
Keysight Technologies

X-Series Signal Analyzers

Internal Preamplifier

Notices

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Internal Preamplifier Installation Kit

Products Affected:

N9000B CXA Signal Analyzer
N9010B EXA Signal Analyzer
N9020B MXA Signal Analyzer
N9021B MXA Signal Analyzer
N9030B PXA Signal Analyzer
N9038B MXE EMI Receiver, Multi-Touch
N9040B UXA Signal Analyzer
N9041B UXA Signal Analyzer
N9048B PXE EMI Receiver

Serial Numbers:

All

Options

CXA

P03 - Preamplifier, 3.0 GHz
P07 - Preamplifier, 7.5 GHz
P13 - Preamplifier, 13.6 GHz
P26 - Preamplifier, 26.5 GHz

EXA

P03 - Preamplifier, 3.6 GHz
P07 - Preamplifier, 7.0 GHz
P13 - Preamplifier, 13.6 GHz
P26 - Preamplifier, 26.5 GHz
P32 - Preamplifier, 32 GHz
P44 - Preamplifier, 44 GHz

MXA

P03 - Preamplifier, 3.6 GHz
P08 - Preamplifier, 8.4 GHz
P13 - Preamplifier, 13.6 GHz
P26 - Preamplifier, 26.5 GHz
P32 - Preamplifier, 32 GHz
P44 - Preamplifier, 44 GHz
P50 - Preamplifier, 50 GHz

PXA

P03 - Preamplifier, 3.6 GHz
P08 - Preamplifier, 8.4 GHz
P13 - Preamplifier, 13.6 GHz
P26 - Preamplifier, 26.5 GHz
P44 - Preamplifier, 44 GHz
P50 - Preamplifier, 50 GHz

MXE

P03 - Preamplifier, 3.6 GHz
P08 - Preamplifier, 8.4 GHz
P26 - Preamplifier, 26.5 GHz
P44 - Preamplifier, 44 GHz

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UXA

P08 - Preamplifier, 8.4 GHz
P13 - Preamplifier, 13.6 GHz
P26 - Preamplifier, 26.5 GHz
P44 - Preamplifier, 44 GHz
P50 - Preamplifier, 50 GHz

PXE

P03 - Preamplifier, 3.6 GHz
P08 - Preamplifier, 8.4 GHz
P26 - Preamplifier, 26.5 GHz
P44 - Preamplifier, 44 GHz

To Be Performed By:

(X) Keysight Service Center

(X) Personnel Qualified by Keysight

(X) Customer

Estimated Installation Time:

0.5 Hours

Estimated Adjustment and Verification Time:

3.5 Hours (see Note 2)

Introduction

This kit contains all of the instructions required to install any of the internal preamplifier options into an X-Series signal analyzer.

NOTE

1. At the time of manufacture the hardware related to this option was fully adjusted and the option performance was verified to be within its warranted specifications. Within one year of the initial calibration date of the instrument this option is fully calibrated with no further adjustment or verification testing.

To determine the initial calibration date, locate the original calibration certificate that was shipped with the instrument at the time of purchase. The Date of Calibration is printed on the original calibration certificate.

To ensure that this newly installed option has been installed properly, the procedure that follows includes a functional check.

No factory test data is available for this option. If you require test data for this option then a full calibration is required after installation of this option. Arrangements regarding the level of calibration must be made with the calibration provider.

2. If this instrument has been adjusted as part of a repair or calibration during its first year, or if the instrument is more than one year old, additional adjustments and performance verification tests are required to ensure that this newly installed option is functioning properly. However, the completion of these tests does not guarantee that the instrument meets all warranted specifications.
3. The latest revision of the X-Series signal analyzer software may be downloaded from:

http://www.keysight.com/find/Xseries_software

4. This option is licensed for one instrument model/serial number combination. The license key will only install on the designated instrument.
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Contents

Quantity	Description	Part Number
1	Installation Note	This note
1	Option Upgrade Entitlement Certificate	-----

Tools Required

- Keysight Calibration and Adjustment Software, N7814A
 - revision E.25.00 or later required for N9021B MXA with frequency range above 26.5 GHz
 - revision E.27.00 or later required for N9021B MXA with frequency range 26.5 GHz or below
 - revision E.21.00 or later required for N9020B MXA with frequency range above 26.5 GHz
 - revision E.23.00 or later required for N9040B UXA
 - revision E.24.00 or later required for N9041B UXA, Performance Verification testing
 - revision E.16.00 or later required for all other analyzers
- Keysight Calibration and Adjustment Software, N7818A
 - revision A.11.00 or later required for N9048B PXE, Calibration ONLY
 - revision A.12.00 or later required for N9038B MXE, Calibration and Adjustment
- Personal computer with internet access and USB port
- USB storage device with > 2 GB free memory

Installation Procedure over USB

1. Locate the Option Upgrade Entitlement Certificate from the kit.
2. Redeem the Option Upgrade Entitlement Certificate by following the instructions on the Certificate.
3. After redeeming your Option Upgrade Entitlement Certificate you will receive an email with an attached License File.
4. Locate a USB storage device. Perform a virus scan on this device before use.
5. Save the License File to the root directory of the USB Storage Device.
6. Connect the USB Storage Device to the signal analyzer USB port. Windows will detect the new hardware and may display the configuration menu shown in **Figure 1**. This menu may be configured according to your preferences.

Figure 1 USB Storage Device Configuration Menu



7. The signal analyzer will automatically consume the License File. (This may take a few minutes) When the License File is consumed the Keysight License Manager will display a “Successful License Installation” message similar to the one shown in **Figure 2**.

Figure 2 Successful License Installation



Alternate Installation Procedure

The License File can be manually installed over USB or LAN by placing the license file in the following folder on the signal analyzer

C:\Program Files\Agilent\licensing

Verify the Installation

1. Cycle the power on the signal analyzer.
2. Press **System, Show System** to display a list of installed options.
3. Verify that the newly installed option(s) appears on the list. For PXE you should also see an LNA option.

Functional Check:

Within one year of the initial calibration date of the instrument this option is fully calibrated with no further adjustment or verification testing. To ensure that this newly installed option has been enabled correctly the following functional check is recommended.

1. Tap the message balloon at the bottom of the main display. This will remove out-of-date errors. Tap **X** to close the error history window.
2. Press **System, Alignments, Align Now, Align Now All**. Tap **X** to close the Align Now window after the alignments are complete.
3. Watch for any errors during the instrument alignment.
4. Tap the message balloon at the bottom of the main display to view the instrument error log.
5. Verify that there were no errors during the alignment. Tap **X** to close the error history window.

Optional Functional Check

If Option P03 was installed:

Preset the signal analyzer. Assure mode is **Spectrum Analyzer**.

Press **Input/Output, RF Calibrator, 50 MHz**

Press **Frequency, Center Frequency**, enter 50 MHz to display the 50 MHz calibrator.

Press **Span, 1 MHz**.

Press **Amplitude, Signal Path, Internal Preamp**, select **Low Band**, and **On** to turn preamp on. The displayed signal amplitude should not change more than 0.2 dB.

If Option P07, P08, P13, P26, P32, P43, P44, or P50 was installed:

Preset the signal analyzer. Assure mode is **Spectrum Analyzer**.

Press **Input/Output, RF Calibrator, 4.8 GHz**

Press **Frequency, Center Frequency**, enter 4.8 GHz to display the 4.8 GHz calibrator.

Press **Span, 1 MHz**.

Press **Amplitude, Signal Path, Internal Preamp**, select **Full Range**, and **On** to turn preamp on. The displayed signal amplitude should not change more than 0.2 dB.

Utilities, Adjustments, and Performance Verification Tests

Calibration Software and specified test equipment is required to perform the adjustments, and can be used to automate the performance verification testing.

See [page 6](#) for a list of Calibration and Adjustment Software revisions for the various model numbers. Information on how to obtain this software can be found at:

<http://www.keysight.com/find/calibrationsoftware>

Utilities Required

None

Adjustments Required

If the instrument is more than one year old, or if this instrument has been adjusted as part of calibration during its first year, the following adjustments are the minimum set required to ensure that this newly installed option is functioning properly.

NOTE

Field adjustments are not available for the N9041B UXA or the N9048B PXE. If the instrument fails the Performance Verification Tests it should be returned to the Service Center for factory repair

CXA (N9000B) Adjustments

Freq Response Below 3.0 GHz, Preamp On

Freq Response Above 3.0 GHz, Preamp On (Option P07, P13, or P26)

EXA (N9010B) Adjustments

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P07, P13, P26, P32, or P44)

MXA (N9020B/21B), PXA (N9030B), and UXA (N9040B/41B) Adjustments

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P08, P13, P26, P32, P44, or P50)

MXE (N9038B) and PXE (N9048B) Adjustments

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P08, P26, and P44)

Performance Testing Required

If the instrument is more than one year old, or if the instrument has been adjusted as part of a calibration during its first year, the following performance verification tests are the minimum set required to ensure that this newly installed option is functioning properly. Performing only these tests does not guarantee the instrument meets all specifications.

CXA (N9000B) Performance Verification Tests

Freq Response Below 3.0 GHz, Preamp On

Freq Response Above 3.0 GHz, Preamp On (Option P07, P13, or P26)

Displayed Average Noise Level

EXA (N9010B) Performance Verification Tests

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P07, P13, P26, P32, or P44)

Displayed Average Noise Level

Effective DANL (Option NF2)

MXA (N9020B/21B), PXA (N9030B), and UXA (N9040B/41B) Performance Verification Tests

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P08, P13, P26, P32, P44, or P50)

Displayed Average Noise Level

Effective DANL (Option NF2)

MXE (N9038B) and PXE (N9048B) Performance Verification Tests

Freq Response Below 3.6 GHz, Preamp On

Freq Response Above 3.6 GHz, Preamp On (Option P08, P26, and P44)

Displayed Average Noise Level

Effective DANL (Option NF2)

Absolute Amplitude Accuracy at 50 MHz

Third Order Intermodulation Distortion

A full calibration is required to assure the instrument meets all specifications

The end user must ultimately determine whether they want a full calibration to be performed after the installation of this upgrade or not. If a full calibration is required, arrangements regarding the level of calibration must be made between the end user and the calibration provider.

For assistance, contact your nearest Keysight Technologies Sales and Service Office. To find your local Keysight office access the following URL, or if in the United States, call the following telephone number:

<http://www.keysight.com/find/assist>

1-800-829-4444 (8 am - 8 pm ET, Monday - Friday)

