

Keysight Add Configurable Test Set Upgrade Kit

To Upgrade PNA N5221A/B or N5222A/B Option 400 to Option 401

Upgrade Kit Order Number: N5221AU-401, N5222AU-401, N5221BU-401, and N5222BU-401

Keysight Kit Number: N5222-60105

NOTICE: This document contains references to Agilent Technologies. Agilent's former Test and Measurement business has become Keysight Technologies. For more information, go to **www.keysight.com**.



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Safety Notes

The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

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.

CAUTION

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Keysight Add Configurable Test Set Upgrade Kit
Upgrade Kit Number: N5225-60105
Installation Note

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.

NOTE

If you had an A model PNA-X with Option 219/419 with Option H85 that was upgraded to a B model, please refer to Options 217/417. If you had an A model PNA-X with Option 224/423 with Option H85 that was upgraded to a B model then refer to Option 222/422.

This upgrade adds the following items to your N5221A/B Option 400 or N5222A/B Option 400 network analyzer:

- reference mixer switch
- bulkhead connectors for test set front plate
- front panel jumpers
- front panel jumpers cable guards
- front panel overlay replacement
- new cables

After installation of this upgrade, your analyzer will be an N5221A/B Option 401 or N5222A/B Option 401.

Getting Assistance from Keysight

By internet or phone, get assistance with all your test and measurement needs.

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.

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

License Key Redemption

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

<http://literature.cdn.keysight.com/litweb/pdf/N5225-90110.pdf>.

For B models: Refer to

<http://literature.cdn.keysight.com/litweb/pdf/N5242-90024.pdf>.

NOTE

The enclosed Software 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 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
 - 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-X model number - N2221A, N5222A, N5241A, N5242A, or N5249A.

- 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>.

Getting Prepared

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**.

Verify the License Contents

Refer to the license message you received from Keysight:

If the model number, serial number, or option number do not match those on the license message you received from Keysight, you will not be able to install the license key file. If this is the case, contact Keysight for assistance. Refer to **“Getting Assistance from Keysight” on page 3**.

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 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

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

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	N5221A/B and N5222A/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 3**.

Table 1 **Contents of Upgrade Kit N5222-60105**

Ref Desig.	Description	Qty	Part Number
--	Installation note (this document)	1	N5222-90105
--	Software Entitlement Certificate	1	5964-5145
A33	Reference mixer switch	1	5087-7758
--	Bracket (for A33 reference mixer switch)	1	N5242-00011
--	Machine screw, M3 x 8, pan head (4 to attach bracket to reference mixer switch; 3 to attach reference mixer switch assembly to deck)	9	0515-0372
--	Cable clamp	9	1400-1334
--	Cable tie	5	1400-0249
--	Cable guard- middle – "A" models	1	N5242-00030
--	Cable guard- middle – "B" models	1	N5242-00049
--	Cable guard – side "A" models	2	N5242-00029
--	Cable guard – side "B" Models	2	N5242-00048
--	Bulkhead connector for test set front plate (hardware supplied with connector)	24	1250-3805
--	Front panel overlay – "A" Models	1	N5222-80006
--	Front panel overlay – "B" Models	1	N5222-80013
W11	RF cable, A25 port 1 receiver coupler to front-panel Port 1 SOURCE OUT	1	N5222-20044
W12	RF cable, Port 1 CPLR THRU to A29 port 1 coupler	1	N5222-20045
W13	RF cable, A25 port 1 receiver coupler to A33 reference mixer switch	1	N5222-20005
W14	RF cable, A29 port 1 coupler to front-panel Port 1 CPLR ARM	1	N5222-20030
W15	RF cable, A26 port 3 receiver coupler to front-panel Port 3 SOURCE OUT	1	N5222-20047
W16	RF cable, Port 3 CPLR THRU to A30 port 3 coupler	1	N5222-20049
W17	RF cable, A26 port 3 receiver coupler to front-panel REF 3 SOURCE OUT	1	N5222-20023
W18	RF cable, A30 port 3 coupler to front-panel Port 3 CPLR ARM	1	N5222-20015
W19	RF cable, A27 port 4 receiver coupler to front-panel Port 4 SOURCE OUT	1	N5222-20050
W20	RF cable, Port 4 CPLR THRU to A31 port 4 coupler	1	N5222-20054
W21	RF cable, A27 port 4 receiver coupler to front-panel REF 4 SOURCE OUT	1	N5222-20025

Table 1 Contents of Upgrade Kit N5222-60105

Ref Desig.	Description	Qty	Part Number
W22	RF cable, A31 port 4 coupler to front-panel Port 4 CPLR ARM	1	N5222-20018
W23	RF cable, A28 port 2 receiver coupler to front-panel Port 2 SOURCE OUT	1	N5222-20051
W24	RF cable, Port 2 CPLR THRU to A32 port 2 coupler	1	N5222-20053
W25	RF cable, A28 port 2 receiver coupler to front-panel REF 2 SOURCE OUT	1	N5222-20059
W26	RF cable, A32 port 2 coupler to front-panel Port 2 CPLR ARM	1	N5222-20034
W30	RF cable, Front panel jumper	12	N5222-20091
W31	RF cable, Port 1 RCVR A IN to A23 mixer brick (A)	1	N5222-20046
W32	RF cable, Port 3 RCVR C IN to A24 mixer brick (C)	1	N5222-20048
W33	RF cable, Port 4 RCVR D IN to A24 mixer brick (D)	1	N5222-20055
W34	RF cable, Port 2 RCVR B IN to A23 mixer brick (B)	1	N5222-20052
W35	RF cable, A33 reference mixer switch to front-panel REF 1 SOURCE OUT	1	N5222-20033
W36	RF cable, REF 1 RCVR R1 IN to A33 reference mixer switch	1	N5222-20032
W40	RF cable, REF 2 RCVR R2 IN to A23 mixer brick (R2)	1	N5222-20039
W48	RF cable, A33 reference mixer switch to A23 mixer brick (R1)	1	N5222-20056
W49	RF cable, REF 3 RCVR R3 IN to A24 mixer brick (R3)	1	N5222-20057
W50	RF cable, REF 4 RCVR R4 IN to A24 mixer brick (R4)	1	N5222-20058
--	Ribbon cable, A19 test set motherboard J3 to A33 reference mixer switch	1	N5242-60002

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

NOTE

Some of the following figures provided in this procedure contain bias tees. Bias tees are included in the Option 219/419 upgrade kits and can be ignored for Options 217/417 and 222/422.

- “Step 1. Obtain a Keyword and Verify the Information.”
- “Step 2. Remove the Outer Cover.”
- “Step 3. Remove the Front Panel Assembly.”
- “Step 4. Install Bulkhead Connectors on the Test Set Front Plate Assembly.”
- “Step 5. Remove Some Existing Cables.”
- “Step 6. Assemble and Install the A37 Reference Mixer Switch Assembly.”
- “Step 7. Install The Cables.”
- “Step 8. Remove the Old Lower Front Panel Overlay.”
- “Step 9. Reinstall Front Panel Assembly.”
- “Step 10. Install the New Lower Front Panel Overlay.”
- “Step 11. Reinstall Front Panel Jumpers.”
- “Step 12. Position the Cables and Wires to Prevent Pinching.”
- “Step 13. Reinstall the Outer Cover.”
- “Step 14. Remove Option 400 License.”
- “Step 15. Enable Option 401.”
- “Step 16. Perform Post-Upgrade Adjustments and Calibration.”
- “Step 17. 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 3**.

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 3.**

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 Front Panel Assembly

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

Step 4. Install Bulkhead Connectors on the Test Set Front Plate Assembly

Install 24 bulkhead connectors to the test set front plate along with washers and nuts (hardware equipped with connector). Torque all nuts to 21 in-lbs. Refer to **Figure 7 on page 20** to see the location of the bulkhead connectors.

Step 5. Remove Some Existing Cables

CAUTION

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

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

These cables may be discarded – they will not be reinstalled.

- W97 (N5222-20074) A25 port 1 receiver coupler to A23 mixer brick (R1)
- W98 (N5222-20080) A26 port 3 receiver coupler to A24 mixer brick (R3)
- W99 (N5222-20081) A27 port 4 receiver coupler to A24 mixer brick (R4)

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

Installation Procedure for the Upgrade

- W100 (N5222-20079) A28 port 2 receiver coupler A23 mixer brick (R2)
- W101(N5222-20084) A25 port 1 receiver coupler to A29 port 1 coupler
- W102(N5222-20085) A26 port 3 receiver coupler to A30 port 3 coupler
- W103(N5222-20082) A27 port 4 receiver coupler to A31 port 4 coupler
- W104(N5222-20083) A28 port 2 receiver coupler to A32 port 2 coupler
- W105(N5222-20088) A29 port 1 coupler to A23 mixer brick (A)
- W106(N5222-20089) A30 port 3 coupler to A24 mixer brick (C)
- W107(N5222-20087) A31 port 4 coupler to A24 mixer brick (D)
- W108 (N5222-20086) A32 port 2 coupler to A23 mixer brick (B)

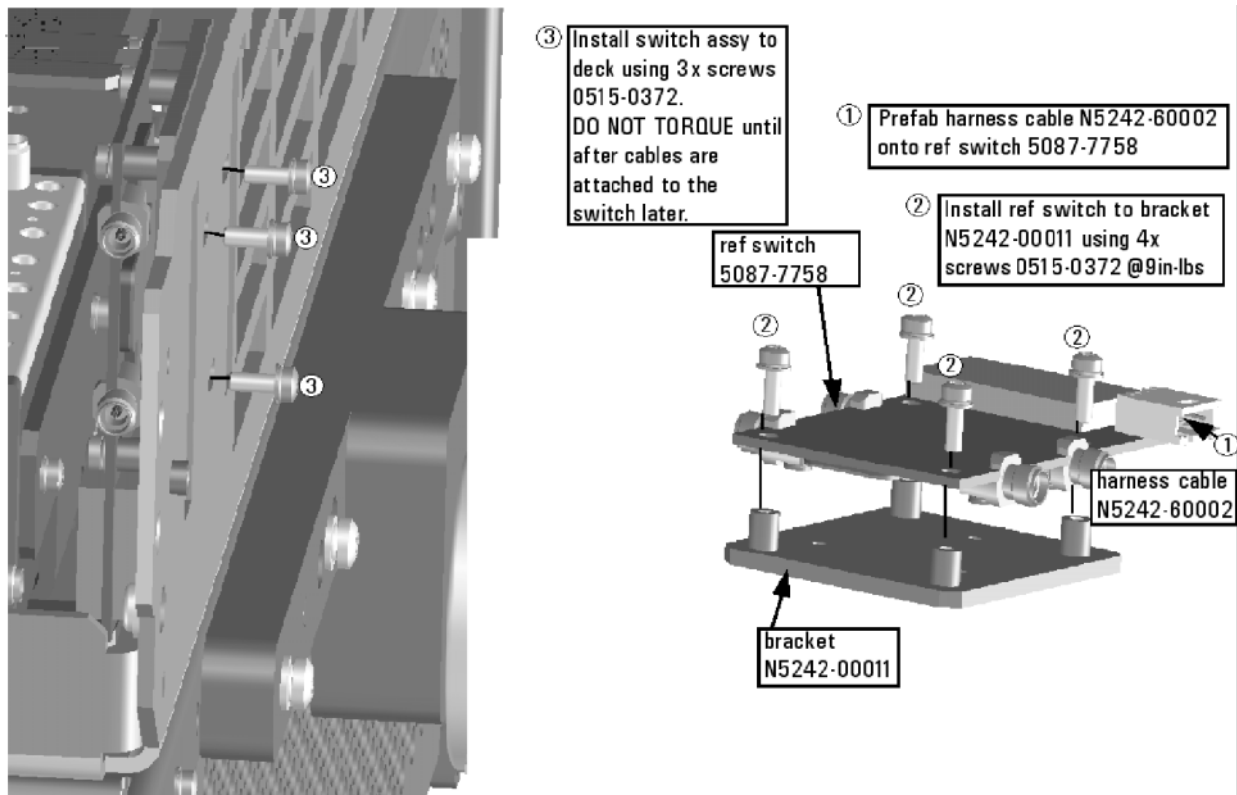
These cables must be saved - they will be reinstalled.

- W8 (N5222-20042) W7 to A27 port 4 receiver coupler
- W4 (N5222-20040) W3 to A25 port 1 receiver coupler
- W10 (N5222-20043) W9 to A28 port 2 receiver coupler

Step 6. Assemble and Install the A37 Reference Mixer Switch Assembly

Refer to **Figure 1** for this step of the procedure. New parts are listed in **Table 1 on page 8**. Use a T-10 TORX driver to tighten all screws.

Figure 1 Reference Mixer Switch Assembly



N5222_105_06

Step 7. 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.

Install the Semirigid Cables

To see an image showing the location of these cables, click the Chapter 6 bookmarks “Bottom RF Cables, 4-port Configuration, Option 401” in the PDF Service Guide. New parts are listed in **Table 1 on page 8**.

Install the following new cables in the order listed.

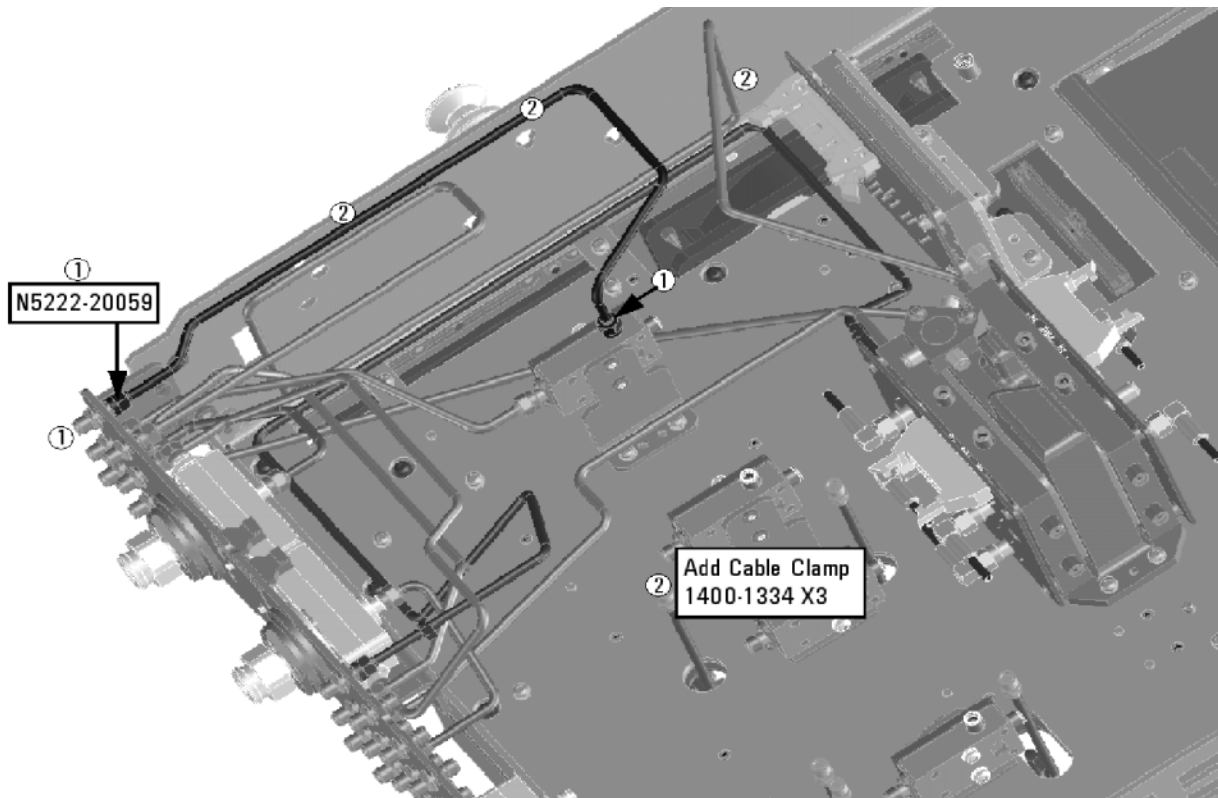
- W26 (N5222-20034) A32 port 2 coupler to front-panel Port 2 CPLR ARM
- W34 (N5222-20052) Port 2 RCVR B IN to A23 mixer brick (B)
- W23 (N5222-20051) A28 port 2 receiver coupler to front-panel Port 2 SOURCE OUT
- W24 (N5222-20053) Port 2 CPLR THRU to A32 port 2 coupler
- W33 (N5222-20055) Port 4 RCVR D IN to A24 mixer brick (D)

Installation Procedure for the Upgrade

- W22 (N5222-20018) A31 port 4 coupler to front-panel Port 4 CPLR ARM
- W20 (N5222-20054) Port 4 CPLR THRU to A31 port 4 coupler
- W50 (N5222-20058) REF 4 RCVR R4 IN to A24 mixer brick (R4)
- W40 (N5222-20039) REF 2 RCVR R2 IN to A23 mixer brick (R2)
- W25 (N5222-20059) A28 port 2 receiver coupler to front-panel REF 2 SOURCE OUT

* As shown in **Figure 2 on page 14**, install three cable clamps (part number 1400-1334) to secure W25 (part number N5222-20059).

Figure 2 Location of Cable Clamps to Secure W25

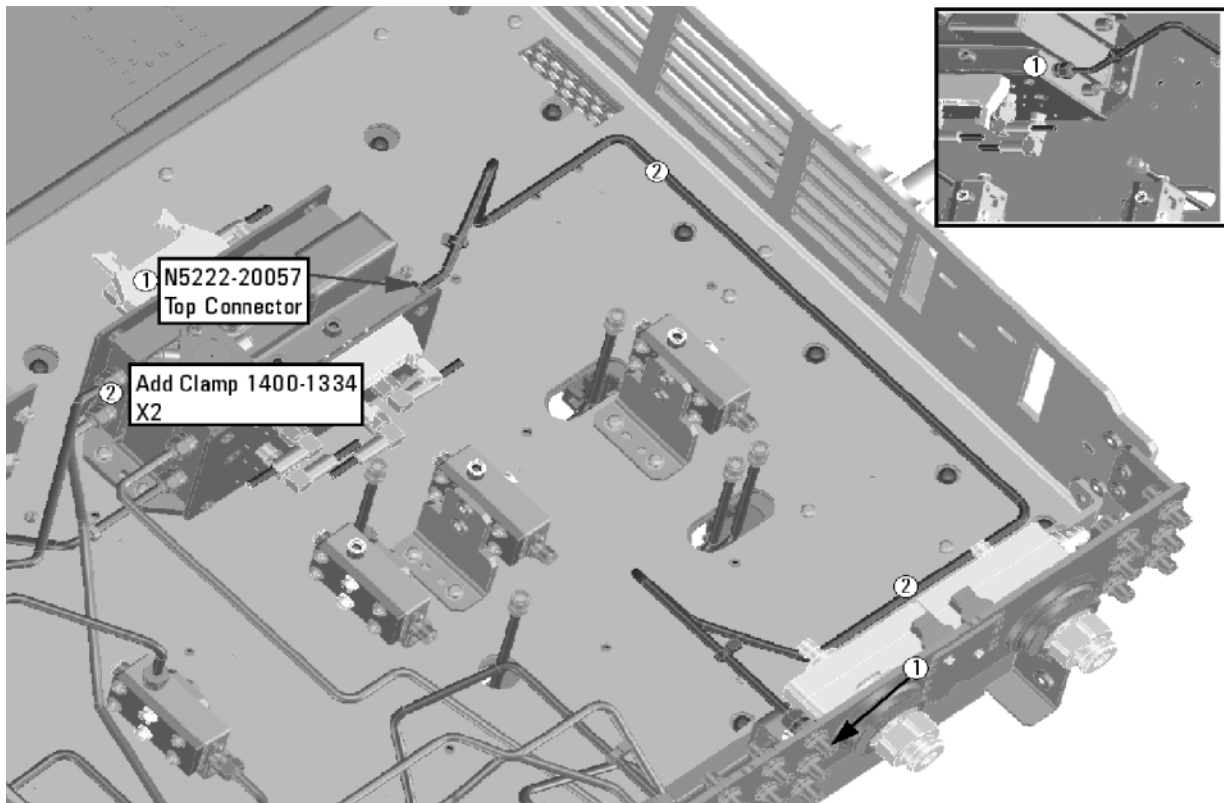


N5222_105_01

- W49 (N5222-20057) REF 3 RCVR R3 IN to A24 mixer brick (R3)

* As shown in **Figure 2 on page 14**, install two cable clamps (part number 1400-1334) to secure W49 (part number N5222-20057).

Figure 3 Location of Cable Clamps to Secure W49



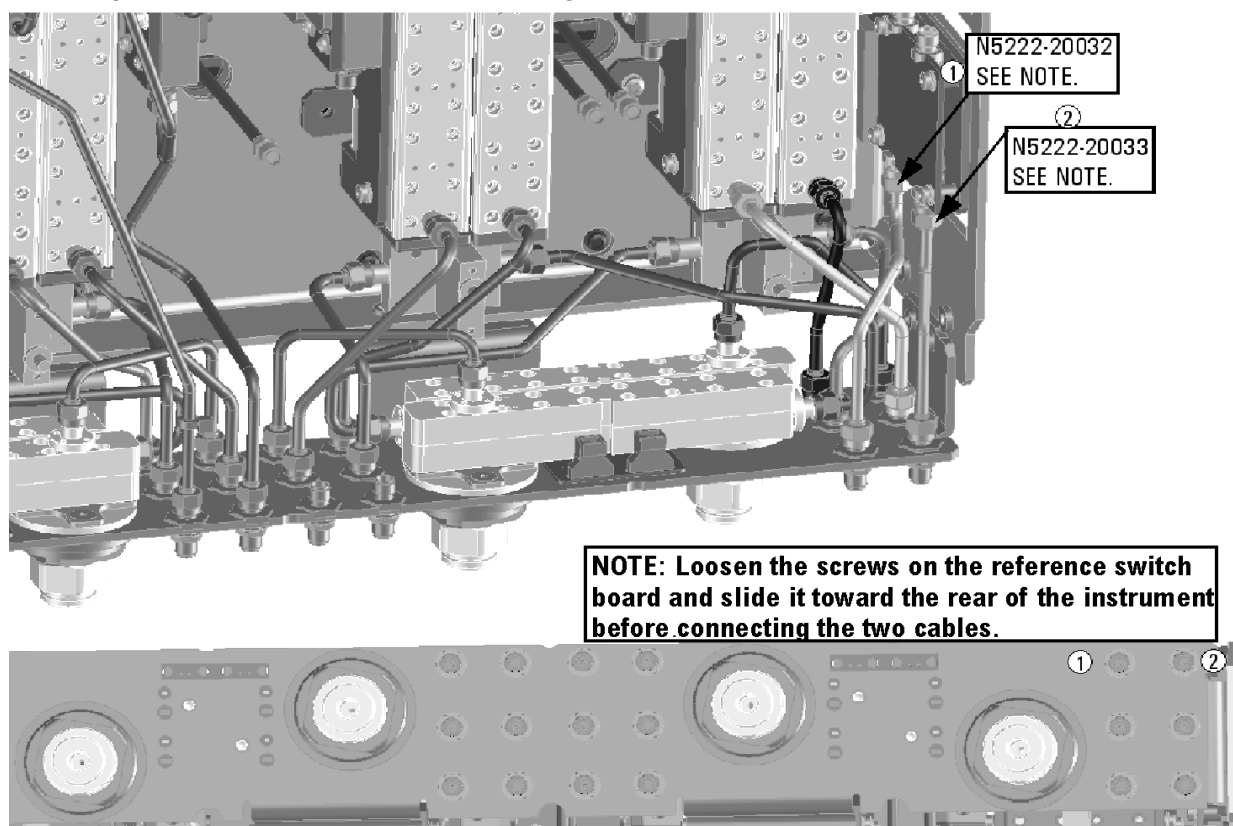
N5222_105_02

- W32 (N5222-20048) Port 3 RCVR C IN to A24 mixer brick (C)
- W18 (N5222-20015) A30 port 3 coupler to front-panel Port 3 CPLR ARM
- W19 (N5222-20050) A27 port 4 receiver coupler to front-panel Port 4 SOURCE OUT
- W21 (N5222-20025) A27 port 4 receiver coupler to front-panel REF 4 SOURCE OUT
- W15 (N5222-20047) A26 port 3 receiver coupler to front-panel Port 3 SOURCE OUT
- W17 (N5222-20023) A26 port 3 receiver coupler to front-panel REF 3 SOURCE OUT
- W31 (N5222-20046) Port 1 RCVR A IN to A23 mixer brick (A)
- W14 (N5222-20030) A29 port 1 coupler to front-panel Port 1 CPLR ARM
- W12 (N5222-20045) Port 1 CPLR THRU to A29 port 1 coupler
- W16 (N5222-20049) Port 3 CPLR THRU to A30 port 3 coupler
- W11 (N5222-20044) A25 port 1 receiver coupler to front-panel Port 1 SOURCE OUT

Installation Procedure for the Upgrade

- W35 (N5222-20033) A33 reference mixer switch to front-panel REF 1 SOURCE OUT
 - * As shown in **Figure 4 on page 16** on page 16, follow the instructions in the “Note” to secure W35.
- W36 (N5222-20032) REF 1 RCVR R1 IN to A33 reference mixer switch
 - * As shown in **Figure 4 on page 16**, follow the instructions in the “Note” to secure W36

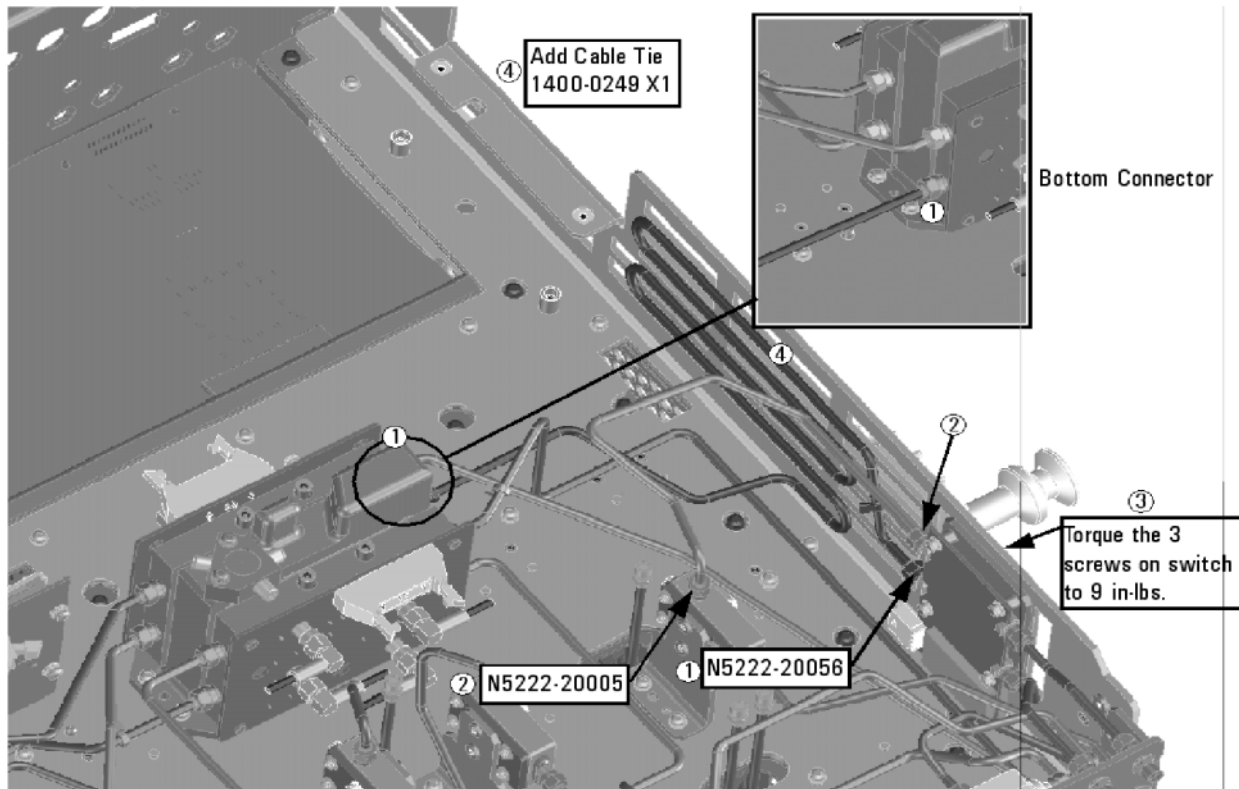
Figure 4 Information for Installing W35 and W36



N5222_105_03

- W48 (N5222-20056) A33 reference mixer switch to A23 mixer brick (R1)
 - * As shown in **Table 5 on page 17**, install a cable tie (part number 1400-0249) to secure W48 (part number N5222-20056). Also, note the instructions about torquing screws.

Figure 5 Location of Cable Tie to Secure W48



N5222_105_04

- W13(N5222-20005) A25 port 1 receiver coupler to A33 reference mixer switch

* As shown in **Figure 5**, note the instructions about torquing screws

- W10 (reuse) (N5222-20043)W9 to A28 port 2 receiver coupler
- W8 (reuse) (N5222-20042)W7 to A27 port 4 receiver coupler
- W4 (reuse) (N5222-20040)W3 to A25 port 1 receiver coupler

Install the Ribbon Cables

To see an image showing the location of this cable, click the Chapter 6 bookmarks “Bottom Ribbon Cables and Wire Harnesses, 4-Port, Option 401” in the PDF Service Guide. New parts are listed in **Table 1 on page 8**.

If not already done, connect the reference mixer switch ribbon cable (N5242-60002) as follows:

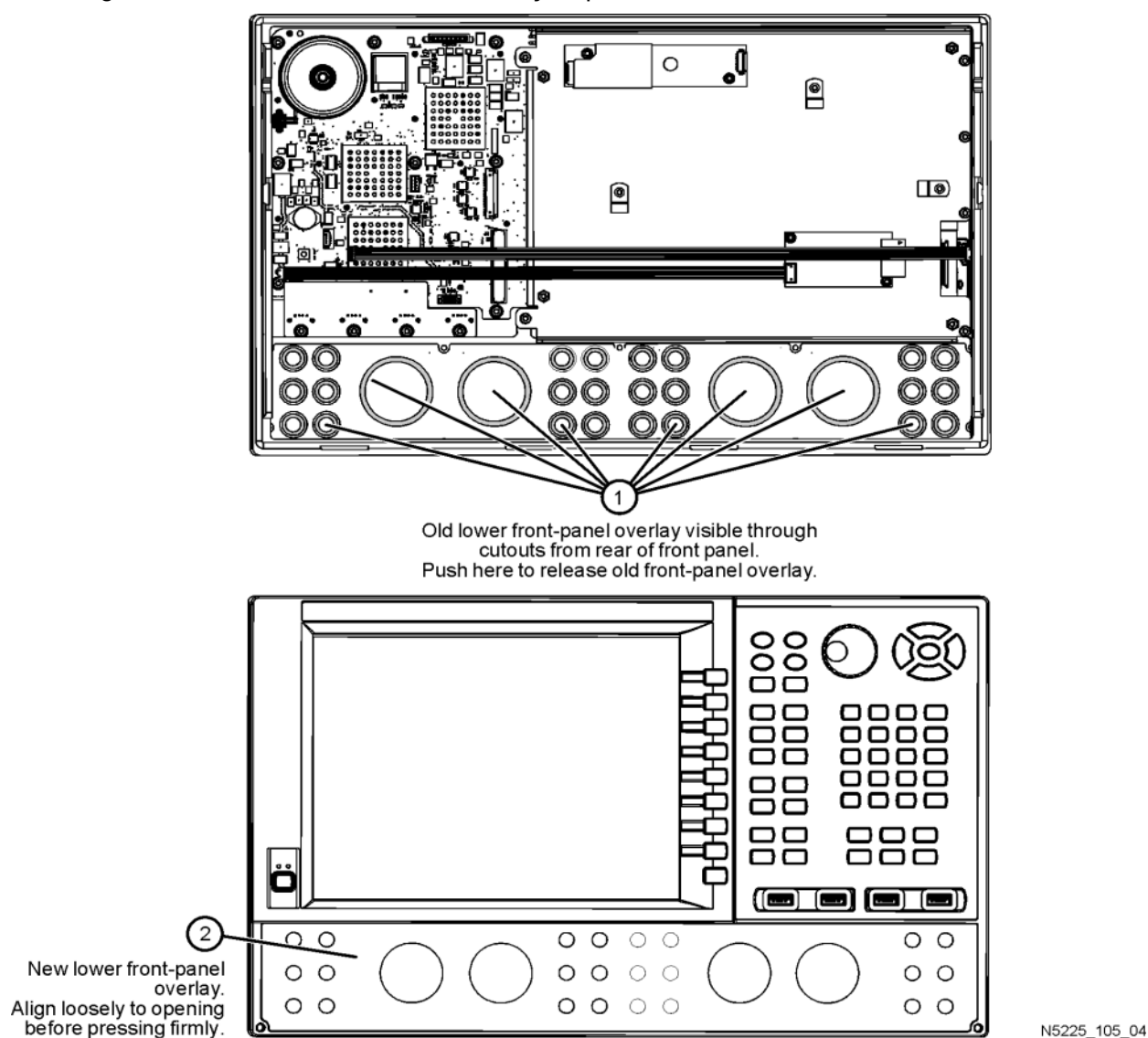
- A19 test set motherboard J3 to A33 reference mixer switch

Step 8. Remove the Old Lower Front Panel Overlay

Refer to **Figure 6** 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.

Figure 6 Lower Front Panel Overlay Replacement



Step 9. 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 10. Install the New Lower Front Panel Overlay

Refer to **Figure 6 on page 18** 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, N5222-80003 (item 7).
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.

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

Step 11. Reinstall Front Panel Jumpers

As shown in **Figure 7**, install 12 front panel jumper cables (reference designator W30; part number N5222-20091).

Figure 7 Front Panel Jumper Cables Installation



① **Reinstall 12x jumper cables N5222-20091 and torque to 10 in-lbs.**

N5225_105_05

Step 12. Position the Cables and Wires to Prevent Pinching

On the top side of the PNA, carefully position the gray 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 13. Reinstall the Outer Cover

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

Step 14. 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.

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.
5. Click OK to confirm that you want to remove the license for the selected option.
6. Click Yes in answer to the displayed question in the Restart Analyzer? box.

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 and click **Delete**.
3. In the Keysight License Manager dialog box that appears, press or click **Yes** to confirm delete.
4. A message displays stating that the option removal was successful.

Step 15. Enable Option 401

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.

- Obtain a license key (A models) or license key file (B models) for installation of this upgrade by following the instructions on the supplied Software Entitlement Certificate.
- A keyboard 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 22.**

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 **401 - 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**.
6. Click **Yes** in answer to the displayed question in the **Restart Analyzer?** box.
7. When the installation is complete, click **Exit**.

"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 "401" is listed after "Options:" in the display. Click **OK**.

Option Enable Procedure for "B" Model Instruments

NOTE

For this step, you will need a USB flash drive.

A single license file 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 1. Obtain a Keyword and Verify the Information” on page 10.**

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

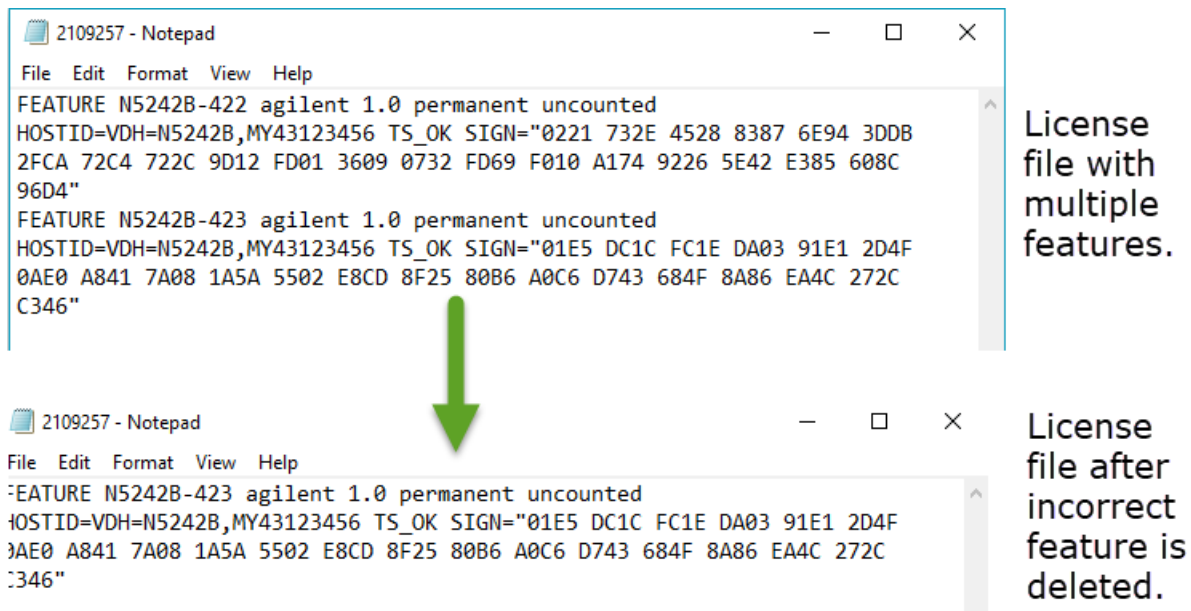
A single license file may contain more than one feature.

3. Verifying and editing the license file:

For these steps, refer to the example in [Figure 8 on page 23](#).

- 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-423 is the correct upgrade. So, N5242B-422 is to be deleted from the text file.)

Figure 8 Editing a Keysight License File Using a Text Editor



NOTE

The figure above 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.
4. Connect the USB flash drive to the PNA. Within 5 seconds, the PNA should display a small "New licenses installed" message.

Else, load the license key file(s), manually move your license file(s) to C:\Program Files\Agilent\licensing. It may take Keysight License Manager an extra ~5 seconds to enable the licenses.

NOTE

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

5. Disconnect the USB flash drive from the PNA.
6. On the analyzer, click or press to open the KLM software from your PNA's Windows taskbar by pressing **Start > More Programs > Keysight License Manager folder > Keysight License Manager** and verify the options are correct.

"B" Model Option Verification Procedure

NOTE

If the option(s) have not been enabled or if your older options have not been removed, contact Keysight Technologies. Refer to **"Getting Assistance from Keysight" on page 3**.

Once 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 217 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 16. 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 model: Options 090, 093, or 094 Only. For B models: Options S93090xA/B, S93093A/B, or S93094A/B Only.)
- Noise adjustment (For N5241/2/9B models: Option 029 with S93029A/B 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.

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 3**.

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 17. Prepare the PNA for the User

1. If necessary, reinstall front jumper cables.
2. If necessary, reinstall 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.

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

