Keysight X-Series Multi-touch Signal Analyzers, N9048B PXE EMI Receiver N9038B MXE EMI Receiver, Multi-Touch

Option SS2

Additional Solid State Drive, Windows 10, for PC8 or PC9

KEYSIGHT TECHNOLOGIES

Installation Note

Notices

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Solid State Disk Drive

Products Affected:	N9000B CXA Signal Analyzer N9010B EXA Signal Analyzer N9020B MXA Signal Analyzer N9021B MXA Signal Analyzer N9030B PXA Signal Analyzer N9032B PXA Signal Analyzer N9038B MXE EMI Receiver N9040B UXA Signal Analyzer N9041B UXA Signal Analyzer N9042B UXA Signal Analyzer N9048B PXE EMI Receiver N8973B Noise Figure Analyzer N8974B Noise Figure Analyzer N8975B Noise Figure Analyzer N8976B Noise Figure Analyzer
Requirements:	Option PC8 or PC9 Option W10 (Windows 10)
To Be Performed By:	(X) Keysight Service Center (X) Advanced User (X) Customer
Estimated Installation Time: Estimated Adjustment and Verification Time:	1.0 Hours 0 Hours

This document provides detailed instructions for the installation and use of a solid state disk drive in an X-Series signal analyzer, MXE EMI receiver, Multi-Touch, or PXE EMI receiver. Please be sure to read this entire document before attempting to put this solid state disk drive into use.

Contents

Quantity	Description
1	Installation Note
1	Programmed Solid State Disk Drive Tray Assembly

Tools Required

- Torx Driver T-10
- USB Mouse
- USB Keyboard
- USB storage device with > 3 GB free memory

What you will find in this User's Guide

Overview

This option provides a removable solid state disk drive for your X-Series Signal Analyzer, MXE EMI receiver, Multi-Touch, or PXE EMI receiver. This option could have been purchased for one of the following reasons:

1. To provide an additional solid state disk drive for use when the original solid state drive must be left inside of a controlled secure environment.
2. To upgrade an instrument to a larger solid state disk drive.

While there may be other reasons to have purchased this solid state disk drive, this document will specifically cover the requirements needed for putting this drive into use for the reasons listed above.

NOTE

This kit is only for use on instruments with the PC8 or PC9 processor installed. Option SS1 should be used if the operating system is Windows 10 and the processor is PC6, PC6S, PC7, or PC7S. Refer to Determining Installed Options and Processor Assembly Type to confirm which processor and operating system is installed.

Since this option was ordered as an upgrade; only default factory calibration data will have been copied onto this drive at the factory. You will need to follow the procedure included in this document in order to copy the calibration data to it from the instrument that it will be used in.

The instrument model and serial numbers will not need to be transferred to the new disk drive, as the master copy of all of these is stored on the instrument A7 Midplane board assembly.

The license keys stored on the Midplane board assembly will be automatically copied to the new disk drive when the instrument first boots up.

NOTE

Should an incorrect version of the X Series calibration file(s) be installed in an instrument, no error messages will be displayed. The instrument may however perform outside of the warranted specifications for that instrument. It is therefore extremely important to ensure that the instrument specific calibration data is properly copied onto this drive before the instrument is used for making any measurements.

Disk Drive Interconnect Life Expectancy

If this upgrade has been ordered to use as an additional solid state disk drive for use when the original solid state drive must be left inside of a controlled secure environment you will want to be aware of the following information with regards to the life expectancy of the interconnect between the removable disk drive and the instrument.

The life expectancy of both the connector on the removable disk drive and the mating connector internal to the instrument is 1,500 cycles. If this is exceeded it is very likely that a failure will occur between these connections. Keysight highly recommends that this cycle limit not be exceeded to prevent an unwanted failure of the instrument.

Putting the Additional Disk Drive Into Service

As mentioned in the Overview section of this document this option could have been purchased for a number of different reasons. This section will outline what steps are required to properly configure the new solid state disk drive before putting it into use.

Before using this solid state disk drive upgrade in any instrument there are three areas of concern that will need to be addressed.

1. The solid state disk drive upgrade will have been shipped with the currently shipping version of the instrument software, which may very well be a different version from what is currently being used in the instrument for which it was purchased.

   While an instrument may function properly with different software versions, the software stored on the different measurement boards within the instrument (FPGA code) may not be compatible with both versions. Also, the factory calibration data file used by the different instrument software versions could be incompatible.

2. The solid state disk drive upgrade will have been shipped with a default factory calibration data file. Before using this drive the instrument specific calibration data file will need to be copied to it.

   Even if the instrument software version that the solid state disk drive upgrade was shipped with is the same as what is in the instrument the instrument specific factory calibration data will still need to be copied and transferred onto the new disk drive.

3. This Option SS2 solid state drive is only for use in instruments with the PC8 or PC9 processor. Do not install this on instruments with a PC6, PC6S, PC7, or PC7S processor. Instruments running Windows 10 with a PC6, PC6S, PC7, or PC7S processor should use the Opt SS1 drive.

Depending on which reason this drive was purchased the instructions for putting it into service will vary. Please follow the appropriate instructions below for the reason that most closely fits why this particular drive was purchased.

When Ordered as an Upgrade from a Smaller Solid State Disk Drive

1. With the original solid state disk drive still installed in the instrument, determine what version of the instrument software is currently installed on it. For instructions on how to verify the currently installed software version see the Software Updates section in this document for instructions. Record the currently installed software version below.

   Instrument S/W Revision: _____

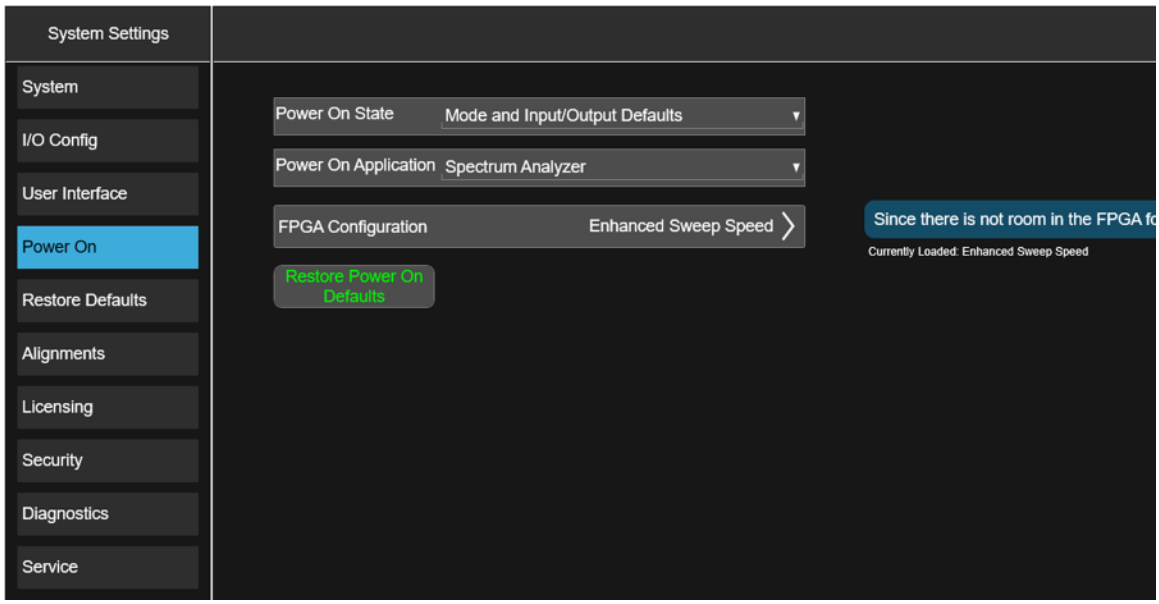
2. Backup the instrument factory calibration data to a USB storage device. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.

3. Determine FPGA Configuration (if possible). Press **System**, on left side pane select **Power On**. Look for FPGA Configuration selection to appear. If FPGA Configuration does not appear continue on. If FPGA Configuration selection appears, check the box below corresponding to the currently loaded FPGA. See Figure 1.

   [ ] Enhanced Sweep Speed

   [ ] Time Domain Scan

Figure 1 FPGA Configuration



4. Replace the original instrument disk drive with the solid state disk drive supplied with this kit. See the Disk Drive Removal and Installation section in this document for instructions.

5. Turn the instrument on with the new solid state disk drive installed and see the Initializing the Instrument Operating System section in this document for instructions.

6. Ignore any hardware related error messages that might appear at this time, as they may be related to software version incompatibilities that will be resolved in the following steps of this procedure.

7. Determine what version of the instrument software is currently installed on the new solid state disk drive. Record the installed software version below.

   Instrument S/W Revision: _____

8. Compare the instrument software revision as recorded in step 7 to that which was recorded in step 1.

   If the instrument software versions are exactly the same skip to step 9 in this procedure.

   If the instrument software revision recorded in step 7 is older than that which was recorded in step 1 update the instrument software on the new disk drive to the latest version. See the Software Updates section of this document for instructions on how to obtain and install the latest instrument software revision.

   If the instrument software revision recorded in step 7 is newer than that which was recorded in step 1 update the instrument FPGA code. See the FPGA Code Update section in this document for instructions on how this is done.

9. Restore the instrument factory calibration data that was previously backed up from the original disk drive. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.

10. The instrument is now ready for use.

When Ordered as an Additional Disk Drive When an Instrument is Being Used In a Controlled Secure Environment

If the instrument that this solid state disk drive upgrade was purchased for has not yet been placed in the controlled secure environment follow the steps below under the heading Before the Instrument Has Been Placed Into a Secure Environment to properly configure the drive for use. If the instrument is already in the controlled secure environment follow the steps below under the heading After the Instrument Has Already Been Placed in a Secure Environment.

Before the Instrument Has Been Placed Into a Secure Environment

1. With the original disk drive still installed in the instrument, verify that the instrument software is the latest version. For instructions on how to verify the currently installed software version, as well as how to know what the latest version is, see the Software Updates section in this document for instructions.
2. If the instrument software is not the latest version update the instrument software to the latest version available. See the Software Updates section of this document for instructions.
3. Once the instrument software has been updated backup the instrument factory calibration data to a USB storage device. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.
4. Replace the original instrument disk drive with the additional disk drive supplied with this kit. See the Disk Drive Removal and Installation section in this document for instructions.
5. Turn the instrument on with the additional disk drive installed. See the Initializing the Instrument Operating System section in this document for instructions.
6. Verify that the instrument software on the additional disk drive is the same version that is on the original disk drive.
7. If the instrument software on the additional disk drive is not the same as what is on the original disk drive update the instrument software on this drive to the latest version available as well. See the Software Updates section in this document for instructions.
8. Once the instrument software has been updated restore the instrument factory calibration data that was previously backed up from the original disk drive. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.
9. Write the instrument model number and serial number on the original disk drive and reinstall it in the instrument.
10. Write the instrument model and serial number on the additional disk drive and place it back in the static safe bag that it was shipped in and place it in a safe place until it is needed again.
11. The instrument is now ready for use.

After the Instrument Has Already Been Placed in a Secure Environment

If the instrument that this additional disk drive is intended to be used with is already inside of a controlled secure environment you will not be able to transfer the instrument specific factory calibration data to the additional disk drive. When the instrument is eventually removed from the controlled secure environment, with the original disk drive left inside the controlled secure environment, follow the procedure below to put the additional disk drive into service.

1. Install the additional disk drive into the instrument and power it on. See the Initializing the Instrument Operating System section in this document for instructions.
2. Verify that the instrument software is the latest version. For instructions on how to verify the currently installed software version, as well as how to know what the latest version is, see the Software Updates section in this document for instructions.
3. Since the instrument specific factory calibration data file is not available to be copied onto this additional disk drive a complete instrument calibration, including all adjustments, will need to be performed.
4. When the instrument is to be placed back into the controlled secure environment backup the factory calibration data to a USB storage device. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.
5. Place a copy of the latest instrument software, as verified in step 2 above, onto the same USB storage device.
6. Remove the additional disk drive from the instrument and write the instrument model and serial number on it for future identification. Place the additional disk drive back in the static safe bag that it was shipped in and place it in a safe place until it is needed again.
7. Return the instrument to the controlled secure environment along with the USB storage device.
8. Re-install the original disk drive into the instrument and turn it on.
9. Verify that the instrument software on the original disk drive is the same version that was just placed on the USB storage device.
10. If the instrument software on the original disk drive is not the same as what was just placed on the USB storage device update the instrument software on this drive using the software installed on the USB storage device. See the Software Updates section in this document for instructions.
11. Once the instrument software has been updated restore the new instrument factory calibration data from the previously backed up calibration data file on the USB storage device. See the Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9) section in this document for instructions.
12. The instrument is now ready for use and the USB storage device can be properly disposed of if necessary.

Initializing the Instrument Operating System

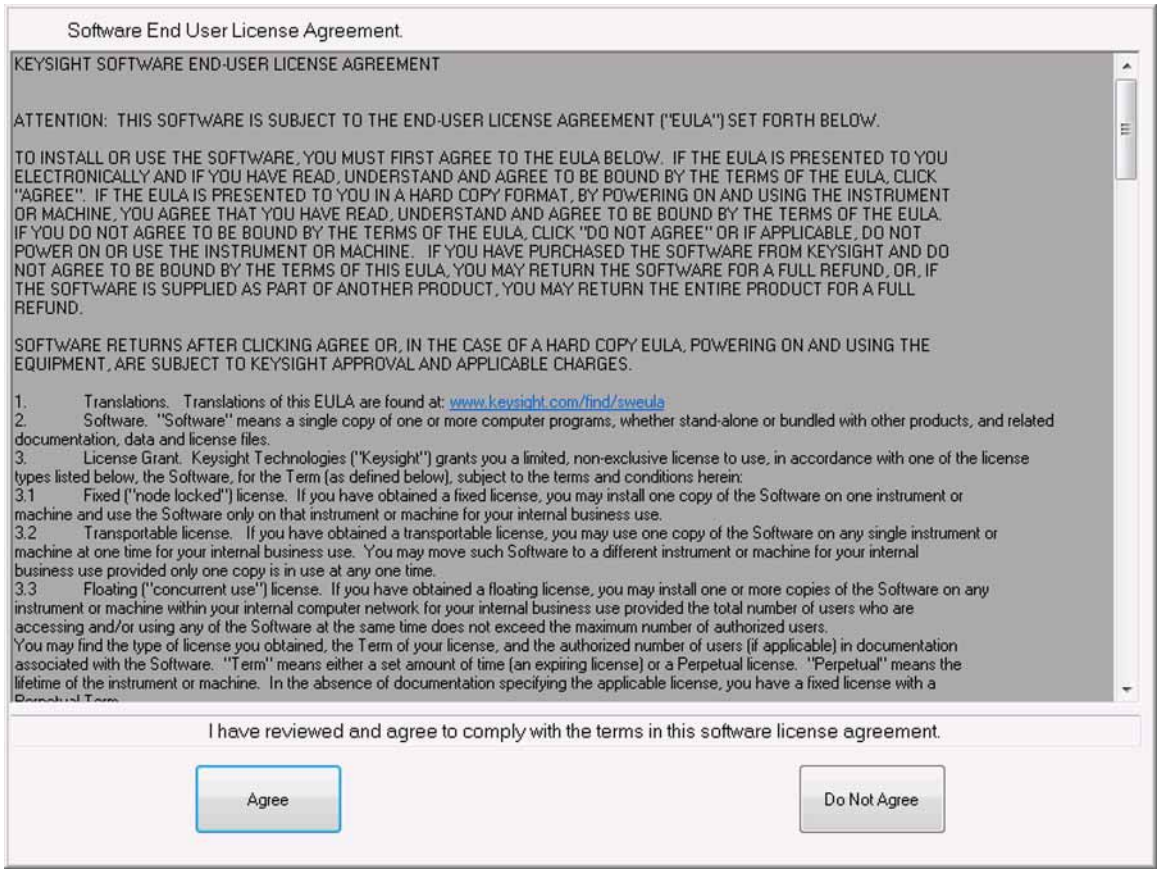
NOTE During the initial power-on process, the instrument may turn itself off and restart a number of times. This is normal and only happens during the initial installation process.

1. Connect a mouse to one of the instrument USB ports.

NOTE This process may take 20 minutes to complete.

2. The Keysight Technologies screen appears followed by a screen that automatically loads the operating system.
3. The License Agreement dialog box as shown in Figure 2 appears, providing information regarding the instrument software licensing.

Figure 2 License Agreement Dialog Box

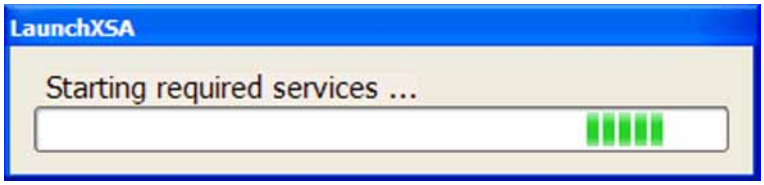


Select **Agree** to continue, or **Do Not Agree** to turn off the instrument before initializing the software.

CAUTION After launching the setup, do not turn off the instrument or remove power before the setup routine completes and the system restarts. Turning off the instrument may corrupt the system and the instrument software may need to be recovered.

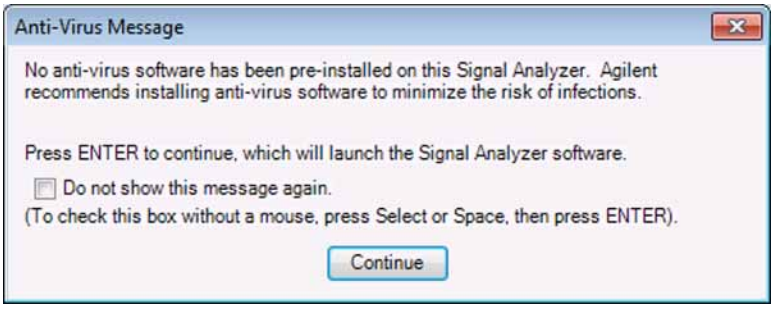
4. Several windows appear regarding getting devices ready and first boot customizations.
5. A message may appear that more recent calibration data is available. Select Yes and follow on-screen prompts to load data from back up file.
6. After the instrument restarts, a status window as shown in Figure 3 appears while the instrument application software loads:

Figure 3 Application Launch Status Window



7. The anti-virus notification as shown in Figure 4 will then appear.

Figure 4 Anti-Virus Message



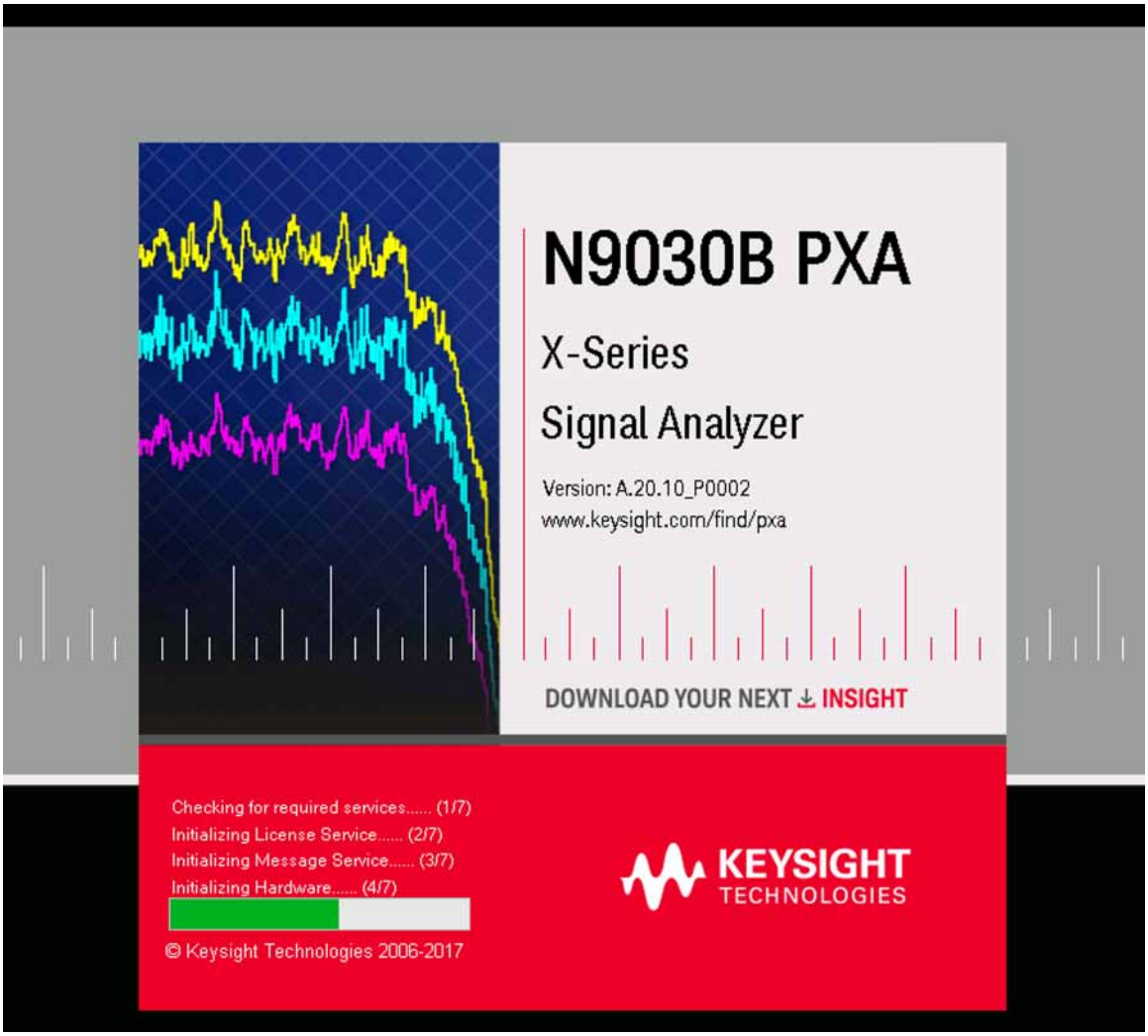
NOTE If you do not check the "Do not show this message again" check box, this message will be displayed each time the instrument is turned on. No application will start while this message is displayed. Before continuing, make sure that you carefully read the Anti-Virus message and determine what action is appropriate.

8. Select Continue.

9. Once the instrument application software completes loading the instrument initialization will be completed.

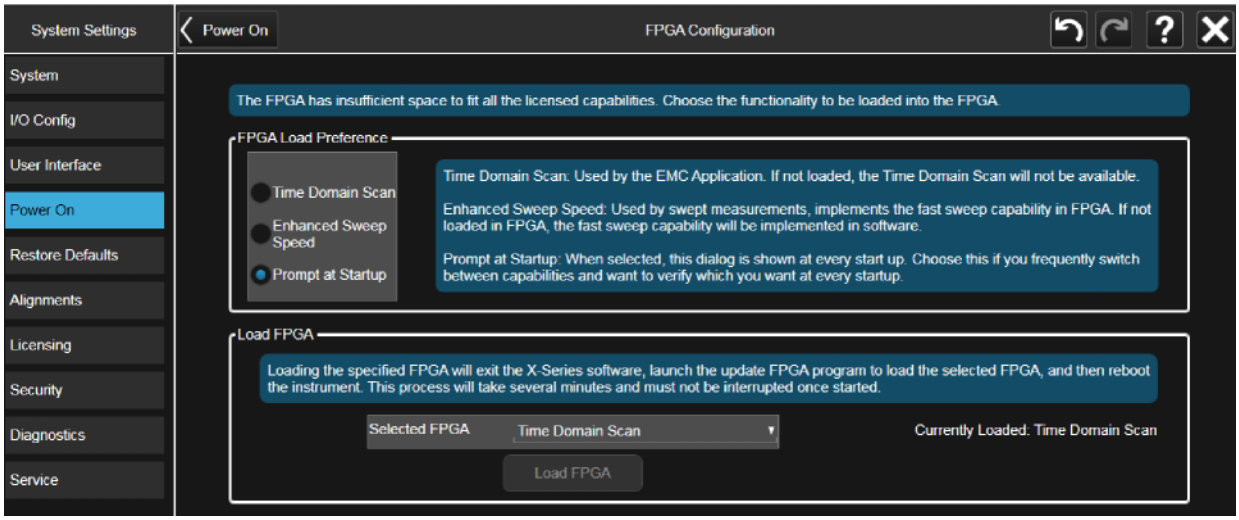
   A screen will appear as shown in Figure 5. The instrument may reboot one more time, and then the initialization will be complete.

Figure 5 Instrument Initialization



10. If the screen in Figure 6 appears, refer to page 7 step 3 to determine which FPGA was loaded when the original SSD was installed. Use this information to determine what is selected under "`FPGA Load Preference`" and "`Selected FPGA`" fields in the configuration screen. Click **Load FPGA** button if you selected a different FPGA than shown in the "`Currently Loaded:`" text.

Figure 6 FPGA Configuration Screen



Determining Installed Options & Processor Assembly Type

To determine your instrument's installed options and processor assembly type:

1. Press the **System** hardkey on the front panel, or tap the gear icon in the user interface. The System Settings panel opens.

System Hardkey Gear Icon

2. Select the `System` tab at left, then, in the Show group, tap `Show System`.
3. A screen appears that displays all installed options, and indicates the instrument's processor assembly type.

   For B-Series instruments, possible processor assembly types are:

   - PC6, This upgrade does not apply. Refer to Opt SSD or SS1 instead.
   - PC6S, This upgrade does not apply. Refer to Opt SSD or SS1 instead.
   - PC7, This upgrade does not apply. Refer to Opt SSD or SS1 instead.
   - PC7S, This upgrade does not apply. Refer to Opt SSD or SS1 instead.
   - PC8, This upgrade does apply.
   - PC9, This upgrade does apply.

For more details, see the User Interface or System Settings sections of the instrument's embedded or online Help.

Data Backup or Restore using Alignment Data Wizard (for processor type PC8 or PC9)

NOTE

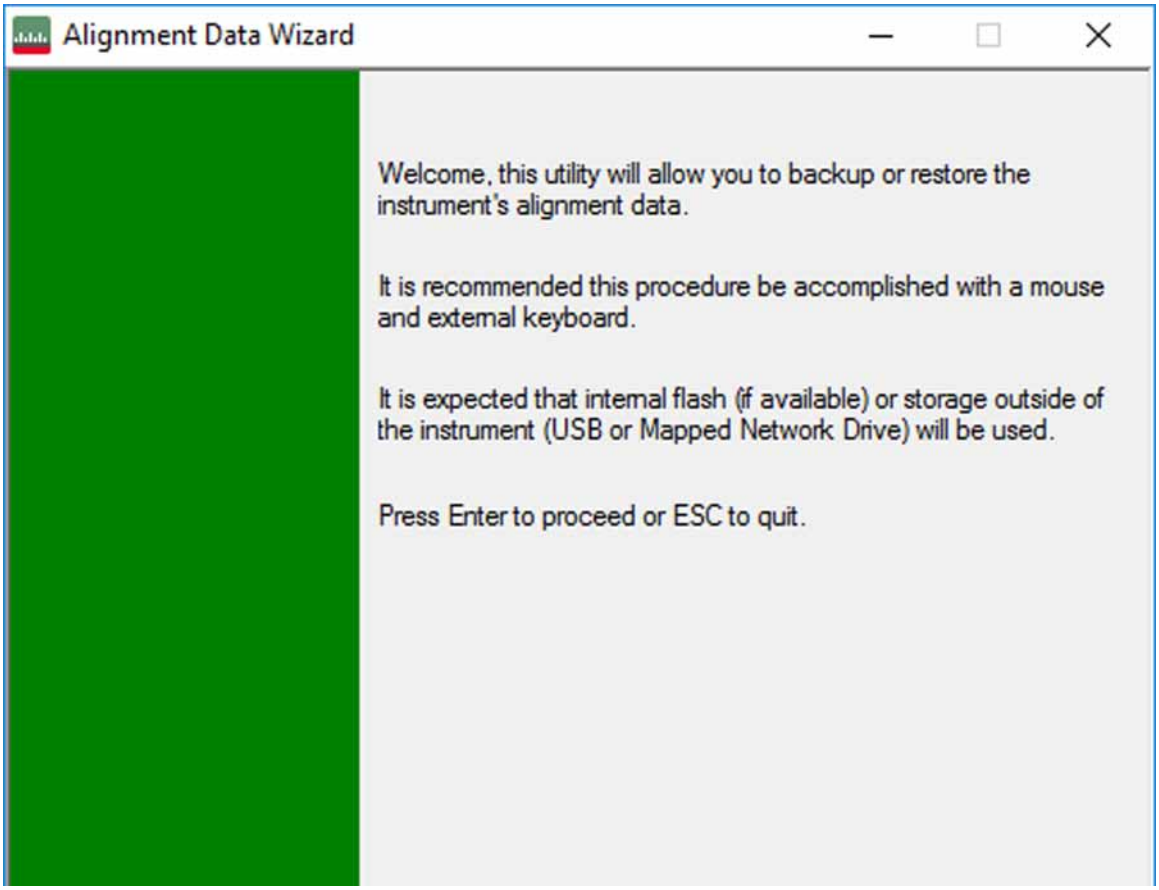
Determine what processor assembly type is in your instrument (see previous section, Determining Installed Options & Processor Assembly Type on page 15). If your instrument has a PC8 or PC9 processor, use the following data backup or restore using Alignment Data Wizard procedure. If your instrument has a PC6, PC6S, PC7, or PC7S processor, do not install the Opt SS2 solid state drive..

The Alignment Data Wizard is launched directly from the instrument application software interface, so you do **not** need to exit the application software before proceeding.

Follow the steps below to start the wizard:

1. Press **System** > **Alignments** > **Backup or Restore Align Data...**
2. If you are prompted to enter the Administrator password, enter either `Keysight4u!`, or `agilent4u`, depending on your instrument's software version.
3. When prompted, press **OK** to close the analyzer program.
4. The `Alignment Data Wizard` dialog appears, as shown in Figure 7:

Figure 7 Alignment Data Wizard Dialog



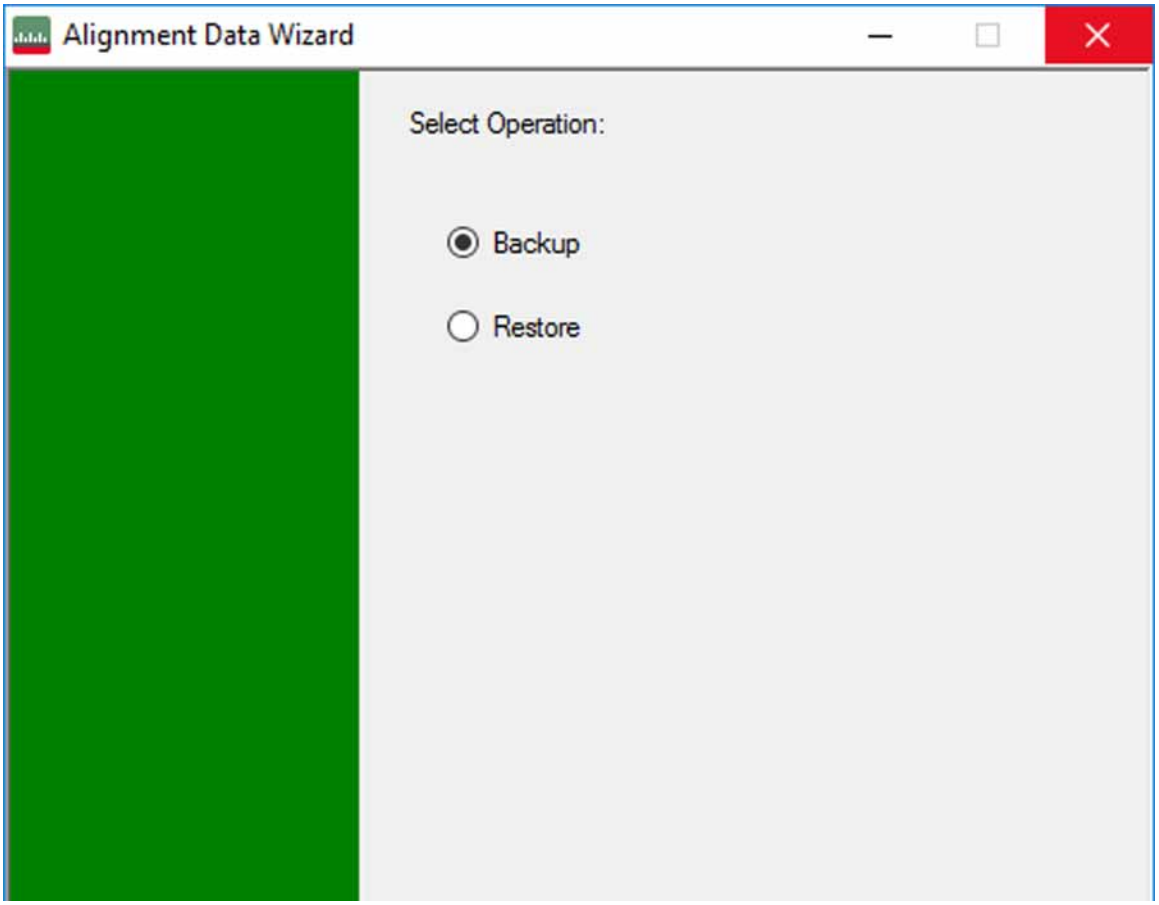
Click **Next** to proceed.

5. The next screen allows you to select either Backup or Restore.
   - To complete a **Backup** operation, follow the instructions in “Backup Operation” on page 17.
   - To complete a **Restore** operation, follow the instructions in “Restore Operation” on page 20.

Backup Operation

1. From the Select Operation screen, select **Backup**, as shown in Figure 8, then click **Next** to proceed.

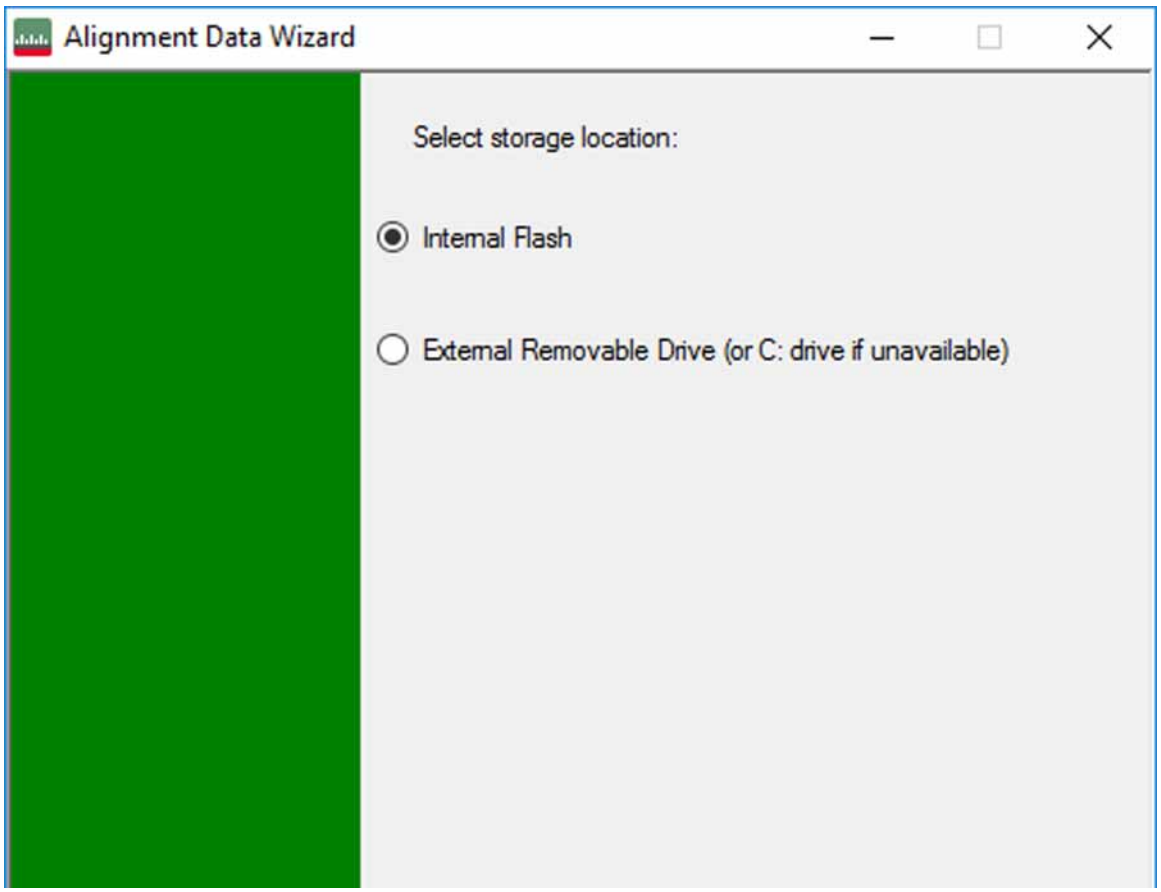
Figure 8 Selecting Backup Operation



2. The content of the next screen displayed depends on the Processor Assembly type. To determine your instrument's Processor Assembly type, see "Determining Installed Options & Processor Assembly Type" on page 15.

   If the instrument has a PC8 or PC9 Processor Assembly, then the screen contains the selections shown in Figure 9.

Figure 9 Alignment Data Wizard Storage Options for PC8/PC9



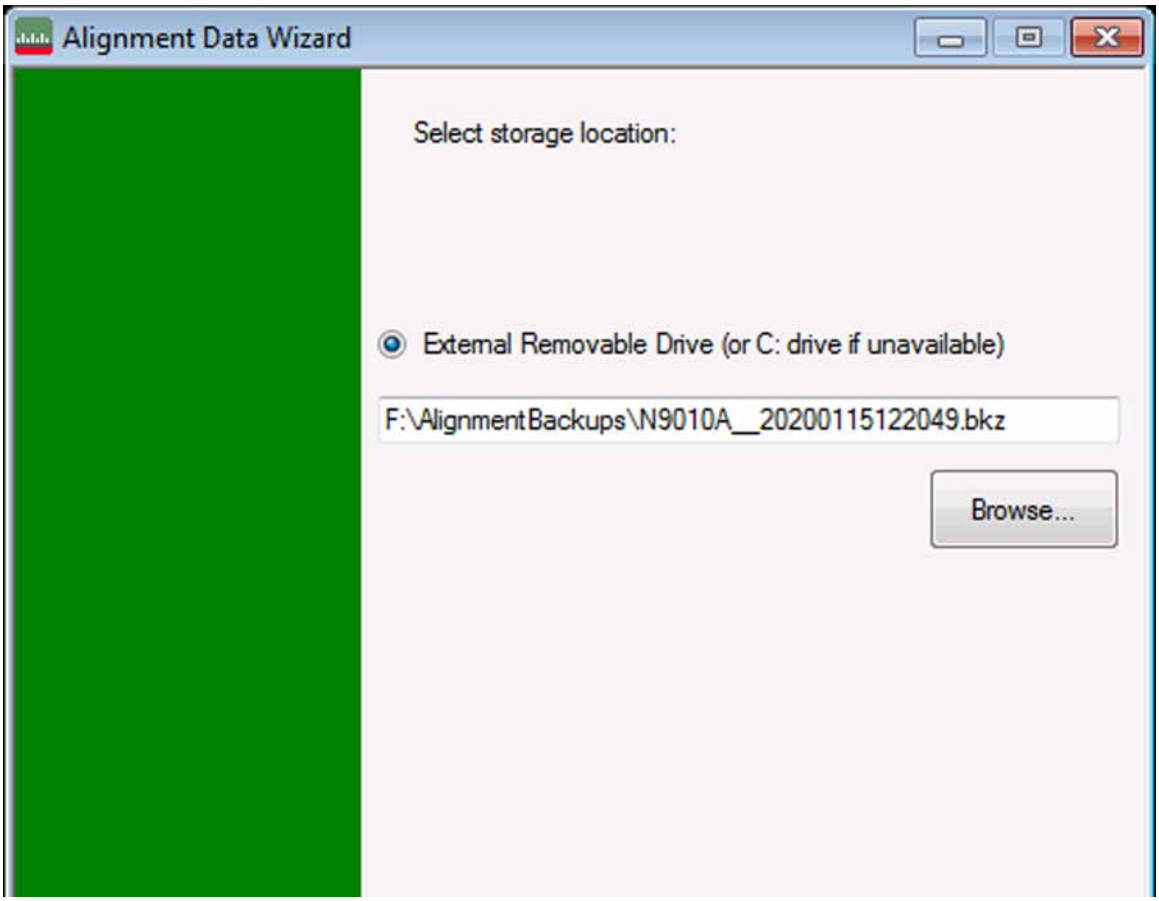
The available storage location options are as follows:

- **Internal Flash** is the Calibration Backup memory in the A4 Processor assembly. For PC8/PC9, this is the default location.
- **External Removable Drive**. This is the SD memory card in the A4 Processor assembly. This could also be a manually selected drive or an external USB drive. Use the browse feature to select the actual destination as needed.

NOTE When naming the file, it is recommended to use the instrument model number, serial number, and date to help identify the calibration data file with the correct instrument.

If the instrument has a PC6 or PC7 Processor Assembly, then the dialog contains only the **External Removable Drive** selection, as shown in Figure 10. In this case, do not proceed; this upgrade is only for instruments with PC8 or PC9 processors installed.

Figure 10 Alignment Data Wizard Storage Options for PC8/PC9



3. Select the desired storage location, then click **Next** and follow the wizard's on-screen instructions to back up the calibration data to the external USB Memory Device or Flash Memory.

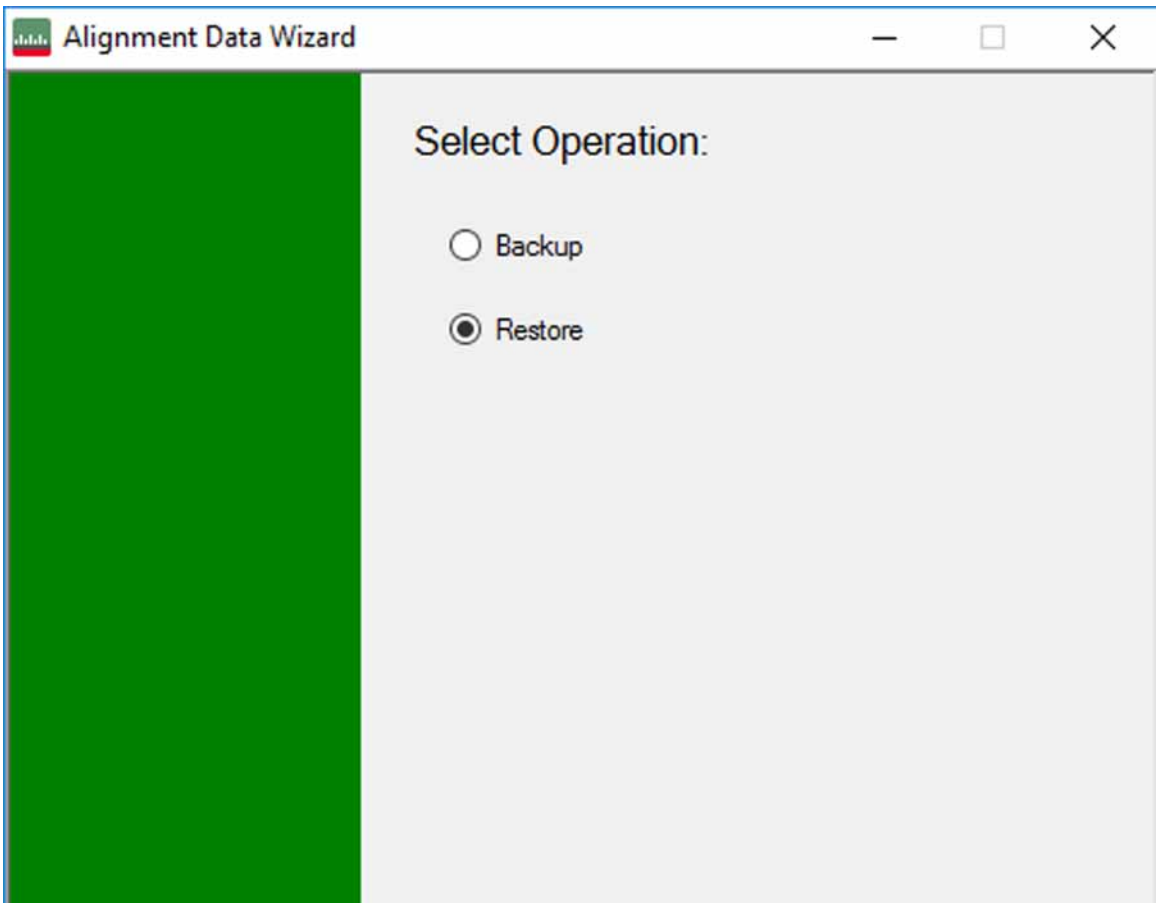
NOTE When naming the file, it is recommended to use the instrument model number, serial number, and date to help identify the calibration data file with the correct instrument.

This completes the Backup operation.

Restore Operation

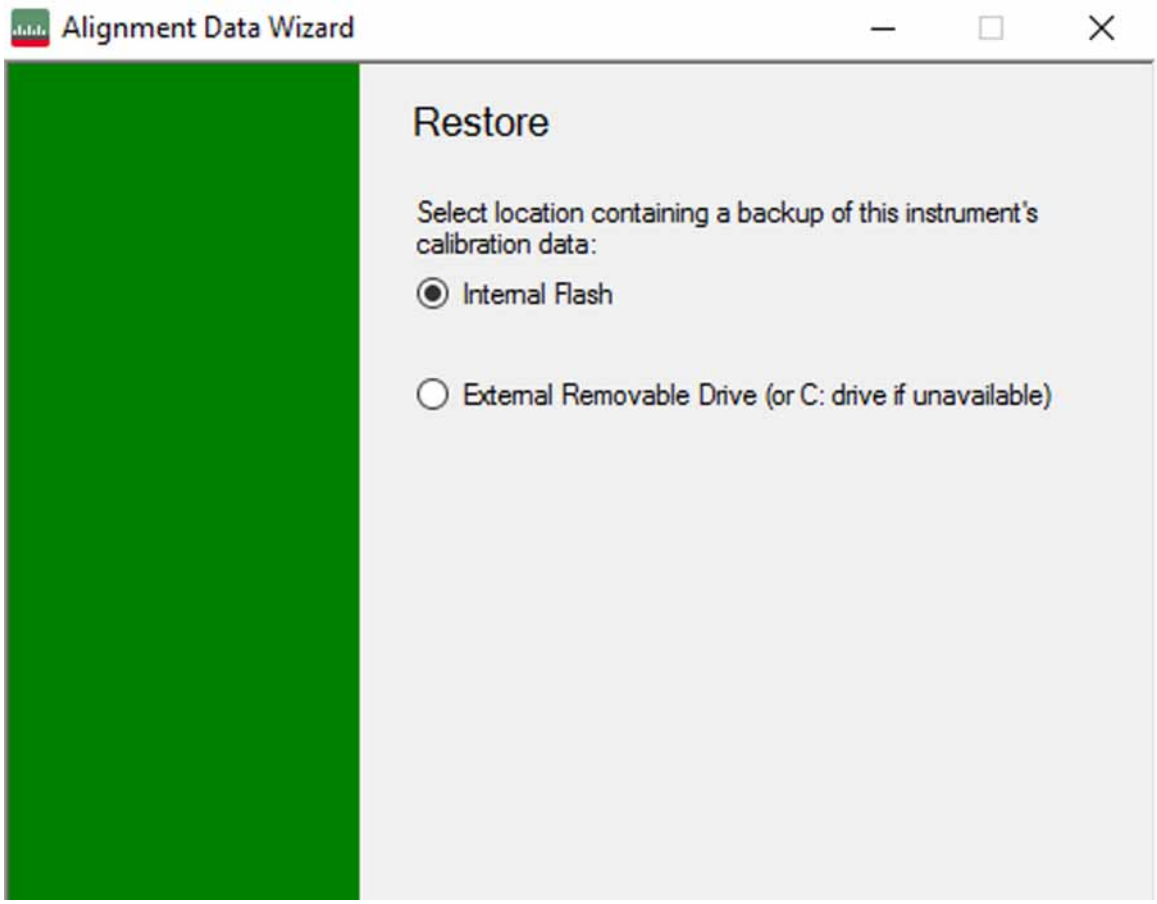
1. From the Select Operation screen, select **Restore**, as shown in Figure 11, then click **Next** to proceed.

Figure 11 Selecting Restore Operation



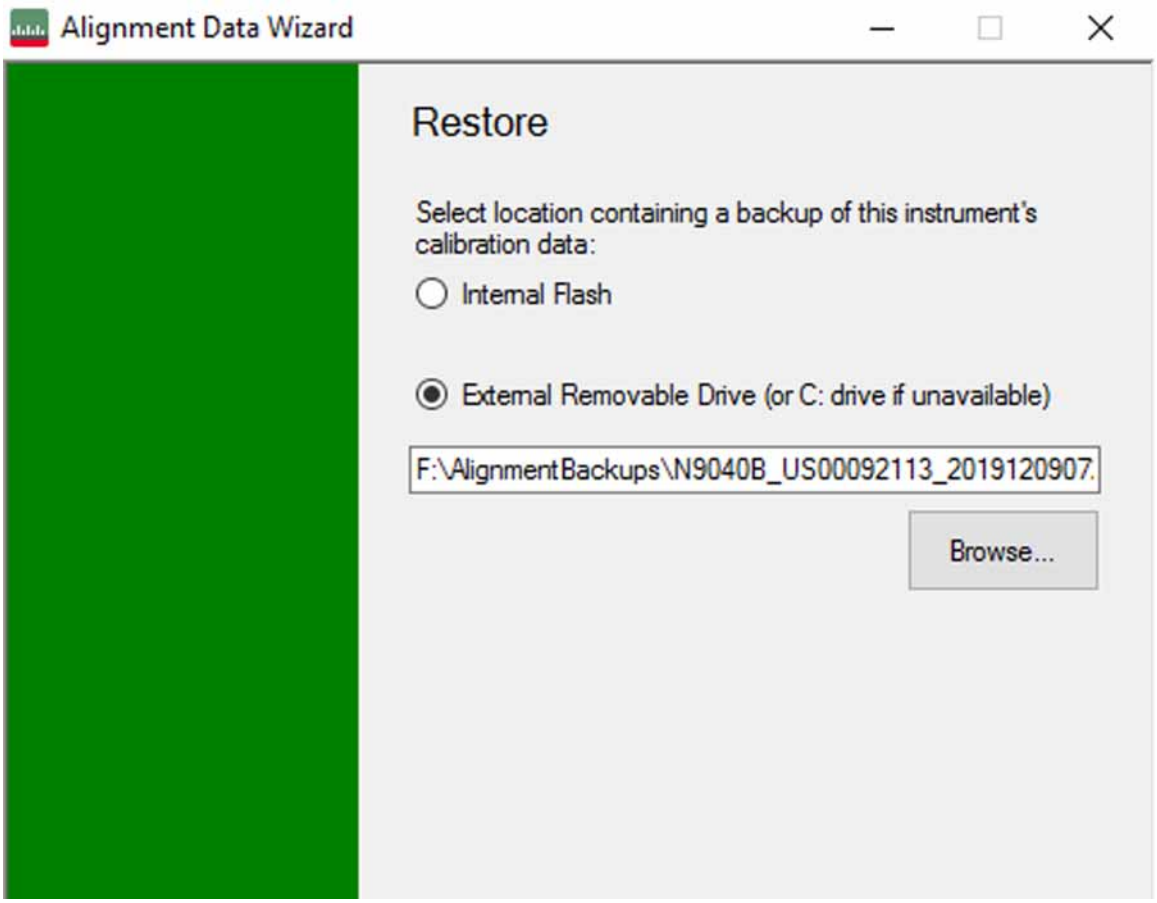
2. If the instrument has a PC8 or PC9 Processor Assembly, then you can choose to perform a Restore operation from Internal Flash Memory. Select that option as shown in Figure 12. To determine your instrument's Processor Assembly type, see "Determining Installed Options & Processor Assembly Type" on page 15.

Figure 12 Restore Operation from Internal Flash (PC8/PC9 only)



Alternatively, you can perform a Restore from an External Removable Drive. This option is shown selected in Figure 13. In this case, use the **Browse** button to select the appropriate backup location for Calibration files

Figure 13 Restore Operation from External Removable Drive (PC8 or PC9)



3. Select the desired storage location, then click **Next** and follow the wizard's on-screen instructions to restore the calibration data from the external USB Memory Device or Flash Memory.

   This completes the Restore operation.

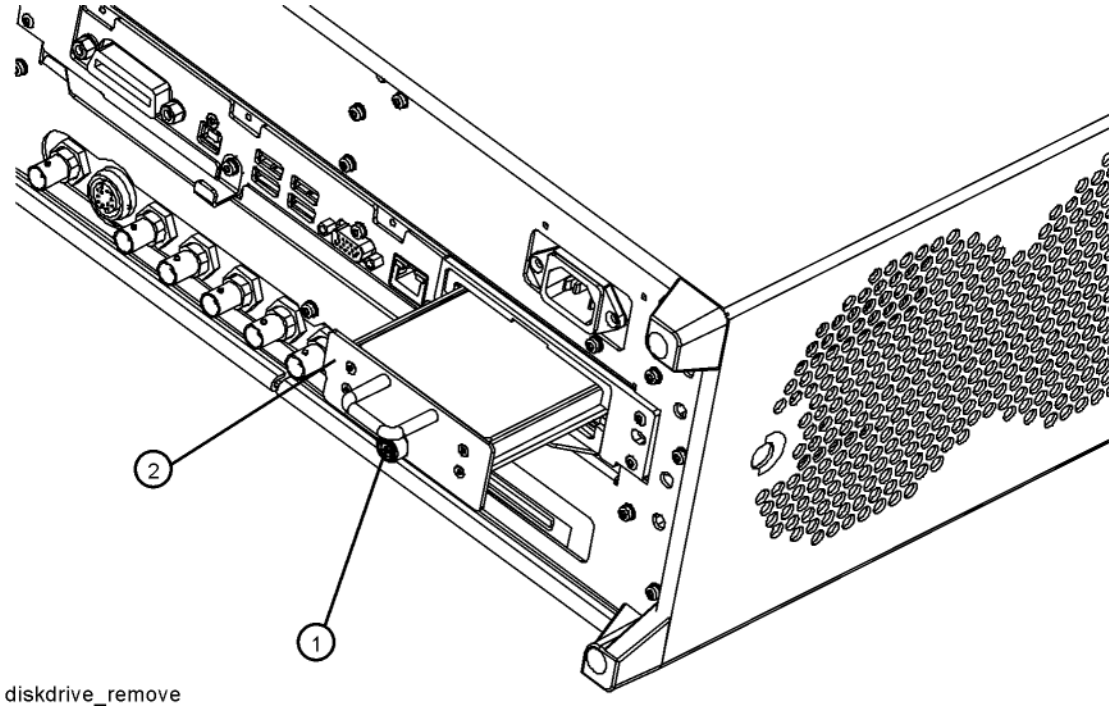
Disk Drive Removal and Installation

CAUTION

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Refer to the documentation that pertains to your instrument for information about static-safe workstations and ordering static-safe accessories.

1. Turn the instrument off, wait until the yellow standby LED is lit, and remove the AC power cord.
2. Refer to Figure 14. Locate and remove the existing disk drive carrier assembly (2) from the instrument by loosening the rear panel screw (1).

Figure 14 Replacing the Disk Drive Carrier Assembly



diskdrive_remove

3. Replace the disk drive carrier assembly (2) into the instrument and tighten the screw (1) to 9 inch-pounds.

Software Updates

The currently installed instrument software version can be easily determined by pressing the following front panel keys:

System, **Show System**

The software revision can be found on this screen as the:

Instrument S/W Revision

Updating the Instrument Software:

If an instrument software update is required, the latest revision of the X-Series software may be downloaded from:

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

FPGA Code Compatibility

One of the main reasons that the instrument application software must be the same version on all disk drives used in a particular instrument, in addition to factory calibration data compatibility issues, is that there is FPGA program code on multiple assemblies inside the instrument that must be compatible with the version of instrument software being used. The only way to ensure compatibility for all disk drives is to use the same instrument application software on all drives.

FPGA Code Update

There is FPGA program code on many different assemblies inside of the instrument, and all of these must be a compatible version with the instrument software revision. In order to ensure that this requirement is met you need to either install the latest software version on all disk drives used with the instrument or run an FPGA update program. If this program detects that there are assemblies that need to be updated it will update them to the correct version.

CAUTION

Once you start the FPGA programming process you MUST NOT interrupt the process for any reason. This would include turning the instrument off or unplugging the power cord to the instrument. Doing so will result in an inoperative instrument, requiring the affected assembly to be replaced.

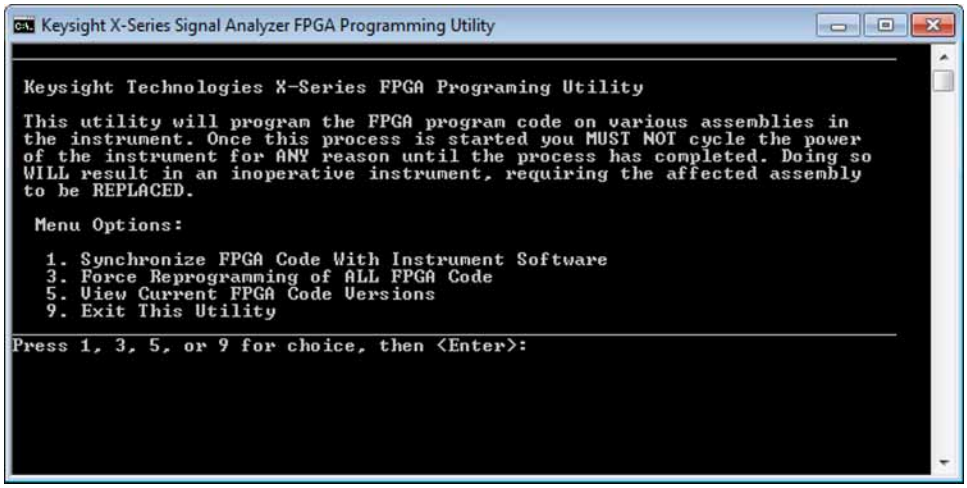
Updating the Instrument FPGA Code

1. Connect a USB mouse and keyboard to available instrument USB ports.
2. Using the mouse, select Start, My Computer. Navigate to the following folder:

   C:\Program Files\Agilent\SignalAnalysis\Physics
3. In this folder find and execute the file named:

   FPGA_Prog.bat
4. The FPGA Programming Utility will start and a window as shown in Figure 15 will appear.

Figure 15 FPGA Programming Utility



5. To program the FPGA code enter 1 and press Enter. You will need to confirm this selection by selecting 1 and Enter one more time.
6. The programming of the FPGA code could take a few minutes to complete. Once it has finished the instrument will reboot itself to use the new code.

Instrument Security Information

Information on the X-Series Signal Analyzer instrument security features and the instrument volatility can be found at:

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

Utilities, Adjustments, and Performance Verification Tests

Utilities Required

None

Adjustments Required

None

Performance Testing Required

None

For assistance, contact your nearest Keysight Technologies Sales and Service Office. To find your local Keysight office access the following URL:

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

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