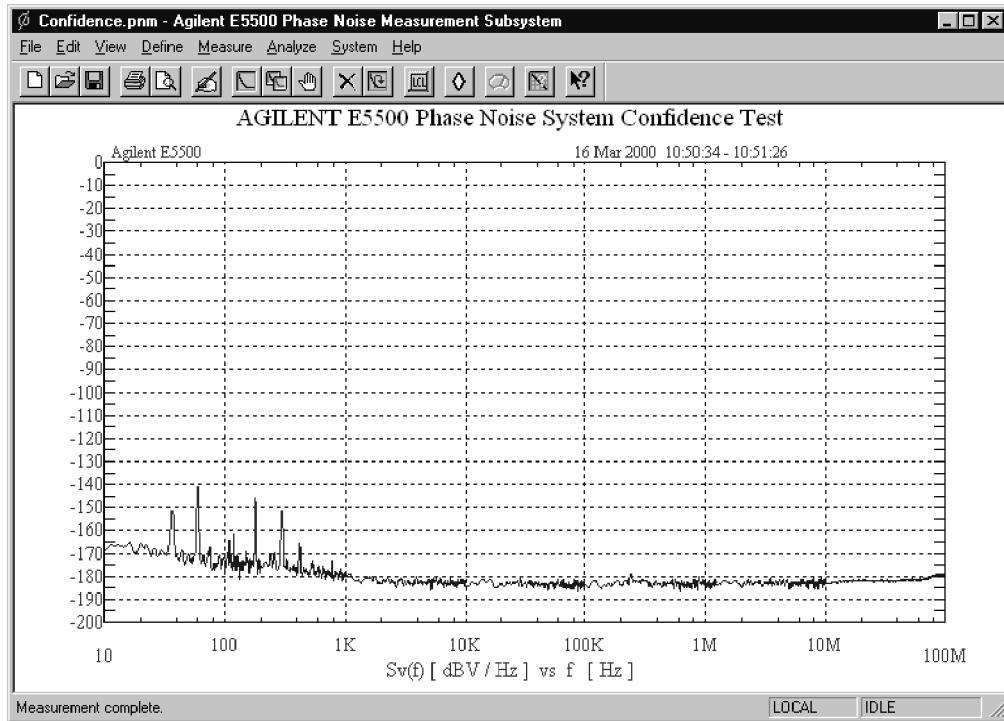


Figure 1-2 Typical Phase Noise Curve for a System Confidence Test.

Congratulations

You have completed a phase noise measurement. You will find that this measurement of the Agilent/HP 70420A Phase Noise Test Set's low-noise amplifier circuitry provides a convenient way to verify that the System hardware and software are properly configured for making noise measurements.

Table 1-5 Parameter Data for the Agilent/HP 70420A Confidence Test Example

Step	Parameters	Data
1	Type and Range Tab	
	Measurement Type	• Baseband Noise (using a test set)
	• Start Frequency	• 10 Hz
	• Stop Frequency	• 100E + 6 Hz (determined by analyzer used)
	• Minimum Number of Averages	• 4
	FFT Quality	• Fast
2	Cal Tab	
	• Gain preceding noise input	• 0 dB
3	Block Diagram Tab	
	• Noise Source	• Test Set Noise Input
4	Test Set Tab	
	Input Attenuation	• 0 dB
	LNA Low Pass Filter	• 20 MHz (Auto checked)
	• LNA Gain	• Auto Gain (Minimum Auto Gain - 14 dB)
	• DC Block	• Not checked
	• PLL Integrator Attenuation	• 0 dBm
	• Ignore out-of-lock conditions	• Not checked
	• Pulsed Carrier	• Not checked
5	Graph Tab	
	• Title	• Agilent Technologies E5500 Phase Noise System Confidence Test
	• Graph Type	• Baseband Noise (dBV/Hz)
	• X Scale Minimum	• 10 Hz
	• X Scale Maximum	• 100 E + 6 Hz
	• Y Scale Minimum	• 0 dBc/Hz
	• Y Scale Maximum	• - 200 dBc/Hz
	• Normalize trace data to a	• 1 Hz bandwidth
	• Scale trace data to a new carrier frequency of	• 1 times the current carrier frequency
	• Shift trace data by	• 0 dB
	• Trace Smoothing Amount	• 0
	• Power present at input of DUT	• 0 dBm

A

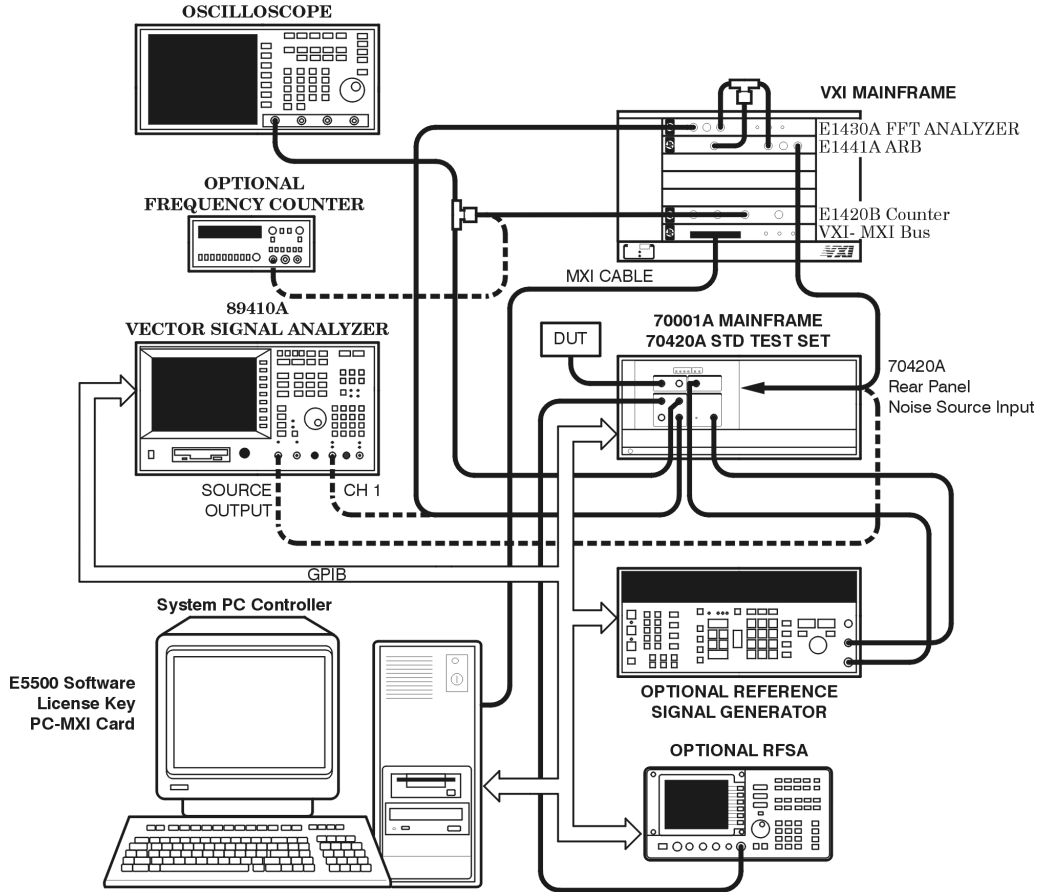
Connect Diagrams

Connect Diagrams You'll Find in This Chapter

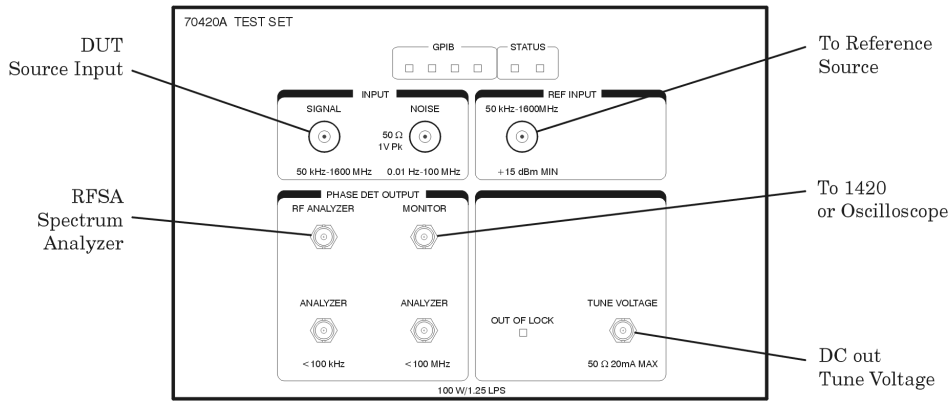
- [E5501A Standard Connect Diagram](#), page A-2
- [E5501A Opt. 001 Connect Diagram](#), page A-3
- [E5501A Opt. 201, 430, 440 Connect Diagram](#), page A-4
- [E5501A Opt. 201 Connect Diagram](#), page A-5
- [E5502A Standard Connect Diagram](#), page A-6
- [E5502A Opt. 001 Connect Diagram](#), page A-7
- [E5502A Opt. 201 Connect Diagram](#), page A-8
- [E5503A Standard Connect Diagram](#), page A-9
- [E5503A Opt. 001 Connect Diagram](#), page A-10
- [E5503A Opt. 201 Connect Diagram](#), page A-11
- [E5504A Standard Connect Diagram](#), page A-12
- [E5504A Opt. 001 Connect Diagram](#), page A-13
- [E5504A Opt. 201 Connect Diagram](#), page A-14

E5501A Standard Connect Diagram

E5501A Standard Phase Noise System



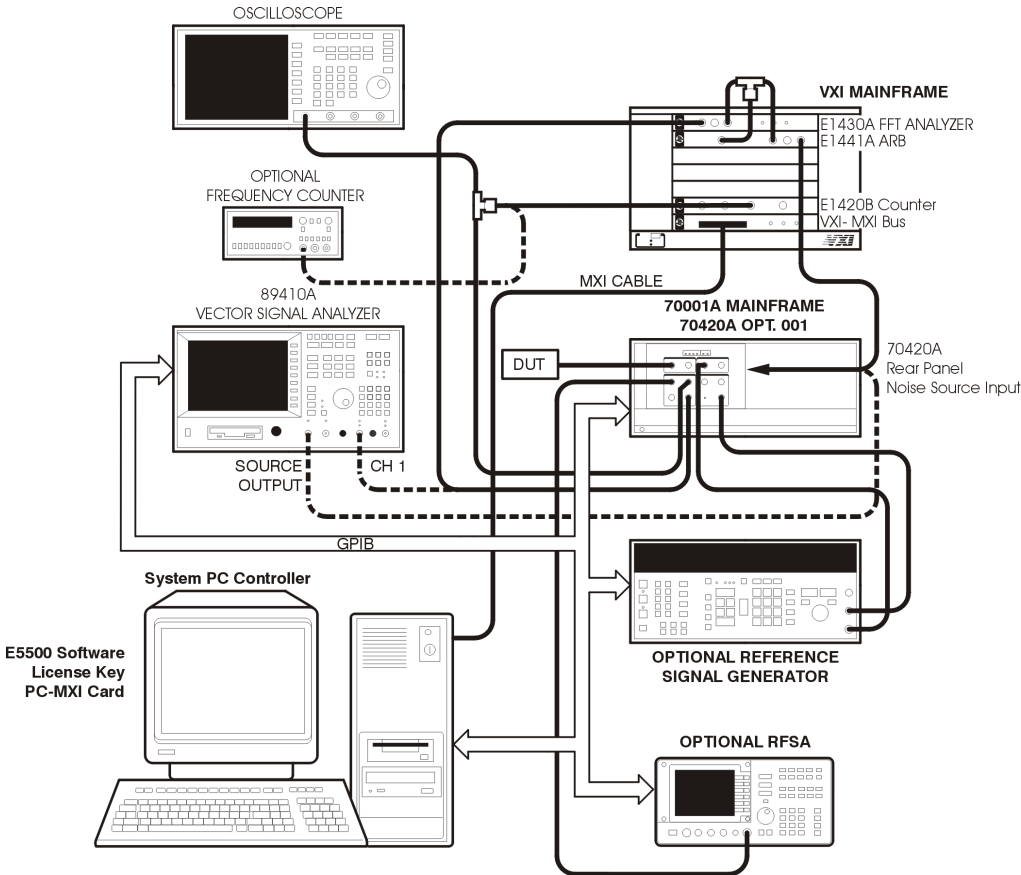
70420A Standard Test Set



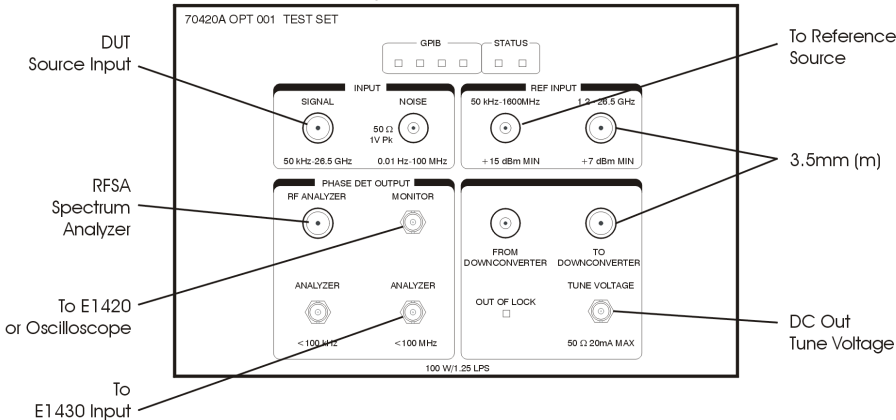
e5500/90001/art/5501 astd.pcx

E5501A Opt. 001 Connect Diagram

E5501A Opt 001 Phase Noise System

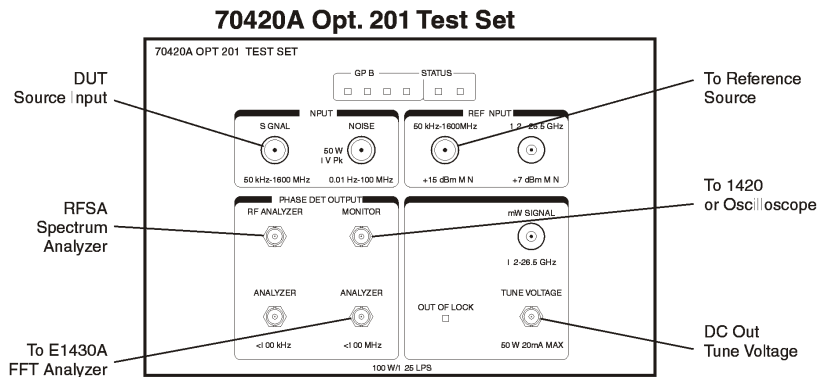
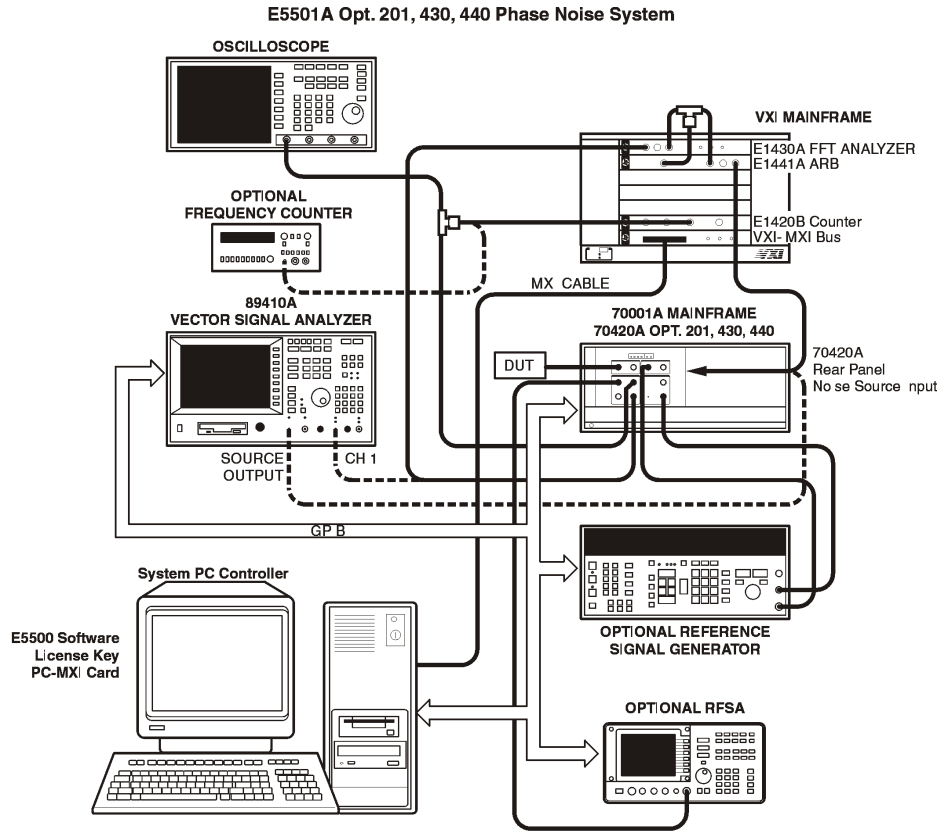


70420A Opt. 001 Test Set



e5500/90001/art/5501a001.pcx

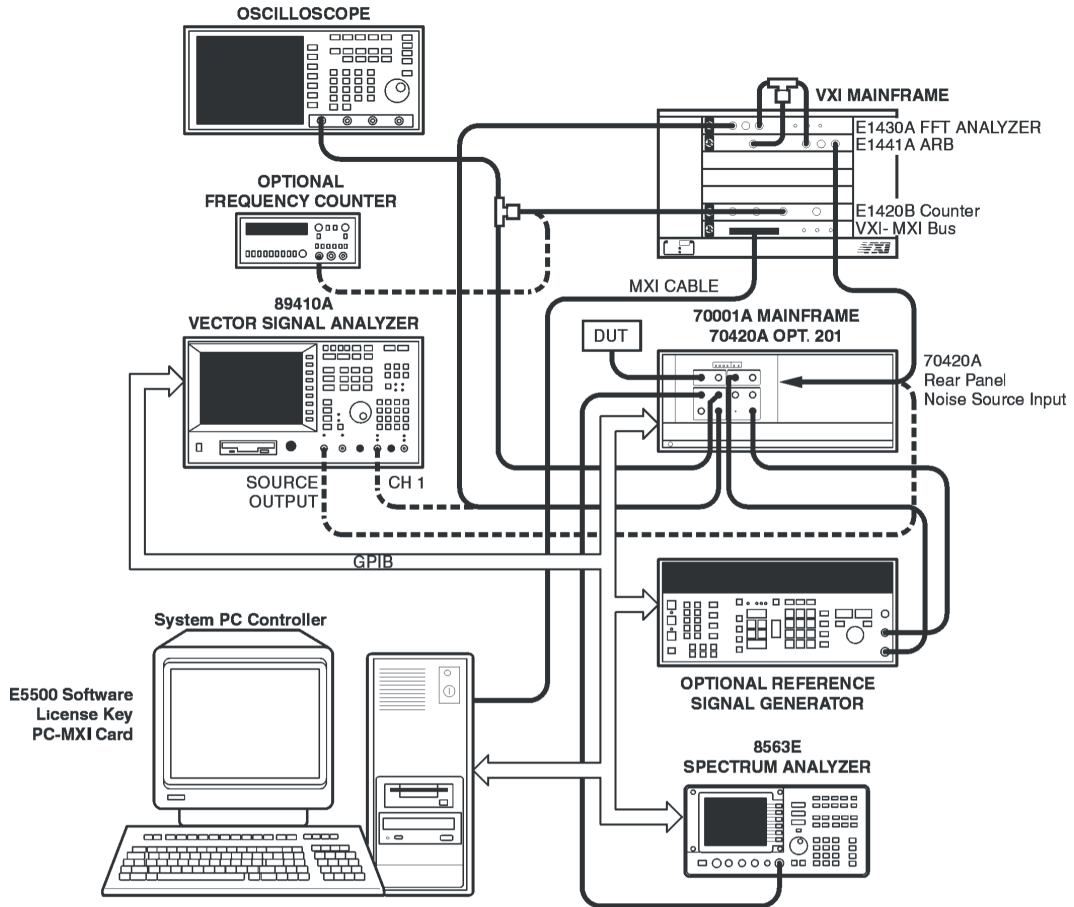
E5501A Opt. 201, 430, 440 Connect Diagram



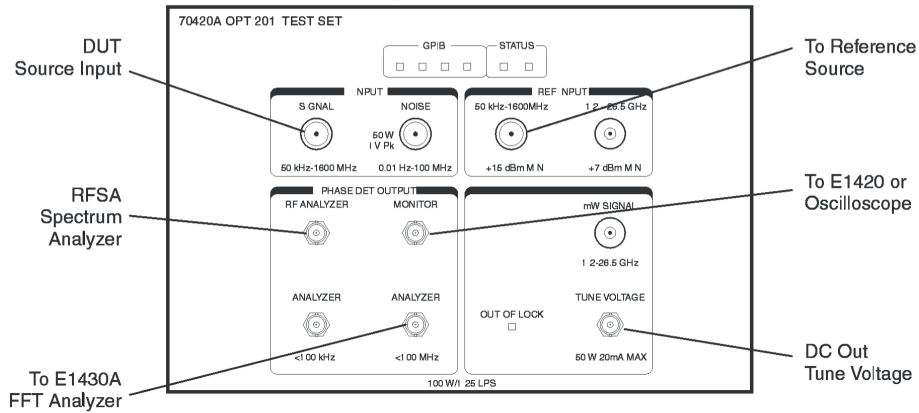
e5500/90001/ar/5501a201430440.pcx

E5501A Opt. 201 Connect Diagram

E5501A Opt. 201 Phase Noise System

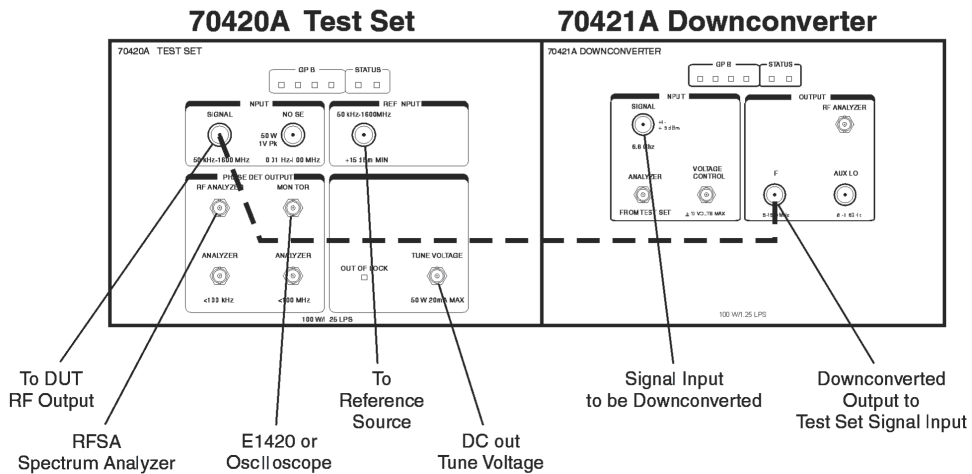
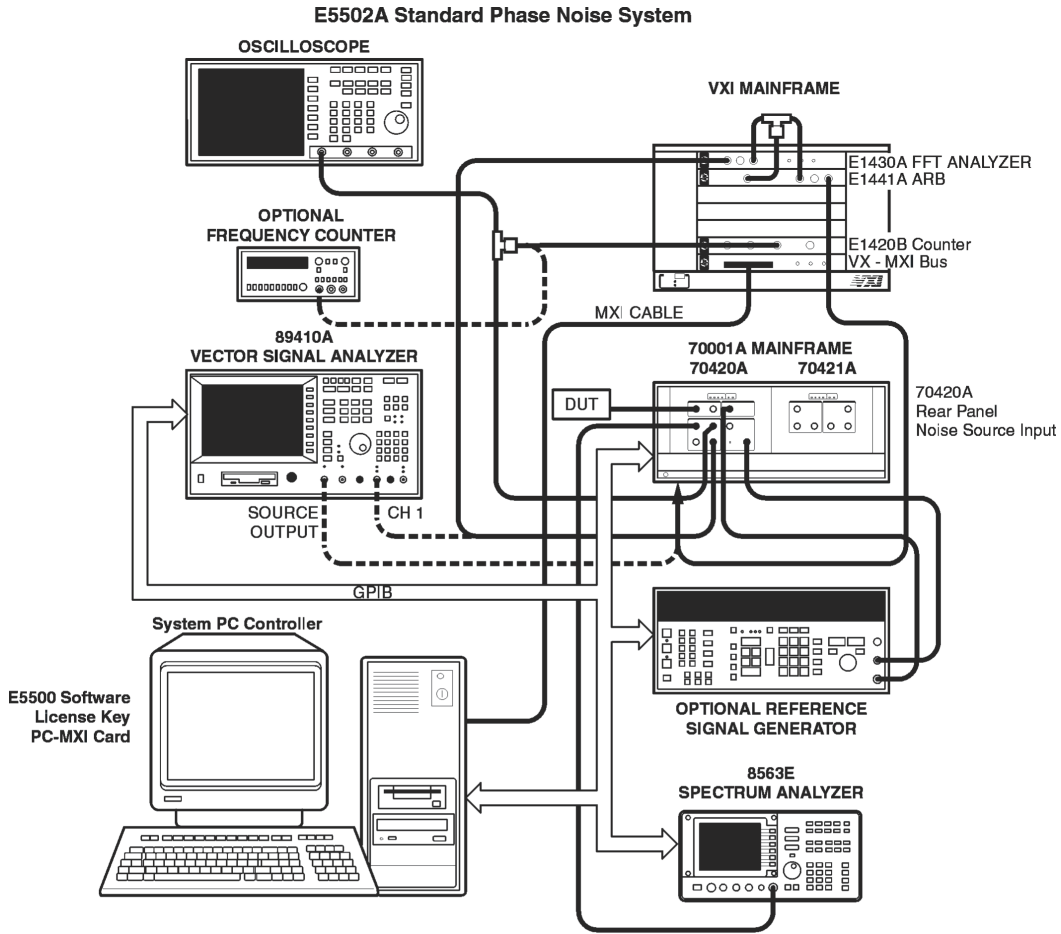


70420A Opt. 201 Test Set



e5500/90001/art/5501a201.pcx

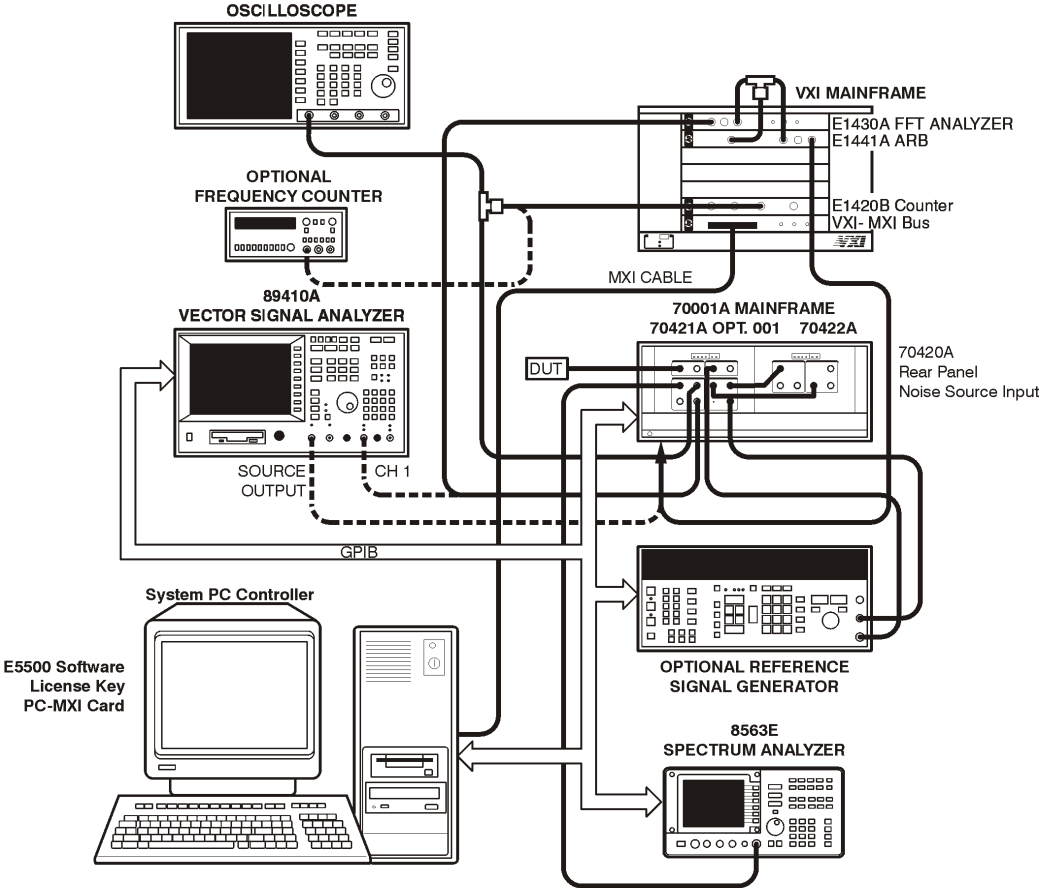
E5502A Standard Connect Diagram



e5500/90001/art/5502astd.pcx

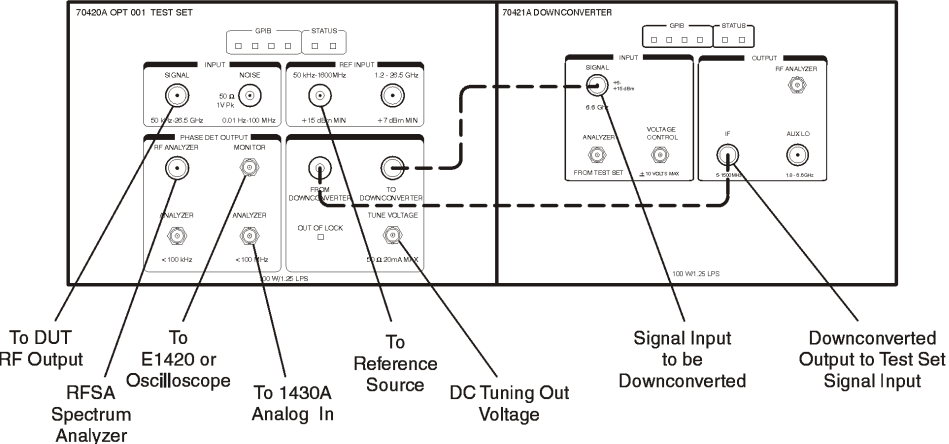
E5502A Opt. 001 Connect Diagram

E5502A Opt. 001 Phase Noise System



70420A Opt. 001 Test Set

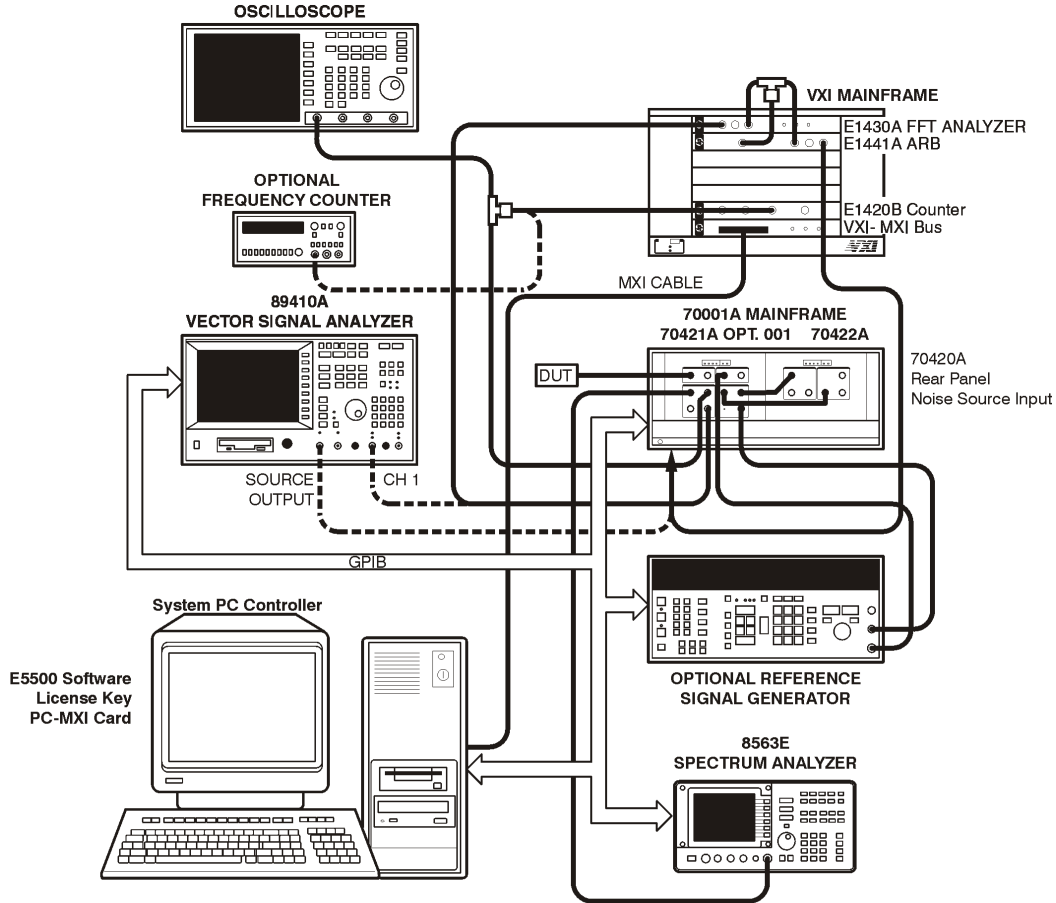
70421A Downconverter



e5500/90001/art/5502a001.pcx

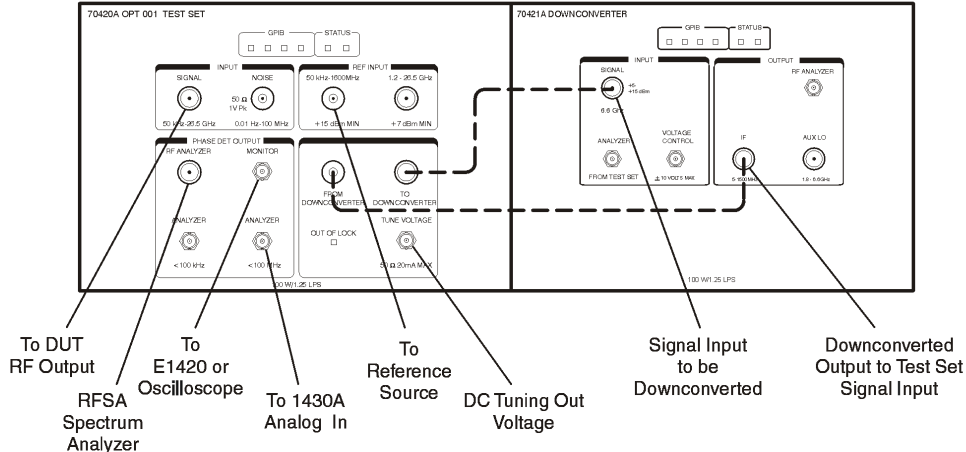
E5502A Opt. 201 Connect Diagram

E5502A Opt. 001 Phase Noise System



70420A Opt. 001 Test Set

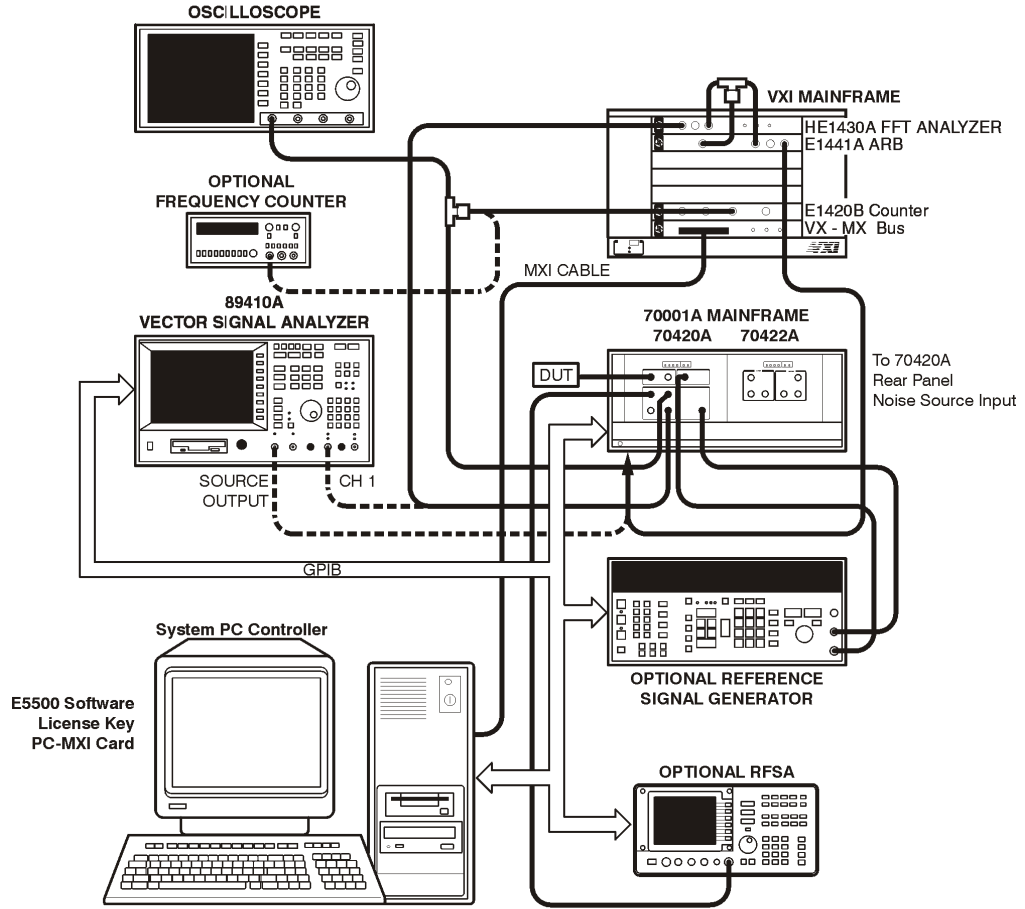
70421A Downconverter



e5500/90001/art/5502a001.pcx

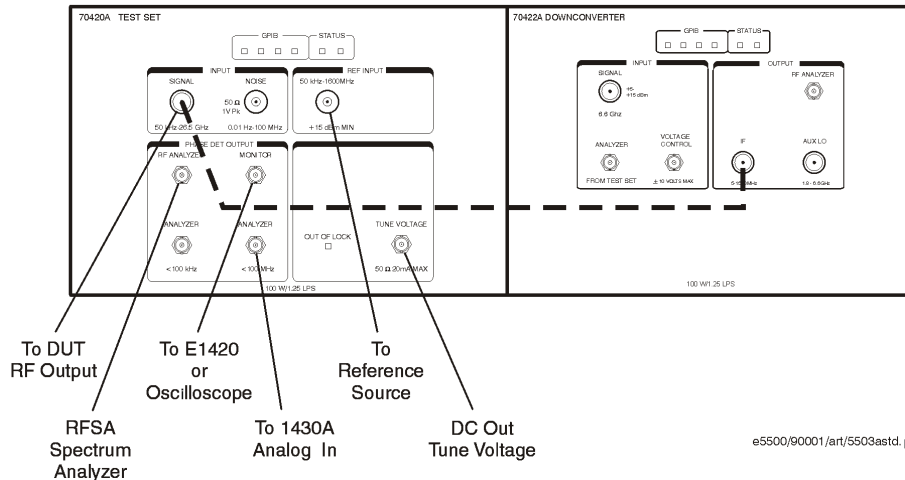
E5503A Standard Connect Diagram

E5503A Standard Phase Noise System



70420A Test Set

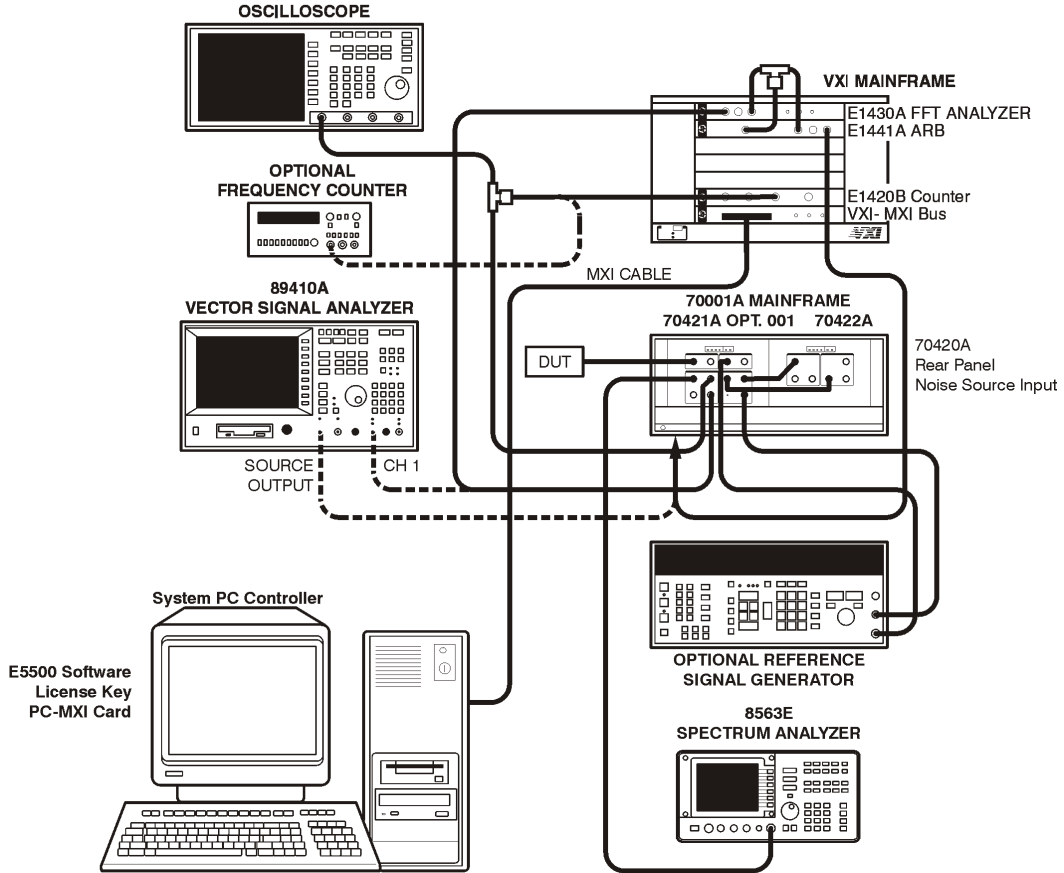
70422A Downconverter



e5500/90001/ar/5503astd.pcx

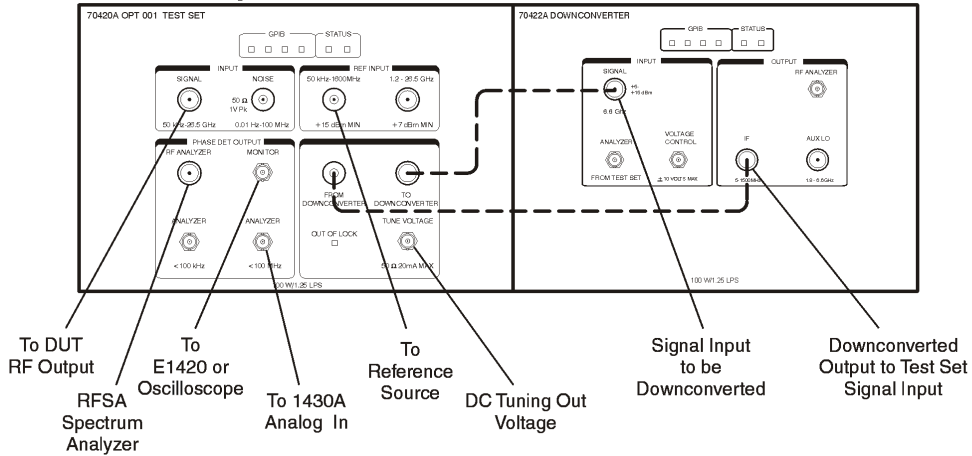
E5503A Opt. 001 Connect Diagram

E5503A Opt. 001 Phase Noise System



70420A Opt. 001 Test Set

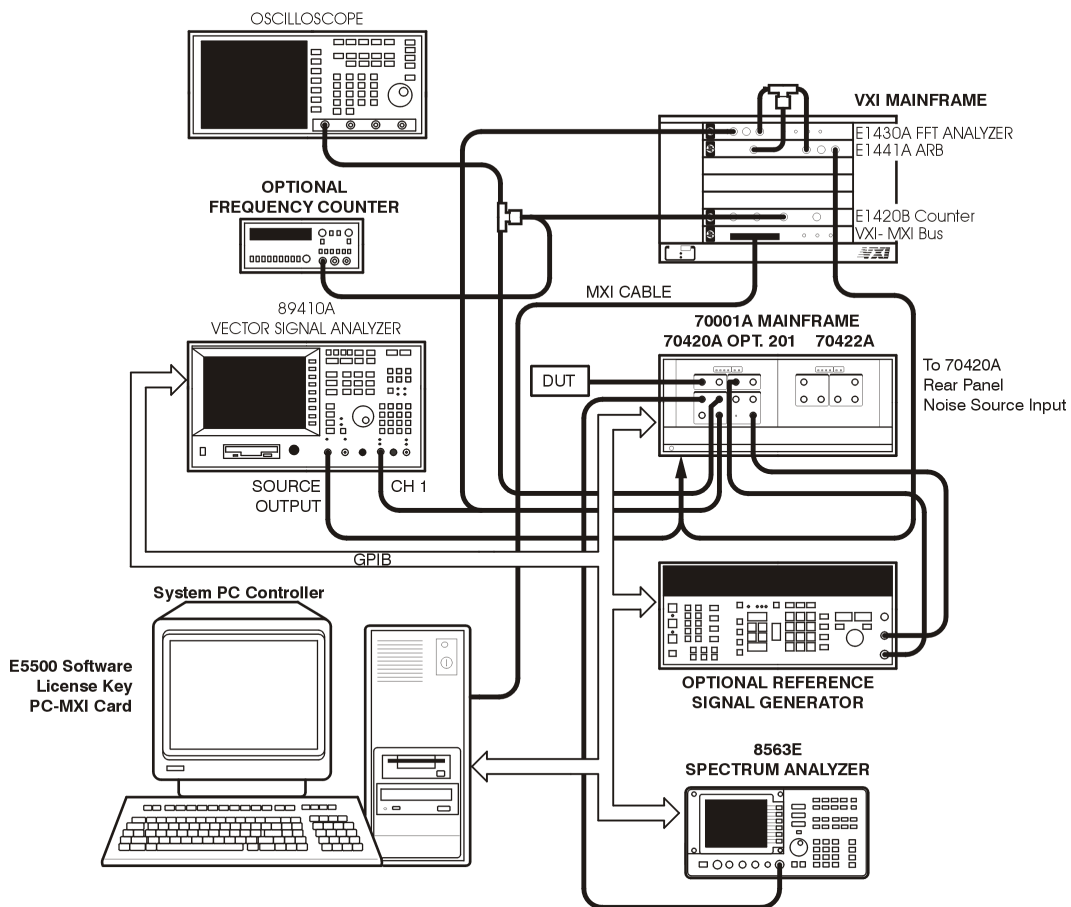
70422A Downconverter



e5500/90001/art/5503a001.pcx

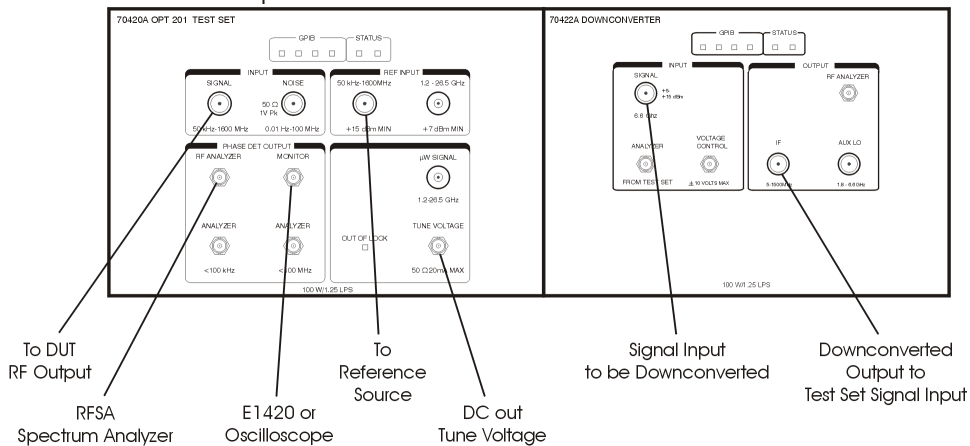
E5503A Opt. 201 Connect Diagram

E5503A Opt. 201 Phase Noise System



70420A Opt.201 Test Set

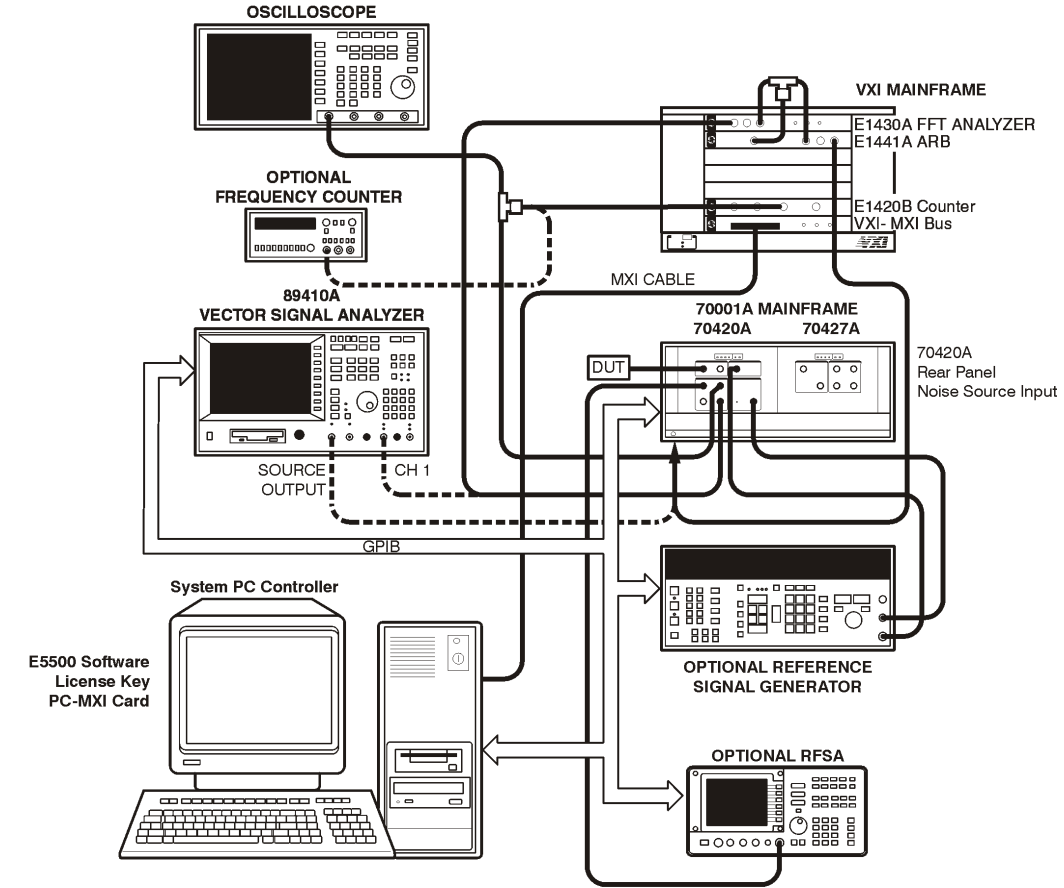
70422A Downconverter



e5500/90001/art/5503a201.pcx

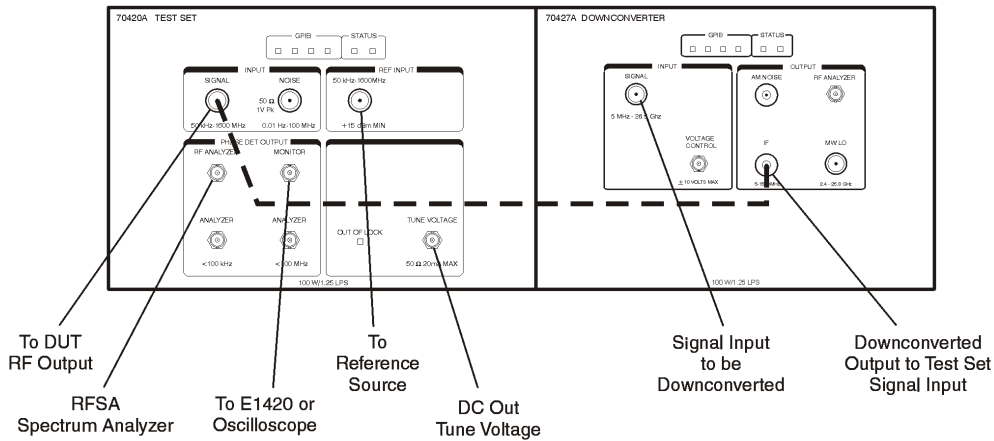
E5504A Standard Connect Diagram

E5504A Standard Phase Noise System



70420A Test Set

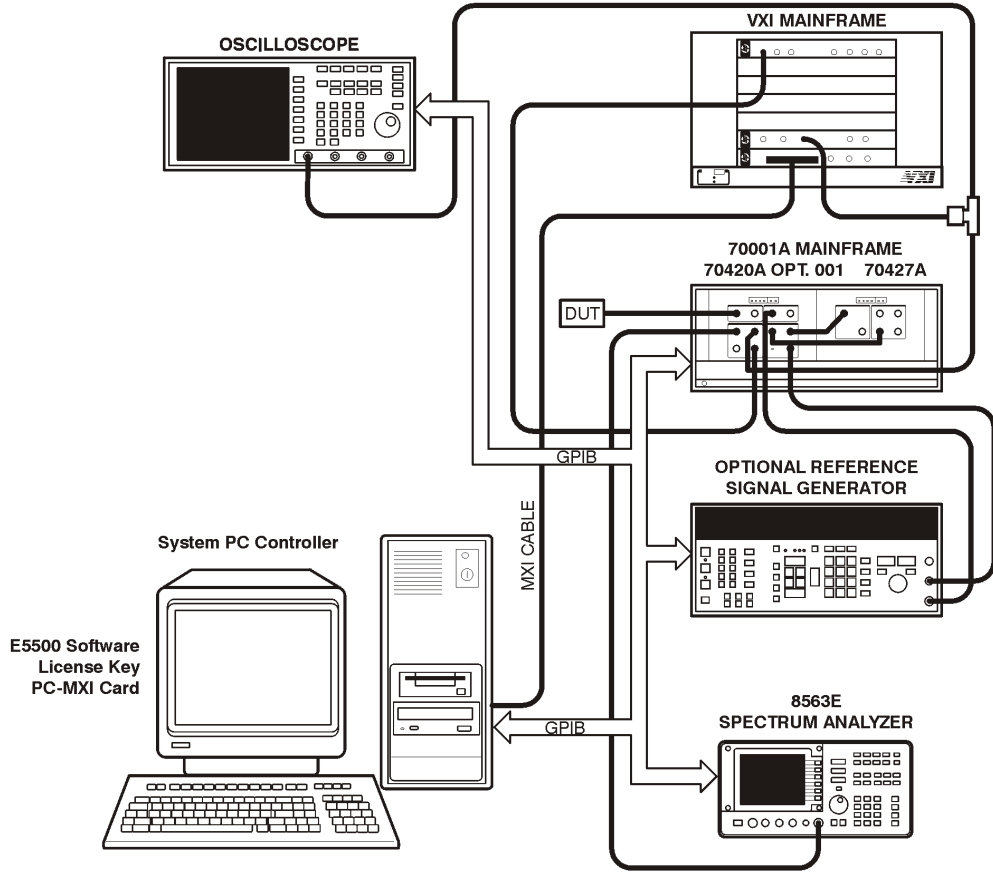
70427A Downconverter



e5500/90001/art/5504astd.pcx

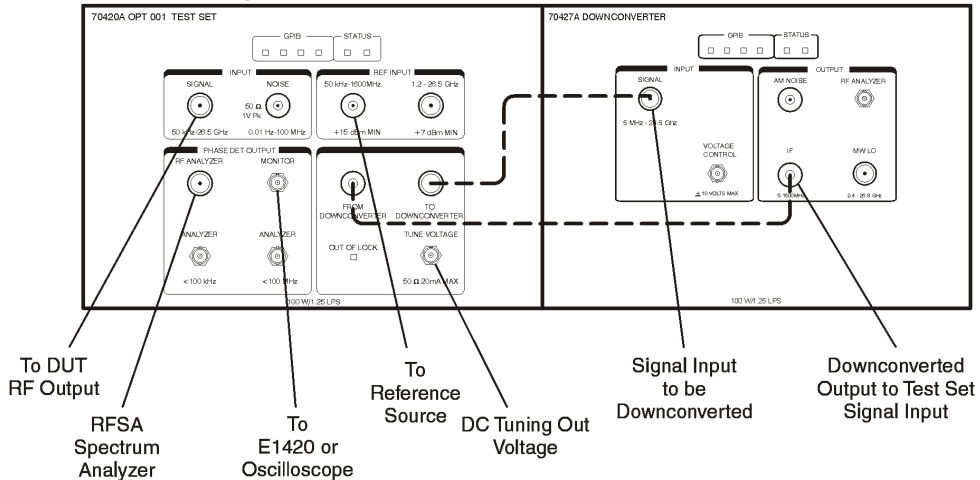
E5504A Opt. 001 Connect Diagram

E5504A Opt. 001 Phase Noise System



70420A Opt.001 Test Set

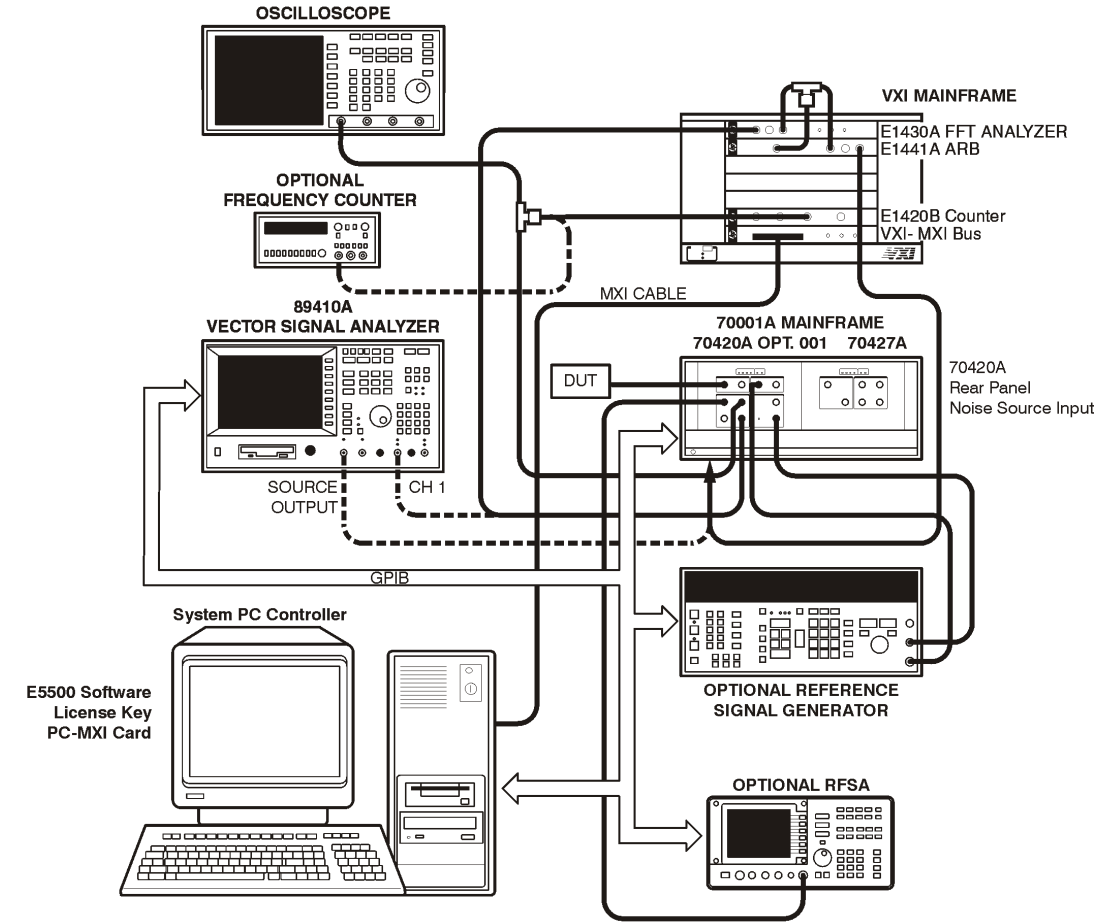
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e5500/90001/art/5504a001.pcx

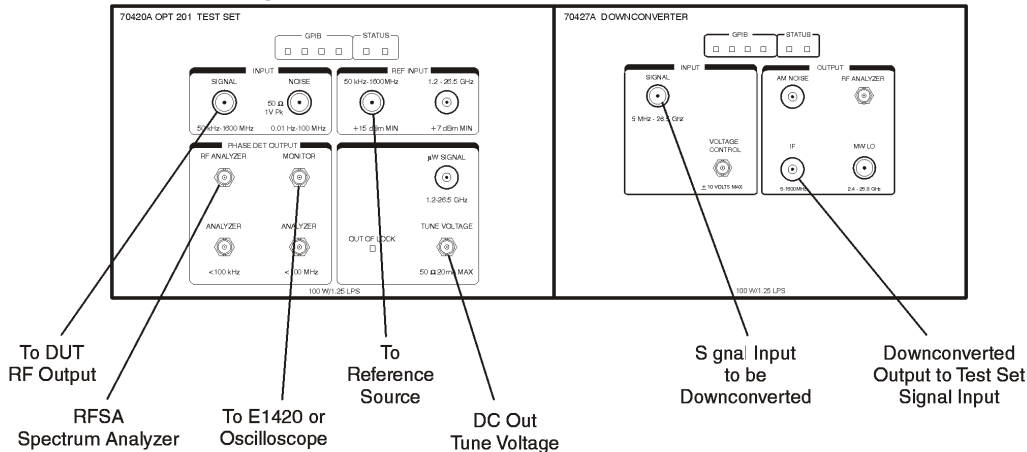
E5504A Opt. 201 Connect Diagram

E5504A Opt. 201 Phase Noise System



70420A Opt. 201 Test Set

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e5500/90001/art/5504a201.pcx

Index

Index

A

accessing your computer's ISA slots, 1-8
Asset Manager
 Configuring your System, 1-21

C

computer cover
 replacing, 1-12
configuring your system
 asset manager, 1-21
connections
 using server hardware, 1-36
cover
 removing computer's, 1-7

E

entering the license key, 1-32
ESD precautions, 1-9

H

hardware
 installing, 1-6

I

I/O libraries
 installing, 1-14
installation steps, 1-3
installing the Agilent/HP I/O library upgrade, 1-15
installing the hardware, 1-6
installing the I/O libraries, 1-14
installing the interface cards, 1-10
installing the measurement software, 1-20
installing the VXI-Digitizer software, 1-17
installing the Windows NT 4.0 Service Pack, 1-19
interface cards
 installing, 1-10
ISA slots
 accessing, 1-8

L

license key
 entering, 1-32

M

measurement software
 installing, 1-20
 starting, 1-35

P

precautions
 ESD, 1-9

R

removing your computer's cover, 1-7
replacing the computer cover, 1-12
requirements
 system, 1-4

S

starting the measurement software, 1-35
steps
 installation, 1-3
system
 confidence test, 1-38
 unpacking, 1-5
system confidence test, 1-38
system requirements, 1-4

U

unpacking your system, 1-5
upgrade
 Agilent/HP I/O library, 1-15
using server hardware connections, 1-36
using this guide, 1-20

V

VXI-Digitizer software
 installing, 1-17

W

Windows NT 4.0 Service Pack
installing, 1-19