Keysight N9320B
Spectrum Analyzer

Notice: This document contains references to Agilent. Please note that Agilent's Test and Measurement business has become Keysight Technologies. For more information, go to www.keysight.com.

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Quick Start Guide

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Contents

1 Getting Started 1

2 Overview 13

Contents

1 Getting Started

This *Quick Start Guide* helps you in preparing the spectrum analyzer for use. With this guide, you will become familiar with its basic operating and programming information. For more information, please refer to *User's Guide* from:
www.keysight.com/find/n9320b

This chapter gives you the information to start using the spectrum analyzer correctly.

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Check the Shipment and Order List

After receiving the shipment, first check the shipment and your order list.

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 that the contents of the shipping container are complete.

Each spectrum analyzer includes the following accessories as standard:

Item	Description
USB cable (A-B)	Connection for remote control
N-BNC adapter and BNC cable	Connection for alignment
Printed Quick Start Guide	Documentation
Three-pin power cord	Specific to shipping location
Help kit CD-ROM	Remote control Software Keysight IO libraries suite PDF files for quick start guide & user's guide

Shipping Problems?

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

• Contact the nearest Keysight Technologies office to arrange for repair or replacement. You will not need to wait for a claim settlement.

• 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.

For any questions about your shipment, Contact Keysight Technologies for consulting and service.

Options

Verify if that the shipment includes your ordered options by checking the option label on the shipping container:

Option	Description	Part number
PA3	3 GHz Preamplifier	N9320B-PA3
AMA	AM/FM demodulation	N9320B-AMA
DMA	ASK/FSK demodulation	N9320B-DMA
EMF	EMC Filter	N9320B-EMF
TG3	3 GHz tracking generator	N9320B-TG3
TR1	RF training kit	N9320B-TR1
1HB	Handle and bumpers	N9320B-1HB
1CM	Rackmount kit	N9320B-1CM
1TC	Hard transit case	N9320B-1TC
UK6	Commercial calibration certificate with testing data	N9320B-UK6

Unless specified otherwise, all options are available when you order a spectrum analyzer; some options are also available as kits that you can order and install/activate after you receive the analyzer. Order kits through your local Keysight Sales and Service Office.

At the time of analyzer purchase, options can be ordered using your product number and the number of the option you are ordering. For example, if you are ordering Option TG3, you would order N9320B-TG3.

If you are ordering an option after the purchase of your analyzer, you will need to add a K to the product number and then specify which option you are ordering. For example, N9320BK-TG3.

For the latest information on keysight N9320B spectrum analyzer options and upgrade kits, visit the following Internet URL:

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

Safety Notice

Read the following warnings and cautions carefully before powering on the spectrum analyzer to ensure personal and instrument safety.

WARNING	**Always use a well-grounded, three-pin AC power cord to connect to power source. Personal injury may occur if there is any interruption of the AC power cord. Intentional interruption is prohibited. If this product is to be energized via an external auto transformer for voltage reduction, make sure that its common terminal is connected to a neutral (earthed pole) of the power supply.**

WARNING	**Personal injury may result if the spectrum analyzer covers are removed. There are no operator-serviceable parts inside. To avoid electrical shock, refer servicing to qualified personnel.**

WARNING	**Electrical shock may result if the spectrum analyzer is connected to the power supply while cleaning. Do not attempt to clean internally.**

CAUTION	Prevent damage to the instrument and ensure protection of the input mixer by limiting average continuous power input to +33 dBm, DC voltage to 50 VDC with $\geq$10 dB input attenuation. Instrument damage may result if these precautions are not followed.

CAUTION	To install the spectrum analyzer in other racks, note that they may promote shock hazards, overheating, dusting contamination, and inferior system performance. Consult your Keysight customer engineer about installation, warranty, and support details.

Power Requirements

The spectrum analyzer has an auto-ranging line voltage input. The AC power supply must meet the following requirements:

Voltage:	100 to 240 VAC (90 to 264 VAC)
Frequency:	50 to 60 Hz
Power:	Maximum 100 W

AC Power Cord

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.

Various AC power cables are available that are unique to specific geographic areas. You can order additional AC power cables for use in different areas. The table **AC Power Cords** lists the available AC power cables, the plug configurations, and identifies the geographic area in which each cable is appropriate.

The detachable power cord is the product disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the product. The front panel switch is only a standby switch and does not disconnect the instrument from LINE power.

AC Power Cords

Plug Type	Cable Part Number	Plug [a] Description	For use in Country & Region
250V 10A	8121-1703	BS 1363/A	Option 900 United Kingdom, Hong Kong, Singapore, Malaysia
250V 10A	8120-0696	AS 3112:2000	Option 901 Australia, New Zealand
250V 16A	8120-1692	IEC 83 C4	Option 902 Continental Europe, Korea, Indonesia, Italy, Russia
125V 10A	8120-1521	CNS 10917-2 /NEMA 5-15P	Option 903 United States, Canada, Taiwan, Mexico
250V 10A	8120-2296	SEV 1011	Option 906 Switzerland
230V 15A	8120-4600	SABS 164-1	Option 917 South Africa, India
125V 15A	8120-4754	JIS C8303	Option 918 Japan
250V 16A	8120-5181	SI 32	Option 919 Israel
250V 10A	8120-8377	GB 1002	Option 922 China

a. Plug description describes the plug only. The part number is for the complete cable assembly.

Power On and Check

    1   Connect the AC power cord into the instrument. Insert the plug into a power socket provided with a protective ground. Set the tilt adjustors for your preference.

Figure 1   Plug in and angle adjustment
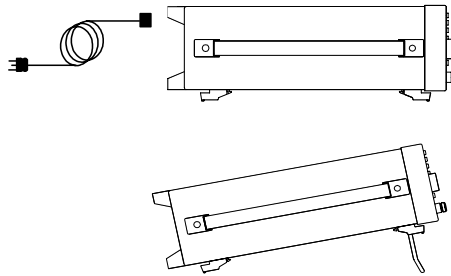
    2   Press the AC line switch ☐ on the rear panel. The standby LED on the front panel will light and the spectrum analyzer is in standby mode (AC power applied).

    3   Press the standby switch ⏻ on the front panel. The On LED will light, and the spectrum analyzer boots up.

    Self-initialization takes about 25 seconds; the spectrum analyzer then defaults to the menu mode. After power on, let the spectrum analyzer warm up for 45 minutes for stabilization.

NOTE The front panel switch is a standby switch only; it is not a power switch. To completely disconnect the spectrum analyzer from the AC line power, shut off the power switch on the rear panel.

Running Internal Alignments

To meet the instrument performance specifications, the analyzer must periodically be manually aligned.

1 Connect a BNC cable with the N-BNC adapter between the **CAL OUT** and **RF IN** front panel connectors.

2 After 15-minute warm up, press **Preset/System** **> Alignment > Align > All**

The self alignment takes about 5 minutes.

Check for Instrument Messages

The spectrum analyzer has two categories of instrument messages: error and warning messages. A error message is triggered by operation errors, for example, parameter setting conflicts or data input that is out of the range of a parameter. An warning message may be triggered by hardware defects which could result in damage to instrument.

Here are some tips to check the instrument messages.

1 Check the display to see if any messages display in the status bar. Press **Preset/System** **> More > Show Errors** to review each message. Please refer to User's Guide for detailed system message descriptions.

2 When you have reviewed and resolved all of the error messages, press **Preset/System** **> More > Show Errors > Clear error queue** to delete the messages.

3 Cycle the power to the analyzer and re-check to see if the Instrument messages are still there.

4 If the error messages cannot be resolved, contact the Keysight Customer Contact Center for assistance or service.

Environmental Requirements

Keysight Technologies has designed this product for use in Installation Category II, Pollution Degree 2, per IEC 61010-1. Keysight has designed the spectrum analyzer for use under the following conditions:

- Indoor use

- Altitude < 3,000 meters

- Operating temperature range: +5 to +45°C;

  Storage temperature range: −20 to +70°C

- Relative humidity range 15% to 95 % at 40°C

Ventilation

Ventilation holes are located on the rear panel and one side of the spectrum analyzer cover. Do not allow these holes to be obstructed, as they allow air flow through the spectrum analyzer.

When installing the spectrum analyzer in a cabinet, do not restrict the convection of the analyzer. The ambient temperature outside the cabinet must be less than the maximum operating temperature of the spectrum analyzer by 4 ^{o}C for every 100 watts dissipated within the cabinet.

Cleaning Tips

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

Rack Mount

It is recommended to use the Keysight rackmount kit (option 1CM) to install the spectrum analyzer into a rack.

Do not attempt to rack mount the spectrum analyzer by the front panel handles only. This rackmount kit will allow mounting of the spectrum analyzer with or without handles.

Refer to the following instructions when installing the rackmount kit on the spectrum analyzer.

1 Remove feet, key-locks and tilt stands.

2 Remove side trim strips and one middle screw per side.

TILT STAND

KEY-LOCK

FOOT

SIDE TRIM
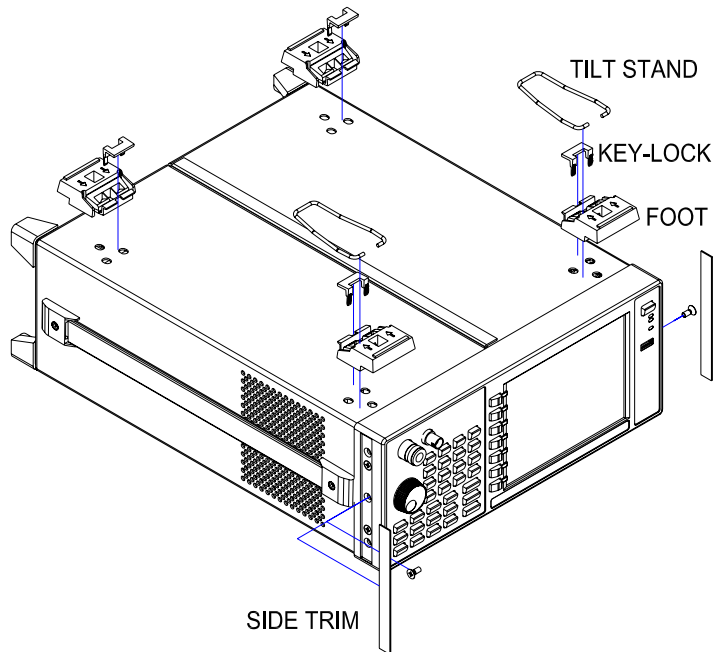
3 Attach rackmount flange and front handle assembly with 3 screws per side.
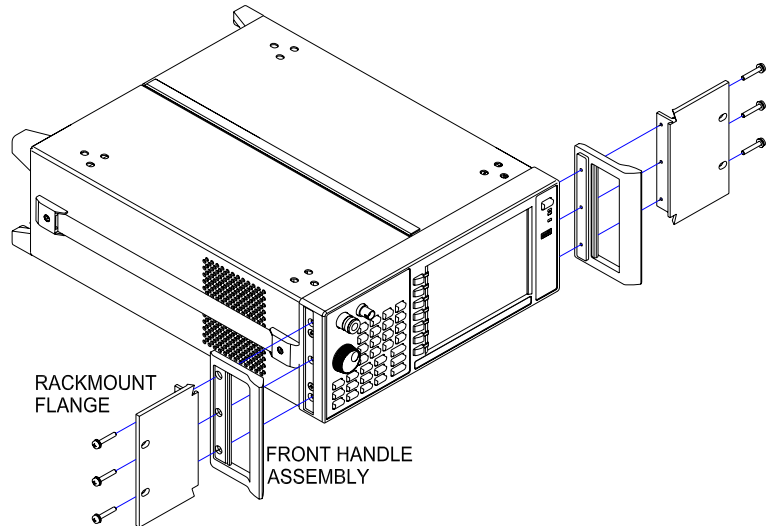
4 Attach the spectrum analyzer to the rack using the rackmount flanges with two dress screws per side.

CAUTION	Installing the spectrum analyzers into other racks may promote shock hazards, overheating, dust contamination, and inferior system performance. Consult your Keysight customer engineer about installation, warranty, and support details.

Transit

It is recommended to use the hard transit case (option 1TC) for instrument transportation.

Electrostatic Discharge Protection

Electrostatic discharge (ESD) damages or destroys electronic components (the possibility of unseen damage caused by ESD is present whenever transported, stored, or while the instrument is in use).

This product contains components that are easily damaged by electrostatic discharge. To help reduce the possibility of ESD damage that can occur while using test equipment, follow these guidelines:

1 Before connecting any coaxial cable to the spectrum analyzer connector for the first time each day, momentarily short the center and outer conductors of the cable together to eliminate any potential electrostatic charges that may exist.

2 Personnel should be grounded with an approved type, 1 MΩ resistor-isolated ESD wrist-strap before touching the center pin of any connector, and before removing any assembly from the spectrum analyzer.

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

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   Overview

This chapter gives you an overview of the front and rear panels of your analyzer. For details on analyzer keys and remote programming, refer to the N9320B User's Guide and N9320B Programmer's Guide.

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Keysight N9320B at a Glance

An Keysight N9320B RF Spectrum Analyzer is a swept portable spectrum analyzer with a frequency range of 9 kHz to 3.0 GHz. It can be a fundamental component of an automated system, and be widely used in electronic manufacturing functional/final/QA test systems.

Features

The Keysight N9320B spectrum analyzer primary features and functions are described below:

- **High sensitive measurement**

The spectrum analyzer includes an optional pre-amplifier for signals in the frequency range up to 3 GHz, enabling more sensitive measurements. This feature is a great help in analysis of weaker signals.

- **Pass/fail limits**

Upper and lower limits can be set on the screen, thereby enable the user to make fast, accurate, automated PASS/FAIL judgments on trace data.

- **Power Measurement Suite**

The built-in one-button power measurement suite offers channel power, ACP, OBW, SEM and TOI measurements.

- **Frequency counter with 0.1 Hz resolution**

A built-in frequency counter allows the user to measure the signal frequency with 0.1 Hz resolution.

- **USB/LAN interface**

Provides USB and LAN interfaces for auto test and remote control.

- **Four-trace detection display**

The spectrum analyzer displays up to four independent traces simultaneously.

- **USB power sensor support**

Built-in power meter function supports Keysight U2000 series power sensor for high accuracy power measurement as a power meter.

- **Modulation analysis function**

provides optional AM/FM modulation analysis function.

- **Tracking generator**

provides an RF source for scalar network analysis (Option-TG3).

For the latest product technical information, please refer to the link below:

http://www.keysight.com/find/n9320b

For the latest option information, please refer to the link below:

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

Front Panel at a Glance
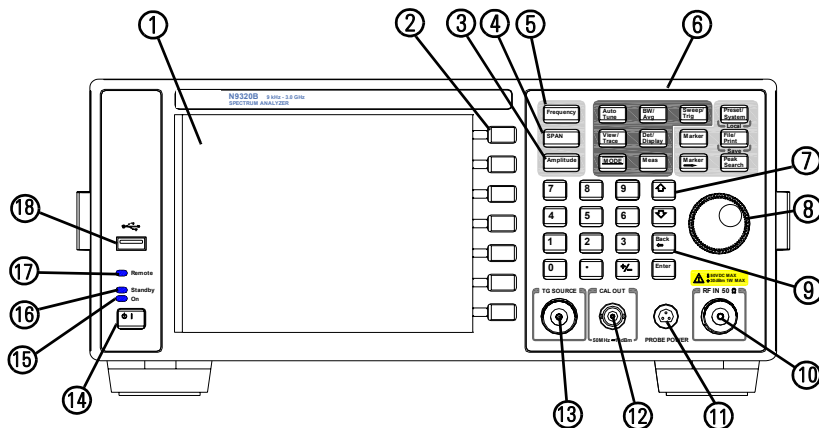
1 **Screen** 6.5 inch TFT color screen shows information of the current function, including the signal traces, status indicators, and instrument messages. Labels for softkeys are located on the right-hand side of the screen.

2 **Softkeys** are the unlabeled keys next to the screen. They activate functions displayed to the left of each key.

3 **Amplitude** activates the reference level function and accesses the amplitude softkeys, with which you set functions that affect data on the vertical axis.

4 **SPAN** sets the frequency range symmetrically about the center frequency. The frequency-span readout describes the total displayed frequency range.

5 **Frequency** activates the center-frequency function, and accesses the menu of frequency functions.

6 **Function Keys** relate directly to the following main functions:

- **Preset/System (Local)** accesses the softkeys to reset the analyzer to a known state, if the analyzer is in the remote mode, pressing this key returns the analyzer to the local mode and enables front-panel control.

- **Auto Tune** searches the signal automatically and locates the signal to the center of the graticule.
- **BW/Avg** activates the resolution bandwidth function and accesses the softkeys that control the bandwidth functions and averaging.
- **Sweep/Trig** accesses the softkeys that allow you to set the sweep time, select the sweep mode and trigger mode of the analyzer.
- **View/Trace** accesses the softkeys that allow you to store and manipulate trace information.
- **Det/Display** accesses the softkeys that allow you to configure detector functions and control what is displayed on the analyzer, including the display line**,** graticule and annotation, as well as the testing of trace data against entered limits.
- **MODE** selects the measurement mode of your analyzer.
- **Meas** accesses the softkeys that let you make transmitter power measurements such as adjacent channel power, occupied bandwidth, and harmonic distortion, etc.
- **Marker** accesses the marker control keys that select the type and number of markers and turns them on and off.
- **Marker**→ accesses the marker function softkeys that help you with the measurement.
- **Peak Search** places a marker on the highest peak.
- **File/Print** accesses the softkeys that allow you to configure the file and printing system of the analyzer.

7   **Arrow Keys** The up and down arrow keys shift the selected item when you press **[MODE]** hardkey; you can also change the mode by rotating the knob.

8   **Knob** The front panel knob increases or decreases a value, a numeric digit, or scrolls up and down to select an item in a list.

9   **Data Control Keys**   including the numeric keypad, ENTER key and backspace key, change the numeric value of an active function such as center frequency, start frequency, resolution bandwidth, and marker position.

10   **RF IN connector**   is the signal input for the analyzer. The maximum damage level is average continuous power +40 dBm, DC voltage 50 VDC or max pulse voltage 125 V. The impedance is 50 Ω (N-type female).

11   **PROBE POWER connector**   provides power for high-impedance AC probes or other accessories (+15 V, –12 V, 150 mA maximum).

12   **CAL OUT connector**   provides an amplitude reference signal output of 50 MHz at –10 dBm (BNC female).

13   **TG SOURCE connector**   N-type female, is the source output for the built-in tracking generator. The impedance is 50 Ω (for Option TG3)

CAUTION   If the tracking generator output power is higher than the maximum power that the device under test can tolerate, it may damage the device under test. Do not exceed the maximum power of DUT.

14   **Standby Switch**   switches on all functions of the analyzer. To switch the analyzer off, press the switch for at least 2 seconds. This deactivates all the functions but retains power to internal circuits so long as the analyzer is connected to line power.

15   **On LED**   (green) lights when the analyzer is switched on**.**

16   **Standby LED**   (orange) lights when the analyzer is connected to the line power.

17   **Remote LED**   lights when the analyzer is remotely controlled by a PC via the USB host interface on the rear panel.

18   **USB Device Connector**   provides a connection between external USB devices and the analyzer, such as a USB memory device.

Display Annotations
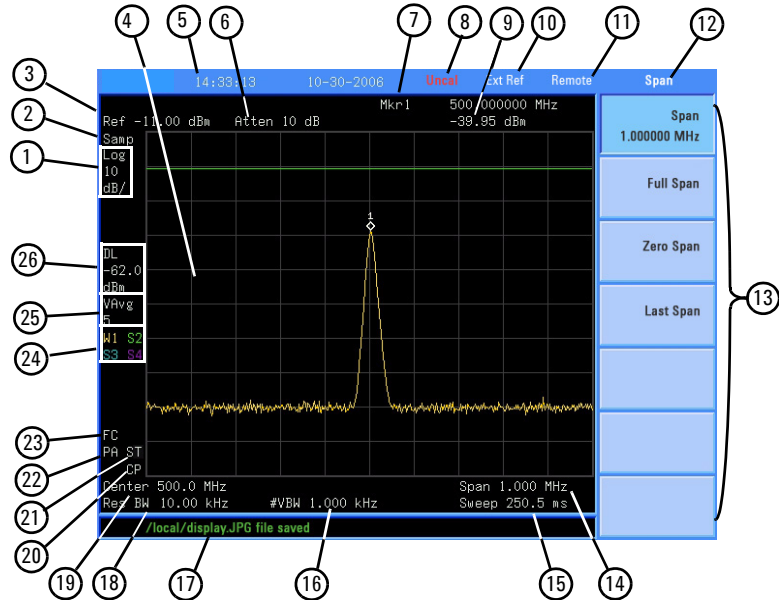
Item	Description	Notes (Associated function key)
1	Amplitude scale	[Amplitude] > Scale Type
2	Detector mode	[Det/Display] > Detector
3	Reference level	[Amplitude] > Ref Level
4	Active function block	The function in use
5	Time and date display	[Preset/System] > Time/Date
6	RF attenuation	[Amplitude] > Attenuation Auto
7	Marker frequency	[Marker] or [Marker] > Function > Frequency Counter
8	Uncal indicator	The readout of amplitude is uncalibrated.
9	Marker amplitude	[Marker]
10	External reference	An external frequency reference is in use.
11	Remote mode	The analyzer is in remote mode
12	Key menu title	Dependent on key selection.

13	Softkey menu	Refer to *User's Guide* for details.
14	Frequency span	[SPAN]
15	Sweep time	[Sweep/Trig] > Sweep Time
16	Video bandwidth	[Bw/Avg] > Video BW
17	Display status line	Display status and instrument messages.
18	Resolution bandwidth	[Bw/Avg] > Res BW
19	Trigger/Sweep **F** - free run trigger **L** - line trigger **V** - video trigger **E** - external trigger **C** - continuous sweep **S** - single sweep	[Sweep/Trig]
20	Continuous peak	[Peak Search] > Continuous pk
21	Signal track	[SPAN] > Span
22	Internal preamp	[Amplitude] > Int Preamp
23	Key menu title	Dependent on key selection
24	Trace mode **W** - clear write **M** - maximum hold **m** - minimum hold **V** - view **S** - store blank	[Marker]
25	Average **VAvg** - video average **PAvg** - power average	[Bw/Avg] > Average On Off
26	Display line	[Det/Display] > display Line On Off

Rear Panel Overview
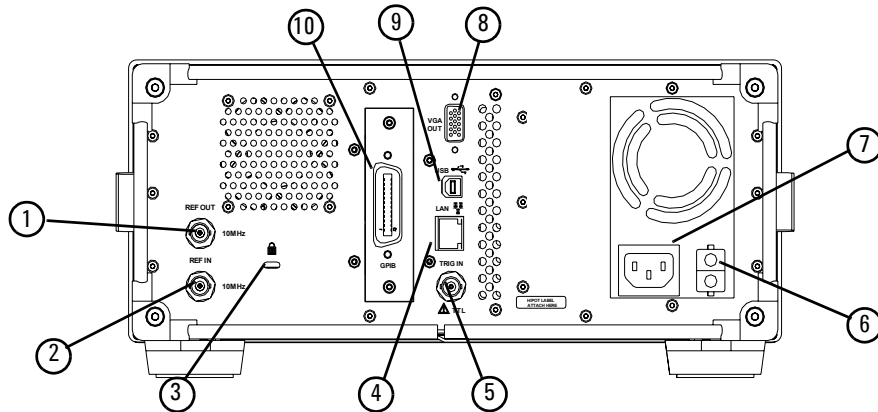
1   **REF OUT connector**   provides a frequency of 10 MHz, amplitude of −10 dBm reference output. (BNC female)

2   **REF IN connector**   accepts an external timebase with a frequency of 10 MHz, amplitude of −5 to +10 dBm. (BNC female)

3   **Kensington Lock**   lock the instrument and keep its safety.

4   **LAN port**   A TCP/IP Interface that is used for remote analyzer operation.

5   **EXT TRG IN (TTL) connector**   accepts an external voltage input, the positive edge of which triggers the analyzer sweep function. (BNC female)

6   **Power switch**   isolates the analyzer from the AC line power. After switch on, the analyzer enters into standby mode and the orange standby LED on the front panel lights.

7   **AC power receptacle**   accepts a three-pin line power plug.

8   **VGA connector**   provides the video output signal to an external monitor or projector. (D-sub 15-pin female)

9   **USB host connector**   provides a connection between the analyzer and PC for remote control.

10   **GPIB connector** (Option G01) is an optional interface. This connector supports remote operation.

Front and rear panel symbols

The instruction manual symbol: indicates that the user must refer to specific instructions in the manual.

The CE mark: a registered trademark of the European Community.

ISM1-A

Shows that this is an Industrial Scientific and Medical Group 1 Class A product. (CISPR 11, Clause 4)

The CSA mark: a registered trademark of the Canadian Standards Association International.

ICES/NMB-001

The ISM device complies with Canadian Interference-Causing Equipment Standard-001.
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

All Level 1, 2 or 3 electrical equipment offered for sale in Australia and New Zealand by Responsible Suppliers must be marked with the Regulatory Compliance Mark **(RCM Mark)**.

marks the "on/standby" position of the switch.

indicates that the instrument requires AC power input.

indicates this product complies with the **WEEE Directive**(2002/96/EC) marking requirements and you must not discard this equipment in domestic household waste. Do not dispose in domestic household waste. To return unwanted products, contact your local Keysight office, or refer to http://www.keysight.com/environment/product/

KC mark: as Korea Certification. This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

China RoHS: Administrative Meaure on the Control of Pollution caused by Electronic Information Products, is a Chinese government regulation to control certain materials, include lead. This Electronic Information Products (EIP) logo indicates the instrument do contain hazardous substances and marked with an Enviroment Friendly User Period (EFUP) period of 40 years.

Overview
Front and rear panel symbols

3   Basic Operation

This chapter gives you the information to start using the spectrum analyzer correctly.

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Making a Basic Measurement

In this guide, the keys labeled with [   ], for example, **[Preset/System]** refer to front-panel hardkeys. Pressing many of the hardkeys accesses softkey menus that are displayed along the right side of the screen. The softkey menu labels are aligned so that they are located next to the softkeys at the right side of the display screen. For example, **Preset** is a softkey menu selection when first pressing **[Preset/System].**

Using the Front Panel

This section provides you with the information on using the front panel of the spectrum analyzer.

Entering Data

When setting the measurement parameters, there are several ways to enter or modify the value of the active function:

Knob	Increments or decrements the current value.
Arrow Keys	Increments or decrements the current value by a step unit.
Numeric Keys	Enters a specific value. Then press the desired terminator (either a unit softkey, or **[Enter]** hardkey).
Unit Softkeys	Terminate (enter) a value with a unit softkey from the menu.
Enter Key	Terminates an entry when no unit of measure is required, or the instrument uses the default unit.
Back Key	To delete the current input digit prior to entering the value.

Using Softkeys

Softkeys are used to modify the analyzer function parameter settings. Some examples of softkey types are:

Toggle	Turn on or off an instrument state.
Submenu	Displays a secondary menu of softkeys, **{More}**.
Choice	Selecting from a list of standard values or filenames.

Adjust   Highlights the softkey and sets the active function.

Presetting the Spectrum Analyzer

Preset function provides a known instrument status for making measurements. There are two types of presets, factory and user:

Factory Preset   When this preset type is selected, it restores the analyzer to its factory-defined state. A set of known instrument parameter settings defined by the factory.

User Preset   Restores the analyzer to a user-defined state. A set of user defined instrument parameter settings saved for assisting the user in quickly returning to known a instrument measurement setup.

Press **Preset/System** **> Pwr on/Preset > Preset Type** to select the preset type.

When **Preset Type** is set to **Factory**, pressing **Preset/System** **> Preset** triggers a factory preset condition. The instrument will immediately return to the factory default instrument parameter setting.

When **Preset Type** is set to **User**, pressing **Preset/System** **> Preset** displays both **User Preset** and **Factory Preset** softkeys. The user may then select the preset desired from the softkey menu selections.

Setting up a User Preset

To quickly return to instrument settings that are user defined, perform the following steps to save the instrument state as the user-defined preset:

1   Set the instrument parameters to the values and settings necessary for the user preset state. This would include the frequency, span, amplitude, BW, and measurement type and any other setup details desired.

2 Press [Preset/ System] **> Pwr on/Preset > Save User Preset**, to save the current instrument settings as the 'user preset' state. The user preset will not affect the default factory preset settings. User preset settings can be changed and saved at any time.

Viewing a Signal

Refer to the procedures below to view a signal.

1 Press [Preset/ System] **> Pow on/Preset > Preset Type > Factory** to enable the factory-defined preset state.

2 Press [Preset/ System] **> Preset** to restore the analyzer to its factory-defined state.

3 Connect the 10 MHz **REF OUT** on the rear panel to the front-panel **RF IN**.

Setting the Reference Level and Center Frequency

1 Press [Amplitude] **> 10 > dBm** to set 10 dBm reference level.

2 Press [Frequency] **> 30 > MHz** to set 30 MHz to center frequency.

Setting Frequency Span

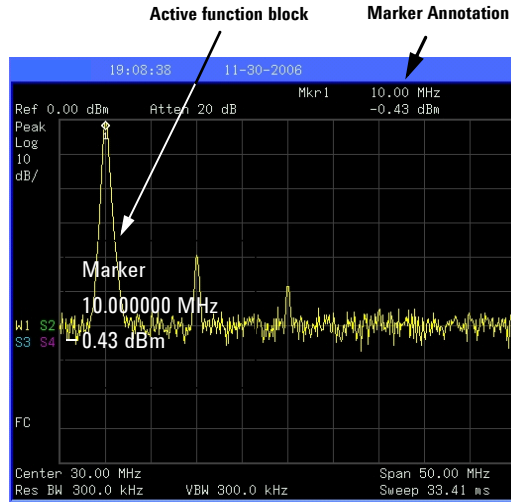Press [SPAN] **> 50 > MHz** to set 50 MHz frequency span.

NOTE Changing the reference level changes the amplitude value of the top graticule line. Changing the center frequency changes the horizontal placement of the signal on the display. Increasing the span will increase the frequency range that appears horizontally across the display.

Reading Frequency and Amplitude

1 Press [Peak Search] to place a marker (labeled 1) on the 10 MHz peak.

Note that the frequency and amplitude of the marker appear both in the active function block, and in the upper- right corner of the screen.

Figure 2   10 MHz Internal Reference Signal

2   Use the knob, the arrow keys, or the softkeys in the **Peak Search** menu to move the marker. The marker information will be displayed in the upper- right corner of the screen.

Changing Reference Level

1   Press **Amplitude** and note that reference level **(Ref Level)** is now the active function.

2   Press **Marker** > **Mkr**-> **Ref Lvl**.

NOTE	Changing the reference level changes the amplitude value of the top graticule line.

Some Helpful Tips

The following contains information to help in using and maintaining the instrument for optimum operation, including alignment, external reference, firmware update and option activation.

Perform a Time Base Calibration

The N9340B provides a manual calibration function to calibrate the time base. The analyzer should warm up for approximately 30 minutes before calibration.

When the calibration function is triggered, the current measurement is interrupted and a gauge displays on the LCD. The gauge simply indicates calibration action rather than calibration course, as the calibration time is unpredictable. When the calibration is finished, the LCD displays a calibration, and the interrupted measurement restarts.

Please refer to the operation procedures as below:

1   Connect a BNC cable with a correct type N-BNC adapter between the **CAL OUT** and **RF IN** front panel connectors.

2   Press **Preset/System** **> Alignment > Timebase** to initiate a calibration.

Using an External Reference

To use an external 10 MHz source as the reference frequency, connect the external reference source to the **REF IN** connector on the rear panel. An EXT REF indicator will display in the upper bar of the display. The signal level must be in the range of –5 to +10 dBm.

Enable the Options

Option license key information is required to enable product options. Contact your nearest Keysight Office for purchasing a license. Refer to the procedures below to activate the options you have purchased.

1 Press **Preset/ System** **> More > More > Licensing > Option**

2 Enter the option number to be enabled. Press **[Enter]** to confirm your input.

3 Press **License key,** enter the license key in the onscreen window. Press **[Enter]** to confirm your input and terminate the license key input.

4 Press **Activate License**. The option will be enabled immediately.

Firmware Update

Press **Preset/ System** **> More > Show software** to view the firmware revision of your analyzer. If you call Keysight Technologies regarding your analyzer, it is helpful to have this revision and the analyzer serial number available. To update the firmware, refer to:

http://www.keysight.com/find/n9320b

Follow this procedure to finish the firmware update:

1 Download the firmware package from web. Extract and copy the file *version and folder "n9320b"* into the root directory of a USB stick.

2 Insert the USB stick into the USB connector. Press **Preset/ System** **> {More} > {Upgrade}**

The analyzer will perform the update process automatically. The upgrade procedure will take several minutes.

CAUTION   Any interruption during the update process will result in update failure and system data lost. Do not remove the USB storage device until the update is finished.

Is your product software up-to-date? Periodically, Keysight releases software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Keysight Technical Support website at www.keysight.com/find/techsupport.

IO Configuration

The N9320B spectrum analyzer provides 3 types of IO connnection: USB, LAN and optional GPIB interface. Press **Preset/System** **> {IO Configure}** to select the corresponding interface as your need.

USB

Select USB to enable the USB connection for remote control.

LAN

The N9320B supports LAN port connection for remote control. Press **Preset/System** **> {More} > {More} > {IP Admin}** to set the IP parameters for the network connection.

Press **{IP Select Static}** to manually set the IP address, gateway and subnet mask with the proper LAN information, or just press **{IP Select DCHP}** to set the IP address in LAN dynamically according DCHP.

Press **{Apply}** to enable all the parameters you set.

Press **Preset/System** **> {IO Configure} > {LAN}** to enable the LAN connection according to the IP configuration you set.

GPIB

Press **Preset/System** **> {GPIB Address}** to set the GPIB address for the analyzer.

Press **Preset/System** **> {IO Configure} > {GPIB}** to enable the GPIB connection. The GPIB softkey is only vaild after the option G01 installed.

Remote Control

The N9320B spectrum analyzer is capable of being connected to a PC via USB, LAN or optional GPIB connection, allowing the analyzer to be operated in remote mode.

USB/LAN/ GPIB cable
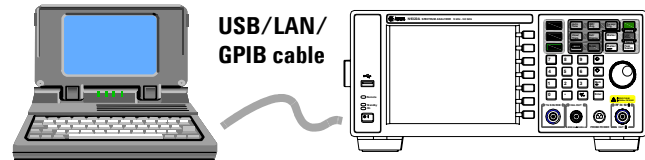
The configuration for setting up a remote control for your N9320B is easily done: connect your N9320B using a USB/network cable to a PC which has had Keysight IO libraries suite installed.

When connecting a PC to the spectrum analyzer, power on the spectrum analyzer. The PC will then detect if there is a connection to the spectrum analyzer.

To maximize the flexibility of the remote control feature, use SCPI commands to create your own programs.

Installing Keysight IO libraries suite

Before remotely control your N9320B, you need to install **Keysight IO libraries suite** on your PC. The Keysight IO libraries suite is a general purpose instrument driver for all Keysight test and measurement instruments. This software is in the documentation CD with the shipment, or download the latest version from

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

Follow the windows wizard to finish the installation. Then, you have successfully set up an environment for remotely controlling your N9320B.

PC Connection

The analyzer provides the USB (Universal Serial Bus) connection and allows you to set up a remote operation environment via the USB, LAN or optional GPIB interface with a controller computer.
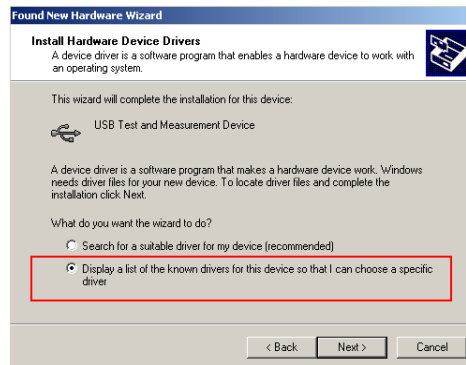
Connecting the N9320B to a PC via the USB Port

Please refer to the following steps to finish the connection:

1 Switch on the N9320B

2 Connect the analyzer to a PC with a USB cable.

3 The PC finds your N9320B as a new hardware and prompts a message saying "Found new hardware...". A **Found New Hardware Wizard** is initiated immediately.
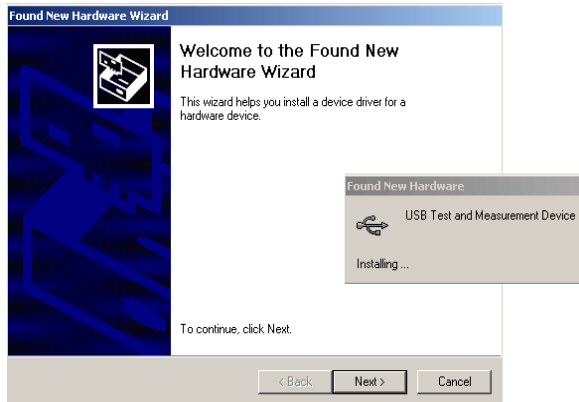
4   Select **Display a list...**

5   PC will detect the instrument automatically. The item **"USB Test and Measurement Device"** displays in the pop-up window. Select it and press **Next**.
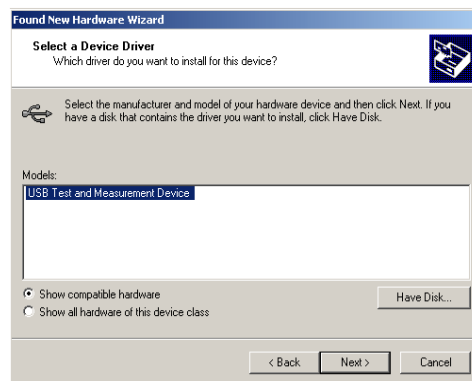
**6**   The wizard will guide you through the rest of installation till the driver is installed.

7   Run Keysight IO libraries suite, the N9320B will be detected automatically. If not, press **Refresh All**.

After the configuration, the analyzer is ready for your programming. For further information on remote control and programming, please refer to the *N9320B Programmer's Guide* in the *N9320B Help Kit* CD.

Connecting the N9320B to a PC via the LAN Port

N9320B provide you a LAN port to establish an network conveniently for remote control. Please refer to the following steps to finish the connection:

1 Switch on the analyzer.

2 Connect the spectrum analyzer to a PC with a LAN cable.

3 Press [Preset/System] **> {More} > {More} > {IP Admin} > {IP address}** to set IP address for the instrument. For example, set "10.0.0.5" as the IP address for the instrument.

4 Run Keysight Connection Expert in IO libraries suite. Right‑click on the LAN (TCPIP0) icon, select "Add Instrument' in the pop‑up menu. The "Add LAN Instruments" window displays for the IP configuration.
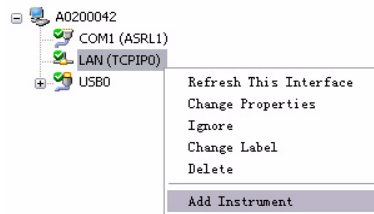
**5** Select "Add Address", check "Use IP Address" in the window and input the IP address as the instrument IP address you set before.

6 Press "Test Connection" to check the LAN connection. The figure below indicates that the connection is ready.

7 Check "*IDN query" and press "Identify Instrument". The instrument information shows the firmware revision and product number. The analyzer is ready for your further programming..
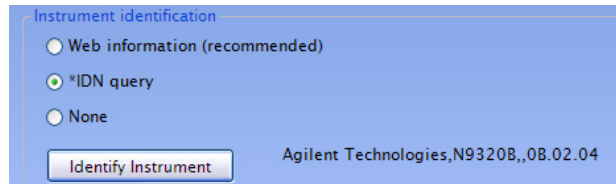
Connecting the N9320B to a PC via the GPIB port

Please refer to the following steps to connect the instrument via the GPIB port:

1. Switch on the analyzer.

2. Connect the analyzer and the PC with the GPIB cable.

3. Press **[Preset/ System]** **> {More} > {More} > {GPIB Address}** to set the GPIB address. The available input range is from 0 to 31.

4. Press **[Preset/ System]** **> {More} > {IO Config} > {GPIB}** to set the GPIB connector as the IO connector.

Then, the analyzer is connected via the GPIB port and ready for your further use.

PC Software

Keysight BSA and HSA PC software is an easy-to-use, PC-based remote control tool for your N9320B spectrum analyzer.

It is able to be used as:

Spectrum monitor   displays and controls the spectrum scans simultaneously to your N9320B.

File manager   sends files to your N9320B from a PC, or gets files from your N9320B to a PC.

The N9320B PC software also provides the following utilities:

• Capture the trace screen or print it out

• Export trace data into a CSV file (in a format of *.csv, open with Microsoft© Office Excel)

The analyzer provides the USB, LAN and optional GPIB connection and allows you to set up a remote operation environment via the USB/LAN/GPIB interface with a controller computer.

Before using the N9320B PC Software, you need to install **Keysight IO libraries suite** on your PC. The Keysight IO libraries suite is a general purpose instrument driver for all Keysight test and measurement instruments. This software is in the documentation CD with the shipment, or download the latest version from

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

The N9320B PC software is in the documentation CD and available for your download from:

http://www.keysight.com/find/n9320b

Click the tab Technical Support in the right side to download the software package. Follow the windows wizard to finish the installation. Please refer to the software online help for your further use.

4   Troubleshooting

This chapter includes information on how to check for a problem with your Keysight Technologies spectrum analyzer, and how to return it for service.

If you experience a problem or would like additional information about your analyzer, Keysight Technologies' worldwide organization is ready to provide the support you need.

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Check the basics

Before calling Keysight Technologies, or returning an analyzer for service, perform the quick checks listed below. This check may eliminate the problem.

- Is there power at the receptacle?

- Is the analyzer turned on? Listen for internal fan noise to determine if the analyzer cooling fan is running. Feel the rear side of the analyzer for air flow.

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

- Review the measurement procedures being performed when the problem first appeared. Make sure all of the settings are correct.

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

NOTE Some analyzer settings are not affected by a Preset. If you wish to reset the analyzer configuration to the state it was in when it was originally sent from the factory, press System, Power On/Preset, Preset Type, Factory. Then press the green Preset key on the front panel.

- Is the measurement being performed, and the results that are expected, within the specifications and capabilities of the analyzer? Refer to the *Technical Overview* for your analyzer.

- Is the analyzer displaying an error message? If so, refer to *User's Guide* for details.

- To meet specifications, the analyzer must be aligned. For more information on how to align the analyzer, refer to "Running Internal Alignments" on page 8.

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

NOTE	If the analyzer is still under warranty or is covered by a maintenance contract, it will be repaired under the terms of the warranty as below.
	If the analyzer is no longer under warranty or is not covered by an Keysight Technologies maintenance plan, Keysight Technologies will notify you of the cost of the repair after examining the analyzer.

If a problem persists, please contact the Keysight Technologies office for further information and service.

Warranty and Service Options

Keysight N9320B spectrum analyzer provides 1-year return-to-Keysight warranty as standard.

Keysight Technologies offers several optional maintenance plans to service your analyzer after the warranty has expired:

R-51B-001-3C

extends this service to 3 years.

R-50C-011-3

Keysight calibration upfront support plan, 3-year coverage.

The calibration cycle of N9320B RF spectrum analyzer is one year.

NOTE	A button cell provides power to the real time clock of the spectrum analyzer. It is not rechargeable. If you find your N9320B encounters a clock defect, please contact your nearest Keysight Customer Contact Center (CCC) for service.

Contact Keysight Technologies

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

Press **Preset/ System** **> More > Show System** to find those information.

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

United States	**Canada**	**China**
(tel) 800 829 4444	(tel) 877 894 4414	(tel) 800 810 0189
(fax) 800 829 4433	(fax) 800 746 4866	(fax) 800 820 2816
Europe	**Japan**	**Korea**
(tel) +31 20 547 2323	(tel) +81 426 56 7832	(tel) 080 769 0800
(fax) +31 20 547 2390	(fax) +81 426 56 7840	(fax) 080 769 0900
Latin America	**Taiwan**	**Australia**
(tel) +1 (305) 269 7500	(tel) 0800 047 866	(tel) 1 800 629 485
	(fax) 0800 286 331	(fax) +61 (3) 9210 5947

Other Asia Pacific Countries

(tel) +65 6375 8100

(fax) +65 6755 0042
Email: tm_ap@keysight.com

Factory Preset State			
Attenuation	20 dB (Auto)	Average Type	Video (Auto)
Center frequency	1.5 GHz	Averaging	1(Off)
CF step size	300 MHz	Peak Excursion	6 dB
Start Frequency	0 Hz	Peak Threshold	-90 dBm
Stop Frequency	3 GHz	Peak Search Type	Max Value
Signal Track	Off	Peak Table	Off
Span	3 GHz	Peak Sort	Amplitude
Reference level	0 dBm	Continuous Pk	Off
Log scale/Division	10 dB	Delta Pair	Delta
Int Preamp	Off	Span Pair	Center
Trace 1	Clear Write	Trigger	Free Run
Trace 2, 3, 4	Blank	Markers	Normal (Off)
Sweep Time	100.2 ms (Auto)	Marker Delta	Off
Sweep	Continuous	Marker Table	Off
Limit	Off	Measure	Meas Off
Limit line testing	Off	File Catalog	Local
Limit point	0	File Type	State
Detector	Peak (Auto)	File Sort	By Date
Display line	-25 dBm (Off)	Phase Noise	Off
Video bandwidth	3 MHz (Auto)	Optimize phase noise	Off
VBW/RBW ratio	1.000 (Auto)	Frequency Counter	Off
Resolution bandwidth	3 MHz (Auto)	Frequency counter resolution	1 kHz (Auto)

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