

## E7495A/B Measurement Optimization Guide

### E7495A/B Measurement Optimization

The following user optimizations help to improve the measurement accuracy of the various measurement screens of the E7495A/B Base Station Test Set.

#### ***Normalizing out the loss associated with Test Cables and Attenuators***

Any cables, adapters, or attenuators added to your measurement configuration will add some loss to the measurement that must be accounted for. The E7495A/B provides 3 fields to compensate for test cable configuration losses for the various measurement screens.

These 3 path losses are measured and stored by using the Two Port Insertion Loss screen. Information on storing and using these fields can be found in the Two Port Insertion Loss section of the E7495A/B Measurement Guide and the Instruments *on-board Help* files.

Note: The latest version of the E7495A/B Measurement Guide can be found on the E7495A/B website at [www.agilent.com/find/e7495\\_manuals](http://www.agilent.com/find/e7495_manuals)

- **RF IN Loss**

The RF Input Loss field is used with the Spectrum Analyzer, Channel Scanner, TX Analyzer, and Over Air Analyzer tools to account for the loss of the cables, attenuator, and other devices between the signal source and the E7495A/B RF In (Port 2).

- **RF OUT Loss**

The RF Output Loss field is used with the Signal Generator tool to account for the loss of the cables and other devices between the E7495A/B RF Out (Port 1) and the input of the receiver under test.

- **Power Meter Loss (PM Loss)**

The Power Meter Loss field is used with the Power Meter tool to account for the loss of the cables, attenuator, and other devices between the signal source and the power sensor connected to the E7495A/B.

### **Measurement Screen Calibrations/Normalizations**

For the Power Meter and Antenna/Cable screens, a “Calibrated”/“Uncalibrated” or “Normalized”/“UnNormalized” message will be displayed in the upper left hand corner of the measurement screen to indicate the calibration status of these measurement screens. Perform these quick calibrations when the indicator displays “Uncalibrated, or UnNormalized or anytime you need the maximum measurement accuracy. Detailed Information on the Calibration/Normalization procedure can be found in the E7495A/B Measurement Guide and the E7495A/B *on-board Help* files for each of the measurement screens.

### **Power Meter (option 600) Calibrations**

- Power Meter Zero
- Power Meter Calibrate

The Power Meter Zero and Calibrate procedures should be run at the following times:

- When the “Uncalibrated” message is displayed on the Power Meter Screen
- Every time you cycle the instruments power
- When a 5 degree C change in temperature occurs with the Instrument or Power Sensor
- Whenever you remove and replace the Power Sensor or Sensor Cable
- Every 24 hours
- Before measuring low level signals (for example, 10 dB above the lowest specified power for the sensor)

### **Antenna/Cable Calibrations**

#### **Two Port Insertion Loss**

- Normalize

#### **One Port Insertion Loss, Return Loss**

- Calibrate

#### **Distance to Fault**

- Calibrate (Manual Frequency Range)
- Calibrate (Auto Frequency Range)

The Calibration/Normalize procedures should be run at the following times:

- When the “Uncalibrated”/“UnNormalized” message is displayed on the Measurement Screen
- Every time you cycle the E7495A/B power
- Change the start frequency to a new value that lies below the start frequency of your previous calibration
- Change the stop frequency to a new value that lies above the stop frequency of your previous calibration

## E7495A/B Measurement Optimization Guide

- Change any of the jumper leads or attenuators that you used for the calibration
- Change the type of cable specified under the [Cable Type] menu key.
- Change the Distance to Fault frequency range between Auto and Manual if either of the Manual or Auto Calibrations has not been performed. (Note: The calibration will become valid again as soon as you switch back to the calibrated Auto or Manual Frequency Range, or perform the calibration for both of the Manual or Auto frequency ranges)

### ***Calibration - Minimizing your Workload***

The Return Loss, One Port Insertion Loss, and Distance to Fault calibrations (when it is performed with Frequency Range set to manual) are common between the 3 measurement screens. If you have already calibrated for any of these three measurements, the calibration will apply to the other two measurements and “Calibrated” (together with the frequency range over which the calibration was performed) will be displayed on top left of the screen for all three if the Start and the Stop frequencies are set within the calibrated frequency range. The Distance to Fault calibration (when it is performed with Frequency Range set to Auto) is only valid for other Distance to Fault measurements that are also performed with Frequency Range set to Auto, and then only if the Start and the Stop Frequencies fall within the previously calibrated frequency range.

If you have not previously performed a calibration, the word “Uncalibrated” appears at the top left of the measurement screen. It is important that you keep the calibration frequency range as close as possible to the actual sweep frequencies you intend using for the measurement or measurements. Calibrating over a large frequency range (for example, 1 GHz) when you only intend measuring over a much smaller range (a few kHz, for example) will reduce your measurement accuracy. If you plan to perform a combination of One-Port Insertion Loss measurement, Return Loss measurement, and Distance to Fault measurements using a frequency range that you will set manually, you can perform one calibration for all three measurements as long as you calibrate over a frequency range that incorporates all three of your measurements, and as long as your cables do not change. For this reason, if you are doing Distance to Fault measurements (using a frequency range that you have set manually) as well as any type of Insertion Loss measurement, Agilent recommends that you select your cable type before performing calibrations. Press [Mode], [Antenna/Cable], [Distance to Fault], [Cable Type] to set the cable type.

The calibration remains valid until you do any one of the following:

- Set the Distance to Fault frequency range to Auto. Note that the calibration will become valid again as soon as you switch from Auto back to Manual Frequency Range, or calibrate the Auto Frequency Range setting.
- Power off the test set
- Change the start frequency to a new value that lies below the start frequency of your previous calibration
- Change the stop frequency to a new value that lies above the stop frequency of your previous calibration
- Change any of the jumper leads that you used for the calibration
- Change any of the attenuators that you used for the calibration
- Change the type of cable specified under the [Cable Type] menu key.