Operating and Service Manual

85130C NMD 3.5 mm to Type-N Adapter Kit

Agilent Technologies

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Hewlett-Packard to Agilent Technologies Transition

This documentation supports a product that previously shipped under the Hewlett-Packard company brand name. The brand name has now been changed to Agilent Technologies. The two products are functionally identical, only our name has changed. The document still includes references to Hewlett-Packard products, some of which have been transitioned to Agilent Technologies.

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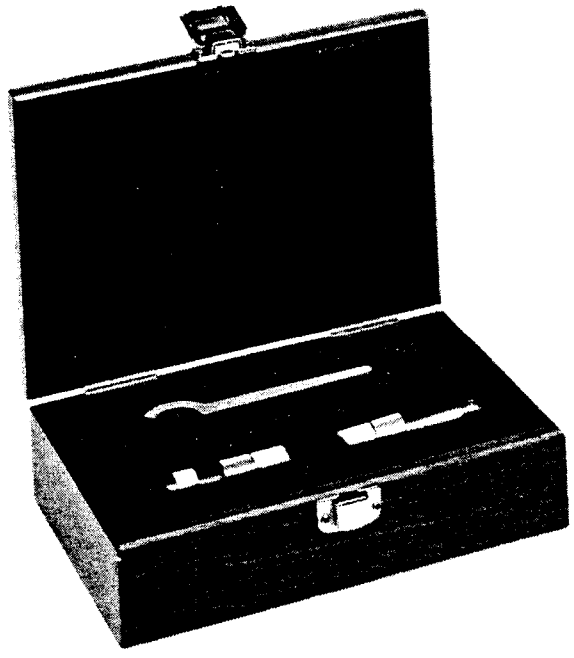
OPERATING AND SERVICE MANUAL

HP 85130C
NMD 3.5 mm to Type-N
ADAPTER KIT



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HP 85130C Adapter Kit

GENERAL INFORMATION

To obtain optimum performance from this adapter kit, observe these simple precautions:

- Make connections carefully to avoid misalignment and connector damage, which will result in inaccurate measurements.
- Keep the connectors free of dirt and any particles.
- When you clean the connectors, try compressed air first. Do not use abrasives. With a clean foam swab, apply **only** Freon TF as a solvent.
- For more information, refer to the Microwave Connector Care manual.

DESCRIPTION

The HP 85130C adapters are used when type-N devices must be attached to a 3.5 mm test set in an HP 8510 network analyzer system. The test set end of the adapters has a NMD-3.5 mm (f) connector while the Device Under Test (DUT) end has a precision slotless type-N connector (PSC-N).

CONTENTS

The HP 85130C kit contains the following:

Description	Quantity	Replacement Part Number
Test port adapters		
NMD-3.5 (f) to PSC-N (m)	1	85130-60030
NMD-3.5 (f) to PSC-N (f)	1	85130-60029
Storage box, foam lined	1	85130-60008
Operating and Service Manual	1	85130-90010
Spanner wrench	1	08513-20014

SPECIFICATIONS

Hewlett-Packard guarantees that your adapters will equal or exceed the following specifications in the +20°to +26°C (+68°to +79°F) temperature range.

DC to 8 GHz ..... ≥34 dB return loss
8 to 18 GHz ..... ≥28 dB return loss

The allowable recession of the center conductor of the NMD-3.5 mm (f) connector is 0.0000 to 0.0022 inches (0.000 to 0.056 mm) below the mating surface of the outer conductor.

The allowable pin position for type-N connectors is:

male = 0.2070 to 0.2075 inch (5.2578 to 5.2705 mm)
female = 0.2065 to 0.2070 inch (5.2451 to 5.2578 mm)

In a mated pair of type-N connectors the center conductor's mating plane is offset from the outer conductor's mating plane by 0.207 inch (5.2578 mm) in the direction of the male connector (Figure 1).

Zero the gages before each use by attaching the appropriate gage master to the end of the gage, torquing the connection to 12 in-lb with a 3/4 inch torque wrench, and adjusting the dial on the face of the gage so the gage reads zero.

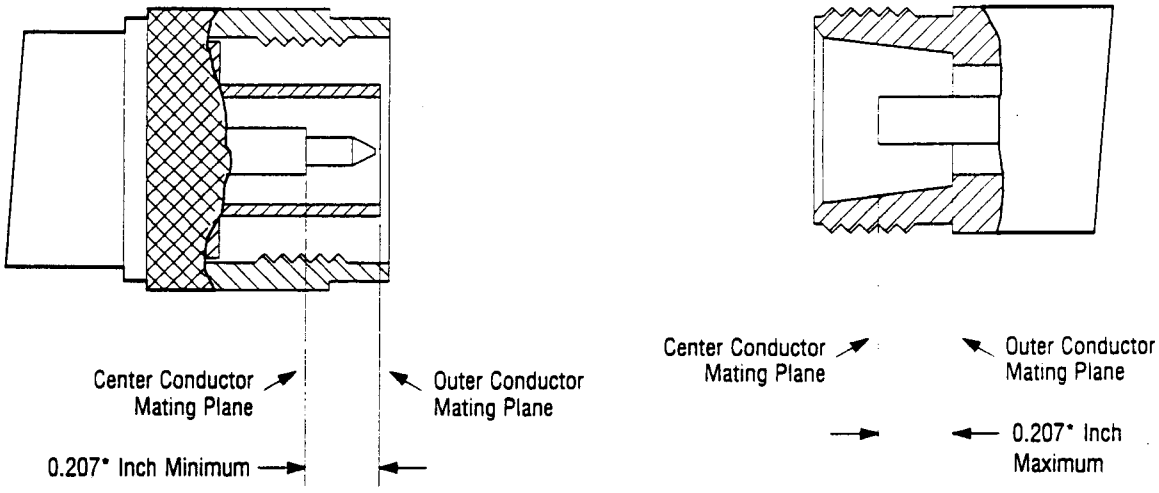
Both type-N gages, male and female, read zero when the center conductor to outer conductor offset is nominally 0.2070 inch (5.2578 mm).

When gaging a male connector the actual recession of the center conductor is −0.2070 inch *plus* the reading on the gage.

When gaging a female connector the actual recession of the center conductor is +0.2070 inch *plus* the reading on the gage.

Example. For a gage reading of −0.0001 inch, the following is true:

Gage Reading	**Actual Pin Position** (versus outer mating plane)	
(this number corresponds to your gage reading)	Male	Female
−0.0001 inch	−0.207 + (−0.0001) = −0.2071 inch	+0.2070 +(−0.0001) = +0.2069 inch



*The gage calibration blocks are manufactured to 0.2072 inches for the male and 0.2068 inches for the female. This takes into consideration the uncertainty of ±0.0002 inches (±0.005 mm) of the gage and its calibration block. Manufacturing the gages blocks this way insures that the center conductors of two mated type-N devices will never have an interference fit between them.

Figure 1. Type-N Connectors

PERFORMANCE TESTS

Using an HP 8510 Network Analyzer perform the following test on your adapters as soon as you receive them, and periodically repeat the test to determine if their performance meets the electrical specifications stated above or if they need to be replaced. An initial period of one year between performance tests is recommended.

Required Equipment	**HP Part Number**
HP 8510A/B Network Analyzer System with time domain option	8510 Opt. 010
Type-N loads (part of the HP 85054B calibration kit)	
male	85054-60033
female	85054-60034
Type-N 50Ω airline, 12.5 cm (part of the HP 85055A verification kit)	85055-60001

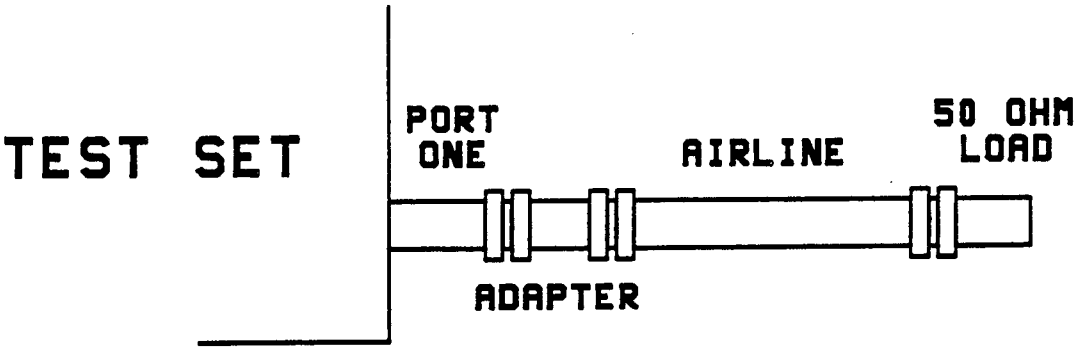


Figure 2. Return Loss set-up

Return loss is measured by connecting a 50-ohm fixed load termination through a 12.5 cm airline to the adapter, then attaching the adapter to port one of the test set (see *Figure 2*).

The effects of an imperfect load may be gated out using the HP 8510 time domain option as follows:

1. Press **[INSTR PRESET]**, the HP 8510 will be set to a pre-determined state.
2. Under STIMULUS, press **[START] [4] [5] [M/μ]**, this sets the start frequency to 45 MHz.
3. Under STIMULUS, press **[STOP] [1] [8] [G/n]**, this sets the stop frequency to 18 GHz.
4. Perform a 3.5 mm one port S11 calibration with 32 averaging at port one of your test set, as described in the HP 8510 Operating and Programming manual. Save the calibration.
5. With correction turned on, under MENUS, press **[DOMAIN]**. This brings up a set of time domain and frequency functions to the softkeys. Select **[TIME BANDPASS]**. This puts you in time domain mode.
6. Under STIMULUS, press **[START] [-] [.] [0] [5] [G/n]**. This sets the start time of the sweep to −.05 nano-seconds.
7. Under STIMULUS, press **[STOP] [1] [.] [9] [G/n]**. This sets the stop time of the sweep to 1.9 nano-seconds.
8. Under RESPONSE, press **[AUTO]**. This brings the trace on screen.
9. Under the softkey functions, press **[SPECIFY GATE]**. A new menu should appear that will allow you to press **[STOP]** softkey.
10. Using the RPG, adjust the stop gate to the center of the airline (see *Figure 3*).
11. Under the softkey functions press **[GATE ON]**. The HP 8510 will now compute the gate coefficients to gate out everything but the cable.

12. Press the **[PRIOR MENU]** button just to the right of the softkeys and a new menu should appear that will allow you to press the **[FREQUENCY]** softkey.

13. Under MENUS, press **[MARKER]**. This brings up a set of functions to the softkeys. Select **[MORE]** **[MAXIMUM]** softkeys.

14. You can now read the return loss value from the screen marker value.

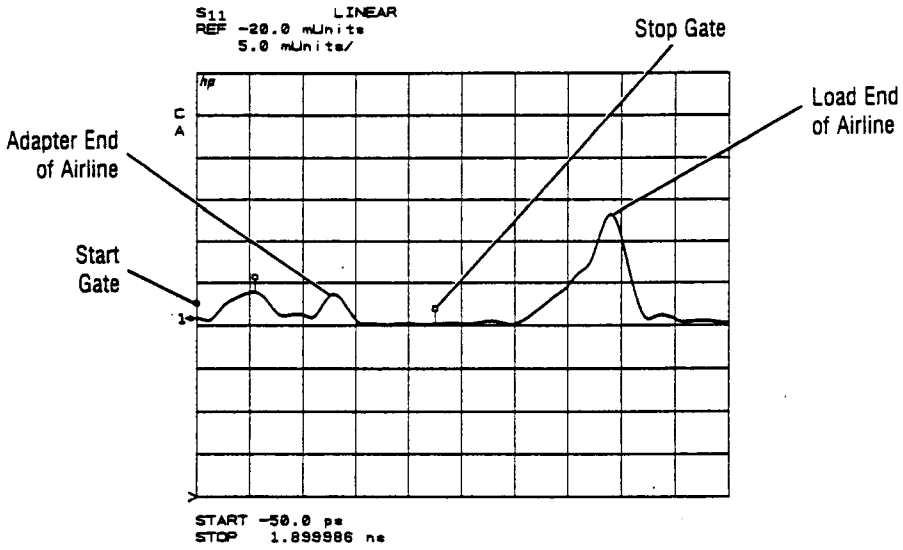


Figure 3. Location of Gates and Airline

PROPER USE

Attach the adapters to the test ports and tighten them finger tight. Use the spanner wrench to hold the test set end of the adapter and torque the test set connector with a 20 mm torque wrench set to 96 N-cm (8 in-lb). Attach a non-rotating clamp to each test port.

REPLACEABLE PARTS

There are no replaceable parts in the HP 85130C adapter kit. A worn or damaged adapter must be replaced in whole.

EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for the maintenance and use of, but are not supplied with, your HP 85130C adapter kit.

3.5 mm gage kit 85052-80010
(part of the HP 85052A/B calibration kits)

Type-N gage kit 85054-80011
(part of the HP 85054B calibration kit)

Torque wrench, 3/4", 136 N-cm (12 in-lb) 8710-1766
(part of the HP 85054B calibration kit)

Torque wrench, 20 mm, 96 N-cm (8 in-lb) 8710-1764
(included with the HP 8515A test set)

Non-Rotating Clamp 08515-60003
(included with the HP 8515A test set)

Microwave Connector Care Manual 08510-90064

Connector cleaning kit 92193Z

Contacting Agilent

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