Keysight X–Series Signal Analyzer

This documentation provides information for the following X-Series Instruments:

UXA Signal Analyzer N9041B

KEYSIGHT
TECHNOLOGIES

Getting Started
and
Troubleshooting
Guide

Notices

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WARNING

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Table of Contents

1 Quick Start

This section explains how to initialize the Signal Analyzer and view a signal.

The following topics can be found in this section:

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Initial inspection

Inspect the shipping container and the cushioning material for signs of stress.

Retain the shipping materials for future use, as you may wish to ship the

analyzer to another location or to Keysight Technologies for service.

Verify the Contents

Verify the shipping container contents using the box contents list.

Shipping Problems?

If the shipping materials are damaged or the contents of the container are incomplete:

– Contact the nearest Keysight Technologies office.

– Keep the shipping materials for the carrier's inspection.

– If you must return an analyzer to Keysight Technologies, use the original (or comparable) shipping materials. See "Returning an Analyzer for Service" on page 79.

Instrument Location and Rack Mounting Requirements

Locating the analyzer

Make sure that the fan inlet and exhaust vent areas on the sides of the analyzer are not obstructed. The minimal required clearance is 2 inches. Airflow restrictions cause additional airflow noise and cause the fans to speed up so they can draw in enough air for the required cooling. This results in excessive audible noise.

Cooling and rack mounting

Do not rack mount the analyzer side-by-side with any other instrument with side-by-side ventilation. Make sure the exhaust air from the first instrument is directed away from the inlet of the second unit. If the pre-heated air from the first instrument is directed into the second instrument, it can cause excessive operating temperatures in the second unit and can cause instrument failures. The analyzer draws air in from the left side and exhausts air from the right side.

CAUTION   When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4° C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

Turning on the Analyzer the First Time

Initial power-on of the analyzer can be accomplished using the following methods:

| NOTE | During the initial power-on process, the instrument turns off and restarts several times. This only happens during the initial installation process |

Initializing the analyzer

Position the analyzer so you have easy access to the power cord and plug it in. See "Instrument Location and Rack Mounting Requirements" on page 9 and "Power requirements" under "Instrument Information" on page 14 for more details.

Steps	Action	Notes
1. Power on the analyzer	a. Press the power switch (located in the lower left corner of the analyzer's front panel) to turn the analyzer on.	The analyzer can require more than 5 minutes to power-on. The Keysight Technologies screen appears followed by a screen that allows you to select Windows 7 or the Recovery option.
2. Launch Microsoft Setup	The analyzer performs the following steps: – Windows 7 Startup window – Black screen – Windows Please wait message window – The following window appears giving you information about the End-User License Agreement.	
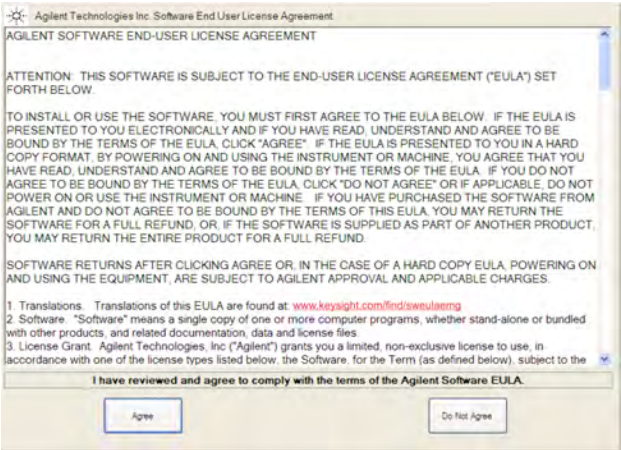
At this time, it is safe to turn off the instrument before initializing the software.

| CAUTION | After launching the setup, do not turn off the instrument or remove power before the Setup Wizard completes and the system restarts. Turning off the instrument may corrupt the system and the application may not operate. |

Steps	Action	Notes
3. Restart and logon	– Click **OK**	When the instrument restarts, the following message window appears:

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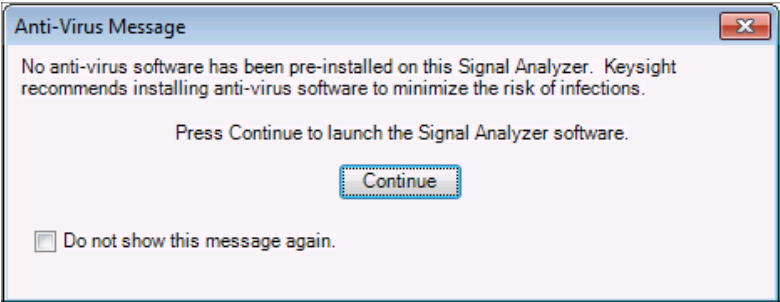
NOTE	If you do not check the "Do not show this message again" check box, this message will be displayed each time the analyzer is turned on. No application will start while this message is displayed. Before continuing, make sure that you carefully read the Anti-Virus message and determine what action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

4. Disable the Anti-Virus message	– Select the check box and click **Continue**.	Messages similar to the following continue to appear: Several required processes continue, then the application initializes.
5. When the installation is complete, you should see a display like this:		

Steps	Action	Notes
6. Set user interface language	a. On the instrument, press **System**, **Interface Settings**. b. Choose the desired language from the Language drop-down menu.	
7. Verify the installation	a. On the instrument, press **System**, **Show System**. b. Verify that the purchased application(s) appear in the list.	If you require further assistance, contact the Keysight support team. Online assistance: http://www.key-sight.com/find/assist
8. View a signal	a. Press **Input/Output**, **RF Calibrator**, **50 MHz**. b. Press **Freq**, **Center Freq, 50 MHz**. c. Press **Span**, **50 MHz**.	This routes the internal 50 MHz signal to the analyzer input.

The 50 MHz reference signal appears on the display as seen in the following graphic:
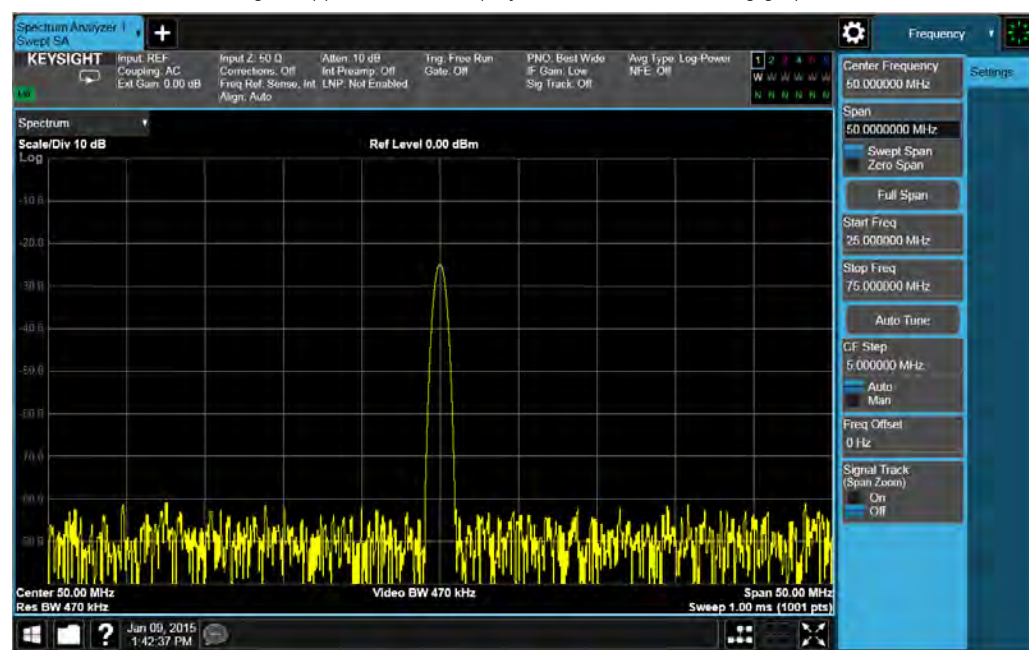
Anti-Virus Software and Firewalls

No anti-virus software is shipped with the analyzer. It is recommended that you install anti-virus software if your analyzer is connected to the LAN. Check with your IT department to see what they recommend.

The analyzer is shipped with the Windows 7 firewall enabled.

Do not modify the default network settings as this may cause problems with the operating system of the analyzer.

Instrument Information

Power requirements

The only physical installation of your Keysight signal analyzer is a connection to a power source. Line voltage does **not** need to be selected.

CAUTION   This instrument has auto-ranging line voltage input; be sure the supply voltage is within the specified range and that voltage fluctuations do not to exceed 10 percent of the nominal supply voltage.

This analyzer does **not** contain customer serviceable fuses.

NOTE   The instruments can operate with mains supply voltage fluctuations up to ±10% of the nominal voltage.

WARNING   This is a Safety Class 1 Product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.
Failure to ground the analyzer properly can result in personal injury. Before turning on the analyzer, you must connect its protective earth terminals to the protective conductor of the main power cable. Insert the main power cable plug into a socket outlet that has a protective earth contact only. DO NOT defeat the earth-grounding protection by using an extension cable, power cable, or autotransformer without a protective ground conductor.

CAUTION   The Mains wiring and connectors shall be compatible with the connector used in the premise electrical system. Failure, to ensure adequate earth grounding by not using the correct components may cause product damage, and serious injury.

AC Power Cords

The analyzer is equipped with a three-wire power cord, in accordance with international safety standards. This cable grounds the analyzer cabinet when connected to an appropriate power line outlet. The cable appropriate to the original shipping location is included with the analyzer. Use Keysight supplied power cord or one with same or better electrical rating. See:

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

CAUTION   Always use the three-prong AC power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord can cause product damage.

WARNING   If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only. Install the instrument so that the detachable power cord is readily identifiable and easily reached by the operator. The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

Protecting Against Overpowering

The Input 1 circuitry of the analyzer can be damaged by applying signals that exceed the maximum safe input level of +30 dBm average total power or +/- 0.2 Vdc.

The Input 2 circuitry of the analyzer can be damaged by applying signals that exceed the maximum safe input level of +5 dBm average total power or 0 Vdc.

Refer to the analyzer's specification guide for more details regarding the Maximum Safe Input Level. Repairing damage to the input circuitry can be expensive.

If the analyzer will be used to measure signals which might be near the maximum safe input level, use external attenuators and/or limiters to help protect the analyzer input. The External Gain, amplitude Corrections, and/or Ref Lvl Offset features may be used to compensate for the gains and losses of external devices. External Gain and Corrections are under the Input/Output menu and Ref Lvl Offset is under the AMPTD Y-Scale menu.

Instrument Maintenance

Cleaning the instrument

WARNING   To prevent electrical shock, disconnect the signal analyzer from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

Cleaning Connectors

Cleaning connectors with alcohol shall only be done with the instrument power cord removed, and in a well-ventilated area. Allow all residual alcohol moisture to evaporate, and the fumes to dissipate prior to energizing the instrument.

WARNING Keep isopropyl alcohol away from heat, sparks, and flame. Store in a tightly closed container. It is extremely flammable. In case of fire, use alcohol foam, dry chemical, or carbon dioxide; water may be ineffective.
Use isopropyl alcohol with adequate ventilation and avoid contact with eyes, skin, and clothing. It causes skin irritation, may cause eye damage, and is harmful if swallowed or inhaled. It may be harmful if absorbed through the skin. Wash thoroughly after handling.
In case of spill, soak up with sand or earth. Flush spill area with water.
Dispose of isopropyl alcohol in accordance with all applicable federal, state, and local environmental regulations.

Battery Information

The analyzer uses a lithium battery located on the CPU board. This is not an operator replaceable part. See"Returning an Analyzer for Service" on page 79. Replaceable parts must be approved or supplied by Keysight Technologies.

You can order the service documentation for the instrument through your Keysight Sales and Service office.

WARNING Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended. Discard used batteries according to the manufacturer's instructions.
Do not throw batteries away but collect as small chemical waste.

DO NOT THROW BATTERIES AWAY BUT COLLECT AS SMALL CHEMICAL WASTE.

Protecting against electrostatic discharge

Electrostatic discharge (ESD) can damage or destroy electronic components (the possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used).

Test equipment and ESD

To help reduce ESD damage that can occur while using test equipment:

WARNING **Do not use these first two techniques when working on circuitry with a voltage potential greater than 500 volts.**

- Before connecting any coaxial cable to an analyzer connector for the first time each day, momentarily short the center and outer conductors of the cable together.

- Personnel should be grounded with a 1 MΩ resistor-isolated wrist-strap before touching the center pin of any connector and before removing any assembly from the analyzer.

- Be sure that all instruments are properly earth-grounded to prevent build-up of static charge.

- Perform work on all components or assemblies at a static-safe workstation.

- Keep static-generating materials at least one meter away from all components.

- Store or transport components in static-shielding containers.

- Always handle printed circuit board assemblies by the edges. This reduces the possibility of ESD damage to components and prevent contamination of exposed plating.

Additional information about ESD

For more information about ESD and how to prevent ESD damage, contact the Electrostatic Discharge Association (http://www.esda.org). The ESD standards developed by this agency are sanctioned by the American National Standards Institute (ANSI).

2 Front and Rear Panel Features

This section describes the following features:

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Front-Panel Features

Item		Description
#	Name	
1	Measurement Keys	These keys (in the shaded area) enable you to set the parameters used for making measurements in the current Mode and Measurement.
2	Preset Keys	Mode Preset - local to the current mode, global to all measurements in the mode, affects most but not all parameters in the mode, does not affect Input/Output or System variables
		User Preset - local to the current mode, global to all measurements in the mode, affects all parameters in the mode as well as the Input/Output variables. Does not affect System variables.
3	Save/Recall Keys	Save - enables you to save states, traces, screen images and other items from the analyzer to files on the analyzer's internal storage, to removable devices, and to directories on the network.
		Recall - enables you to recall previously saved states, traces and other items to the analyzer from files on the analyzer's internal storage, from removable devices, and from directories on the network.
4	Sweep Keys	Single/Cont - toggles between single and continuous measurement sweeps.
		Restart - restarts the measurement.
5	Mode/Measurement Key	This key enables you to select the desired Mode (measurement application), Measurement, and/or View.

Item		Description
#	Name	
6	Enter and Arrow Keys	The Enter key terminates data entry when either no unit of measure is needed, or you want to use the current unit. The arrow keys: – Increment and decrement the value of the current measurement selection. (up/down = big increment, left/right = small increment) – Navigate help topics. – Navigate or make selections within Windows dialogs. – Navigate within forms used for setting up measurements. – Navigate within tables.
7	Knob	Increments and decrements the value of the current active function.
8	Utility Key	The following keys are available in the Utility section: Numeric key pad System Help Local/Cancel/(Esc) Back-space Delete Control Alt Undo/Redo Touch On/Off Onscreen Keyboard Tab
9	Input 1	2.4 mm (m) Connector for inputting external signals 3 Hz to 50 GHz. Make sure that the total power of all signals at this analyzer input does not exceed +30 dBm (1 watt).
10	USB Connectors	Standard USB 2.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, DVD drive, or hard drive.
11	Headphones Output	Headphones can be used to hear any available audio output.
12	Probe Power	Supplies power for external high frequency probes and accessories.
13	Ext Mixer	Provides LO output signal to and receives IF input signals from an external mixer. See the Specifications Guide for details on signal levels.

Item		Description
#	Name	
14	Input 2	1.0 mm (m)
		Connector for inputting external signals 3 Hz to upper range of the analyzer. Make sure that the total power of all signals at this analyzer input does not exceed +5 dBm (3.16 mW) with 0 dB attenuation.
15	Power Standby/ On	Turns the analyzer on. A green light indicates power on. A yellow light indicates standby mode.
		NOTE The front-panel switch is a standby switch, not a LINE switch (disconnecting device). The analyzer continues to draw power even when the front-panel switch is in standby. The main power cord can be used as the system disconnecting device. It disconnects the mains circuits from the mains supply.

Display Features

This section describes the regions of the display.

Screen Tabs

Along the top of the display are tabs, one for each measurement screen you have defined. Tap the + sign to "clone" the current measurement, which can be changed once it is created. Tap the current screen tab (or press the Mode/Meas hardkey) to display the following dialog:

This dialog allows you to choose a Mode, Measurement and View.

When you select a mode, the measurements that are available in the mode are displayed in the Measurement column.

When you select the desired measurement, the views available for the measurement are displayed under the View column.

You can have up to 16 measurement tabs, but only 6 can be viewed at one time. If the tabs overfill the top bar, they scroll left and right using the arrows to the left and right of the tabs.

You switch screens by touching the tabs. To view multiple screens, press the icon on the Bottom Bar.

Meas Bar

The Meas Bar shows general measurement settings and information. The annotations on this bar can be used to change settings. Tap anywhere in the annotation box to access the drop-down panel that contains relevant parameters. The following graphic shows some of the drop-down menus and the parameters they contain.
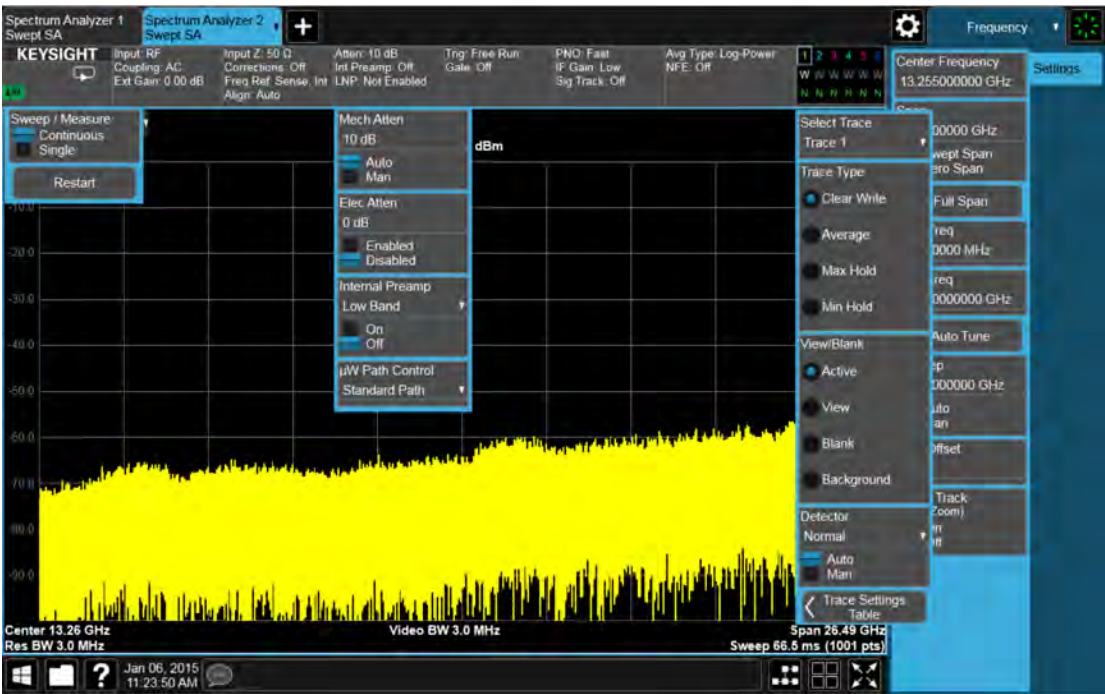
⊷ 🔄 Indicates single/continuous measurement.

Measurement Display

This area shows the measurement results in graphical and tabular form. You can interact with this area using pinch, drag, scroll and tap gestures.

On the signal:

Horizontal pinch – changes the span of the analyzer

Horizontal drag – changes the center frequency

Vertical pinch – changes the vertical scaling

Vertical drag – changes the reference level

Markers may be moved by dragging them to the desired location

Touch and hold – simulates a right click

Swipe scroll – allows you to view information that extends beyond the window area. When you begin to scroll, the scroll bar appears and fades once you stop scrolling.

The annotation drop-downs in the window area allow you to change parameters. The window title drop-down allows you to resize the windows in the multi-window format. When you tap in those areas, the drop-down control menus appear as shown in the following graphic.
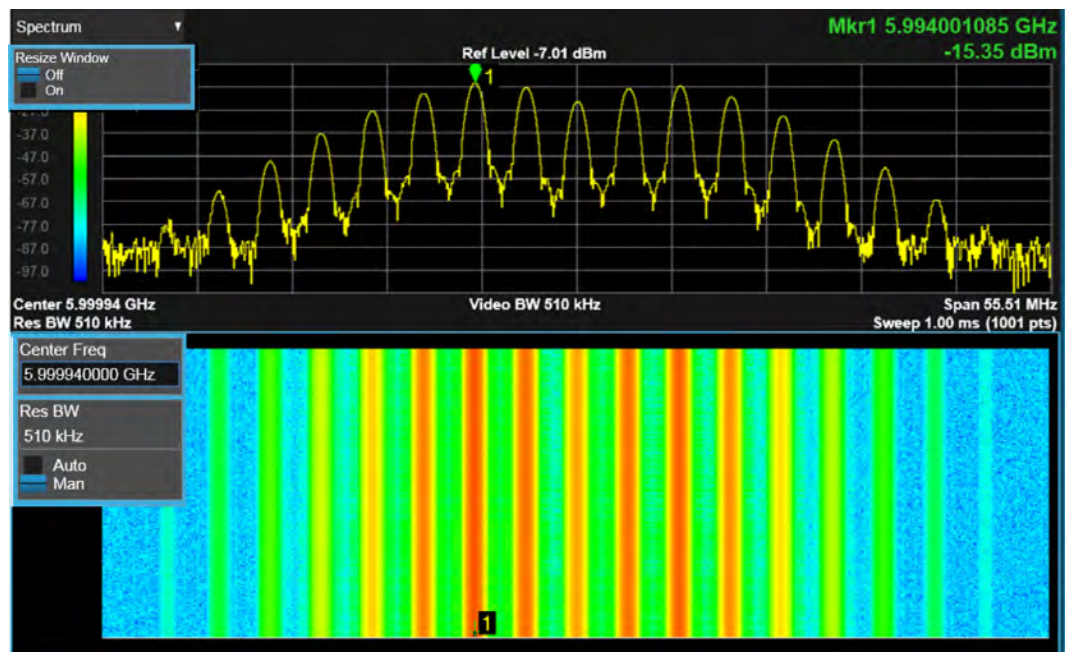
Menu Panel

At the top of the menu panels are two icons:

The Preset icon accesses the following control menu:
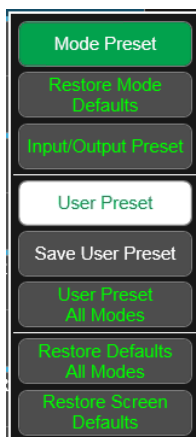
The System icon accesses the following dialog:
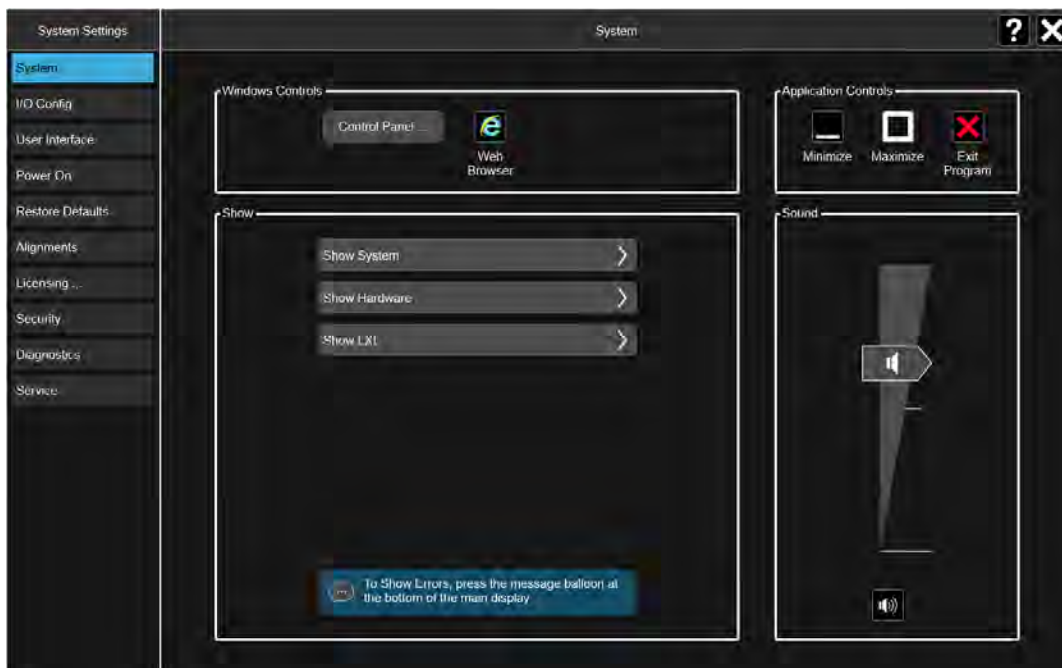
The hardkey drop-down panel contains the measurement controls. These are the same as the hardkeys in the shaded area of the keypad.

You can select functions using either the keypad or the drop-down menu.

Notice that the Frequency panel has a Settings tab on the right side. Other panels may have multiple tabs. The tabs access controls for the particular parameter noted on the tab.

Bottom Bar

The bottom bar contains several icons that access various controls.

Rear–Panel Features

Item		Description
#	Name	
1	EXT REF IN	Input for an external frequency reference signal:
2	EXT IF OUT	Enabled by Option CRW. Wide BW IF output for center frequency above 50 GHz.
3	CAL 1 IN	Reserved for future use
4	10 MHz OUT	An output of the analyzer internal 10 MHz frequency reference signal. It is used to lock the frequency reference of other test equipment to the analyzer.
5	SNS Series Noise Source	For use with Keysight N4000A, N4001A, N4002A Smart Noise Sources (SNS).
6	Noise Source Drive +28 V (Pulsed)	For use with Keysight 346A, 346B, and 346C Noise Sources.
7	TRIGGER 1 IN	Allows external triggering of measurements.
8	TRIGGER 2 IN	Allows external triggering of measurements.

Item		Description
#	Name	
9	Sync	Reserved for future use.
10	TRIGGER 1 OUT	A trigger output used to synchronize other test equipment with the analyzer. Configurable from the Input/Output keys.
11	TRIGGER 2 OUT	A trigger output used to synchronize other test equipment with the analyzer. Configurable from the Input/Output keys.
12	Analog Out	For Option YAV: Screen Video Log Video Linear Video
13	Digital Bus	Reserved for future use
14	Aux IF Out	CR3 Second IF Out CRP Arbitrary IF Out ALV Log Video
15	Line power input	The AC power connection. See the product specifications for more details.
16	Removable Disk Drive	Standard on all analyzers.
17	VGA	Allows connection of an external VGA monitor.
18	DisplayPort	Used for video output. Accepts a standard mini-display port connector, or adaptor for connection of an external monitor.
19	LAN/USB	A TCP/IP Interface that is used for remote analyzer operation. USB 2.0 port, Type A Connect to external peripherals such as a mouse, keyboard, printer, DVD drive, or hard drive.
20	USB Connector	USB 3.0 port, Type B. USB TMC (test and measurement class) connects to an external pc controller to control the instrument and for data transfers over a 480 Mbps link.
21	USB Connectors	Standard USB 3.0 ports, Type A. Connect to external peripherals such as a mouse, keyboard, printer, DVD drive, or hard drive.
22	PCIe X4	Reserved for future use
23	GPIB	A General Purpose Interface Bus (GPIB, IEEE 488.1) connection that can be used for remote analyzer operation.

Front and Rear Panel Symbols

	This symbol is used to indicate power ON (green LED).
	This symbol is used to indicate power STANDBY mode (yellow LED).
~	This symbol indicates the input power required is AC.
	The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to instructions in the documentation.
CE	The CE mark is a registered trademark of the European Community.
	The RCM mark is a registered trademark of the Australian Spectrum Management Agency.
ISM 1-A (GRP.1 CLASS A)	This is a symbol of an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 5).
ICES / NMB 001	"This ISM device complies with Canadian ICES-001." "Cet appareil ISM est conforme a la norme NMB du Canada."
CSA	The CSA mark is a registered trademark of the CSA International.
	This symbol indicates separate collection for electrical and electronic equipment mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive 2002/96/EC).
40	Indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.
	This symbol indicates compliance with the China RoHS regulations for paper-/fiberboard packaging.
KC	South Korean Certification (KC) mark; includes the marking's identifier code which follows this format: MSIP-REM-YYY-ZZZZZZZZZZZZZZZ.

3 Instrument Operating System

This chapter describes the Microsoft Windows 7, configuration and the settings used with the Keysight instrument software. It includes information about changing some of the system settings. And it describes the Windows operating system configuration and the software installations that are present on the Disk Drive when the instrument leaves the factory.

It is possible to use the front panel and touchscreen for changing operating system configuration items, but it is easier to perform these tasks with a USB mouse and external keyboard. For more useful shortcuts, see.

The following topics can be found in this chapter:

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Microsoft Windows

Your instrument has Microsoft Windows installed at the factory. Keysight has already configured many of the settings in Microsoft Windows for optimal behavior in your instrument. This chapter contains details about many of these settings.

Windows Help and Support Center

Throughout this chapter you will find references to the Windows Help and Support Center. To access the Windows Help and Support Center follow the instructions below, either on your PC or on the instrument itself.

NOTE   **You must have an Internet connection to access the Windows Help and Support Center.**

If the xSA is on-screen, tap the [icon] icon in the lower left corner of the display,.

Tap the [icon] icon and enter "help and support" into the Search window.
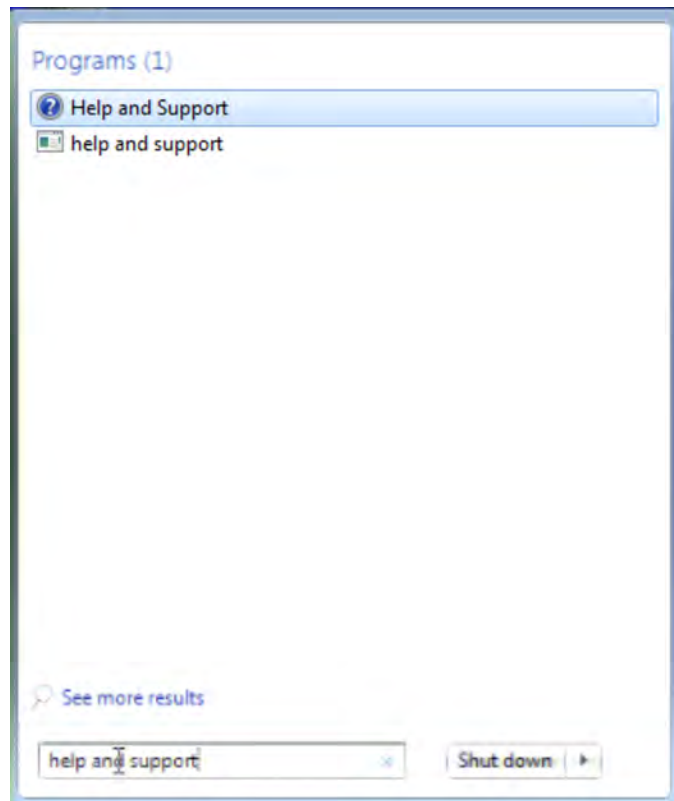
Installed Software

Signal analyzer software

The N9060C Spectrum Analyzer Measurement Application software is installed in the signal analyzer. Additional measurement applications are available. Each application requires a license to execute the software. All of these applications are installed by the factory at the time of manufacture, even if the licenses have not been purchased. You may purchase additional licenses at a later date.

Vector signal analyzer software

The 89600 VSA software is installed in the signal analyzer. This software was installed by the factory at the time of manufacture, even if the license was not purchased. If the license was not purchased, VSA will run in demo mode using prerecorded waveforms. You may purchase the license at a later date.

Customer Installation of Software

3rd Party Software verified by Keysight

Keysight has verified that the following programs are compatible with the instrument's applications:

– MathWorks MATLAB

Installation of other 3rd Party Software

The X-Series Signal Analyzer platform is an Open Windows environment, so you can install software on the instrument. However, installation of non-approved software may affect instrument performance. Keysight does not warrant the performance of the analyzers with non-approved software installed.

NOTE   Before installing any additional programs on the instrument, you should exit the Signal Analyzer application.
Also, you must not remove any applications or programs that were installed on the instrument when it was shipped from the factory.

If you install programs other than those that Keysight has tested, it could cause problems with the instrument's applications. If this happens, you should try uninstalling the program that has caused the problem, or try changing the program's configuration. If this does not correct the problem, you may have to use the Instrument Recovery system to reinstall the instrument's system software.

User Accounts

The instrument ships with a number of different accounts already set up. In addition you can create your own accounts if you desire. The privileges associated with each account determine what you can and cannot do from that account.

Administrator account

The default Administrator password that ships from the factory is "Keysight4u!".

Using the Administrator account you can perform the following operations:

– Install software

– Configure network and printer access

– Access all files on the instrument

– Add or change user accounts and passwords

– Change Firewall settings

– Change Windows settings (e.g., using Device Manager)

– Change the time and date

– Run any application

Instrument accounts

The default user account that ships from the factory is "Instrument" with the password "measure4u". This user is a member of the standard Users group. Using the Instrument account, you may perform the following operations:

– Configure network and printer access (although not local printer access)

– Access files on the instrument that are accessible to the Users group

– Run applications that are accessible to the Users group

Power Users accounts

– Install software (with some limitations, for example, you cannot install drivers)

– Configure network and local printer access

– Access files on the instrument that are accessible to the Power Users group

– Change the time and date

– Run applications that are accessible to the Power Users group

KeysightOnly user account

The instrument contains a user account called "KeysightOnly" that can be used by Customer Support in the event that the customer has changed the Administrator password and has forgotten the password. You must not remove or modify the KeysightOnly account.

Service user accounts

There are user accounts defined in the instrument for servicing the instrument.

Customer creation of accounts

You can create additional user accounts and decide on the level of security granted to any new user accounts created. For example, the level of security can be assigned as administrator, power user, standard user, backup operators. User names are not case sensitive but passwords are case sensitive.

It is Keysight's expectation that each user's My Documents folder is mapped to the D: drive. This is to avoid overwriting the user's data in the event the Instrument Recovery must be performed. Also, this facilitates convenient backup by copying the contents of the D: drive to external media. All user accounts created by the factory already have My Documents mapped to the D: drive. It is recommended to map all new users' My Documents folders to the D: drive.

Keysight X-Series Analyzer Licensing Options

The Keysight UXA Signal Analyzer has two licensing types: Fixed Perpetual and Transportable Perpetual. These licensing types are available on all existing measurement applications except the Spectrum Analyzer Measurement Application, which requires a fixed perpetual license (shipped Standard). Fixed Perpetual licenses are also required to enable hardware options.

Fixed Perpetual

Fixed Perpetual licenses are the traditional license type (Fixed) with the same duration (Perpetual) that have been available for all features since the introduction of the X-Series analyzers. Fixed Perpetual licenses are identified by the "F" in the second character and "P" in the third character of the option designator:

Example: N9068C-2FP

A license key is instrument model and serial number dependent. You can only install the license key on the specific instrument for which it was created.

Transportable Perpetual

Transportable Perpetual licenses are an optional license type offering deployment duration which is not fixed to a specific instrument model and serial number. Transportable Perpetual licenses are identified in the product structure by a "T" in the second character and "P" in the third character of the option designator:

Example: N9068C-2TP

Transportable Perpetual licenses require a connection to the Keysight server only for managing the check-in/out of the license. The Keysight licensing server also provides for storage of unused licenses that have been transported off instruments but are awaiting assignment to new instruments. The server will limit the number of transports per 30 day period per application license to 10.

Unlike Fixed Perpetual licenses which are pre-installed at the factory with new instrument purchases, Transportable Perpetual licenses require redemption and installation of the license before the first use. This allows the user to determine on which instrument to initially install the application license.

It is recommended that instruments be at the same instrument software release to ensure the latest code is available on each instrument so that the user experience is identical between instruments. This is particularly important when transporting the license for a newly-released application, which may only be available in the latest software release.

Licensing New Measurement Application Software –

Additional measurement application software can be ordered after your initial purchase of the signal analyzer. Software upgrades are provided in a kit that includes an option based Entitlement Certificate and a license agreement. The licenses are downloaded from the license Web site onto a USB storage device so they can be loaded into the instrument.

For all software upgrades, we recommend that the latest version of the instrument software be installed. This ensures that the measurement application being licensed and activated is installed and is the most current version.

The latest revision of the software may be downloaded from:

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

A license key is usually for one instrument model and serial number combination. The license key will only install itself on that instrument.

| NOTE | No calibration is required after a measurement application installation. |

Installation procedure over USB

Step	Action	Notes
1. Redeem the Option Upgrade Entitlement Certificate	Follow the instructions on the Certificate	After redeeming your Option Upgrade Entitlement Certificate you will receive an e-mail with an attached License File.
2. Save the license file	Save the .lic file to the root directory of a USB storage device	
3. Load the license file	Connect the USB storage device to one of the signal analyzer USB ports.	Windows will detect the new hardware and may display the configuration menu. The signal analyzer will automatically load the license file. (This may take a few minutes) Upon completion, the Keysight License Manager will display a "Successful License Installation" message.

| NOTE | Alternatively the license file can be manually installed over USB or LAN by placing the license file in the following folder on the signal analyzer. C:\Program Files\Agilent\licensing |

Step	Action	Notes
4. Verify installation	– Cycle the power on the signal analyzer.	The application will not be available for use until after the power has been cycled.
	– Press System, Show System.	This displays the list of installed applications.
	– Verify that the new	

Step	Action	Notes
	application appears in the list.	If you require further assistance, please contact the Keysight support team. Online assistance: http://www.keysight.com/find/assist If you do not have access to the Internet, contact your local Keysight Technologies Sales and Service Office, or if in the United States, call 1-800-829-4444.

Windows Configuration

The Windows settings have been optimized for the best measurement performance. Any modifications to these settings may degrade instrument performance and measurement speed. In general, most Windows System settings (typically set through the Windows Control Panel) should not be modified. Those that can be safely modified are listed below.

CAUTION **To recover from problems caused by changing Windows Systems settings, you may have to reinstall the Windows system and instrument applications using the Instrument Recovery process.**

Settings that can be changed

You may change the following Windows settings or administrative tasks (available from the Windows Control Panel) to suit your own personal preferences. It is recommended that you document any changes to the instrument's configuration in case an Instrument Recovery is performed and the configuration is reset.

NOTE Some of these actions can only be performed with Administrator privileges.

You May Use This Feature:	To Do This...
Windows Update	Configure Microsoft Windows Automatic Updates.
	Microsoft recommends that you always get the latest critical Windows updates to ensure that the instrument's Windows operating system is protected. If the instrument has internet access, the instrument default is set to automatically check for critical Windows Updates and notify you.
	You can change the configuration of the Microsoft Automatic Updates. You can choose not to have automatic updates. However, if you do this then you should manually update Windows periodically, by accessing Internet Explorer and selecting Windows Update from the Tools menu.
Action Center	Install and configure an Anti Virus program
User Accounts	Setup new user accounts.
	CAUTION Do not delete or modify the "KeysightOnly" user account. Doing so may prevent Keysight from servicing the instrument.
Network and Sharing Center	Add the Instrument to a network

You May Use This Feature:	To Do This...
Devices and Printers	Install and configure a printer
Date and Time	Set the time and date
System	f you click on "Advanced System Settings" a dialog will open called "System Properties." On this dialog there is an "Advanced" tab, which opens up a dialog with a number of settings options. One of these is "Performance", and if you click on the "Settings" button under "Performance", you will see another dialog with a number of settings options. The default is "Let Windows choose what's best for my computer." You can also select "Adjust for best performance." You should leave the remaining selections unchanged.

Settings that must not be changed

Avoid changing the settings described below (available from the Windows Control Panel). Changes to these settings may degrade instrument performance, screen displays, and measurement speed.

Do NOT Use This Feature:	To Do This...
Power Options	Do not change Power Options.
System	If you click on "Advanced System Settings" a dialog will open called "System Properties." On this dialog there is a tab called "Hardware." You should not modify any settings under the "Hardware" tab. On this dialog there is also a tab called "Advanced." You should not modify any settings under the "Advanced" tab except as described above under "Settings that can be changed".
Fonts	Do not remove installed Fonts
Display	Do not change the following Display Settings: – Screen Saver settings (under "Personalization) – Screen resolution (under "Adjust Resolution")

Do NOT Use This Feature:	To Do This...
	– DPI setting (under "Set custom text size")
Region and Language	Do not change any settings under "Region and Language" or the instrument keyboard and display may not operate properly
User Accounts	Do not delete or modify the "KeysightOnly" user account.

– In addition, Do Not:

– Add, delete, or modify disk drive partitions.

– Delete or modify Keysight registry entries.

– Change the contents of any directories containing the name "Keysight".

– Stop the IIS server

– Tamper with any virtual directories (or their contents) that came configured with the instrument.

– Uninstall these libraries, interfaces, or programs:
   – The I/O Libraries

   – The .NET Framework or any Hotfixes or Service Packs for the .NET Framework

   – The "Microsoft Visual J# .NET Redistributable Package 1.1"

   – Programs that begin with "Keysight"

   – The Adobe Acrobat reader

– Modify:
   – The I/O Library "GPIB27", "GPIB28" interfaces shown as configured Instrument I/O in the Connection Expert or I/O Config

Autoplay/Autorun

Since the introduction of Windows XP, the term Autoplay (sometimes also called Autorun) has come to be associated with the feature which assists users in selecting appropriate actions when new media and devices are detected. The Autoplay/Autorun feature is turned off in the instrument, by default, for heightened security, unless the Administrator account is running.

If you wish to re-enable Autoplay/Autorun, you may use the Auto Play function in the Control Panel. However, be aware that if you do this you may be more subject to virus attack from portable media such as USB flash drives.

Configure Printers

Printers are configured using the Microsoft Windows Control Panel. It is easily accessed from the Windows Start menu or from under the front panel System key. This setup process can be done using the touch screen and front-panel keys. See "Navigating Windows Without a Mouse" on page 58.

When setting up a new printer, you may need to load the printer driver (unless you are using a network printer that your IT department has set up to include the driver). The manufacturer of the printer supplies the driver software and process. That may require that you attach an external USB disk drive. An alternative is to connect the instrument to the LAN and download the driver from the printer manufacturer's internet site.

Configuring LAN

Hostname

The Computer Name, or Hostname, is preconfigured from the factory. It must be a unique name such that it does not conflict with other equipment on your LAN. The preconfigured Computer Name is A-N9041B-xxxxx, where xxxxx is the last 5 digits of the instrument's serial number.

To change the Computer Name consult the Windows Help and Support Center.

IP Address & Gateway

The instrument is preconfigured to obtain an IP Address via DHCP. You can change the IP Address and Gateway as you desire. The Windows Help and Support Center describes how to configure the LAN.

Connecting to a Network Shared Folder

The instrument contains standard Windows networking. The time required to authenticate is dependent on your LAN infrastructure. You may have improved performance by mapping a network drive to the shared folder that you need to access.

To map a network drive, click the icon . and right-click Computer.
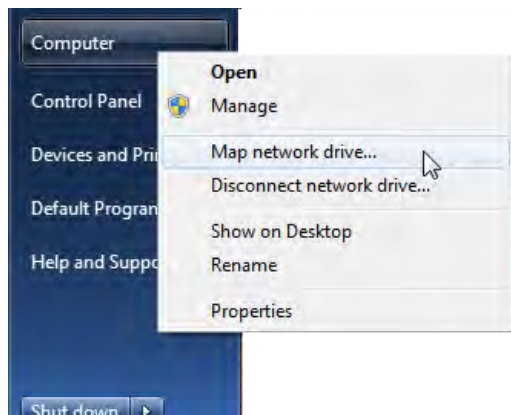
When the Map Network Drive window appears, browse to the correct folder, select both check boxes and click Finish.
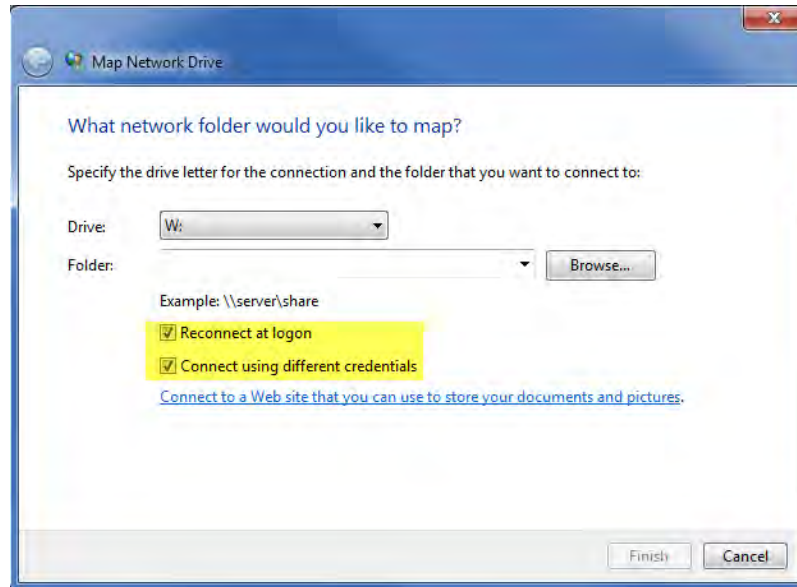
NOTE   In Windows 7 there is no visual indication that authentication is in progress.

Windows Security

Microsoft recommends the following to ensure the instrument's Windows operating system is protected:

– Use an internet firewall.

– Get the latest critical Windows updates.

– Use up-to-date antivirus software.

Windows Firewall

 Windows Firewall

The instrument is shipped with the Windows Firewall enabled. You can verify the status of Windows Firewall by going to the Control Panel and clicking on System and Security, Windows Firewall.

Windows Firewall Exceptions for programs and ports have been added to allow proper operation of the instrument over a network. Modifying these settings may cause the instrument to not operate properly.

Automatic Updates

Microsoft recommends that you always get the latest critical Windows updates to ensure that the instrument's Windows operating system is protected. If the instrument has internet access, the instrument default is set to automatically check for critical Windows Updates and notify you.

You can change the configuration of the Microsoft Automatic Updates. You can choose not to have automatic updates. However, if you do this then you should manually update Windows periodically, by accessing Internet Explorer and selecting Windows Update from the Tools menu.

NOTE   **Be aware that downloading and installing Windows Updates can be network and CPU usage intensive (impacting the instrument performance), and some Windows Updates automatically reboot the instrument. It is recommended that Windows Updates be performed when the instrument is not in normal use.**

Virus Protection

There is no antivirus software included with your instrument. To find information regarding recommended antivirus software, visit the following website:

http://www.keysight.com/find/x-series

and select FAQs under Technical Support.

NOTE   **Having antivirus software installed may have a slight impact on the instrument performance.**

Spyware Protection

There is no anti-spyware software installed on the instrument. This should not be a problem if you do not use the instrument for a lot of internet browsing. Having spyware in the instrument could have an impact on the instrument performance.

System Maintenance

Backup

It is recommended that you have a regular backup strategy. Your IT department may already have a backup strategy in place which is suitable for the instrument and its data. Using the Instrument Recovery system in conjunction with a regular backup strategy should allow full recovery of the instrument data.

Windows has a Backup utility that you can use to archive files and folders in case of a disk drive failure. See the Windows Help and Support Center for more information on this utility. You can also use third party backup utilities. However, you must ensure that this third party software is compatible with the instrument's system software. See "Customer Installation of Software" on page 34 for more information.

When performing backups, we recommend that you backup the data to an external storage device connected to the network or one of the instrument's USB connectors. Also, you should perform backups at times when the instrument is not being used for normal operations, as it may impact the instrument's overall performance.

System Restore

Windows contains the capability to restore the system to a previous point in time. System Restore is enabled with default settings as provided by Microsoft. However, System Restore is not always 100% successful. Therefore, it is not recommended that you rely on System Restore to protect your instrument. System Restore has not been tested to verify successful restoring.

Disk Defragmenting

The instrument has a solid state drive. Disk defragmenting is not recommended.

USB Connections

All of the USB ports are compatible with the USB 2.0/3.0 and 1.1 specification. The three USB ports on the front panel (see graphic below) and three of the USB ports on the rear panel are USB Series "A" ports. These are ports to which you can connect USB mass storage devices and printers. The instrument USB Host support includes the standard Microsoft Windows USB drivers for human interface, mass storage, printing, scanning, and imaging devices. A complete up-to-date list of the Windows USB class driver support is available on the Microsoft website.
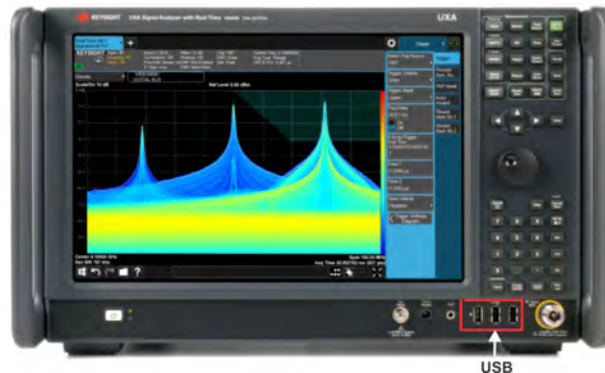
The square USB port (see graphic below) on the rear panel is a USB 3.0 Series "B" port and is used for controlling the instrument over USB. Information to help you program your instrument is documented in the X–Series Programmer's Guide. The instrument USB device driver included in the instrument software supports the test and measurement industry standard USBTMC–USB488 device class.

In addition, the IO Libraries CD that was included with your instrument contains USB Host drivers that allow control of other instruments connected to the USB ports.

Keysight Technologies does not support or warrant correct instrument operation if additional USB drivers from third parties are installed in the instrument. It is possible that additional drivers could break the normal USB operation. If USB operation is broken, recovery would require reinstalling the instrument application using the Instrument recovery process.

Disk Drive Partitioning and Use

The drive is partitioned into 3 sections: C:, D: and E:

– The C: partition contains the Windows 7 operating system and software installed by Keysight. This is an Open System which means you can install additional software, and these should be installed on the C: drive. However, only a limited set of software applications are tested for use with the Keysight measurement software. The installation and/or use of other software is not warranted and could interfere with the operation of the measurement software. If instrument repair is ever needed, the Keysight version of the C: drive is the only part of the instrument software that is restored by the Instrument Recovery process. You must reload any other software that you have added in the instrument.

– The D: partition is reserved for data storage. The User Accounts that are configured by Keysight have their My Documents folder mapped to the D: drive. This is for the convenience of backing-up the measurement data. You should always back-up the data on the D: drive to an external device. This allows you to restore the data if you ever need to replace the disk drive.

– The E: partition is reserved for Keysight's use. The primary use of the E: drive is for housing the Calibration and Alignment data. Do not change or overwrite the files on this drive. This could cause your instrument to not meet specifications, or even to stop functioning correctly. Do not use this drive for data storage. It is also recommended that you back up the contents of this drive by using the factory calibration data backup utility.

Backing-up the factory calibration data

To back-up the factory calibration data you will need a USB storage device.

Step	Notes
1. Press System, Alignments, Backup/Restore Align Data...	An information window appears that informs you that the instrument must shut down to complete the backup: "Press OK to force shut down and proceed. Press Cancel to exit."
2. Select OK.	The Alignment Data Wizard will appear:
3. Follow the on screen instructions to backup the calibration data to the USB drive and save the file.	**NOTE** The default location is an internal flash SD card, but you can choose another location.

Disk Drive Recovery Process

The Instrument Recovery System can be used to repair errors on the instrument's C: drive partition or to restore the original factory configuration of the system software on the disk drive. The Instrument Recovery System is stored in a separate hidden disk drive partition.
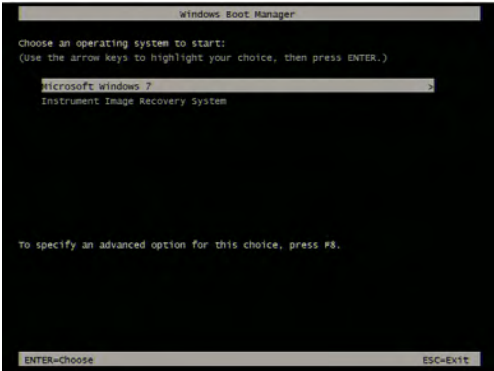
Repairing errors on the disk drive may result in loss of data or files. If you require more information, see the "chkdsk" documentation in the Windows Help and Support Center.
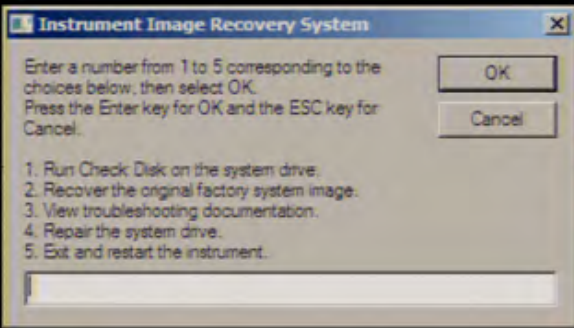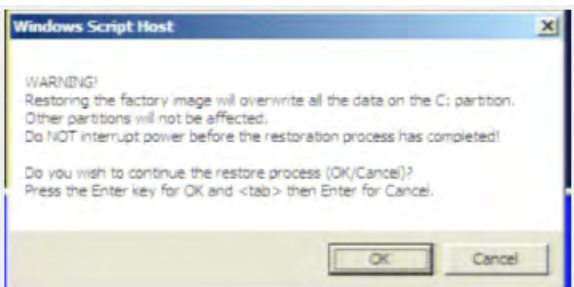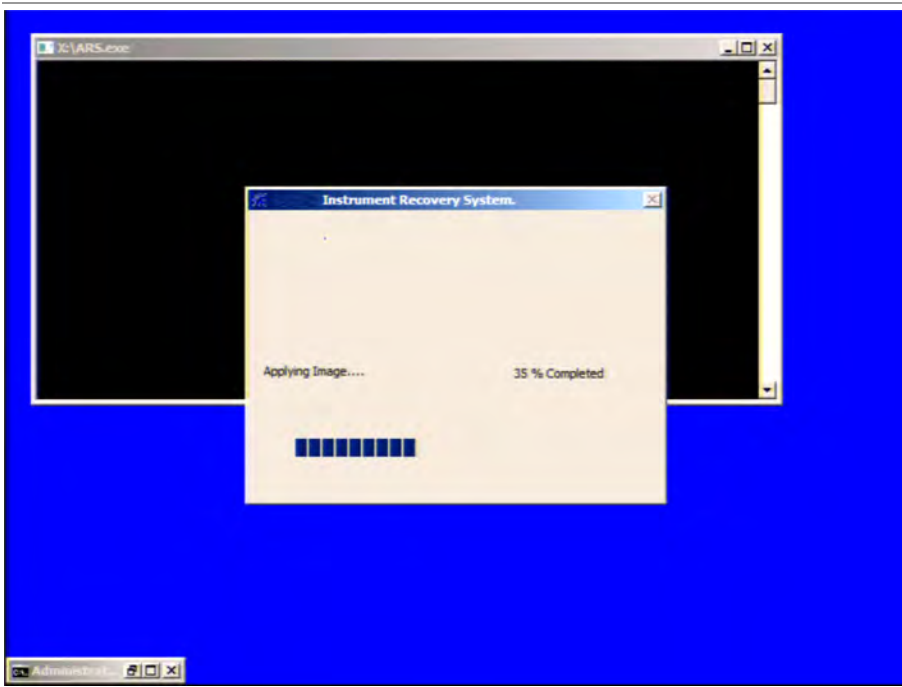
Restoring the original factory system software does not restore any of the following items:

– Additional software that has been installed after the instrument was shipped from the factory. (Thus, following an Instrument Recovery any software installed after the instrument was shipped from the factory will need to be re-installed.)

– System configurations (for example user accounts, windows configurations) that have been made after the instrument was shipped from the factory. (Thus, following an Instrument Recovery configuration changes will have to be performed.)

– The Instrument Recovery overwrites the contents of the C: partition. It does not affect the D: or E: partitions.

It is recommended that the customer use a regular back up strategy. The customer's IT department may already have a backup strategy in place which is suitable for the instrument and its data. Using the Instrument Recovery System in conjunction with a regular back up strategy should allow the customer to fully recover the instrument's software and data.

Recovery Process

Step	Notes
1. Make sure the instrument is turned off.	
2. Turn on the instrument. – Press the down arrow key to move the highlight to Instrument Recovery System, then press Enter.	After the Keysight Technologies screen is displayed, This screen is displayed for five seconds.

Step	Notes
3. When the Instrument Recovery System has booted, follow the on-screen instructions to recover the image of the C: drive. – Press 2, then press Enter to select the recovery.	
4. A warning message appears. – Press Enter to start the recovery, which may take up to 25 minutes to complete.	

5. Press Enter to exit and reboot the instrument once this portion of the recovery has completed.

NOTE   Additional recovery steps may be required to fully recover the system to a more current working state. This could involve restoring your own backups of the instrument information or re-installing applications, data and performing system customizations.

Updating the software

Choose one of these two processes:

– To install the latest software version, the software and installation instructions are available at:
http://www.keysight.com/find/xseries_software

– To re-install the software version you recovered to, follow the process below.

The following steps load a copy of the instrument software that forces the program code resident in the instrument's various programmable gate arrays to be in sync with the restored system software.

Installing the Software

Step	Notes
1. Log out of the default user (instrument): – Select Start, select Log Off from the Shut down drop-down menu.	
2. At the log in prompt enter: – User Name: administrator – Password: Keysight4u!	
3. Navigate to C Drive: – Click Start, My Computer, C: Drive and open the Temp folder.	
4. Locate the software installer program: "XSA_Installer_A.XX.XX.exe"	
5. Double-click on the installer.exe.	It may take a minute or two for the installer to start.
6. A window appears showing the extraction process.	Following the extraction screen, there may be a short period where there is no activity on the screen. The desk top may be displayed for a short period.
7. Follow the on-screen prompts to continue the installation.	

Step	Notes
WARNING	When you see the message Programming FPGAs...Do NOT turn off power to the instrument, be sure to do as it says and DO NOT turn off the instrument power at this time for ANY reason. If this process is interrupted the instrument most likely will need to be sent back to an Keysight Service Center for servicing before it will be usable again.

Updating Digital IF (0014.01) FPGA from version 03.05.05.02 to 03.05.05.03

Do not turn off power or interrupt this process!
不要关闭电源或中断此过程!
電源を切ったり、更新プロセスを中断したりしないで下さい。
전원을 끄거나 진행되는 작업을 중단 시키지 마세요!
Ne pas interrompre ni couper l'alimentation électrique!
Nicht ausschalten oder abbrechen!
Не выключать и не прерывать процесс!

FPGA code updates may require a significant period of time. Interrupting the FPGA update process may result in corrupt FPGA code which would require returning this instrument to Agilent for service.

NOTE	The installation process can take up to 45 minutes. Do not turn the instrument power off or serious damage may occur. If any pop up windows appear, click OK or Ignore to proceed.

8. When the installation has finished, select Yes, I want to restart my computer now, Finish.

9. After the instrument restarts, the newly installed version of the X-Series instrument software will run.

It is possible a newer version of the instrument software is available on the web at http://www.keysight.com/find/xseries_software.

NOTE   Additional recovery steps may be required to fully recover the system to a more current working state. This could involve restoring your own backups of the instrument configuration, including re-installing applications, data, and performing system customizations.

4 Using Window Tools

NOTE

The capabilities described in this section are Microsoft Windows 7 features. The discussion provided here gives some guidelines for using the capabilities with the instrument. You need to refer to the Windows 7 help documentation for more information. Your version of Windows may not match these instructions exactly.

You need an external keyboard and mouse to fully use these features.

KEYSIGHT
TECHNOLOGIES

Navigating Windows Without a Mouse

Key Presses	Actions
Esc	Exits/closes a Windows dialog box (does not exit an Application window)
Enter	Does the current "default action". If a menu item or a button is currently highlighted, then the Enter key activates that menu item or button.
Alt	Moves focus/control to the pull down menus bar in the active Window
Right Arrow	In pull-down menu: opens the next menu to the right, or opens a submenu
In a dialog box: selects an option button	
Left Arrow	In pull-down menu: opens the next menu to the left, or opens a submenu
In dialog box: selects an option button	
Up Arrow	In pull-down menu: Moves to next selection up in the menu
In dialog box: selects an option button	
Down Arrow	In pull-down menu: Moves to next selection down in the menu
In dialog box: selects an option button	
Tab	In dialog box: moves to the next/previous field
Del	Deletes the currently selected item
Alt + Tab	Switches between the next/previous Application
Alt + Enter	Shows the Properties of the currently selected item
Alt + Esc	Cycles through items in the order that they had been opened
Backspace	In My Computer or Windows Explorer: move up one level
In Internet Explorer: works like the BACK arrow key	
Ctrl + Left arrow	Moves to the left one word at a time
Ctrl + Right arrow	Moves to the right one word at a time
Ctrl + Tab	In dialog box: moves to the next/previous Tab location
Ctrl + Esc	Opens the Windows Start Menu
Ctrl + Alt + Delete	Opens a window that enables you to select the Windows Task Manager

Remote Desktop: Using the X-Series Signal Analyzers Remotely

Windows Remote Desktop is recommended for remote control of the instrument. It offers fully-interactive control that is almost identical to direct face-to-face control of the instrument. You can also remotely control the instrument using the Embedded Web Server interface. The Embedded Web Server functionality provides a communications method that does not require login to the instrument. However, due to its slower response time, it is only recommended for setup and data exchanges that do not involve instrument control.

> **NOTE** The Remote Desktop functionality is a Microsoft Windows 7 capability. The following discussion provides some guidelines for using this capability with the instrument. You need to refer to the Windows 7 help documentation for more information. As Windows evolves, these instructions may no longer be exact.

You need an external keyboard and mouse to fully use this functionality.

Overview of Remote Desktop operation

Using the Remote Desktop functionality of the instrument allows you to control and interact with the instrument from a remote computer as though you were sitting in front of the instrument.

When you have configured the instrument for remote connectivity, and configured a separate computer to act as a Remote Desktop Host, you can send commands to the instrument from the remote computer, and you can see the instrument display on the screen of the remote computer.

This section provides full details of how to set up the instrument for remote connectivity, and also how to set up a computer running any version of Microsoft Windows as a Remote Desktop Host.

Setting up Remote Desktop operation
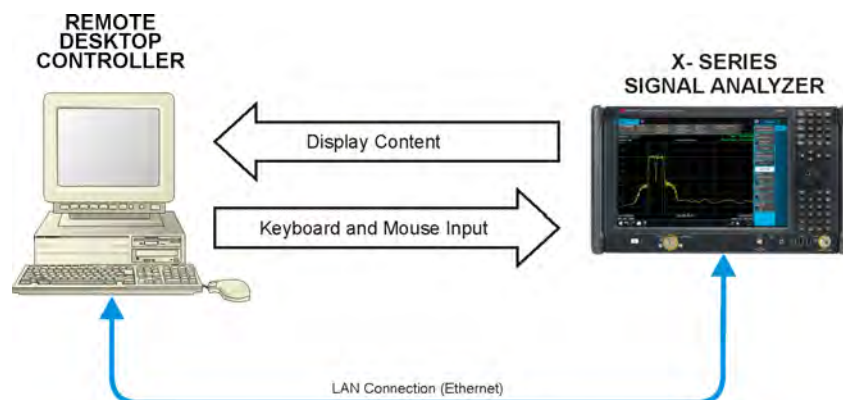
> **NOTE** To perform this operation successfully, you must have Administrator level access to the instrument.

Setting up a remote desktop connection

Step	Action
1. On the instrument, open the Windows Control Panel	– From the instrument application, press System, Control Panel,
2. Select System functions	– From the Adjust your computers settings menu, click System.
3. Access Remote setting	– In the Control Panel Home window, select Remote settings
4. Select the Remote option	– On the Remote tab, in the Remote Desktop section, click the appropriate checkbox.
5. To add users	– Click Select Users, Add.
6. Follow the on screen instructions.	

Setting up the remote computer

The procedure depends on whether the Remote Computer to be set up is running Windows 7, or another version of Microsoft Windows.

Remote computer running Windows 7

Windows 7 includes the Remote Desktop Connectivity Client software, so no additional setup is required.

Remote computer running another version of Windows

You can use any version of Windows to install and run the Client software for Remote Desktop Connectivity. However, you need to have available a Windows installation CD-ROM, because that contains the Client software.

NOTE   The following instructions relate to software provided by Microsoft Corporation. Keysight offers no warranty regarding the operation of such software. The procedure described here may be changed by Microsoft at some future time.

Installing the Client software

Step	Notes
1. When the Welcome Screen appears, click Perform additional tasks	
2. From the What do you want to do? screen, click Set up Remote Desktop Connection.	The Remote Desktop Connection InstallShield Wizard appears.
3. Click Next.	Follow the on screen instructions provided by the Wizard.
4. To access the installed software, click Start > All Programs > Accessories > Communications > Remote Desktop Connection.	

How to locate the computer name of the instrument

To connect a remote computer to the instrument, you need to know its Computer Name. The Computer Name can be displayed as follows:

Locating the name from the Keysight application

Step	Notes
On the instrument front panel, press System, Show System.	A page listing various parameters appears. The instrument's computer name is shown in the list next to the title Computer Name.

Locating the name from the Windows desktop (with a mouse)

Step	Notes
1. Click Start, Control Panel.	
2. Select System and Security and Double-click System	The Computer name is listed in the Computer name, domain, and workgroup settings section.

Running a Remote Desktop session

Initializing a Remote Desktop session

NOTE   To initialize a Remote Desktop Session, you need to know the Computer Name of the instrument.

After setting up the remote computer for Remote Desktop Connectivity, as described in , you are ready to start a Remote Desktop session.

Starting a session

Step	Notes
1. Click Start > All Programs > Accessories > Communications > Remote Desktop Connection.	A Remote Desktop Connection dialog appears:
2. Enter the computer name of the instrument.	
3. Click Connect.	A login dialog box appears.
4. Enter the login account name and password.	The default account name is Instrument and the default password is measure4u, but these parameters may be changed by instrument users.

| NOTE | Only the current User or an Administrator can remotely log into the instrument. To see who the current user of the instrument is, press Ctrl+Esc on the instrument until you can view the current user name on the Start menu. If no one is currently logged into the instrument, any valid instrument user can remotely log in. |

The instrument display appears on the screen of the remote computer. A mouse connected to the remote computer is used to navigate the user interface and change instrument settings.

Windows Remote Desktop Options

Setting Remote Desktop options

Step	Notes
1. On the Remote Desktop Connection menu, click Options.	
	The Options dialog has several tabs. Generally, the default settings are correct.
2. Under the General tab, ensure that the Computer name, User name and Domain name are set correctly.	You may choose to enter the password and save it for future sessions, by checking the Save my password box.

Step	Notes
3. Click the Display tab. – Under Remote desktop size, you may select the size of the window in which the instrument display appears. Do not select any size smaller than the instrument's front panel display. Selecting a remote desktop size smaller than the instrument's front panel display results in some of the items on the instrument display not being fully visible. In such circumstances, scroll bars do not appear, so portions of the display are not accessible. – Under Colors, set this to 16 bits If you operate Remote Desktop with greater color depth (e.g., 32-bit) your windows may have a different appearance than they do on the instrument display because transparency becomes enabled.	
4. Click the Local Resources tab. – Selecting the Disk Drives checkbox enables you to transfer data between the remote desktop and the local PC. – To transfer data, click Start on the task bar of the remote computer, then click My Computer. Explorer opens on the remote computer and displays the drives of both the remote computer and the local computer. You can now copy and paste between the two disk drives.	
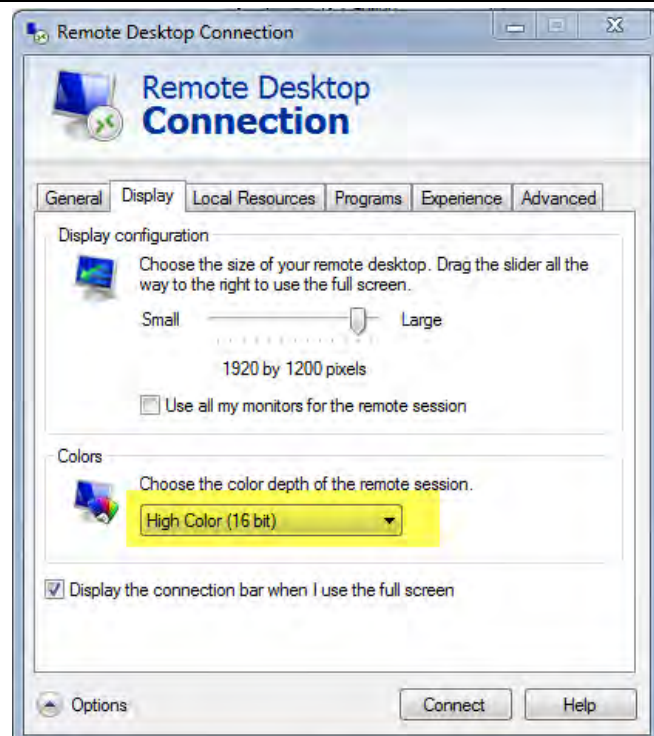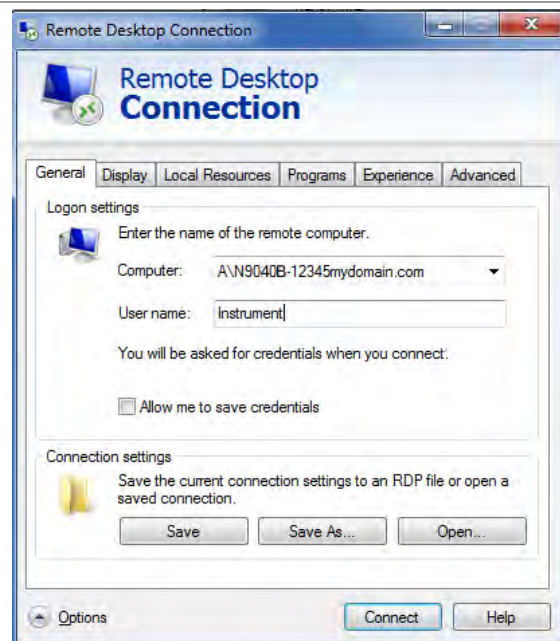
Step	Notes
5. Click the Experience tab.	To Optimize the performance of the Remote Desktop session, choose the appropriate connection format from the drop-down list.
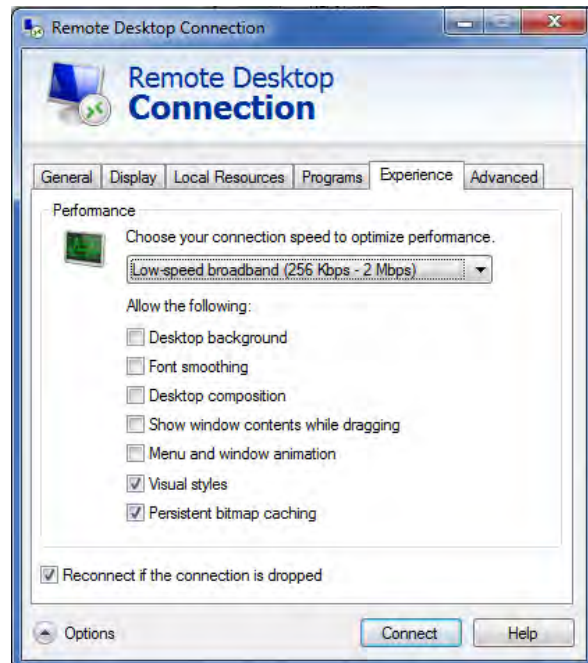
Ending a Remote Desktop session

There are two ways to disconnect the remote computer from the instrument, ending the session:

Step	Notes
1. Click the X, then click OK.	For full-screen, the X appears at the top center of the window. For non full-screen, the X appears in a red box at the right of the window's title bar.
Or	
2. When the remote desktop is full screen, move the cursor to the bottom left of the window:	
– Click Start, Disconnect.	You are asked to confirm that you want to disconnect.
– Click Disconnect.	

Embedded Web Server: Using the X-Series Signal Analyzers Remotely

The instrument can be controlled using either the Embedded Web Server or Windows Remote Desktop. The Embedded Web Server is a good solution when you do not want to log into the instrument's user account. This allows you to view the display or control the instrument, without logging the current user off. Multiple users can connect at the same time

The web server in the UXA updates many times per second and it has the advantage over Remote Desktop that it does not lock out the front panel.

NOTE Drag gestures do not work in web control, whereas they do in Remote Desktop.

Browsers that support UXA Embedded Web Server (these versions or later)

IE	Chrome	Safari	FireFox	iOS Safari	Chrome for
Android					
11	35	8	34	8	39

Accessing the instrument through the Internet

It is possible to access and control the instrument through the Internet and World Wide Web, or a local internet, using the built-in Embedded Server functionality. This section provides details of how to use this functionality.

The instrument may also be accessed and controlled using the Windows Remote Desktop functionality (see the section"Remote Desktop: Using the X-Series Signal Analyzers Remotely" on page 59, for details).

The instrument Embedded Server capabilities are fully compliant with the LXI (LAN eXtensions for Instrumentation) standard.

NOTE To gain access to the instrument from the LAN, you need to know its hostname (or IP Address). For details of how to locate this information using the instrument Display, see "How to locate the computer name of the instrument" on page 61.

Accessing the instrument

Step	Notes
1. Enter a URL corresponding to the instrument hostname or IP Address.	**NOTE** This functionality is only fully supported when using Internet Explorer. In this example, the host name is "a-n9040b-00104".

When the connection is made, the welcome page appears.

2. Click Control Instrument	A password entry dialog appears.
	By default, this password is set at the factory as "Keysight". However, you may subsequently change the password. (Press System, I/O Config, Reset Web Password on the instrument front panel to change the password.) When the correct password has been entered, the Control Instrument web page appears.

Step	Notes
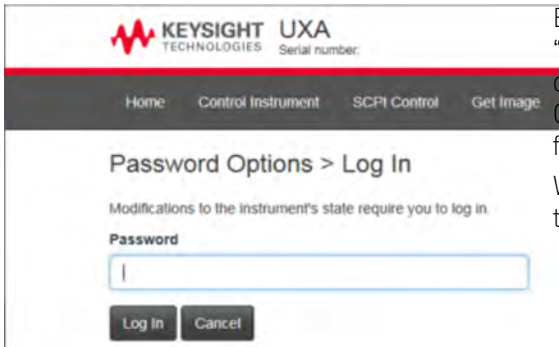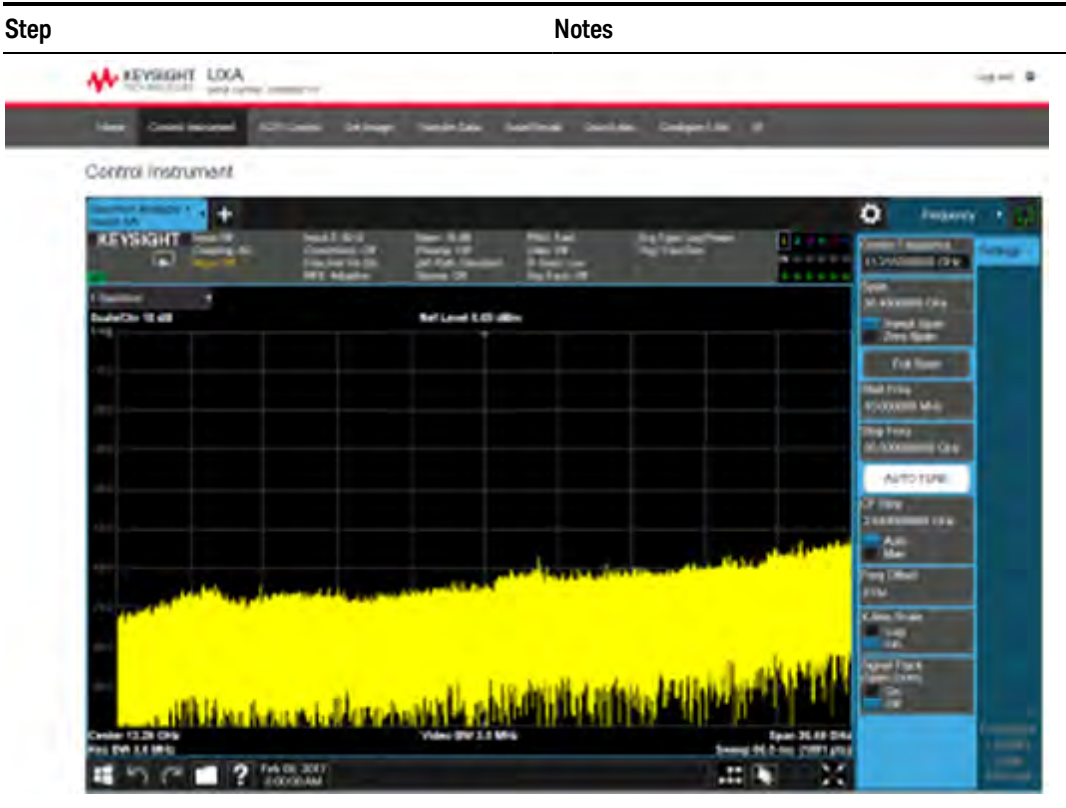
Other Web Control Functions

Selecting function in the navigation bar enables you to interact with the instrument through the web server.

SCPI Control

This control enables you to send, save, recall and browse SCPI commands in the instrument.

Get Image

This control enables you to customize the image returned from the instrument.

The image is captured as a Portable Network Graphics (PNG) file, to the default file name Screen.png. The image file can be saved to the client computer disk drive, or copied to the Windows clipboard.

A typical screen capture image appears as follows:

Transfer Data

This control enables you to get measurement and trace data that can be saved to your computer.
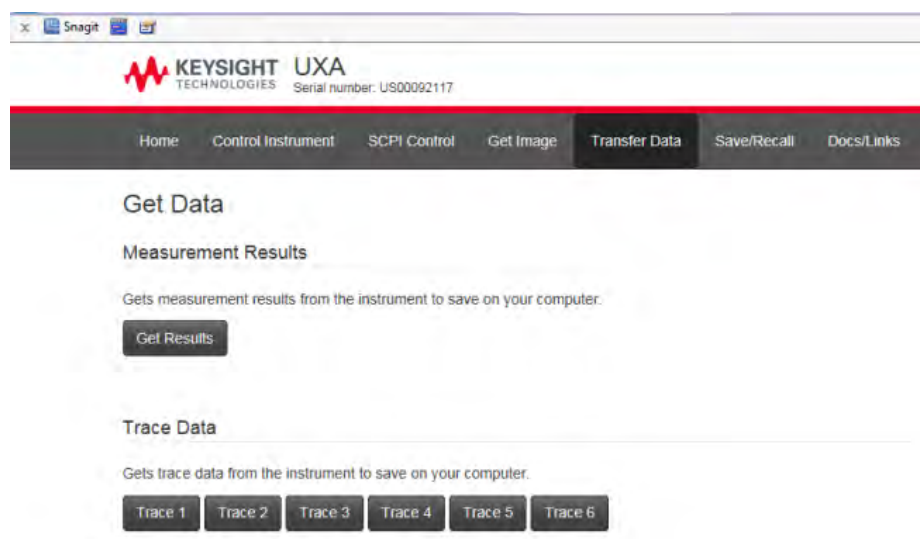
Save/Recall

This control enables you to save and recall an instrument stated.
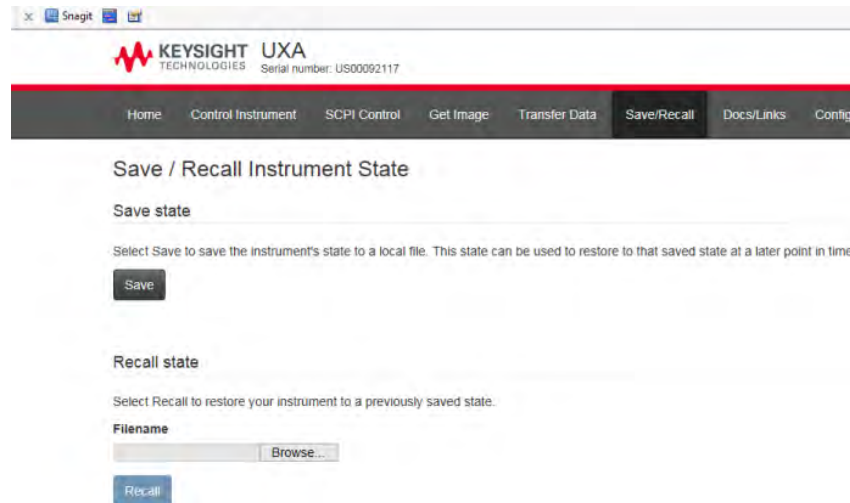
Docs/Links

This control enables you to access links to other instrument information and services.
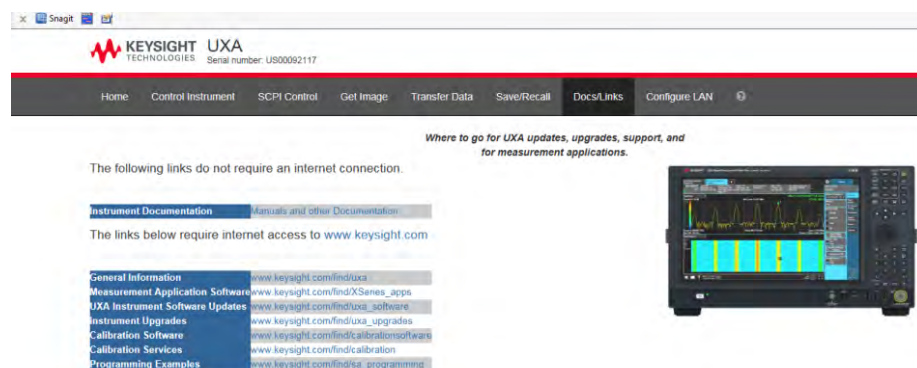
Configure LAN

This control provides the current LAN configuration of the instrument and provides access to Advanced options. Access to Advanced options requires an additional login.

Advanced options enables you to Reset network, Restore factory default network, and Control Instrument configurations. Windows Shortcuts and Miscellaneous Tasks

This section provides a list of windows shortcuts (key combinations) that are useful when you operate the instrument without an attached mouse and keyboard. .) Although these shortcuts are

available in any Windows 7 system, they are not commonly used when a mouse and keyboard are attached.

Windows Shortcuts and Miscellaneous Tasks

This section provides a list of windows shortcuts (key combinations) that are useful when you operate the instrument without an attached mouse and keyboard. (See also "Navigating Windows Without a Mouse" on page 58.) Although these shortcuts are available in any Windows 7 system, they are not commonly used when a mouse and keyboard are attached.

Windows shortcuts (key combinations)

You can use the following combinations of front panel keys to perform basic windows tasks when using the instrument without an attached mouse and keyboard.

Windows shortcut key combinations

To do the following:	Press:
Display the Windows Start Menu	Ctrl+Esc
Cycle through all open applications	Alt+Tab
Select the first menu of a menu bar	Alt
Move through menu headings	Left Arrow, Right Arrow
Open (drop down) a menu	Down Arrow
Move through items in an expanded menu	Up Arrow, Down Arrow
Close the current menu selection	Esc
Cancel the current menu bar selection	Alt
Open an application's control menu (usually the left-most menu on the menu bar, starting with File)	Alt+Down Arrow
In a dialog: move between tabs	Ctrl+Tab
In a dialog: move forward through dialog box items	Tab
In a dialog: move backward through dialog box items	Shift+Tab
In a dialog: open a list box	Alt+Down Arrow
In a dialog list box or check box: select or deselect one item at a time	Shift+Up Arrow, Shift+Down Arrow
In My Computer, expand a selected folder	Enter
In My Computer, open a folder one level up from the current folder	Bk Sp

Windows taskbar auto-hide feature

The Windows taskbar should always be in the auto-hide mode when using the instrument application. If the taskbar is not set to auto-hide, the lower part of the instrument display is obscured by the taskbar.

If at any time the Windows taskbar is inadvertently set to the non-auto-hide mode, you can restore the auto-hide behavior by doing the following:

Restoring taskbar auto-hide mode

Step	Notes
1. Click Start, Control Panel	If not using a mouse, press Ctrl+Esc.
2. Click Taskbar and Start Menu	f you are not using a mouse, use the shortcut key combinations specified in the Section "Windows shortcuts (key combinations)" on page 80 to make these selections.
3. Click the Taskbar tab	The Taskbar and Start Menu Properties dialog appears.
4. Select the Auto-hide the taskbar check box	If you are not using a mouse, press Tab repeatedly until the auto-hide option is selected, then press Select to toggle the check box state.
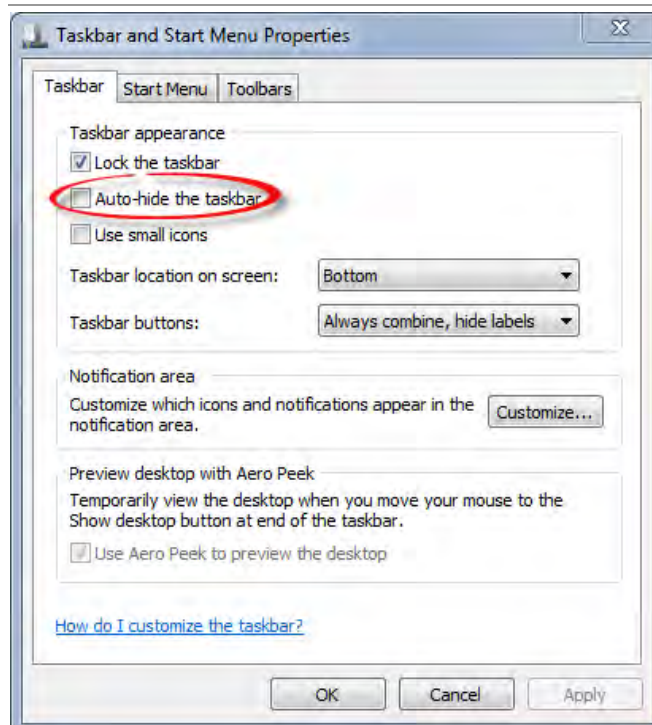
5. Click OK.	This applies the change and closes the dialog box.

5 Troubleshooting

WARNING   No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.

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Check the Basics

- Is there power at the receptacle?

- Is the analyzer turned on? Check to see if the green LED beside the power switch is on. Also, listen for internal fan noise to determine if the analyzer cooling fans are running.

- If other equipment, cables, and connectors are being used with your signal analyzer, make sure they are connected properly and operating correctly.

- If the analyzer cannot completely load or run the operating system, or the instrument application is not successfully launched, the problem could be a corrupt disk drive. If the analyzer gets far enough along in the boot process to run the "Instrument Recovery System", perform the "Disk Drive Recovery Process" as described on page 60.

- Is the Measurement Application running? If not, there is a software launch shortcut/icon on the desktop.

- Does the instrument application have the focus? If not, move focus to the application with Alt-Tab.

- Review the measurement procedures being performed when the problem first appeared. Are all of the settings correct?

- If the analyzer is not functioning as expected, return the analyzer to a known state by pressing Mode Preset.

NOTE   Some analyzer settings are not affected by a Preset. If you wish to reset the analyzer settings, press System, Power On, Restore Power On Defaults.

- Is the measurement being performed, and the results that are expected, within the specifications and capabilities of the analyzer?
  Refer to the specifications guide for your analyzer.
  http://www.keysight.com/find/N9041B

- If the analyzer is not communicating via the LAN connection, check for the presence of blinking yellow LEDs on the rear panel LAN connector. If the ACT LED is not blinking, check the LAN cable and LAN integrity.

- To meet specifications, the analyzer must be aligned. Either the Auto Align (On) feature must be selected (press System, Alignments, Auto Align, and select Normal), or the analyzer must be manually aligned.

- Perform an Alignment. Press System, Alignments, Align Now, Align All Now.
-

– If the previously performed alignments did not resolve the problem, press System, Alignments, Restore Align Defaults. Then press System, Alignments, Align Now, Align Now All.

– If the analyzer exhibits large amplitude errors (> 10 dB) especially at frequencies above 10 GHz, the RF preselector might not be properly centered. Press AMPTD, Signal Path, Presel Center. If the signal amplitude error is corrected, the preselector characterization should be performed. Press System, Alignments, Advanced, Characterize Preselector. The characterization will take several minutes and the analyzer must not be interrupted during this time. If the analyzer is interrupted during the characterization process, the characterization data will be destroyed and it will be necessary to perform the entire process again.

– Is the analyzer displaying an error message? If so, refer to the Instrument Messages Guide.

– Check if the external frequency reference is selected but not available. Verify that it is selected by pressing Input/Output, Freq Ref Input. If External is selected, changing the setting to Sense allows the analyzer to sense the presence of an external reference and use it only if it is available. The frequency of the reference should be set correctly.

– If you are using a Windows program other than the instrument application, you may notice it running slow. Place the instrument application in single sweep/measurement.

TIP   You can get automatic electronic notification of new firmware releases and other product updates/information by subscribing to the Keysight Technologies Test & Measurement E-Mail Notification Service for your signal analyzer at http://keysight.com/find/MyKeysight

Problems with Microsoft Windows 7

The Microsoft Windows 7 operating system settings have been optimized for the best performance. Modification of these settings may degrade instrument performance and measurement speed. Those that can be safely modified are described in "Settings that can be changed" on page 44.

The X-Series if Signal Analyzers operate in an open Windows environment, so you can install software on the instrument. However, installation of non-approved software may affect instrument performance. Keysight does not warrant the performance with non-approved software installed.

Returning an Analyzer for Service

Calling Keysight Technologies

Keysight Technologies has offices around the world to provide you with complete support for your analyzer. To obtain servicing information or to order replacement parts, contact the nearest Keysight Technologies office listed below. In any correspondence or telephone conversations, refer to your analyzer by its product number, full serial number, and software revision.

Press System, Show System, and the product number, serial number, and software revision information will be displayed on your analyzer screen. A serial number label is also attached to the rear panel of the analyzer.

Locations for Keysight Technologies

Online assistance: http://www.keysight.com/find/assist		
Americas		
Canada	Latin America	United States
1 877 894 4414	(305) 269 7500	1 800 829 4444
Asia Pacific		
Australia	China	Hong Kong
1 800 629 485	800 810 0189	800 938 693
India	Japan	Korea
1 800 112 929	0 120 (421) 345	080 769 0800
Malaysia	Singapore	Taiwan
1 800 888 848	1 800 375 8100	0800 047 866
Thailand		
1 800226 008		
Europe & Middle East		
Austria	Belgium	Denmark
43 (0) 1 360 277 1571	32 (0) 2 404 93 40	45 70 13 15 15
Finland	France	Germany
358 (0) 10 855 2100	0825 010 700*	49 (0) 7031 464 6333
	*0.125 Euros/minute	
Ireland	Israel	Italy
1890 924 204	972-3-9288-504/544	39 02 92 60 8484
Netherlands	Spain	Sweden
31 (0) 20 547 2111	34 (91) 631 3300	0200-88 22 55
Switzerland	United Kingdom	
0800 80 53 53	44 (0) 118 9276201	
Other European Countries: http://www.keysight.com/find/contactus		

Read the Warranty

The warranty for your analyzer is in the front of your Specifications Guide. Please read it and become familiar with its terms.

If your analyzer is covered by a separate maintenance agreement, please be familiar with its terms.

Service Options

Keysight Technologies offers several optional maintenance plans to service your analyzer after the warranty has expired. Call your Keysight Technologies office for full details.

If you want to service the analyzer yourself after the warranty expires, you can download the service documentation that provides all necessary test and maintenance information from the Keysight web page.

Packaging the Instrument

Use original packaging or comparable. It is best to pack the unit in the original factory packaging materials if they are available.

WARNING Analyzer damage can result from using packaging materials other than those specified. Never use styrene pellets in any shape as packaging materials. They do not adequately cushion the equipment or prevent it from shifting in the carton. They cause equipment damage by generating static electricity and by lodging in the analyzer louvers, blocking airflow.

You can repackage the analyzer with commercially available materials, as follows:

Step	Notes
1. Wrap the analyzer in anti-static plastic to reduce the possibility of damage caused by electrostatic discharge	
2. Use a strong shipping container.	The carton must be both large enough and strong enough to accommodate the analyzer. A double-walled, corrugated cardboard carton with 159 kg (350 lb) bursting strength is adequate. Allow at least 3 to 4 inches on all sides of the analyzer for packing material.
3. Surround the equipment with three to four inches of packing material and prevent the equipment from moving in the carton.	If packing foam is not available, the best alternative is plastic bubble-pak. This material looks like a plastic sheet filled with 1-1/4 inch air bubbles. Use the pink-colored bubble which reduces static electricity. Wrapping the equipment several times in this material should both protect the equipment and prevent it from moving in the carton.
4. Seal the shipping container securely with strong nylon adhesive tape.	
5. Mark the shipping container "FRAGILE, HANDLE WITH CARE" to assure careful handling.	
6. Retain copies of all shipping papers.	

6 Keysight Connector Kit

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Connector Kit Overview

The N9041B, Signal Analyzer has two input connectors, the right side RF Input 1 connector is a 2.4 mm male.

The left side RF Input 2 connector is a special 1.0 mm male Keysight bulk head connector that has 14 mm wrench flats. This test port connector has external threads that accept the Keysight Test port adaptors, and has internal threads that will accept Keysight standard 1.0 mm female adaptor, such as the 11920B.

The Connector Kit contains:

Adaptor - 2.4 Female to K Female	Used on RF Input 1 as a connector saver to connect 3.5 mm or sma devices or cables.
Adaptor 2.4 mm Female- 2.4 mm Female	Used on RF Input 1 as a connector saver
1 mm female test port to 1 mm female adaptor	Used on RF Input 2 as a connector saver
1 mm female test port to 1.85 mm female adaptor	Used on RF Input 2 as a connector saver and to connect 1.85 mm devices or cables
Torque Wrench	Double ended wrench with 10 inch-pound (setting for test port adaptors) and 4 inch-pound (setting for Keysight standard 1 mm adaptors)
Connector Vise for RF Input 2	If the test port adaptors cannot be used, this vise will help secure a Keysight standard 1 mm female adaptor to the instrument RF Input 2 connector.

Use of the Test Port Adaptors on Instrument RF Input 2

Two, 1mm test port adaptors are supplied in the kit. The 1 mm female test port to 1 mm female adaptor is used as a connector saver to extend the lifespan of the instrument RF Input 2 connector. The other test port adaptor is a 1mm female test port to 1.85 mm female adaptor. This adaptor is also a connector saver.

CAUTION   **USE CAUTION WHEN INSTALLING ADAPTORS! Rotation of the adaptor after the connectors are engaged will damage the input connector on the instrument.**

1. Align the test port adaptor with the 1 mm RF Input 2 connector on the instrument and engage the nut of the input connector with the adaptor. Fully engage the threads, but do not attempt to fully torque the connection.

2. Locate the torque wrench in the kit. Locate a 14 mm open-end wrench.

3. Place the jaws of the open end wrench onto the test port adaptor wrench flats, but do not turn this wrench.

4. Place the jaws of the 10-inch-pounds end of the torque wrench onto the instrument RF Input 2 connector. While holding the test port adaptor still with the open end wrench, torque the input connector to 10- inch-pounds.

Input Connector Vise Assembly

Keysight Technologies recommends the use of the supplied Keysight Technologies test port adaptors when using RF Input 2, the 1 mm input connector. The test port adaptors attach to the external threads on the instrument bulkhead input connector.

However, if Keysight Technologies standard adaptors will be used instead of the test port adaptors, the use of the supplied Connector Vise assembly is recommended to prevent damage to the 1 mm input connector due to over torque.

Standard adaptors other that those manufactured by Keysight Technologies may not work with the Vise Clamp.

CAUTION   USE CAUTION WHEN INSTALLING ADAPTORS! Rotation of the adaptor after the connectors are engaged will damage the input connector on the instrument.

To use Keysight Technologies standard adaptors with the Vise Clamp:

1. Install the Vise Clamp with the two supplied pan-head screws. Tighten the screws to 9 inch-pounds.

2. Loosen the Vise Clamp screw so that the vise jaws clear the body of the standard adaptor that is to be used.

3. Align the flats of the 1 mm female end of the adaptor with the vise jaws and tighten the Vise Clamp screw until the jaws grip the adaptor. Loosen the screw slightly to allow the adaptor to slide in the jaws.

4. Align the adaptor with the 1 mm input connector on the instrument and engage the nut of the input connector with the adaptor. Fully engage the threads, but do not attempt to fully torque the connection.

5. Re-align the jaws of the vise so they make good contact with the flats on the adaptor. Do this by pulling back on the vise jaws while tightening the vise clamp screw. DO NOT OVER TIGHTEN.

6. Tighten the input connector nut to 4 inch-pounds using the 4-inch-pounds end of the 14 mm torque wrench.

7. Re-tighten the vise clamp screw to snugly lock the jaws against the flats of the adaptor. DO NOT OVER TIGHTEN.

8. If the standard adaptor will remain on the input connector for a long period of time, periodically check the Vise Clamp screw to ensure that it remains snugly tightened.

The Vise Clamp will now protect the input connector from damage when connections are made to the adaptor that exceed 4 inch-pounds torque. The Vise Clamp is only a rotation prevention device. It will not protect the input connector against damage from bending due to heavy side to side or up/down loading on the adaptor.
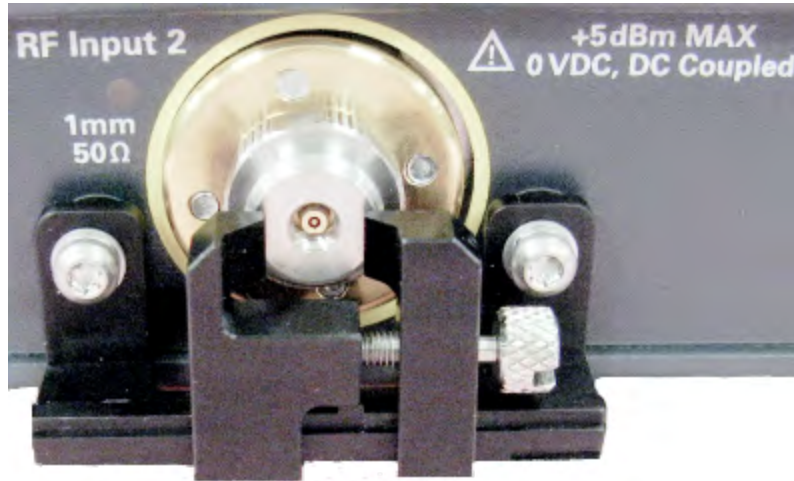
RF Input 1, 2.4 mm adaptor installation

Align the adaptor with the 2.4 mm input connector on the instrument and engage the nut of the input connector with the adaptor.

Torque the bulkhead 2.4 mm input connector (with an 8 mm or 5/16" torque wrench) to 8 inch-pounds while holding the adaptor with a 7 mm open-end wrench.

Refer to "Connector Care" on page 89.

7 Connector Care

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Visual Inspection

Visual inspection and , if necessary cleaning should be done every time a connection is made. Metal particles from connector threads may fall into the connector when it is disconnected. One connection made with a dirty or damaged connector can damage both connectors beyond repair.

Magnification is helpful when inspecting connectors, but it is not required and may actually be misleading. Defects and damage that cannot be seen without magnification generally have no effect on electrical or mechanical performance. Magnification is of great use in analyzing the nature and cause of damage and in cleaning connectors, but it is not required for inspection.

Obvious defects or damage

Examine the connectors first for obvious defects or damage:

- Plating
    - Bare metal showing

    - Burrs or blisters

- Deformed threads

- Center conductors
    - Bent

    - Broken

    - Misaligned

    - Concentricity

- Connector nuts should move smoothly and be free of:
    - Burrs

    - Loose metal particles

    - Rough spots

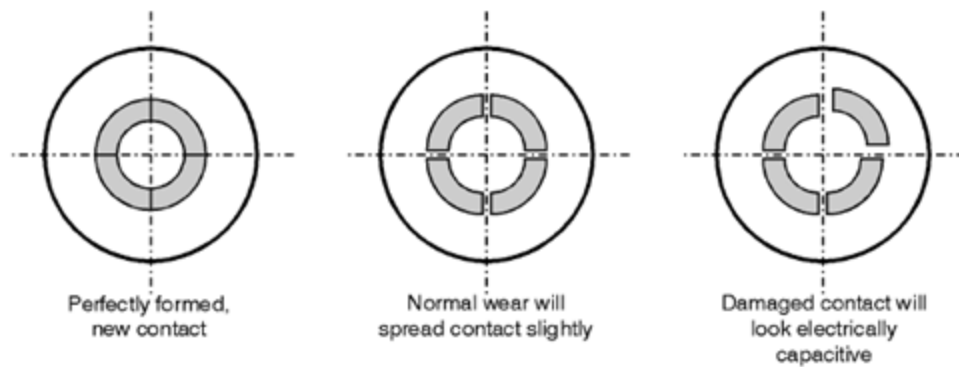Any connector that has obvious defects should be discarded.

Connector Contacts

Inspect the connector contacts for integrity. It is necessary to use good lighting (such as a halogen task light) to see the contacts.

Notice the location of the cross hairs in relationship to the center of the figures.

Contact integrity

Refer to the following for visual guidelines when evaluating the contact integrity of a connector.

Perfectly formed, new contact   Normal wear will spread contact slightly   Damaged contact will look electrically capacitive

Concentricity

The following examples show the concentricity of both the male and female 1.0 mm connectors:

Female connector:

Perfectly concentric   .025 mm off-center specification maximum   >.025 mm off-center DO NOT USE

Male connector:

Perfectly concentric   .025 mm off-center   >.025 mm off-center
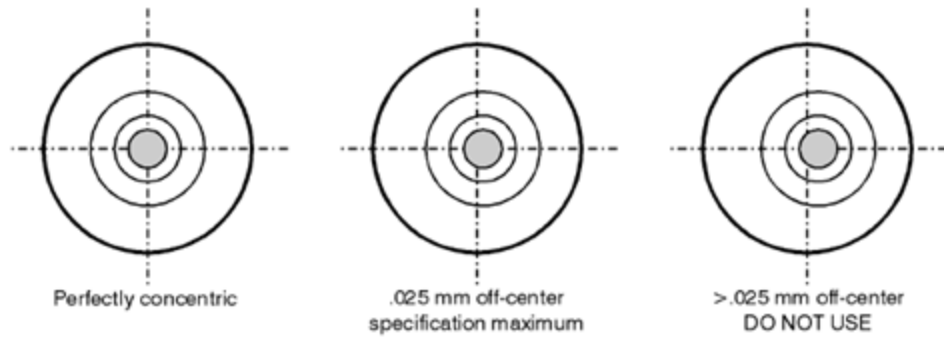   specification maximum   DO NOT USE
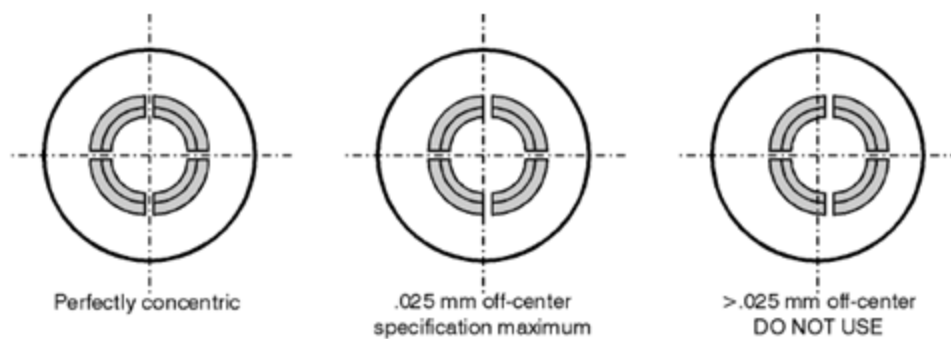
Making Connections

Good connections require a skilled operator. Instrument sensitivity and coaxial connector mechanical tolerances are such that slight errors in operator technique can have a significant effect on measurements and measurement uncertainties.

NOTE   **The most common cause of measurement error is poor connections.**

Connection Procedure

1. Ground yourself and all devices (wear a grounded wrist strap and work on an antistatic mat).

2. Visually inspect the connectors (refer to Visual Inspection).

3. If necessary, clean the connectors (refer to Cleaning Connectors).

4. Carefully align the connectors. The male connector center pin must slip concentrically into the contact fingers of the female connector.

5. Push the connectors straight together. Do *not* twist or screw them together. As the center conductors mate, there is usually a slight resistance.

   CAUTION   Do *not* twist one connector into the other (like inserting a light bulb). This happens when you turn the device body, rather than the connector nut. Major *damage* to the center conductor and the outer conductor can occur if the device body is twisted.

7. Initial tightening can be done by hand or with an open-end wrench. Tighten until "snug" or where the connectors are first making contact. The preliminary connection is tight enough when the mating plane surfaces make uniform, light contact. *Do not over tighten* this connection.
   At this point, all you want is for the outer conductors to make gentle contact on both mating surfaces. Use very light finger pressure (no more than 2 inch-pounds of torque).

8. Relieve any side pressure on the connection from long or heavy devices or cables. This assures consistent torque.

9. Torque the cable or device to the final value using a torque wrench.

Cleaning Connectors

Basic Cleaning Procedure

1. Inspect the connectors for dust, dirt, metal fragment, oils or film, and debris.

2. Blow off any dust with a filtered, clean supply of compressed air.

3. Add a few drops of high-purity isopropyl alcohol to a small cleaning swab (do not apply alcohol directly to the parts).

    NOTE . **When using isopropyl alcohol to clean connectors *do not* allow the liquid to flow down inside the connector. This may cause measurement errors due to residue inside the connector. If possible keep the connector facing down.**

5. Gently wipe connecting surfaces with the end of the cleaning swab.

6. Blow dry with compressed air.

7. Inspect and repeat cleaning procedure if necessary.

Replacement Parts

Description	Ordering number
Test Port Adaptor, 1mm (f) to 1mm (f)	Y1900B
Test port Adaptor, 1mm (f) to 1.85mm (f)	Y1901B
2.4 mm (f) to 2.4 mm (f),	11900B
2.4 mm (f) to 2.92 mm (f),	11904B
Wrench-Torque Special Double-end 14mm-open end 4 and 10-lb-in	8710-2819
Vise Kit	N9041-60032

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