

Agilent Technologies
Innovating the HP Way

Agilent 8511A/B and Antenna Measurement System Performance Verification Software

Installation and
Getting Started Guide

Manual part number: 5962-0493
Printed in USA
December 1999

Revision 1.1

Notice

The information contained in this document is subject to change without notice.

Agilent Technologies makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Agilent Technologies assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Agilent Technologies.

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without prior written consent of Agilent Technologies.

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013 for DOD agencies, and subparagraphs (c)(1) and (c)(2) of the Commercial Computer Software Restricted Rights clause at FAR 52.227-19 for other agencies.

Agilent Technologies, Inc.
1400 Fountaingrove Parkway
Santa Rosa, CA 95403-1799, U.S.A.

© Copyright Agilent Technologies, Inc. 1999

In This Manual...

- Performance Verification Package Contents
- Software and Hardware Requirements
- Using the Help Systems
- Installing the Performance Verification Software
- Getting Started
- Setup
- Performing Tests
- Selecting Individual Tests
- Equipment Substitution

Limited Warranty

Software

Hewlett-Packard warrants that the software will perform substantially in accordance with the written materials for a period of one (1) year from the date of receipt.

Hewlett-Packard does not warrant that the operation of the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, the customer's remedy shall be to return the media to Hewlett-Packard for replacement. Should Hewlett-Packard be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of all copies of the software.

Media

Hewlett-Packard warrants the media upon which this product is recorded to be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of purchase. In the event any media prove to be defective during the warranty period, Customer's remedy shall be to return the media to Hewlett-Packard for replacement. Should Hewlett-Packard be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

Notice of Warranty Claims

Customer shall notify Hewlett-Packard in writing of any warranty claim not later than thirty (30) days after the expiration of the warranty period.

Limitation of Warranty

Hewlett-Packard makes no other express warranty, whether written or oral, with respect to this product.

Any implied warranty of merchantability or fitness is limited to one (1) year duration of this written warranty.

This warranty gives specific legal rights, and Customer may also have rights which vary which vary from state to state, or province to province.

Exclusive Remedies

The remedies provided above are Customer's sole and exclusive remedies. In no event shall Hewlett-Packard be liable for any direct, indirect, special, incidental, or consequential damages (including lost profit) whether based on warranty, contract, tort, or any other legal theory.

Assistance

For assistance, call your local Hewlett-Packard Sales and Service Office (refer to "Service and Support" on page v).

Service and Support

Contact your local HP Service Center for any required product support that is not contained in this manual. You can find a list of HP Service Centers on the web at <http://www.agilent.com>

If you do not have access to the Internet, one of these HP centers can direct you to your nearest HP representative:

United States:	Hewlett-Packard Company Test and Measurement Call Center PO Box 4026 Englewood, CO 80155-4026 (800) 452 4844 (toll-free in US)
Canada:	Hewlett-Packard Canada Ltd. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 (905) 206 4725
Europe:	Hewlett-Packard European Marketing Centre Postbox 999 1180 AZ Amstelveen The Netherlands (31 20) 547 9900
Japan:	Yokogawa-Hewlett-Packard Ltd. Measurement Assistance Center 9-1, Takakura-Cho, Hachioji-Shi Tokyo 192, Japan (81) 426 56 7832 (81) 426 56 7840 (FAX)
Latin America:	Hewlett-Packard Latin American Region Headquarters 5200 Blue Lagoon Drive, 9th Floor Miami, Florida 33126, U.S.A. (305) 267 4245 (305) 267 4288 (FAX)
Australia/New Zealand:	Hewlett-Packard Australia Ltd. 31-41 Joseph Street Blackburn, Victoria 3130 Australia 1 800 629 485 (toll-free)
Asia-Pacific:	Hewlett-Packard Asia Pacific Ltd. 17-21/F Shell Tower, Times Square 1 Matheson Street, Causeway Bay Hong Kong (852) 2599 7777 (852) 2506 9285 (FAX)

Contents

Performance Verification Software Overview	1
Products Tested by the Software	1
Agilent 85301B Antenna Measurement System	1
Agilent 85301C Antenna Measurement System	1
Performance Verification Package Contents	2
Software and Hardware Requirements	3
Computer Requirements	3
Connector Torque Information	3
Using the Help Systems	9
Test Help	9
Test Interface Help	9
Installing the Performance Verification Software	10
Before Installing the Software	10
Installing the Software	10
Getting Started	17
Testing Overview	17
Run Tab	18
Manual Test Selection Tab	18
Equipment Selection Tab	18
Test Reports Tab	19
Administration Tab	19
Setup	20
Add and Define Your Test Equipment	20
Adding More Test Stations	23
Define GPIB and Calibration Information for Each Device	23
Entering Power Sensor Calibration Data	24
Performing Tests	25
Selecting Individual Tests	39
Running Individual Tests	39
Equipment Substitution	41
Viewing Current Test Equipment and Making Temporary Changes	41

Performance Verification Software Overview

The performance verification software is used to verify the performance of millimeter and microwave downconverters. These downconverters are used in the Agilent/HP 8511A/B and the Agilent/HP 85301B Systems with Agilent/HP 85320A/B or Agilent/HP 85325A/B Mixers (Agilent/HP 11970 Series Mixers).

Products Tested by the Software

Agilent/HP 8510B/C Network Analyzer System

The Agilent/HP 8510B/C Network Measurement System is configured from the following equipment:

- Agilent/HP 8510B/C Network Analyzer
- Agilent/HP 8360-Series Synthesized Sweeper or HP 8340/41 (two required)
- Agilent/HP 8511A or Agilent/HP 8511B Frequency Converter

Agilent/HP 85325A R, Q, U, V, W Millimeter-wave Subsystem

The Agilent/HP 85325A Millimeter-wave Subsystem is configured from the following equipment:

- Agilent/HP 8510B/C Network Analyzer
- Agilent/HP 8360-Series Synthesized Sweeper or HP 8340/41 (two required)
- Agilent/HP 85309A LO/IF Unit
- Agilent/HP 8349A Microwave Amplifier
- Agilent/HP 8355xA Millimeter-wave Source Module

Agilent/HP 85301B Antenna Measurement System

The Agilent 85301B Antenna Measurement System is configured from the following equipment:

- HP 8530A Microwave Receiver or an Agilent/HP 8510B/C Network Analyzer with Antenna Measurement Firmware.
- Agilent/HP 8360-Series Synthesized Sweeper or HP 8340/41 (two required)
- Agilent/HP 85309A LO/IF Distribution Unit
- Agilent/HP 85320A/B Reference and Test Mixers

Agilent /HP 85301C Antenna Measurement System

The Agilent/HP 85301C Antenna Measurement System is configured from the following equipment:

- Agilent/HP 8530A Microwave Receiver or an Agilent/HP 8510B/C Network Analyzer with Antenna Measurement Firmware.
- Agilent/HP 8360-Series Synthesized Sweeper or HP 8340/41.
- Agilent/HP 8511A Frequency Converter or Agilent/HP 8511B Frequency Converter (Agilent/HP 85301C Option 001).

Performance Verification Package Contents

The Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Software package consists of the items listed in Table 1.

Table 1 *Package Contents*

Item Name	Part Number	Description
Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Software Assembly	08511-60024	Includes the Installation and Getting Started Guide, the CD-ROM, and the Software License.
Installation and Getting Started Guide	5962-0493	Contains instructions on how to install the software, start the software, and run a test.
CD-ROM		Contains the performance verification software, a web-based help file, and Carbon Copy 32 [®] 1. The documentaion.htm help file contains the installation and getting started information, as well as information specific to each performance verification test. This help file is intended to be viewed using a browser independent of the performance verification software. Carbon Copy 32 [®] enables communication with the computer system for purposes of remote service support.

1. Carbon Copy is a registered trademark of Compaq Corporation.

Software and Hardware Requirements

Computer Requirements

The computer requirements to successfully install and operate the software are as follows:

- IBM-PC compatible computer
- Intel Pentium 133 MHz or better
- Minimum of 32 Mb RAM
- Minimum of 65 Mb available space on hard drive
- SVGA display with minimum 800x600 screen resolution or better
- Windows 95[®], Windows 98[®] or Windows NT[®] 4.0
- GPIB interface card and cable:
 - Hewlett-Packard 82341C/D with Agilent I/O library rev F.01.00 or better
 - National Instruments AT-GPIB/TNT, PCMCIA-GPIB, PCI-GPIB
- CD-ROM reader
- Internet Explorer[®] 4.0 or higher or Netscape[®] 4.0 or higher
- HP BASIC for Windows, version 6.32 or higher

Connector Torque Information

Table 2 Proper Connector Care

Connector	Torque cm-kg	Torque N-cm	Torque in-lbs	Wrench Part Number
Type-N	52	508	45	8710-1935
3.5 mm	9.2	90	8	8720-1765
SMA	5.7	56	5	8710-1582
2.4	9.2	90	8	8720-1765

Required Test Equipment

The following tables list the required equipment and tools needed to perform Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Tests.

Table 3 *Equipment, Accessories and Tools for Agilent/HP 8511A or Agilent/HP 85301C Standard*

Description	Quantity	Recommended Equipment
Source	1	HP 8340 series or Agilent/HP 8360 series ^{1,2}
Network analyzer	1	Agilent/HP 8510B/C or Agilent/HP 8530A microwave receiver ²
Power meter	1	Agilent/HP 436 Option 022, Agilent/HP 437, Agilent/HP 438, Agilent/HP E4418, or Agilent/HP E4419
Power sensor	1	Agilent/HP 8485A - 2 GHz to 26.5 GHz (APC 3.5) ³
Power splitter ⁴	1	Agilent/HP 11667B - dc to 26.5 GHz (APC 3.5) ³
Female to female adapter	1	1250-1749 - dc to 26.5 GHz (APC 3.5) ³
Male to male adapter	1	1250-1748 - dc to 26.5 GHz (APC 3.5) ³
50 ohm load (male connector)	2	Agilent/HP 909D #040 - dc to 26.5 GHz (APC 3.5) ³
50 ohm load (female connector)	1	Agilent/HP 909D #011 - dc to 26.5 GHz (APC 3.5) ³
Torque wrench, 8 in-lb, 5/16 in ⁵	1	8710-1765
RF cable, 1 m, RF source to splitter (26.5 or 50 GHz as needed)	1	Use good quality flex or semirigid cable
Attenuator, 6 dB	2	Agilent/HP 8493C #006 - dc to 26.5 GHz (APC 3.5) ³
Attenuator, 10 dB	1	Agilent/HP 8493C #010 - dc to 26.5 GHz (APC 3.5) ³
RF Cable 1 M	1	APC 3.5 ³
RF Cable 10 in	2	APC 3.5 ³

1. The frequency range of the source should exceed the frequency range of the mixers.
2. Part of the Agilent/HP 85301C antenna system.
3. If the Agilent/HP 8511A stop frequency is greater than 26.5 GHz, use the Agilent/HP 8511B equipment list.
4. One output of the splitter must be labeled with a "T" and one output labeled with a "P" (see Figure 18 on page -27).
5. See Table 2 on page 4 for torque wrench information.

Table 4 Equipment, Accessories, and Tools for Agilent/HP 8511B or Agilent/HP 85301C Opt. 001

Description	Quantity	Recommended Equipment
Source	1	HP 8340 series or Agilent/HP 8360 series ^{1,2}
Network analyzer	1	Agilent/HP 8510B/C or HP 8530A microwave receiver ²
Power meter	1	Agilent/HP 436 Option 022, Agilent/HP 437, Agilent/HP438, Agilent/HPE4418, or Agilent/HPE4419
Power sensor	1	Agilent/HP 8487A - 2 GHz to 50 GHz (APC 2.4)
Power splitter ³	1	Agilent/HP 11667C - dc to 50 GHz (APC 2.4) ⁴
Female to female adapter	1	Agilent/HPP 11900B - dc to 50 GHz (APC 2.4)
Male to male adapter	1	Agilent/HP 11900A - dc to 50 GHz (APC 2.4)
50 ohm load (male connector)	2	Agilent/HP 85138A - dc to 50 GHz (APC 2.4) ⁴
50 ohm load (female connector)	1	Agilent/HP 85138B - dc to 50 GHz (APC 2.4) ⁴
Torque wrench, 8 in-lb, 5/16 in ⁵	1	8710-1765
RF cable, 1 m, RF source to splitter (26.5 or 50 GHz as needed)	1	Use good quality flex or semirigid cable
Attenuator, 6 dB	1	Agilent/HP 8490D #006 - dc to 50 GHz (APC 2.4) ⁴
Attenuator, 10 dB	1	Agilent/HPHP 8490D #010 - dc to 50 GHz (APC 2.4) ⁴
RF Cable 1 M	1	APC 2.4, P/N 08511-20031 ⁴
RF Cable 10 in	2	APC 2.4, P/N 5063-9809

1. The frequency range of the source should exceed the frequency range of the mixers.
2. Part of the Agilent/HP 85301C antenna system.
3. One output of the splitter must be labeled with a "T" and one output labeled with a "P" (see Figure 18 on page -27).
4. Part of the Agilent/HP 8511B verification kit (08511-60016).
5. See Table 2 on page 4 for torque wrench information.

Table 5 *Agilent/HP 8511B Verification Kit Contents (Part Number 08511-60016)*

Description	Quantity	Part Number
Cable, RF test	2	08511-20025
Cable, RF source	1	08511-20031
Power splitter	1	Agilent/HP 11667C - dc to 50 GHz (APC 2.4)
50 ohm load (male connector)	1	Agilent/HP 85138A - dc to 50 GHz (APC 2.4)
50 ohm load (female connector)	1	Agilent/HP 85138B - dc to 50 GHz (APC 2.4)
Attenuator, 6 dB	2	Agilent/HP 8490D #006 - dc to 50 GHz (APC 2.4)
Attenuator, 10 dB	1	Agilent/HP 8490D #010 - dc to 50 GHz (APC 2.4)

Table 6 Equipment, Accessories and Tools for the Agilent/HP 85301B

Description	Quantity	Recommended Equipment
Source	2	HP 8340 series or Agilent/HP 8360 series ¹
Network analyzer	1	Agilent/HP 8530A microwave receiver
Power meter	1	Agilent/HP 436 Option 022, Agilent/HP 437, Agilent/HP 438, Agilent/HP 4418, or Agilent/HP E4419
Power sensor	1	Agilent/HP 8482A - 0.1 GHz to 4.2 GHz (Type N) Agilent/HP 8481A - 0.1 GHz to 18 GHz (Type N) Agilent/HP 8485A - 0.05 GHz to 26.5 GHz (APC 3.5) Agilent/HP 8487A - 0.05 GHz to 50 GHz (APC 2.4)
Power splitter ²	1	Agilent/HP 11667A - dc to 4 GHz (Type N) Agilent/HP 11667B - dc to 26.5 GHz (APC 3.5) Agilent/HP 11667C - dc to 50 GHz (APC 2.4) ³
Female to female adapter	1	1250-0777 - dc to 4 GHz (Type N) 1250-1749 - dc to 26.5 GHz (APC 3.5) Agilent/HP 11900B - dc to 50 GHz (APC 2.4)
Male to male adapter	1	1250-0778 - dc to 4 GHz (Type N) 1250-1748 - dc to 26.5 GHz (APC 3.5) Agilent/HP 11900A - dc to 50 GHz (APC 2.4)
50 ohm load (male connector)	2	Agilent/HP 909A #012 - dc to 4 GHz (Type N) Agilent/HP 909D #040 - dc to 26.5 GHz (APC 3.5) Agilent/HP 85138A - dc to 50 GHz (APC 2.4) ³
50 ohm load (female connector)	1	Agilent/HP 909A #013 - dc to 4 GHz (Type N) Agilent/HP 909D #011 - dc to 26.5 GHz (APC 3.5) Agilent/HP 85138B - dc to 50 GHz (APC 2.4) ³
RF cable, 1 m, RF source to splitter (26.5 or 50 GHz as needed)	1	Use good quality flex or semirigid cable
Attenuator, 6 dB	1	Agilent/HP 8491A/B #006 - dc to 4 GHz (Type N) Agilent/HP 8493C #006 - dc to 26.5 GHz (APC 3.5) Agilent/HP 8490D #006 - dc to 50 GHz (APC 2.4) ³
Attenuator, 20 dB	2	Agilent/HP 8491A/B #020 - dc to 4 GHz (Type N) Agilent/HP 8493C #020 - dc to 26.5 GHz (APC 3.5) Agilent/HP 8490D #020 - dc to 50 GHz (APC 2.4)
Cable, Agilent/HP 85309A to test mixer LO/IF	1	Agilent/HP 85381A ⁴
Cable, Agilent/HP 85309A to reference mixer LO IN	1	Agilent/HP 85381A ⁴
Cable, Agilent/HP 85309A to reference mixer detector voltage	1	Agilent/HP 85382A ⁴
Cable, Agilent/HP 85309A to reference mixer IF OUT	1	Agilent/HP 85382A ⁴

1. The frequency range of the source should exceed the frequency range of the mixers.
2. One output of the splitter must be labeled with a "T" and one output labeled with a "P" (see Figure 18 on page -27).
3. Part of the Agilent/HP 8511B verification kit (08511-60016).
4. The cables from the customer's range may be used if they are within the length limits of a standard Agilent/HP 85301B system. These lengths are documented in the 1999 printing of the Agilent/HP 85301A/B/C Configuration Guide.

Non-Band Dependent Equipment

The following table shows equipment that can be used with the Agilent/HP 85301B antenna measurement system combined with any Agilent/HP 85325A millimeter-wave subsystem.

Table 7 Recommended Test Equipment, Accessories and Tools (non-banded) Agilent/HP 85325A

Item	Critical Specification	Agilent/HP Recommended Mode (or Part Number)
The following equipment is part of the antenna measurement system		
Network Analyzer	No substitute	8510B/C or 8530A
LO Source	HP 8350, HP 8340 or HP 8341	8360 series
LO/IF Unit	No substitute	85309A
RF Source	HP 8350, HP 8340 or HP 8341	8360 series
Amplifier ¹	Frequency band of test	8349A
Computer Requirements		
IBM-PC compatible computer	No substitute	
Pentium 133 or better	No substitute	
Windows 95 [®] , Windows 98 [®] , Windows NT [®] 4.0 installed		
GPIB interface card and cable (Hewlett-Packard [®] or National Instruments [®])		
HP BASIC for Windows, version 6.32 or later installed		
A CD-ROM reader		
Internet Explorer [®] 4.0 or higher, or Netscape [®] 4.0 or higher		
System performance verification software		8511A,B and Antenna Measurement System Performance Verification Software
Additional Equipment Needed		
Power Meter ²	No substitute	436A,437B,438A, E4418, E4419
Power Sensor ³	No substitute	8485A, 8481A or 8487A
Connector Adapters	Type-N and 3.5 mm	Various ³
3/32 Hex Ball Driver	No substitute	8710-1539 (supplied with 85325A)
Torque Wrench	No substitute	Refer to Table 2 on page -4 for information

1. Not all antenna test systems will use an amplifier.

2. For traceability verification the Power Meter and Power Sensor should be traceable. No other traceable instruments are required.

3. Type-N(m) to 3.5 (f), type-N (f) to 3.5 (f), 3.5 (f) to 3.5 (f).

Band Dependent Equipment

Table 8 shows equipment that is millimeter-wave band dependent. Power sensors, fixed terminations, variable attenuators, and directional couplers are only usable in one band. Therefore, if your system has more than one millimeter-wave subsystem band, you must have a power sensor, termination, variable attenuator, and directional coupler for *each subsystem*.

NOTE

U-band: Contact Agilent/HP Service and Support (listed on page “Service and Support” on page -v for U-band verification information.

Table 8 *Recommended Test Equipment, Accessories and Tools For the Agilent/HP 85301B with Agilent/HP 85325A (band dependent)*

Item	Critical Specification	Agilent/HP Recommended Model or Part Number
Power Sensor	No substitute	R-band: R8486A Q-band: Q8486A V-band: V8486A W-band: W8486A
Fixed Termination ¹	Return loss >30 dB	R-band: R910A Q-band: Q910A V-band: V910C W-band: W910C
Variable Vane Attenuator	0 to 40 dB attenuation	R-band: R382A Q-band: Q382A V-band: Millitech DRA-15 (v-band) W-band: Millitech DRA-10 (w-band)
Directional Coupler	Coupling factor 10 dB	R-band: R752C Q-band: Q752C V-band: V752C W-band: W752C

1. You must have a fixed termination for each test channel of your system

Using the Help Systems

The Agilent/HP 8511A/B and Antenna Measurement System Software Performance Verification Software includes these comprehensive on-line help systems:

- Test Help (help specific to installing, starting, and test plans)
- Test Interface Help (help specific to the user interface)

Test Help

The Test Help system is located on the CD-ROM and is installed with the software. This help system is intended to be used independent of the performance verification software. This enables the user to access the help system at any time using a web browser.

Test Help includes an overview of the test plan, system-level configuration diagram, equipment and accessories list, tools list, and a list of the performance verification tests that can be run. In addition, specific information about each test is provided, including a test description, whether the test measures a warranted specification or typical performance, test dependencies (if applicable), and an interconnect diagram showing how to connect test equipment.

Test Interface Help

The Test Interface Help system provides information on the user interface and controls, system configurations, and overall software operation.

This help system is accessed by selecting the **Help** drop-down menu.

Installing the Performance Verification Software

Before Installing the Software

HP Basic for Windows, version 6.32 or later, must be installed and operating properly prior to installation. The following are recommended steps:

1. Set up and configure all hardware and equipment, making certain all GPIB addresses are correct and all interconnections are properly made. The computer should be connected to GPIB bus (or computer bus) on the back of the network analyzer, *not* the network analyzer bus.
2. Verify HP Basic for Windows, version 6.32 or later, is functioning properly.

To verify that HP Basic for Windows is functioning properly, type and run the following command:

```
OUTPUT 716  
ENTER
```

This will address the network analyzer using the GPIB. In the lower right-hand corner of the HP Basic screen the display changes from **IDLE** to **COMMAND** and back to **IDLE** when `OUTPUT 716` is executed. If this display sequence does not occur, recheck your system configuration and perform this check again. To obtain HP Basic, version 6.32 or later, or for information on HP Basic for Windows, contact your local Agilent/HP sales and service office.

Installing the Software

The following procedure provides instructions for installing the Agilent/HP 8511A/B and Antenna System Performance Verification software.

1. Exit all applications before installing the software.
2. Insert the CD-ROM containing the Agilent/HP 8511A/B and Antenna System Performance Verification software into the CD-ROM drive.
3. Select **R**un... from the **F**ile menu.
4. Enter `D:\setup.exe` in the command line, where `D:` is the CD-ROM drive, or click **B**rowse... to select the correct path. See Figure 1 on page -13.

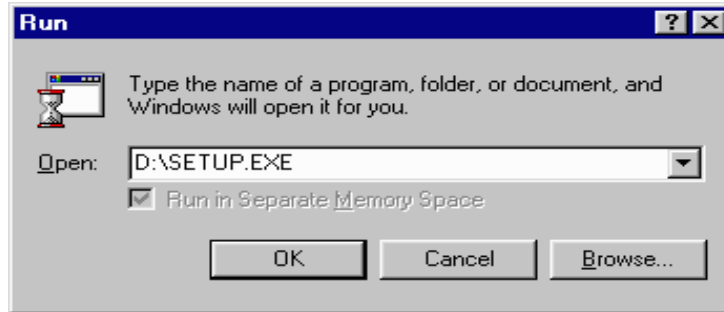


Figure 1 *Run Dialog Box*

5. Press **OK** to initiate the setup procedure. Follow the on-screen prompts to install the software.
6. The **Welcome** window is displayed. Read the welcome message then click **OK**. See Figure 2.

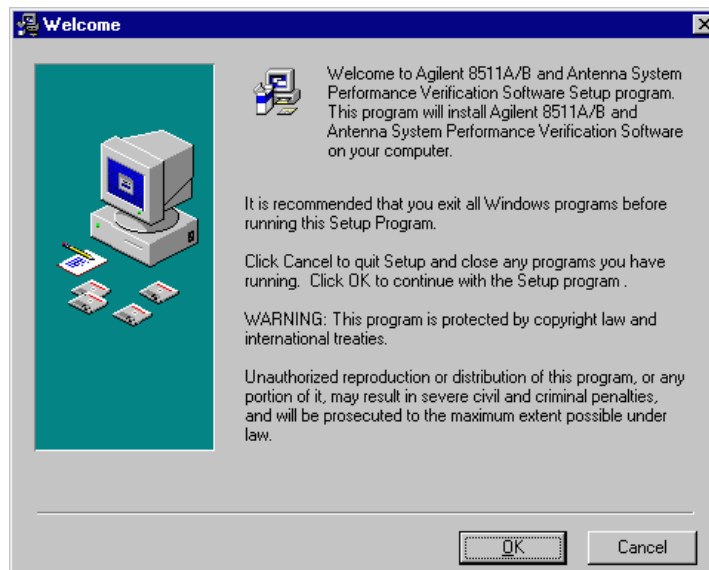


Figure 2 *Welcome Message Window*

7. The **Read Me File** window is displayed. This window provides information about test system requirements and types of products verified by this software. Read the system requirement notes then click **Next>** to continue. See Figure 3.

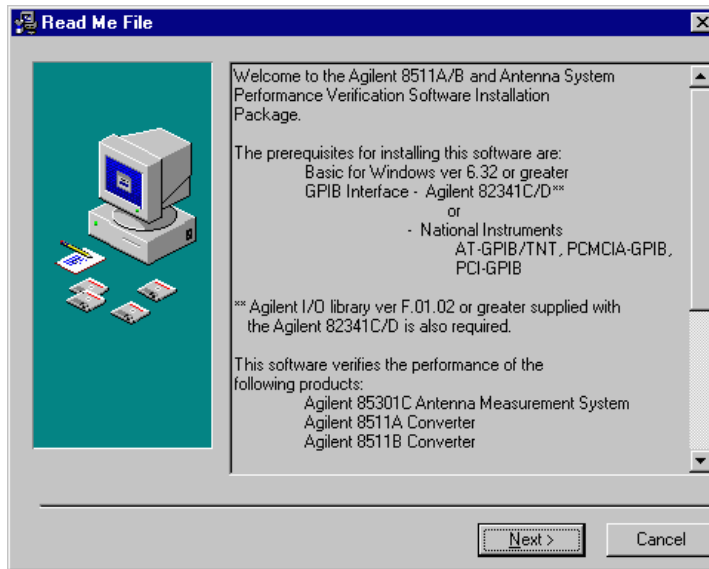


Figure 3 *Read Me File Window*

8. The **Agilent/HP Antenna System Verification Software Installation** window is displayed. Select the **F**ull or **C**ustom installation radio button (**F**ull is recommended). Choose the default destination directory or click **B**rowse to locate a different directory for the software installation. See Figure 4.

NOTE

Selecting **C**ustom allows you to choose which components of the software to install; TestExec SL v3.1, Test Interface, or the Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Software.

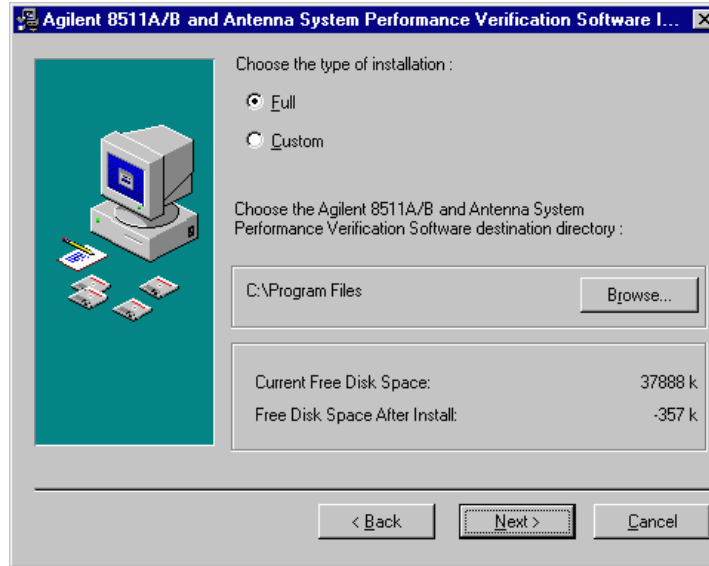


Figure 4 Choose Installation Destination Window

9. Click **Next>** to continue.
10. The **Get Program Manager Group** window is displayed. Click **Next>** to select the default program manager group (**TestInterface**). See Figure 5.

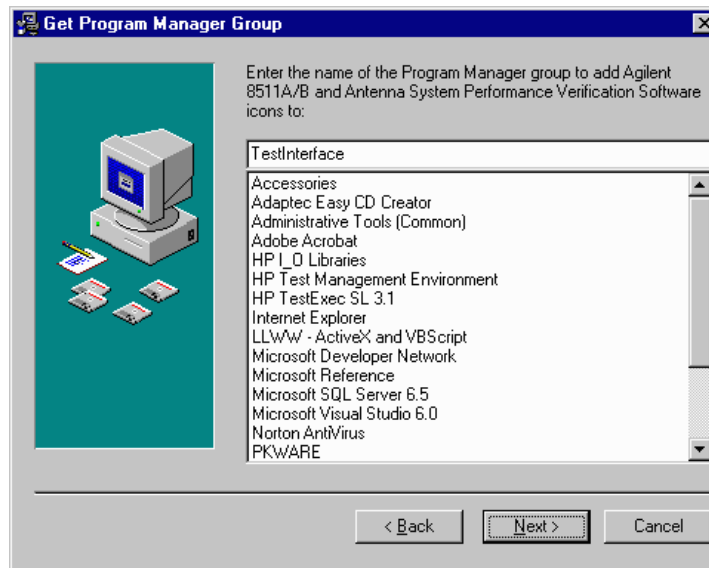


Figure 5 Get Program Manager Group Window

11. The **Start Installation** window is displayed. Click **Next>** to continue. See Figure 6 on page -16.

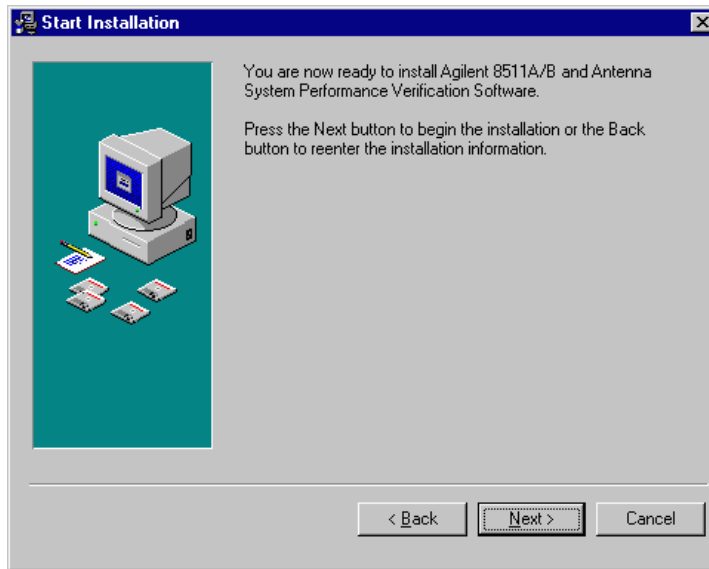


Figure 6 *Start Installation Window*

12. During the file transfer several screens are displayed showing the progress of the installation. See Figure 7.

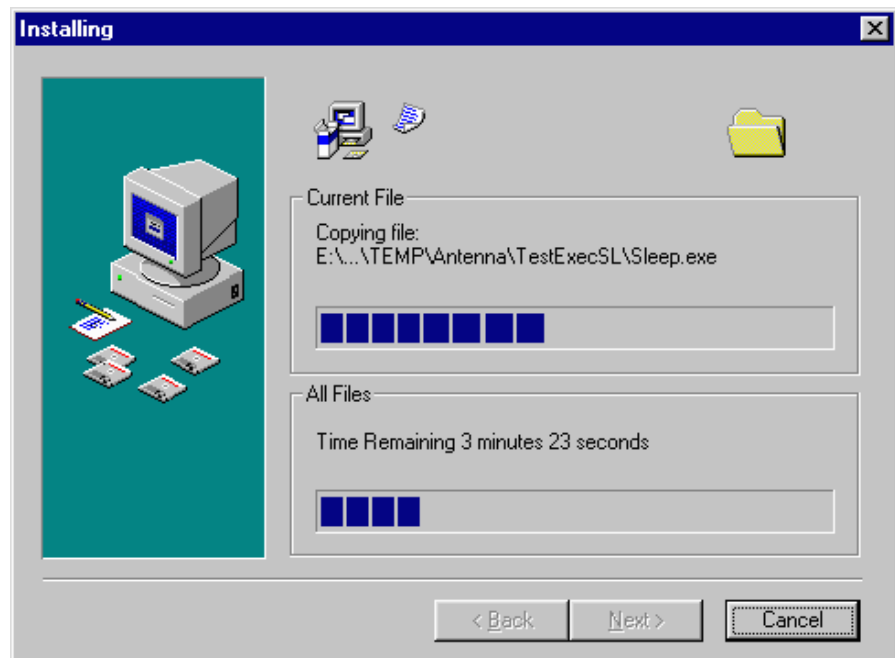


Figure 7 *Installation Progress Screen*

13. Near the end of the installation procedure, the **Interface Selection Window** is displayed. Select the appropriate interface for your system then click **OK**. See Figure 8.

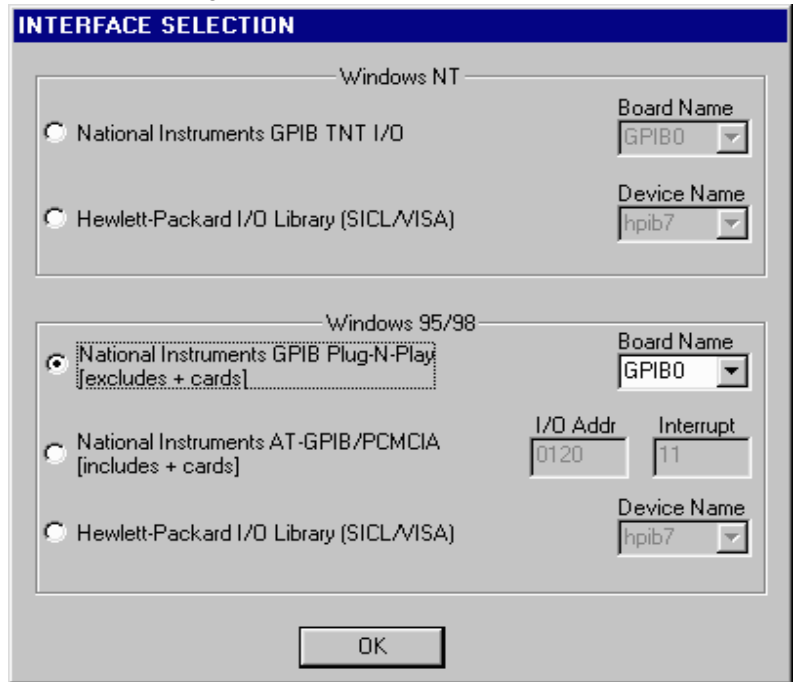


Figure 8 *Interface Selection Window*

14. The **Installation Complete Window** is displayed. Click **Finish >** to continue. See Figure 9.

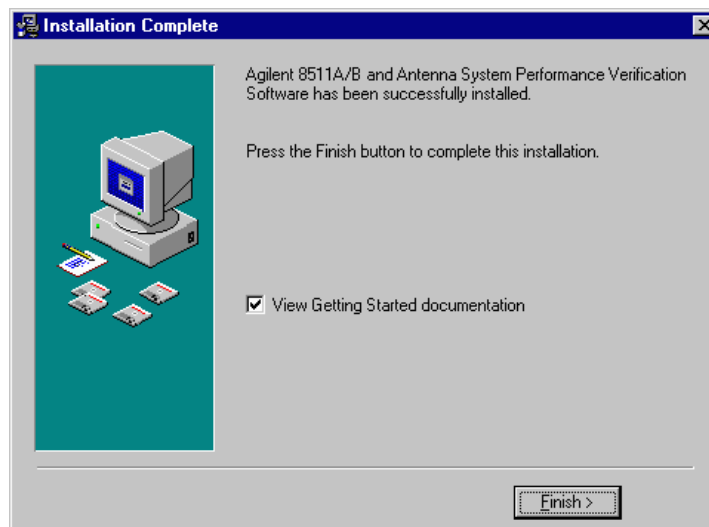


Figure 9 *Installation Complete Window*

15. A window is displayed indicating your computer must be restarted. Click **OK** to restart the computer and complete the installation. See Figure 10.

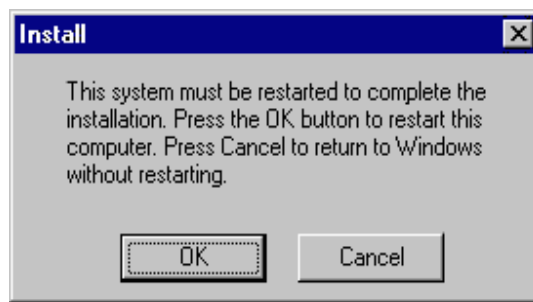


Figure 10 Restart System Window

Getting Started

Testing Overview

The Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Software allows you to use test plans included with the software to test and record the performance of Agilent/HP 85301B and Agilent/HP 85301C antenna measurement systems and network analyzers used with the Agilent/HP 8511A/B frequency converter. Figure 11 shows the primary user interface that is used to organize and configure the equipment needed to perform the automated verification test sequences, and record and print the test results.

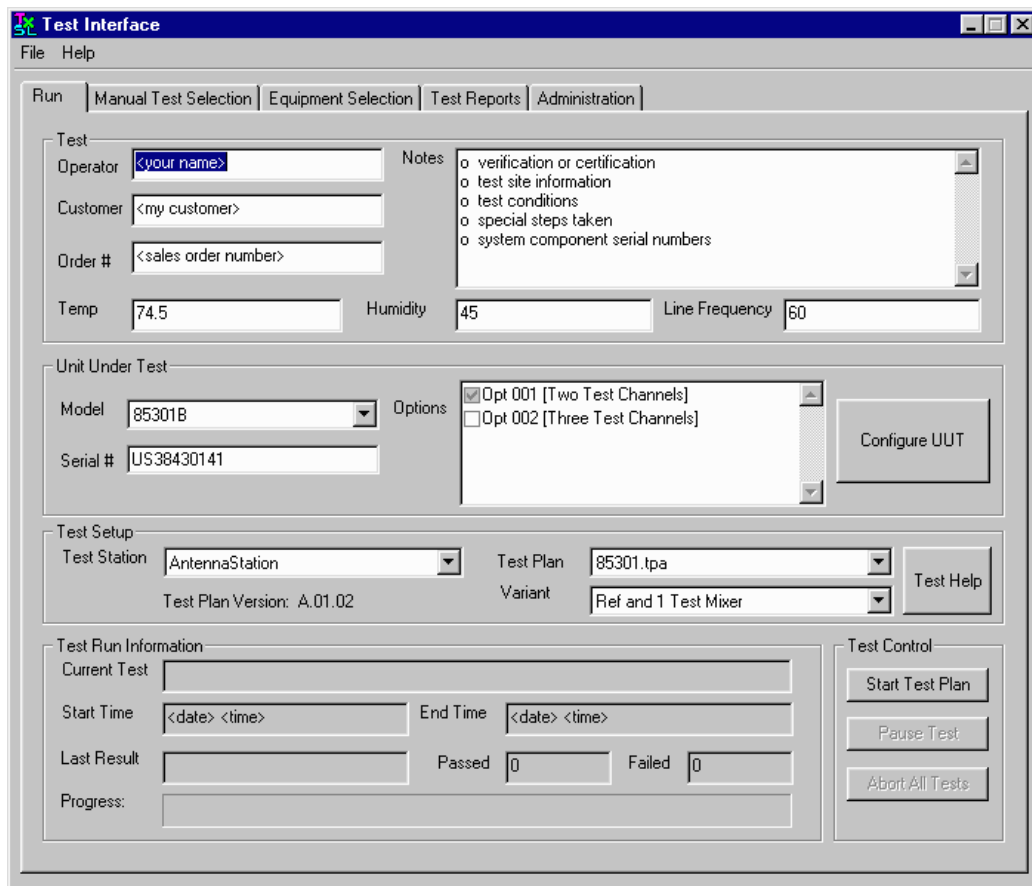


Figure 11 Software User Interface

A test station must be configured by your test administrator before a test plan can be executed. A test station can contain not only bench equipment, but also any portable equipment that your test administrator has configured to run test plans.

Run Tab

The **Run** tab is the main test interface that allows you to choose the type of system, such as an Agilent/HP 8511A, as the unit under test (UUT), select a pre-defined test plan to run, and identify the test station used to run the test plan. You can also edit the device and component characteristics (GPIB addresses and serial numbers) of the system instruments. The **Run** tab is used to enter the operator name, customer information, environmental conditions, and to start the test plan. The automated test sequences are run in the correct order, and the test results are recorded. You can monitor the results while you run the test plan, or you can review the results later in the form of a printed report. See the **Manual Test Selection** tab for running individual tests or changing the test sequence.

NOTE

Operator name, customer order number, and environmental conditions can be entered at any time prior to running the tests.

Manual Test Selection Tab

The **Manual Test Selection** tab is used to run individual tests for the selected UUT. Running tests from this menu offer capabilities not available in the **Run** tab:

- You can run one test at a time.
- You can loop one or more tests.
- You can loop selected test(s) a specified number of times.

The **Manual Test Selection** tab is also used to perform repeated testing of one or more tests in a test plan. This allows you to configure a test to be looped to help resolve test failures or intermittent problems. The most common reasons for test failures are dirty or damaged connectors and connections that have been made without using proper torque techniques. Ensure all connections are made using the torque wrench specified in Table 3 on page -5 and Table 4 on page -6. Also see Table 2 on page 4 for more information.

Equipment Selection Tab

The **Equipment Selection** tab is used to view the list of test equipment in use, check the equipment calibration status, and check or change GPIB addresses. You can make temporary changes to the test equipment selections and substitute an instrument or device with another unit that has already been defined in the **Administration** tab.

Test Reports Tab

The **Test Reports** tab is used to view or print test reports. You can select simple pass/fail (summary) or full performance test results (detailed). The reports are stored on the hard drive of the computer and are identified by UUT model, serial number, and time and date. The file suffixes are:

- .dtr (detailed)
- .sum (summary)
- .log (log file)

NOTE

As a test plan is running, individual test results are presented in a graphical format. This information is displayed only during testing and is not saved. You must print each individual graph to capture the information presented before continuing to the next test.

Administration Tab

The **Administration** tab is used by the test administrator to add and define (map) each piece of test equipment to a test station, which is a collection of specific instruments that are used to test the UUT. A test administrator is assigned a password to control unauthorized access to this section of the software. The **Administration** tab is also used to enter instrument or device serial numbers, GPIB addresses, calibration factors (where applicable), and instrument calibration dates.

Entries in the **Administration** tab are automatically saved. You do not have to manually save this information. If you install a new version of the software, the database is preserved. It is not overwritten or deleted. The only time the database is destroyed is if the software is uninstalled. A program to uninstall the software is not provided.

Setup

The first task to be performed before you can begin testing is to create test stations by adding and defining the test equipment in your inventory.

NOTE

You can add all of the test equipment in your office, and later select the specific components, by serial number, you plan to use during testing. This is referred to as mapping the equipment. You can map each specific component to your customer's system.

NOTE

Entries in the **Administration** window are automatically saved. You do not have to manually save any of this information.

Add and Define Your Test Equipment

To start the Agilent/HP 8511A/B and Antenna Measurement System Performance Verification Software and begin configuring test stations, follow the procedure below:

1. Press **Start** in the lower menu bar of Windows 95, Windows 98 or Windows NT 4.0.
2. In the **Programs** menu go to **Test Interface** and select either **Antenna Verification Software** or **Agilent/HP 8511A/B Verification Software**.
3. Click the **Administration Tab**.
4. At the **Administrative Login** window, type `Admin` in the **Password** text box. Then click **OK**. Note that the name and password are case sensitive. See Figure 12.

NOTE

The login name cannot be changed.

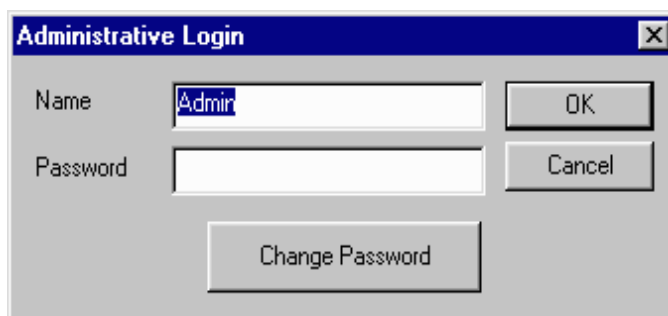


Figure 12 *Administrative Login Screen*

- In the **Test Plan Name** drop-down menu, select the appropriate test plan for the system under test. See Figure 13. Table 9 shows available test plans provided with your software.

Table 9 Test Plan Names

Unit Under Test	Test Plan
HP 8511A	8511A.tpa
HP 8511B	8511B.tpa
HP 85301B	85301.tpa
HP 85301C	8511.tpa
HP 85325A	85325.tpa

- After you have selected an appropriate test plan, click **Add Station**. See Figure 13.

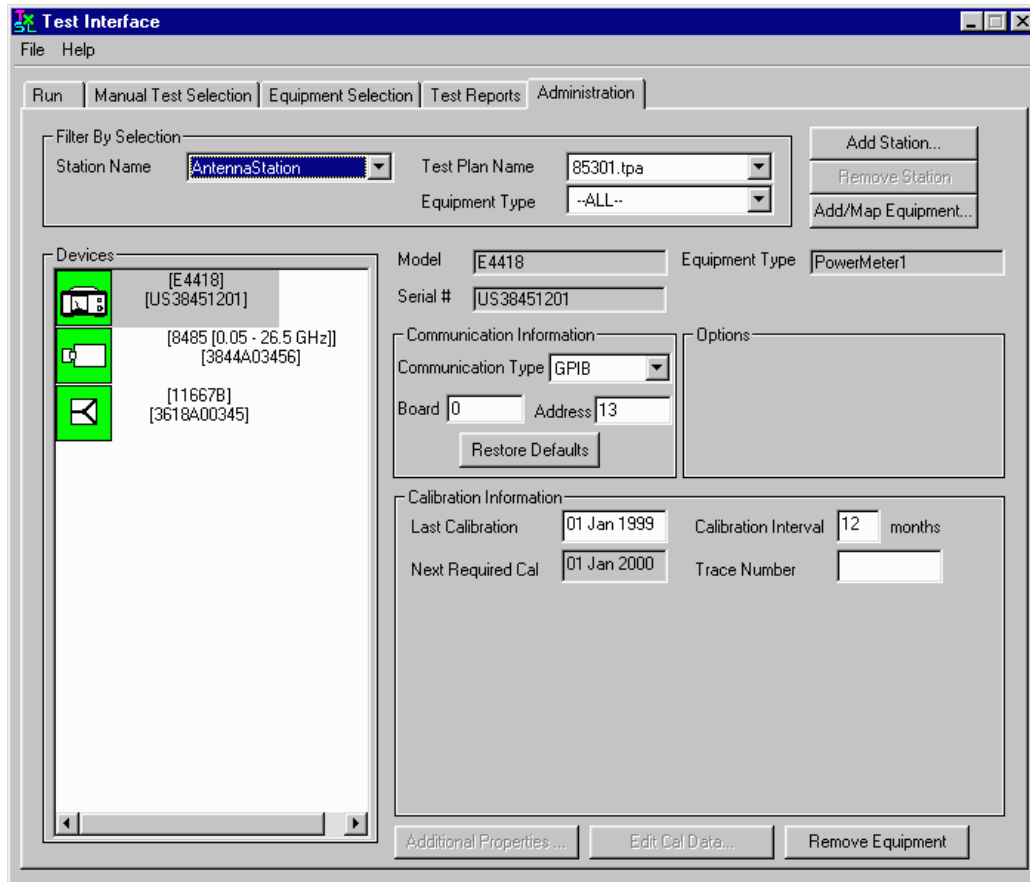


Figure 13 Administration Tab

7. Enter a name for this test station. After you have named the test station, click **OK**. See Figure 14.

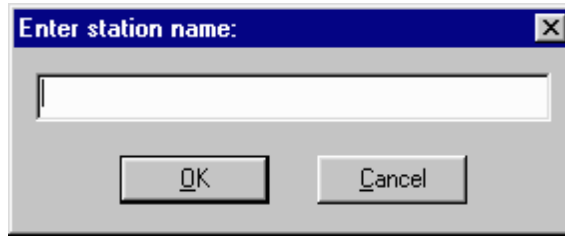


Figure 14 Naming a Test Station

8. Click the **Add/Map Equipment** button to begin adding (mapping) equipment to this test station. See Figure 13. The mapping function allows you to add all the equipment in your inventory to the software database, and then map specific instruments (by serial number) to specific test station setups.
9. Select the first item in the **Equipment Type** drop down list. See Figure 15.

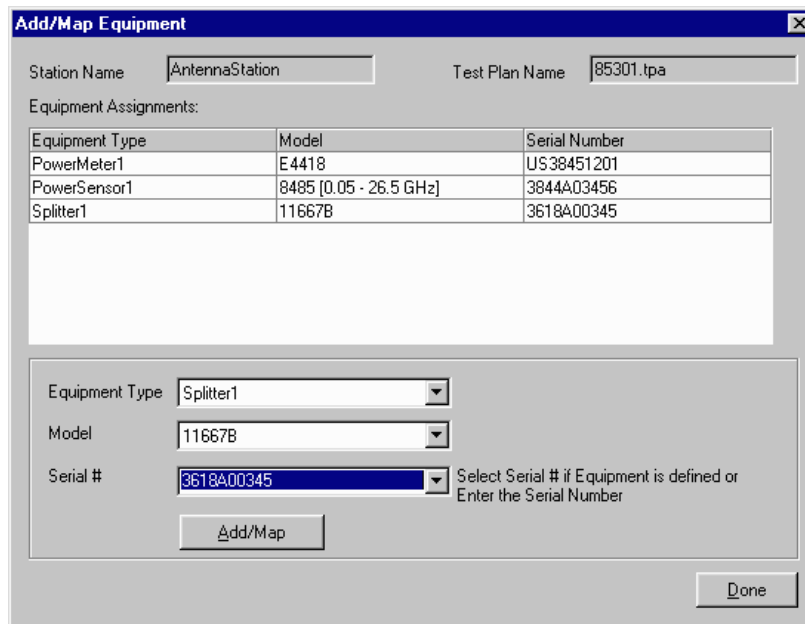


Figure 15 Add/Map Equipment

10. Select the model number from the **Model** drop down list.
11. Enter the serial number of the instrument or device, or click the **Serial #** in the drop down list if the instrument or device has previously been entered.
12. Click the **Add/Map** button.

13. Click **OK** when the dialog box is displayed. See Figure 16.

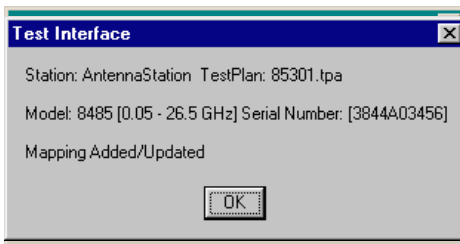


Figure 16 *Mapping Added/Updated*

14. Repeat this procedure for each device, then click **Done** when finished. See Figure 15.

Adding More Test Stations

If you want to define more test stations, or redefine an existing test station to use a different test plan, repeat the above process.

Define GPIB and Calibration Information for Each Device

When you have finished defining all of the desired test stations, enter the GPIB and calibration data for each instrument or device in each of your test stations. See Figure 13. When you enter the date of the most recent calibration, the device icon changes colors as follows:

- Green – the device is in calibration.
- Yellow – the device is within one month of its required calibration.
- Red – the device is out of calibration or not configured properly.

NOTE

The graphical list of instruments and devices is located in the left side of the window. When you fill out the GPIB and calibration information, it will apply only to the instrument or device that is highlighted. The icon color does not change until you click a different device icon.

Entering Power Sensor Calibration Data

After you have defined all of the equipment for a test station, the calibration data for the power sensor needs to be entered. When the power meter icon in the device list is selected, a list of calibration factor entries is displayed in the lower-right portion of the window. To edit the calibration data for the power sensor, perform the following steps:

1. Click on the power sensor icon in the device list.
2. Click the **Edit Cal Data...** button located at the bottom of the window. See Figure 13 on page -23.
3. Edit the entries in the list as required. See Figure 17.
 - a. To enter the first frequency, click inside the frequency box, delete the existing frequency, and type in the first value.
 - b. Press the [Tab] key to move to the next column and continue entering the required information.
 - c. Press the [Tab] key to go to the next row and repeat the process until all calibration data has been entered. If you need to add a new row, go to the bottom of the list, enter the new row on the last line, then click **Sort Records**.
 - d. To delete a row (frequency point) highlight the row you wish to delete by clicking the button to the left of the row, then press [Delete].
 - e. Click **OK** when done. See Figure 17.

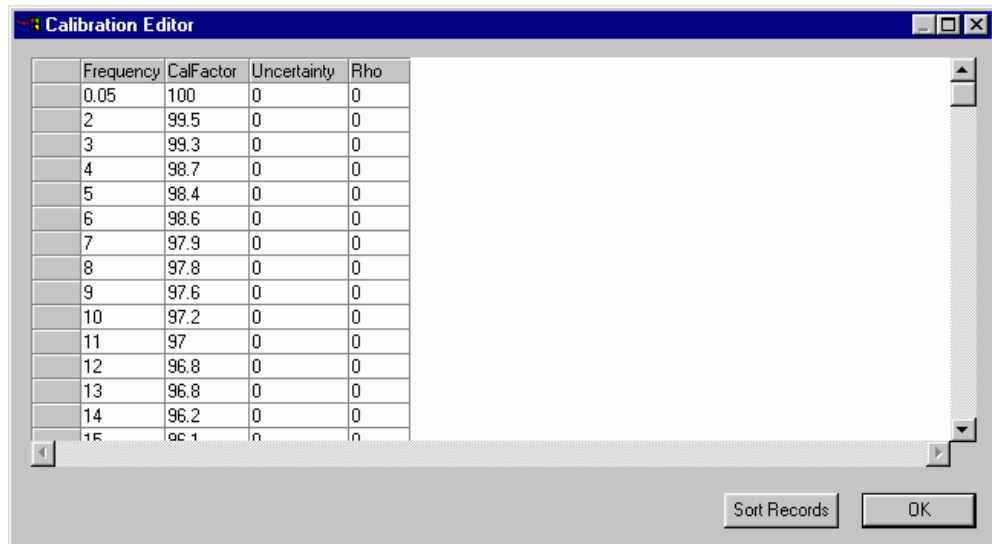
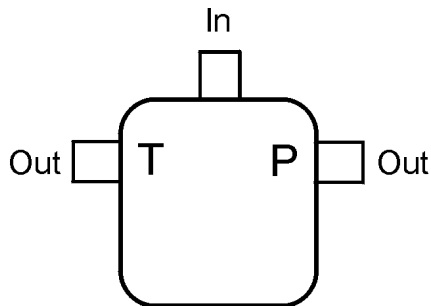


Figure 17 *Editing Calibration Data*

When you have finished defining test stations, leave the **Administration** window by clicking one of the other main tabs.

Performing Tests

When assembling your equipment prior to running any performance verification tests, it is necessary to label the outputs of the power splitter as shown in Figure 18. Using whatever means is available, label one output with a “P” and one output with a “T”. The choice of which output is “T” and which output is “P” is arbitrary. Labeling the splitter in this manner will ensure repeatability during testing.



labsplt.cdr

Figure 18 *Labeling the Power Splitter*

NOTE

Testing cannot begin until the administrative setup procedure is performed. Refer to “Setup” on page 22.

After all of your test equipment has been configured and mapped to a test station, you can begin running tests. You can run an entire test plan or you can select and run individual tests from a test plan. Perform the following procedure to begin testing.

1. Click the **Run** tab. See Figure 19.
2. In the **Test** section of the screen, enter your name, the customer name, order number, and environmental conditions.

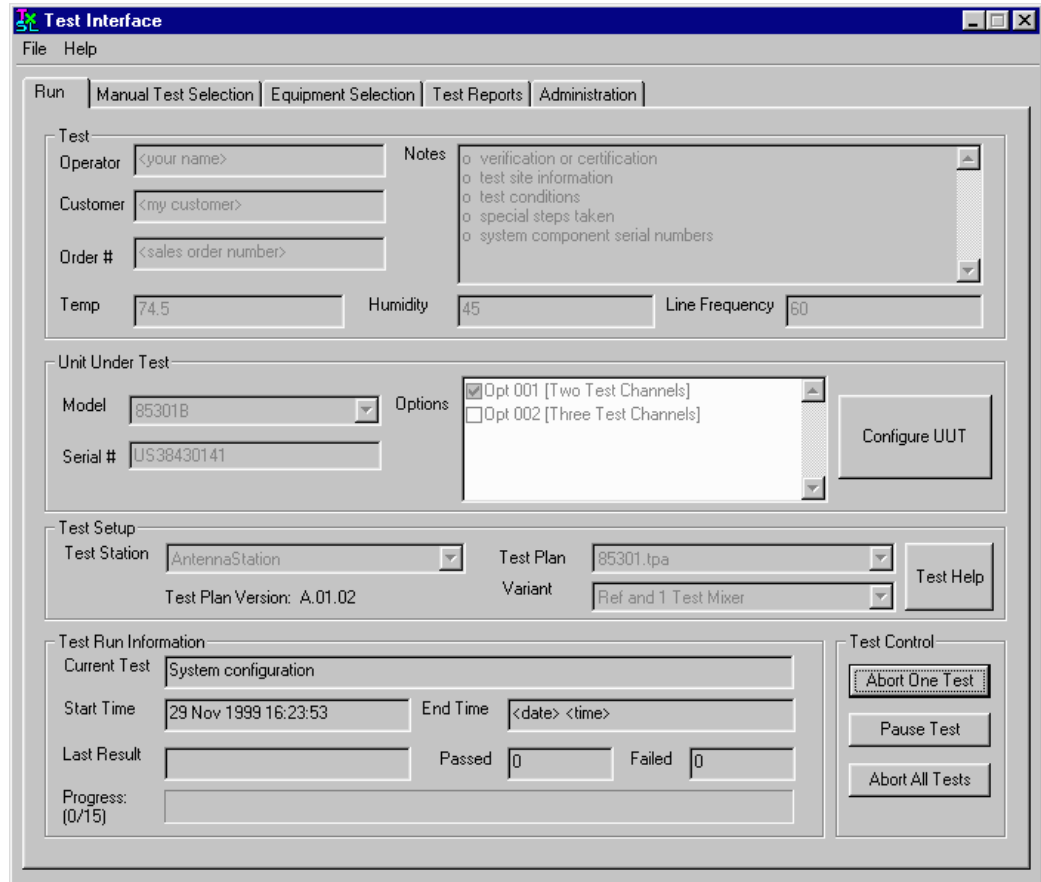


Figure 19 *Running a Test*

NOTE

The test information is optional and does not affect testing. However, a serial number and UUT configuration are mandatory before testing can begin.

3. Select the **Model** of the unit under test (UUT) from the drop-down menu in the **Unit Under Test** field. UUT refers to the customer's system. See Figure 20. Table 10 describes the UUT selections.

Table 10 *Unit Under Test Selection*

Agilent/HP Model	Description
8511A	Downconverter, 0.045 to 26.5 GHz
8511B	Downconverter, 0.045 to 50 GHz
85301B	Antenna test system
85301C	Antenna test system
85325	Millimeter-wave subsystem

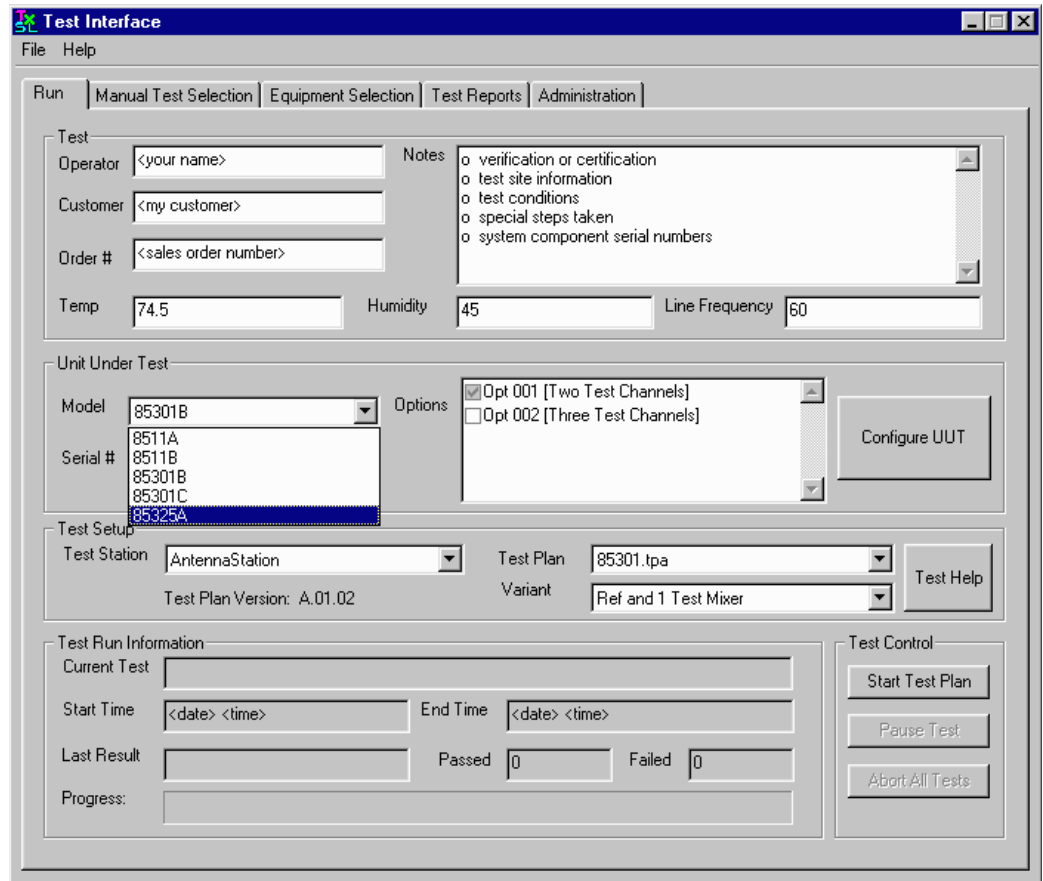


Figure 20 *Model Drop-Down List*

4. Click the **Configure UUT** button on the right side of the **Unit Under Test** field.

5. Select the appropriate options for the UUT in the **Options** field by clicking the **UUT properties** radio button. The option check boxes do not clear automatically. Be sure to manually remove the check box for any options that do not apply to your UUT. See Figure 21 for configuring a single component UUT and Figure 22 on page -31 for configuring a multi-component UUT.

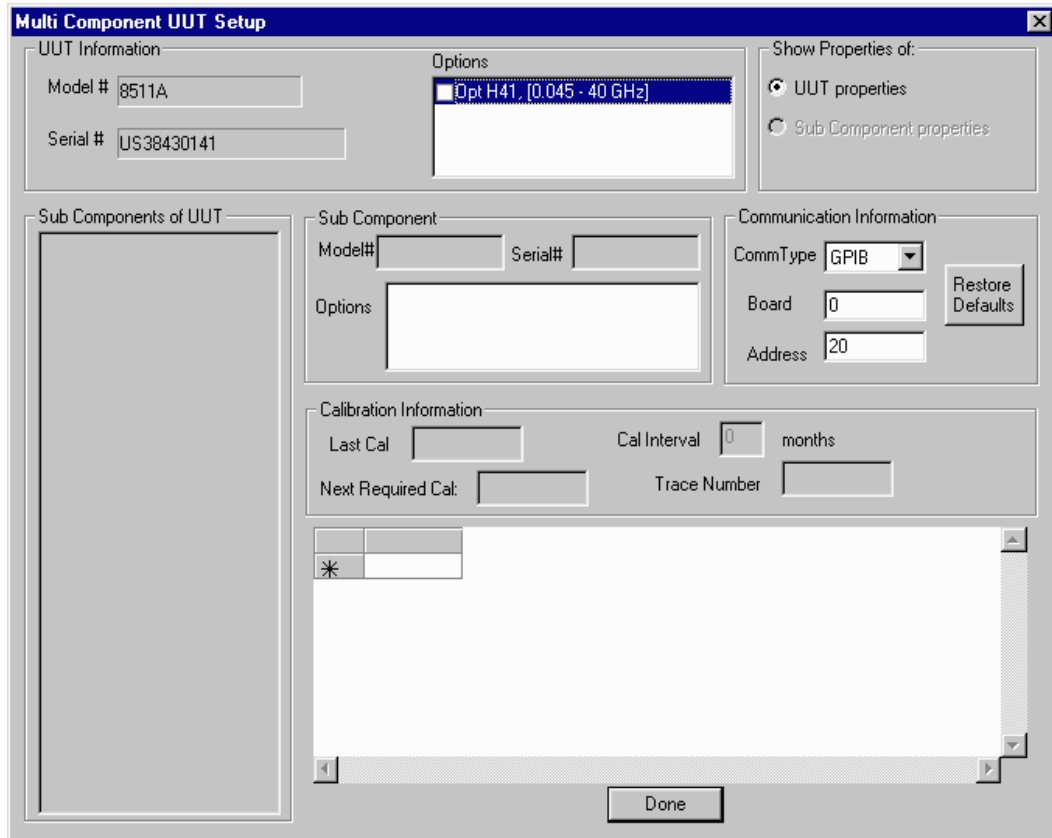


Figure 21 *Configuring a Single Component UUT*

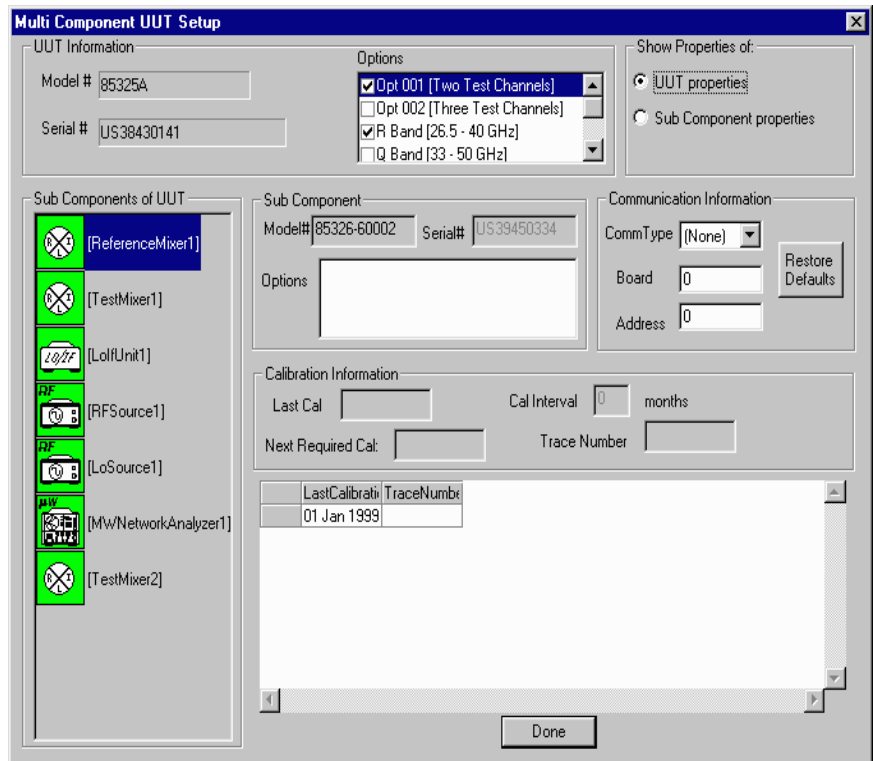


Figure 22 *Configuring a Multi-Component UUT*

6. Click the **Sub Component Properties** radio button in the upper-right portion of the window. This screen allows you to define properties of the multi-component UUT. See Figure 23 on page -33. Table 11 through Table 13 describe the component options information.

Table 11 *Selecting Component Options for the Agilent/HP 85325A*

Device	
LO/IF Unit	a Select no options
Test and Reference Mixers	a Select no options
RF and LO Sources	Options are not applicable. HP 8340 or Agilent/HP 8360 series may be used.
MW Network Analyzer	Options are not applicable. Agilent/HP 8530A or Agilent/HP 8510B/C series may be used.

Table 12 *Selecting Component Options for the Agilent/HP 85301B and Agilent/HP 85325A*

Device	
LO/IF Unit	<ul style="list-style-type: none"> • Select no options for standard unit. • Select H20, H21, or H25 if so equipped. • If testing an H2X option, complete all tests in low band then select High Band and repeat all tests.
Test and Reference Mixers	<ul style="list-style-type: none"> • Select no options for standard unit. • Select H20 or H50 if so equipped. • If testing an H2X option, complete all tests in low band then select High Band and repeat all tests. • Standard instrument testing is done using the 1st and 3rd harmonics across the specified frequency range. In addition, if required, you can scroll down and select the 5th and 7th Harmonic. This selection is applicable to standard mixers up to 26.5 GHz. When you choose the H50 mixer options, the test system will automatically test in 5th and 7th harmonics up to 50 GHz
RF and LO Sources	Options are not applicable. HP 8340 or Agilent/HP 8360 series may be used.
MW Network Analyzer	Options are not applicable. Agilent/HP 8530A or Agilent/HP 8510B/C series may be used.

Table 13 *Selecting Component Options for the Agilent/HP 85301C*

Device	
Downconvertor	Select options if appropriate.
RF Source	Options are not applicable. HP 8340 or Agilent/HP 8360 series may be used.
Network Analyzer	Options are not applicable. Agilent/HP 8530A or Agilent/HP 8510B/C series may be used.

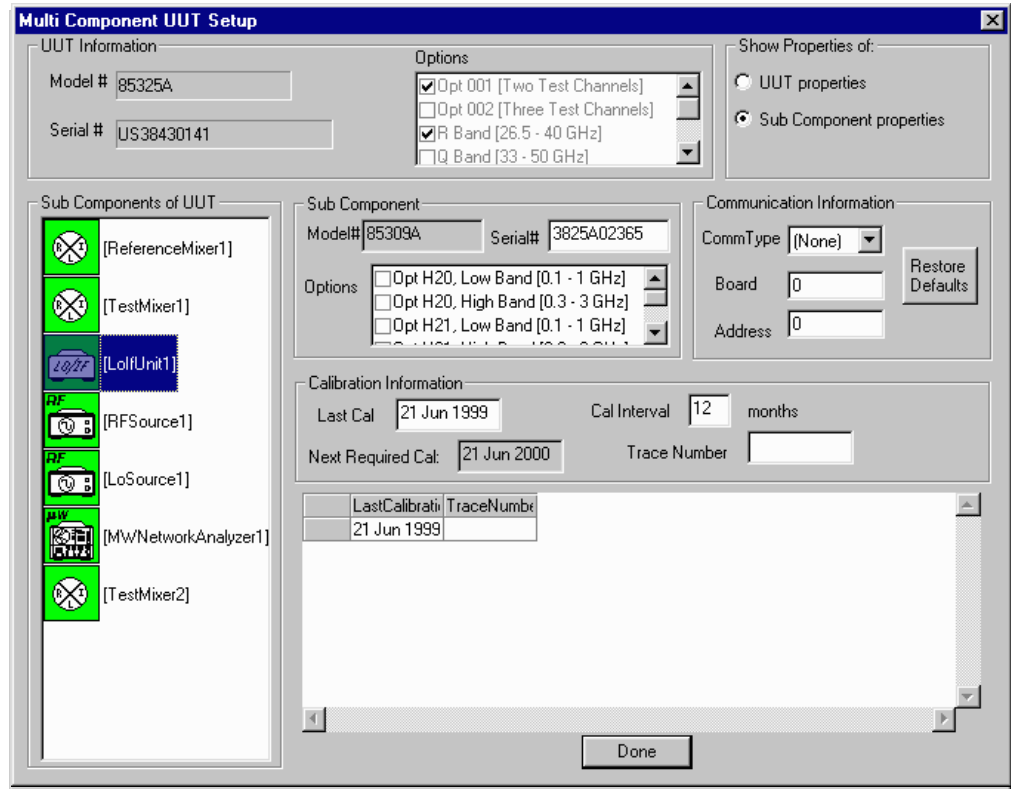


Figure 23 *Selecting Subcomponent Options of a Multi-component UUT*

7. Enter serial numbers and, if required, change GPIB addresses from the default in the **Communication Information** field, then select GPIB for the **Communications Type**.
8. Enter the date of the most recent instrument calibration in the **Calibration Information** field. The device icons change color depending on the calibration date:
 - Green – the device is in calibration.
 - Yellow – the device is within one month of its required calibration.
 - Red – the device is out of calibration or not configured properly.
9. Select each of the displayed instruments and perform each of the above steps until all instruments have been entered. Change GPIB addresses if required.
10. Click **Done**. You will be returned to the **Run** tab.
11. In the **Test Setup** section of the **Run** tab, select the desired **Test Station** from the drop-down menu.
12. Under the **File** drop-down menu is a **Save Test Information File** selection that saves the information in the **Test** area of the **Run** tab window. This saves the operator name, customer name, order number, and so on, so you can quickly recall this information at a later time.

NOTE

Before proceeding to the next step, it is recommended you click the **Equipment Selection** tab to verify all of the equipment configured in your selected test station is OK (green icons). If any icons are yellow, the device is within one month of required calibration. If any icons are red, and equipment substitutions need to be made, refer to “Equipment Substitution” on page 43 for more information.

13. Select the desired variation of the test plan from the **Variant** drop-down menu. See Figure 24 on page -35. Table 14 describes the test plan variations.

Table 14 *Variant Selections*

Agilent/HP System Type	Variant	Description
8511A 8511B 85301C	All	Performs all tests. Use this for customer systems.
	Subcomponent Tests	Runs only those tests required to verify published specifications for the downconverter.
	System Level Tests	Runs only those tests required for system level dynamic range performance
85301B	Reference and 1 Test Mixer	These selections provide flexibility to test any desired subset of test mixers configured for your Agilent/HP 85301B test system
	Reference and 2 Test Mixers	
	Reference and 3 Test Mixers	
85325A	Reference and 1 Test Mixer	Used to add a millimeter sub-system to an existing Agilent/HP 85301B system
	Reference and 2 Test Mixers	
	Reference and 3 Test Mixers	
	Installation	

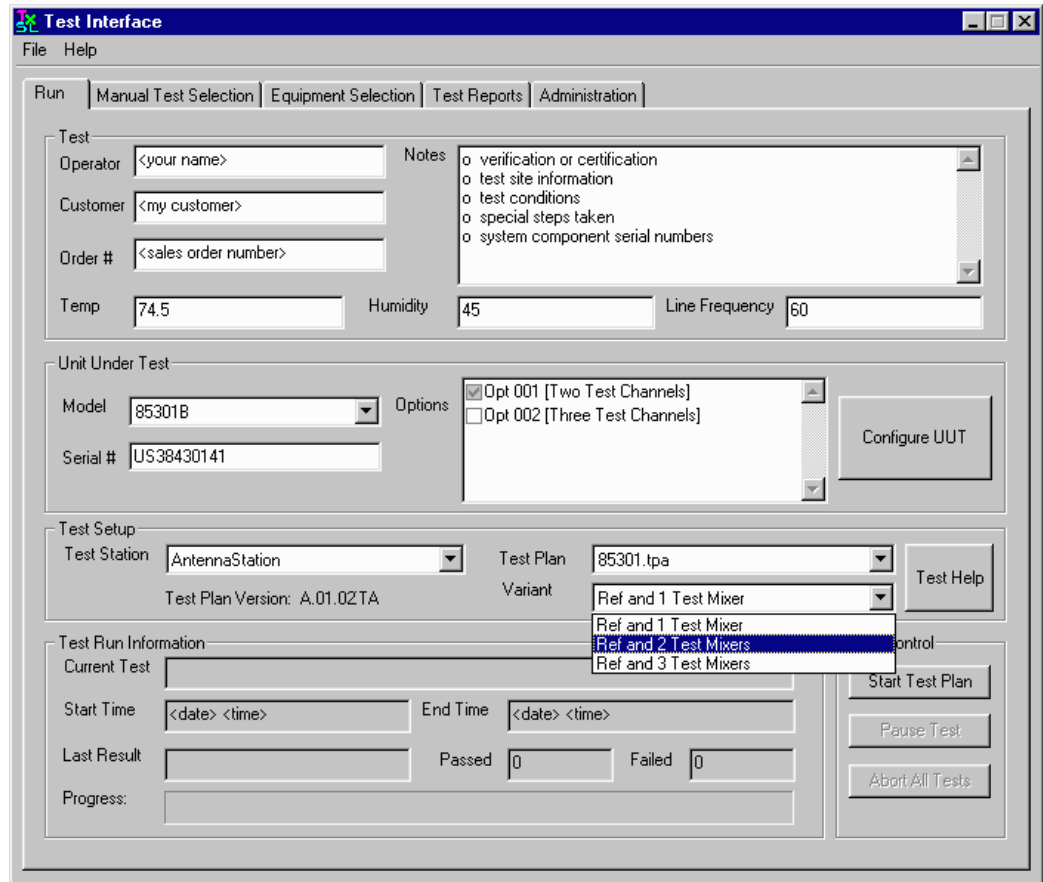


Figure 24 Test Plan Variants

- To run the selected test plan, click **Start Test Plan**. You can monitor the progress of the tests by observing the **Test Run Information** area at the bottom of the window.

NOTE

If a message is displayed indicating some required devices are not assigned (Figure 25) refer to “Equipment Substitution” on page 43.



Figure 25 Required Devices Not Assigned

Performing Tests

15. **For antenna tests only:** You may be prompted to set the LO power level. See Figure 26. Table 15 describes typical LO source power settings. To determine the correct LO source power setting, follow the steps below:
- Disconnect the LO cable from the Agilent/HP 85309A LO input.
 - Connect the cable to the power sensor.
 - Set the LO source to the highest system LO frequency.
 - Use the power meter to measure the LO cable output power.
 - Set the LO source power to indicate 0 dB on the power meter.
 - Reconnect the cable to the Agilent/HP 85309A.
 - Enter the LO source power obtained in step e.
 - Click **OK** to accept the LO power setting and continue with the test plan.

Table 15 *Typical LO Source Power Settings*

LO Cable Length ¹	Recommended LO Power
< 4 m	0 dBm
4 to 8 m	5 dBm (default) ²
> 8 m	10 dBm

1. From the LO source to the Agilent/HP 85309.

2. 10 dBm for an Agilent/HP 85325A Sub-System.

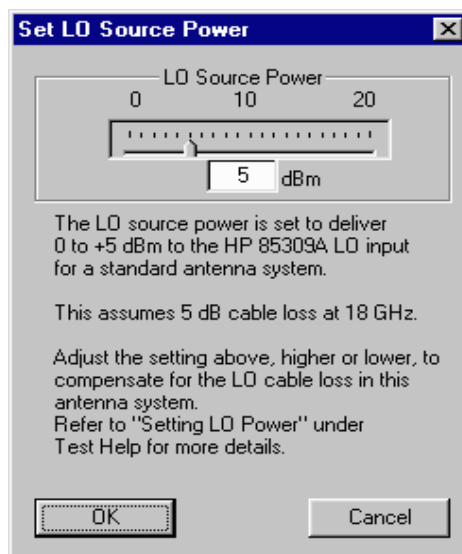


Figure 26 *Setting LO Source Power*

- i. When prompted, perform the Agilent/HP 85309A Detector Voltage Adjustment and click OK to continue. See Figure 27.

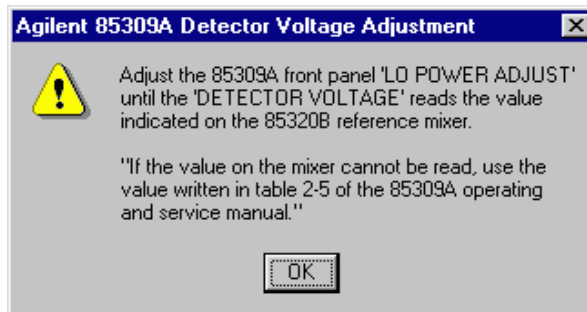


Figure 27 Agilent/HP 85309A Detector Voltage Adjustment

16. You are prompted to make equipment connections and perform various user interactions as the test plan proceeds. See Figure 28 for an example of the prompt window.

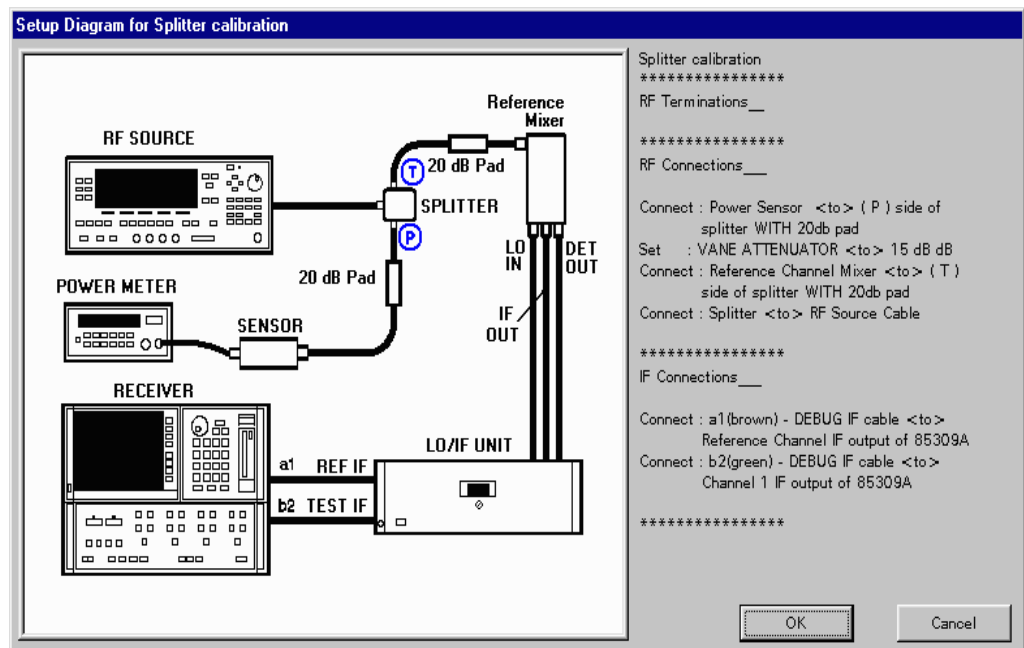


Figure 28 User Interaction Prompt

Performing Tests

- Individual test results are presented graphically. These graphs are displayed to indicate the progress of specific tests. To see the frequency and amplitude of any specific data point, place the cursor on the data point, and when the cursor changes to a hand, click the left mouse button. See Figure 29.

NOTE

It is recommended that you print a copy of each graph for your records as each test is completed. This information is *not* saved, so this is the only time you can print this information. A detailed test report of all other test data can be generated after the test plan is completed by clicking the **Test Reports** tab.

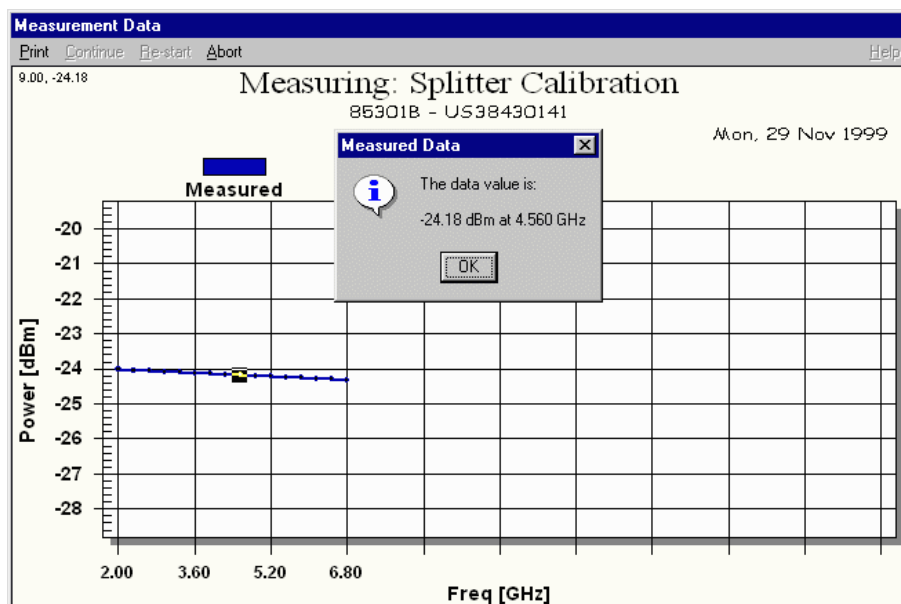


Figure 29 *Graphical Information Window*

- Click **Print** to print the current graph. Click **Continue** in the menu bar of each graph to continue the test plan as the individual tests are completed. Click **Re-start** to run current test again. You can select **Abort** to abort all testing or restart the current test.

19. After all tests in the selected test plan are done, click the **Test Reports** tab to select and print the recorded test data. You can select summary or detailed reports identified by UUT model, serial number, and time and date. See Figure 30.

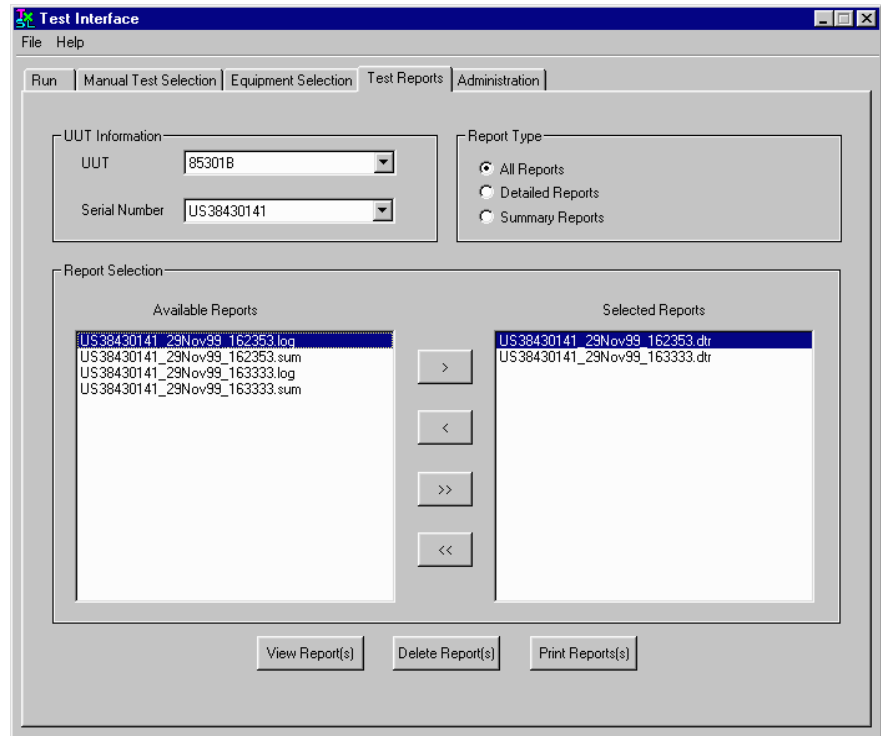


Figure 30 *Test Reports Tab*

20. If any individual test(s) fails, refer to “Selecting Individual Tests” on page 40 for more information.

Selecting Individual Tests

You can select and run individual tests for the selected UUT from the **Manual Test Selection** tab. The performance verification software ensures that dependent test data is available before a selected test can be run. A message will appear on the computer screen indicating that test data is required when running certain tests. The data file presented is for a specific UUT's serial number sorted by date measured. You may select any measured data on file by date for the purposes of troubleshooting or ascertaining trends.

Running tests from this menu offers capabilities not available in the **Run** tab:

- You can run one test at a time.
- You can loop one or more tests.
- You can loop selected test(s) a specified number of times.

NOTE

Some of the individual tests are dependent on data from other tests. Test dependencies (if applicable) are outlined in the Test Help system. See "Using the Help Systems" on page -11 for more information

Running Individual Tests

To run individual tests:

1. Click the **Manual Test Selection** tab. See Figure 31.

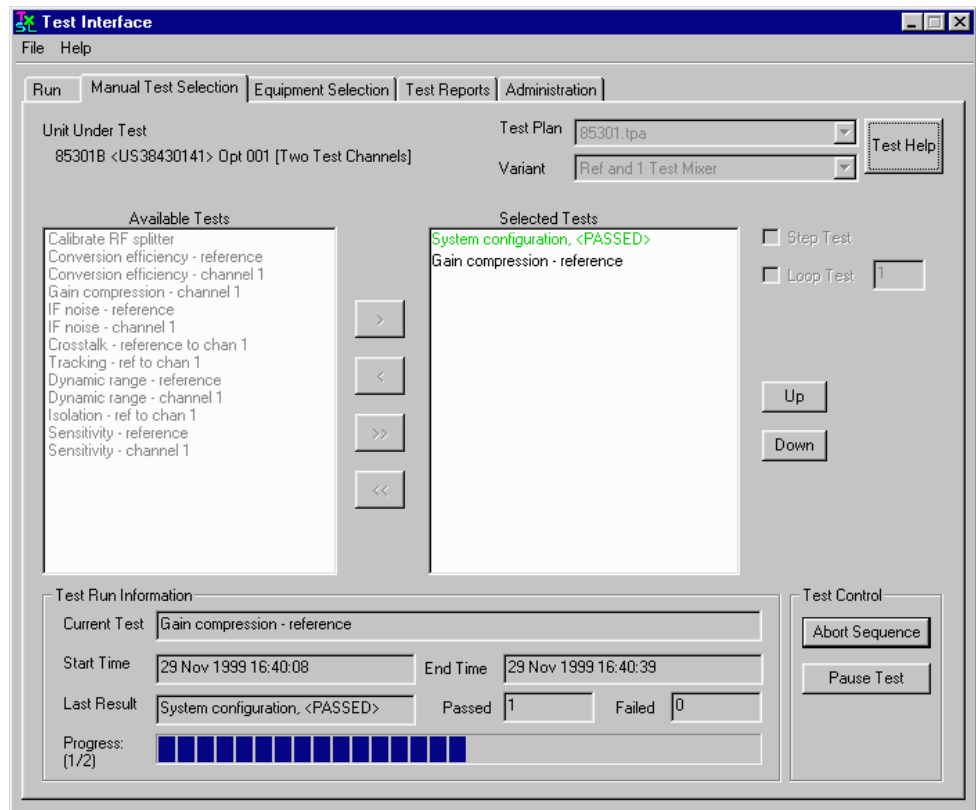


Figure 31 Manual Test Selection Tab

2. Select a test in the **Available Tests** field that you want to run, then click [>] to move the test into the **Selected Tests** field.
3. Repeat as required until all desired tests are selected. You can move all tests at once by clicking the [>>] button.
4. If desired, select **Loop Test** to loop selected tests and enter the number of times the loop is to be repeated.
5. Click **Start Sequence** to begin testing.
6. A message is displayed if data from a dependent test is not available and testing will not continue. The file manager dialog box lists valid data for that UUT's serial number, sorted by date. Select any appropriate date, then click **Open**. See Figure 32.

Selecting Individual Tests

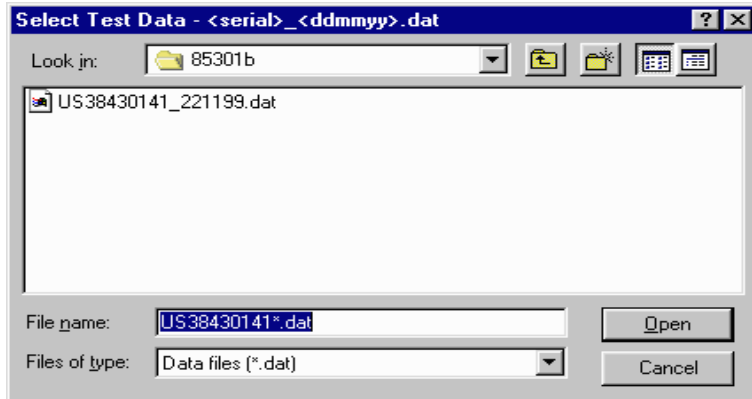


Figure 32 *Select Test Data Window*

The test report generated will be for the selected tests only. For more information on printing test reports, refer to “Test Reports Tab” on page 39.

Equipment Substitution

Viewing Current Test Equipment and Making Temporary Changes

The **Equipment Selection** tab is used to view the list of test equipment in use, check the equipment calibration status, and check GPIB addresses, change GPIB addresses, or both. You can make temporary changes to the test equipment selections and substitute an instrument or device with another unit that has already been defined in the **Administration** tab.

Calibration status is determined by the color of the device icon, or by looking at the **Calibration Information** field. The following icon colors indicate calibration status:

- Green – the device is in calibration.
- Yellow – the device is within one month of its required calibration.
- Red – the device is out of calibration or has not been configured properly.

NOTE

To check if a device has been set up in the database, click the **Administration** tab. If you do not have password permission to access the **Administration** tab, contact your test administrator.

The **Equipment Selection** tab is different from the **Administration** tab in the following ways:

- The **Equipment Selection** tab allows equipment substitution within the selected test station.
- The **Administration** tab is used to define test stations and all equipment available for use in testing.

To substitute equipment perform the following steps:

1. Highlight the device to be substituted.
2. Select the model number and serial number of the new device from the drop-down menus on the right side of the **Equipment Selection** window. See Figure 33.

NOTE

If the serial number is missing when a model number is selected, the device is not available. Change the model number to a device that has a serial number or contact your test administrator. For more information on defining test equipment, refer to “Setup” on page 22.

Equipment Substitution

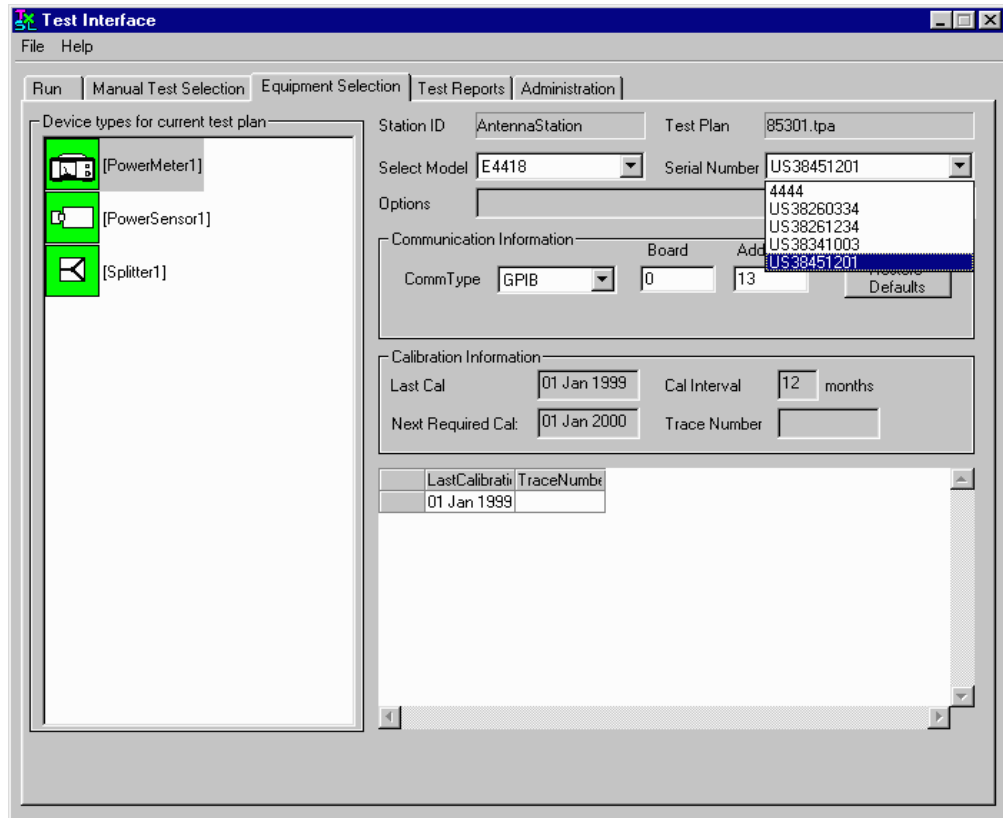


Figure 33 *Equipment Selection Tab*

3. If necessary, change the GPIB address in the **Communication Information** field.
4. Click the **Run** tab or the **Manual Test Selection** tab to continue running tests.