

**NEW**

**Introducing the  
33210A function/  
arbitrary waveform  
generator**

*See page 6*



**Pay less for high-quality waveforms for your device under test**

- System-ready interfaces with GPIB, USB, and LAN (LXI-C)
- IntuiLink Waveform Editor software included



**Agilent Technologies**

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*Technical data subject to change.*

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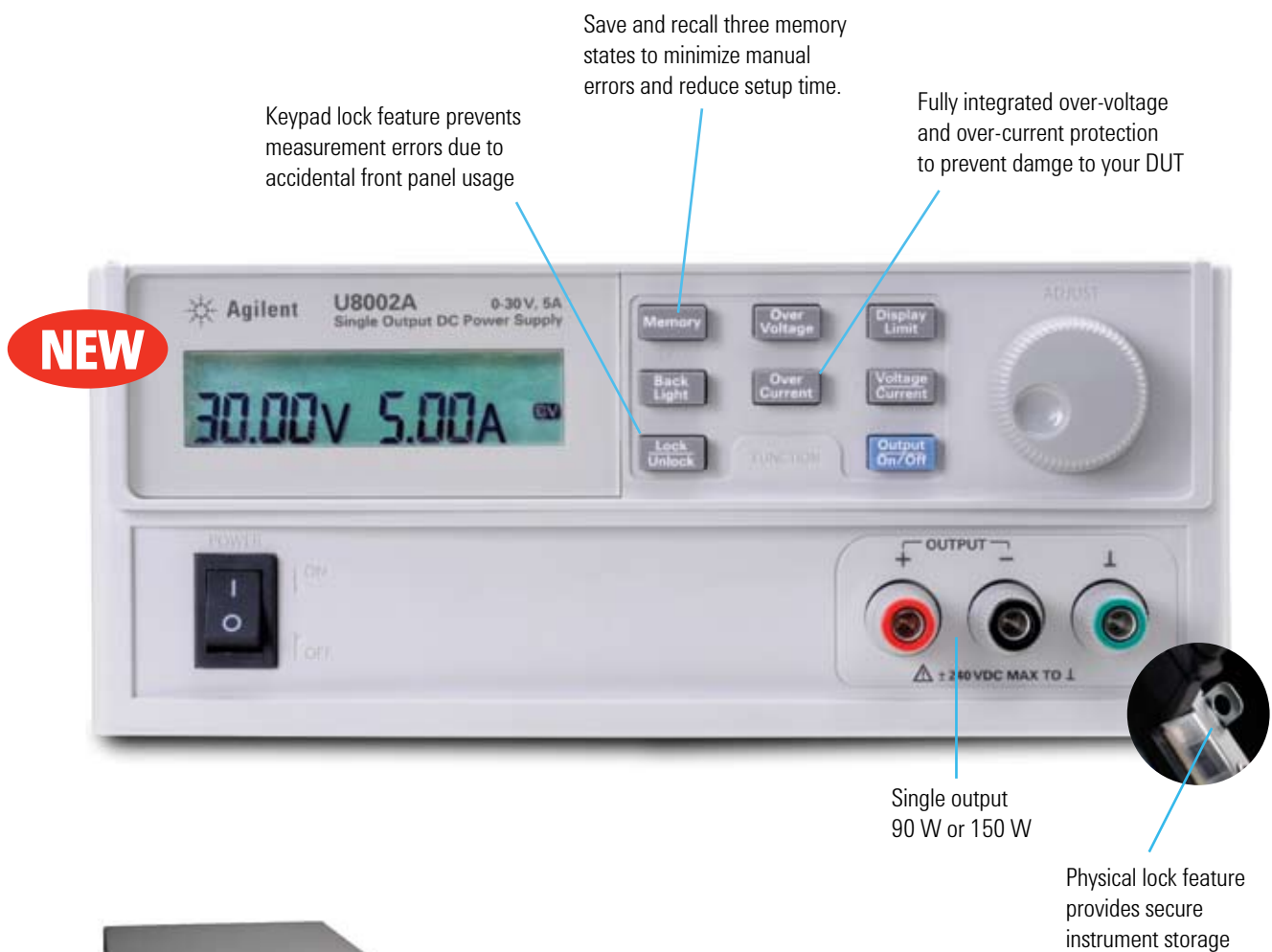
## Agilent U8000 DC power supplies

### Get extra features and functions without spending more

U8000 Series 90- to 150-W single-output, non-programmable DC power supplies include extra features — typically found only in more-expensive supplies. The U8000 Series delivers excellent value for applications in electronics manufacturing and educational settings.

#### Solid, reliable DC power at the right price

- Low output noise (as low as 1 mVrms) minimizes interference into your DUT
- Excellent 0.01% load and line regulation for steady output power levels
- Fast load transient response time (50 msec) reduces test time and manufacturing cost



	GPIB	Output	Range	Voltage	Current	Power
<b>U80001A</b>	N	1	1	30 V	3 A	90 W
<b>U80002A</b>	N	1	1	30 V	5 A	150 W

## Agilent E3600 Family of DC power supplies

### Reliable power, repeatable results

Quiet, stable, reliable DC power. For environments that need to watch test costs as closely as they watch test results.

- Extremely low output noise—as low as 1 mVp-p/0.2mVrms
- Tight 0.01% load and line regulation for steady output power levels
- Fast load transient response time (<50 μs)
- Choice of models from 30 to 200 W output power
- Convenient front-panel programming and/or GPIB and RS-232

### E3610A-17A/20A/30A manual DC power supplies

- Up to 120 V and 6 A—just the power you need
- 30 to 60 W—single, double and triple outputs
- 10-turn pots—make fine adjustments easily

### E3631A-34A programmable DC power supplies

- System-level performance without the high price
- 80 to 200 W—single or triple output for more power options
- Rotary knob and self-guiding keypads—precise adjustments for output resolution



### E3640A-49A programmable DC power supplies

- Remote sensing—eliminate voltage regulation errors due to drop in load leads
- Front and rear output terminals—flexible measurement setup
- Internal non-volatile memory—store and recall setups fast

#### E3610A-17A/20A/30A

	GPIB	Output	Range	Voltage	Current	Power
<b>E3610A</b>	N	1	2	8 V 15 V	3 A 2 A	30 W
<b>E3611A</b>	N	1	2	20 V 35 V	1.5 A 0.85 A	30 W
<b>E3612A</b>	N	1	2	60 V 120 V	0.5 A 0.25 A	30 W
<b>E3614A</b>	N	1	1	8 V	6 A	48 W
<b>E3615A</b>	N	1	1	20 V	3 A	60 W
<b>E3616A</b>	N	1	1	35 V	1.7 A	60 W
<b>E3617A</b>	N	1	1	60 V	1 A	60 W
<b>E3620A</b>	N	2	1	25 V	1 A	50 W
<b>E3630A</b>	N	3	1	6 V 20 V -20 V	2.5 A 0.5 A 0.5 A	35 W

#### E3631A-34A

	GPIB	Output	Range	Voltage	Current	Power
<b>E3631A</b>	Y	3	1	25 V -25 V 6 V	1 A 1 A 5 A	80 W
<b>E3632A</b>	Y	1	2	15 V 30 V	7 A 4 A	120 W
<b>E3633A</b>	Y	1	2	8 V 20 V	20 A 10 A	200 W
<b>E3634A</b>	Y	1	2	25 V 50 V	7 A 4 A	200 W

#### E3640A-49A

	GPIB	Output	Range	Voltage	Current	Power
<b>E3640A</b>	Y	1	2	8 V 20 V	3 A 1.5 A	30 W
<b>E3641A</b>	Y	1	2	35 V 60 V	0.8 A 0.5 A	30 W
<b>E3642A</b>	Y	1	2	8 V 20 V	5 A 2.5 A	50 W
<b>E3643A</b>	Y	1	2	35 V 60 V	1.4 A 0.8 A	50 W
<b>E3644A</b>	Y	1	2	8 V 20 V	8 A 4 A	80 W
<b>E3645A</b>	Y	1	2	35 V 60 V	2.2 A 1.3 A	80 W
<b>E3646A</b>	Y	2	2	8 V 20 V	3 A 1.5 A	60 W
<b>E3647A</b>	Y	2	2	35 V 60 V	0.8 A 0.5 A	60 W
<b>E3648A</b>	Y	2	2	8 V 20 V	5 A 2.5 A	100 W
<b>E3649A</b>	Y	2	2	35 V 60 V	1.4 A 0.8 A	100 W

Agilent makes over 200 models of power supplies — 5 W up to 6.6 kW.

Get more information at [www.agilent.com/find/dcpower](http://www.agilent.com/find/dcpower)



## Agilent N5700 Series system DC power supplies

### Save valuable rack space with these compact, high-power, single-output power supplies

- 24 affordable models in a compact, 1U package to save you rack space
- Multiple I/O interfaces standard — LAN, USB and GPIB — to simplify test-system development
- Easy front-panel operation



750 W Models	
<b>N5741A</b>	6 V, 100 A, 600 W
<b>N5742A</b>	8 V, 90 A, 720 W
<b>N5743A</b>	12.5 V, 60 A, 750 W
<b>N5744A</b>	20 V, 38 A, 760 W
<b>N5745A</b>	30 V, 25 A, 760 W
<b>N5746A</b>	40 V, 19 A, 760 W

1500 W Models	
<b>N5761A</b>	6 V, 180 A, 1080 W
<b>N5762A</b>	8 V, 165 A, 1320 W
<b>N5763A</b>	12.5 V, 120 A, 1500 W
<b>N5764A</b>	20 V, 76 A, 1520 W
<b>N5765A</b>	30 V, 50 A, 1500 W
<b>N5766A</b>	40 V, 38 A, 1520 W

## Agilent N6700 low-profile modular power system

### Squeeze 4 DC power supplies in 1U of rack space with this fast and flexible modular power system

- Multiple-output power supply system lets you mix and match from 22 different 50-W, 100-W, or 300-W DC power modules
- Multiple interfaces standard — LAN, USB and GPIB — to simplify test-system development
- Improve your throughput with fast settling times and fast command processing (<1 ms)



*(Modules must be used with N6700 mainframe, sold separately)*

50 W Models		100 W Models		300 W Models	
<b>N6731B</b>	5 V, 10 A	<b>N6741B</b>	5 V, 20 A	<b>N6773A</b>	20 V, 15 A
<b>N6732B</b>	8 V, 6.25 A	<b>N6742B</b>	8 V, 12.5 A	<b>N6774A</b>	35 V, 8.5 A
<b>N6733B</b>	20 V, 2.5 A	<b>N6743B</b>	20 V, 5 A	<b>N6775A</b>	60 V, 5 A
<b>N6734B</b>	35 V, 1.5 A	<b>N6744B</b>	35 V, 3 A	<b>N6776A</b>	100 V, 3 A
<b>N6735B</b>	60 V, 0.8 A	<b>N6745B</b>	60 V, 1.6 A	<b>N6753A</b>	HiPerform 20 V, 50 A
<b>N6736B</b>	100 V, 0.5 A	<b>N6746B</b>	100 V, 1 A	<b>N6754A</b>	HiPerform 60 V, 20 A
<b>N6751A</b>	HiPerform 50 V, 5 A	<b>N6752A</b>	HiPerform 50 V, 10 A		
<b>N6761A</b>	Precison 50 V, 1.5 A	<b>N6762A</b>	Precison 50 V, 3 A		

### Agilent N6705A DC power analyzer

Gain insights into your DUT's power consumption — in minutes, not hours — without writing a single line of code

- Save time and increase your productivity for sourcing and measuring DC voltage and current into your DUT — this instrument integrates up to four advanced power supplies with DMM, scope, arb, and data logger features
- Tailor the N6705A to meet your needs using the same modules listed for the N6700 (above)



## Buy the function/arbitrary waveform generator that you need—don't sacrifice quality

### Agilent 33200 family function/arbitrary waveform generators

Produce clean, low-distortion signals with THD less than 0.04% and flatness as low as  $\pm 0.1$  dB

**33220A:** Low-cost and full-featured function generator provides arbitrary waveforms at no extra cost. Includes a 64K point arbitrary waveform generator standard as well as sine and square waves up to 20 MHz.

**33250A:** Competitively priced 80-MHz function/arbitrary waveform generator – if you need higher frequency than the 33220A offers



33220A



33250A

Pulse generation with variable edge

Standard waveforms—including sine and square wave, ramp, pulse, noise and burst 10 MHz or 80 MHz

Arbitrary waveforms 2 points to 64 K points at 50 MSa/s or 200 MSa/s  
Optional for the 33210A, standard on the 33220A and 33250A

External frequency reference synchronizes to an external 10 MHz clock or another 33210A, 33220A, 33250A – Optional for the 33210A and 33220A, standard on the 33250A

**NEW**



33210A

Intuitive, task-oriented front panel

LXI

**33210A:** A cost-effective solution that provides low-distortion, highly accurate signals

*Triple versatility; optimum signal fidelity*

**81150A:** Integrated 120 MHz pulse, function/arbitrary waveform and noise generator – three instruments in one – with pulse capabilities, higher bandwidth, 13 standard functions and more than 80 measurements available

- Intrinsic jitter < 8 ps RMS at any frequency
- Flexible noise and selectable crest factor for realistic test signals



81150A

**Helpful selection hints:**

- The new **33210A** offers an entry level basic function generator with the ability to upgrade to an arbitrary waveform generator
- The **33250A** offers the same features as the **33220A** but with a higher frequency range (80 MHz)
- For greater flexibility, consider the **81150A**, which combines the capabilities of a pulse generator, a function/arbitrary waveform generator and a noise generator
- The **81100A** family provides bandwidth to 660 MHz and capabilities for specialty or digital applications

	<b>NEW</b> 33210A	33220A	33250A	81150A
<b>Sine wave frequency</b>	10 MHz	20 MHz	80 MHz	240 MHz
<b>Standard waveforms</b>	Sine, square, ramp, pulse, noise, DC volts	Sine, square, pulse, triangle, ramp, noise, sin(x)/x, exponential rise and fall, cardiac, DC volts		Pulse, sine, square, triangle, sin(x)/x, ramp, noise
<b>Arbitrary waveforms</b>	Optional 8K-points, sin(x)/x, exponential rise and fall, cardiac,	2 to 64 K points		14-bit, 2 GSa/s
<b>Sample rate</b>	50 MSa/s	50 MSa/s	200 MSa/s	2 GSa/s
<b>Modulation</b>	AM, FM PWM, sweep and burst (all internal/external)	AM, FM, PM, FSK, PWM, sweep and burst (all internal/external)	AM, FM, FSK, sweep and burst (all internal/external)	FM, AM, PW, PWM, FSK modulation capabilities up to 10 MHz
<b>Burst</b>	Gated, N-cycle	Gated, N-cycle	Gated, N-cycle	Gated, N-cycle
<b>Noise generation</b>	7 MHz	9 MHz	50 MHz	120 MHz
<b>Pulse width range</b>	40 ns	20 ns	20 ns	4.16 ns (period – 4.16 ns)
<b>Connectivity</b>	GPIB, USB, LAN, LXI class C compliant (IntuiLink software included)	GPIB, USB, LAN, LXI class C compliant (IntuiLink software included)	GPIB/RS-232	GPIB, USB, LAN, LXI class C compliant (IntuiLink software included)

**Agilent 81100A pulse pattern generator family**

**Flexible pulses and patterns for digital designs**

A pulse pattern generator family covering a frequency range from 15 MHz up to 660 MHz. Fully triggerable and with variable width, delay and transition time.

<b>8114A</b>	15 MHz, 100 V/2A
<b>81101A</b>	50 MHz, 10 Vpp
<b>81104A</b>	80 MHz, up to 10 Vpp
<b>81110A</b>	165 MHz/10 V or 330 MHz/3.8 V
<b>81130A</b>	400 MHz/3.8 V or 660 MHz/2.5 V



8114A



81101A

## Lab accuracy at production-line speeds

### Choose the best benchtop DMM for your application

#### 34401A 6½ digit:

##### *The industry-standard DMM*

system capable with configuration rates starting at 26/sec and autorange rate (DCV) >30/sec

- IntuiLink PC connectivity software included, GPIB and RS-232 standard, USB with adaptor, SCPI commands for easy system use
- 1,000 readings/sec in ASCII format across the GPIB bus at 4½ digits continuous

#### 34405A economy DMM:

##### *5½ digits with dual display at an affordable price*

- 16 measurement functions including temperature and capacitance
- 120,000 counts resolution
- 0.025% DC voltage accuracy



5½ digit 34405A

12 measurement functions including 4 W Ohm, continuity and diode test

Store up to 512 readings in internal memory

Limit testing ratio and min/max average



6½ digit 34401A

3 Hz to 300 kHz AC bandwidth

Null allows you to remove lead resistance and other fixed offsets in your measurements

0.0035% 1-year DCV accuracy  
0.06% 1-year ACV accuracy  
01% basic Ohms accuracy

**34410/11A 6½ digit high-performance DMM:**  
*Fast, accurate and affordable bench and system testing*

- Data logger with 50,000 reading non-volatile memory
- Built-in LAN, USB 2.0 and GPIB interfaces standard
- LXI Class C compliant
- Intuilink software included
- 1u high version available for manufacturing applications



6½ digit 34411A

**34420A 7½ digit nanovolt/micro-ohm meter:**  
*High-sensitivity multimeter optimized for low-level measurements*

- 0.1-ppm transfer accuracy
- High sensitivity for low-level measurements
- Low-noise voltage measurements with resistance and temperature functions
- 100 pV / 100 nOhm sensitivity

**3458A high-speed DMM:**  
*Get both high accuracy and high system throughput*

- 0.1-ppm transfer accuracy
- 8-ppm 1 year dcV accuracy, optional 4-ppm
- 0.05 ppm dcV transfer accuracy
- Superior AC voltage measurements

**Helpful selection hints:**

- The **3458A** offers the highest resolution (8½ digits) but is the most expensive model
- **Lower-cost DMMs** do not include the more accurate 4-wire resistance measurements
- If the DMM will be **part of a system**, consider how fast readings can be transferred to the computer
- The **34411A** offers the highest reading speed for a 6½ digit unit (50,000 readings/sec)

	34405A	34401A	34410A	34411A	3458A	34420A
<b>Description</b>	Benchtop DMM, dual display	Benchtop DMM	Benchtop DMM, dual display		Benchtop DMM	Nanovolt/μΩ meter
	Slightly lower performance and price point than 34401A	Industry standard for accuracy, speed, measurement ease and versatility	More measurements, faster readings over the bus than 34401A	Highest throughput of benchtop DMMs, best choice for system use	Highest resolution and accuracy, recognized worldwide as the standard in high-performance DMMs	Very accurate, low-level measurements
<b>Digits of resolution</b>	5 ½	6 ½	6 ½		8 ½	7 ½
<b>Measurement speed (rdgs/s)</b>	19	1,000	10,000	50,000	100,000	250
<b>Basic measurements</b>	DC and AC voltage, DC and AC current, 2-wire Ω, frequency	DC and AC voltage, DC and AC current, 2- and 4-wire resistance, frequency, period and capacitance				DC voltage, 2- and 4-wire Ω, low power Ω, ratio
<b>Temperature</b>	Thermistor	N/A	Thermistor, RTD	Thermistor, RTD	Thermistor, RTD	Direct SPRT, RTD, thermistor, thermocouple
<b>Connectivity</b>	USB 2.0	GPIB, RS-232	LAN, USB 2.0, GPIB, plus LXI class C compliant		GPIB	GPIB, RS-232
	IntuiLink software—provides a toolbar in Microsoft® Word and Excel to import multimeter data for further analysis					IntuiLink software

Microsoft is a U.S. registered trademark of Microsoft Corporation.

## Agilent U1600 Series handheld oscilloscopes

### Get maximum versatility for troubleshooting in the factory or field

Use this full-featured, dual-channel scope with built-in DMM and data logger capability for high-performance troubleshooting on the go.

- Capture glitches easily with flexible triggering and 200 MSa/s sampling rate
- Uncover subtle details with 125 kB memory per channel, zoom functions and large 4½ color LCD display
- Perform quick waveform analysis with waveform math
- Document results easily using the standard USB 2.0 interface

	U1602A	U1604A with FFT math functionality
<b>Bandwidth</b>	20-MHz	40-MHz
<b>Sample rate</b>	200 MSa/s interleaved, 100 MSa/s each channel (50 s/div to 125 ns/div)	200 MSa/s interleaved, 100 MSa/s each channel (50 s/div to 250 ns/div)
<b>Memory depth</b>	125 kilobytes/channel	



## Agilent U1200 Series handheld DMMs

### Check more, fix more, spend less!

These affordable, rugged handhelds put precision measurements in the palm of your hand.

**U1240 Series handheld DMMs** feature true RMS readings on a 10,000-count display. Adjustable backlighting helps you do your job even in subdued lighting conditions, while prolonging battery life.

**U1250 Series handheld DMMs** combine the functions of a full-featured DMM and frequency counter, so you can make temperature measurements and output square waves with one unit. And accessories are included at no extra cost.



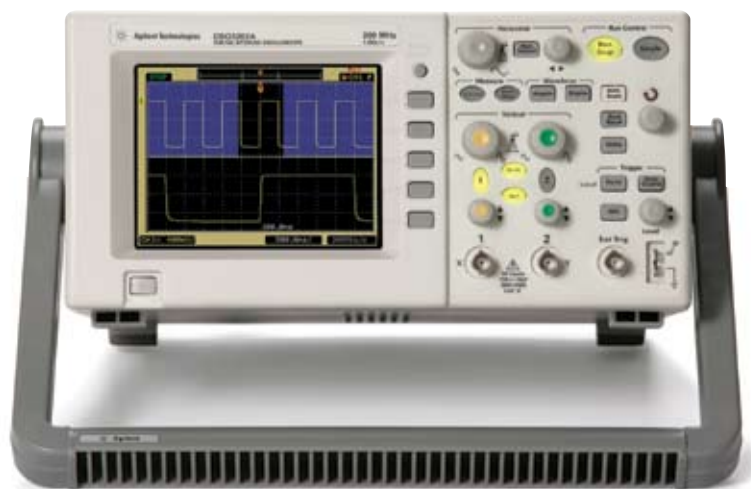
	U1241A	U1242A	U1251A	U1252A
<b>Digits</b>	4	4	4½	4½
<b>Standard functions</b>	Voltage, current, resistance, frequency, continuity with beeper, diode test, min/max, hold		Capacitance, temperature, peak, dB/dBm	
<b>Advanced functions</b>	Harmonic ratio, dual and differential temperature measurements		20 MHz frequency counter, programmable square wave generator	
<b>Accuracy</b>	0.09% basic DC voltage accuracy		Up to 0.025% basic DC voltage accuracy	

## Agilent 3000 Series oscilloscopes

### Full-featured scopes on a budget

The 3000 Series provides deep insight into signal details—without digging deep into your budget.

- Large 15-cm (5.9 in) color display
- Advanced measurement and triggering—edge, pulse-width, and line-selectable video
- 20 automatic measurements
- Segmented memory acquisition
- 5 standard math functions with FFT
- Pass/fail testing based on user-defined masks
- Digitally filter unwanted portions of input signals
- 3-year standard warranty



	DSO3062A	DSO3102A	DSO3152A	DSO3202A
<b>Bandwidth</b>	60 MHz	100 MHz	150 MHz	200 MHz
<b>Channels</b>	2			
<b>Sampling rate</b>	1 GSa/s (1 channel), 500 MSa/s (2 channels)			
<b>Memory</b>	4 kpts per channel			
<b>Connectivity</b>	USB*, GPIB and RS-232 optional			

\* USB device standard; USB host optional with module N2865A

## Oscilloscope probes

### Get the most from your oscilloscope

Using the right probe is the first step in making reliable measurements. For every oscilloscope we sell, we offer a variety of different probes, each with different strengths. To get the best performance from your oscilloscope, choose the right probes for your applications.

### Recommended probes for Agilent oscilloscopes

	U1600 Series	3000 Series		5000 Series		6000/7000 Series	
<b>Scope bandwidth</b>	20-40 MHz	60-150 MHz	200 MHz	100-300 MHz	500 MHz	100 MHz	300 MHz-1 GHz
<b>Probe interface</b>	BNC	BNC		AutoProbe Lite		BNC	AutoProbe Lite
<b>Passive probe 1:1</b>	U1560A			10070C			
<b>Passive probe 10:1</b>	U1561A	N2862A	N2863A	N2863A	10073C 1165A, 1171A	10074C	10073C 1165A, 1171A
<b>High-voltage passive probe 100:1</b>	U1562A			10076C			
<b>High-voltage passive probe 1000:1</b>				N2771A			
<b>Low Z</b>				1163A			
<b>Active single-ended probe</b>				1144A*	1156A 1145A* 1144A*	1156A, 1144A* or 1130A with SE probe accessory	
<b>Active differential probe (high speed)</b>		1144A*		1144A*	1130A* 1141A*	1130A* or 1141A*	
<b>Active differential probe (high voltage)</b>				N2771A*			
<b>Current probe</b>		1146A, N2780A/81A/82A/83A*		1146A 1147A, N2780A/81A/82A/83A*		1146A, N2780A/81A/ 82A/83A*	1146A, N2780A/81A/ 82A/83A*

\* Requires additional accessories

## Agilent InfiniiVision Series Oscilloscopes

### Engineered for the best signal visibility

*Thanks to MegaZoom III technology, every InfiniiVision scope provides responsive deep memory allowing you to see subtle signal details and infrequent events that other scopes miss.*

### All InfiniiVision 5000, 6000, and 7000 Series scopes feature:

- Patented MegaZoom III designed to uncover elusive details by capturing up to 100,000 deep-memory waveforms per second
- Responsive deep memory
- Standard 3-year warranty
- XGA display with 256 intensity levels to show subtle signal detail
- XVGA out standard, USB, LAN
- Wide range of applications—see table below

# InfiniiVision

### Agilent InfiniiVision 7000 Series oscilloscopes

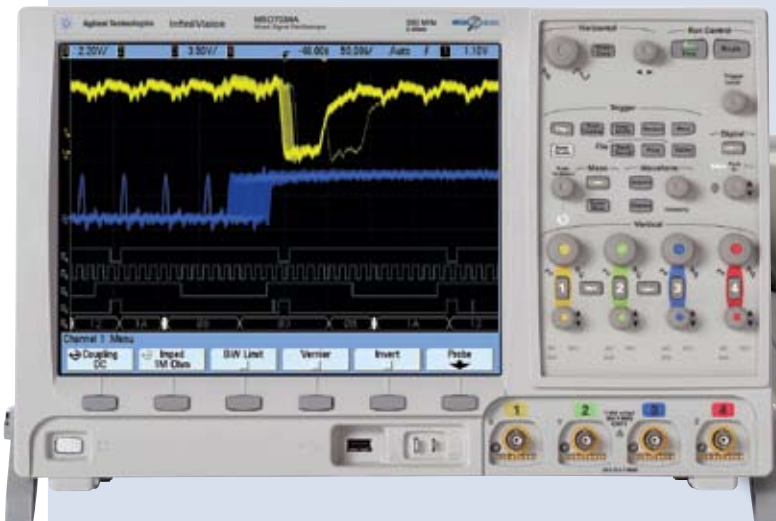
*Engineered for the best signal visibility*

- 12.1" display—nearly 40% larger than the nearest competitor
- DSO and MSO models from 350 MHz to 1 GHz for analog, digital or serial measurements
- 8 Mpts memory standard

### Agilent InfiniiVision 6000 Series oscilloscopes

*Integrated measurements for analog, digital, and serial designs*

- DSO and MSO models from 100 MHz to 1 GHz for analog, digital, or serial measurements
- Battery option
- 8 Mpts memory standard
- 1U high version available for manufacturing applications



7000 Series



6000 Series

## Agilent Infiniium 8000 Series oscilloscopes

### *Deep signal analysis for superior insight*

Measure a huge variety of signal types and speeds to address a range of analog, digital and serial design challenges. Ideal for mixed-signal and embedded designs incorporating SDRAM, FPGAs, microprocessors and DSPs.



## Agilent InfiniiVision 5000 Series oscilloscopes

### *Affordable performance in a compact package*

- DSO models from 100 MHz to 500 MHz for analog and/or serial measurements
- Compact form factor with GPIB
- Up to 8 Mpts memory



5000 Series

### Gain even greater insight into your problem with powerful

# InfiniiVision

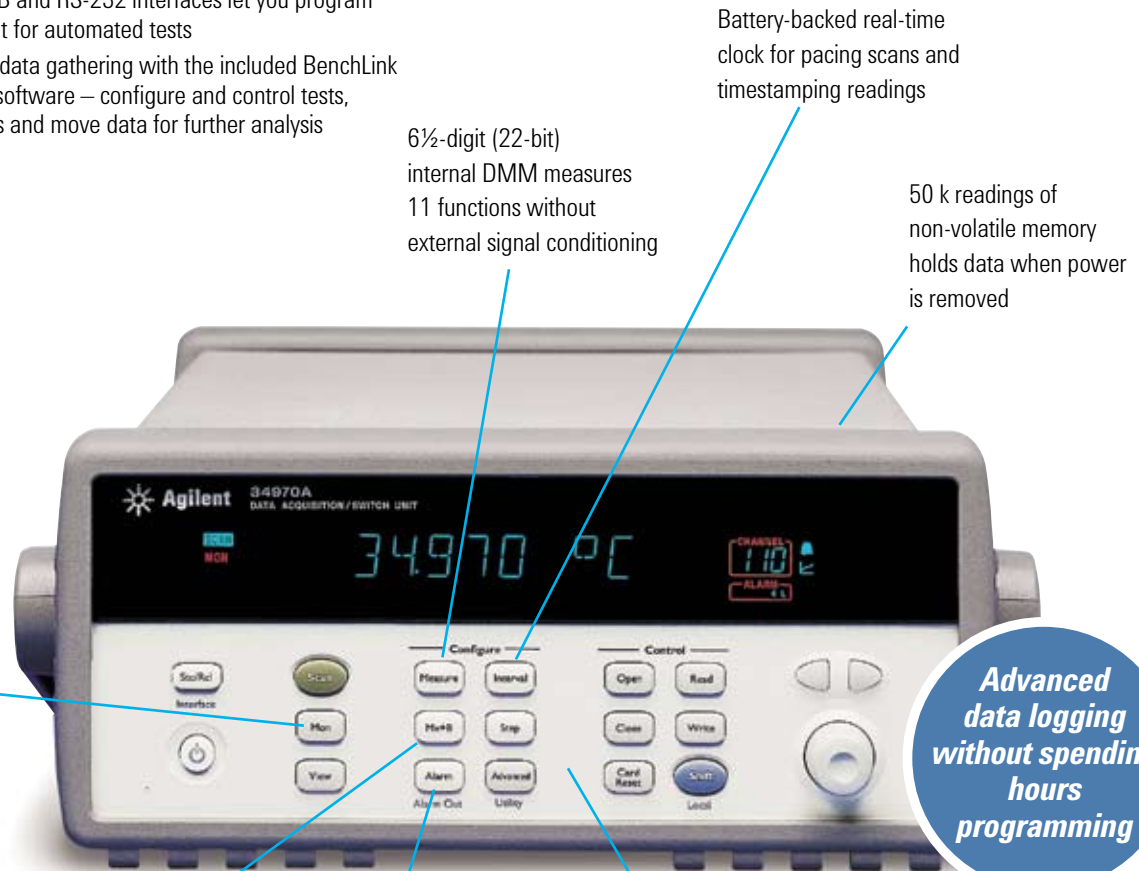
## applications

Model	Description	5000	6000	7000
<b>B4610A</b>	Offline viewing	X	X	X
<b>N5406A</b>	Xilinx FPGA dynamic probe		MSO	MSO
<b>N5423A</b>	I <sup>2</sup> C/SPI serial trigger and decode	4 ch	4 ch	4 ch
<b>N5424A</b>	CAN/LIN triggering and decode	4 ch	4 ch	4 ch
<b>N5432A</b>	FlexRay triggering and decode		MSO	MSO
<b>N5434A</b>	Altera FPGA dynamic probe		MSO	MSO
<b>N5454A</b>	Segmented memory	X	X	X
<b>N5457A</b>	RS-232/UART serial decode and trigger	4 ch	4 ch	4 ch
<b>U1881A</b>	Power measurement		X	X
<b>89601A</b>	Vector signal analysis		X	X

## Agilent 34970A data acquisition/switch unit

### Agilent performance at a fraction of the cost of other standalone data acquisition systems

- Get the flexibility you need with a 3-slot mainframe and your choice of 8 plug-in modules
- Standard GPIB and RS-232 interfaces let you program the instrument for automated tests
- Simplify your data gathering with the included BenchLink Data Logger software – configure and control tests, display results and move data for further analysis



For a convenient way to collect and analyze your data, expand the capabilities of Agilent 34970A data acquisition/switch units with **Agilent BenchLink 34830A Data Logger Pro software**

#### Eight modules to choose from:

	34901A	34902A	34903A	34904A	34905A	34906A	34907A			34908A
<b>Description</b>	20-channel multiplexer	16-channel multiplexer	20-channel actuator/GP switch	4x8 matrix	Dual 4-channel RF mux, 50 Ω	Dual 4-channel RF mux, 75 Ω	Multifunction module			40-channel single-ended
<b>Type</b>	2-wire armature (4-wire selectable)	2-wire reed (4-wire selectable)	SPDT/Form C	2-wire armature	Common low (unterminated)	Common low (unterminated)	Two 8-bit digital I/O ports	26-bit, 100-kHz event counter	Two 16-bit analog outputs	40-channel single-ended multiplexer
<b>Speed (ch/sec)</b>	60	250	120	120	60	60	N/A	N/A	N/A	60
<b>Max voltage</b>	300 V	300 V	300 V	300 V	42 V	42 V	42 V	42 V	±12 V	300 V
<b>Max current</b>	1 A	50 mA	1 A	1 A	0.7 A	0.7 A	400 mA	N/A	10 mA	1 A

## Agilent 34980A multifunction data acquisition switch/measure unit

### A compact platform at a compact price

This eight-slot mainframe includes a choice of 21 optional plug-in modules for custom configurations. This one-box solution is ideal for medium to high-density switch/measure applications in design verification, automated test and data acquisition applications.

- High-performance switching—up to 560 2-wire multiplexer channels or 1024 matrix cross-points in one mainframe
- Optional built-in 6½-digit DMM—make 11 measurements with more than 3000 readings/sec
- Built-in Ethernet, USB 2.0, and GPIB
- BenchLink Data Logger software (34826A) for high-speed data logging with no programming



LXI

### 21 modules to choose from:

Model	Description	Key specifications
34921A-25A	Multiplexers	Up to 300 V/1 A
34931A-33A	Matrix switches	Up to 128 crosspoints
34934A <b>NEW</b>	High-density switch	512-crosspoint reed matrix
34939A <b>NEW</b>	High-density switch	64-channel Form A channels up to 10 W
34937A/38A	GP switches	1A and 5A
34941A/42A	RF switches	50 to 75 Ohms
34945	µW switch/attenuation driver	Drive 64 coils
34946A/47A <b>NEW</b>	µW switches	SPDT switch to 20 GHz, 1- or 2-wire configurations
34950A-34959A	System control	D/A, DIO, Counter & breadboard to choose from



**Advanced  
data logging  
without spending  
hours  
programming**

For a convenient way to collect and analyze your data, expand the capabilities of Agilent 34980A data acquisition/switch units with **Agilent BenchLink 34832A Data Logger Pro software**

## Agilent 53131A universal frequency counter

### Fast, precise measurements and a host of high-end features at an affordable price

- Make accurate measurements quickly and easily with the intuitive interface and one-button access to frequently used functions
- Real-time digital signal processing for higher resolution measurements in a fraction of the time it takes other counters
- Automated limit tests and one-button measurement setups for fast, easy operation
- Choose an optional third channel for measurements up to 12.4 GHz.



## Additional Agilent frequency counters

### Agilent 53132A universal frequency counter

For applications requiring higher resolution than the 53131A

- Up to 12-digits/sec frequency resolution and 150-ps time interval resolution
- Advanced arming mode for time interval measurements

### Agilent 53181A RF frequency counter

An easy-to-use counter that's optimized for RF applications

- Digit-blanking function lets you easily eliminate unnecessary digits when you want to read measurements quickly
- For higher-frequency measurements, choose an optional second channel that provides measurements up to 1.5 GHz, 3 GHz, 5 GHz, or 12.4 GHz

Model	53131A	53132A	53181A
<b>Type</b>	2 Channel* Universal; optional 3rd Channel		1 Channel RF; optional 2nd Channel
<b>Measurements</b>	Frequency, frequency ratio, time interval, period, rise/fall time, positive/negative pulse width, duty cycle, phase, totalize, peak voltage, time interval average, time interval delay		Frequency, frequency ratio (with optional Channel 2), period, peak voltage
<b>Analysis</b>	Automatic limit testing, math (scale and offset), statistics (minimum, maximum, mean, standard deviation)		
<b>Frequency range (optional)</b>	DC to 225 MHz (3, 5 or 12.4 GHz)	DC to 225 MHz (3, 5 or 12.4 GHz)	DC to 225 MHz (1.5, 3, 5 or 12.4 GHz)
<b>Resolution (frequency, time interval)</b>	10 digits/s, 500 ps	12 digits/s, 150 ps	10 digits/s, RF
<b>Connectivity</b>	Standard IntuiLink software, GPIB, and RS-232 (print only)		

\* Channel 2 can only be used to make frequency, period, ratio, and voltage measurements – measurements on Channel 1 and Channel 2 are made sequentially.

## GPIB, LAN and USB tools for PC/instrument connectivity

### The easiest way to plug instruments into the work environment

#### CONVERTERS

Mix and match virtually any combination of instruments and interfaces.

You can establish error-free connections in less than 15 minutes using Agilent IO Libraries Suite.

From...	To converter...	To PC via...	Features
GPIB...	▶ <b>Agilent 82357B USB/GPIB interface</b>	▶ ...USB	<ul style="list-style-type: none"> <li>• High-speed USB 2.0 with auto configuration</li> <li>• GPIB transfer rate of more than 1.15 MB/s</li> <li>• Connect to up to 14 instruments</li> </ul>
GPIB...	▶ <b>Agilent E5810A LAN/GPIB gateway</b>	▶ ...LAN	<ul style="list-style-type: none"> <li>• Share equipment and collaborate globally</li> <li>• 10BASE-T/100BASE-TX LAN for remote control of GPIB instruments</li> <li>• Digital display and built-in Web browser for easy setup/configuration</li> </ul>
GPIB...	▶ <b>Agilent E5813A networked 5-port USB hub</b>	▶ ...USB	<ul style="list-style-type: none"> <li>• Connect USB devices anywhere on the LAN</li> <li>• Eliminates 5-meter distance limitation for USB</li> <li>• No switches to set, no PC cards to install</li> </ul>

#### GPIB CARDS

Easily control instruments and exchange data with maximum throughput

##### Agilent 82350B PCI high-performance GPIB interface card

<b>Speed</b>	Built-in buffering: speeds up to 900 KB/s
<b>Size</b>	Full PCI height
<b>Power</b>	5 V

##### Agilent 82351A PCIe™-GPIB interface card

<b>Speed</b>	1.4 MB/s transfer rate
<b>Size</b>	Compact half-height
<b>Power</b>	3.3 V



#### GPIB CABLES




Easily connect your GPIB instruments with a PC GPIB interface using reliable and durable Agilent GPIB cables. These cables are available in various lengths ranging from 0.5 meter (1.6 ft) to 8 meters (26.2 ft). Daisy-chain multiple cables together if necessary.

##### 10833A/B/C/D/F or G GPIB Cables



## Low Cost Spectrum Analyzers

Choose from a growing selection of portable, low-cost instruments

	<b>N9320B spectrum analyzer</b>	<b>N9340B handheld spectrum analyzer</b>	<b>N1996 CSA spectrum analyzer</b>
	Basic and affordable spectrum analyzer offering the performance and speed best in its class, boosts productivity and reduces cost for you 	Optimized for field use, superior performance with lowest DANL, narrowest minimum RBW and fastest test speed in its class 	Basic spectrum analyzer covering broadest frequency range from 100 kHz to 6 GHz, with built in VSWR bridge and powerful stimulus response measurement suite 
<b>Frequency range</b>	9 kHz to 3 GHz	100 kHz to 3 GHz	100 kHz to 6 GHz
<b>Resolution bandwidth (RBW)</b>	10 Hz to 1 MHz	30 Hz to 1 MHz in 1-3-10 sequence	10 Hz to 5 MHz
<b>DANL</b>	-130 dBm -148 dBm w/preamp	-144 dBm w/preamp	-156 dBm w/preamp
<b>TOI</b>	+13 dBm	+10 dBm at 200 kHz offset	+18 dBm

### N9320B spectrum analyzer

**Professional performance, compact size and unbeatable value**

Now get improved measurement reliability and new features to make your job easier with the N9320B, the optimized basic spectrum analyzer for effective and accurate measurements

- Overall amplitude accuracy:  $<\pm 1.5$  dB
- Minimum non-zero span sweep:  $<10$  ms
- Optional tracking generator: 100 kHz to 3 GHz
- Optional AM/FM demodulation
- Power meter function with Agilent U2000 series USB power sensor support
- LAN and USB connectivity, with optional GPIB interface
- Multi-language user interface: 11 languages



Pair the N9320B spectrum analyzer with an N9310A signal generator.

**See page 20 for details.**

## N9340B 3-GHz handheld spectrum analyzer

### New bright display and powerful features for testing in the field

If you need a reliable, accurate and detailed picture of your spectrum, put the speed and performance of Agilent spectrum analysis to work.

#### Exceptional usability

- 6.5" TFT color screen with bright display for use in all lighting conditions
- Back-lit keys for night use
- 4 hours of continuous battery operation – recharge or swap the battery in the field
- Modern USB and LAN connectivity for data transfer and remote control

#### Superior performance and powerful features

- Lowest DANL and narrowest RBW in its class
- Optional AM/FM and ASK/FSK modulation analysis
- 1-button power measurements: channel power, OBW, and ACPR



## N1996A Agilent CSA spectrum analyzers

### Price, performance, portability... PERFECT

The N1996A combines low price, great performance, and a highly portable design that takes quality measurements anywhere, anytime.

- Best-in-class usable dynamic range
- Two models: 100 kHz to 3 or 6 GHz
- Wide range of video bandwidths
- Adjustable sweep time
- Enhanced channel power measurements for radio standards analysis
- 2 hours of continuous battery operation
- Only 7.5 kg (16.5 lbs)
- Many options available to customize your spectrum analyzer



## Agilent N9310A signal generator

### Capability, reliability and affordability for generating CW and modulated RF signals

- Ideal for benchtop R&D, education, field measurements, and signal monitoring and manufacturing
- Rugged body, lightweight frame, large display and full-size front panel
- Standard USB connectivity for test automation and memory stick support
- 9 kHz to 3 GHz frequency coverage with 0.1 Hz resolution
- Wide bandwidth (40 MHz) IQ modulator for generating digital modulated signals from your own custom IQ signals



### Pair the N9310A signal generator with the N9320B spectrum analyzer to maximize your productivity, minimize your cost.

- Both start at 9 kHz to meet EMC testing requirements
- Both are easy to use with additional functionality built in

**The N9320B spectrum analyzer** offers built-in one button measurements for Channel power, ACPR, SEM, OBW, TOI.

**The N9310A signal generator** has built-in analog modulation capabilities to generate modulated AM, FM, QM and pulse signals easily. Add the optional analog IQ input capability and generate complex IQ modulated signals such as GSM, CDMA and OFDM signals from custom IQ inputs.



## Agilent E4418B/19B power meter

### Make accurate CW and average power measurements faster and more affordably

- Accelerate tests with faster range switching and measurement throughput up to 200 readings/s over GPIB
- Simple operation via uncluttered front panel
- Optional battery operation for field use



### Additional power meters and sensors

#### EPM-P Series power meters (E4416A/17A)

Advanced capabilities for advanced power measurements

- Accurately profile complex modulation formats of up to 5 MHz video bandwidth with 20 M-samples per second continuous sampling rate
- PC software included for power and statistical analysis
- High throughput—up to 1,000 corrected readings/s via GPIB

#### P-Series power meters (N1911A/12A)

Accurate, fast and repeatable power measurements for R&D and manufacturing environments

- Ideal for aerospace/defense, wireless communications and wireless 802.11a/b/g networking
- Capture single-shot and repetitive events over a wide bandwidth with 30-MHz video bandwidth and 100 Msamples per second continuous sampling capability
- Comprehensive power, time, and statistical measurements

#### Agilent power sensors

Stable, repeatable measurements for a wide variety of applications

- **NEW N8480-Series family:** Thermocouple-based sensors offer exceptional accuracy and superior usability
  - Built-in EEPROM feature for ease of use
  - Extended dynamic range of 5 dB at lower range
  - Improved linearity and accuracy
  - Backward compatibility with EPM, EPM-P and P-Series power meters
- **8480 family:** Average power using both diode and thermocouple technology
- **E-Series family:** Includes E441x wide dynamic range CW sensors, E9300 wide dynamic range average power sensors, E9320 peak and average power sensors
- **P-Series family:** Peak and average power measurements of wide-bandwidth modulated signals using diode technology

Model number	Number of channels	Frequency range	<b>NEW</b> N8480-Series sensors	P-Series sensors	E-Series E9320 sensor	E-Series E9300 sensors	E-Series CW sensors	8480 Series sensors	Standard interfaces
E4416A	1	9 kHz to 110 GHz	-35 dbm to +20 dBm	N/A	-65 dBm to +20 dBm	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, RS-232
E4417A	2	9 kHz to 110 GHz	-35 dbm to +20 dBm	N/A	-65 dBm to +20 dBm	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, RS-232
E4418B	1	9 kHz to 110 GHz	-35 dbm to +20 dBm	N/A	N/A	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, RS-232
E4419B	2	9 kHz to 110 GHz	-35 dbm to +20 dBm	N/A	N/A	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, RS-232
N1911A	1	9 kHz to 110 GHz	-35 dbm to +20 dBm	-35 dBm to +20 dBm	-65 dBm to +20 dBm	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, LAN, USB
N1912A	2	9 kHz to 110 GHz	-35 dbm to +20 dBm	-35 dBm to +20 dBm	-65 dBm to +20 dBm	-60 dBm to +44 dBm	-70 dBm to +20 dBm	-70 dBm to +44 dBm	GPIB, LAN, USB

## Agilent U2000 Series USB power sensors

### Fast, accurate measurements over long distances

Travel light, save space, and get measurements on the go. The U2000 Series provides fast average-power measurements from RF and microwave devices over long cables via the USB port—no separate power meter required.

- Precision power sensors plug directly into PC- or USB-enabled Agilent instruments (with firmware upgrade)
- Simple setup via USB plug-and-play—no external power needed
- Long-distance measurements using USB-to-LAN hub internal zeroing without disconnecting the DUT—Up to 250 average power readings per second
- >1,000 readings/sec average power measurement under-buffer mode
- Accuracy: < 0.12 dB (50 MHz at 0 dBm)
- Now compatible with handheld spectrum analyzer turning it into an accuracy power meter particularly useful for installation and maintenance.



### High-power USB average-power sensors

- Enhanced firmware enables time-gated measurements and frequency sweeping (free and self-upgrade firmware for existing USB power sensor users)
- Built-in attenuator to enable power measurement up to +44 dBm. Eliminates the use of external attenuator and improve mismatch.

**NEW**



Model	Frequency range	Power range	Connector type
U2000A	10 MHz to 18 GHz	-60 dBm to +20 dBm	Type-N
U2000B	10 MHz to 18 GHz	-30 dBm to +44dBm	Type-N
U2000H	10 MHz to 18 GHz	-50 dBm to +30dBm	Type-N
U2001A	10 MHz to 6 GHz	-60 dBm to +20 dBm	Type-N
U2001B	10 MHz to 6 GHz	-30 dBm to +44dBm	Type-N
U2001H	10 MHz to 6 GHz	-50 dBm to +30dBm	Type-N
U2002A	50 MHz to 24 GHz	-60 dBm to +20 dBm	3.5 mm
U2002H	50 MHz to 24 GHz	-50 dBm to +30dBm	3.5 mm
U2004A	9 kHz to 6 GHz	-60 dBm to +20 dBm	Type-N

## Agilent RF and microwave test accessories

### Over 200 accessories—the key to getting great performance, accuracy, and flexibility

#### Agilent J7211A/B/C attenuation control unit

Highly accurate and automated measurements for benchtop and ATE applications of attenuators



#### Attenuators

##### 32 models for signal conditioning and control

- Long operating life—5 million cycles
- RF repeatability 0.03 dB
- Average power: 1 W, 2 W, 25 W

#### Agilent 11713B/C switch driver

Remote or front-panel drive control for programmable attenuators and electromechanical or solid state switches

#### L-Series electromechanical switches

##### Reliable, economical switching with low insertion loss

- 0.03 dB insertion loss repeatability—guaranteed for 2 million cycles
- Excellent isolation, typically >80 dB at 26.5 GHz



Model	Frequency range	Type	Attenuation
<b>8490G</b>	DC to 67 GHz	Fixed	3, 6, 10, 20, 30, 40 dB
<b>8491A</b>	DC to 12.4 GHz	Fixed	3, 6, 10, 20, 30, 40, 50, 60 dB
<b>8494B</b>	DC to 18 GHz	Manual	0 to 11 dB, 1 dB steps
<b>8496B</b>	DC to 18 GHz	Manual	0 to 110 dB, 10 dB steps
<b>8494H</b>	DC to 18 GHz	Programmable	0 to 11 dB, 1 dB steps
<b>8496H</b>	DC to 18 GHz	Programmable	0 to 110 dB, 10 dB steps

Model	Frequency range	Type	Connector
<b>L7104A/B/C</b>	DC to 4/20/26.5 GHz	Terminated/SP4T	SMA (f)
<b>L7106A/B/C</b>	DC to 4/20/26.5 GHz	Terminated/SP6T	SMA (f)
<b>L7204A/B/C</b>	DC to 4/20/26.5 GHz	Unterminated/SP4T	SMA (f)
<b>L7206A/B/C</b>	DC to 4/20/26.5 GHz	Unterminated/SP6T	SMA (f)
<b>L7222C</b>	DC to 26.5 GHz	Transfer	SMA (f)

## LCR Resistance Meter

### Agilent E4980A precision LCR meter

#### Precise, reliable, high-speed test for both high and low impedance measurements

- Five times faster than the Agilent 4284A LCR meter
- Make accurate, repeatable measurements from 20 Hz to 2 MHz

#### Simple and intuitive operation

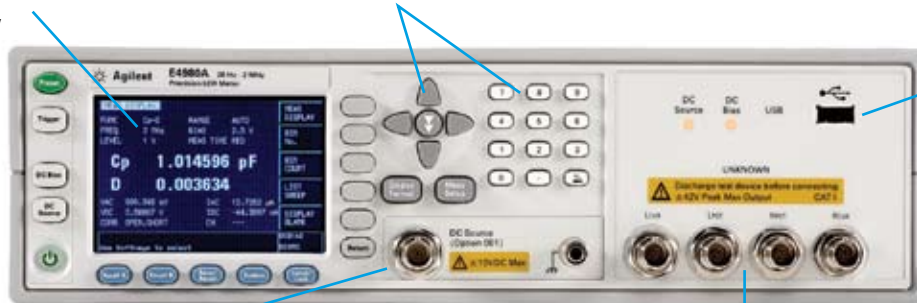
Easily configure measurements with soft keys (same interface as Agilent 4284A) and one-touch front panel keys

#### USB interface

(memory devices only)  
Easily save measurement states, data logs, and screen captures to USB memory devices

#### High-resolution LCD display

Full, 7-digit display and 6 display modes for clear and easy viewing



#### DC source

Low-noise DC source port provides more measurement flexibility, and enables a one-box solution, making an additional DC source or multimeter unnecessary. 0 to ±10 V

#### 100 μV to 2 Vrms/20 Vrms variable test signals

Provides high signal levels to evaluate AC voltage characteristics

# Professional performance, compact size and unbeatable value

# N9320B

Built to perform  
Priced to compete

kHz ~ 3 GHz



Now get improved measurement reliability and new features to make your job easier with the N9320B spectrum analyzer.

- Frequency range: 9 kHz to 3 GHz
- Minimum non-zero span sweep: < 10 ms
- Resolution bandwidth (RBW): 10 Hz – 1 MHz
- Overall amplitude accuracy:  $\pm 1.5$  dB

Find out how to make your RF tests better, faster, and more affordably with the ideal combo: the N9320B and N9310A signal generator.

See pages 18 and 20.

## Agilent Authorized Distributors

The confidence of Agilent quality and support with the convenience of local, personalized service

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