



**Advanced Test Equipment Rentals**  
**www.atecorp.com 800-404-ATEC (2832)**

## **Operating and Service Manual**

---

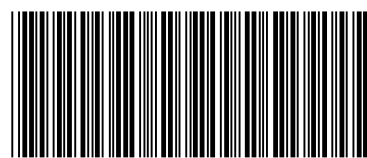
# **85130D NMD 3.5 mm to 3.5 mm Adapter Kit**



**Agilent Technologies**

Part Number 85130-90012

Printed in USA July 2004



85130-90012

© Agilent Technologies, Inc. 1987, 2004

---

## **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.

---

## **Documentation Warranty**

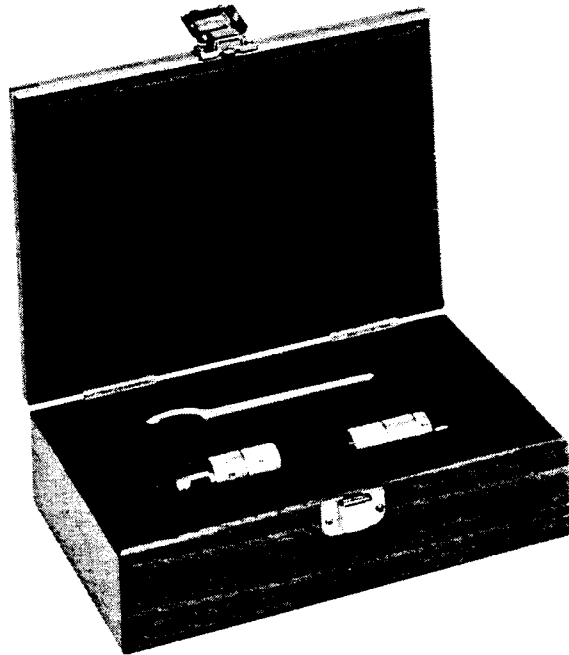
THE MATERIAL CONTAINED IN THIS DOCUMENT IS PROVIDED "AS IS," AND IS SUBJECT TO BEING CHANGED, WITHOUT NOTICE, IN FUTURE EDITIONS. FURTHER, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, AGILENT DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED WITH REGARD TO THIS MANUAL AND ANY INFORMATION CONTAINED HEREIN, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AGILENT SHALL NOT BE LIABLE FOR ERRORS OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, USE, OR PERFORMANCE OF THIS DOCUMENT OR ANY INFORMATION CONTAINED HEREIN. SHOULD AGILENT AND THE USER HAVE A SEPARATE WRITTEN AGREEMENT WITH WARRANTY TERMS COVERING THE MATERIAL IN THIS DOCUMENT THAT CONFLICT WITH THESE TERMS, THE WARRANTY TERMS IN THE SEPARATE AGREEMENT WILL CONTROL.

---

## **DFARS/Restricted Rights Notice**

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 (June 1995), or as a "commercial item" as defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause. Use, duplication or disclosure of Software is subject to Agilent Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

**HP 85130D  
NMD 3.5 mm to 3.5 mm  
ADAPTER KIT**



**HEWLETT  
PACKARD**

## WARRANTY

This Hewlett-Packard instrument product is warranted against defects in material and workmanship for a period of one year from date of delivery. During the warranty period, Hewlett-Packard Company will, at its option, either repair or replace products which prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by HP. Buyer shall prepay shipping charges to HP and HP shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to HP from another country.

HP warrants that its software and firmware designated by HP for use with an instrument will execute its programming instructions when properly installed on that instrument. HP does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

## LIMITATION OF WARRANTY

The foregoing warranty shall not apply to defects resulting from improper handling by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, or operation outside of the environmental specifications for the product.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED, HP SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

## EXCLUSIVE REMEDIES

THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES, HP SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

## ASSISTANCE

*Product maintenance agreements and other customer assistance agreements are available for Hewlett-Packard Products.*

*For any assistance, contact your nearest Hewlett-Packard Sales and Service Office. Addresses are provided at the back of this manual.*

# HP 85130D 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 85130D adapter kit consists of two NMD-3.5 mm to 3.5 mm adapters and a spanner wrench. The test set end of the adapters has a NMD-3.5 mm connector while the Device Under Test (DUT) end has a precision slotless 3.5 mm connector (PSC-3.5). The NMD-3.5 mm to PSC-3.5 (m) adapter is used as a connector saver on the test port of the test set. The NMD-3.5 mm to PSC-3.5 (f) adapter is used when a female test port is required.

## CONTENTS

The HP 85130D kit contains the following:

Description	Quantity	Replacement Part Number
Test port adapters		
NMD-3.5 to PSC-3.5 (m)	1	85130-60006
NMD-3.5 to PSC-3.5 (f)	1	85130-60005
Storage box, foam lined	1	85130-60009
Operating and Service Manual	1	85130-90012
Spanner wrench	1	08513-20014

## SPECIFICATIONS

Hewlett-Packard guarantees that your adapters will equal or exceed the following specifications:

DC to 8 GHz	.....	≥ 34 dB return loss
8 to 18 GHz	.....	≥ 30 dB return loss
18 to 26.5 GHz	.....	≥ 28 dB return loss

The center conductor of the NMD-3.5 mm connector should be recessed 0.0000 to 0.0022 inches (0.000 to 0.056 mm) below the mating surface of the outer conductor.

The center conductors of the 3.5 mm precision connectors (3.5 mm (m) and PSC-3.5) should be recessed 0.0001 to 0.0005 inch (0.0025 to 0.013 mm) below the mating surface of the outer conductor.

## PERFORMANCE TESTS

Using an HP 8510 Network Analyzer perform the following tests on your adapters as soon as you receive them, and periodically repeat the tests 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
3.5 mm loads (part of the HP 85052B calibration kit)	
male	85052-60010
female	85052-60011
3.5 mm 50Ω airline, 7.5 cm (part of the HP 85053B verification kit)	85053-60005

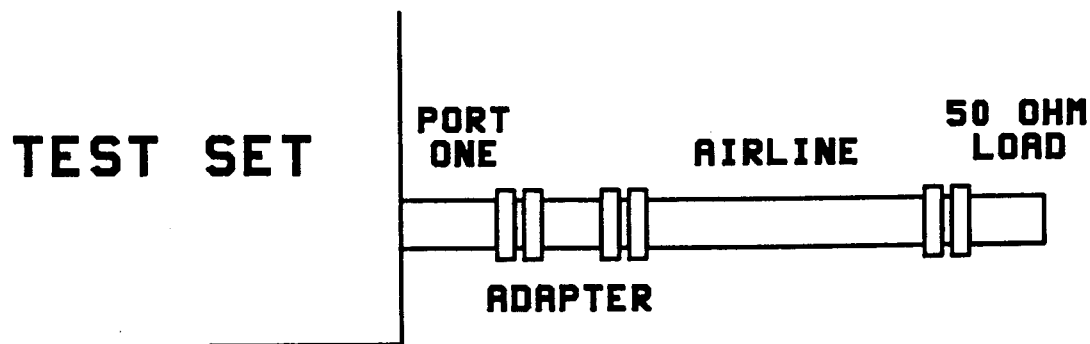


Figure 1. Return Loss set-up

**Return loss** is measured by connecting a 50-ohm fixed load termination through a 7.5 cm airline to the adapter, then attaching the adapter to port one of the test set (see *Figure 1*).

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] [2] [6] [.] [5] [G/n]**, this sets the stop frequency to 26.5 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] [.] [2] [G/n]**. This sets the stop time of the sweep to 1.2 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 2*).
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 **[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.

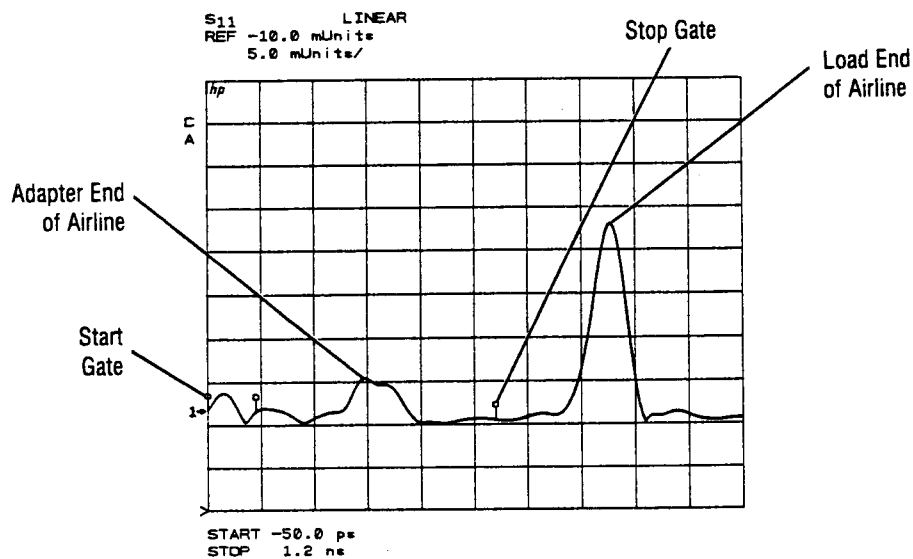


Figure 2. Location of Gates and Airline

## 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 85130D 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 85130D adapter kit.

- 3.5 mm gage kit ..... 85052-80010  
(part of the HP 85052A/B calibration kits)
- Torque wrench, 20 mm, 96 N-cm (8 in-lb) ..... 8710-1764
- Torque wrench, 5/16 inch, 96 N-cm (8 in-lb) ..... 8710-1765  
(part of the HP 85052A/B calibration kits)
- Microwave Connector Care Manual ..... 08510-90064
- Connector cleaning kit ..... 92193Z
- Non-rotating Clamp ..... 08515-60003  
(included with the HP 8515A test set)



©Copyright                      HEWLETT-PACKARD COMPANY                      1987  
1400 FOUNTAINGROVE PARKWAY, SANTA ROSA, CA 95401 U.S.A.

For more information, call your local HP sales office listed in the telephone directory white pages. Ask for the Electronic Instruments Department. Or write to Hewlett-Packard: U.S.A. - P. O. Box 10301, Palo Alto, CA 94303-0690. Europe - P.O. Box 999, 1180 AZ Amstelveen, The Netherlands. Canada - 6877 Goreway Drive, Mississauga L4V 1M8, Ontario. Japan - Yokogawa-Hewlett-Packard Ltd., 3-29-21, Takaide-Higashi, Suginami-ku, Tokyo 168. Elsewhere in the world, write to Hewlett-Packard Intercontinental, 3495 Deer Creek Road, Palo Alto, CA 94304.

MANUAL PART NO. 85130-90012  
Microfiche Part No. 85130-90013

Printed November 1987  
Printed in U.S.A.

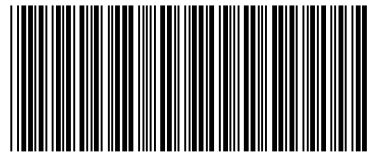
**D.S.I.**

# Contacting Agilent

<b>Online assistance:</b> <a href="http://www.agilent.com/find/assist">www.agilent.com/find/assist</a>			
<b>Americas</b>			
<b>Brazil</b> (tel) (+55) 11 4197 3700 (fax) (+55) 11 4197 3800	<b>Canada</b> (tel) 888 447 7378	<b>Mexico</b> (tel) 1 800 734 7703 (fax) 1 800 734 7704	<b>United States</b> (tel) 800 829 4444 (alt) (+1) 303 662 3998 (fax) 800 829 4433
<b>Asia Pacific and Japan</b>			
<b>Australia</b> (tel) 1 800 225 574 (alt) 1 800 893 449 (fax) 1 800 681 776 (fax) 1 800 225 539	<b>China</b> (tel) 800 810 0508 (alt) 800 810 0510 (fax) 800 810 0507 (fax) 800 810 0362	<b>Hong Kong</b> (tel) 800 933 229 (fax) 800 900 701	<b>India</b> (tel) 1600 112 929 (alt) 1600 112 626 (fax) 1600 112 727 (fax) 1600 113 040
<b>Japan (Bench)</b> (tel) 0120 32 0119 (alt) (+81) 426 56 7799 (fax) 0120 01 2144	<b>Japan (On-Site)</b> (tel) 0120 802 363 (alt) (+81) 426 56 7498 (fax) (+81) 426 60 8953	<b>Singapore</b> (tel) 1 800 275 0880 (fax) (+65) 6836 0240 (fax) (+65) 6755 1235 (fax) (+65) 6755 1214	<b>South Korea</b> (tel) 080 770 7774 (tel) 080 778 0011 (tel) 080 778 0012 (alt) +65 270 1207 (fax) 080 778 0013 (fax) +82 080 778-0014 (fax) 080 770 7778
<b>Taiwan</b> (tel) 0800 047 661 (tel) 0800 047 669 (fax) 0800 047 667	<b>Thailand</b> (tel) 1 800 2758 5822 (alt) (+66) 259 3442 (fax) 1 800 656 336	<b>Malaysia</b> (tel) 1800 880 399 (fax) 1800 801 054	
<b>Europe</b>			
<b>Austria</b> (tel) 0820 87 44 11* (fax) 0820 87 44 22	<b>Belgium</b> (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	<b>Denmark</b> (tel) (+45) 7013 1515 (alt) (+45) 7013 7313 (fax) (+45) 7013 1555	<b>Finland</b> (tel) (+358) 10 855 2100 (fax) (+358) 10 855 2923
<b>France</b> (tel) 0825 010 700* (alt) (+33) (0)1 6453 5623 (fax) 0825 010 701*	<b>Germany</b> (tel) 01805 24 6333* (alt) 01805 24 6330* (fax) 01805 24 6336*	<b>Ireland</b> (tel) (+353) (0)1 890 924 204 (alt) (+353) (0)1 890 924 206 (fax) (+353) (0)1 890 924 024	<b>Israel</b> (tel) (+972) 3 9288 500 (fax) (+972) 3 9288 501
<b>Italy</b> (tel) (+39) (0)2 9260 8484 (fax) (+39) (0)2 9544 1175	<b>Luxemburg</b> (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	<b>Netherlands</b> (tel) (+31) (0)20 547 2111 (alt) (+31) (0)20 547 2000 (fax) (+31) (0)20 547 2190	<b>Russia</b> (tel) (+7) 095 797 3963 (alt) (+7) 095 797 3900 (fax) (+7) 095 797 3901
<b>Spain</b> (tel) (+34) 91 631 3300 (alt) (+34) 91 631 3000 (fax) (+34) 91 631 3301	<b>Sweden</b> (tel) 0200 88 22 55* (alt) (+46) (0)8 5064 8686 (fax) 020 120 2266*	<b>Switzerland (French)</b> (tel) 0800 80 5353 opt. 2* (alt) (+33) (0)1 6453 5623 (fax) (+41) (0)22 567 5313	<b>Switzerland (German)</b> (tel) 0800 80 5353 opt. 1* (alt) (+49) (0)7031 464 6333 (fax) (+41) (0)1 272 7373
<b>Switzerland (Italian)</b> (tel) 0800 80 5353 opt. 3* (alt) (+39) (0)2 9260 8484 (fax) (+41) (0)22 567 5314	<b>United Kingdom</b> (tel) (+44) (0)7004 666666 (alt) (+44) (0)7004 123123 (fax) (+44) (0)7004 444555		
(tel) = primary telephone number; (alt) = alternate telephone number; (fax) = FAX number; * = in country number			



**Agilent Technologies**



85130-90012