

Keysight Technologies N9040B UXA Signal Analyzer

Option BUM, 255 MHz to 510 MHz Analysis Bandwidth

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Manual Part Number

N9040-90020

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Option BUM, 255 MHz to 510 MHz Analysis Bandwidth

Products Affected	UXA N9040B
Serial Numbers:	All
Options Required:	N9040B-B2X N9040B-544 or 550
To Be Performed By:	(X) Keysight Service Center () Personnel Qualified by Keysight () Customer
Estimated Installation Time:	2.0 Hours
Estimated Adjustment Time:	8.0 Hours
Estimated Verification Time:	4.0 Hours

Introduction

This installation note explains how to install an additional wideband digital IF assembly and associated hardware to upgrade a UXA analyzer (frequency range 44 or 50 GHz) that currently contains Option B2X, 255 MHz analysis bandwidth, to Option B5X, 510 MHz analysis bandwidth.

The option is licensed for one instrument model number/serial number combination. The license file that is downloaded from the web will only install on the designated instrument.

Contents

Quantity	Description	Keysight Part Number
1	Installation Note	This note
1	Option Upgrade Entitlement Certificate	5964-5178
1	Wideband Digital IF assembly	N9020-60311
1	Flex Circuit	N9040-60041
1	Spring Clip (for flex cable)	N9040-00035
1	Front End assembly, 50 GHz max, 510 MHz IF	N9020-60218
1	Wire Harness, Switch 1/2 and B5X switches on Front End assembly to A15J801 Front End Controller	N9040-60031
1	Flex Circuit cable for Option RTS/B5X	N9040-60048
30	Screw, Flat Head, M3 x 0.5 6 mm long	0515-1946
1	Connector plug	1252-1873

Tools Required

- Personal computer with internet access and USB port
- USB storage device with > 2 GB free memory
- T-10 TORX Driver
- T-20 TORX Driver
- 5/16-inch torque wrench
- 1/4-inch open-end wrench
- Keysight Calibration and Adjustment Software, N7814A (revision E.19.00 or later required)
- Test equipment and computer supported by the Keysight Calibration and Adjustment Software
- UXA Signal Analyzer Service Guide, N9040-90006. Available online.

Initial Instrument Functionality Check

1. Power on the instrument and allow the instrument to boot up, run the alignments and display the measurement screen. The instrument will probably display a spectrum analyzer screen and you will see the instrument sweeping.
2. There should be no alignment failures. If there are failures, investigate and fix the problem before continuing.
3. Verify N9040B-B2X is present. Press **System**, **Show System** and look for N9040B-B2X listed under the options section. If B2X is not listed, the assumption is the B2X hardware and license is not present, and this instrument does not contain Option B2X. You can also press **System**, **Show Hardware** and look for WB Digital IF and WB Analog IF listings to assure the wideband hardware that supports Option B2X is present.

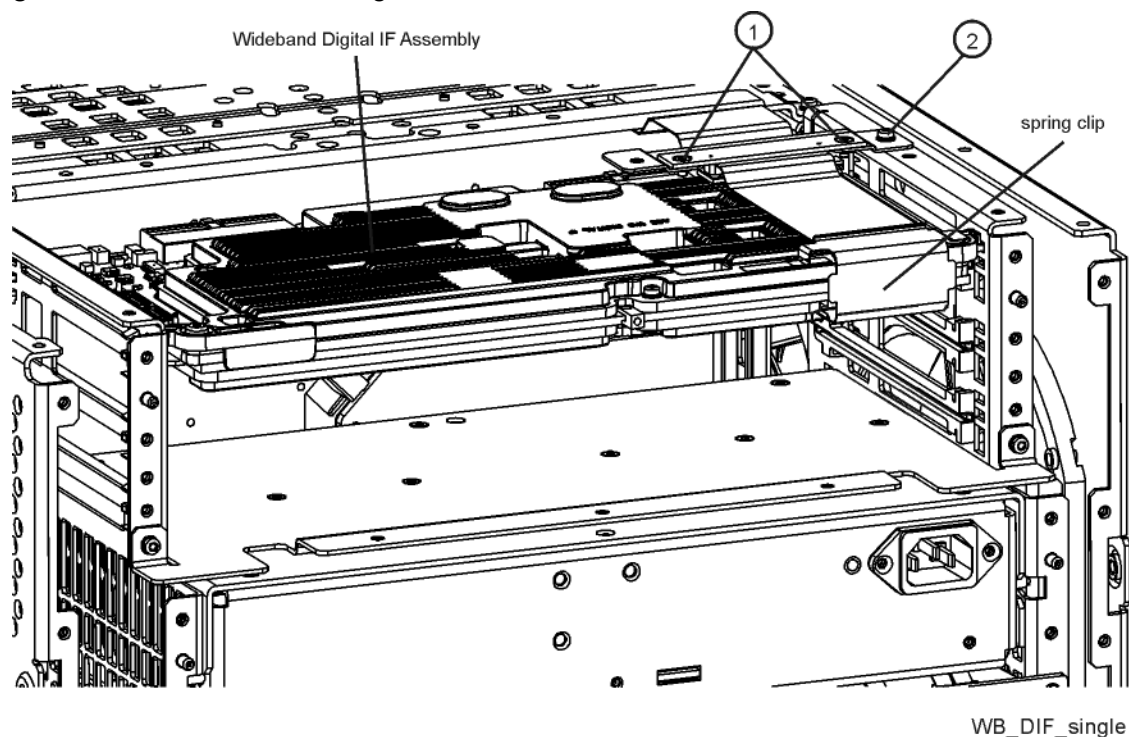
This kit cannot be used unless the instrument contains Option B2X.

4. Verify the instrument frequency range is 44 or 50 GHz. If the instrument has frequency range of less than or equal to 26.5 GHz, this kit cannot be used.

Wideband Digital IF Assembly Hardware Installation

1. Power down the instrument, wait till the standby light comes on, and remove the power cord.
2. Remove the instrument side strap handles, feet, outer case, top brace, card cage brace, and remove the rear panel (be careful to not damage the cables), and remove the rear brace. Notice when removing the Rear Brace that a flat head screw secures the Wideband Digital IF assembly to the middle of the Rear Brace. See the UXA Service Guide Assembly Replacement Procedure section for A22 and A23 WB Digital IF Boards. Save all screws for reuse.
3. See **Figure 1**. Remove spring clip that secures the flex circuit cable to the Wideband Digital IF assembly, and then remove the flex circuit cable from the Digital IF assembly.

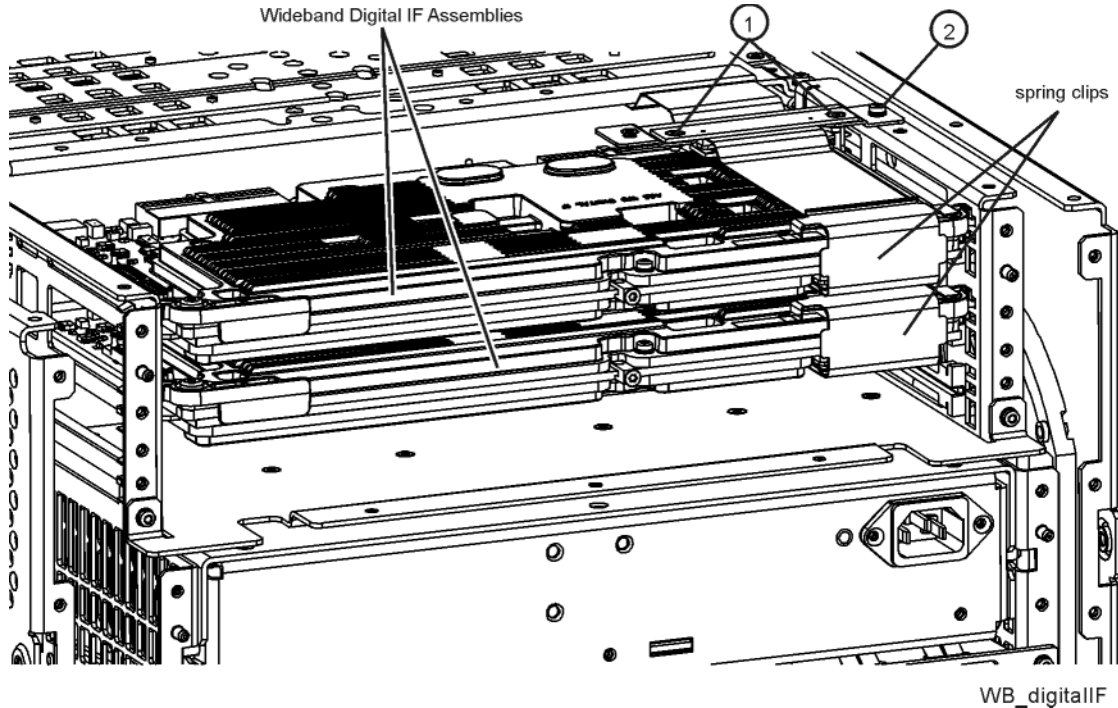
Figure 1 Wideband Digital I.F. Flex Circuit Cable Removal



4. Remove the two flathead screws (1) that hold the flex circuit cables to the interconnect bracket, and remove the pan head screw (2) that secures the interconnect board to the chassis. Disconnect the flex circuit cables. Discard the flex circuit cable that was connected to the Wideband Digital IF assembly.

5. Locate the Wideband Digital IF assembly in the kit, and install this assembly below the existing Wideband Digital IF assembly as shown in **Figure 2**.

Figure 2 Wideband Digital I.F. Assemblies Installation



6. Locate the Flex Circuit cable in the kit and install the cable between the two Wideband Digital IF assemblies and re-connect the other end to the flex cable to the flex cable you previously disconnected. Re attach the flex cable connection to the interconnect bracket using the two flat head screws (1), and mount the interconnect bracket to the instrument frame using a pan head screw (2).
7. Locate the spring clip in the kit, and the spring clip previously removed. Install these spring clips to secure the flex circuit connection to the Wideband Digital IF assembly.
8. Re-install the Rear Brace. Use two of the flat head screws (0515-1946) in the kit to secure the Wideband Digital IF assemblies to the rear brace.
9. Re-install the Rear Panel.

CAUTION

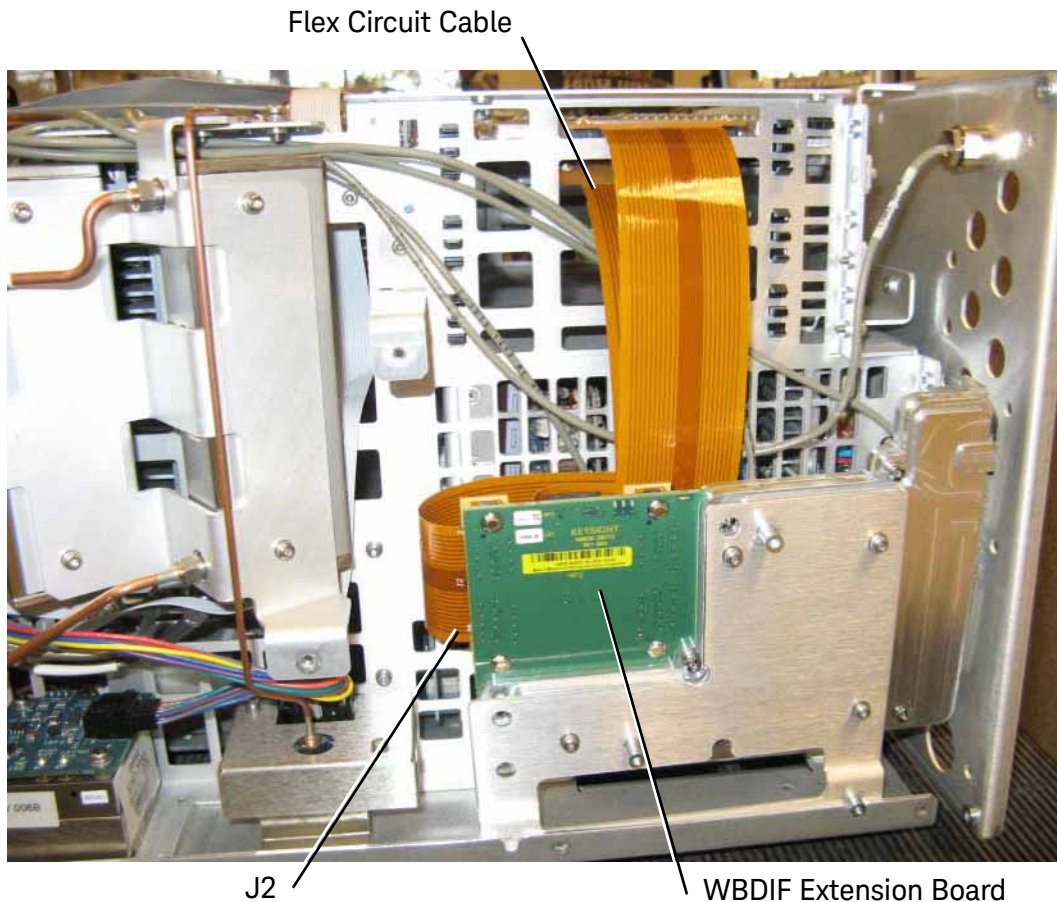
Perform the following steps **ONLY** if the instrument currently has Option RTS. If the instrument does not have option RTS refer to the **“Front End Assembly Replacement”** section.

Previously, when Option RTS was installed on instruments that have option B2X, there was only one Wideband Digital IF in the instrument. This WB Digital IF assembly is connected to the WBDIF Extension board “streaming board” located on the right rear of the instrument, with a single Flex

Circuit cable. With the upgrade to Option B5X, there are two WB Digital IF assemblies, and an additional Flex Circuit Cable is required so that both WB DIF assemblies can connect to the WBDIF Extension board.

1. Remove the right side chassis (RF Side Bracket) by first removing the front frame assembly. See the service manual for removal process.
2. Locate the N9040-60048, Flex Circuit Assembly for option RTS/B5X, in the kit. See **Figure 3**.

Figure 3 Flex Circuit Assembly for option RTS/B5X



3. Connect the end of the Flex Circuit Cable that has the alignment pins, to J2 connector of the WBDIF Extension Board. J2 is located on the edge of the board.
4. Install the cable as shown in **Figure 3**. The cable should be pre-folded. Run this new flex circuit cable behind the existing flex circuit cable, and plug the cable into the connector header on the bottom WB Digital IF assembly.
5. Re install the right side chassis, but do not reinstall the front frame.

Front End Assembly Replacement

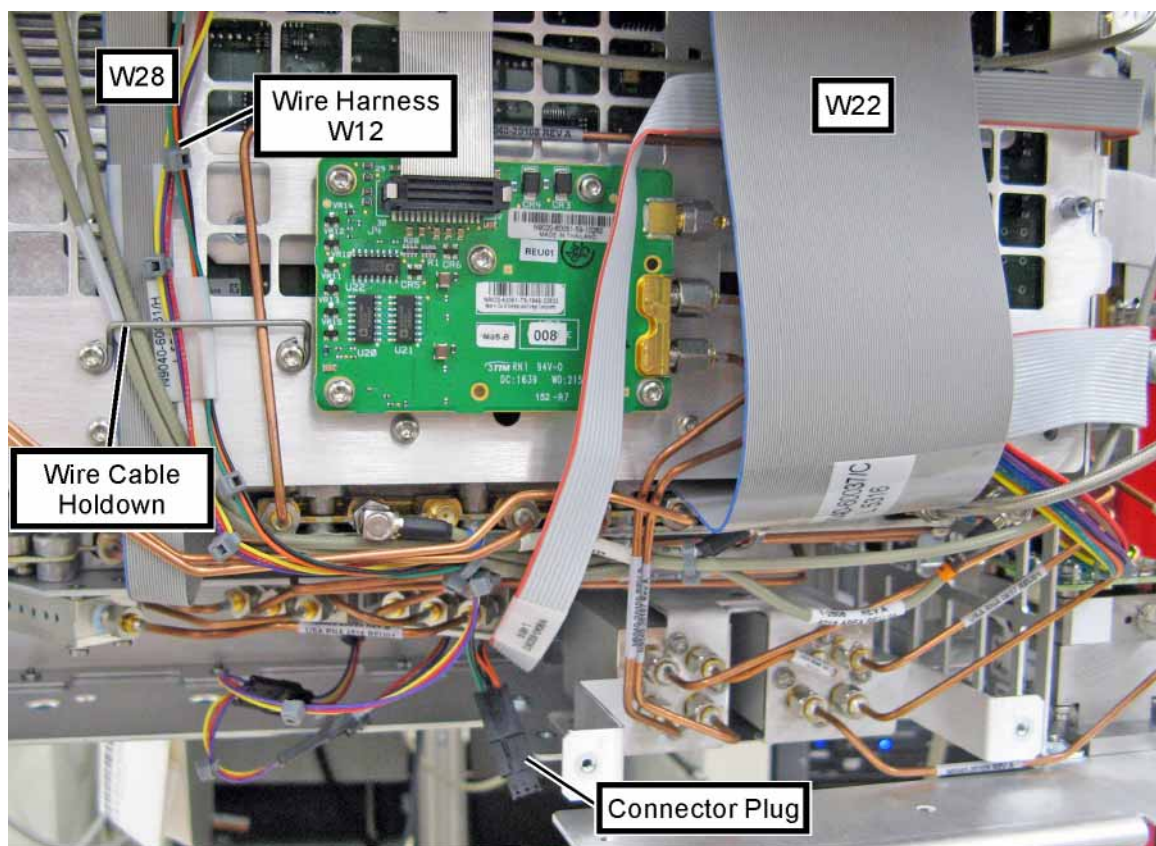
1. See the UXA Service Guide Assembly Replacement Procedure section, Front Frame Assembly for instruction on Front Frame removal.
2. See the UXA Service Guide Assembly Replacement Procedure section for A13 RF Front End Assembly. Follow steps 1 through 5 to remove the existing Front End Assembly and the bypass switches.

To make the process easier, remove one screw from the wire cable hold down that routes the small ribbon cable and the multi colored wire harness. This allows the removal of these two cables. See [Figure 4](#).

When removing the bypass switches, leave the switch control ribbon cable attached until you remove the switch assembly.

3. Remove the W22 and W28 ribbon cables from the A13 RF Front End Assembly you just removed. Notice how the big ribbon cable is routed through two tabs in the casting.
4. Locate the Front End Assembly in the kit. Install the big ribbon cable W22 into the board header, and route the ribbon cable between the two tabs in the board casting. Install the W28 ribbon cable into the board header.
5. Install the replacement Front End Assembly into the instrument, using the six screws removed earlier.
6. Locate the bypass switch/ bracket removed earlier and re-attach the ribbon cable to the switch header.
7. Locate the Wire Harness in the kit. This new Wire Harness replaces the W12 harness removed previously, and has two more connectors that connect to the replacement Front End assembly coax switches. See [Figure 4](#).

Figure 4 Front End Assembly Installation



frontend_optBUM

8. Notice the wire harness has two orange/black/green pigtails with connectors. Attach one orange/black/ green pigtail to the yellow/black /green wire connector from the bypass switch.
9. Locate the connector plug, **1252-1873** in the kit. Insert this connector plug into the other wire harness orange/black/ green connector body
10. Reinstall the bypass switches/bracket with ribbon cable and wire harness attached, to the instrument frame using the three screws. Refer again to the UXa Service Guide Assembly Front End Replacement Procedure. Follow steps 4 through 6 of the Replacement section.
11. Connect the wire harness to the Front End controller, then connect one set of the yellow/red/purple wires to one of the Front End Switches that have the same color code wires. Then connect the other wire harness connector that has the same color code wires to the other switch. It does not matter which switch you connect either wire harness connector to.
12. Assure all ribbon cables and semi rigid coax cables are reconnected to the Front End, Front End Controller and the bypass switches.
13. Replace the Front Frame Assembly. Assure the Ext Mixer semi-rigid cable is connected.
14. Power up the instrument.

License Installation Procedure over USB

1. Locate the Option Upgrade Entitlement Certificate (5964-5178) 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 5. This menu may be configured according to your preferences.

Figure 5 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 as shown in Figure 6.

Figure 6 Successful License Installation



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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 License Installation and Hardware

1. Cycle power on the signal analyzer and wait until the analyzer boots to the measurement application screen.
2. Press **System, Show System** to display a list of installed options.
3. Verify that the installed options list contains the newly installed N9040B-B5X.

Instrument Software Installation

This upgrade requires instrument software version A.17.55 or later.

To verify the current version, press **System, Show System** and look for the "Instrument S/W Revision".

Even if the instrument software is the latest, reinstalling the software will reprogram the FPGAs in the new Wideband Digital IF assemblies.

The latest revision of the X-Series Signal Analyzers software may be downloaded from:

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

Verify Option B5X Functionality

1. Press **MODE/MEAS**, and select I/Q Analyzer (Basic). Assure Complex Spectrum is highlighted. Tap OK. Tap Frequency to view the pull down menu and select Meas Setup. Tap IF Path, then IF Path again and verify 510 MHz appears. Select this 510 MHz path.
2. Inject an input signal at 4 GHz, -10 dBm, and set the span to 510 MHz. Select a 4 GHz center frequency on the analyzer. The 4 GHz signal should appear on screen. The Microwave Preselector Bypass is automatically turned on at this point. The preselector bypass is mentioned only because it is possible during re installation, a cable was not installed or tightened, and this could be one reason you do not see a correct signal.

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Utilities, Adjustments, and Performance Verification Tests

Utilities Required

None

Adjustments Required

Adjustment Name
Perform all adjustments
Remember to perform YTF Alignment. Press System, Alignments, Advanced, Characterize Preselector .
After all adjustments perform Characterize Noise Floor. Press System, Alignments, Advanced, Characterize Noise Floor .

Performance Testing Required

Verification Test Name
Perform all tests

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