

# Keysight X-Series Signal Analyzers

This manual provides documentation for the following analyzers:

PXA Signal Analyzer N9030A

MXA Signal Analyzer N9020A

EXA Signal Analyzer N9010A

CXA Signal Analyzer N9000A

Security  
Features and  
Document of  
Volatility

# Notices

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### 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.

## Where to Find the Latest Information

Documentation is updated periodically. For the latest information about these products, including instrument software upgrades, application information, and product information, navigate to the URL above, then in the **Support by Product Model Number** box, enter the Product Number of your instrument (for example, **N9030A**) and click **Find**.

To receive the latest updates by email, subscribe to Keysight Email Updates:

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

Information on preventing instrument damage can be found at:

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

### Is your product software up-to-date?

Periodically, Keysight releases software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Keysight Technical Support website at:

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

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# 1

## Contacting Keysight Sales and Service Offices

Assistance with test and measurement needs, and information to help you find a local Keysight office, is available via the internet at, <http://www.keysight.com/find/assist>. If you do not have internet access, please contact your designated Keysight representative.

### NOTE

In any correspondence or telephone conversation, refer to the instrument by its model number and full serial number. With this information, the Keysight representative can determine whether your unit is still within its warranty period.

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## 2

## Products Covered by this Document

Product Family Name	Product Names	Model Numbers
X-Series Signal Analyzers	PXA Signal Analyzer	N9030A
	MXA Signal Analyzer	N9020A
	EXA Signal Analyzer	N9010A
	CXA Signal Analyzer	N9000A

This document describes instrument memory types and security features. It provides a statement regarding the volatility of all memory types, and specifies the steps required to declassify an instrument through memory clearing, sanitization, or removal.

For additional information, go to:

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

### IMPORTANT

Be sure that all information stored by the user in the instrument that needs to be saved is properly backed up before attempting to clear any of the instrument memory. Keysight Technologies cannot be held responsible for any lost files or data resulting from the clearing of memory.

Be sure to read this document entirely before proceeding with any file deletion or memory clearing.

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## X-Series Processor and Disk Drive Configurations

This document describes alternative Processor and Disk Drive Configurations for X-Series analyzers. Due to continuous improvement of the X Series Analyzer range, configurations may vary according to such factors as: manufacturing date, product name, and installed options. Processor and disk drive configurations are considered separately, due to the large number of possible combinations.

The installed memory components, and the procedures for sanitization of the instrument's memory, differ according to the processor and disk drive configurations. Therefore, to identify the correct information and procedures for your instrument, you need to determine its **Processor Assembly Configuration** and **Disk Drive Configuration**.

### Processor Assembly Configuration

There are several possible processor assembly configurations: older configurations have a non-removable (fixed) disk drive, while newer configurations have a removable disk drive. The relationship between processor assembly type and product name is detailed in **Table 2-1** below. (For details of how to determine installed options, see **"Determining Installed Options"** on page 13)

Table 2-1 Processor Assembly & Product Name

Type	Configuration	Product Names & Installed Options
1	<b>Fixed Disk</b>	<p>The disk is referred to as "fixed", because it can only be removed by removing and opening the instrument's processor assembly.</p> <p>This configuration is standard for:</p> <ul style="list-style-type: none"><li><b>a.</b> MXA instruments without Option PC2, PC4 or PC6(S),</li><li><b>b.</b> EXA instruments without Option PC2, PC3, PC4, PC5, PC6(S) or PC7(S),</li><li><b>c.</b> CXA instruments without Option PC3, PC5 or PC7(S)</li></ul>
2	<b>Removable Disk</b>	<p>The disk may be removed from the instrument's rear panel, without removing or opening the processor assembly.</p> <p>This configuration is standard for:</p> <ul style="list-style-type: none"><li><b>a.</b> All PXA instruments,</li><li><b>b.</b> MXA instruments with Option PC2, PC4 or PC6(S),</li><li><b>c.</b> EXA instruments with Option PC2, PC3, PC4, PC5, PC6(S) or PC7(S),</li><li><b>d.</b> CXA instruments with Option PC3, PC5 or PC7(S)</li></ul>



## Disk Drive Configuration

There are several possible disk drive configurations, as listed below in [Table 2-2](#). The actual configuration depends on the instrument's Product Name and installed options. For details of how to determine installed options, see [“Determining Installed Options” on page 13](#).

For details of the capacities of each of the drive types listed below, see [“Non-Volatile Memory” on page 18](#).

Table 2-2 Disk Drive Configurations

Type	Configuration	Product Names & Installed Options
Fixed Magnetic	Fixed Magnetic Drive	This configuration applies to: <ul style="list-style-type: none"><li>a. MXA instruments without Option PC2 or PC4,</li><li>b. EXA instruments without Option PC2, PC3, PC4 or PC5,</li><li>c. CXA instruments without Option PC3 or PC5.</li></ul>
Removable Magnetic	Removable Magnetic Drive	This configuration applies to: <ul style="list-style-type: none"><li>a. PXA instruments without <a href="#">Option SSD</a>,</li><li>b. MXA instruments with Option PC2, but without <a href="#">Option SSD</a>.</li><li>c. EXA instruments with Option PC2 or PC3, but without <a href="#">Option SSD</a>.</li></ul> <p>(To determine whether your instrument includes <a href="#">Option SSD</a>, which is now included with new instruments by default, see <a href="#">“Determining Installed Options” on page 13</a>.)</p>
Removable Solid-State	Removable Solid-State Drive (Flash drive)	This configuration applies to all instruments with <a href="#">Option SSD</a> , Option PC4, PC5, PC6(S) or PC7(S). <p>Originally an option, a solid-state disk drive cartridge is now supplied by default with X-Series Analyzers.</p>

### Option SSD

You can obtain a [Removable Solid-State](#) disk drive for your instrument, either as an upgrade to replace a [Removable Magnetic](#) disk drive, or as an additional solid-state drive, by ordering Option SSD. You can order Option SSD either at the time that you purchase the instrument, or at any later time.

If your instrument's current processor assembly configuration is [Fixed Disk](#), in order to be able to use the removable disk you will need to upgrade the instrument to a [Removable Disk](#), by ordering Option PC6 or PC7 as appropriate. (Older CXA instruments may require Option PC5 instead of PC7. Before ordering, check with your Keysight Sales office, as described in [“Contacting Keysight Sales and Service Offices” on page 6](#).)

Note that [Removable Solid-State](#) disk units exist in various capacities, ranging from 32 GB to 256 GB (or greater).

## Determining Instrument Configuration based on Product Name

Use the following procedures to determine the processor assembly and disk drive configurations of your instrument, starting from its Product Name.

### Processor Assembly Configuration

The following procedure allows you to determine whether your instrument has a **Fixed Disk** or **Removable Disk** processor assembly.

Step	Procedure
1	What is the Product Name of your instrument? <ul style="list-style-type: none"><li>– PXA: Your instrument has a <b>Removable Disk</b> processor assembly.</li><li>– MXA, EXA, CXA: Go to Step 2.</li></ul>
2	Examine the instrument's rear panel and compare with the illustrations in " <b>Rear Panel Configurations</b> " on page 12. Does it resemble <b>Figure 2-1</b> (Fixed Disk) or <b>Figure 2-2</b> (Removable Disk)? <ul style="list-style-type: none"><li>– Fixed Disk: Your instrument has a <b>Fixed Disk</b> processor assembly.</li><li>– Removable Disk: Your instrument has a <b>Removable Disk</b> processor assembly.</li></ul>

### Disk Drive Configuration

The following procedure allows you to determine your instrument's disk drive configuration

Step	Procedure
1	What is the Product Name of your instrument? <ul style="list-style-type: none"><li>– PXA: Go to Step 4</li><li>– MXA, EXA: Go to Step 3</li><li>– CXA: Go to Step 2</li></ul>
2	Examine the instrument's rear panel and compare with the illustrations in " <b>Rear Panel Configurations</b> " on page 12. Does it resemble <b>Figure 2-1</b> (Fixed Disk) or <b>Figure 2-2</b> (Removable Disk)? <ul style="list-style-type: none"><li>– Fixed Disk: Your instrument has a 40 GB <b>Fixed Magnetic</b> disk drive.</li><li>– Removable Disk: Your instrument has a <b>Removable Solid-State</b> disk drive., with capacity in the range from 32 GB to 256 GB</li></ul>
3	Examine the instrument's rear panel and compare with the illustrations in " <b>Rear Panel Configurations</b> " on page 12. Does it resemble <b>Figure 2-1</b> (Fixed Disk) or <b>Figure 2-2</b> (Removable Disk)? <ul style="list-style-type: none"><li>– Fixed Disk: Your instrument has a 40 GB <b>Fixed Magnetic</b> disk drive.</li><li>– Removable Disk: Go to Step 4.</li></ul>

Products Covered by this Document  
Determining Instrument Configuration based on Product Name

Step	Procedure
4	<p>Check the instrument's installed options (see <a href="#">“Determining Installed Options” on page 13</a>).</p> <ul style="list-style-type: none"><li>– If the list includes <a href="#">N90X0A-IDE</a>, your instrument has a 160 GB <a href="#">Removable Magnetic</a> disk drive.</li><li>– If the list includes <a href="#">N90X0A-SSD</a>, your instrument has a <a href="#">Removable Solid-State</a> disk drive, with capacity in the range from 32 GB to 256 GB.</li></ul>

Rear Panel Configurations

Figure 2-1      Rear Panel of Instrument with **Fixed Magnetic** Disk

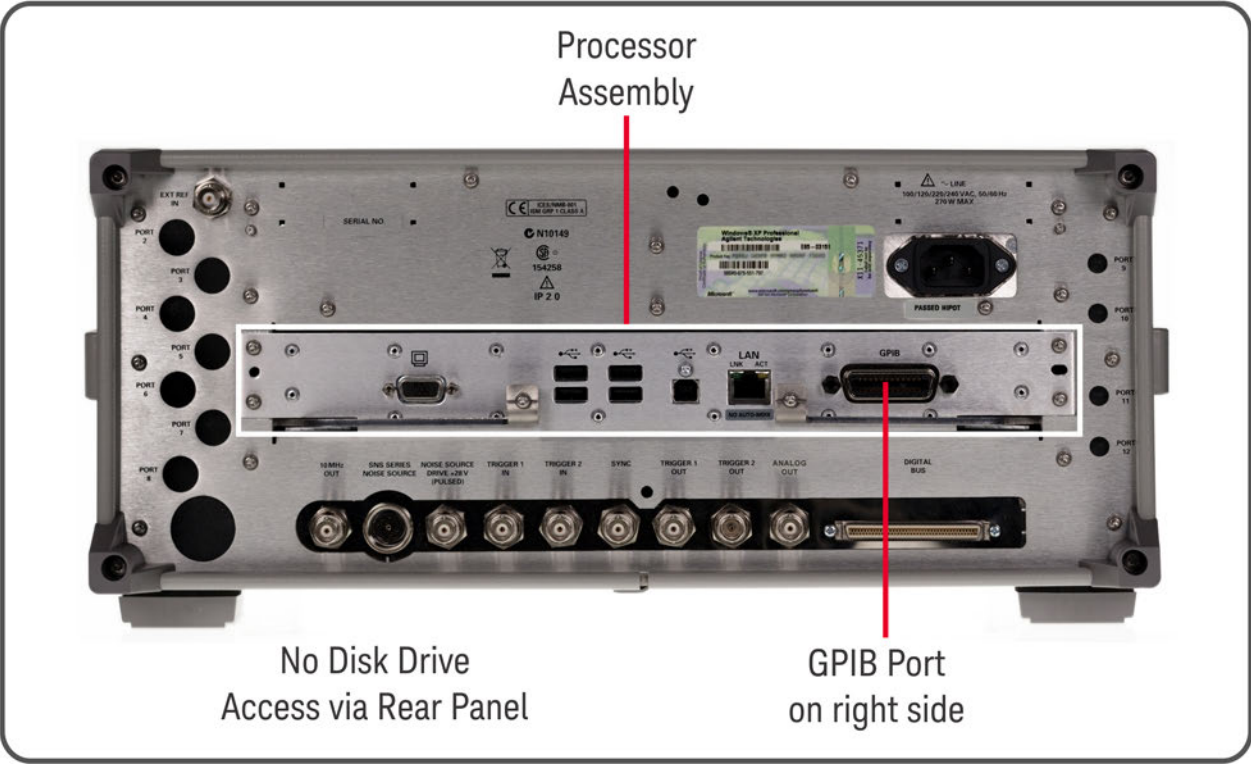
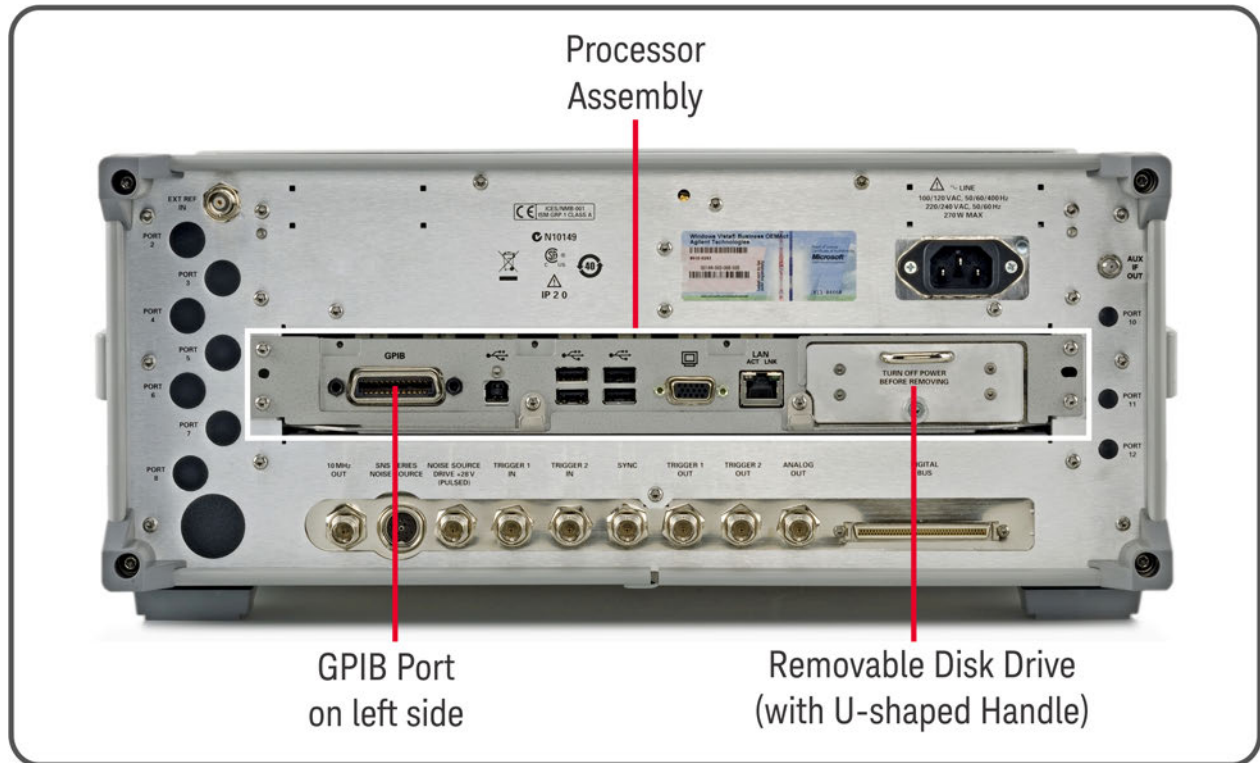


Figure 2-2 Rear Panel of Instrument with **Removable Magnetic or Removable Solid-State Disk**



## Determining Installed Options

Use the following procedure to determine whether your instrument has a magnetic or solid-state disk drive, and whether any of Options PC2 through PC7 are installed.

1. Using the instrument front panel and softkey menus, press **System > Show > System**.
2. The **Show System** display appears. Look for start of the **Option** listing, a few lines below the top of the table, as shown in **Figure 2-3** below.

**Figure 2-3** Show System Display: Option Listing

Installed  
Options  
List

MXA	Signal Analyzer
Product Number	N9020A
Serial Number	US01020035
Instrument S/W Revision	A.04.00_R0011
Computer Name	A-N9020A-20035
IP Address	127.0.0.1
Host ID	N9020A,US01020035
mDNS Enabled	Yes
mDNS Host Name	A-N9020A-20035
mDNS Service Name	
Option	Name / Description
N9020A-IDE	FUJITSU MHT2030AT

3. The entries under the **Option** heading have the significance described in **Table 2-3**.
4. To dismiss the **Show System** display, press any other front-panel or menu key.

**Table 2-3** Interpretation of Option Items

Listing Identifier	Installed Option
N90X0A-SSD <sup>a</sup>	A <b>Removable Solid-State</b> disk drive is installed (either because the instrument was supplied with this drive, or because Option SSD has been installed)
N90X0A-IDE <sup>a</sup>	A <b>Fixed Magnetic</b> disk drive is installed, as shown in the example in <b>Figure 2-3</b> above
N90X0A-PC1 <sup>a</sup>	A <b>Fixed Magnetic</b> disk drive is installed
N90X0A-PC2 <sup>a</sup>	A <b>Removable Magnetic</b> or <b>Removable Solid-State</b> disk drive is installed
N90X0A-PC3 <sup>a</sup>	A <b>Removable Magnetic</b> or <b>Removable Solid-State</b> disk drive is installed
N90X0A-PC4 <sup>a</sup>	A <b>Removable Solid-State</b> disk drive is installed
N90X0A-PC5 <sup>a</sup>	
N90X0A-PC6 <sup>a</sup>	
N90X0A-PC6S <sup>a</sup>	
N90X0A-PC7 <sup>a</sup>	
N90X0A-PC7S <sup>a</sup>	

Products Covered by this Document  
Determining Instrument Configuration based on Product Name

- a. "X" is a digit between 0 and 3, according to the Model Number

### 3 Security Terms and Definitions

Term	Definition
<b>Clearing</b>	<p>As defined in Section 5 of <a href="#">NIST SP 800-88, Revision 1, Guidelines for Media Sanitization</a>, Clearing is a sanitization method by which classified information in user-addressable storage space on the media is overwritten with non-sensitive data, using the standard read and write commands for the device.</p> <p>Hence, clearing is typically used when the instrument is to remain in an environment with an acceptable level of protection.</p>
<b>Instrument Declassification</b>	<p>A term that refers to procedures that must be undertaken before an instrument can be removed from a secure environment (aka controlled area), such as is the case when the instrument is returned for calibration. Declassification procedures include memory sanitization or memory removal, or both.</p>
<b>Sanitization</b>	<p>Sanitization methods are defined and discussed in <a href="#">NIST SP 800-88, Revision 1, Guidelines for Media Sanitization</a>. In that document, <b>Purging</b> is defined as a method by which classified information is completely removed from memory, or the memory is destroyed, so that even a laboratory attack using known techniques or analysis will not recover any information.</p> <p>In this document, the term <b>Sanitization</b> is reserved for the Purge Sanitization method described in the NIST document.</p> <p>Hence, instrument sanitization is typically required when an instrument is moved from a secure to a non-secure environment, such as when it is returned to the factory for calibration.</p> <p>Keysight memory sanitization procedures are designed for customers who need to meet the requirements specified by the US Defense Security Service (DSS). These requirements are specified in the “Media Sanitization Matrix” in Appendix T of the <a href="#">Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM)</a>.</p>
<b>Secure Erase</b>	<p>Secure Erase is a term that is used to refer to either the clearing or sanitization features of Keysight instruments.</p>



## 4

# Instrument Memory & Volatility

This chapter summarizes all memory types in the instrument, for the following processor assembly and disk drive configurations:

- a. **Fixed Disk** processor assemblies,
- b. **Removable Disk** processor assemblies.

For definition of terms, and to determine the configuration of your instrument, based on its Product Name and installed options, see [“X-Series Processor and Disk Drive Configurations” on page 8](#).

The descriptions below are divided between:

- 1. **Non-Volatile Memory**,
- 2. **Volatile Memory**.

## Non-Volatile Memory

This section contains information on the memory components available in your instrument.

- “Components for All Instruments” on page 19
- “Additional Components for PXA and some MXA Instruments” on page 24
- “Additional Components for Instruments with PC6, PC7, PC6S, and PC7S Processor Assemblies” on page 26

All tables provide details of the size of each memory component, its type, how it is used, its location, volatility, and the sanitization procedure.

### NOTE

The instrument contains no user-accessible non-volatile memory, except for the Disk Drive described in Item 1 of [Table 4-1](#) and the SD Memory Card described in [Table 4-3](#). For this reason, as indicated in the tables below, no sanitization procedure is required for any memory component except the Disk Drive and SD Memory Card.

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## Components for All Instruments

Table 4-1 Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
<p>1. Disk Drive</p> <p><b>Fixed Magnetic:</b> 40 GByte</p> <p><b>Removable Magnetic:</b> 160 GByte</p> <p><b>Removable Solid-State:</b> Capacity Varies, 32 GByte - 256 GByte</p> <p>This drive is partitioned, as detailed in “<b>Disk Drive Partitioning</b>” on page 27.</p>	Yes	Yes	Contains operating system, Instrument Software, Factory Calibration Data, Diagnostic software, Crash recovery image, user instrument states, user data files, user trace data and any user installed third party software.	Programmed before installation or by factory/service center calibration procedure software, or by upgrade installation software. Also programmed via operations and by the user.	<p><b>Fixed Disk:</b> A4 Processor Assy.</p> <p><b>Removable Disk:</b> Rear Panel (Removable)</p> <p>Contains user data.</p>	See Table 5-1 on page 30.
<p>2. CPU BIOS (CMOS NVRAM)</p> <p>256 Byte (battery backed)</p>	No	Yes	Contains default BIOS settings to use when booting the Processor Assembly.	Programmed by factory. Settings can be toggled by user.	<p>A4 Processor Assy.</p> <p>Battery backed to maintain Windows calendar time.</p> <p>Contains no user data.</p>	None.
<p>3. License Storage Memory (EEPROM)</p> <p>512 kbit</p>	No	Yes	Contains instrument serial number and license keys for measurement applications. License keys are encrypted.	Programmed before installation and by installing new license keys.	<p>A7 Midplane Assy.</p> <p>Contains no user data.</p>	None.

Table 4-1 Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
4. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A14 Synthesizer Assy. Contains no user data.	None.
5. Config Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A14 Synthesizer Assy. Contains no user data.	None.
6. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A15 Front End Control Assy. Contains no user data.	None.
7. Config Memory (Flash) 2 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up. Primarily YTF, attenuator, and front end switch control.	Programmed before installation.	A15 Front End Control Assy. Contains no user data.	None.
8. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A2 Analog IF Assy. Contains no user data.	None.
9. Control Logic Memory (CPLD) 1600 Gates	No	Yes	Contains control algorithms to optimize filter performance.	Programmed before installation.	A2 Analog IF Assy. Contains no user data.	None.

Table 4-1 Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
10. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.
11. Config Memory (Flash) 8 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.
12. Control Logic Memory (CPLD) 6400 Gates	No	Yes	Contains measurement and control algorithms to optimize digital filtering.	Programmed before installation.	A3 Digital IF Assy. Contains no user data.	None.
13. Serial Presence Detect Memory (EEPROM) 2 Mbit	No	Yes	Used on commercial SDRAM Module, programmed by chip vendor. Contains module identification information.	Programmed by IC vendor only.	A3 Digital IF Assy. Contains no user data.	None.
14. Config & Cal Memory (EEPROM) 8 kbit (1024 x 8)	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.
15. FPGA Config Memory (EEPROM) 2 Mbit	No	Yes	Contains measurement and control software.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.

Table 4-1 Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
16. Digital Potentiometer (EEPROM) 112 bits (14 Bytes)	No	Yes	Contains default data to preset digital potentiometers during power-up.	Programmed before installation.	A16 Reference Assy. Contains no user data.	None.
17. Front Panel EEPROM 64 kbit	No	Yes	Contains software for running front panel microcontroller. Operates front panel LEDs, and transmits key presses to processor.	Programmed before installation.	A1A2 Front Panel Interface Board Contains no user data.	None.
18. Front Panel CPLD 800 Gates	No	Yes	Contains fixed digital logic associated with front panel keyboard button operation and LEDs.	Programmed before installation at the factory only.	A1A2 Front Panel Interface Board Contains no user data.	None.
19. EDID Memory (EEPROM) 2 kbit	No	Yes	Extended Display Identification Data is a VESA standard data format that contains basic information about a monitor and its capabilities, including vendor information, maximum image size, color characteristics, factory pre-set timings, frequency range limits, and character strings for the monitor name and serial number.	Programmed before installation.	A1A2 Front Panel Interface Board. Contains no user data.	None.
20. A11 Config Memory (EEPROM) 8 kbit	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A11 Low Band Switch. Contains no user data.	None.

Table 4-1 Summary of Non-Volatile instrument memory - All Instruments (Single-Core and Dual-Core Processors)

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
21. A12 Config Memory (EEPROM) 8 kbit	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A12 YTF Assembly. Contains no user data.	None.
22. A13 Config Memory (EEPROM) 8 kbit	No	Yes	Header EEPROM used to identify the assembly.	Programmed before installation.	A13 Front End Assembly. Contains no user data.	None.
23. A18 Header Memory. (EEPROM) 8 kbit	No	Yes	Contains header information used to identify the assembly.	Programmed before installation.	A18 BBIQ Connector Assembly. Contains no user data.	None.
24. A19 Header Memory. (EEPROM) 8 kbit	No	Yes	Contains header information used to identify the assembly.	Programmed before installation.	A19 BBIQ Main Assembly. Contains no user data.	None.
25. Config Memory (Flash) 2 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A19 BBIQ Main Assembly. Contains no user data.	None.
26. Config Memory (Flash) 32 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A19 BBIQ Main Assembly. Contains no user data.	None.

## Additional Components for PXA and some MXA Instruments

In [Table 4-2](#) below, refer to the footnotes to determine to which model number a particular component applies.

Table 4-2 Summary of Non-Volatile instrument memory - Additional Components for all PXA Instruments and some MXA Instruments

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Boot ROM (Flash) 8 MByte	No	Yes	Contains the boot ROM, operating system and run-time code for the WBDIF CPU.	Programmed by factory at installation time, or during firmware upgrade.	A26 WBDIF assembly <sup>a</sup> Contains no user data.	None.
2. (Flash) 16 MByte (2 x 64 Mbit)	No	Yes	Contains up to 3 WBDIF FPGA images.	Programmed by factory at installation time, or during FPGA upgrade process.	A26 WBDIF assembly <sup>a</sup> Contains no user data.	None.
3. (EEPROM) 512 Byte	No	Yes	Contains header information used to identify the assembly, and configuration information used to initialize the PCI bus.	Programmed before installation.	A26 WBDIF assembly <sup>a</sup> Contains no user data.	None.
4. (EEPROM) 1024 byte	No	Yes	Contains configuration information used during initialization of the PCI bus.  This component is currently unprogrammed.	Programmed before installation.	A26 WBDIF assembly <sup>a</sup> Contains no user data.	None.
5. (CPLD) 256 Macrocells	No	Yes	Contains critical hardware control algorithms.	Programmed before installation.	A26 WBDIF assembly <sup>a</sup> Contains no user data.	None.



Table 4-2 Summary of Non-Volatile instrument memory - Additional Components for all PXA Instruments and some MXA Instruments

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
6. A16A1 Header Memory (EEPROM) 8 kbit	No	Yes	Contains header information used to identify the assembly.	Programmed before installation.	A16A1 Reference Daughter Assembly <sup>b</sup> Contains no user data.	None.
7. Config Memory (Flash) 1 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A16A1 Reference Daughter Assembly <sup>b</sup> Contains no user data.	None.
8. A25 Header Memory (EEPROM) 8 kbit	No	Yes	Contains header information used to identify the assembly.	Programmed before installation.	A25 WBAIF <sup>a</sup> Contains no user data.	None.
9. Control Logic Memory (CPLD) 1600 Gates	No	Yes	Contains control algorithms.	Programmed before installation.	A25 WBAIF <sup>a</sup> Contains no user data.	None.
10. Config Memory (Flash) 2 Mbit	No	Yes	Contains measurement and control software, which is preloaded into FPGA during instrument power-up.	Programmed before installation.	A25 WBAIF <sup>a</sup> Contains no user data.	None.

a. Present in all PXA and MXA instruments with Option B85, B1A or B1X

b. Present in all PXA instruments, all MXA instruments with serial numbers higher than or equal to MY/SG/US5233, and MXA instruments with serial numbers lower than MY/SG/US5233, but with Options B85, B1A or B1X.

## Additional Components for Instruments with PC6, PC7, PC6S, and PC7S Processor Assemblies

The components listed below are included only in some instruments. To determine your instrument's configuration, see ["Determining Installed Options" on page 13](#).

**Table 4-3** Summary of Non-Volatile instrument memory - Additional Components for instruments with PC6, PC7, PC6S, and PC7S Processor Assemblies

Memory Component, Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. SD Memory Card 16 GByte	Yes	Yes	Calibration database file backup	Programmed by instrument software and by the user	A4 Processor Assy Contains user data.	See <a href="#">Table 5-4 on page 32</a> .
2. SD card controller configuration memory 2 Kbit EEPROM	No	Yes	Configuration for the SD card controller on boot up	Programmed before installation	A4 Processor Assy Contains no user data	None
3. PCIe retimer configuration 8 Kbit EEPROM	No	Yes	Configuration for the PCIe retimer for external PCIe communication	Programmed before installation	A4 Processor Assy Contains no user data	None
4. Calibration Backup memory 1 Gbit Flash	No <sup>a</sup>	Yes	Calibration data backup	Programmed by instrument software	A4 Processor Assy <sup>b</sup> Contains no user data	None

a. Accessible only via a Keysight-provided utility, which permits only storage and retrieval of calibration data.

b. Present only in instruments with PC6S or PC7S Processors.

## Disk Drive Partitioning

The instrument's disk drive is divided at the factory into three visible partitions, labeled C:, D: and E:, plus a fourth hidden partition.

The sizes of each partition vary according to the instrument's [Disk Drive Configuration](#).

Details of the partition functions are provided in [Table 4-4](#) below.

Table 4-4

Disk Drive Partitions

Partition Label	Purpose
C:	Primary partition for applications and secondary data.
D:	Default location for user data.
E:	Calibration data.
Hidden	Factory recovery image of the C: partition.

## Volatile Memory

The volatile memory in the instrument does not have battery backup. It does not retain any information when AC power is removed.

Removing power from this memory meets the memory sanitization requirements specified in the “Media Sanitization Matrix” in Appendix T of the [Defense Security Service \(DSS\) Assessment and Authorization Process Manual \(DAAPM\)](#).

Table 4-5 Summary of Volatile Instrument Memory - Instruments with Single-Core and Dual-Core Processors

Memory Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
1. Processor SDRAM  <b>Fixed Disk:</b> 1 GByte or 2 GByte  <b>Removable Disk:</b> From 4 GByte to 16 GByte	Yes	No	Main dynamic RAM memory for processor.  Contains working copies of operating system, instrument measurement applications, calibration data, and measurement data.	Programmed before installation, or by factory/service center calibration procedure software, or by firmware upgrade installation software.  Also programmed via firmware operations and by user.	A4 Processor Assy.  Contains user data.	Turn off instrument power. <sup>a</sup>
2. SDRAM 256 MByte	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A3 Digital IF Assy.  Contains raw measurement data.	Turn off instrument power. <sup>a</sup>
3. SDRAM 2 GByte	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A3 Digital IF Assy.  For all N9030A instruments, and instruments with Options DP2, B40, MPB  Contains raw measurement data.	Turn off instrument power. <sup>a</sup>

Table 4-5 Summary of Volatile Instrument Memory - Instruments with Single-Core and Dual-Core Processors

Memory Type and Size	Writable During Normal Operation?	Data Retained When Powered Off?	Purpose/Contents	Data Input Method	Location in Instrument and Remarks	Sanitization Procedure
4. SDRAM 2 GByte Module	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A26 Wideband Digital IF Assy. <sup>b</sup> Contains raw measurement data.	Turn off instrument power. <sup>a</sup>
5. SDRAM 4 GByte Module	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A26 Wideband Digital IF Assy. <sup>c</sup> Contains raw measurement data.	Turn off instrument power. <sup>a</sup>
6. SDRAM 256 MByte Module	Yes	No	Contains measurement data from data acquisition system.	Programmed by firmware. Not accessible by user.	A26 Wideband Digital IF Assy. <sup>d</sup> Contains raw measurement data.	Turn off instrument power. <sup>a</sup>

a. This memory is **not** battery backed-up or connected to standby power.

b. Resident in instruments that meet these criteria:

1. Contains Option DP2,
2. Does **not** contain Option DP4,
3. Contains one or more of Options B85, B1A, or B1X

c. Resident in all instruments that contain Option DP2 **and** one or more of Options B85, B1A, or B1X

d. Resident in instruments that contain Options B1A, B1X, or B85.

## 5 Memory Sanitization and Removal Procedures

This section explains how to clear, sanitize, and remove memory from your instrument, for all types of non-volatile memory that can be written to during normal instrument operation.

Table 5-1

### Disk Drive

<b>Description and purpose</b>	<p>The Disk Drive is the main memory for the instrument. It has very large storage capacity, plus fast read and write times. There are no limitations on the number of read/write cycles.</p> <p>It contains the operating system, Instrument Software, Factory Calibration Data, Diagnostic software, Crash recovery image, user instrument states, user data files, user trace data and any user-installed third party software. The Disk Drive is written to frequently by the operating system and other application software.</p>
<b>Size</b>	<p><b>Fixed Magnetic</b> magnetic disk drive: 40 Gigabytes</p> <p><b>Removable Magnetic</b> disk drive: 160 Gigabytes</p> <p><b>Removable Solid-State</b> disk drive: capacity from 32 Gigabytes to 256 Gigabytes</p>
<b>Memory clearing</b>	<p>Software utilities are available that comply with the clearing requirements specified for Magnetic Disks and Flash Drives in the "Media Sanitization Matrix" in Appendix T of the <b>Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM)</b>.</p>
<b>Memory sanitization</b>	<p>We recommend always removing the Disk Drive to achieve sanitization.</p> <p>For program classifications lower than Top Secret, the disk can be sanitized using method "d" (for magnetic disks) or method "c" followed by "h" (for solid-state drives) as defined in the "Media Sanitization Matrix" in Appendix T of the <b>Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM)</b>.</p> <p>For Top Secret and higher program classifications, Disk Drive removal is the only acceptable sanitization procedure.</p>
<b>Memory removal</b>	<p><b>Fixed Disk</b> Processor assembly: see <b>"Instruments with Non-Removable Drives" on page 53</b>, in the Chapter <b>"Disk Drive Removal Procedure"</b>.</p> <p><b>Removable Disk</b> Processor assemblies: see <b>"Instruments with Removable Drives" on page 55</b>, in the Chapter <b>"Disk Drive Removal Procedure"</b>.</p>
<b>Write protecting</b>	<p>The Disk Drive cannot be write protected. The operating system and software must be able to read from and write to the drive during normal operation.</p>
<b>Memory validation</b>	<p>The Disk Drive memory can be validated using third-party Windows utilities.</p>

Table 5-2 CPLD, CMOS Programmable Logic Devices

<b>Description and purpose</b>	These memory devices are used to execute timing, control, and measurement functions. No user data is contained in these devices. This memory cannot be written to during instrument operation.
<b>Size</b>	1600 to 6400 logic gates.
<b>Memory clearing</b>	Not applicable. This memory does not contain user information and is not accessible by the user.
<b>Memory sanitization</b>	Not applicable. This memory does not contain user information and is not accessible by the user.
<b>Memory removal</b>	Not applicable.
<b>Write protecting</b>	Not applicable.
<b>Memory validation</b>	Not applicable.
<b>Remarks</b>	These devices are programmed in the factory via diagnostic connectors on the PCB assemblies. After instrument assembly, the diagnostic connectors are not physically accessible and not electrically connected.

Table 5-3 EEPROM Memories

<b>Description and purpose</b>	These memories are used to identify the assemblies (header info) and store option configuration data. Some are also used to hold factory software for FPGAs. The software is loaded when the instrument powers up. This memory cannot be written to during instrument operation.
<b>Size</b>	2 kbit to 8 Mbit
<b>Memory clearing</b>	Not applicable. This memory does not contain user information and is not accessible by the user.
<b>Memory sanitization</b>	Not applicable. This memory does not contain user information and is not accessible by the user.
<b>Memory removal</b>	Not applicable.
<b>Write protecting</b>	Not applicable.
<b>Memory validation</b>	Not applicable.
<b>Remarks</b>	<p>With one exception, as described below, these memories are only writable by factory/service center software, or upgrade installation software. These memories are internally connected to proprietary internal control data busses (as opposed to standard computer busses such as IDE, PCI, USB). They are not accessible by the operating system or by third-party software, or by the user, to protect the measurement accuracy and consistency of the instrument. They are rarely modified, to ensure no degradation of instrument performance. These memories contain no user data. Many of these memories have long write times, and limited write endurance, so they are not intended to be written to dynamically by software.</p> <p>The sole exception applies to the EEPROM on the A7 Midplane Assembly. Inserting a USB memory device containing a valid license key file into the instrument causes the key file to be copied to both the C: drive and the EEPROM on the A7 Midplane Assembly.</p>

Table 5-4

## SD Memory Card

<b>Description and purpose</b>	<p>The intended purpose of the SD Memory Card is for backing up the instrument calibration database file. The backup and restore process used by the instrument will default to this location.</p> <p>Users can also write to this memory, since it appears as another disk drive to the instrument.</p>
<b>Size</b>	16 Gigabytes
<b>Memory clearing</b>	Software utilities are available that comply with the clearing requirements specified for Flash Drives in the "Media Sanitization Matrix" in Appendix T of the <a href="#">Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM)</a> .
<b>Memory sanitization</b>	<p>We recommend always removing the SD Memory Card to achieve sanitization.</p> <p>For program classifications lower than Top Secret, this media type can be sanitized using the methods defined in the "Media Sanitization Matrix" in Appendix T of the <a href="#">Defense Security Service (DSS) Assessment and Authorization Process Manual (DAAPM)</a>.</p> <p>For Top Secret and higher program classifications, SD Card removal is the only acceptable sanitization procedure.</p>
<b>Memory removal</b>	See the Chapter <a href="#">"SD Memory Card Removal Procedure"</a> on page 57.
<b>Write protecting</b>	The SD Memory Card can be write protected by the use of a switch located on the card itself. Write protecting the card does not interfere with the normal operation of the instrument operating system or the instrument application software.
<b>Memory validation</b>	The SD Memory Card can be validated using third-party Windows utilities.



## Instrument Sanitization Procedures

This section includes flowcharts that describe how to sanitize an instrument by physical removal and replacement of either the Processor Assembly or Disk Drive.

- For **Fixed Disk** instruments, see “**Replacement of Processor Assembly**” on **page 33**.
- For **Removable Disk** instruments, see “**Replacement of Disk Drive (Instruments without PC6S/PC7S)**” on **page 34** or “**Replacement of Disk Drive (Instruments with PC6S/PC7S)**” on **page 37** as appropriate for your instrument.

### Application License Key Storage

Note that License keys are stored in EEPROM on the A7 Midplane Assembly (as described in Item 3 of **Table 4-1 on page 19**). Therefore, when replacing either the Processor Assembly or Disk Drive, you usually do **not** need to back up and restore the license keys.

### Replacement of Processor Assembly

This procedure applies only to **Fixed Disk** instruments.

Note that this procedure differs from that for replacement of the Disk Drive only in that the entire Processor Assembly is replaced.

#### Items Required

To perform these tasks in a controlled area, you will need:

- 1x Instrument
- 2x Processor Assemblies for the instrument
- 1x One-time writable media, plus 1x compatible writing device for the non-controlled area **and** 1x reading device for the controlled area. See “**Selection of USB Memory Device**” on **page 42** for details.

#### Procedure

Steps below that appear on a yellow background take place in the controlled area. All other steps take place in a non-controlled area.

Step	Task
1	Receive new or recalibrated instrument from factory/service center.
2	Archive calibration files from Disk Drive to portable media. For details of the procedure, see “ <b>Archiving and Restoring Factory Calibration Data Files</b> ” on <b>page 42</b> .

Step	Task
3	Physically deploy instrument into controlled area.
4	Use instrument inside controlled area until cal or repair is needed.
5	Remove main Processor Assembly #1 and retain in controlled area. For details of how to remove the Processor Assembly, see <a href="#">"Processor Assembly Removal Procedure" on page 50</a> .
6	Physically remove instrument from controlled area. Without the Processor Assembly, instrument is sanitized.
7	Install secondary non-classified Processor Assembly #2. Note that calibration files archived in Step 2 may need to be copied into this Processor Assembly.
8	Instrument is now operational with original calibration data. Deliver to service center for cal/repair.
9	Service center generates new calibration files on Disk Drive.
10	Instrument returned to customer's non-controlled area.
11	Archive calibration files from Disk Drive to read-only portable media. For details of the procedure, see <a href="#">"Archiving and Restoring Factory Calibration Data Files" on page 42</a> .
12	Remove the non-classified Processor Assembly #2 and retain outside of controlled area. For details of how to remove the Processor Assembly, see <a href="#">"Processor Assembly Removal Procedure" on page 50</a> .
13	Physically deploy instrument back into controlled area, without a Processor Assembly. Bring the read-only media containing the calibration files (created in Step 11) into the controlled area.
14	Re-insert classified Processor Assembly #1 into instrument.
15	Restore calibration file (Step 11) from read-only portable media to instrument.
16	Done. Go to Step 4.

## Replacement of Disk Drive (Instruments without PC6S/PC7S)

This procedure applies to [Removable Disk](#) instruments.

### IMPORTANT

Ensure that the Instrument Software Revision on the secondary non-classified disk drive matches that of the classified drive in the controlled area.

If the non-classified drive receives a software upgrade, or if the non-classified drive is replaced with a drive that contains a newer revision of software than that of the classified drive, the classified drive will require a software upgrade (inside the controlled area) to match the non-classified drive.

### Items Required

To perform these tasks in a controlled area, you will need:

- 1x Instrument
- 2x Disk Drives for the instrument  
One drive (Disk Drive #1) stays permanently within the controlled area, and the other (Disk Drive #2) stays permanently outside it
- 1x One-time writable media, plus 1x compatible writing device for the non-controlled area **and** 1x reading device for the controlled area. See [“Selection of USB Memory Device” on page 42](#) for details.

### Procedure

Steps below that appear on a yellow background take place in the controlled area. All other steps take place in a non-controlled area.

#### NOTE

The first twelve steps listed below are performed in order to prepare a spare drive (Disk Drive #2) that has the same software revision and calibration files, and has been used in the same CPU assembly, as the original disk drive (Disk Drive #1).

Step	Task
1	Receive new instrument from factory.  The instrument shipment may include a spare disk drive (additional drive) prepared by the factory, which contains the same calibration data and software revision as the disk drive in the instrument. If such a factory-prepared disk drive is present, you can skip steps <a href="#">3</a> , <a href="#">4</a> , <a href="#">6</a> , <a href="#">7</a> , <a href="#">9</a> , and <a href="#">10</a> below.
2	Power up the instrument and verify the Instrument Software Revision.  For instructions on how to verify the currently installed Instrument Software Revision, see <a href="#">“Determining Instrument Software Revision” on page 43</a> .  Write down the software revision.
3	If the instrument’s software is not the latest version, update the instrument software to the latest version available. For instructions, see <a href="#">“Is your product software up-to-date?” on page 3</a>  Write down the software revision.

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Step	Task
4	Back up (archive) the instrument factory calibration data to the USB memory device. For details of the procedure, see <a href="#">“Archiving and Restoring Factory Calibration Data Files” on page 42.</a>
5	Remove the Disk Drive and SD Memory Card (if present) from the instrument. See <a href="#">“SD Memory Card Removal Procedure” on page 57.</a>
6	Replace the original instrument disk drive (Disk Drive #1) with the spare disk drive (Disk Drive #2) that was obtained previously. For details of how to remove the Disk Drive, see <a href="#">“Disk Drive Removal Procedure” on page 52.</a>
7	Turn on the instrument with the spare Disk Drive #2 installed.
8	Verify that the instrument software on the spare Disk Drive #2 has the same revision as that on the original Disk Drive #1.
9	If the Instrument Software Revision on the spare Disk Drive #2 is not the same as that on the original Disk Drive #1, update the instrument software on this drive to match the software revision that you documented in step 3. For instructions, see <a href="#">“Is your product software up-to-date?” on page 3</a>
10	Restore the instrument calibration data that was previously backed up from the original Disk Drive #1. For details, see <a href="#">“Archiving and Restoring Factory Calibration Data Files” on page 42.</a>
11	Write the instrument model number, serial number, and software revision on the original Disk Drive #1, then reinstall it in the instrument.
12	Write the instrument model number, serial number, and software revision on the spare Disk Drive #2, place it back in the static safe bag that it was shipped in, then store it in a safe place until it is needed again.
13	The instrument is now ready for use in a secure environment.
14	Physically deploy instrument into controlled area.
15	Use instrument inside controlled area until cal or repair is needed.
16	Make a note of the current software version, because the instrument's software may have been updated inside the secure area. To determine this, press <b>System, Show System</b> , and write down the Instrument Software Revision. Attach this note to the instrument.
17	Remove Disk Drive #1 and retain in controlled area. For details of how to remove the Disk Drive, see <a href="#">“Disk Drive Removal Procedure” on page 52.</a>
18	Physically remove instrument from controlled area. Without the Disk Drive, instrument is sanitized.

Step	Task
19	Install secondary non-classified Disk Drive #2, which was previously prepared in Step 12.  Power on instrument.
20	When the instrument has booted up, press <b>System, Show System</b> , and confirm that the Instrument Software Revision is the same as noted in Step 16. If not, upgrade the instrument software to the same version as recorded in Step 16.
21	Instrument is now operational with original calibration data. Deliver to service center for cal/repair.
22	Service center may or may not generate new calibration files on Disk Drive, depending on whether an adjustment is performed.  This procedure assumes that new cal data was generated.
23	Instrument returned to customer's non-controlled area.
24	Verify Instrument Software Revision, to determine whether the service center upgraded the software. See Step 2.
25	Back up (archive) calibration file from Disk Drive to portable read-only media.  For details of the procedure, see "Archiving and Restoring Factory Calibration Data Files" on page 42.
26	Remove the non-classified Disk Drive #2 and retain outside of controlled area. If necessary, update the documented software revision on the drive label.  For details of how to remove the Disk Drive, see "Disk Drive Removal Procedure" on page 52.
27	Physically deploy instrument back into controlled area, without a Disk Drive.  Bring read-only media containing calibration file (created in Step 25) into controlled area.
28	Re-insert classified Disk Drive #1 into instrument, and verify Instrument Software Revision, as in Step 2.
29	If the Instrument Software Revision does <b>not</b> match the revision documented in step 24 (because the software was updated at service center), then a software update must be performed, to force the controlled-area drive to match the non-controlled-area drive that was used to calibrate the instrument.
30	Restore calibration file (Step 27) from read-only media to instrument.
31	Done. Go to Step 15.

## Replacement of Disk Drive (Instruments with PC6S/PC7S)

### IMPORTANT

Ensure that the Instrument Software Revision on the secondary non-classified disk drive matches that of the classified drive in the controlled area.

If the non-classified drive receives a software upgrade, or if the non-classified drive is replaced with a drive that contains a newer revision of software than that of the classified drive, the classified drive will require a software upgrade (inside the controlled area) to match the non-classified drive.

### Items Required

To perform these tasks in a controlled area, you will need:

- 1x Instrument
- 2x Disk Drives for the instrument.

One drive (Disk Drive #1) stays permanently within the controlled area, and the other (Disk Drive #2) stays permanently outside it

### Procedure

Steps below that appear on a yellow background take place in the controlled area. All other steps take place in a non-controlled area.

**NOTE**

The first twelve steps listed below are performed in order to prepare a spare drive (Disk Drive #2) that has the same software revision and calibration files, and has been used in the same CPU assembly, as the original disk drive (Disk Drive #1).

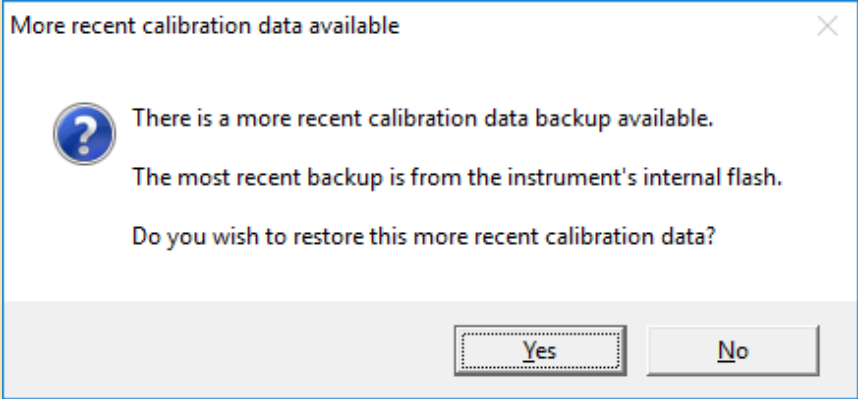
Step	Task
1	Receive new instrument from factory.  The instrument shipment may include a spare disk drive (additional drive) prepared by the factory, which contains the same calibration data and software revision as the disk drive in the instrument. If such a factory-prepared disk drive is present, you can skip steps 3, 4, 6, 7, 9, and 10 below.
2	Power up the instrument and verify the Instrument Software Revision.  For instructions on how to verify the currently installed software revision, see <a href="#">“Determining Instrument Software Revision” on page 43</a> .  Write down the software revision.
3	If the instrument’s software is not the latest version, update the instrument software to the latest version available. For instructions, see <a href="#">“Is your product software up-to-date?” on page 3</a>  Write down the software version.
4	If software update was performed in step 3, back up (archive) the instrument factory calibration data to internal Flash memory.  For details of the procedure, see <a href="#">“Data Backup or Restore using Alignment Data Wizard” on page 47</a> .

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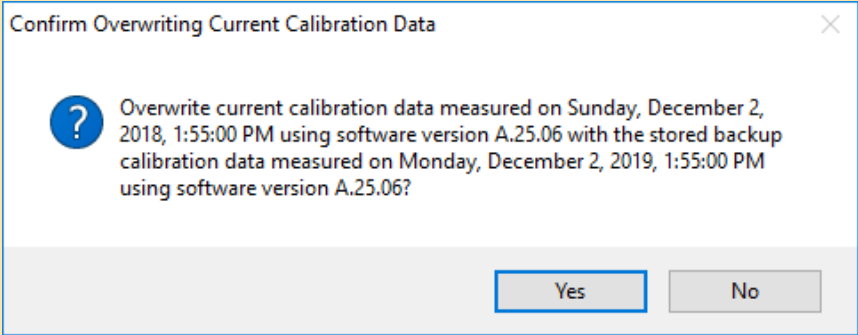
Step	Task
5	Remove the Disk Drive and SD Memory Card (if present) from the instrument. See <a href="#">“SD Memory Card Removal Procedure” on page 57.</a>
6	Replace the original instrument disk drive (Disk Drive #1) with the spare disk drive (Disk Drive #2) that was obtained previously.  For details of how to remove the Disk Drive, see <a href="#">“Disk Drive Removal Procedure” on page 52.</a>
7	Turn on the instrument with the spare Disk Drive #2 installed.
8	Verify that the instrument software on the spare Disk Drive #2 has the same revision as that on the original Disk Drive #1.
9	If the Instrument Software Revision on the spare Disk Drive #2 is not the same as that on the original Disk Drive #1, update the instrument software on this drive to match the software revision that you documented in step 3.  For instructions, see <a href="#">“Is your product software up-to-date?” on page 3</a>
10	Restore the instrument calibration data that was previously backed up from the original Disk Drive #1.  For details, see <a href="#">“Data Backup or Restore using Alignment Data Wizard” on page 47.</a>
11	Write the instrument model number, serial number, and software revision on the original Disk Drive #1, then reinstall it in the instrument.
12	Write the instrument model number, serial number, and software revision on the spare Disk Drive #2, place it back in the static safe bag that it was shipped in, then store it in a safe place until it is needed again.
13	The instrument is now ready for use in a secure environment.
14	Physically deploy instrument into controlled area.
15	Use instrument inside controlled area until cal or repair is needed.
16	Make a note of the current software version, because the instrument's software may have been updated inside the secure area. To determine this, press <b>System, Show System</b> , and write down the Instrument Software Revision. Attach this note to the instrument.
17	Remove Disk Drive #1 and retain in controlled area.  For details of how to remove the Disk Drive, see <a href="#">“Disk Drive Removal Procedure” on page 52.</a>
18	Physically remove instrument from controlled area. Without the Disk Drive, instrument is sanitized.
19	Install secondary non-classified Disk Drive #2, which was previously prepared in Step 23.
20	When the instrument has booted up, press <b>System, Show System</b> , and confirm that the Instrument Software Revision is the same as noted in Step 16. If not, upgrade the instrument software to the same version as recorded in Step 16.

Step	Task
21	Instrument is now operational with original calibration data. Deliver to service center for cal/repair.
22	Service center may or may not generate new calibration files on Disk Drive, depending on whether an adjustment is performed.  This procedure assumes that new cal data was generated.
23	Instrument returned to customer's non-controlled area.
24	Remove the non-classified Disk Drive #2 and retain outside of controlled area. If necessary, update the documented software revision on the drive label.  For details of how to remove the Disk Drive, see <a href="#">"Disk Drive Removal Procedure" on page 52</a> .
25	Physically deploy instrument back into controlled area, without a Disk Drive.
26	Re-insert classified Disk Drive #1 into instrument.  If cal files were updated during repair /calibration, a dialog will appear on the instrument screen, as shown in <a href="#">Figure 5-1</a> below, advising you that more recent calibration data is backed up to the instrument's internal Flash memory. You are asked whether you wish to restore the calibration data from the internal memory; select <b>Yes</b> .

**Figure 5-1**                      **Restore Calibration Data Dialog**





Step	Task
27	<p>A further dialog appears, as shown in <a href="#">Figure 5-2</a> below, asking you to confirm that you want to overwrite the current calibration data (presently on the Disk Drive) with the backup data stored in the internal Flash memory. The measurement date, time and software revision are displayed for each set of calibration data.</p> <p><b>Figure 5-2                      Confirm Overwrite Calibration Data Dialog</b></p> 
28	<p>Verify that the software revisions shown in <a href="#">Figure 5-2</a> are the same.</p> <p>If so, select <b>Yes</b>.</p> <p>If the software revisions displayed in the dialog shown in <a href="#">Figure 5-2</a> do <b>not</b> match, this is probably because the software was updated at the service center. In this case, it is highly recommended that you should perform a software update on Disk Drive #1. This ensures that the software on controlled-area Disk Drive #1 matches the software used on non-controlled-area Disk Drive #2 that was installed when the instrument was adjusted and recalibrated.</p>
29	<p>Done. Go to Step <a href="#">15</a>.</p>

## Archiving and Restoring Factory Calibration Data Files

This section describes how to archive ("back up") the instrument's factory calibration data to an external memory device, or restore the calibration data from an external **USB Memory Device**. The appropriate device type depends on your instrument's environment; for details, see ["Selection of USB Memory Device" on page 42](#) below.

The backup and restore procedures differ according to the Instrument Software Revision. This section describes the three possible pairs of procedures.

- To determine the instrument software revision, follow the procedure ["Determining Instrument Software Revision" on page 43](#) below.
- To determine which backup or restore procedures should be used, according to the instrument software revision, see [Table 5-5 on page 44](#).

### Selection of USB Memory Device

The appropriate choice of USB Memory Device depends on the circumstances. In cases where the calibration data will **not** need to be brought into a controlled area, a USB Flash drive is generally a good choice.

In cases where the calibration data must be moved into a controlled area, USB Flash devices are not permitted. In these cases, a good choice is to back up the calibration data to write-once optical media such as a CD-R, DVD±R or BD-R disc.

The optical disc can be written using an external writer device outside the controlled area, and then read using a further external reader device situated in the controlled area.

### Tools Required

To perform backup or restore operations, you need:

- a mouse with a USB interface
- an alphanumeric keyboard with a USB interface
- a portable USB Memory Device. For details, see ["Selection of USB Memory Device" on page 42](#).

Determining Instrument Software Revision

- 1. On the instrument front panel, press **System** > **Show** > **System**.
- 2. The **Show System** display appears, as shown in **Figure 5-3** below. Look for the Software Revision number specified in the **Instrument S/W Revision** entry.

**Figure 5-3**      Show System Display

Software  
Revision  
Entry



Agilent Spectrum Analyzer - Swept SA					
IXI	50 Ω			AC	S
Agilent Technologies					
MXA		Signal Analyzer			
Product Number		N9020A			
Serial Number		US01020035			
Instrument S/W Revision		A.03.01			
Computer Name		A-N9020A-20035			
IP Address		127.0.0.1			
Host ID		N9020A,US01020035			
mDNS Enabled		Yes			
mDNS Host Name		A-N9020A-20035			
mDNS Service Name		Agilent N9020A Signal Analyzer			
Option		Name / Description			

- 3. To dismiss the **Show System** display, press any other front-panel or menu key.

When you have obtained the Instrument Software Revision number, refer to [Table 5-5 on page 44](#) below for the appropriate backup or restore procedure.

Table 5-5 Backup & Restore Procedures for all Instrument Software Revisions

Instrument Software Revision	Backup Procedure	Restore Procedure
A.01.55 or lower	See <a href="#">“Data Backup using XML File” on page 44.</a>	See <a href="#">“Data Restore using XML File” on page 44.</a>
Greater than A.01.55; lower than A.02.00	See <a href="#">“Data Backup using Utility Program” on page 45.</a>	See <a href="#">“Data Restore using Utility Program” on page 46.</a>
A.02.00 or greater	See <a href="#">“Data Backup or Restore using Alignment Data Wizard” on page 47.</a>	See <a href="#">“Data Backup or Restore using Alignment Data Wizard” on page 47.</a>

## Software Revision A.01.55 or Lower

If the instrument software revision is A.01.55 or lower, the calibration data is stored in an XML database file.

### Data Backup using XML File

Follow the steps below:

1. Close the instrument application software by pressing **File > Exit > Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB Memory Device into another of the instrument's USB ports. For details of appropriate devices, see [“Selection of USB Memory Device” on page 42.](#)
4. Using the mouse, double-click on the Windows Explorer icon on the desktop and navigate to the following folder:  
[E:\AlignDataStorage](#)
5. Copy the following file onto the USB Memory Device:  
[CurrentDataSet.xml](#)

### Data Restore using XML File

The data can be restored from a USB Memory Device containing the XML database file, by using the following process.

1. Close the instrument application software by pressing **File > Exit > Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB Memory Device into another of the instrument's USB ports. For details of appropriate devices, see [“Selection of USB Memory Device” on page 42.](#)
4. Using the mouse, double-click on the Windows Explorer icon on the desktop and navigate to a folder on the USB Memory Device containing a previously-saved calibration data file named:

[CurrentDataSet.xml](#)

5. Select the calibration data file, then copy it to the Windows clipboard by selecting **Edit > Copy** from the Windows Explorer pull-down menu.
6. Navigate to the folder below and paste the file by selecting **Edit > Paste** from the Windows Explorer pull-down menu:

[E:\AlignDataStorage](#)

7. Verify that the file [CurrentDataSet.xml](#) was copied to the new location.
8. Cycle the instrument power.

## Software Revision Greater than A.01.55 and Lower than A.02.00

If the instrument software revision is greater than A.01.55, the calibration data is stored in an SQL database file.

For software revisions greater than A.01.55, but lower than A.02.00, the SQL file is written and read by a utility program called [BackupAndRestore.exe](#).

### Data Backup using Utility Program

Follow the steps below:

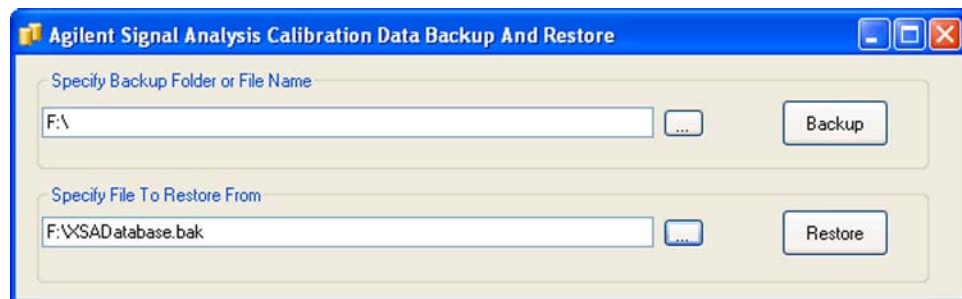
1. Close the instrument application software by pressing **File > Exit > Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB Memory Device into another of the instrument's USB ports. For details of appropriate devices, see ["Selection of USB Memory Device" on page 42](#).
4. Plug the USB keyboard into another of the instrument's USB ports.
5. Using the mouse double-click on the Windows Explorer icon on the desktop and navigate to the following folder:

[C:\Program Files\Agilent\SignalAnalysis\Physics](#)

6. Double-click on [BackupAndRestore.exe](#).

The [Calibration Data Backup And Restore](#) dialog shown in [Figure 5-4](#) appears.

**Figure 5-4** Calibration Data Backup



7. In the group box **Specify Backup Folder or File Name** use the mouse to press the “...” button to open the “Browse For Folder” dialog.
8. In the **Browse For Folder** dialog, select or create the desired folder on the USB memory device, then press **OK**.
9. Press **Backup**, then wait for the calibration database to be backed up.
10. When the backup has completed, close the **Calibration Data Backup And Restore** dialog.

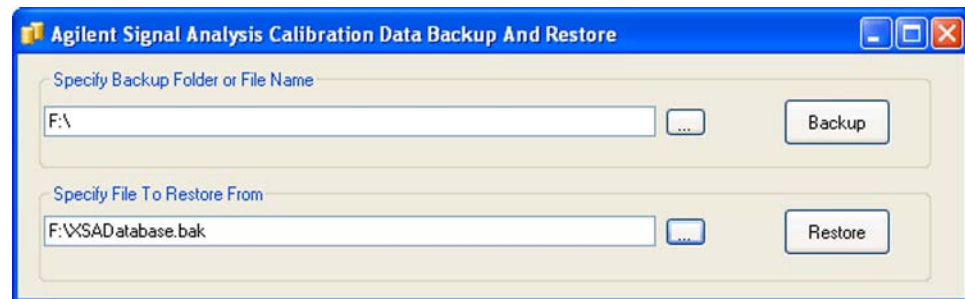
### Data Restore using Utility Program

Follow the steps below:

1. Close the instrument application software by pressing **File > Exit > Enter**.
2. Plug the mouse's USB cable into one of the instrument's USB ports.
3. Plug the USB Memory Device into another of the instrument's USB ports. For details of appropriate devices, see **“Selection of USB Memory Device” on page 42**.
4. Using the mouse, double-click on the Windows Explorer icon on the desktop and navigate to the following folder:  
**C:\Program Files\Agilent\SignalAnalysis\Physics**
5. Double-click on **BackupAndRestore.exe**: the **Calibration Data Backup And Restore** dialog shown in **Figure 5-4** appears.

**Figure 5-5**

**Calibration Data Backup**



6. In the group box **Specify File To Restore From** use the mouse to press the “...” button to open the **Browse For File** dialog.
7. In the **Browse For File** dialog, select the desired file on the USB memory device, then press **OK**.
8. Press **Restore**, then wait for the calibration database to be restored.
9. When the restore has completed, close the **Calibration Data Backup And Restore** dialog.

### Software Revision A.02.00 or Greater

For software revisions A.02.00 or greater, the calibration data file is read and written by the Alignment Data Wizard.

## Data Backup or Restore using Alignment Data Wizard

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.

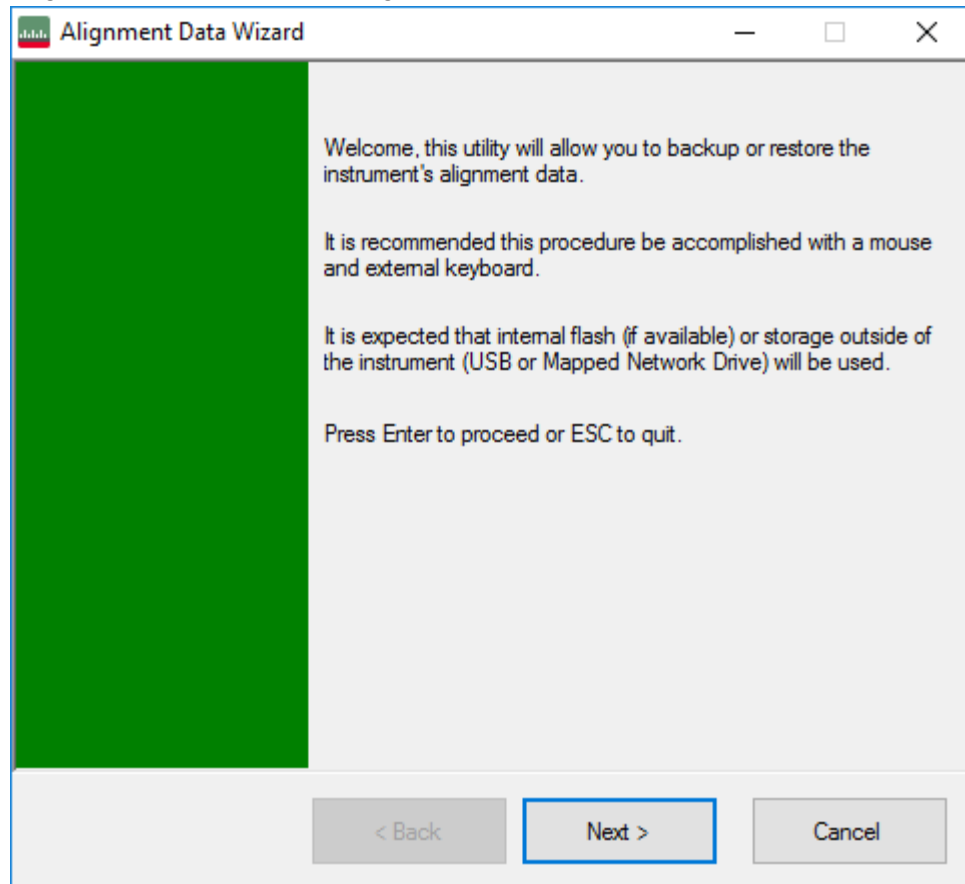
Follow the steps below to start the wizard:

1. Plug the mouse's USB cable into one of the instrument's USB ports.
2. Plug the USB Memory Device into another of the instrument's USB ports. For details of appropriate devices, see ["Selection of USB Memory Device" on page 42](#).
3. Plug the USB keyboard into another of the instrument's USB ports.
4. Press **System > Alignments > Backup or Restore Align Data...**
5. If you are prompted to enter the Administrator password, enter either [Keysight4u!](#), or [agilent4u](#), depending on your instrument's software version.
6. When prompted, press **OK** to close the analyzer program.
7. The [Alignment Data Wizard](#) dialog appears. Its content depends on the instrument's processor type.

If the instrument does **not** have a PC6S or PC7S Processor Assembly, then the dialog is as shown in [Figure 5-6](#) below:

**Figure 5-6**

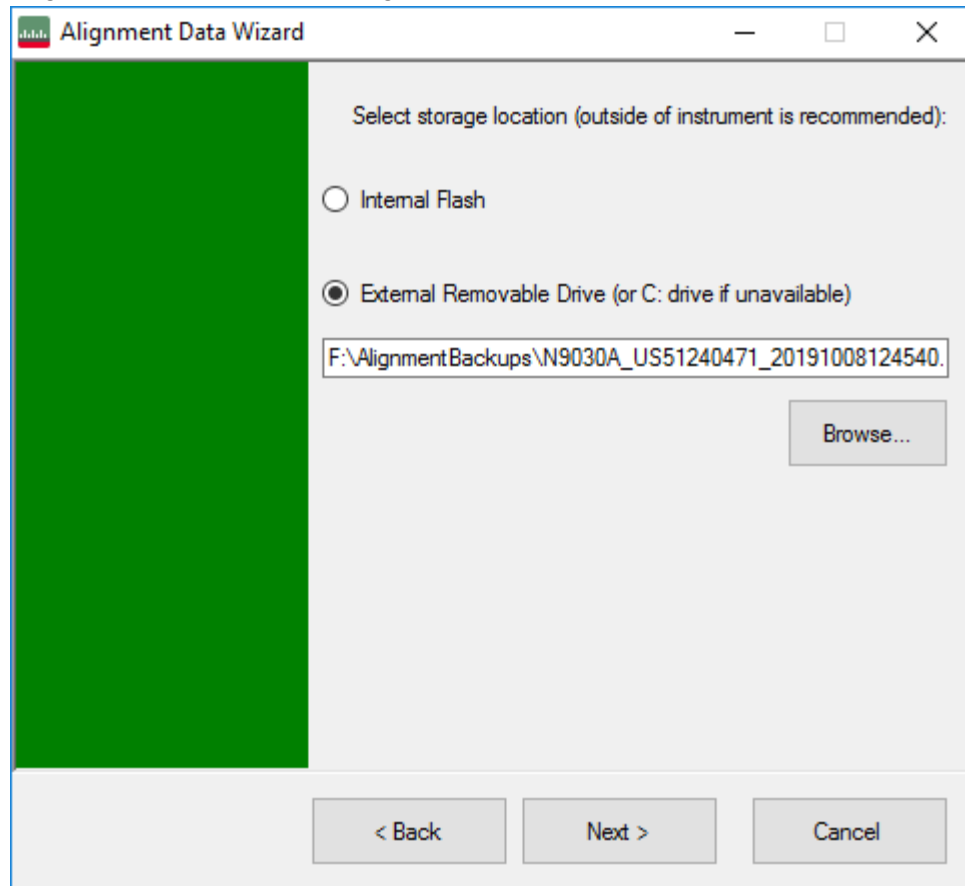
**Alignment Data Wizard Dialog**



If the instrument has a PC6S or PC7S Processor Assembly, then the [Alignment Data Wizard](#) dialog contains the selections shown in [Figure 5-7](#) below.



**Figure 5-7** Alignment Data Wizard Dialog for PC6S/PC7S



In this case, the storage location options are as follows:

- **Internal Flash** is the Calibration Backup memory in the A4 Processor assembly. See item 4 of [Table 4-3](#).
- **External Removable Drive**. If the instrument has PC6(S) or PC7(S), then the default storage location for this option is the SD memory card in the A4 Processor assembly. See item 1 of [Table 4-3](#).

To determine your instrument's Processor Assembly type, see [“Determining Installed Options” on page 13](#).

8. Follow the wizard's on-screen instructions to back up the calibration data to the external USB Memory Device or Internal Flash memory, **or** to restore the data from the memory.

## 6 Processor Assembly Removal Procedure

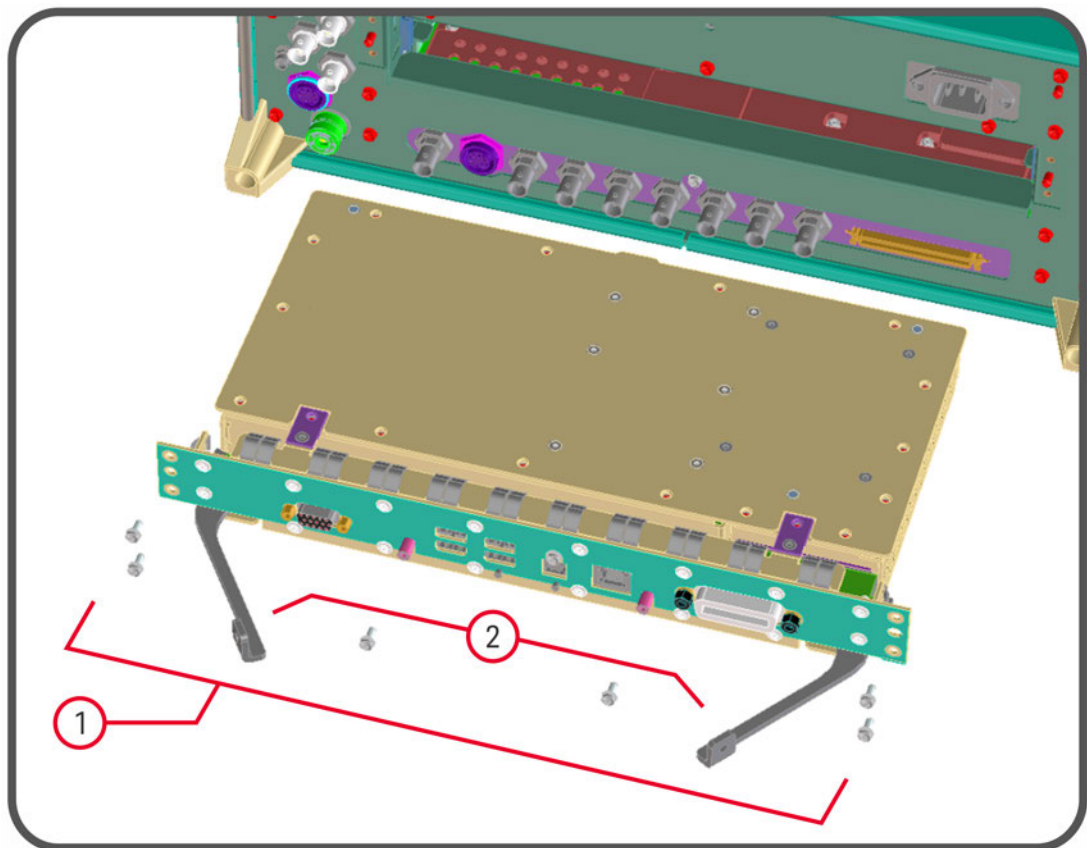
To remove the processor board assembly, follow the procedure below, while referring to [Figure 6-1](#), which shows the rear panel of instruments with **Fixed Disk** processor assemblies.

The procedure for instruments with **Removable Disk** processor assemblies is identical, although the appearance of the rear panel differs from that shown in [Figure 6-1](#). (For comparative illustrations of the rear panel types, see “[Rear Panel Configurations](#)” on page 12.)

### CAUTION

Before removing the Processor Assembly, ensure that the instrument's power is turned off.

Figure 6-1 Processor Assembly Removal Procedure



## Processor Assembly Removal Procedure

1. Locate and remove the Processor Assembly from the instrument, by removing the 6 rear panel screws (part number 0515-0372, M3 x 0.5, 8 mm long).
2. The assembly can be removed from the chassis by pulling it straight out. Use the two ejector arms to remove the Assembly from the instrument

## 7

# Disk Drive Removal Procedure

This chapter describes the procedures for physical removal of the disk drive from:

- a. **Instruments with Non-Removable Drives** (generally, older MXA, EXA and CXA instruments),
- b. **Instruments with Removable Drives** (generally, all PXA instruments, and newer MXA, EXA and CXA instruments).

For detailed information about the drive types installed in each instrument type, see the section “X-Series Processor and Disk Drive Configurations” on page 8, in the Chapter **Products Covered by this Document**.

### TIP

Application License keys are stored in EEPROM on the A7 Midplane Assembly (as described in Item 3 of **Table 4-1 on page 19**). Therefore, when replacing the Disk Drive, you do **not** need to back up and restore the license keys.

When installing a replacement Disk Drive, ensure that the instrument software revision on the replacement drive matches that of the original drive.

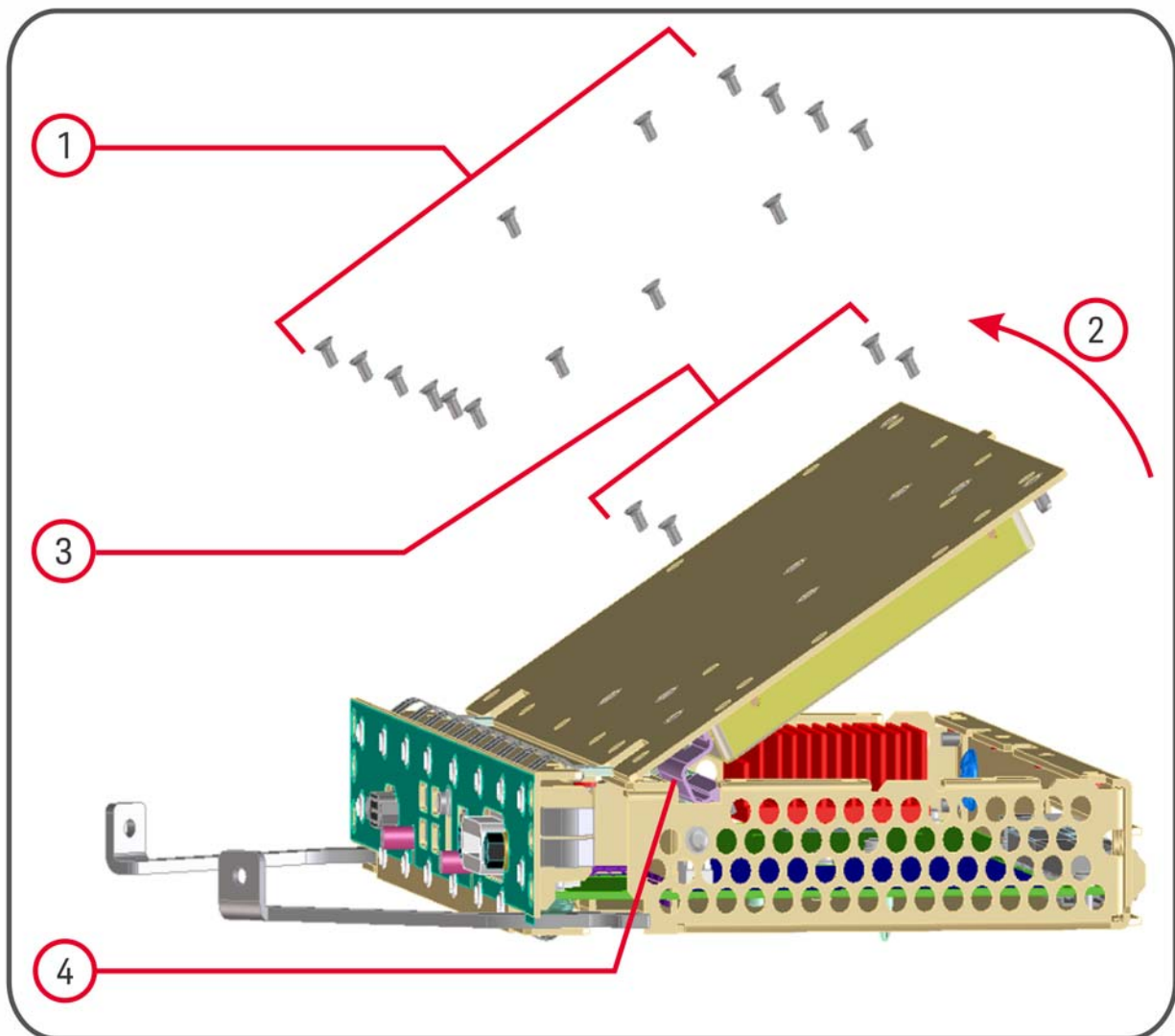
---

## Instruments with Non-Removable Drives

To remove the disk drive, follow the procedure below, while referring to [Figure 7-1](#). The numbered items in the figure correspond to the step numbers in the procedure.

Before commencing this procedure, remove the complete Processor Assembly from the instrument, following the procedure described in the chapter [Processor Assembly Removal Procedure](#).

Figure 7-1 Disk Drive Removal Procedure



1. Remove 15 screws from the top lid of the Processor Assembly.
2. Tilt the lid up.
3. While holding the disk drive to prevent it from falling, remove the 4 drive retaining screws.

- 4. Disconnect the drive cable from the disk drive.**

## Instruments with Removable Drives

To remove the disk drive, follow the procedure below. You do **not** need to remove the Processor Assembly from the instrument before removing the drive.

The numbered items in the figures below correspond to the step numbers in the procedure.

### CAUTION

Before removing the disk drive, ensure that the instrument's power is turned off.

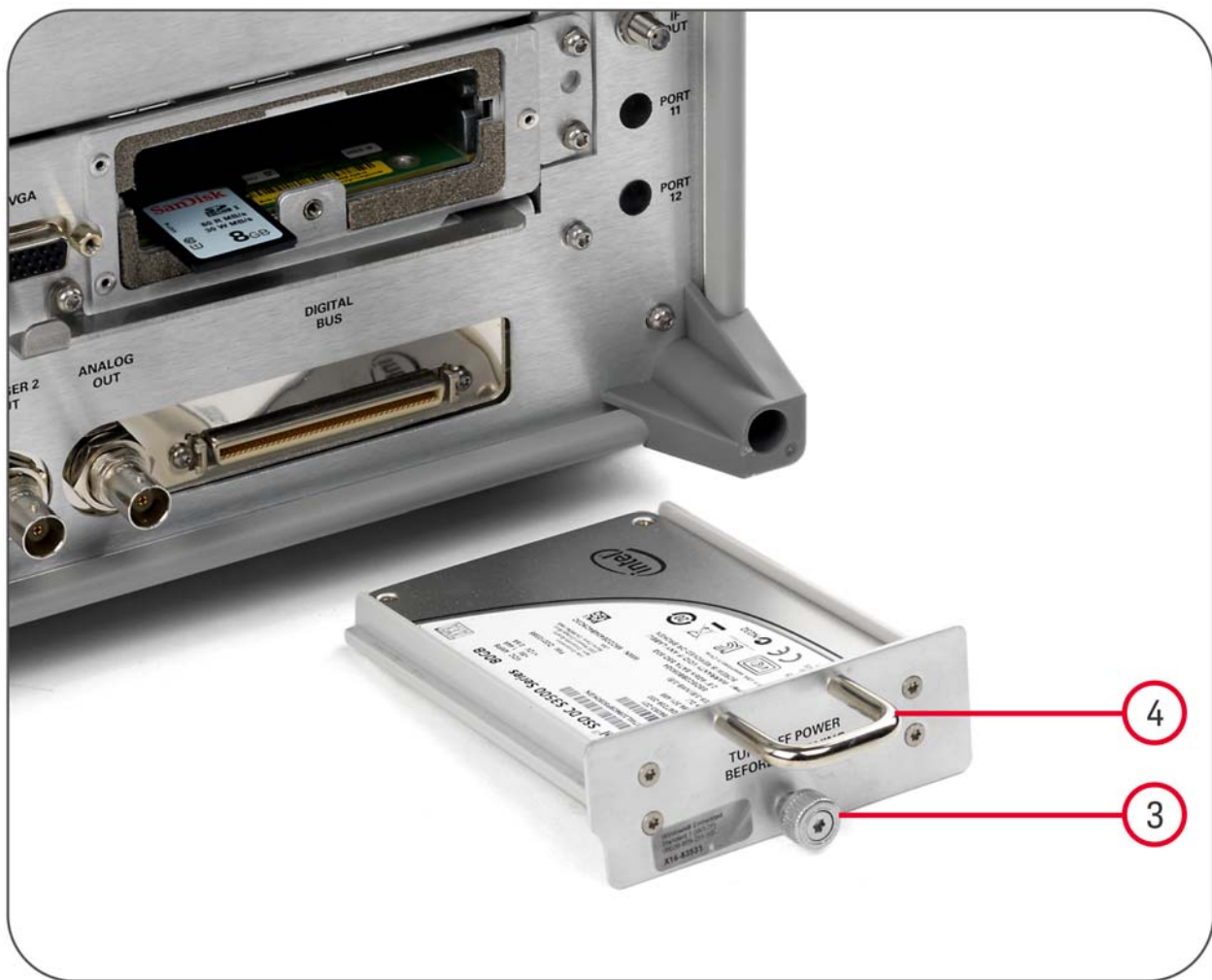
1. Locate the Processor and Disk Drive Assembly on the instrument's rear panel, as shown in [Figure 2-2](#) in the section "[Rear Panel Configurations](#)" on [page 12](#). In [Figure 7-2](#) below, the processor assembly is shown removed from the rear panel for clarity.

**Figure 7-2** Processor Assembly with Removable Disk Drive



2. Locate the removable drive, and its retaining thumbscrew, as shown in [Figure 7-2](#).
3. Turn the thumbscrew to release the drive from the panel, as shown in [Figure 7-3](#) below. If the thumbscrew is too tight to turn by hand, use a TORX T10 screwdriver to loosen it.

**Figure 7-3** Removable Disk Drive Unit partially extracted (shows SD Memory Card for PC6/PC7 Assemblies only)



4. Pull the U-shaped handle attached to the drive unit, to remove the drive from the Processor Assembly, as shown in [Figure 7-3](#).



## 8

# SD Memory Card Removal Procedure

The SD Memory Card is present only in instruments with the PC6 and PC7 processor assemblies. See “[Determining Installed Options](#)” on page 13 for details.

When present, the SD Memory Card is located on the A4 Processor assembly. However, it can only be accessed after the instrument’s disk drive is removed.

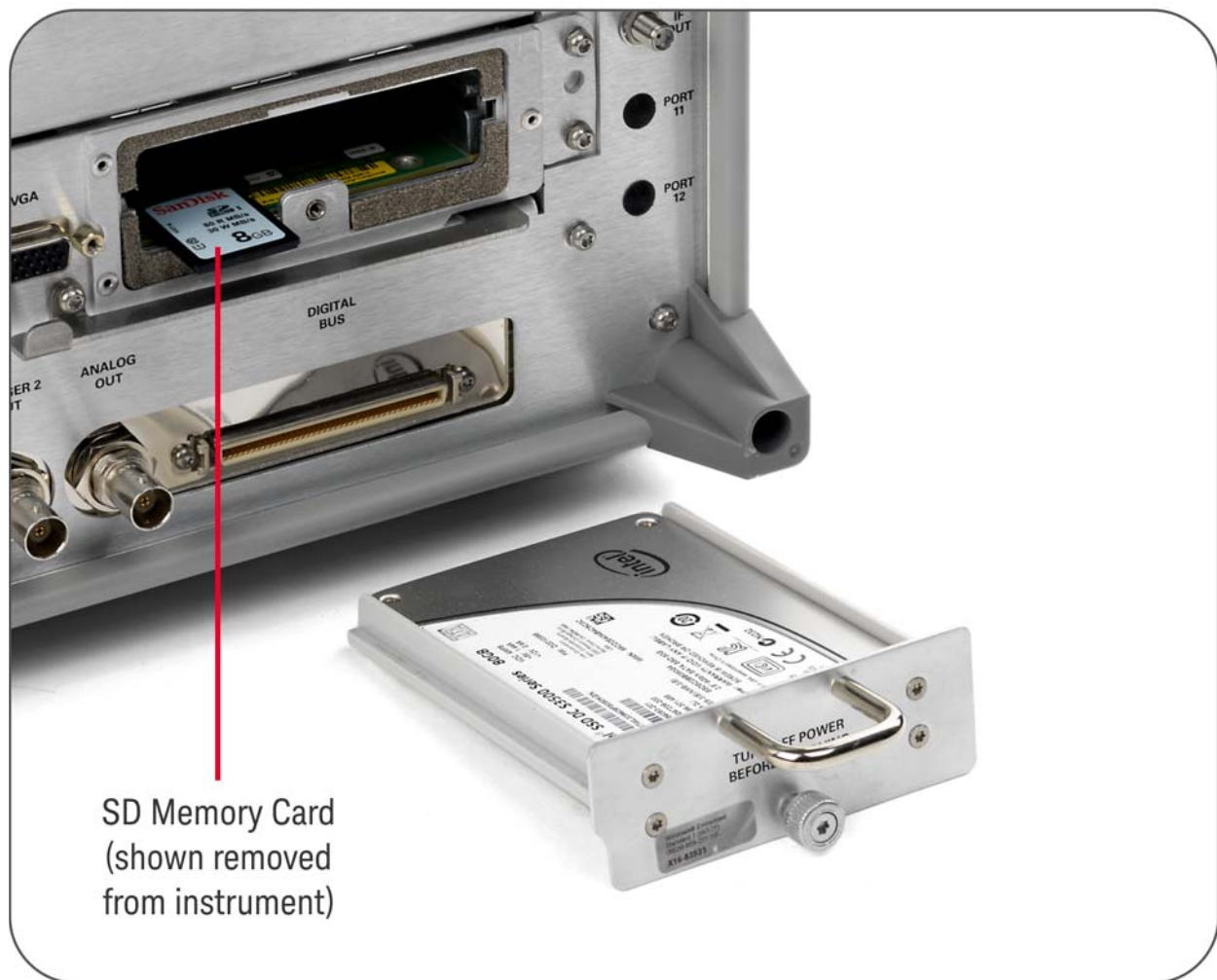
To remove the SD Memory Card:

1. Remove the disk drive by following the “[Disk Drive Removal Procedure](#)” on page 52.

Once the disk drive has been removed, the SD Memory Card is accessible.

2. Push in on the SD Memory Card and release. The Card springs back out, and can then be removed. [Figure 8-1 on page 58](#) below shows the instrument rear panel, with the Disk Drive Assembly and SD Memory Card extracted from the instrument.

**Figure 8-1** Instrument Rear Panel, showing Removable Disk Drive Assembly and SD Memory Card



**3. Reinstall the disk drive assembly.**

Removing the SD Memory Card does not interfere with normal operation of the instrument operating system or the instrument application software.

## 9 User and Remote Interface Security Measures

This chapter discusses options that are available to you to control and configure remote access to the instrument, including:

- [SCPI/GPIB Control of Interfaces](#)
- [Operating System Security Features](#)
- [USB Interfaces](#). This topic includes information about how to set the instrument's USB ports to read-only.

### IMPORTANT

Users are responsible for providing security for the I/O ports for remote access, by controlling physical access to the I/O ports. The I/O ports must be controlled because they provide access to most user settings, user states, and the display memory.

---

### SCPI/GPIB Control of Interfaces

The GPIB command [LLO](#) (local lockout) can be sent by the controller to disable operation of the instrument's front-panel keys and softkey menus.

However, sending the [LLO](#) command does **not** disable access to the instrument via its USB ports. For details of how to restrict the operation of the USB ports, see [“Configuring USB for Read-only” on page 64](#) below.

### Operating System Security Features

The instrument's Windows operating system includes a variety of features that you can invoke or modify to enhance system security. These include the following:

- The ability to create custom user accounts, and assign different security levels to each account by adding it to an existing group. The group types predefined by Windows are: Administrator, Power User, User, Backup Operator, and Guest, but you can also define new group types.
- To provide additional protection for instruments that have a network (or internet) connection, the standard Windows Firewall is enabled by default.

- You can install standard third-party antivirus and spyware detection software designed for use with Windows. If your instrument has a network (or internet) connection, this may be advisable.

### CAUTION

Running any third-party program while making measurements may adversely affect the instrument's performance.

---

Details of all these features are provided in the "Windows Security" chapter of the [Keysight X-Series Signal Analyzer: Getting Started Guide](#).

## Determining the Instrument's Operating System

You can easily determine your instrument's operating system version as follows:

1. Using the instrument front-panel, press **System > Control Panel...**
2. The Windows Control Panel appears. From the menu at the top of the Control Panel window, select **Help > About Windows**
3. The **About Windows** message box appears, displaying the installed version of Windows

## USB Interfaces

The instrument's Microsoft Windows operating system can be configured to improve the security of the USB interfaces. This section includes the following topics:

- [“Disabling or Enabling AutoRun/AutoPlay” on page 60](#)
- [“Configuring USB for Read-only” on page 64](#)

## Disabling or Enabling AutoRun/AutoPlay

**AutoRun**, and the associated **AutoPlay**, are Windows features that assist users in selecting appropriate actions when new media and devices are detected. The AutoRun feature is disabled in the instrument by default, for improved security, unless the Administrator account is running. (In Administrator mode, AutoRun is enabled, to aid with program installation.)

The procedure for disabling and enabling AutoPlay depends on your instrument's operating system (either [Windows 7](#) or [Windows XP](#)). To determine the operating system version of your instrument, see [“Determining the Instrument's Operating System” on page 60](#).

## Windows 7

If your instrument has the Windows 7 operating system, you can disable or enable AutoPlay via the Control Panel. Open the Control Panel and select **Hardware and Sound > AutoPlay**, then uncheck or check the "Use AutoPlay for all media and devices" checkbox.

If you want to understand details of how this AutoPlay setting affects the Windows Registry, see the [Windows XP](#) discussion below.

## Windows XP

You can change the AutoRun configuration by editing the value of one of two Windows Registry keys. The Windows Registry is a database that stores critical configuration information for the instrument's operating system.

### CAUTION

Exercise extreme caution whenever you edit the Windows Registry. Entering an incorrect Registry value, or accidentally deleting Registry keys, may have serious consequences that can prevent the system from starting, or require that you reinstall Windows. The instructions in ["Disable & Enable Procedure" on page 62](#) below assume that you are familiar with the use of the Windows Registry Editor to modify Registry settings.

---

## Registry Key Definitions

AutoRun can be configured per-machine or per-user.

### NOTE

If the per-machine Registry key is present, its settings override those of the per-user Registry key.

---

The Registry key that controls the **per-machine** AutoRun settings is:

`HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\NoDriveTypeAutoRun`

The Registry key that controls the **per-user** AutoRun settings is:

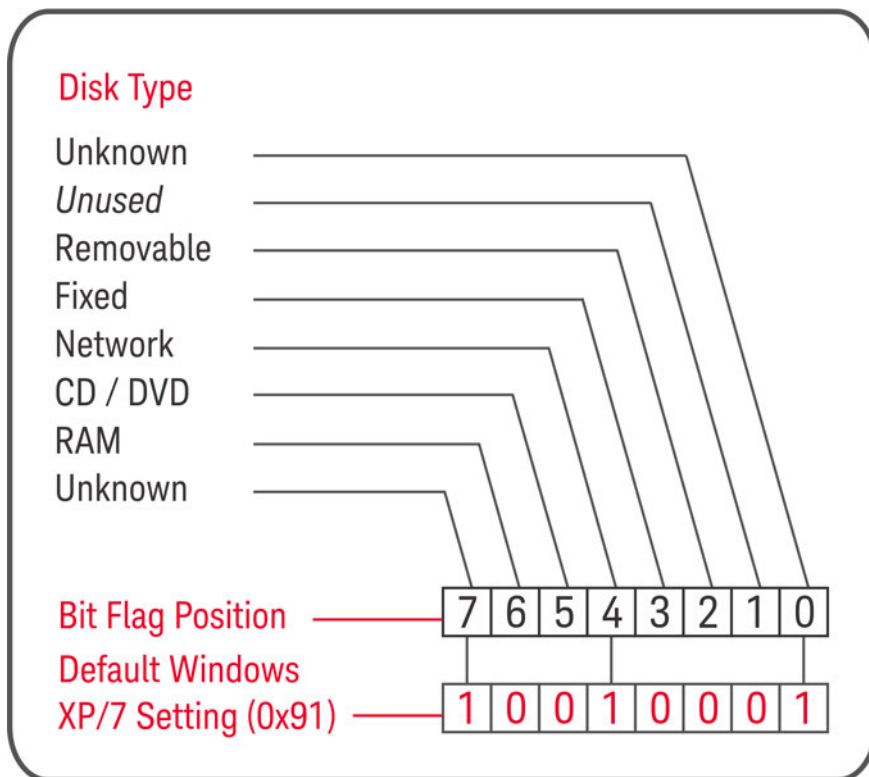
`HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\policies\Explorer\NoDriveTypeAutoRun`

In the following discussions, we use the industry-standard abbreviation **HKLM** for the root key `HKEY_LOCAL_MACHINE`, and the industry-standard abbreviation **HKCU** for the root key `HKEY_CURRENT_USER`.

The DWORD value of either of these entries represents a set of single-bit flags. Each flag specifies the AutoRun setting for a specific drive type, as shown in [Figure 9-1](#). Setting a bit flag to 1 disables AutoRun for that drive type.

Figure 9-1

AutoRun Flag Definitions for NoDriveTypeAutoRun Registry entry



As shown in [Figure 9-1](#) above, the default Windows XP (post-SP2) and Windows 7 value for this entry is `0x91` (under the entry `HKCU\...\NoDriveTypeAutoRun`). This setting disables AutoRun for **Unknown** and **Network** drives, but enables AutoRun for **Removable**, **Fixed**, **CD/DVD** or **RAM** drives.

You can disable AutoRun for all drive types by changing the value to `0xFF`, as described in the following section.

#### Disable & Enable Procedure

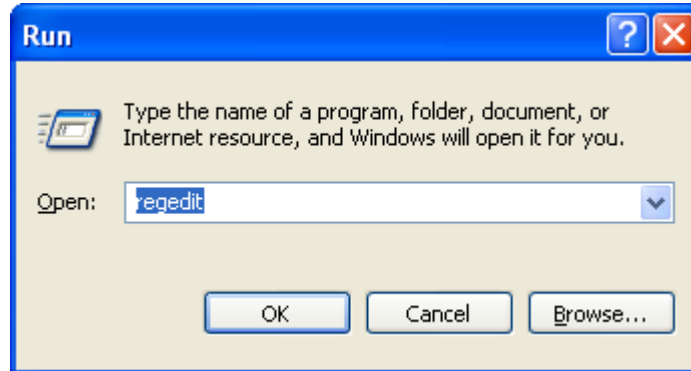
In view of the interaction between the per-machine and per-user Registry settings, as described above, it is recommended that, if both keys exist in your instrument's Registry, you should alter the settings of **both** Registry keys to the same value at the same time.

Use the following procedure to disable AutoRun for all drive types, or to revert all AutoRun settings to their Windows XP or Windows 7 default values. (Note that if your instrument has a Windows 7 operating system, there is a simpler way to do this via the Control Panel; see ["Windows 7"](#) on [page 61](#) above.)

1. Open the Windows Registry editor, using one of the following methods depending on your instrument's operating system:

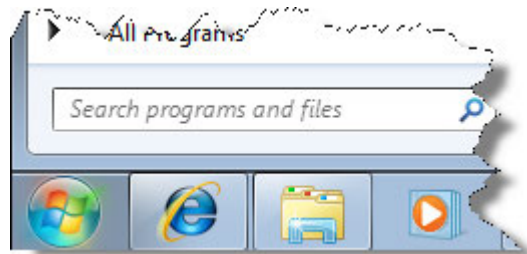
- a. For Windows XP, select **Run...** from the Windows Start menu. Then, type `regedit` into the Windows Run dialog box, as shown in **Figure 9-2** below, and click **OK**.

**Figure 9-2** Windows XP Run Dialog



- b. For Windows 7, click the Windows **Start** button at the bottom left of the screen, type `regedit` into the **Search programs and files** box, as shown in **Figure 9-3** below, then press **Enter**.

**Figure 9-3** Windows 7 Search edit box



2. The Registry Editor window appears. Using the tree view control on the left of the window, navigate to the per-machine (**HKLM**) key:  
`HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer`.
3. To **disable** AutoRun for all drive types, set the value of entry `NoDriveTypeAutoRun` to `0xff`.  
To **revert** AutoRun settings to the Windows default values, set the value of entry `NoDriveTypeAutoRun` to `0x91`.
4. Again using the tree view control on the left of the Registry Editor window, navigate to the per-user (**HKCU**) key:  
`HKCU\SOFTWARE\Microsoft\Windows\CurrentVersion\policies\Explorer`.
5. To **disable** AutoRun for all drive types, set the value of entry `NoDriveTypeAutoRun` to `0xff`.  
To **revert** AutoRun settings to the Windows default values, set the value of entry `NoDriveTypeAutoRun` to `0x91`.

6. From the Registry Editor menu, select **File > Exit** to save the settings and exit the editor.
7. Shut down and restart the instrument, to enable the new settings to take effect.

#### Microsoft AutoRun Patch

#### NOTE

The information in this section applies only to Windows XP. If your instrument has a Windows 7 operating system, you do not require this patch.

---

There is a defect in Windows XP that compromises the ability to disable AutoRun. This defect has been fixed by a patch from Microsoft, as described in the [Microsoft Knowledge Base Article ID: 967715](#).

This patch has been included in new instrument shipments from the factory since revision A.03.00.

After the patch has been applied, there will be a Registry entry at:

`HKLM\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\HonorAutorunSetting` with a default value of 1.

#### More Information

The following Wikipedia articles provide more information about AutoRun and AutoPlay:

<http://en.wikipedia.org/wiki/AutoRun>

<http://en.wikipedia.org/wiki/AutoPlay>

## Configuring USB for Read-only

As from instrument software revision A.04.00, a convenient mechanism is provided to set the instrument's USB interfaces to read-only, thus preventing transfer of files from the instrument onto USB devices.

You can change this setting only when you are logged on as the Administrator. For details of how to log on to the instrument as the Administrator, see the [Keysight X-Series Signal Analyzer: Getting Started Guide](#). To change the setting, do the following:

1. If you are **not** currently logged on to the instrument as the Administrator, you must log off.

If you are currently logged on to the instrument as the Administrator, and the Keysight XSA application is already running, go to Step 4.

The log-off procedure executes more quickly if you first exit the Keysight XSA application, but you can also log off without exiting the application.

2. To log off, use one of the following procedures, depending on your instrument's operating system:



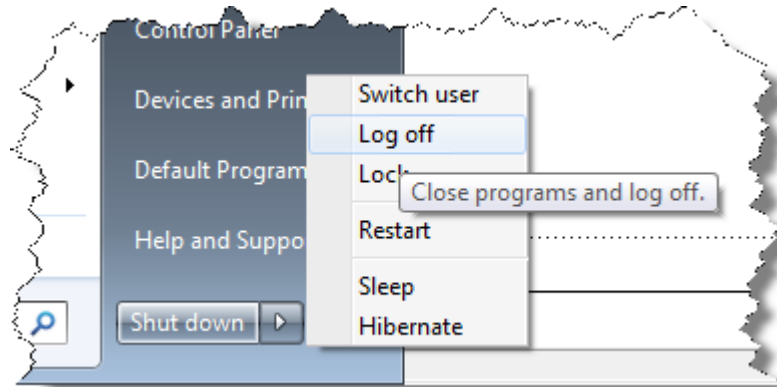
- a. For Windows XP, select **Log Off** from the Windows XP Start menu (as highlighted in **Figure 9-4** below), then click **Log Off** in the Log Off Windows dialog that appears.

**Figure 9-4** Log Off Button in Windows XP Start Menu



- b. For Windows 7, click the Windows **Start** button, then select **Shut down > Log off** from the Windows Start menu, as shown in **Figure 9-5** below.

**Figure 9-5** Windows 7 Log off Control



3. After you have logged on to the instrument as the Administrator, restart the Keysight XSA application.
4. When the XSA application has fully initialized (that is, when the main results view and softkey menu are visible), press the **System** front-panel key.
5. From the System softkey menu, select: **More > Security > USB**.
6. Select the option **Read Only**.
7. To activate the configuration change, either log out and then back in under your usual user name (which by default is "instrument"), or cycle the instrument power.

## 10 Procedure for Declassifying a Faulty Instrument

Even if the instrument is not able to power on, it may be declassified by:

1. Removing the disk drive from the instrument, using the appropriate procedure as described in **“Disk Drive Removal Procedure” on page 52.**
2. Removing the SD Memory card (if present), using the procedure described in **“SD Memory Card Removal Procedure” on page 57.**

## 11 Special Options

You can install certain special options that provide security-related functionality. The following available options are described in this chapter.

- “Option SF1” on page 68
- “Option SF2” on page 69

To determine which of these options, if any, are installed in your instrument, use the procedure described in “Determining Installed Options” on page 13.

## Option SF1

Option SF1 is a license key-enabled special option that addresses the requirements of security-conscious users. Installing Option SF1 in the instrument causes changes to available functionality in certain menus, and suppression of certain SCPI commands, to prevent the launching of Windows programs from the instrument application. This reduces the instrument's vulnerability to the effects of unauthorized or undesirable third-party programs or scripts.

This section summarizes the functional modifications to the instrument capabilities when Option SF1 is installed.

### Menu & Command Changes

Installing Option SF1 causes the following menu and command changes in the instrument.

#### File Menu

In the **File** menu, the **File Explorer** key is not available.

#### System Menu

In the **System** menu, the keys **Control Panel...**, and **Web Browser** are not available.

In the **System** > **Service** menu, the keys **Front Panel Test...**, **Front Panel Pixel Test...**, and **Front Panel Touch Test...** are not available.

In the **System** > **Licensing** menu, the key **License Manager...** is not available.

#### SCPI Commands

The SCPI command `:SERVice[:PRODUCTION]:RUN` is not available.

## Option SF2

Option SF2 is a license key-enabled special option that addresses the requirements of security-conscious users who need to be able to prevent the saving of measurement results or user configurations to the instrument's disk drive while in the instrument application. The option also prevents the recall of results and configurations from the disk.

Installing Option SF2 makes the following changes to the instrument's operating environment:

- Modifies aspects of the Windows operating system, specifically to disable memory page file usage. For details, see [“Operating System Changes” on page 69](#).
- Disables certain menu keys and SCPI commands, eliminating the ability to save or recall user data. For details, see [“Menu & Command Changes” on page 69](#).

### Operating System Changes

Installing Option SF2 disables Windows memory page files. The reason for this change is to ensure that memory page swapping does not inadvertently cause the instrument to create on-disk copies of RAM data.

Note that one effect of disabling memory page files is to reduce the available memory space for preloading applications at power-on.

#### TIP

If a disk recovery and software update is performed, memory paging files will automatically be re-enabled. If the X-Series application is then started (with Option SF2 installed), an advisory dialog appears, describing how to disable the page files.

The X-Series application will not start until memory page files are disabled. For details of how to run [SF2RegSetup.reg](#), refer to [Installation Note: Keysight X-Series Signal Analyzers Option SF2](#).

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### Menu & Command Changes

Installing Option SF2 causes several menu and command changes in the instrument, as follows.

#### Front-panel Keys

The functions of the following front-panel keys are disabled. Pressing one of these keys displays the informational message “Settings conflict; Feature not available for Option SF2”.

- **Quick Save**
- **Recall**

– **Save**

**NOTE**

Save and Recall are often used with the N9069C Noise Figure Measurement Application to allow multiple noise sources to be used without the need to re-enter ENR values or to perform the noise source calibration each time a different noise source is connected. When Option SF2 is installed, this functionality is not available.

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## File Menu

The **Page Setup**, **Print**, **Quick Save**, **Recall** and **Save** icons are not available.

## Preset Menu

The **User Preset**, **Save User Preset**, and **User Preset All Modes** icons are not available.

## System Menu

In the **System** > **Power On** menu, the Power On Type selection keys (**Mode Preset**, **User Preset** and **Last State**) are not available.

## Disabled SCPI Commands

The following SCPI commands are **not** available. Attempting to use any of these commands generates the Error message: **-113,"Undefined header"**.

Note that some of the commands listed are specific to individual applications, thus the set of available commands depends on which applications are licensed for a given instrument.

### IEEE 488.2 Common Commands (\*)

- **\*RCL**
- **\*SAV**

### MMEMory Subsystem

- **:MMEMory:CLEar:ALL**
- **:MMEMory:CLEar:STAtE**
- **:MMEMory:COMMEnt**
- **:MMEMory:COpy:DEVIce**
- **:MMEMory:INITialize**
- **:MMEMory:LOAD:ALIMit**
- **:MMEMory:LOAD:ALISt**
- **:MMEMory:LOAD:ATRACE**
- **:MMEMory:LOAD:AUTO**

Special Options  
Option SF2

- :MMEMory:LOAD:AXConfig
- :MMEMory:LOAD:CAPTured
- :MMEMory:LOAD:CCORrection
- :MMEMory:LOAD:CHTable
- :MMEMory:LOAD:CORRection
- :MMEMory:LOAD:CORRection:DDIRectory
- :MMEMory:LOAD:CORRection:GROup
- :MMEMory:LOAD:DLISt
- :MMEMory:LOAD:DPD:REFeRence:DATA
- :MMEMory:LOAD:DPD:REFeRence:SRATe?
- :MMEMory:LOAD:DTRaces
- :MMEMory:LOAD:ENR
- :MMEMory:LOAD:EVMSetup
- :MMEMory:LOAD:FMT
- :MMEMory:LOAD:FREQuency
- :MMEMory:LOAD:IQRef
- :MMEMory:LOAD:LIMit
- :MMEMory:LOAD:LIMit:DDIRectory
- :MMEMory:LOAD:LOSS
- :MMEMory:LOAD:MASK
- :MMEMory:LOAD:MPADapter:CORRection
- :MMEMory:LOAD:PDATA
- :MMEMory:LOAD:PSET
- :MMEMory:LOAD:RDATa
- :MMEMory:LOAD:RECORDing
- :MMEMory:LOAD:REGister
- :MMEMory:LOAD:SCAN
- :MMEMory:LOAD:SCONfig
- :MMEMory:LOAD:SETup
- :MMEMory:LOAD:SLISt
- :MMEMory:LOAD:SSSetup
- :MMEMory:LOAD:STATe

Special Options  
Option SF2

- :MMEMory:LOAD:STATe:VSA
- :MMEMory:LOAD:T2Config
- :MMEMory:LOAD:TMMConfig
- :MMEMory:LOAD:TRACe
- :MMEMory:LOAD:TRACe:DATA
- :MMEMory:LOAD:TRACe:REGister
- :MMEMory:LOAD:VSASetup
- :MMEMory:LOAD:ZMAP
- :MMEMory:MSIS
- :MMEMory:NAME
- :MMEMory:NFIGure:LOAD:ENR
- :MMEMory:NFIGure:LOAD:FREQuency
- :MMEMory:NFIGure:LOAD:LOSS
- :MMEMory:NFIGure:STORe:ENR
- :MMEMory:NFIGure:STORe:FREQuency
- :MMEMory:NFIGure:STORe:LOSS
- :MMEMory:REGister:STATe:LABe1
- :MMEMory:REGister:STATe:LABe1:MAXimum?
- :MMEMory:REGister:STATe:MAXimum?
- :MMEMory:REGister:TRACe:LABe1
- :MMEMory:REGister:TRACe:LABe1:MAXimum?
- :MMEMory:REGister:TRACe:MAXimum?
- :MMEMory:RESu1ts:CORRection:MODE
- :MMEMory:RESu1ts:LIMits:MODE
- :MMEMory:RESu1ts:OUTPut
- :MMEMory:RESu1ts:SCAN
- :MMEMory:RESu1ts:SCReen:THEME
- :MMEMory:RESu1ts:SLISt
- :MMEMory:RESu1ts:TRACe:DATA
- :MMEMory:RESu1ts:TRACe:HEADer
- :MMEMory:RESu1ts:TRACe:SETTing
- :MMEMory:RMEDia:LABe1



Special Options  
Option SF2

- :MMEMory:RMEDia:LIST?
- :MMEMory:RMEDia:SIZE?
- :MMEMory:RMEDia:WPRotect?
- :MMEMory:SElect[:ITEM]:ALL
- :MMEMory:SElect[:ITEM]:DEFault
- :MMEMory:SElect[:ITEM]:HWSettings
- :MMEMory:SElect[:ITEM]:LINEs:ALL
- :MMEMory:SElect[:ITEM]:NONE
- :MMEMory:SElect[:ITEM]:SCData
- :MMEMory:SElect[:ITEM]:TRACe[:ACTive]
- :MMEMory:SElect[:ITEM]:TRANsducer:ALL
- :MMEMory:STORE:ALIMit
- :MMEMory:STORE:ALISt
- :MMEMory:STORE:ATRace
- :MMEMory:STORE:AXConfig
- :MMEMory:STORE:CAPTured
- :MMEMory:STORE:CHTable
- :MMEMory:STORE:CORRection
- :MMEMory:STORE:CORRection:GROup
- :MMEMory:STORE:CPData
- :MMEMory:STORE:DLISt
- :MMEMory:STORE:DTRaces
- :MMEMory:STORE:ENR
- :MMEMory:STORE:FMT
- :MMEMory:STORE:FREQuency
- :MMEMory:STORE:IQRef
- :MMEMory:STORE:LIMit
- :MMEMory:STORE:LOSS
- :MMEMory:STORE:MPADapter:CORRection
- :MMEMory:STORE:PSET
- :MMEMory:STORE:QSAVE
- :MMEMory:STORE:RDATA

Special Options  
Option SF2

- :MMEMory:STORe:RECORDing
- :MMEMory:STORe:RESuLts
- :MMEMory:STORe:RESuLts:DATA
- :MMEMory:STORe:RESuLts:MTABLe
- :MMEMory:STORe:RESuLts:PTABLe
- :MMEMory:STORe:RESuLts:SNGLS
- :MMEMory:STORe:RESuLts:SPECTrogram
- :MMEMory:STORe:RESuLts:TABLe:CUMulative
- :MMEMory:STORe:RESuLts:TABLe:CURREnt
- :MMEMory:STORe:RESuLts:TABLe:PDW
- :MMEMory:STORe:RESuLts:TABLe:PDW:FULL
- :MMEMory:STORe:RESuLts:TABLe:PULSe
- :MMEMory:STORe:RESuLts:TABLe:PULSe:FULL
- :MMEMory:STORe:RESuLts:TABLe:VPDW
- :MMEMory:STORe:RESuLts:TABLe:VPDW:FULL
- :MMEMory:STORe:SCAN
- :MMEMory:STORe:SCONfig
- :MMEMory:STORe:SCREen
- :MMEMory:STORe:SCREen:THEMe
- :MMEMory:STORe:SLISt
- :MMEMory:STORe:STATe
- :MMEMory:STORe:T2Config
- :MMEMory:STORe:TMMConfig
- :MMEMory:STORe:TRACe
- :MMEMory:STORe:TRACe:DATA
- :MMEMory:STORe:TRACe:REGISter
- :MMEMory:STORe:ZMAP
- :MMEMory:TRACe:CLient
- :MMEMory:TRACe:CLient:STATe
- :MMEMory:TRACe:LOGO:FILE
- :MMEMory:TRACe:LOGO:STATe
- :MMEMory:TRACe:OPERator

Special Options  
Option SF2

- :MMEMory:TRACe:OPERator:STATe
- :MMEMory:TRACe:PDEscription
- :MMEMory:TRACe:PDEscription:STATe
- :MMEMory:TRACe:TITLe
- :MMEMory:TRACe:TITLe:STATe

**SYSTem Subsystem**

- :SYSTem:PON:TYPE
- :SYSTem:PRESet:SAVE
- :SYSTem:PRESet:TYPE
- :SYSTem:PRESet:USER
- :SYSTem:PRESet:USER:ALL
- :SYSTem:PRESet:USER:SAVE
- :SYSTem:PRINT:THEMe

## A: References

Some items below provide links to non-Keysight URLs. Please note that such links are subject to deletion or change without notice. In case of the failure of any such link, please contact the specified third party.

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2. **NIST SP 800-88, Revision 1, Guidelines for Media Sanitization**  
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<http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-88r1.pdf>
3. **Keysight X-Series Signal Analyzer: Getting Started Guide**  
Keysight Technologies 2008-2019. Part Number: subject to change as document is revised.  
A printed copy of this document is supplied with each Keysight X-Series Analyzer.  
It is also available in Acrobat (PDF) form:
  - on the Documentation DVD supplied with each instrument,
  - via download from:  
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Keysight Technologies 2018. Part Number: N9020-90234.  
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