

Keysight Add Configurable Test Set and Source Attenuators Upgrade Kit

To Upgrade PNA N5231A/B or N5232A/B Option 400 to Option 416

Upgrade Kit Order Numbers: N5231AU-416, N5232AU-416, N5231BU-416, or N5232BU-416

Keysight Kit Number: N5232-60102

Notices

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Manual Part Number

N5232-90102

Edition

Edition 2, September 2019
Supersedes: May 2017

Printed in USA/Malaysia

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

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Description of the Upgrade

NOTE

Some of the assembly drawings in this document may be different from your instrument, but the process is similar for both an "A" model and "B" model instruments.

This upgrade adds the following items to your N5231A/B Option 400 or N5232A/B Option 400 network analyzer:

- 60 dB source step attenuators with brackets and wire harnesses
- front panel jumpers
- cable guards for front panel jumpers
- front panel overlay replacement
- new cables

After installation of this upgrade, your analyzer will be an N5231A/B Option 416 or N5232A/B Option 416.

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, refer to www.keysight.com and the **Contact Keysight** link.

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 license key - refer to **“License Key Redemption”** below.
- 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 and full instrument calibration. To view the equipment list, click the Chapter 3 bookmark “Tests and Adjustments” in the PDF Service Guide¹.

License Key Redemption

NOTE

The only difference between an A model license key redemption and a B model is that the A model uses a 12-character license key and the B model uses a license key file.

NOTE

Ensure that you are connected to an external server, before attempting to download your email and license key file.

If you are unfamiliar with the licensing process, for A models, refer to the <http://literature.cdn.keysight.com/litweb/pdf/N5235-90110.pdf> or for B models, refer to the <http://literature.cdn.keysight.com/litweb/pdf/N5242-90024.pdf>.

To enable the option product, you must request license key(s) (A models) or license key files(s) (B models) from the Keysight Software Manager: <http://www.keysight.com/find/softwaremanager>.

To complete the request, you will need to gather the following information:

- From the certificate
 - Order number

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

Getting Prepared

- Certificate number
- From your instrument
(Instrument information is available in the network analyzer - on the toolbar, click Help, then click About Network Analyzer.)
 - Model number
 - Serial number
- **A models ONLY:** From the online Keysight HostID utility
Part of the OEC procedure to obtain the 12-digit license key online requires you to provide the HostID number of the PNA. This HostID number is NOT the one currently shown on the PNA. To find your new HostID, go to <http://www.na.support.keysight.com/pna/upgrades.html> and, using the HostID utility, enter the PNA serial number and your new, upgraded PNA-L model number - N5231A/B and N5232A/B.
 - Host ID

Using the information just gathered, you must request license key(s) for your A model or for your B models, a license key file(s) from the Keysight Software Manager: <http://www.keysight.com/find/softwaremanager>.

You will need to provide an email address, Keysight will promptly email your A model license key(s) or a for a B model, license key file(s) attachment message. Refer to **“License Key Redemption” on page 5**.

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: N5227A) 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 Guide¹.

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

CAUTION

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

About Installing the Upgrade

Products affected	N5231A/B and N5232A/B Option 400
Installation to be performed by	Keysight service center or personnel qualified by Keysight
Estimated installation time	2 hours
Estimated adjustment time	0.5 hours
Estimated full instrument calibration time	4.5 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 N5232-60102**

Ref Desig.	Description	Qty	Part Number
--	Installation note (this document)	1	N5232-90102
--	Software Entitlement Certificate	1	5964-5145
--	China RoHS Addendum	1	9320-6722
A29	Source 60 dB step attenuator	1	33321-60082
--	Bracket (for A29 source 60 dB step attenuator)	1	N5235-00012
--	Machine screw, M3 x 8, pan head (to attach bracket to step attenuator; to attach attenuator assembly to deck)	5	0515-0372
--	Cable clamp	13	1400-1334
--	Front panel overlay - "A" Models	1	N5232-80006
--	Front panel overlay - "B" Models	1	N5232-80011
--	Front panel jumper cable guard - "A" Models	1	N5232-00004
		4	N5232-00003
--	Front panel jumper cable guard - "B" Models	1	N5232-00007
		4	N5232-00006
--	Dust caps for test ports	4	1401-0214
W30	RF cable, front panel jumper	9	N5222-20091
W42	RF cable, A20 MASSQuad (main out) to A29 60 dB step attenuator	1	N5232-20057
W43	RF cable, A20 MASSQuad (main switch input) to A29 60 dB step attenuator	1	N5232-20056
W44	RF cable, A20 MASSQuad (A) to PORT 1 SOURCE OUT	1	N5232-20050
W45	RF cable, A20 MASSQuad (B) to Port 2 SOURCE OUT	1	N5232-20058
W46	RF cable, A20 MASSQuad to Port 3 SOURCE OUT	1	N5232-20060
W47	RF cable, A20 MASSQuad (D) to Port 4 SOURCE OUT	1	N5232-20062
W48	RF cable, PORT 1 CPLR THRU to A25 test port 1 bridge coupler (thru)	1	N5232-20051
W49	RF cable, PORT 2 CPLR THRU to A26 test port 2 bridge coupler (thru)	1	N5232-20051
W50	RF cable, PORT 3 CPLR THRU to A27 test port 3 bridge coupler (thru)	1	N5232-20051

Table 1 Contents of Upgrade Kit N5232-60102

Ref Desig.	Description	Qty	Part Number
W51	RF cable, PORT 4 CPLR THRU to A28 test port 4 bridge coupler (thru	1	N5232-20051
W52	RF cable, A25 test port 1 bridge coupler (arm) to PORT 1 CPLR ARM	1	N5232-20052
W53	RF cable, A26 test port 2 bridge coupler (arm) to PORT 2 CPLR ARM	1	N5232-20052
W54	RF cable, A27 test port 3 bridge coupler (arm) to PORT 3 CPLR ARM	1	N5232-20052
W55	RF cable, A28 test port 4 bridge coupler (arm) to PORT 4 CPLR ARM	1	N5232-20052
W56	RF cable, A20 MASSQuad (Ref) to Reference SOURCE OUT	1	N5232-20054
W57	RF cable, Port 1 RCVR A IN to A24 mixer brick	1	N5232-20053
W58	RF cable, Port 2 RCVR B IN to A24 mixer brick	1	N5232-20059
W59	RF cable, Port 3 RCVR C IN to A24 mixer brick	1	N5232-20061
W60	RF cable, Port 4 RCVR D IN to A24 mixer brick	1	N5232-20063
W61	RF cable, Reference RCVR R1 IN to A24 mixer brick	1	N5232-20055
--	Wire harness, A19 test set motherboard J8 to A29 60 dB step attenuator	1	8121-0982

NOTE

Extra quantities of items such as protective plastic caps, screws, cable ties, and cable clamps may be included in this upgrade kit. It is normal for some of these items to remain unused after the upgrade is completed.

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 Inner Cover."
- "Step 4. Remove the Front Panel Assembly."
- "Step 5. Remove Some Existing Cables."
- "Step 6. Assemble the A29 Source Attenuator Assembly."
- "Step 7. Install the A29 Source Attenuator Assembly."
- "Step 8. Install the Cables."
- "Step 9. Secure the Hex Nuts on the Front Panel Bulkhead Connectors."
- "Step 10. Remove the Old Lower Front Panel Overlay."
- "Step 11. Reinstall Front Panel Assembly."
- "Step 12. Install the New Lower Front Panel Overlay."
- "Step 13. Install Front Panel Jumpers."
- "Step 14. Reinstall the Inner Cover."
- "Step 15. Reinstall the Outer Cover."
- "Step 17. Remove Option 400 License."
- "Step 17. Enable Options 416."
- "Step 18. Perform Post-Upgrade Adjustments and Calibration."
- "Step 19. Prepare the PNA for the User."

Step 1. Obtain a Keyword and Verify the Information

Follow the instructions on the Software 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 (A models) or license key file (B models) has been received and the information verified, you can proceed with the installation at [“Step 2. Remove the Outer Cover” on page 11](#).

NOTE

If the model number, serial number, or option number do not match those on your license key (A models) or license key file (B models), 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](#).

Step 2. Remove the Outer Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide¹.

Step 3. Remove the Inner Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide¹.

Step 4. Remove the Front Panel Assembly

For instructions, click the Chapter 7 bookmark “Removing and Replacing the Front Panel Assembly” in the PDF Service Guide¹.

1. See [“Downloading the Online PNA Service Guide” on page 6](#).

Step 5. Remove Some Existing Cables

NOTE

Leave the gray flexible cables, the wire harnesses, and the ribbon cables connected where possible. Any that are removed should be labeled for reconnection later.

NOTE

Be careful not to damage the center pins of the semi-rigid cables. Some flexing of the cables may be necessary but do not over-bend them.

NOTE

When removing a cable, also remove the plastic cable clamp, if present. It is normal for some of the cable clamp's adhesive to remain.

1. Place the analyzer bottom-side up on a flat surface.

Remove the following cables. To see an image showing the location of these cables, click the Chapter 6 bookmark "Bottom RF Cables, Standard 4-Port Configuration, Option 400" in the PDF Service Guide¹.

These RF cables may be discarded - they will not be reinstalled.

- W34 (N5232-20044) A20 MASSQuad B to A26 test port 2 bridge coupler (thru)
- W32 (N5232-20064) A20 MASSQuad jumper cable
- W33 (N5232-20046) A20 MASSQuad A to A25 test port 1 bridge coupler (thru)
- W38 (N5232-20043) A26 test port 2 bridge coupler (arm) to A24 mixer brick
- W37 (N5232-20045) A25 test port 1 bridge coupler (arm) to A24 mixer brick
- W35 (N5232-20042) A20 MASSQuad C to A27 test port 3 bridge coupler (thru)
- W36 (N5232-20040) A20 MASSQuad D to A28 test port 4 bridge coupler (thru)
- W40 (N5232-20039) A28 test port 4 bridge coupler (arm) to A24 mixer brick
- W41 (N5232-20047) A20 MASSQuad to mixer brick
- W39 (N5232-20041) A27 test port 3 bridge coupler (arm) to A24 mixer brick

These cables must be saved - they will be reinstalled.

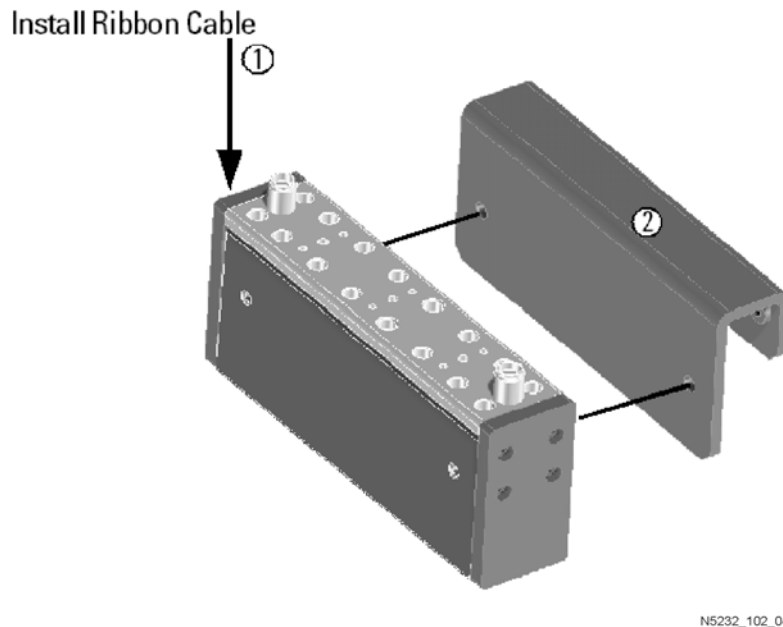
- W10 (N5232-20081) A24 mixer brick to test set deck cable bracket
- W9 (top-side cable) (N5235-20041) A10 13.5 GHz LO Synthesizer board to test set deck cable bracket
- W31 (N5232-20049) A20 MASSQuad to test set deck cable bracket

Step 6. Assemble the A29 Source Attenuator Assembly

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

1. Gather the A29 source attenuator (33321-60082) and install the ribbon cable (8121-0982).
2. Install bracket N5235-00012 on the source attenuator using two screws (0515-0372) with the bracket. Use a T-10 TORX driver set to 9 in-lbs to tighten the screws.

Figure 1 Source Attenuator Assembly

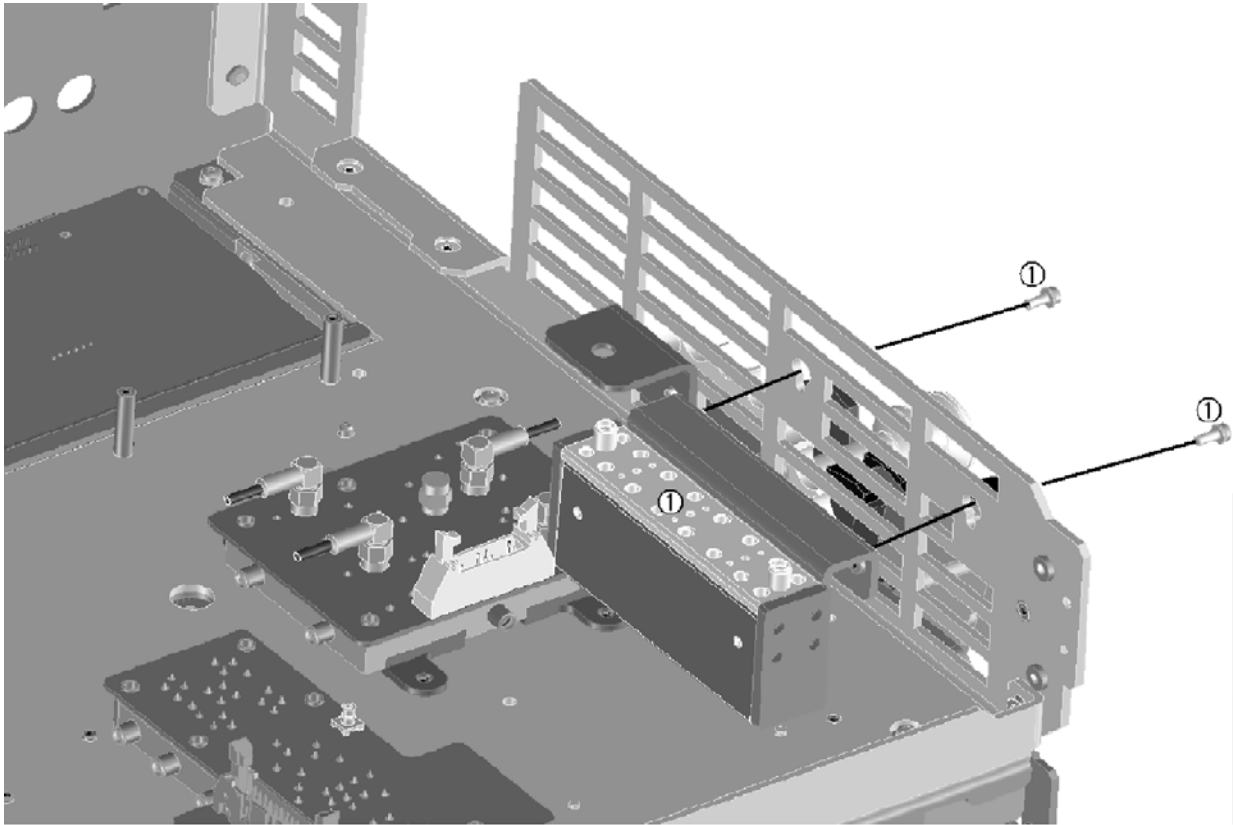


Step 7. Install the A29 Source Attenuator Assembly

Refer to **Figure 2** for this step of the procedure. New parts are listed in **Table 1 on page 8**.

1. Install the A29 source attenuator assembly to the side of the chassis as shown, using two screws (0515-0372). Use a T-10 TORX driver set to 9 in-lbs to tighten the screws.

Figure 2 Source Attenuators Installation



N5232_102_05

Step 8. Install the Cables

CAUTION

Follow instructions carefully when making cable connections, especially wire harness connections. Incorrect connections can destroy components, resulting in additional customer costs.

CAUTION

Be careful not to damage the center pins of the semi-rigid cables. Some flexing of the cables may be necessary but do not over-bend them.

CAUTION

Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections except the front and rear panel bulkhead connectors. On these, use a 9 mm nutsetter or open end torque wrench set to 21 in-lb.

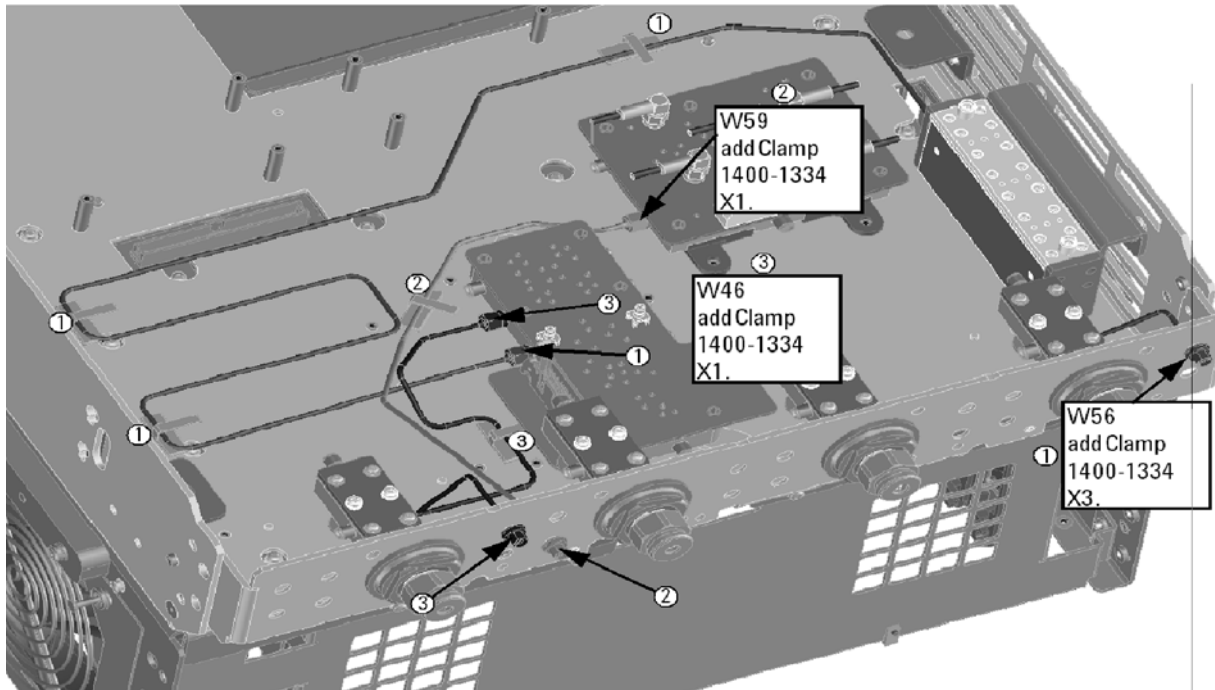
Install the Semi-rigid Cables

To see an image showing the location of these cables, click the Chapter 6 bookmarks “Bottom RF Cables, 4-Port Configuration, Option 416” in the PDF Service Guide¹. New parts are listed in **Table 1 on page 8**.

Install the following new cables in the order listed.

- W56 (N5232-20054) A20 MASSQuad (Ref) to Reference SOURCE OUT
 - * As shown in **Figure 3**, install three cable clamps (part number 1400-1334) to secure W56 (part number N5232-20054).

Figure 3 Location of Cable Clamps to Secure W46, W56, and W59

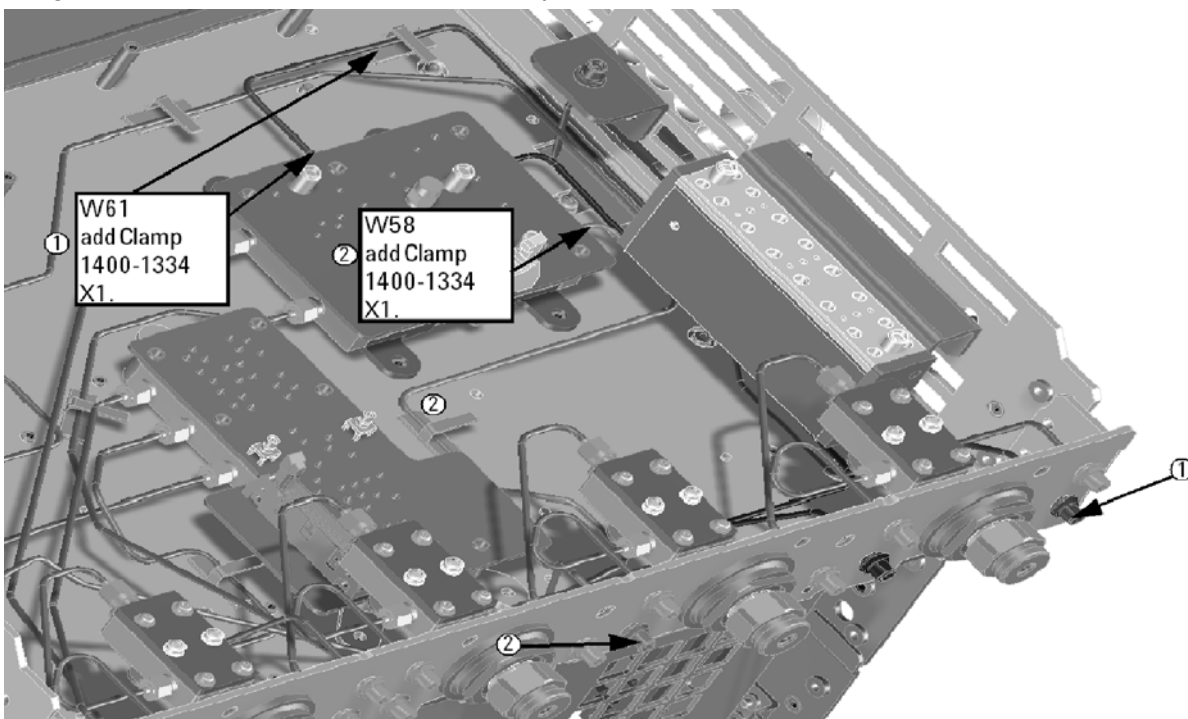


N5232_102_01

- W59 (N5232-20061) Port 3 RCVR C IN to A24 mixer brick
 - * As shown in **Figure 3**, install one cable clamp (part number 1400-1334) to secure W59 (part number N5232-20061).
- W46 (N5232-20060) A20 MASSQuad to Port 3 SOURCE OUT
 - * As shown in **Figure 3**, install one cable clamp (part number 1400-1334) to secure W46 (part number N5232-20060).
- W60 (N5232-20063) Port 4 RCVR D IN to A24 mixer brick
- W47 (N5232-20062) A20 MASSQuad (D) to Port 4 SOURCE OUT
- W31 (reuse) (N5232-20049) A20 MASSQuad to test set deck cable bracket
- W61 (N5232-20055) Reference RCVR R1 IN to A24 mixer brick
 - * As shown in **Figure 4**, install one cable clamp (part number 1400-1334) to secure W61 (part number N5232-20055).

1. See [“Downloading the Online PNA Service Guide” on page 6.](#)

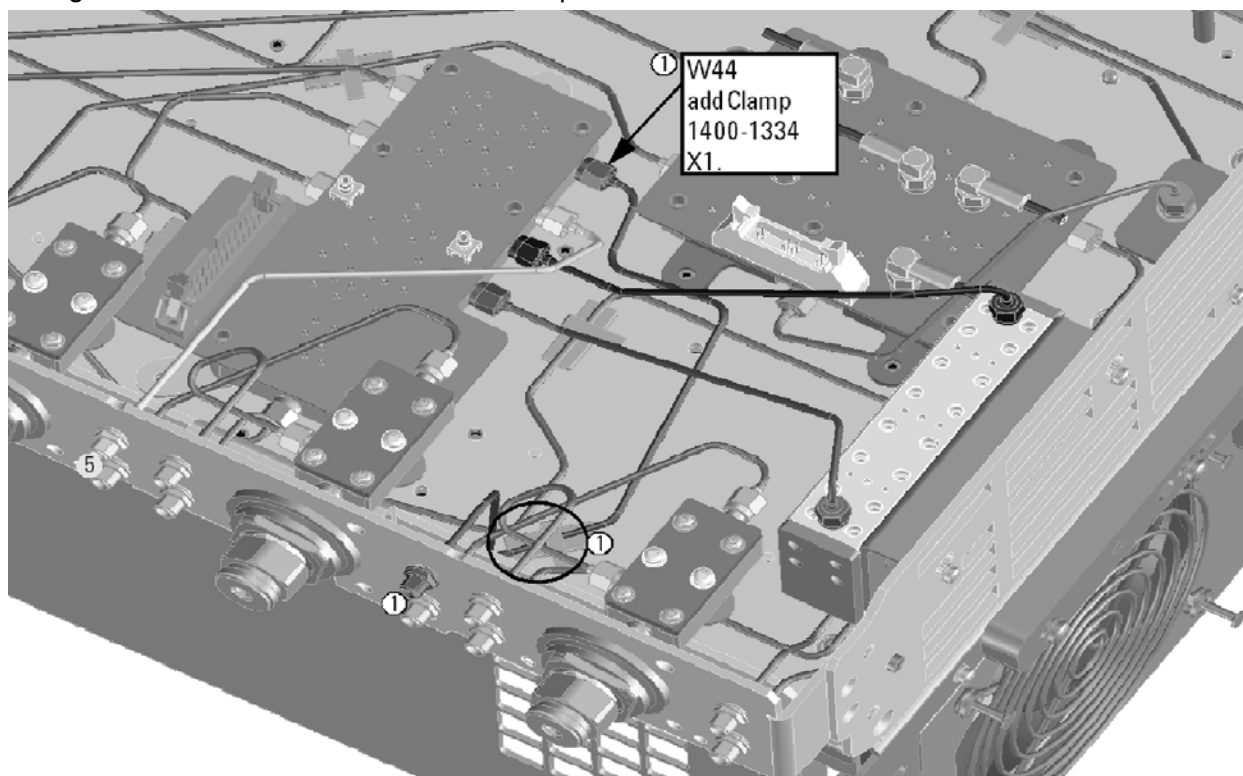
Figure 4 Location of Cable Clamps to Secure W61 and W58



N5232_102_02

- W58 (N5232-20059) Port 2 RCVR B IN to A24 mixer brick
 - * As shown in **Figure 4**, install one cable clamp (part number 1400-1334) to secure W58 (part number N5232-20059).
- W57 (N5232-20053) Port 1 RCVR A IN to A24 mixer brick
- W9 (reuse) (N5235-20041) A10 13.5 GHz LO Synthesizer board to test set deck cable bracket
- W44 (N5232-20050) A20 MASSQuad (A) to PORT 1 SOURCE OUT
 - * As shown in **Figure 5**, install one cable clamp (part number 1400-1334) to secure W44 (part number N5232-20050).

Figure 5 Location of Cable Clamps to Secure W44



N5232_102_03

- W10 (reuse) (N5232-20081) A24 mixer brick LO In to test set deck cable bracket
- W43 (N5232-20056) A20 MASSQuad (main switch input) to A29 60 dB step attenuator
- W42 (N5232-20057) A20 MASSQuad (main out) to A29 60 dB step attenuator
- W45 (N5232-20058) A20 MASSQuad (B) to Port 2 SOURCE OUT
- W48 (N5232-20051) PORT 1 CPLR THRU to A25 test port 1 bridge coupler (thru)
- W49 (N5232-20051) PORT 2 CPLR THRU to A26 test port 2 bridge coupler (thru)
- W50 (N5232-20051) PORT 3 CPLR THRU to A27 test port 3 bridge coupler (thru)
- W51 (N5232-20051) PORT 4 CPLR THRU to A28 test port 4 bridge coupler (thru)
- W52 (N5232-20052) A25 test port 1 bridge coupler (arm) to PORT 1 CPLR ARM
- W53 (N5232-20052) A26 test port 2 bridge coupler (arm) to PORT 2 CPLR ARM

- W54 (N5232-20052) A27 test port 3 bridge coupler (arm) to PORT 3 CPLR ARM
- W55 (N5232-20052) A28 test port 4 bridge coupler (arm) to PORT 4 CPLR ARM

Install the Wire Harnesses

To see an image showing the location of this wire harnesses, click the Chapter 6 bookmarks “Bottom Ribbon Cables and Wire Harnesses, 4-Port, Option 416” in the PDF Service Guide¹. New parts are listed in **Table 1 on page 8**.

If not already done, connect these wire harnesses:

- 8121-0982 A19 test set motherboard J8 to A29 60 dB step attenuator

Step 9. Secure the Hex Nuts on the Front Panel Bulkhead Connectors

Some of the new cables that were installed in the previous step connect to the front panel bulkhead. These cables were shipped with hex nuts. If not already done, secure the cable connectors to the front panel bulkhead with the hex nuts, torquing to 21 in-lbs.

Step 10. Remove the Old Lower Front Panel Overlay

Refer to **Figure 5-1** for this step of the procedure. New parts are listed in **Table 1 on page 8**.

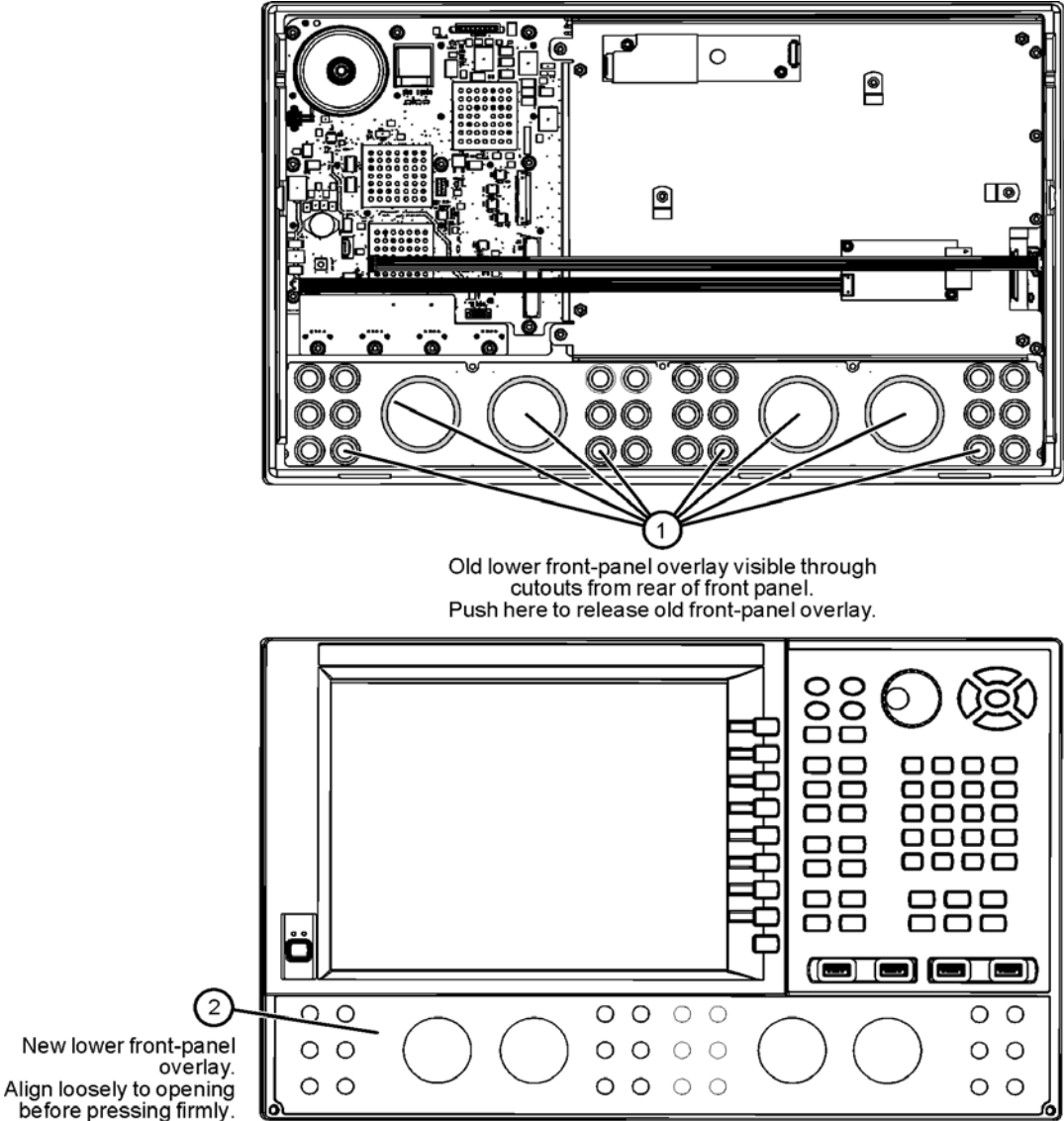
1. From the back side of the front panel, use a blunt object in the cutouts in the lower front dress panel to push on the old overlay (item ①) and separate it from the front dress panel.
2. From the front side of the front panel, pull off the overlay completely and discard it.
3. Remove any adhesive remaining on the front panel.

NOTE

IMPORTANT! To avoid possible damage to the lower front panel overlay, do not attempt to attach the lower front panel label until **“Step 12. Install the New Lower Front Panel Overlay” on page 20**.

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

Figure 5-1 Lower Front Panel Overlay Replacement



N5225_105_04

Step 11. Reinstall Front Panel Assembly

For instructions on reinstalling the front panel assembly, click the Chapter 7 bookmark “Removing and Replacing the Front Panel Assembly” in the PDF Service Guide¹.

Step 12. Install the New Lower Front Panel Overlay

Refer to **Figure 5-1 on page 19** for this step of the procedure. New parts are listed in **Table 1 on page 8**.

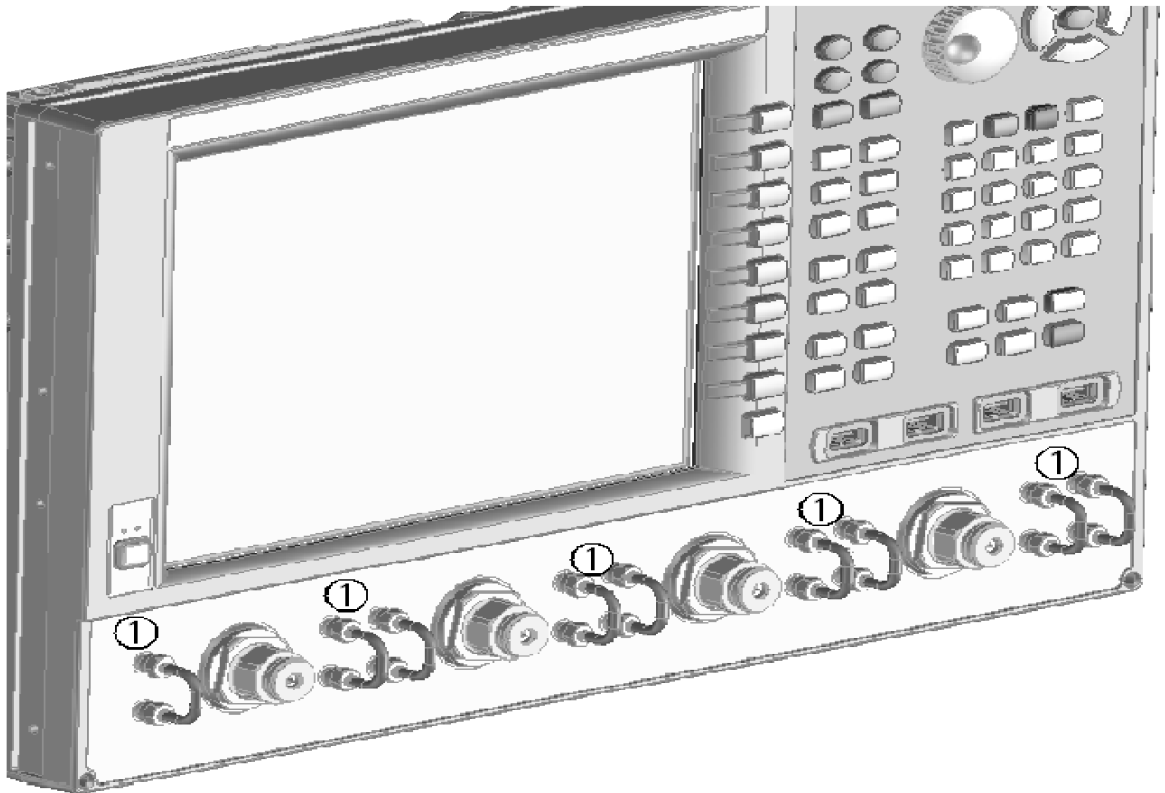
1. Remove the protective backing from the new front panel overlay, N5227-80015 (item ②).
2. Starting from either side, **loosely** place the overlay in the recess on the lower front panel, ensuring that it fits tightly against the edges of the recess.
3. Once the overlay is in place, press it firmly onto the frame to secure it.
4. Be sure to install the two new screws (0515-1946) in the front panel, next to test ports 3 and 4. Torque these screws to 9 in-lbs.

Step 13. Install Front Panel Jumpers

As shown in **Figure 6**, install nine front panel jumper cables (part number N5222-20091). Torque to 10 in-lbs.

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

Figure 6 Front Panel Jumper Cables Installation



N5232_102_06

Step 14. Reinstall the Inner Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide¹.

Step 15. Reinstall the Outer Cover

For instructions, click the Chapter 7 bookmark “Removing the Covers” in the PDF Service Guide¹.

Step 17. Remove Option 400 License

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must **not** be running.
- A keyboard and mouse must be connected to the network analyzer.

1. See [“Downloading the Online PNA Service Guide” on page 6](#).

A Model Option 400 License Removal Procedure

For B models, refer to [“B Model Option 400 License Removal Procedure.”](#)

1. To start the option enable utility, press UTILITY **System**, then **Service**, then **Option Enable**. 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 **400**.
4. Click **Remove**.

B Model Option 400 License Removal Procedure

For A models, refer to [“A Model Option 400 License Removal Procedure.”](#)

1. To start the Keysight License Manager, press Start > Keysight License Manager > Keysight License Manager. A Keysight License Manager dialog box will appear.
2. Right click the on the desired option.
3. In the Select Desired Option list, click **400** and click **Delete**.
4. Click **Remove**.
5. A message displays stating that the option removal was successful.

Step 17. Enable Options 416

Procedure Requirements

- The analyzer must be powered up and operating to perform this procedure.
- The Network Analyzer program must **not** be running.
- Refer to the license message you received from Keysight: Verify that the analyzer’s model and serial numbers match those on the license message you received from Keysight.
- A keyboard and mouse must be connected to the network analyzer.

For "A" models, refer to [“Option Enable Procedure for "A" Model Instruments” on page 22.](#)

For "B" models refer to [“Option Enable Procedure for "B" Model Instruments ” on page 23.](#)

Option Enable Procedure for "A" Model Instruments

1. To start the option enable utility, press UTILITY **System**, then **Service**,

then **Option Enable** . 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 **416 - Configurable Test Set**.
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.
5. Click **Enable**.

"A" Model 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 "416" is listed after "Options:" in the display. Click **OK**.

NOTE

If Option 416 has not been enabled, contact Keysight Technologies. Refer to ["Getting Assistance from Keysight" on page 4](#).

Option Enable Procedure for "B" Model Instruments

NOTE

For this step, you will need a USB flash drive.
A single license may contain more than one feature.

1. Locate the email(s) from Keysight which contain license file attachments. These emails are a result of Step 3 on ["License Key Redemption" on page 5](#).
2. Copy the license file(s) from the email(s) to the root directory of the USB flash drive.
More than one license file may be copied to the USB flash drive.

NOTE

A single license may contain more than one feature.

Verifying and editing the license file:

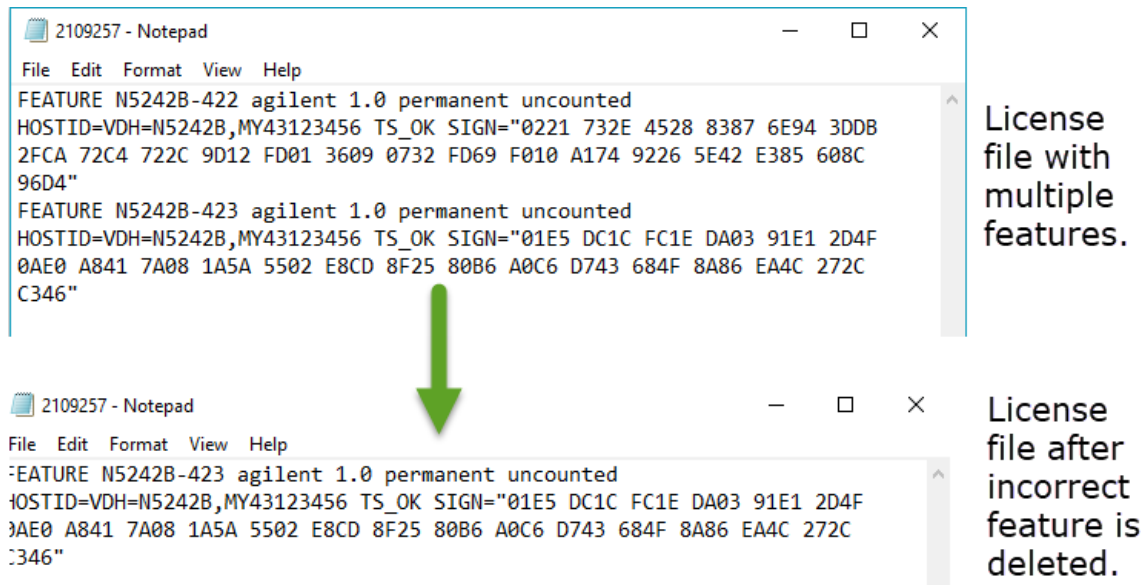
For these steps, refer to the example in [Figure 6-1 on page 24](#).

- a. Verify your USB flash drive is connected to a PC.

- b. Open your license file using a text read/write program similar to Notepad.
- c. If you have more than one licensed feature, delete the feature that is **not** required for this upgrade. (e.g., in this case N5242B-422 is the correct upgrade. So, N5242B-422 is to be deleted from the text file.)

Figure 6-1 Editing a Keysight License File Using a Text Editor.

Note: This figure may not contain your specific features and is an example only. In this example N5242B-422 is the incorrect feature. N5242B-423 is the correct feature.



- d. Re-save the text license file to the root directory of your USB flash drive.
- e. Verify that only the single correctly edited text license file is in the root directory of your USB drive.
- f. Eject your USB flash drive and remove the USB flash drive from your PC.

NOTE

Attempting to re-install a license file that is already installed may generate a "Corrupt Media" error message. Ignore this message.

"B" Model Option Verification Procedure

NOTE

If the option has not been enabled, contact Keysight Technologies. Refer to **"Getting Assistance from Keysight" on page 4.**

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

1. Start the Network Analyzer program.
2. Once the Network Analyzer program is running:
 - Press **Help > About NA** and verify that Option 416 is listed in the PNA application.
3. After successful installation of all upgrades, some features require some adjustments to ensure the instrument meets its specified performance. Refer to the following Web site: <http://na.support.keysight.com/pna>.

Step 18. Perform Post-Upgrade Adjustments and Calibration

Adjustments

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

- source adjustment
- IF gain adjustment
- receiver characterization
- receiver adjustment
- IF Response adjustment (For A models: Options 090, 093, or 094 Only. For B models: Options S93090xA, S93093A, or S93094A Only.)

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 bookmark "Tests and Adjustments" in the PDF Service Guide¹.

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

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

Operator's Check

Perform the Operator's Check to check the basic functionality of the analyzer. For instructions, click the Chapter 3 bookmark "Tests and Adjustments" in the PDF Service Guide¹.

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

Calibration

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, click the Chapter 3 bookmark "Tests and Adjustments" in the PDF Service Guide¹.

Step 19. Prepare the PNA for the User

1. If necessary, reinstall front jumper cables.
2. Install the cable guards, pushing them over the front jumper cables until the cushioning material touches the front panel of the PNA.
3. Install the dust caps on the test ports.
4. Clean the analyzer, as needed, using a damp cloth.



This information is subject to change
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Edition 2, September 2019



N5232-90102

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