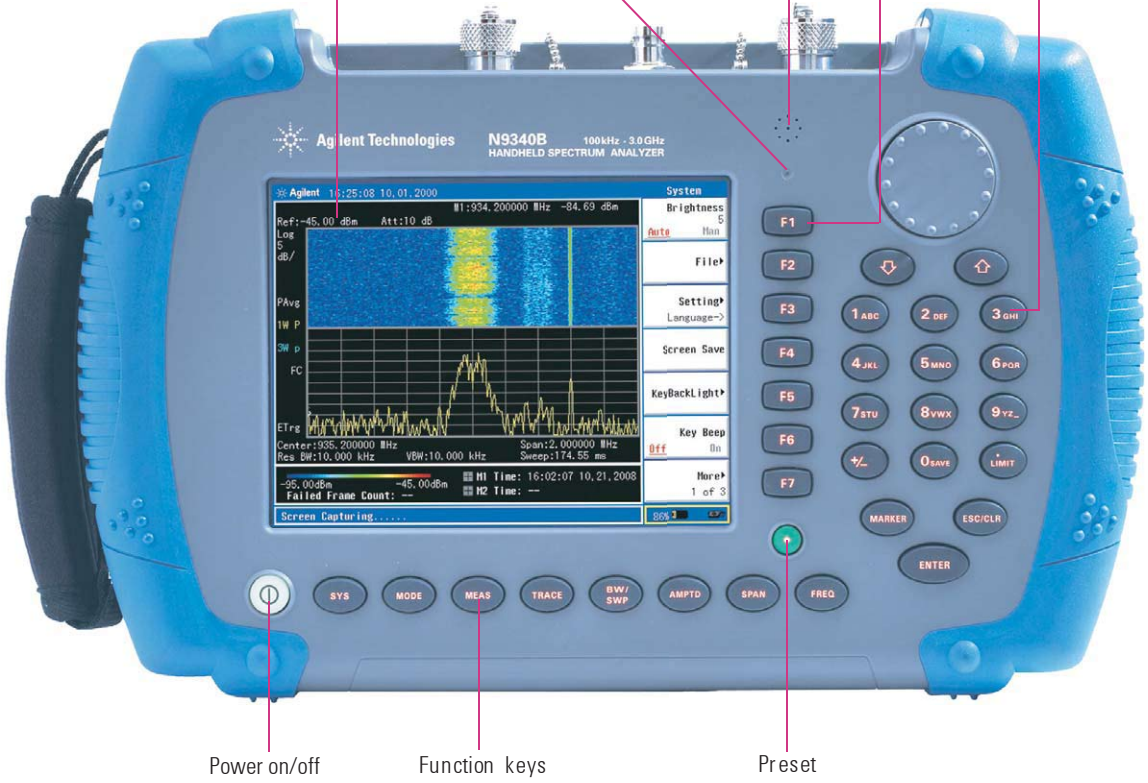
Agilent N9340B Handheld Spectrum Analyzer (HSA)

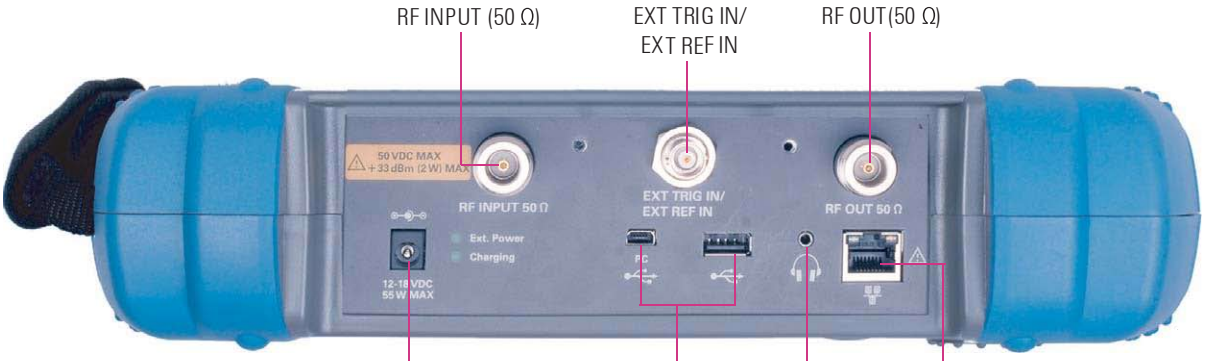
Technical Overview

Put the speed and performance of Agilent spectrum analysis in the hands of your engineers in the field

Agilent Technologies

N9340B Handheld Spectrum Analyzer (HSA)
Front and Top Panel





N9340B
Handheld Spectrum Analyzer (HSA)

Know your spectrum

Regardless of whether you are handling military communications, a Wireless Service Provider (WSP), or involved with spectrum management you need to avoid impaired communication. The N9340B provides you with a reliable, accurate and detailed picture of your communication spectrum.

Optimize your test time versus accuracy

When you test, you need fast data capture to help locate and identify elusive, transient interference signals. That's why every N9340B spectrum analyzer has a truly fast sweep time. It requires less time to measure across the spectrum, to obtain more reliable test results and to help you achieve more for the same investment of time and money.

Gain confidence in your test results

Spurious signals and noise are of great concern to all network users. A superior combination of low displayed average noise level (DANL) and single sideband (SSB) phase noise coupled with a narrow resolution bandwidth (RBW) means your signal measurements are more reliable and you will have more confidence in your test results. The N9340B's low DANL and SSB phase noise helps you detect very low-level signals (spurs or noise) which are close to the carrier. You will avoid missing these difficult-to-identify signals, which would otherwise lead to an insufficient or even incorrect understanding of the spectrum.

N9340B Superior Performance Ensures the Field Test Confidence

- Superior sensitivity: lowest DANL in-the-class
- Fastest sweep time
- Narrowest resolution available

- Frequency range : 100 kHz to 3 GHz (tunable to 9 kHz)[1]
- DANL : (RBW=30Hz, 10 MHz < fc ≤1.5 GHz)
  - –124 dBm
  - –144 dBm with preamp on
- Sweep time
  - 10 ms to 1000 s, span ≥ 1 kHz
  - < 120 ms at full span
- RBW : 30 Hz to 1 MHz in 1-3-10 sequence
- VBW : 3 Hz to 1 MHz
- SSB Phase noise : < – 87 dBc/Hz at 30 kHz offset
- Amplitude accuracy : ±1.5 dB

[1] Low frequency performance enhancement options available, check option N9340B-IBC and N9340B-XDM

The N9340B's RBW is the narrowest in its class. The narrow 30 Hz bandwidth of the analyzer ensures that it is even easier to identify, resolve, and measure two signals that are close together. Additionally, with a resolution filter shape-factor of less than 5, the N9340B has the ability to resolve closely spaced signals with unequal amplitudes.

Moreover, the narrow RBW means that the spectrum analyzer introduces minimal noise itself, helping to further reduce DANL and improve sensitivity.

Superior sensitivity

With more wireless devices on the market requiring greater bandwidth usage, the ability to discriminate between different signals becomes more challenging. It's under such demanding conditions that the superior performance of an N9340B analyzer proves its worth. The N9340B has one of the best sensitivity and selectivity specifications. The DANL is –124 dBm, or –144 dBm with the optional preamplifier (30 Hz RBW, 10 MHz < fc ≤ 1.5 GHz). The optional preamplifier adds 20 dB gain for improved analyzer sensitivity.

Speed at your fingertips

The RF spectrum is a finite resource, therefore its usage requires management. Most regulatory authorities responsible for administering frequency allocation require service suppliers and network operators to perform routine monitoring of signal power and transmission frequency stability.

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N9340B is now equipped with powerful features to address field applications using a handheld spectrum analyzer. An important application of spectrum analysis is identifying interfering signals. These often arise from illegal transmissions, and may cause impairment of services for authorized users, often resulting in financial loss. These interfering signals could possibly restrict critical communications of civil aviation and emergency services, which could jeopardize public safety.

N9340B Applications for Field Test

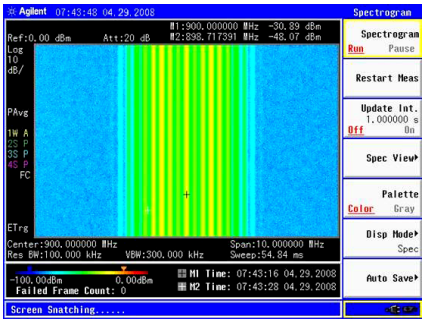
- Aerospace & Defence: radio and radar test, interference analysis, on-site repair
- Wireless Service Providers: interference analysis, on-site repair
- TV & Broadcasting: interference analysis, channel power check
- Spectrum Management Authority: spectrum monitoring

Spectrogram

Now you can take advantage of the spectrogram display to view the behavior of varying signal parameters over time. The N9340B includes spectrogram as a standard feature. The scrolling three-dimensional display is noted for its ability to track the frequency and power behavior over the time, particularly intermittent signals. The user can use spectrogram to analyze the stability of a signal over the time, or to identify intermittent interference signals in communications systems.

There are two markers for the user to identify power versus frequency and time. Also the time interval between two consecutive colored rows can be adjusted. When a marker is put on the spectrogram, the N9340B can display the trace for the time of the selected marker.

The spectrogram data and screenshots can be saved and recalled for later analysis or reporting.



The spectrogram gives the three-dimensional display of power, frequency and time.

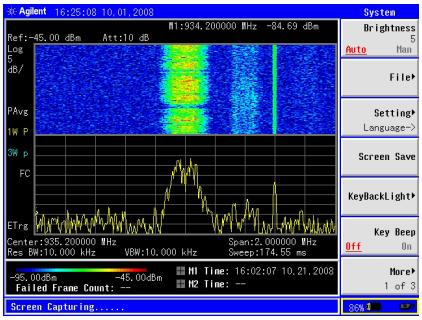
Extended spectrogram monitoring (Option INM)

Option INM extends the N9340B spectrogram capability further with the ability to continuously monitor and save spectrogram data over time not only to the analyzer's internal memory or a USB flash drive, but also directly to a PC. With option INM users can save more than 1,500 continuous frames of data depending on the size of the USB flash drive or PC memory.

Option INM also supports an Automatic Save function. The N9340B can save the spectrogram at a user specific time or at a set interval of frame. All the small files with the same prefix can be combined into one file using N9340 PC Software, making analysis easier.

The user can choose among the 3 display modes: spectrogram only, spectrum trace only or the combination of a spectrogram and a spectrum trace in one screen. Limit lines with pass/fail functionality is also available in this measurement. The N9340B will identify the failed frame of spectrogram data with a red mark. The Pass/Fail test can also provide alerts. Users may use marker to find the previous/next frame failed data to quickly find the offending event or interference. The spectrogram data may be played back for review on either the analyzer's display or on a PC utilizing N9340B PC Software.

With the option INM, the Agilent N9340B spectrum analyzer can provide unattended monitoring of communication systems capturing performance or intermittent events like interference over extended periods of time – days rather than hours. The option INM can provide additional value for the wireless network communication system managers, hospital administrators, etc. as well as police and homeland security by recording spectrogram measurement results over time.



The N9340B INM shows spectrogram and spectrum trace on the same screen.

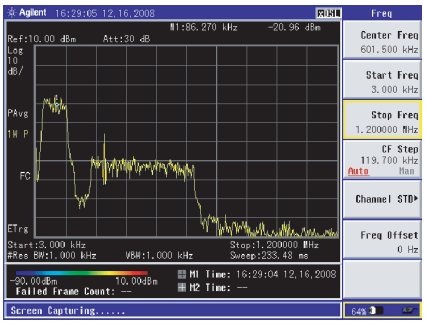
DSL measurements (Option XDM)

xDSL (ADSL and VDSL) is widely used for broadband internet connections at homes and businesses. Service providers occasionally face problems with interference on their xDSL lines. The interference is mainly intermittent intrusion from nearby external sources such as electric motors, elevators, and appliances. In order to monitor, capture and remove intermittent interference, the engineer may need to work in the field for extended periods of time.

With hardware option XDM the N9340B now supports measurements on ADSL, ADSL2+ and VDSL networks. It provides very good sensitivity with low displayed average noise levels (DANL) to meet the mask requirements overADSL frequency ranges, from 9 kHz to 12 MHz, for ADSL.

Users may choose to make the xDSL measurement in either spectrum analysis or spectrogram mode. Using xDSL measurement in spectrogram mode is ideal for capturing intermittent interference on xDSL lines. When used with option INM, the DSL measurement application can measure and record DSL performance data to a USB flash drive or PC over hours or even days.

An xDSL probe from Vierling is required to connect the N9340B analyzer to xDSL networks for measurements in the field.



ADSL measurement with N9340B XDM

The option XDM is not available as an upgrade and must be ordered at the time of instrument purchase. The XDM option can also be used for other applications which require improved DANL and phase noise at frequencies from 9 kHz to 12 MHz.

IBOC measurements (Option IBC) New

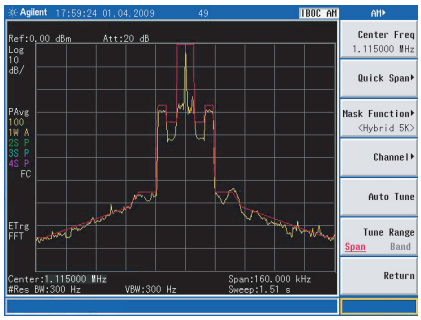
Option IBC equips the N9340B with in-band on-channel (IBOC) measurement capability through a dedicated measurement personality and selected hardware improvements. IBOC technology is a method of transmitting digital and analog radio broadcast signals (AM and FM) simultaneously on the same frequency. This HD Radio™ version of hybrid digital/ analog technology is the only one approved by the FCC for U.S. radio broadcast stations.

The IBC option adds enhanced SSB phase noise for IBOC AM measurements and a noise cancellation process for improved IBOC FM measurement margins. IBOC-AM covers 530 kHz to 1.7 MHz and IBOC-FM covers the 87.5 MHz to 108 MHz frequencies.

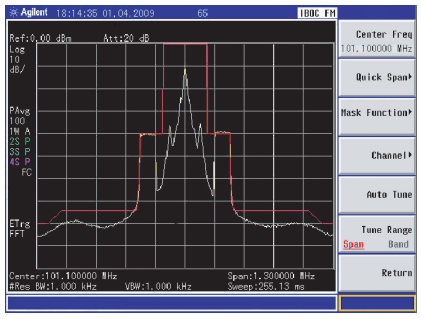
Option IBC has built-in FCC and NRSC (National Radio Systems Committee) spectral emission masks for quick compliance measurements with visual and audible pass/fail indicators.

N9340B IBC also supports a one-button auto-tune function that greatly simplifies the otherwise complex user setup required to capture and measure IBOC signals of interest. The auto-tune function will automatically set the frequency span, RBW, Average and Detector types, etc. It only takes seconds for the auto-tune function to display the correct measurement results.

The included Channel list feature enables users to easily create and recall setup and measurement parameters for single or multiple broadcast frequencies and channels. The user no longer needs to spend time remembering numerous channel setups but can simply load the desired channel from the list to start a measurement. The Channel list can be loaded, copied and deleted.



IBOC-AM measurement with N9340B IBC



IBOC-FM measurement with N9340B IBC.

N9340B is the industry's first handheld spectrum analyzer with a dedicated IBOC measurement mode. The option IBC is not available as an upgrade and must be ordered at the time of instrument purchase.

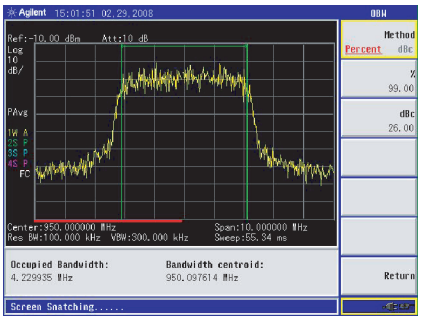
One-button measurement

The Agilent N9340B supports one-button measurements of occupied bandwidth, channel power and adjacent channel power ratio. This virtually eliminates set-up time in the field.

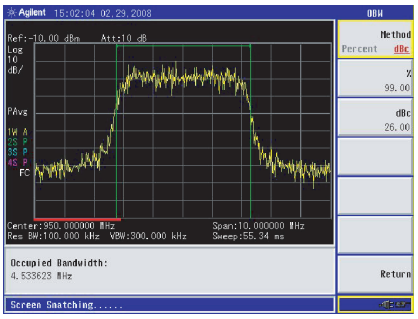
Occupied bandwidth (OBW)

An occupied bandwidth measurement integrates the power of the displayed spectrum and puts one pair of vertical lines at the frequencies between which the interested signal is contained.

An N9340B spectrum analyzer supports two ways to measure the occupied bandwidth, in percentage or in dBc.



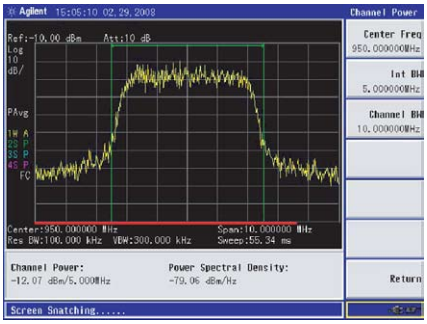
The occupied bandwidth measured in percentage.



The occupied bandwidth measured in dBc.

Channel power

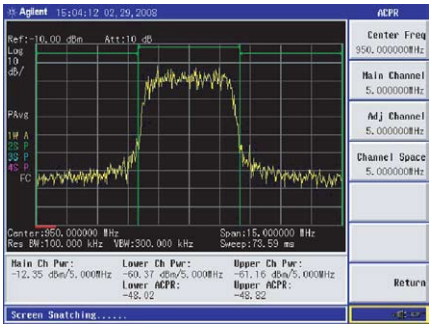
Use channel power to measure both power and power spectral density in a user-specified channel bandwidth. One pair of vertical lines on the display indicates the edges of the channel bandwidth.



It is quick and easy to set center frequency, integration bandwidth, and channel bandwidth.

Adjacent channel power ratio (ACPR)

Wireless service providers need to minimize the interference caused by power leaking into adjacent transmit channels. Adjacent channel power ratio measurements help to check for signal leakage and the identification and control of sources of interference.



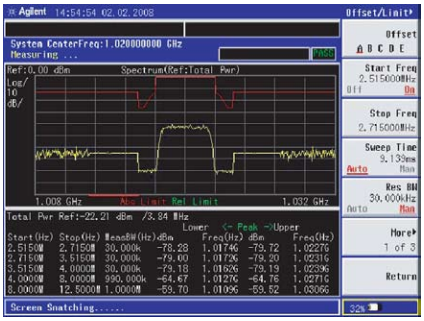
Center frequency, main channel bandwidth, adjacent channel bandwidth, and channel space can eadily be set.

Spectrum emission mask (SEM)

The new N9340B adds Spectrum Emission Mask (SEM) as a standard feature. SEM is a mask for out-of-channel emissions measurement. The SEM is defined relative to in-channel power.

The user can set the parameters of the main channel, out-of-channel frequency bands, and the limit lines. Included is Pass/Fail testing for the overall spectrum emission mask and each individual out-of-channel frequency range. The N9340B will trigger the failure indicator once any measurement result violates the mask.

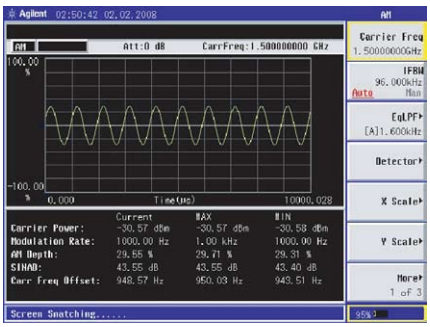
Also displayed are the main channel power and the power level metrics relative to in-channel power for each out-of-channel frequency range. The user can save the spectrum scan, the mask, the data or screenshot for later analysis and reporting.



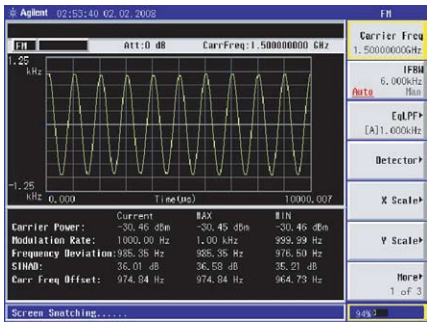
The spectrum emission mask shows the main channel power and the power level vectors relative to in-channel power for each out-of-channel frequency range.

AM/FM modulation analysis (Option AMA)

Optional AM/FM modulation analysis shows the metrics you need, including carrier power, modulation rate, AM depth/FM deviation, SINAD and carrier frequency offset. User definable limits provide Pass/Fail indicators in 4 cases: higher than carrier power, larger than AM modulation index or FM deviation, lower than AM modulation index or FM deviation, or larger than carrier frequency offset. The user can save the waveforms with metrics for reporting as well as the set-up parameters for future measurements or analysis.



The detailed metrics offer you the complete understanding of the AM.

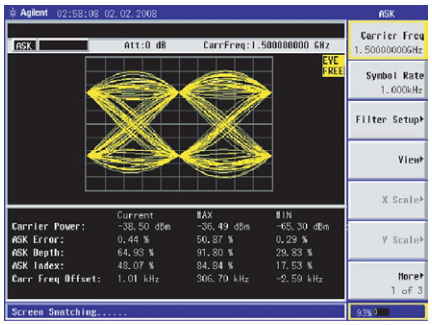


The detailed metrics offer you the complete understanding of the FM.

ASK/FSK modulation analysis (Option DMA)

Optional ASK/FSK modulation analysis is now available. Amplitude Shift Keying (ASK) is used in RFID and optical systems. Frequency Shift Keying (FSK) is used in many applications including cordless phone, paging system and RFID.

N9340B w/option DMA supports 4 display modes: Symbol, Waveform, ASK/FSK Error, and Eye Diagram. Included is Pass/Fail testing of higher than carrier power, higher than ASK modulation depth/FSK frequency deviation, lower than ASK modulation depth/FSK frequency deviation and higher than FSK frequency deviation. The metrics you need are shown, including carrier power, ASK/FSK error, ASK depth/FSK frequency deviation, and ASK index etc. For reports and future measurements the waveform with metrics and setup parameters can be saved.



The Eye Diagram of ASK also shows the metrics with detailed parameters.

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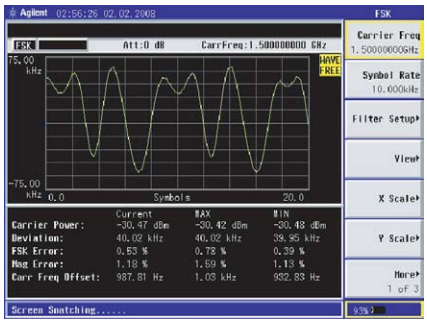
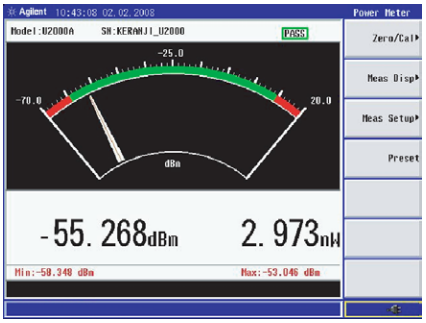


The Waveform of FSK also shows the metrics with detailed parameters.



N9340B supports Meter and Chart mode to display the results of power measurements.

High accuracy power measurement

The N9340B now supports high-accuracy, USB plug-and-play power measurements as standard when connected to an Agilent U2000 series USB power sensor. Make true average power measurements for all signal types with wide dynamic range up to 18 GHz with just the push of a button. The Agilent U2000 USB sensors require no external power supplies and with internal zeroing eliminate the need for external calibration. Without the need for additional boxes, the user can easily set up, calibrate and control the power meter/sensor via the analyzer's USB port. The N9340B can collect, display and save the power meter results.

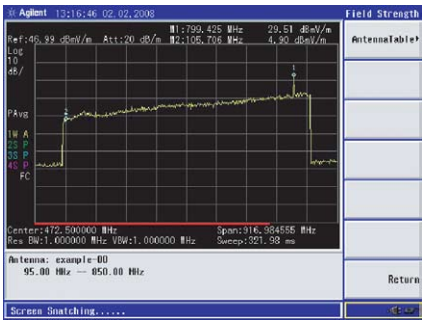
The analyzer also provides Pass/Fail testing with user set upper and lower limits and a Pass/Fail indicator. Test results are shown in dBm and W when making absolute measurements and in dB and percentage when measurements are relative. Two display modes are available: Meter or the Chart mode to log power measurements over time.

N9340B supports U2000 series USB power sensors for high accuracy power measurement.

Field strength measurement

Field strength measurement

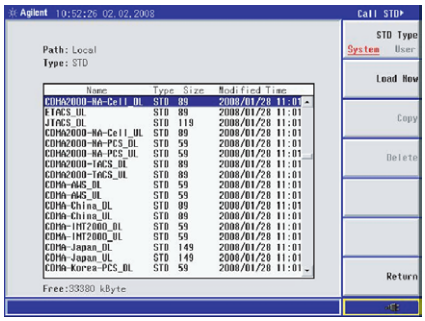
Electric field strength measurements are frequently required for field testing of transmitter and antenna coverage. Field strength measurements are now a standard function in the N9340B. Calibrated field strength measurements are easy to make once the antenna factors are loaded into the analyzer via the provided PC software based antenna template. Either field strength (in dBμV/ m, dBmV/ m, or V/m) or power flux density (in dBm/m^2 or W/m^2) can be displayed. With the amplitude offset function, the user can correct gain or loss. And finally together with the user-definable multi-limit line function, the N9340B offers the user quick and convenient field strength measurements and analysis.



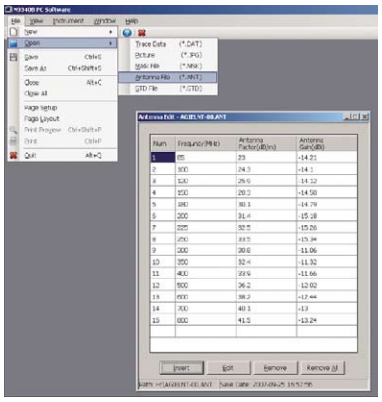
The field strength measurement automatically takes into the account of the antenna factor. The antenna table is definable by the standard N9340B PC software.

Channel table

For the users who prefer to tune the spectrum analyzer according to channel numbers rather than center frequency, you will find the new Channel Table feature easy-to-use. The Channel Table includes the major wireless communication standards, such as AMPS, GSM/EDGE/GPRS, CDMA, CDMA2000 etc. The Channel Table can also be edited by the user with the included N9340 PC Software. The revised Channel Table can be downloaded to the analyzer via a PC USB cable or a USB memory stick.



The channel table offers the ability to tune N9340B according to channel numbers.



The channel table is editable by N9340B PC software.

N9340B Optimized Usability to Enhance Field Test Productivity

- 6.5'' TFT screen with bright display for use indoors and outdoors
- Back-lit keys for night use
- Four-hour battery life
- Modern USB and LAN connectivity for data transfer and remote control
- Multi-language User Interface
- Rugged design, MIL-PRF 28800F Class 2 compliance

A standard soft carrying case provides further protection for your analyzer.

See traces clearly indoors and outdoors

As with all the newest Agilent portable field equipment, operating under challenging bright sunlight or other difficult natural lighting conditions is no problem. The unusual 6.5'' TFT display with resolution of 640 x 480 pixels provides a superior, bright and clear trace for indoor and outdoor use. There is no need to operate in the shade.

Back-lit keys for night use

The N9340B is installed with back-lit keys for night use. The user can see the keys clearly even in darkness. The user can adjust the brightness of keys and the duration of the key light. It offers the user the ability to easily operate N9340B at night.

Built-in light sensor

The N9340B is installed with a light sensor in the front panel. The light-sensor can be activated to adjust the display brightness to adapt to changing lighting conditions.

Long battery life

Testing in the field often means operating away from main power supplies. Batteries need to have the longest possible operating time before recharging. You'll find an Agilent N9340B analyzer has superior power management, providing an impressive 4-hour battery operating time. It's easy to operate for an entire day in the field. There is an advanced, in-built battery management system. This helps extend the useful battery operating time typically up to four hours. With just one battery and a spare, or a quick recharging from any vehicle using the supplied auto-lighter charger, you are able to operate for an entire day away from a mains power source.

Modern USB and LAN connectivity

Remote control N9340B via SCPI over USB/LAN is now available!

Detailed analysis of results in the field is not always convenient or possible. You will need to store the results for later investigation. N9340B supports USB memory stick for data storage and retrival. It makes it easy to transfer and safeguard your measurement data. Connecting to a PC is simple and data transfer is fast via the USB cable. In test lab and bench-top use, the USB/LAN interface and PC software also support PC remote control of Agilent's N9340B spectrum analyzer This allows appropriate use of a large format PC screen. Windows®*-compatible software provides automatic storage of selected data and graphics.

Tough enough for the military

You will find that this Agilent analyzer is tough enough for military applications. Apart from its generally compact and rugged construction, the large rubberized grips wrap around both ends, providing additional robust protection from rough handling. The sealed keypad and screen are moisture resistant and dust proof. Of course, there is a protective carrying case that provides further protection for your analyzer.

Multi-language user interface

Users around the world will find operating Agilent N9340B is easy. In addition to English, there are ten more user-selectable, on-screen languages, including Chinese, Japanese, Korean and a number of European languages (see Specifications – General).

N9340B supports remote control via SCPI over USB and LAN.

* Windows is a U.S. registered trademark of the Microsoft Corporation.

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Specifications

Specifications apply under the following conditions:

- *After a warm-up time of 30 minutes, and at least two hours of operation or storage at operating temperature*
- *Within a valid calibration period*
- *Data with no given tolerances are typical values only. Data designated as 'typical' is not covered by the product warranty.*

Frequency

		Supplemental information
Frequency		
Frequency range :	100 kHz to 3 GHz (tunable to 9 kHz)	AC coupled
Internal 10 MHz frequency reference accuracy		
Aging rate :	± 1 ppm / year	
Temperature stability :	± 2 ppm	0 °C to 30 °C
	in addition +2 ppm / 10 °C	30 °C to 50 °C
Frequency readout accuracy with marker (Start, stop, center, marker)		
Marker resolution :	(frequency span) / (number of sweep points – 1)	
Uncertainty :	± (frequency indication × frequency reference uncertainty +1% × span + 20% × resolution bandwidth + marker resolution+1 Hz)	
Frequency reference uncertainty = (aging rate x *period of time since adjustment + temperature stability)*		
Marker frequency counter		
Resolution:	1 Hz	
Accuracy:	± (marker frequency × frequency reference uncertainty + Counter resolution)	RBW/ span ≥ 0.02; marker level to displayed noise level > 25 dB; frequency offset 0 Hz
Frequency reference error = (aging rate x *period of time since adjustment + temperature stability)*		
Frequency span		
Range :	0 Hz (zero span), 1 kHz to 3 GHz	
Resolution :	1 Hz	
Accuracy :	± span / (sweep points – 1)	
SSB phase noise		
Carrier offset :		
30 kHz	< – 87 dBc (1 Hz)	20 °C to 30 °C; *Typical*
100 kHz	< – 100 dBc (1 Hz)	fc = 1 GHz; RBW 100 Hz; VBW 10 Hz; RMS detector
1 MHz	< – 120 dBc (1 Hz)	
Resolution bandwidth (RBW)		
– 3 dB bandwidth :	30 Hz to 1 MHz	1- 3 - 10 sequence
Accuracy :	± 5%	*Nominal*
Resolution filter shape factor :	< 5 : 1	60 dB / 3 dB bandwidth ratio;*Nominal;* Digital, approximately Gaussian shape
Video bandwidth (VBW)		
– 3 dB bandwidth :	3 Hz to 1 MHz	1- 3 - 10 sequence
Accuracy :	± 5%	*Nominal*

Amplitude

Measurement range

	Displayed average noise level (DANL) to +20 dBm	
Input attenuator range :	0 to 51 dB, in 1 dB steps	

Maximum safe input level

Average continuous power :	+ 33 dBm, 3 minutes maximum. *Norminal*	Input attenuator setting ≥ 20 dB (input protection switch active when input level > 33 dBm)
DC voltage :	50 VDC maximum	

Displayed average noise level

Preamp off :		Reference level ≤ – 50 dBm
100 kHz < f_c ≤ 1 MHz	< – 90 dBm	
1 MHz < f_c ≤ 10 MHz	< – 110 dBm	
10 MHz < f_c ≤ 1.5 GHz	< – 124 dBm	< – 121 dBm when option IBC or XDM is installed
1.5 GHz < f_c ≤ 3 GHz	< – 117 dBm	< – 113 dBm when option IBC or XDM is installed
f_c = 50 MHz	< – 126 dBm *(Typical)*	
f_c = 1.9 GHz	< – 122 dBm *(Typical)*	
Preamp on :		Reference level ≤ – 70 dBm
100 kHz < f_c ≤ 1 MHz	< – 115 dBm	
1 MHz < f_c ≤ 10 MHz	< – 128 dBm	
10 MHz < f_c ≤ 1.5 GHz	< – 144 dBm	< – 141 dBm when option IBC or XDM is installed
1.5 GHz < f_c ≤ 3 GHz	< – 136 dBm	< – 132 dBm when option IBC or XDM is installed
f_c = 50 MHz	< – 146 dBm *(Typical)*	
f_c = 1.9 GHz	< – 142 dBm *(Typical)*	

RBW = 30 Hz, VBW = 3 Hz, input terminated 50 Ohm, 0 dB attenuation, RMS detector, Trace average ≥ 40

Level display range

Log scale and units :	1 to 10 dB/division in 1, 2, 5, 10 dB steps, 10 divisions displayed	
Linear scale and units :	0 to 100%, ten divisions displayed. dBmV, dBµV, V, mV, µV, nV, W, mW	
Sweep (Trace) points :	461	
Marker level readout resolution :		
Log scale	0.01 dB	
Linear scale	0.01% of reference level	
Detectors :	Normal, Positive Peak, Sample, Negative Peak, Average (Video, RMS, Voltage)	
Number of traces :	4	
Trace functions :	Clear / write, Maximum hold, Minimum hold, Average	
Level measurement error :	±1.5 dB (excluding input VSWR mismatch) ±0.5 dB, *Typical*	20 to 30 °C, peak detector, preamplifier off, input signal 0 dBm to –50 dBm, 20 dB input attenuation, frequency > 1 MHz, auto sweep time, RBW = 1 kHz, VBW = 1 kHz, trace average on to reduce noise

Reference level

Setting range :	– 100 to + 20 dBm	Steps of 1 dB
Setting resolution :		
Log scale	0.1 dB	
Linear scale	1% of reference level	
Accuracy :	0	Because reference level affects only the display not the measurement, it causes no additional error in measurement results from trace data markers

RF Input VSWR (at tuned frequency)

Attenuator setting 0 dB	< 1.8 : 1	10 MHz to 3.0 GHz, *Nominal*
Attenuator setting 10 dB	< 1.8 : 1	100 kHz to 10 MHz, *Nominal*
	< 1.5 : 1	10 MHz to 2.5 GHz, *Typical*
	< 1.8 : 1	2.5 GHz to 3.0 GHz, *Typical*
Attenuator setting 20 dB	< 1.6 : 1	100 kHz to 10 MHz, *Nominal*
	< 1.4 : 1	10 MHz to 3.0 GHz, *Typical*

Spurious response

Second harmonic distortion :	< – 70 dBc	Mixer level = – 40 dBm, frequency ≥ 50 MHz
Third - order intermodulation : (third order intercept)	+ 10 dBm, *Typical*	Third-order intermodulation products, 2 x – 20 dBm, reference level –10 dBm, center frequency 300 MHz, frequency separation 200 kHz RF attenuation = 0 dB RF preamplifier = OFF
Input related spurious :	< – 70 dBc	– 40 dBm signal at input mixer, carry offest > 1 MHz.
Inherent residual response :	< – 88 dBm	Input terminated and 0 dB RF attenuation, preamplifier off, reference level – 30 dBm, f > 30 MHz, RBW ≤ 10 kHz

Sweep

Sweep time

Range :	10 ms to 1000 s	Span ≥ 1 kHz
	6 µs to 200 s	Span = 0 Hz (zero span)
Sweep mode :	Continuous, single	
Trigger source :	Free run, video, external	
Trigger slope :	Selectable positive or negative edge	
Trigger delay :		
Range	6 µs to 200 s	
Resolution	6 µs	

Front panel input / output

RF input

Connector and impedance :	Type - N female, 50 Ω	*Nominal*

10 MHz reference / External trigger input

Reference input frequency :	10 MHz	
Reference input amplitude :	0 to + 10 dBm	
Trigger voltage :	5 V TTL level	*Nominal*
Connector and output impedance :	BNC female, 50 Ω	*Nominal*

Connectivity

USB host :	USB Type-A female,compatible with USB 2.0 full speed
USB device :	USB Type-mini AB female Compatible with USB 2.0 full speed
LAN :	RJ-45, 10 Base-T

General

Display

Resolution :	640 x 480 pixels	
Size and type :	6.5 inch (170 mm) TFT color display	

Internal memory

User memory :		Able to store about 3,600 traces

Languages

On-Screen GUI :	English, Simplified Chinese, Traditional Chinese, French, German, Italian, Japanese, Korean, Russian, Spanish, Portuguese.	

Power requirements and calibration

Adaptor Voltage :	90 to 120 or 195 to 263 VAC, 50 to 60 Hz 12 to 18 VDC, < 55 W	Auto-ranging
Power consumption :	13 W	*Typical*
Battery :		
Operating time (fully charged battery)	4 hours 3 hours	Tracking generator off Tracking generator on
Charging time	3 hours	
Life time	300 to 500 charge cycles	
Warm-up time :	30 minutes	
Calibration cycle :	One year	

Environmental and size

Temperature range :	– 10 to + 50 °C – 40 to + 70 °C	Operating (Battery: 0 to 50 °C) Storage (Battery: –20 to 50 °C)
Relative humidity :	< 95%	
Weight :	3.2 kg (7 lbs)	Net (shipping) approximately, 3.5 kg (7.7 lbs) with battery
Dimensions :	318 × 207 × 69 mm	Approximately (W x H x D)

Options

Spectrogram Monitoring (Option INM)

3 display modes :	Spectrogram Spectrum trace Combination of spectrogram and spectrum trace in one screen	

Low frequency performance enhancement and xDSL measurement capability (Option XDM)

XDM Channel :	9 kHz to 12 MHz	
DANL :	30 Hz RBW, 3 Hz VBW, 50 Ohm termination on input, 0 dB attenuation, RMS detector, Trace Average ≥ 40	
	Preamp off	Reference level ≤ – 50 dBm
	9 kHz < f_c ≤ 100 kHz < – 117 dBm, nominal 100 kHz < f_c < 12 MHz < – 132 dBm	
	Preamp on	Reference level ≤ – 70 dBm
	100 kHz < f_c ≤ 1 MHz < – 138 dBm, nominal 1 MHz < f_c ≤ 12 MHz < – 140 dBm	

Low frequency performance enhancement and AM/FM In-Band On-Channel IBOC Measurement (Option IBC)

Frequency Range :

AM Channel :	430 kHz to 1800 kHz	According to IBOC (AM) requirement
FM Channel :	87.25 MHz to 108.55 MHz	According to IBOC (FM) requirement

DANL : 30 Hz RBW, 3 Hz VBW, 50 Ohm termination on input, 0 dB attenuation, RMS detector, Trace Average ≥ 40

Preamp off		reference level ≤ – 50 dBm
9 kHz < f_c ≤ 100 kHz	< – 117 dBm, nominal	
100 kHz < f_c < 12 MHz	< – 132 dBm	
Preamp on		reference level ≤ – 70 dBm
100 kHz < f_c ≤ 1 MHz	< – 138 dBm, nominal	
1 MHz < f_c ≤ 12 MHz	< – 140 dBm	

RF preamplifier (Option PA3)

Frequency range :	1 MHz to 3 GHz	
Gain :	20 dB	*Nominal*

Tracking generator (Option TG3)

Frequency range :	5 MHz to 3 GHz	
Output level :	0 to –25 dBm	1 dB steps
Output flatness :	± 3 dB	Referenced to 50 MHz, 0 dBm
VSWR :	< 2.0 : 1	*Nominal*
Connector and impedance :	Type-N female, 50 Ω	

Demodulation

Frequency range :	10 MHz to 3 GHz	
Carrier power accuracy :	±2 dBm ±1 dBm	*Typical*
Carrier power displayed resolution :	0.01 dBm	

AM measurement

Modulation rate :	20 Hz to 100 kHz	
Accuracy :	1 Hz, nominal (Modulation rate < 1 kHz) < 0.1% modulation rate, nominal (Modulation rate ≥ 1 kHz)	
Depth :	5 to 95%	
Accuracy :	±4%	*Nominal*

FM measurement

Modulation rate :	20 Hz to 200 kHz	
Accuracy :	1 Hz, nominal (Modulation rate < 1 kHz) < 0.1% modulation rate, nominal (Modulation rate ≥ 1 kHz)	
Deviation :	20 Hz to 400 kHz	
Accuracy :	±4%	*Nominal*

ASK measurement

Symbol rate range : 200 Hz to 100 kHz

Modulation depth/index

Range : 10% to 95%

Accuracy : ±4% of reading nominal

Displayed resolution : 0.1%

FSK measurement

Symbol rate range : 1 kHz to 100 kHz

FSK deviation

Range : 1 kHz to 400 kHz

Accuracy : ±4% of reading nominal ß* ≥ 1 and ß ≤ 4

Displayed resolution : 0.01 Hz

* ß is the ratio of frequency deviation to symbol rate (deviation/rate)

Ordering Information

Model number	Description

N9340B handheld spectrum analyzer 100 kHz to 3.0 GHz

Accessories supplied as standard with each

- Multi-language Quick Start Tutorial
- CD-ROM of the manual
- Soft carrying case

Options

N9340B-INM	Extended spectrogram monitoring
N9340B-XDM	N9340B with Low frequency performance enhancement and xDSL measurement capability
N9340B-IBC	N9340B with low frequency performance enhancement and AM/FM In-Band On-Channel IBOC Measurement
N9340B-PA3	3 GHz preamplifier
N9340B-TG3	3 GHz tracking generator
N9340B-AMA	AM/FM modulation analysis
N9340B-DMA	ASK/FSK modulation analysis
N9340B-1TC	Hard transit case
N9340B-1DC	Automotive 12 V DC adaptor
N9340B-BAT	Spare battery pack
N9340B-ADP	Spare AC/DC adaptor
N9340B-BCG	External battery charger
N9340B-TAD	Adaptor Type-N(m) 50 Ohm to Type-N (f) 75 Ohm DC to 1 GHz
N9340B-ABA	Manual – English
N9340B-AB2	Manual – Chinese
N9340B-ABJ	Manual – Japanese

Warranty and service

Standard warranty is one year.

R-51B-001-3C	1 year Return-to-Agilent warranty extended to 3 years

Calibration

R-50C-001-3	Agilent Calibration Upfront Support Plan 3 year coverage

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Revised: June 8, 2011

Product specifications and descriptions in this document subject to change without notice.

Published in USA, December 10, 2011
5989-7847EN

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