Keysight Option H01 Upgrade Instructions

To Upgrade N5222/4/5/7A and N5242/5/7A Network Analyzers to Include Option H01

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Installation Note

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	**Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.**
CAUTION	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

Description of the Upgrade

This upgrade adds Option H01 to the network analyzer. Depending on the network analyzer model, there are two or three new synthesizer boards that must be installed, replacing the original boards. To learn which boards to order, refer to .

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 New Synthesizer Boards

Keysight stands behind the quality of the new synthesizer boards. If you have problems with any of the boards, email Keysight Component Test Division (CTD) Support at **ctd-soco_support@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, you will need the following:

- New synthesizer boards. See *"Ordering the New Synthesizer Boards From Keysight" on page 6*.

- 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 5*.

- Enough time - refer to *"About Installing the Upgrade" on page 5*.

- 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].

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].

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1. See *"Downloading the Online PNA Service Guide" on page 4*.

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	N/A
T-20 TORX driver (set to 21 in-lbs)	1	N/A
5/16-in torque wrench (set to 10 in-lbs)	1	N/A

CAUTION   Use a 5/16-in torque wrench set to 10 in-lbs on all cable connections.

About Installing the Upgrade

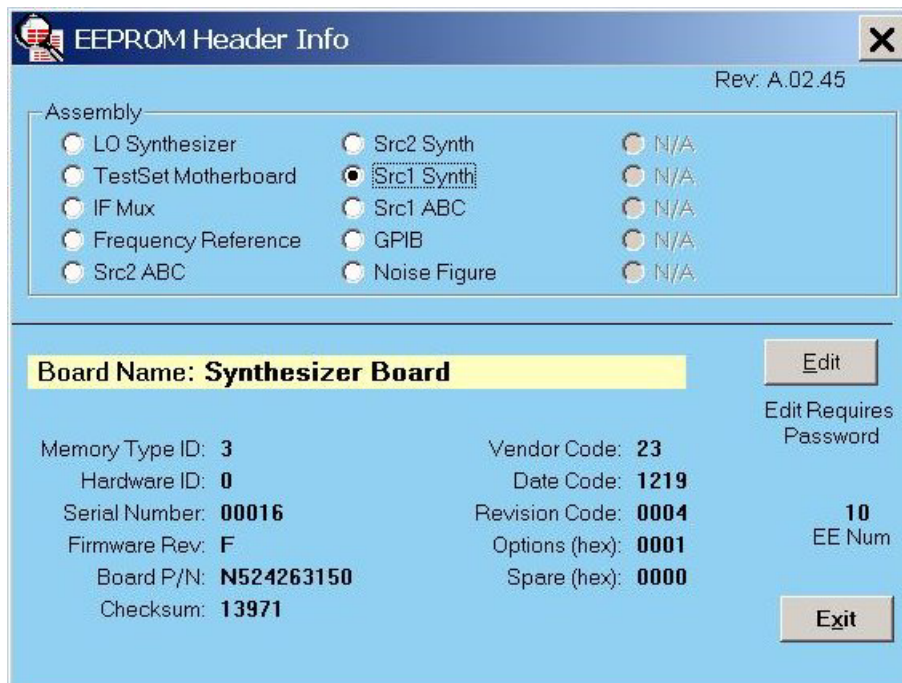| |
|---|
| Products affected . . . . N5222/4/5/7A and N5242/4/5/7A Network Analyzers |
| Installation to be performed by . . . . Keysight service center or personnel qualified by Keysight |
| Estimated installation time . . . . 1.0 hour |
| Estimated adjustment time . . . . 0.5 hours |
| Estimated full instrument calibration time . . . . 4.5 hours |

Ordering the New Synthesizer Boards From Keysight

Verify the Part Number(s) and Quantities of the Existing Synthesizer Boards in the PNA

NOTE   In the two steps below, you are instructed to note which boards (and their part numbers) are installed in your analyzer, to help determine the replacement boards that you will order. If your analyzer model is the N5222/4/5/7A or N5247A, you do not need to note each board P/N because you will order only the N5242-60071 replacement boards.

1. On the PNA, select **System**, **Service**, **Utilities**, **View EEPROM Headers**. Refer to Figure 1.

2. In the EEPROM Header Info dialog window:

    a. Click **LO Synthesizer**, and note the board P/N (part number).

    b. Click **Src2 Synth**, and note the board P/N, if any. This board may not be included in the PNA, depending on the options installed.

    c. Click **Src1 Synth**, and note the board P/N.

Figure 1   **EEPROM Header Info Dialog Window**

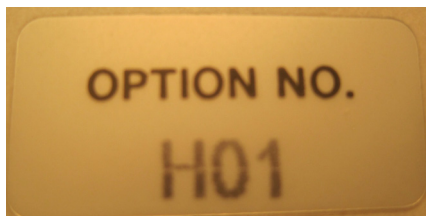## Order the New Synthesizer Boards

1. If your network analyzer has synthesizer boards with part number N5242-63150, or if your analyzer model is the N5222/4/5/7A or N5247A, order the new replacement board part number N5242-60071. These boards have tabs or "ears" that allow them to be secured with screws to the analyzer chassis.

2. If your network analyzer has synthesizer boards with part number N5242-63166, or N5230-63002, or N5230-60002, order the new replacement board part number N5242-60072. These boards do not have tabs or "ears."

NOTE   If the PNA already contains N5242-60071 or N5242-60072 boards, they do not need to be replaced.

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3. Contact Keysight for help with ordering. Refer to "Contacting Keysight" on page 3.

Request an H01 Label for the PNA Rear Panel

You must request an adhesive H01 label – as shown in the photo below – from CTD Support by sending an email including your name and mailing address to *ctd-soco_support@keysight.com*. In the subject line of the email, type "H01 Label." The label is to be attached on the PNA rear panel to indicate the H01 upgrade has been performed.

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.**

Step 1.   Replace the Existing Synthesizer Boards with the New Synthesizer Boards

The following instructions are abbreviated for the purpose of this document, but illustrations and the details of each instruction are available in your PNA Service Guide's chapter 7 – see "Downloading the Online PNA Service Guide" on page 4.

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.**

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.

- Remove the outer cover.
- Remove the inner cover.
- Remove and replace the existing 13.5 GHz (source 1) synthesizer board (replace with either the N5242-60071 or N5242-60072, depending on what you ordered).
- Remove and replace the existing 13.5 GHz (LO) synthesizer board (replace with either the N5242-60071 or N5242-60072, depending on what you ordered).
- If necessary, remove and replace the existing 13.5 GHz (source 2) synthesizer board (replace with either the N5242-60071 or N5242-60072, depending on what you ordered). This board may not be included in the PNA, depending on the options installed.
- Reinstall the inner cover.
- Reinstall the outer cover.

Step 2.   Install Adhesive Label on Rear Panel

On the previous page of this document, you were instructed to request an adhesive H01 label from CTD Support. Attach this label to the PNA rear panel, next to the instrument serial number label.

Step 3. If Necessary, Download PNA Firmware

For the new N5242-60072 boards to function properly in your PNA, you must upgrade your PNA firmware to rev A09.33.00 or above. Download PNA firmware at: http://na.support.keysight.com/pna/firmware/firmware.html.

Step 4.   Perform Post-Upgrade Adjustments and Calibration

NOTE   The analyzer may display error messages when first powered on. Adjustments and normal operation should clear the error messages.

Adjustments

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

- synthesizer bandwidth adjustment
- EE default adjustment (initialization only)
- 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 found in the PNA Service Guide.

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

If you experience difficulty with the basic functioning of the analyzer, contact Keysight. Refer to "Contacting Keysight" on page 3.

Performance Tests

Perform the following tests using TME based test software or using the analyzer's internal performance test software:

- Source Power Linearity Test
- Source Maximum Power Test
- Trace Noise Test

To view information on the performance test software, click the Chapter 3 bookmark "Tests and Adjustments" in the PDF Service Guide[1].

Step 5.   Prepare the PNA for the User

1. If necessary, reinstall the dust caps on the test ports.

2. Clean the analyzer, as needed, using a damp cloth.

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1. See "Downloading the Online PNA Service Guide" on page 4.

For More Information on Option H01

For more information on Option H01, email Keysight Component Test Division (CTD) Support at **ctd-soco_support@keysight.com**, or telephone the CTD Hotline at (707) 577-6802 and leave a voice mail message.

NOTE	It is not necessary to return the old boards to Keysight.

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