Keysight Add Option H85 High Power Configuration Capability

To Upgrade PNA-X N5244A or N5245A Options 219, 224, 419, or 423 to include Option H8

Upgrade Kit Order Numbers: N5244AU- H85 and

N5245AU- H85

Keysight Kit Number: N5245-60108

KEYSIGHT TECHNOLOGIES

Installation Note

Notices

© Keysight Technologies, Inc. 2009-2016

No part of this manual may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Keysight Technologies, Inc. as governed by United States and international copyright laws.

Trademark Acknowledgments

Manual Part Number

N5245-90011

Edition

October 2016

Printed in USA/Malaysia

Published by:
Keysight Technologies
1400 Fountaingrove Parkway
Santa Rosa, CA 95403

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, KEYSIGHT 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. KEYSIGHT 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 KEYSIGHT 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.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

U.S. Government Rights

The Software is "commercial computer software," as defined by Federal Acquisition Regulation ("FAR") 2.101. Pursuant to FAR 12.212 and 27.405-3 and Department of Defense FAR Supplement ("DFARS") 227.7202, the U.S. government acquires commercial computer software under the same terms by which the software is customarily provided to the public. Accordingly, Keysight provides the Software to U.S. government customers under its standard commercial license, which is embodied in its End User License Agreement (EULA), a copy of which can be found at http://www.keysight.com/find/sweula The license set forth in the EULA represents the exclusive authority by which the U.S. government may use, modify, distribute, or disclose the Software. The EULA and the license set forth therein, does not require or permit, among other things, that Keysight: (1) Furnish technical information related to commercial computer software or commercial computer software documentation that is not customarily provided to the public; or (2) Relinquish to, or otherwise provide, the government rights in excess of these rights customarily provided to the public to use, modify, reproduce, release, perform, display, or disclose commercial computer software or commercial computer software documentation. No additional government requirements beyond those set forth in the EULA shall apply, except to the extent that those terms, rights, or licenses are explicitly required from all providers of commercial computer software pursuant to the FAR and the DFARS and are set forth specifically in writing elsewhere in the EULA. Keysight shall be under no obligation to update, revise or otherwise modify the Software. With respect to any technical data as defined by FAR 2.101, pursuant to FAR 12.211 and 27.404.2 and DFARS 227.7102, the U.S. government acquires no greater than Limited Rights as defined in FAR 27.401 or DFAR 227.7103-5 (c), as applicable in any technical data.

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Keysight Add Option H85 High Power Configuration Capability Upgrade Kit Order Numbers: N5244AU- H85 and N5245AU- H85
Installation Note

Description of the Upgrade

This upgrade adds Option H85 (high power configuration) to your N5244A or N5245A Option 219, 224, 419, or 423 analyzer by:

- replacing specific semirigid cables
- replacing the lower front panel overlay
- and removing the bias tees

KEYSIGHT TECHNOLOGIES

Getting Assistance from Keysight

Installing this upgrade kit requires special skills and experience. If you think you may not be qualified to do the work, or need advice, contact Keysight

Contacting Keysight

Assistance with test and measurements needs and information on finding a local Keysight office are available on the Web at:
http://www.keysight.com/find/assist

If you do not have access to the Internet, please contact your Keysight field engineer.

NOTE

In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine whether your product is still within its warranty period.

If You Have Problems With the Upgrade Kit Contents

Keysight stands behind the quality of the upgrade kit contents. If you have problems with any item in the kit, email Keysight Component Test Division (CTD) Support at support_ctd-soco@keysight.com, or telephone the CTD Hotline at (707) 577-6802 and leave a voice mail message. Please include details of the problem.

Getting Prepared

CAUTION

The PNA contains extremely sensitive components that can be ruined if mishandled. Follow instructions carefully when making cable connections, especially wire harness connections.

The person performing the work accepts responsibility for the full cost of the repair or replacement of damaged components.

To successfully install this upgrade kit, you will need the following:

- A PDF copy or a paper copy of the PNA Service Guide - refer to "Downloading the Online PNA Service Guide" below.
- An ESD-safe work area - refer to "Protecting Your Workspace from Electrostatic Discharge" below.
- Correct tools - refer to "Tools Required for the Installation" on page 7.
- Enough time - refer to "About Installing the Upgrade" on page 7.
- Test equipment for the post-upgrade adjustments. To view the equipment list, click the Chapter 3 bookmark "Tests and Adjustments" in the PDF Service Guide[1].

License Key Redemption

NOTE

The enclosed Option Entitlement Certificate is a receipt, verifying that you have purchased a licensed option for the PNA of your choice. You must now use a Keysight Web page to request a license key for the instrument that will receive the option.

To enable the option product, you must request a license key from: http://www.keysight.com/find/softwarelicense. To complete the request, you will need to gather the following information:

- From the certificate
  - Order number
  - Certificate number
- From your instrument
  - Model number
  - Serial number
  - Host ID

The instrument information is available on the network analyzer – on the analyzer's Help menu, click About Network Analyzer.

1. See "Downloading the Online PNA Service Guide" on page 6.

If you provide an email address, Keysight will promptly email your license key. Otherwise, you will your receive your license key via postal mail.

Downloading the Online PNA Service Guide

To view the online Service Guide for your PNA model number, use the following steps:

1. Go to www.keysight.com.
2. In the Search box, enter the model number of the analyzer (Ex: N5242A) and click Search.
3. Click Technical Support > Manuals.
4. Click Service Manual.
5. Click the service guide title to download the PDF file.
6. When the PDF of the Service Guide is displayed, scroll through the Contents section bookmarks to locate the information needed.

Protecting Your Workspace from Electrostatic Discharge

For information, click on the Chapter 1 bookmark, “Electrostatic Discharge Protection” in the PDF Service Guide[1].

ESD Equipment Required for the Installation

Description	Keysight Part Number
ESD grounding wrist strap	9300-1367
5-ft grounding cord for wrist strap	9300-0980
2 x 4 ft conductive table mat and 15-ft grounding wire	9300-0797
ESD heel strap (for use with conductive floors)	9300-1308

Tools Required for the Installation

Description	Qty	Part Number
T-10 TORX driver - set to 9 in-lbs (1.02 N.m)	1	N/A
T-20 TORX driver - set to 21 in-lbs (2.38 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench - set to 10 in-lbs (1.13 N.m)	1	N/A
5/16-in (8 mm) nutsetter or open end torque wrench - set to 21 in-lbs (2.38 N.m)	1	N/A

CAUTION Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections except the front panel and some rear panel cable connectors. Torque these connections to 21 in-lb.

About Installing the Upgrade

Products affected	N5244A and N5245A Option 219, 224, 419, or 423
Installation to be performed by	Keysight service center or personnel qualified by Keysight
Estimated installation time	1 hour
Estimated adjustment time	0.5 hour
Estimated full instrument calibration time	4 hours

Items Included in the Upgrade Kit

Check the contents of your kit against the following list. If any part is missing or damaged, contact Keysight Technologies. Refer to "Getting Assistance from Keysight" on page 4.

Table 1 Contents of Upgrade Kit N5242-60108

Ref Desig.	Description	Qty	Part Number
-	Installation note (this document)	1	N5245-90011
Items for Option 219 or Option 224, 2-port PNA:			
W20	Front panel port 1 CPLR THRU to A33 port 1 coupler	1	N5245-20045
W32	Front panel port 2 CPLR THRU to A36 port 2 coupler	1	N5245-20106
--	Lower front panel overlay (for PNA Option 219)	1	N5242-80014
--	Lower front panel overlay (for PNA Option 224)	1	N5245-80013
Items for Option 419 or Option 423, 4-port PNA:			
W24	Front panel port 1 CPLR THRU to A33 port 1 coupler	1	N5245-20098
W28	Front panel port 2 CPLR THRU to A36 port 2 coupler	1	N5245-20096
W20	Front panel port 3 CPLR THRU to A34 port 3 coupler	1	N5245-20099
W32	Front panel port 4 CPLR THRU to A35 port 4 coupler	1	N5245-20097
--	Lower front panel overlay (for PNA Option 419 or Option 423)	1	N5242-80016
Items for Option 423 (with Options 029 or H29)			
W124	Cable Assy-RF, CPLR to SW, Port 1 (Option H29)	1	N5245-20137
W125	Cable Assy-RF, 4P, CPLR to SW, Port 2 (Option H29/029)	1	N5245-20138
W159	Cable Assy-RF, 4P, CPLR to SW, Port 1 (Option 029)	1	N5245-20162
--	Overlay, Lower, 4 Port (Option H85/029)	1	N5245-80024
--	Overlay, Lower, 4 Port (Option H85/H29)	1	N5242-80019
Items for Option 224 (with Option 029)			
W157	Cable Assy-RF, 2P, CPLR to SW, Port 1 (Option 029)	1	N5245-20160
W158	Cable Assy-RF, 2P, CPLR to SW, Port 2 (Option 029)	1	N5245-20161
--	Overlay, Lower, 2 Port (Option H85/029)	1	N5245-80025

Installation Procedure for the Upgrade

The network analyzer must be in proper working condition prior to installing this option. Any necessary repairs must be made before proceeding with this installation.

WARNING

This installation requires the removal of the analyzer's protective outer covers. The analyzer must be powered down and disconnected from the mains supply before performing this procedure

Overview of the Installation Procedure

"Step 1. Obtain a Keyword and Verify the Information."

"Step 2. Remove the Outer Cover."

"Step 3. Remove the Front Panel Assembly."

"Step 4. Remove the Bias Tees."

"Step 5. Discard the Semirigid Bias Tee Cables."

"Step 6. Install the New Semirigid Cables."

"Step 7. Replace the Lower Front Panel Overlay."

"Step 8.Reinstall Front Panel Assembly."

"Step 9. Reassemble the PNA."

"Step 10. Position the Cables and Wires to Prevent Pinching."

"Step 11.Reinstall the Outer Cover."

"Step 12. Enable Option H85."

"Step 13. Perform Post-Upgrade Adjustments and Calibration."

Step 1.Obtain a Keyword and Verify the Information

Follow the instructions on the Option Entitlement Certificate supplied to obtain a license key for installation of this upgrade. Refer to "License Key Redemption" on page 5.

Verify that the model number, serial number, and option number information on the license key match those of the instrument on which this upgrade will be installed.

If the model number, serial number, or option number do not match those on your license key, you will not be able to install the option. If this is the case, contact Keysight for assistance before beginning the installation of this upgrade. Refer to "Contacting Keysight" on page 4.

Once the license key has been received and the information verified, you can proceed with the installation at step 2.

Step 2. Remove the Outer Cover

For instructions, click the Chapter 7 bookmark "Removing the Covers" in the PDF Service Guide[1].

Step 3.Remove the Front Panel Assembly

For instructions, click the Chapter 7 PDF bookmark “Removing and Replacing the Front Panel Assembly” in the online Service Guide[1].

Step 4.Remove the Bias Tees

For instructions, click the Chapter 7 PDF bookmark “Removing and Replacing the A42-A45 Bias Tees” in the online Service Guide[1].

Step 5.Discard the Semirigid Bias Tee Cables

Since the bias tees will not be reinstalled, the semirigid cables disconnected in the previous step (4 cables for a 2-port PNA, or 8 cables for a 4-port PNA) may be discarded.

Step 6.Install the New Semirigid Cables

For PNA Option 219 or Option 224

Install the following semirigid cables in the order listed. To see an image showing the location of these cables, click the Chapter 6 PDF bookmark “Bottom RF Cables, Standard 2-Port Configuration, Option 200” in the online Service Guide1. (The Option 200 image is used because the bias tees, normally included with Option 219 and Option 224, have been removed.) New parts are listed in Table 1 on page 8.

– W20 (N5245-20045) Front panel port 1 CPLR THRU to A33 port 1 coupler

– W32 (N5245-20106) Front panel port 2 CPLR THRU to A36 port 2 coupler

For PNA Option 419 or Option 423

Install the following semirigid cables in the order listed. To see an image showing the location of these cables, click the Chapter 6 PDF bookmark “Bottom RF Cables, Standard 4-Port Configuration, Option 400” in the online Service Guide[1]. (The Option 400 image is used because the bias tees, normally included with Option 419 and Option 423, have been removed.) New parts are listed in Table 1 on page 8.

– W28 (N5245-20096) Front panel port 2 CPLR THRU to A36 port 2 coupler

1. See “Downloading the Online PNA Service Guide” on page 6.

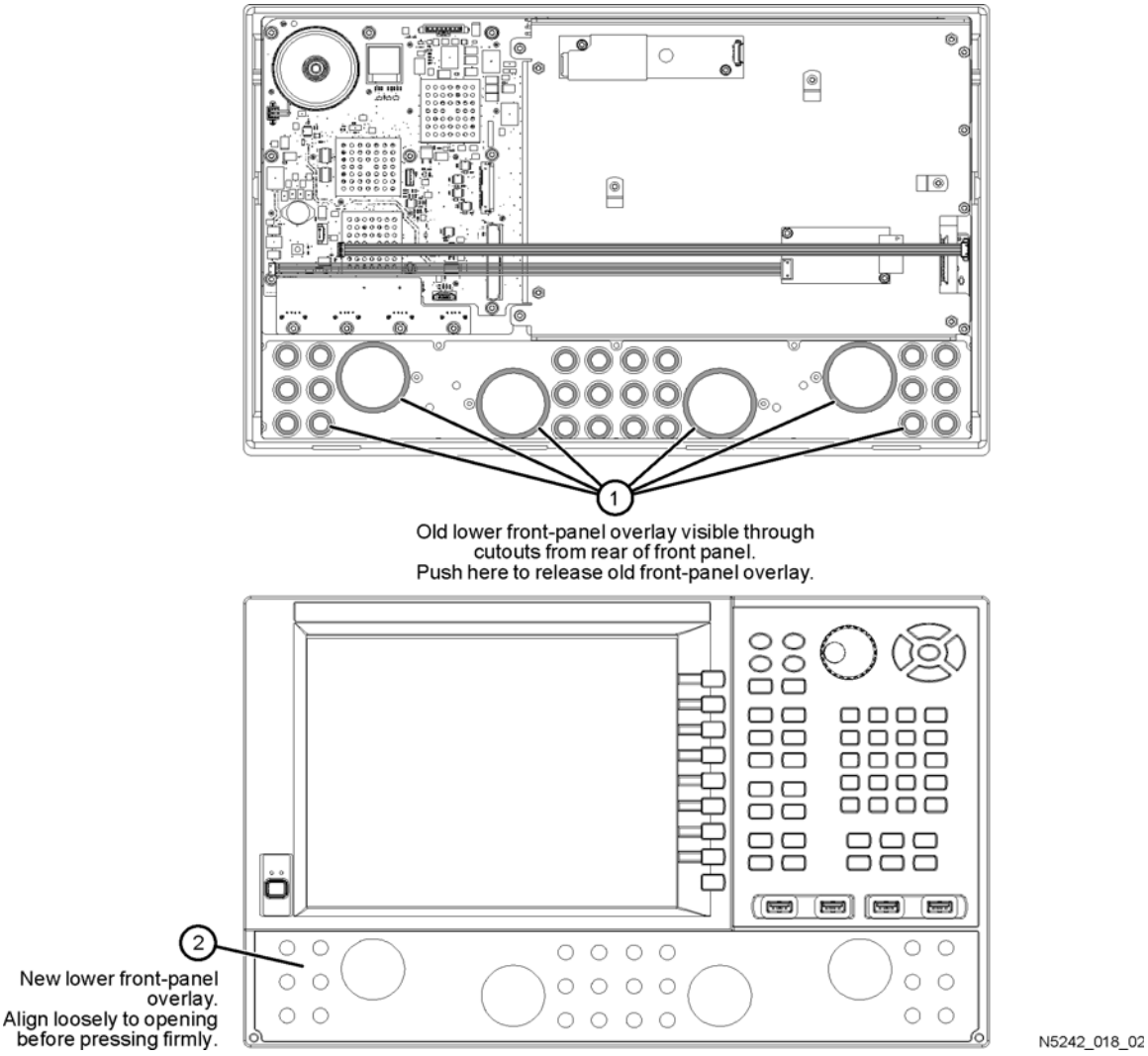
– W32 (N5245-20097) Front panel port 4 CPLR THRU to A35 port 4 coupler
– W24 (N5245-20098) Front panel port 1 CPLR THRU to A33 port 1 coupler
– W20 (N5245-20099) Front panel port 3 CPLR THRU to A34 port 3 coupler

Step 7.Replace the Lower Front Panel Overlay

Refer to Figure 1 on page 12 for this step of the procedure. New parts are listed in Table 1 on page 8.

1. From the back side of the front panel, use a blunt object in the cutouts in the lower front dress panel to push on the old overlay (item ?) and separate it from the front dress panel.
2. From the front side of the front panel, pull off the overlay completely and discard it.
3. Remove any adhesive remaining on the front panel.
4. Remove the protective backing from the new front panel overlay (item ?).
5. Loosely place the overlay in the recess on the lower front panel.
6. Placing the index finger of both hands at the middle, press the overlay firmly onto the frame while sliding your fingers in opposite directions towards an end of the overlay. Repeat on all areas of the overlay.

Figure 1 Lower Front Panel Overlay Replacement



Step 8.Reinstall Front Panel Assembly

For instructions on reinstalling the front panel assembly, click the Chapter 7 PDF bookmark “Removing and Replacing the Front Panel Assembly” in the online Service Guide[1].

Step 9. Reassemble the PNA

For instructions, click the Chapter 7 PDF bookmark “Removing and Replacing the A42-A45 Bias Tees” in the online Service Guide[1]. Refer to the “Replacement Procedure,” ignoring those instructions concerning the bias tees (since they are not being reinstalled).

Step 10.Position the Cables and Wires to Prevent Pinching

On the top side of the PNA, carefully position the grey flex cables so they can’t be pinched between the covers and the rails.

On the bottom side of the PNA, carefully fold or push down the ribbon cables and wires so they can’t be pinched between the hardware and the outer cover. Ribbon cables and wires must never be positioned on top of hardware.

Step 11.Reinstall the Outer Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide[1].

Step 12.Enable Option H85

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure
- The Network Analyzer program must be running.
- Obtain a license key for installation of this upgrade by following the instructions on the supplied Option Entitlement Certificate.

Option Enable Procedure

1. To start the option enable utility, press UTILITY , then , then . An option enable dialog box will appear.
2. Click the arrow in the Select Desired Option box. A list of available options will appear.
3. In the Select Desired Option list, click H85 - Delete Bias Ts.
4. Using the keyboard, enter the license key in the box provided. The license key is printed on the license message you received from Keysight. Enter this key exactly as it is printed on the message.

1. See “Downloading the Online PNA Service Guide” on page 6.

5. Click Enable.
6. Click Yes in answer to the displayed question in the Restart Analyzer? box.
7. When the installation is complete, click Exit.

Option Verification Procedure

Once the analyzer has restarted and the Network Analyzer program is again running:

1. On the analyzer's Help menu, click About Network Analyzer.
2. Verify that "H85" is listed after "Options:" in the display. Click OK.

NOTE

If Option H85 has not been enabled, perform the Option Enable Procedure again. If the option is still not enabled, contact Keysight Technologies. Refer to "Getting Assistance from Keysight" on page 4.

Step 13.Perform Post-Upgrade Adjustments and Calibration

Adjustments

The following adjustments must be made due to the hardware changes of the analyzer.

– source adjustment

– receiver adjustment

These adjustments are described in the PNA Service Guide and in the PNA on-line HELP. A list of equipment required to perform these adjustments is also found in the service guide.

To view this service guide information, click the Chapter 3 PDF bookmark "Tests and Adjustments" in the online Service Guide[1].

After the specified adjustments have been performed, the analyzer should operate and phase lock over its entire frequency range.

Operator's Check

Perform the Operator's Check to check the basic functionality of the analyzer. For instructions, click the Chapter 3 PDF bookmark "Tests and Adjustments" in the online Service Guide[1].

If you experience difficulty with the basic functioning of the analyzer, contact Keysight. Refer to "Contacting Keysight" on page 4.

Calibration

1. See "Downloading the Online PNA Service Guide" on page 6.

Although the analyzer functions, its performance relative to its specifications has not been verified. It is recommended that a full instrument calibration be performed using the analyzer's internal performance test software. To view information on the performance test software in the service guide, click the Chapter 3 PDF bookmark "Tests and Adjustments" in the online Service Guide[1].

This information is subject to change without notice.
© Keysight Technologies 2009-2016
January 2016

N5245-90011
www.keysight.com

KEYSIGHT
TECHNOLOGIES