

# Agilent General Purpose RF Instruments



# Agilent N9310A RF Signal Generator

## Built to Perform, Price to Compete



[www.agilent.com/find/n9310a](http://www.agilent.com/find/n9310a)



### Professional Performance:

- RF Output frequency Range: 9 kHz to 3 GHz
- Low Frequency Output: 20 Hz to 80 kHz
- Level: -127 dBm to +13 dBm (settable to +20 dBm)
- Sweep: Frequency/Amplitude/List
- SSB Phase Noise: -95 dBc/Hz (20 kHz offset)
- Switch Time: < 10 ms
- Modulation: AM, FM,  $\Phi$ M, pulse modulation
- IQ Modulator: 40 MHz baseband bandwidth

### Design for Usability:

- A clear, bright 6.5" TFT color screen with associated, easy-to-read soft keys help users quickly set
- Up to 11 languages user interface shorten the learning curve of users all over the world
- USB ports for fast remote control and easy configuration transfer
- Compact size and light weight, save your space on a crowded bench

### Options

- N9310A-001: IQ modulator
- N9310A-1PA: 30 dB power attenuator

# RF training solution

## Engage your students the moment they touch the real RF world



### Optimizing your lab's flexibility

The RF training kit offers unique flexibility. Not only can students simulate the typical Tx and Rx paths, but also the main components can be used separately for characterization experiments.

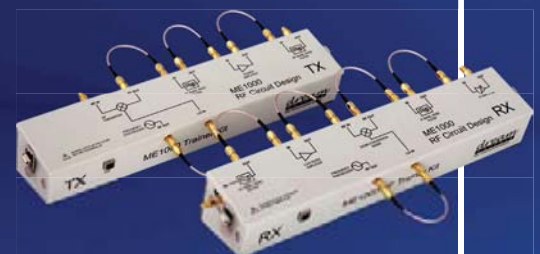
### Straightforward and engaging for your students

Agilent's industry leading RF instruments and the easy-to-use RF training kit helps you to create a high quality educational lab that enables your students to gain an intuitive understanding of the RF world.



### Extended value from a single suite

Besides helping you to generate effective labs for your students, Agilent's basic RF signal generator and spectrum analyzers have sufficient performance for many basic research projects.



RF Training Kit: TX board, RX board

# Agilent N9320B RF Spectrum Analyzer

## Best-in-class performance, practical value



[www.agilent.com/find/n9320b](http://www.agilent.com/find/n9320b)

### Exceptional Usability

#### Easy to use RF analysis tool

- One-button auto-tune quickly centers and reads out frequency and amplitude of the highest peak
- Display 4 traces with independent detectors simultaneous
- 12 markers with marker table and peak table
- 11 languages user interface

#### Cost-effective tool for automated test projects

- LAN, USB and GPIB connectivity
- SCPI remote command set complies with IEEE488.2
- Dedicate NI Labview driver
- Remote language compatibility with Agilent ESA series spectrum analyzer

### Best-in-Class Performance

#### Superior performance

- $\pm 1.5$  dB overall amplitude accuracy (typical  $\pm 0.5$  dB)
- Down to -148 dBm display average noise level (with 10 Hz RBW)
- 10 Hz to 1 MHz RBW in 1-3-10 steps
- -88 dBc/Hz at 10 kHz offset

#### Powerful Features

- One button power suite including channel power, adjacent channel power, inter-modulation, spectrum emission mask and occupied bandwidth
- AM/FM modulation analysis, tune & listen
- Able to analysis ASK/FSK modulated signal, which are most commonly used in consumer electronics
- CISPR EMI filters (-6 dB): 200 Hz, 9 kHz, 120 kHz and 1 MHz
- Support USB memories for data logging and transfer
- 3 GHz tracking generator for transmission test

### Key Options

• N9320B-PA3: 3 GHz pre-amplifier	• N9320B-TG3: 3 GHz tracking generator
• N9320B-AMA: AM/FM demodulation metrics	• N9320B-DAM: ASK/FSK demodulation metrics
• N9320B-EMF: EMI filter	• N9320B-G01: GPIB interface
• N9320B-TR1: RF training kit	• N9320B-1HB: Handle and bumper

## N9320B spectrum analyzer

# Minimize your cost

# Maximize your productivity

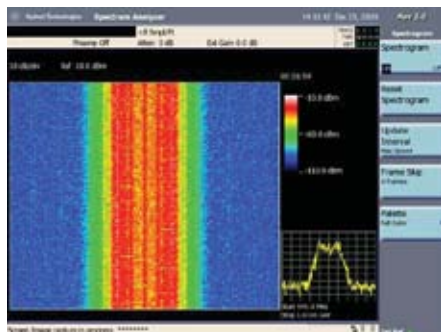


# Agilent N1996A Portable Spectrum Analyzer

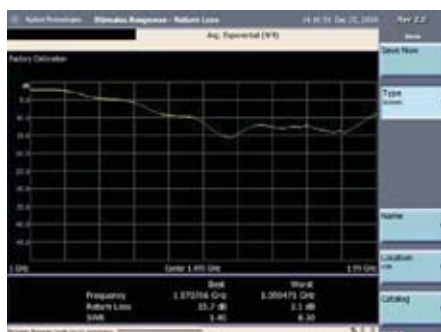
## Choice for General Spectrum Analysis up to 6 GHz



www.agilent.com/find/n1996a



Spectrogram



Stimulus response



Battery pack

### Professional Performance:

- Frequency Range: 100 kHz to 3GHz/6GHz
- Resolution Bandwidth: 10 Hz to 5 MHz
- Display Average Noise Level: -156 dBm/Hz with Pre-amplifier on
- TOI: +18 dBm (typical)
- 1 dB compression: +13 dBm (nominal)
- Phase Noise: -85 dBc/Hz (10 kHz offset)
- Overall Amplitude Accuracy: + 0.5 dB (95% confidence)

### Features and Values:

- Stimulus Response Measurement: with internal bridge and integrated software function, easy to measure S11, S21 and Distance to Fault
- Idea portable Spectrum Analyzer for both bench and field operation: 8.5 kg weight with battery
- Spectrogram for long time spectrum monitoring
- Remote control through LAN: easiest to configure and stable connectivity
- Auto Tune, Auto Scale and Auto Range: most convenient way to configure
- Battery operatable

### Options

- N1996A-503: 100 kHz to 3 GHz Spectrum Analysis
- N1996A-506: 100 kHz to 6 GHz Spectrum Analysis
- N8995A-SR3: Stimulus-response suite, 3 GHz
- N8995A-SR6: Stimulus-response suite, 6 GHz
- N1996A-SRK: Stimulus response calibration kit
- N1996A-AFM: AM/FM Tune and Listen
- N8996A-1FP: AM/FM Demodulation Analysis
- N1996A-271: Spectrogram measurement suite
- N1996A-BAT: Battery pack, 2 pieces
- N1996A-BCG: External battery charger

# Agilent N9330B Cable and Antenna Tester



www.agilent.com/find/n9330b

## Fast test speed and good usability at a competitive price

### Optimized designed for Usability

- Battery with 4 hours operating time
- 6.5" TFT screen with bright display for use indoors and outdoors
- Rugged design for installation and maintenance measurement
- 11 languages user interface

### Increased productivity

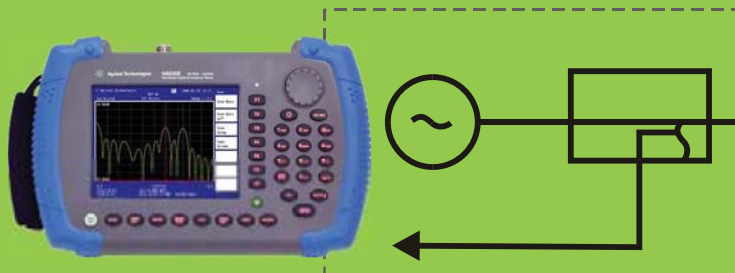
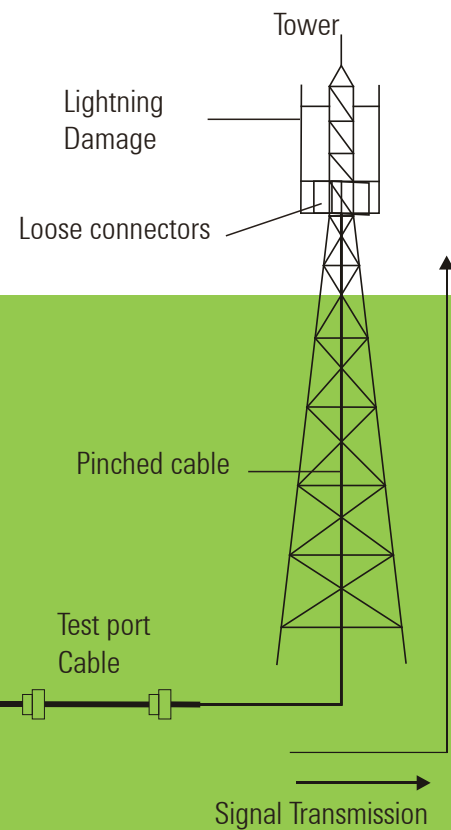
- Modern USB connectivity for unlimited external storage and remote control
- Fast test speed to improve test efficiency
- Pass/fail test with beep on/off

### Fast measurement speed with best performance in class

- Able to measure return loss, SWR, one port cable loss and distance to fault
- Measurement Ranges:
  - Return Loss: 0 to 60 dB
  - SWR: 0 to 65
  - Cable Loss: 0 to 30 dB
- Corrected directivity
  - 38 dB with electrical calibrator
  - 42 dB with mechanical calibrator
- Max sweep points: 521
- Typical 1.6 second @ full span, 521 data points

### N9330B Options

- N9330B-201: Precision mechanical short/open/50ohm load DC-4GHz N M
- N9330B-202: Precision mechanical short/open/50ohm load DC-4GHz 7/16 DIN M
- N9330B-203: Electronic Calibrator
- N9330B-301: Phase stable extension cable 1.5m Nm to N F
- N9330B-302: Phase stable extension cable 1.5m Nm to 7/16 DIN F
- N9330B-303: NM to 7/16 DIN F Adaptor
- N9330B-304: Extended cable 1.5m N (male) – 1N(male)
- N9330B-BAT: Spare Battery Pack



# Agilent N9340B Handheld Spectrum Analyzer

## Built to Perform, Price to Compete



[www.agilent.com/find/n9340b](http://www.agilent.com/find/n9340b)

## Exceptional Usability

### Usability designed for field testing

- 6.5" TFT screen with bright display for use indoors and outdoors
- Back-lit keys for night use
- Battery with 4 hours operating time, ruggedized design for installation and maintenance measurement

### Increased productivity with modern connectivity for remote control and data transfer

- USB, LAN and free PC software for remote control and data transfer, 11-language user interface

## Options

- N9340B-PA3: 3 GHz preamplifier
- N9340B-TG3: 3 GHz tracking generator
- N9340B-INM: Interference monitoring
- N9340B-AMA: AM/FM modulation analysis
- N9340B-DMA: ASK/FSK modulation analysis
- N9340B-XDM: xDSL Measurement
- N9340B-IBC: IBOC Measurement

## Superior Performance

### More powerful features for field applications

- Comprehensive interference analysis capability with spectrogram, to capture, logging and analysis time deviated or transient signal.
- Spectrum emission mask for out-of-channel emission measurement
- USB power sensor support
- Field strength measurement to measure electric field strength and power flux density
- Measurement of occupied bandwidth and channel power
- AM/FM, ASK/FSK modulation analysis (optional)
- Dedicate low frequency channel for high sensitivity test from 3 kHz to 12 MHz.

### Achieve more complete understanding of spectrum, improve networks quality

- Best sensitivity: DANL  $-144$  dBm (with preamp)
- Fastest sweep time: 10 ms min (None-zero span)
- Narrowest resolution bandwidths: 30 Hz  $-1$  MHz in 1-3-10 steps



## Antenna

N9311X-500

Antenna	Frequency range	Antenna gain	Weight	Dimension	Other information
<b>N9311x-500</b>	70 to 1000 MHz	N/A	65 g	113.5 cm (full length), 19.5 cm (retracted), 10 stages	180 degrees tilt angle adjustable, telescopic whip antenna
<b>N9311x-501</b>	700 to 2500 MHz	N/A	70 g	210 x 20 mm	Omni-directional
<b>N9311x-504</b>	700 MHz-4 GHz	4 dBi	270 g	340 x 200 x 25 mm	Logarithmic-periodic
<b>N9311x-508</b>	680 MHz-8 GHz	5 dBi	250 g	340 x 200 x 25 mm	Logarithmic-periodic
<b>N9311x-518</b>	680 MHz-18 GHz	5 dBi	250 g	340 x 200 x 25 mm	Logarithmic-periodic

## Bandpass Filter


N9311X-550

Bandpass filter	3 dB Passband	Rejection	Insertion loss	VSWR
<b>N9311X-550</b>	814 to 850 MHz	≥36 dBc @ 740 MHz ≥36 dBc @ 915 MHz	≤0.5 dB	≤1.5
<b>N9311X-551</b>	880 to 915 MHz	≥35 dBc @ 862 MHz ≥35 dBc @ 932 MHz	≤1 dB	≤1.5
<b>N9311X-552</b>	1707.5 to 1787.5 MHz	≥35 dBc @ 1550 MHz ≥35 dBc @ 1925 MHz	≤0.4 dB	≤1.5
<b>N9311X-553</b>	1845 to 1915 MHz	≥35 dBc @ 1770 MHz ≥35 dBc @ 1986 MHz	≤0.6 dB	≤1.5
<b>N9311X-554</b>	1910 to 1990 MHz	≥35 dBc @ 1825 MHz ≥35 dBc @ 2070 MHz	≤0.6 dB	≤1.5

## Adapter

<p><b>N9311X-545</b></p> <p>Type-N(f) to SMA(m), DC to 12.4 GHz</p> 	<p><b>N9311X-541</b></p> <p>Type-N(m) to SMA(f), DC to 12.4 GHz</p> 	<p><b>N9311X-540</b></p> <p>Type-N(m) to BNC(f), DC to 2 GHz</p> 	<p><b>N9311X-543</b></p> <p>Type-N(f) to BNC(m), DC to 4 GHz</p> 	<p><b>N9311X-542</b></p> <p>Type-N(f) to 7/16 DIN(f), DC to 7.5 GHz</p> 	<p><b>N9311X-544</b></p> <p>Type-N(f) to 7/16 DIN(m), DC to 7.5 GHz</p> 	<p><b>N9311X-546</b></p> <p>Type-N(f) to Type-N(f), DC to 18 GHz</p> 
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## Cable

	<p><b>N9311X-580</b></p> <p>1.5 m, Type-N(m) to type-N(m), DC to 18 GHz</p>	<p><b>N9311X-581</b></p> <p>3.0 m, Type-N(m) to type-N(m), DC to 18 GHz</p>	<p><b>N9311X-582</b></p> <p>1.5 m, Type-SMA(m) to type-SMA(m), DC to 8 GHz</p>	<p><b>N9311X-583</b></p> <p>1.5 m, Type-BNC(m) to type-BNC(m), DC to 1 GHz</p>
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## Attenuator

Attenuator	Attenuation	Port	VSWR	Power rating	Length	Weight
<b>N9311X-560</b>	40 dB	N (m) to N (f)	DC – 4.0 GHz: 1.15 4.0 – 8.5 GHz: 1.2	10 watts average	67.3 mm (2.65 inch)	0.085 kg/3 oz
<b>N9311X-561</b>	40 dB	N (m) to N (f)	DC – 4.0 GHz: 1.2 4.0 – 8.5 GHz: 1.3	50 watts average	111.76 mm (4.37 inch)	0.28 kg/10 oz
<b>N9311X-562</b>	40 dB	N (m) to N (f)	DC – 4.0 GHz: 1.2 4.0 – 8.5 GHz: 1.3	100 watts average	112.01 mm (4.41 inch)	1.5 kg/3.3 lb

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