

Getting Started Guide

E4406A VSA Transmitter Tester Performance Verification and Adjustment Software



Agilent Technologies

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About the Software Test Environment

Test Management Environment is the new high performance, 32 bit, component-based calibration platform from Agilent. Agilent Test Management Environment can be expanded by purchasing test packages to test additional HP/Agilent instruments. Agilent Test Management Environment reduces the cost of instrument maintenance by providing quick and accurate automated tests—reducing instrument downtime—and providing a “common look and feel”—reducing operator training.

Agilent Test Management Environment feature highlights:

- Runs on Microsoft[®] Windows 95/98 or NT 4.0
- Provides fast automated testing
- Provides easy customizing of test sequences
- Provides ANSI Z540 compliant test reports
- It is Y2K compliant
- Runs from a graphical user interface
- Provides test standard tracking
- Provides administration security to control the test standards used
- Provides comprehensive on-line help

Required Test Equipment

The following table identifies the equipment required to run the performance verification tests and adjustments. Some tests can use various models of a particular equipment type. The “Recommended HP/Agilent Model” is the preferred equipment. However, the “Alternative HP/Agilent Model” is an acceptable substitute. Not all of the listed test equipment needs to be connected to perform an individual test. To run a test, only the equipment specified for that test needs to be connected.

NOTE The validity of the performance verification and adjustment software measurements depends in part on required test equipment measurement accuracy. Verify proper calibration of test equipment before running tests with this software.

Table 1-1 Required Test Equipment Summary

Instrument	Recommended HP/Agilent Model Number	Alternative HP/Agilent Model Number
Controller		
Computer		
IEEE 488 Interface Card	82341D	National p/n AT-GPIB/TNT
Signal Source		
Synthesized Signal Generator	8663A	
Synthesized Swept Signal Generator	83620B	83623B, 83630A, B, L 83640A, B, L 83650A, B, L
Arbitrary Waveform Generator	E4433B option UND	E4430B option UND E4431B option UND E4432B option UND E4434B option UND E4435B option UND E4436B option UND E4437B option UND
Analyzers		
Network Analyzer	8753E, ET, ES Option 6	8753D Option 6
Counters		
Universal Counter	53132A	

Introduction
Required Test Equipment

Table 1-1 Required Test Equipment Summary (Continued)

Instrument	Recommended HP/Agilent Model Number	Alternative HP/Agilent Model Number
Meters		
Digital Multimeter	3458A	
Power Meter	E4419A	
Power Sensor	8482A Option H84	8482A (Standard) Will increase measurement uncertainty.
Power Sensor	8482A	8481A
Power Sensor	8481D	
Standards		
Frequency Standard	5071A	
Attenuators		
10 dB Step Attenuator	8496G	
1 dB Step Attenuator	8494G	
Attenuator Driver	11713A	
6 dB Fixed Attenuator	8491A Options 006 & H47	
30 dB Fixed Attenuator	8491A Options 030	
20 dB Fixed Attenuator	8491A Option 020	
Terminations		
50Ω Termination	909A Option 012	
Miscellaneous Devices		
Power Splitter	11667A	11667B
Directional Bridge	8721A	
Attenuator Interconnector Kit	11716A	
50Ω Calibration Kit	85032B	
Cables		
Type-N 2 required	11500C	
BNC 2 required	10503A	

Table 1-1 Required Test Equipment Summary (Continued)

Instrument	Recommended HP/Agilent Model Number	Alternative HP/Agilent Model Number
Adapters		
N (f) to N (f)	1250-1472	
N (m) to N (m)	1250-1475	
N (f) to BNC (m)	1250-1477	
N (m) to BNC (f)	1250-1476	
N (m) to BNC (m)	1250-1473	
APC-3.5 mm (f) to N (f)	1250-1745	
7 mm to N (f)	Included in calibration kit	
Filters		
50 MHz Low Pass	0955-0306	

List of Performance Verification Tests

The performance verification tests are designed to provide the highest level of confidence that the instrument being tested conforms to published, factory-set specifications. The tests are supplied in an automated test software application. The automatic execution of the full set of performance tests will take between two and three hours to complete. The tests are designed to test an instrument operating within the temperature range defined by the instrument specifications. Some repairs require a performance test to be run after the repair.

Performance Verification Tests include:

- Absolute Amplitude Accuracy
- Frequency Response (Flatness)
- Amplitude Accuracy at 50 MHz
- Attenuator Accuracy at 50 MHz
- Amplitude Linearity
- Third-Order Intermodulation Distortion
- Gain Compression
- Displayed Average Noise Level (DANL)
- Residual FM
- Phase Noise
- Spurious Responses
- Residual Responses
- Internal 10 MHz Frequency Reference
- Input VSWR
- IF Amplitude Flatness
- IF Phase Ripple

If the instrument is unable to pass any of the performance tests or adjustments, further repairs are needed.

List of Adjustments

Adjustments should not be used for calibration. These procedures are designed to reset various circuit parameters. In addition, some of the tests reset or calculate correction values associated with some measurements. The adjustments are supplied in an automated test software application. The software is designed to adjust an instrument operating within the temperature range defined by the instrument specifications.

Never perform adjustments as routine maintenance. Adjustments should be performed only after a repair or after a performance test failure.

Supported Adjustments include:

- Frequency Response (Flatness)
- Internal 50 MHz Calibrator
- Internal 10 MHz Frequency Reference
- Synthesizer Number One
- Synthesizer Number Two

Getting Started

NOTE Refer to the software built-in help documentation for complete information on using the performance verification and adjustment software.

NOTE Contact Agilent Technologies for assistance with the Performance Verification and Adjustment Software. For software technical support, contact the Agilent Technologies Test and Measurement Call Center at 1-800-452-4844.

Before You Start

You must do the following *before* starting performance verification or adjustment:

1. Ensure you have a compatible controller (IBM compatible computer), refer to Table 1-1 on page 7.
2. Install Performance Verification/Adjustment software on the computer.
3. Ensure you have the proper test equipment. Refer to Table 1-1 on page 7 for a list of test equipment.
4. Switch the unit under test (UUT) on and let it warm up in accordance with warmup requirements in the instrument specifications.

Software Installation and Configuration

Refer to the instructions on the Performance Verification/Adjustment Software CD-ROM packaging for installation instructions.

After installation, refer to the online help instructions for configuring the software for performing tests and adjustments.

Warmup Time

Test Equipment Warmup

Allow sufficient warmup time for the test equipment. Refer to individual operating and service manuals for warmup specifications.

UUT Warmup

The UUT must be stored at a constant temperature, within the specified operating temperature range, for a minimum of two hours prior to running the performance verification tests or adjustments. Switch on the instrument and let it warm up in accordance with warmup requirements in the instrument specifications.

NOTE

The Internal 10 MHz Frequency Reference test and the Internal 10 MHz Frequency Reference adjustment require a minimum of 24 hours warmup time. The instrument must be turned on —**not in standby**— for the entire warmup period.

Equipment Connections

GPIB Cables

All test equipment controlled by GPIB should be connected to the internal GPIB connector of the controller (select code 7). If the controller has only one GPIB connector, connect the UUT to it as well. If the controller has dual GPIB connectors, connect the UUT to the second GPIB (typically, select code 8).

Test Setups

Complete detailed illustrations are located in the online help supplied with the test software. The program prompts the operator to make appropriate equipment connections.

Failure to Meet Specifications

If the instrument does not meet one or more of the specifications during testing, check the test setup for proper configuration, check the condition of all connectors, and ensure all connections are tight. After these things have been checked and confirmed correct, run the failed tests again. If the results are still unsatisfactory, complete any remaining tests and refer to the troubleshooting information in the service guide to correct the problem.

Abnormal Indications during Adjustment

If the indications received during an adjustment do not agree with the normal conditions given in the adjustment procedures, a fault exists in your instrument. The fault should be repaired *before* proceeding with any further adjustments. Refer to the troubleshooting and repair information in the service guide.

Calibration Cycle

The performance verification tests should be used to check the instrument against the instrument specifications every twelve months.

The instrument requires periodic verification of performance. Under most conditions of use, you should check the instrument against the instrument specifications every twelve months using the complete set of automated performance verification tests located on the *Performance Verification and Adjustment Software CD*.

When test results show proper operation and calibration, no adjustments are necessary.