

Agilent E5070B/E5071B ENA Series RF Network Analyzers

Impedance Parameter Display

First Edition



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Overview

The Impedance Parameter Display is the VBA application software for the Agilent E5070B/E5071B Series RF network analyzers. The software calculates impedance parameters such as C, D, L, and Q from S-parameter measurement results and then displays them on the ENA's screen.

NOTE: We recommended that you use the E5070B/E5071B firmware revision 3.54 and above.

Installation

- Save the installation program of the Impedance Parameter Display to your floppy disk to create the installer disk.
- Reboot the ENA. (Turn the ENA's power OFF, and then turn it ON again.)
- Insert the installer disk in the ENA.
- Press [**Save/Recall**], **Explorer** to open the Windows Explorer and double-click on the installation program in the A drive.
- Install the Impedance Parameter Display by following the instructions of the installation program.

If the ENA has an older version of the Impedance Parameter Display installed in it, uninstall the older version before installing the newer version. The procedure is as follows:

- Reboot the ENA. (Turn the ENA's power OFF, and then turn it ON again.)
 - Double-click on the installation program in the Windows Explorer.
 - Uninstall the older version by selecting "Remove ImpedanceParameterDisplay" in the dialog box.
 - Double-click on the installation program again, and install the newer version by following the instructions given in the dialog box.
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- The Impedance Parameter Display program file and two related DLL files will be installed under the path D:/VBA of the ENA.

Operating Procedure

- Connect your test fixture to the ENA's test port 1 (for S11 Reflection mode) or between the ENA's test ports 1 and 2 (for S21 Transmission Series mode or Transmission Shunt mode).
- Before running the Impedance Parameter Display program, make measurement setups and calibration at Channel-1 of the ENA by manual operation.

Typical setup items:

- Start and stop frequencies
- Sweep type
- Number of points
- Source power level
- IF Bandwidth

Calibration:

- If you are going to use the S11 Reflection mode (Shunt to Ground) for impedance measurement, perform the full 1-port calibration at test port 1.
- If you are going to use the S21 Transmission Series mode (Series Through) or Transmission Shunt mode (Shunt Through) for impedance measurement, perform the full 2-port calibration or TRL calibration (using the TRL VBA macro) between test ports 1 and 2.
- Run the Impedance Parameter Display to make impedance measurements.
 - Press [**Macro Setup**], **Load&Run**, and select **ImpParamDisp**
(Alternatively, you can press [**Macro Setup**], **Load Project**, load "ImpParamDisp.vba" at D:/VBA, and press [**Macro Run**].)

You will see the control panel of the Impedance Parameter Display as shown in Figure 1.

NOTE: The Load&Run function is available on the E5070B/E5071B firmware revision 3.5 and above.

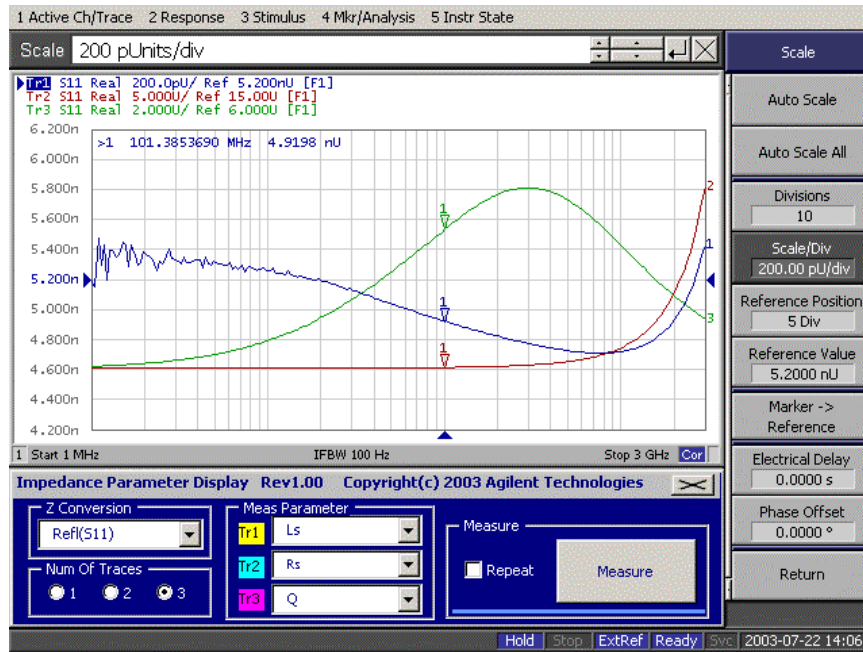


Figure 1. Impedance Parameter Display Control Panel

- Select the conversion mode at the **Z Conversion** menu.

Conversion Mode	Calculation	Model
S11 Reflection	$Z=Z0*(1+S11)/(1-S11)$	
S21 Transmission Series	$Z=Z0*2*(1-S21)/S21$	
S21 Transmission Shunt	$Z=Z0*S21/(2*(1-S21))$	

NOTE: Z0 is fixed to 50 ohms in the calculations of the Impedance Parameter Display.

- Select the number of traces in the **Num Of Traces** menu.

- Select the measurement parameters in the **Meas Parameters** menu.

Parameter	Description
Ls	Series Inductance
Lp	Parallel Inductance
Cs	Series Capacitance
Cp	Parallel Capacitance
Rs	Series Resistance
Rp	Parallel Resistance
Q	Quality Factor
D	Dissipation Factor
G	Conductance
B	Susceptance
R	Resistance
X	Reactance
Zmag	Impedance Magnitude
Ymag	Admittance Magnitude
Zphase(Rad)	Impedance Phase in radian
Zphase(Deg)	Impedance Phase in degree
Yphase(Rad)	Admittance Phase in radian
Yphase(Deg)	Admittance Phase in degree

NOTES:

- All of the parameters are displayed with the linear scale for the y-axis. It is not possible to display the parameters with the logarithmic scale for the y-axis.
- For the traces displayed by the Impedance Parameter Display, do not change the display format by using the softkeys under the ENA's [Format] key. This will corrupt the impedance measurement data.
- Measure the DUT.
 - To make a single sweep, click on **Measure**.
 - To make a continuous sweep, turn **Repeat ON**.
- To leave the Impedance Parameter Display, click on the close button [X] in the upper right hand corner of the control panel.

NOTES:

- If you want to perform the following key operations, stop the sweep by turning **Repeat OFF**.
 - Change the stimulus setups such as IFBW, NOP, Start, Stop, and so on.
 - Re-perform calibrations.

- The following functions are not available when using the Impedance Parameter Display.
 - Format
 - Memory Trace, Trace Math
 - Electrical Delay, Phase Offset
 - Timedomain Transform, Gating
 - Z Conversion
 - Smoothing

- Do not change the setup of trigger related functions with the ENA's front panel keys while using the Impedance Parameter Display. The trigger is controlled by the VBA program.

- If you want to preset the ENA or use the save/recall function, leave the Impedance Parameter Display by using the close button [X].

- When the analyzer's sweep time is long, the status bar under the **Measure** button indicates the progress of the sweep.