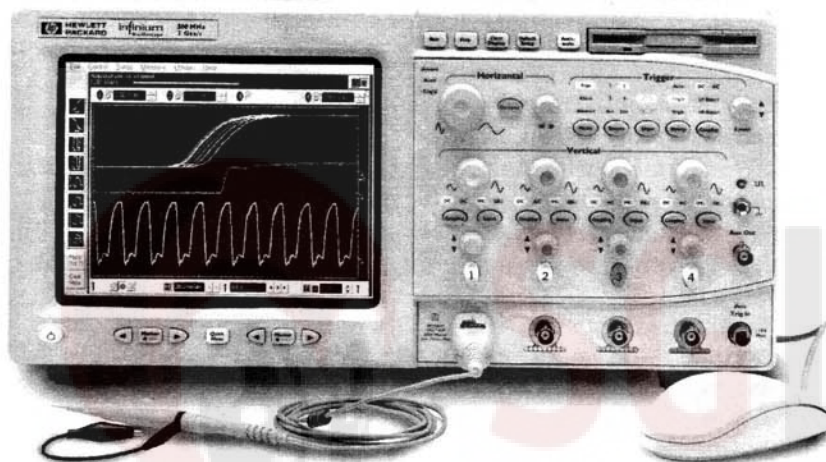




HP 54810/15/20/25/45A Infinium Oscilloscopes

Technical Data



Performance you can use

- 500-MHz to 1.5-GHz bandwidth
- 2- or 4-channel models
- Up to 8-GSa/s sample rates
- Simple, analog-like front panel
- Windows®95-based graphical user interface
- Built-in information system
- LAN printing and file sharing

HP Infinium Oscilloscopes combine a simple, analog-like front panel, the graphical user interface of a PC and a built-in information system to make high-performance features accessible and uncomplicated. We call it usable performance. We think you'll call it a significant improvement.

Simple Analog-like Front Panel

Infinium high-performance oscilloscopes give you the simple, uncluttered front panel of an analog scope for accessing basic functions. Dedicated scale and position knobs for each vertical channel provide intuitive operation. Trigger LEDs show you trigger status at a glance. To speed up measurements, the QuickMeas key gives you instant access to any four measurements.

The Default Setup key returns the scope to a known state with one touch - a valuable feature if you share a scope.

Standard Graphical User Interface

Infinium Oscilloscopes employ a graphical user interface based on Windows 95. Because this is a familiar and intuitive user interface, you won't have to spend a lot of time learning and relearning the scope. Pull-down menus give you easy access to advanced features. Dialog boxes display all the choices you need to make for measurement setups.

Drag and Drop Measurements

Just drag and drop an icon from the measurement toolbar onto the

portion of the waveform you want to measure and the measurement appears instantly on screen.

Direct Manipulation

Waveforms and markers can be easily moved using simple drag and drop mouse operations. Just click on the waveform or marker you want to move, drag it to the new location and drop it! No cumbersome selection through softkeys.

Easy Zooming

Infinium's graphical user interface gives you a new, easier way to zoom. Use the mouse to draw a box around the section of the waveform that you want to expand, then click inside the box to zoom in on the area of interest.

Built-in Information System

Infinium's built-in information system puts measurement assistance at your fingertips – in six different languages (English, French, German, Japanese, Korean and Chinese - for Taiwan). You'll no longer have to look for the manual when you need help setting up scope functions or making complex measurements. The Setup Guide gives you step-by-step instructions for 24 different measurements and procedures. In addition, you'll find a thorough index of help topics and context-sensitive help available from the dialog boxes.

New Triggering

Infinium Oscilloscopes include HP Violation Trigger technology, based on a new trigger IC developed specifically for Infinium. In addition to standard trigger modes, such as edge, glitch, display, logic, state and video, HP's Violation Trigger technology adds trigger capabilities such as rise time trigger, fall time trigger, setup and hold time trigger, and runt trigger.

Waveform Math with FFTs

Infinium Oscilloscopes have 12 math functions, including Fast Fourier Transforms. Use FFTs to help identify noise or other interference.

Extra-Large Display

Infinium's high-resolution color display has a waveform viewing area more than double that of many products in its class. Connect the scope to a VGA monitor for an even larger view of your waveforms.

Display Annotation

Add labels to the display to identify waveforms, annotate setups, or provide operator instructions.

Internal Hard and Floppy Disk Drives

Documentation is simple with built-in disk drives. Use the internal 1.4 Gbyte hard drive or the 3.5" MS-DOS compatible floppy disk drive to store waveforms, instrument setups, or screen images. Images can be stored as BMP, EPS, GIF, PCX, or PS files for easy import into various programs for documentation or further analysis.

Standard Interfaces

LAN, HP-IB, RS-232, and Centronics interfaces are standard features. LAN allows you to transfer files or use network printers with the same ease as when you do these tasks on your PC. Infinium Oscilloscopes are fully HP-IB programmable.

Printer Support

Use any printer that has a Windows 95 driver. In fact, Infinium has hundreds of pre-loaded drivers for printers from over 40 different manufacturers! And new drivers can be loaded from a floppy disk.

Infinium Accessories

A complete line of accessories is available with Infinium. For example, if you don't have the bench space for a standard mouse, a clip-on trackball is available. Also, a keyboard is available to make file naming easier if you are archiving waveforms or instrument setups. For complete information, see the Infinium Probes and Accessories Product Overview (5966-3543).

AutoProbe Interface

The AutoProbe Interface is an intelligent communication and power link between compatible probes and the Infinium Oscilloscope. AutoProbe identifies the type of probe attached and sets up the proper input impedance, attenuation ratio, probe power, and offset range as needed.

HP 1160 Family of Miniature Passive Probes

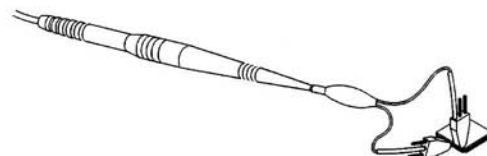
The HP 1160 family of miniature probes was developed as a result of intensive market research on probing. We developed a probe with a browser that won't slip off the test point being probed and short to some adjacent point. The browser uses a crown point that digs in to solder, and won't slip. These probes include a variety of ground leads and 50 mil SMD clips for attaching to different grounding points. Each Infinium ships with the HP 1160 family passive probes.

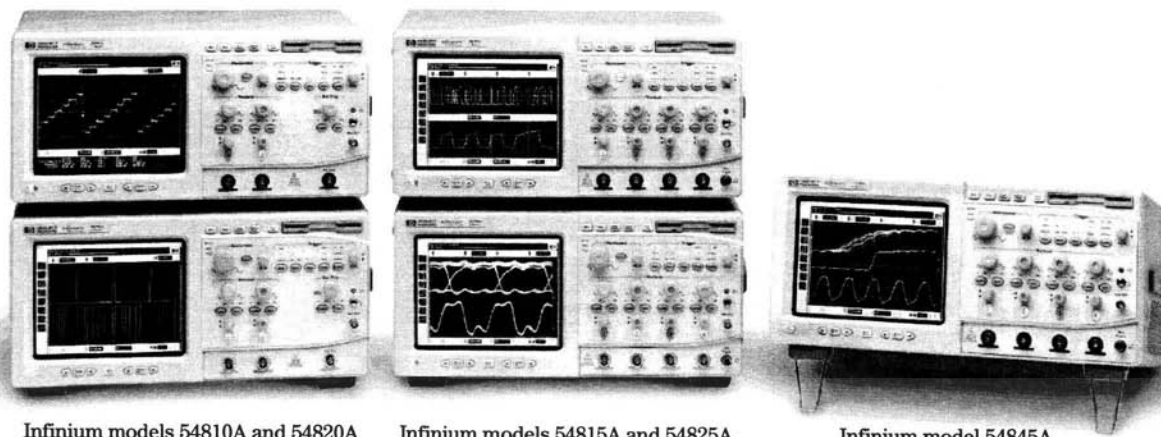
HP 1152A 2.5-GHz, 0.6-pF Active Probe

Use the HP 1152A active probe with Infinium model 54845A for the most non-intrusive, faithful reproduction of signals. Even without grounding, this probe accurately reproduces high-frequency edges. HP's breakthrough technology assures minimum loading on your circuit.

Simple Surface-Mount Probing

The HP Wedge Probe Adapter provides accurate, mechanically non-invasive contact to 0.5 mm TQFP/PQFP package leads. Infinium's probes include an adapter that connects to the Wedge to make surface-mount probing hassle-free.





Infinium models 54810A and 54820A

Infinium models 54815A and 54825A

Infinium model 54845A

Lab Scope Performance

Infinium models 54810A and 54815A offer 1 GSa/s on 2 and 4 channels respectively, for general purpose lab measurements. The 54820A and 54825A offer 2 GSa/s on 2 and 4 channels respectively, for more accurate single shot measurements.

1 ns Peak Detect

With Infinium models 54810/15/20/25A you can use peak detect to improve your measurement confidence when using your scope at slower sweep speeds. Peak detect runs the sampler at a high rate, regardless of the time-per-division setting, so you can see narrow events that would otherwise be missed.

Ultimate Performance

Infinium model 54845A provides superior bandwidth and sample rate to capture high-speed signals accurately. 1.5-GHz bandwidth and 8-GSa/s sample rate assure your signal will be recorded accurately.

New A/D Technology

Based on new analog-to-digital converter technology developed by HP Laboratories, Infinium model 54845A interleaves four 4-GSa/s channels to achieve two 8-GSa/s channels of simultaneous, real-time acquisition, with 64-K memory depth on each channel. The Infinium 54845A offers a new level of performance in a highly usable and affordable benchtop package.

Model	Channels	Bandwidth	Sample Rate	Memory Depth
HP 54810A	2	500 MHz	1 GSa/s	32K
HP 54815A	4	500 MHz	1 GSa/s	32K
HP 54820A	2	500 MHz	2 GSa/s	32K
HP 54825A	4	500 MHz	2 GSa/s	32K
HP 54845A	4	1.5 GHz	8 GSa/s (2 channel mode)	64K (2 channel mode)
			4 GSa/s (4 channel mode)	32K (4 channel mode)

Performance Characteristics

* Denotes Warranted Specifications, all others are typical. Specifications are valid after a 30-minute warm-up period, and $\pm 10^{\circ}\text{C}$ (models HP 54810A/15A/20A/25A) or $\pm 5^{\circ}\text{C}$ (model HP 54845A) from firmware calibration temperature.

HP 54810A, 54815A, 54820A and 54825A		HP 54845A
Acquisition		
Maximum Sample Rate Real Time	HP 54810A/15A: 1 GSa/s on each channel HP 54820A/25A: 2 GSa/s on each channel	2 channel mode: 8 GSa/s 4 channel mode: 4 GSa/s
Maximum Effective Sample Rate Equivalent Time	100 GSa/s	500 GSa/s
Memory Depth	32,768 points/channel	2 channel mode: 65,536 points 4 channel mode: 32,768 points
Memory Depth Modes	Optimized for best combination of update rate and display quality.	
Auto:	Selectable	
Manual:	Selectable from 16 to 32,768 points	Selectable 2 channel mode: from 16 to 65,536 points 4 channel mode: from 16 to 32,768 points
Sampling Modes		
Real Time:	Successive single shot acquisitions.	
Equivalent Time:	Random Repetitive sampling (higher time resolution at faster sweep speeds)	
Peak detect:	Captures and displays narrow pulses or glitches 1 ns or wider at sample rates of 250 MSa/s or less	n/a
Filters:		
9-bit Bandwidth Limit Filter:	BW = Sample Rate/20	
(Sinx)/x Interpolation:	On/Off selectable FIR digital filter. Digital signal processing adds points between acquired data points to enhance measurement accuracy and waveform display quality. BW= Sample Rate/4	
Averaging	Selectable from 2 to 4096	
Vertical		
Number of Channels	HP 54810A/20A: 2 (simultaneous acquisition) HP 54815A/25A: 4 (simultaneous acquisition)	4 (simultaneous acquisition)
Analog Bandwidth (-3dB)*	500 MHz	50 Ω : 1.5 GHz 1 M Ω : 500 MHz (with HP 1161A probe)
System Bandwidth with		
1160A 10:1 passive probe	500 MHz	-
1161A 10:1 passive probe	-	500 MHz
1162A 1:1 passive probe	25 MHz	25 MHz
1163A 10:1, 500 Ω passive probe	500 MHz	1.5 GHz
1152A 2.5 GHz, .6 pF active probe	500 MHz	1.3 GHz
1153A 200 MHz differential probe	200 MHz	200 MHz
Real Time Bandwidth*	HP 54810A/15A: 250 MHz HP 54820A/25A: 500 MHz	50 Ω : 1.5 GHz (2 channel mode) 1.0 GHz (4 channel mode) 1 M Ω : 500 MHz
Rise Time ¹	54810A/15A: 700 ps (Equivalent Time) 1.4 ns (Real Time) 54820A/25A: 700 ps	50 Ω : 233 ps 1 M Ω : 700 ps
Sensitivity ²		
1 M Ω :	1 mV/div to 5 V/div	2 mV/div to 2 V/div
50 Ω :	1 mV/div to 5 V/div	2 mV/div to 1 V/div
Input Impedance*	1 M $\Omega \pm 1\%$ (≈ 8 pF), or 50 $\Omega \pm 1\%$	1 M $\Omega \pm 1\%$ (≈ 12 pF), or 50 $\Omega \pm 1.5\%$
VSWR (50 Ω)	n/a	dc to 500 MHz: 1.3 500 MHz to 1 GHz: 1.5 1 GHz to 1.5 GHz: 1.75
Input Coupling	dc, ac (7 Hz, available in 1 M Ω only)	dc, ac (7 Hz, available in 1 M Ω only)
Maximum Input Voltage*		
1 M Ω :	± 250 V (dc + ac) [ac<10 kHz], CAT I	± 100 V (dc + ac) [ac<10 kHz], CAT I
50 Ω :	5 Vrms, CAT I	5 Vrms, CAT I
Hardware Bandwidth Limit (-3 dB)	On/Off selectable, 30 MHz	n/a
Channel-to-channel isolation (with channels at equal sensitivity)	dc to 50 MHz: 50 dB 50 MHz to 500 MHz: 40 dB	dc to 100 MHz: 40 dB 100 MHz to 1 GHz: 30 dB 1 GHz to 1.5 GHz: 25 dB

Performance Characteristics

* Denotes Warranted Specifications, all others are typical. Specifications are valid after a 30-minute warm-up period, and $\pm 10^\circ\text{C}$ (models HP 54810A/15A/20A/25A) or $\pm 5^\circ\text{C}$ (model HP 54845A) from firmware calibration temperature.

Vertical (continued)		HP 54810A, 54815A, 54820A and 54825A	HP 54845A
Offset Range	Vertical Sensitivity 1 mV to 49 mV/div > 50 mV to 249 mV/div > 250 mV to 1.24 V/div 1.25 V to 5V/div Available Offset ± 2 V ± 10 V ± 50 V ± 250 V	Vertical Sensitivity 1MΩ: 2 mV/div to 104 mV/div 50 Ω: >105 mV/div to 2 V/div all	Available Offset ± 4 V ± 40 V > ± 12 div
Dynamic Range	± 12 div from center screen		±8 div from center screen
Full resolution channel scales	All volts/division settings ≥ 7 mV/div		10, 20, 50, 100, 200, 500, 1000 mV/div (plus 2000 mV/div in 1 MΩ)
dc Gain Accuracy* ^{2,3}	± 1.25% of full scale at full resolution channel scale		± 1% of full scale at full resolution channel scale
Resolution ²			
Real Time	8 bits (0.4% of full scale), 12 bits with averaging		
Equivalent Time	8 bits (0.4% of full scale), 12 bits with averaging		
Offset Accuracy* ²	± (1.25% of channel offset + 2% of full scale) at full resolution channel scale		± (1% of channel offset + 1% of full scale) at full resolution channel scale
dc Voltage Measurement Accuracy* ^{2,3}			
Dual Cursor	±[(dc gain accuracy)+(resolution)]		
Single Cursor	±[(dc gain accuracy)+(offset accuracy)+(resolution/2)]		
Example (Single cursor accuracy, 70 mV signal, 10 mV/div, 0 offset)	Accuracy = ±[1.25%(80mV) + (1.25%(0)+2%(80 mV)) + (.4%/2)(80 mV)] = ±2.8 mV		Accuracy = ±[1%(80mV) + (1%(0 V)+1%(80 mV)) + (.4%/2)(80 mV)] = ±1.76 mV
AutoProbe Interface	AutoProbe is an intelligent communication and power link between compatible probes and Infinium scopes. AutoProbe completely configures the scope for the attached probe. For instance, it identifies the probe type and sets up the proper input impedance, attenuation ratio, probe power and offset range, as needed.		
Horizontal			
Main Time Base Range	500 ps/div to 20 s/div	100 ps/div to 20 s/div	
Horizontal Position Range (pre trigger)	0 to -1 s or one full screen width, whichever is larger		
Horizontal Position Range (post trigger)	0 to 1 s or one full screen width, whichever is larger		
Delayed Sweep Range	1 ps/div to current main time base setting	1 ps/div to current main time base setting	
Delayed Sweep Delay Range	Within main time base acquisition record		
Resolution	10 ps	2 ps	
Timebase Accuracy	50 ppm (.005%)	70 ppm (.007%)	
Delta-t Accuracy*			
Real Time mode ⁴	±[(.005%)(delta-t) + (0.2)(sample period)]		±[(.007%)(delta-t)+(0.2)(sample period)]
Equivalent Time mode (≥ 16 avgs.)	±[(.005%)(delta-t) + (full scale/(2*memory depth)) + 60ps]		±[(.007%)(delta-t)+(full scale/(2*memory depth))+ 30ps]
Peak Detect mode	±[(.005%)(delta-t)+(1 sample period)]		n/a
Example (Equivalent Time mode (≥ 16 avgs.), 9 ns signal, 1 ns/div, 1 channel)	Accuracy = ±[(.005%)(9 ns)+(10 ns)/(2*32,768))+ 60ps] = ±[(450 x 10 ⁻¹⁵)+(152 x 10 ⁻¹⁵)+(60 x 10 ⁻¹²) = 61 ps		Accuracy = ±[(.007%)(9 ns)+(10 ns)/(2*65,536))+ 30ps] = ±[(630 x 10 ⁻¹⁵)+(76 x 10 ⁻¹⁵)+(30 x 10 ⁻¹²) = 31 ps
Jitter, RMS	n/a	8 ps ± .005% (delay setting)	
Trigger			
Sensitivity* ²			
Internal (normal)	dc to 100 MHz: 0.5 div 100 MHz to 500 MHz: 1.0 div	dc to 100 MHz: 0.5 div 100 MHz to 500 MHz: 1.0 div 500 MHz to 1 GHz: 1.5 div	
Internal (noise reject)	dc to 100 MHz: 1.0 div 100 MHz to 500 MHz: 1.5 div	n/a	
External (HP 54810/20A)	dc to 100 MHz: 0.0225 x (signal range) 100 MHz to 500 MHz: 0.045 x (signal range)	n/a	
Auxiliary (HP 54815/25/45A)	dc to 500 MHz: 300 mVp-p	dc to 500 MHz: 300 mVp-p	
Maximum Input Voltage*			
External (HP 54810/20A)	1 MΩ: ±250 V (dc + ac) [ac<10 kHz], CAT I, 50 Ω: 5 Vrms, CAT I		n/a
Auxiliary (HP 54815/25/45A)	2.5 kΩ: ±15 V, CAT I		2.5 kΩ: ±15 V, CAT I
Minimum Pulse Width (internal, external)	1 ns at > 1.0 div		500 ps at > 1.0 div
Level Range			
Internal	± 12 div from center screen		
External (HP 54810/20A)	± 1 V, ± 5 V, ± 25 V		
Auxiliary (HP 54815/25/45A)	± 5 V		
Sweep Modes	Auto, triggered, single		
Trigger Coupling	dc, ac (7 Hz), low frequency reject (50 kHz), high frequency reject (50 kHz)		
Trigger Holdoff Range	60 ns - 320 ms		

Performance Characteristics

* Denotes Warranted Specifications, all others are typical. Specifications are valid after a 30-minute warm-up period, and $\pm 10^{\circ}\text{C}$ (models HP 54810A/15A/20A/25A) or $\pm 5^{\circ}\text{C}$ (model HP 54845A) from calibration temperature.

Trigger (continued)	HP 54810A, 54815A, 54820A and 54825A	HP 54845A
Trigger Modes	Edge, Glitch, Pattern, State, Delay by Time, Delay by Events, Violation (Runt, Setup/Hold Time, Pulse width, Transition), Video, Line	
Glitch	Select positive or negative polarity, width. Captures glitches as narrow as 500 ps.	
Pattern	Select inputs as High, Low or X (don't care) to create pattern. Trigger when pattern is entered, exited, present > t, present < t, or present over a range of time. Captures patterns as narrow as 500 ps.	
State	Select one channel as clock, specify other inputs as High, Low or X. Logic Type: AND or NAND. Setup time is 1 ns and hold time is 0 ns.	
Delay by Time	Time: 30 ns to 160 ms. The trigger is qualified by an edge. After the delay, a rising/falling edge on any one selected input will generate the trigger.	
Delay by Events	Events: 1 to 16,000,000 rising or falling edges. The trigger is qualified by an edge. After the delay, a rising/falling edge on any one selected input will generate the trigger.	
Violation Trigger		
Runt	Select Positive, Negative or either polarity, thresholds, time qualified. Captures runts as narrow as 500 ps.	
Setup/Hold	Modes: Setup, Hold or Setup and Hold. Select Clock, thresholds, setup and/or hold time. Edges must be ≥ 1.5 ns. The difference in slew rates between clock and data must be less than a 2:1 ratio.	
Pulse Width	Triggers on pulse width > t, or < t. Captures pulses as narrow as 500 ps.	
Transition	Select Rise Time or Fall Time, present > t or present < t, thresholds. Captures edges as fast as 800 ps.	
Accuracy (time) for glitch, pulse width and time-qualified pattern	1.5 ns - 20 ns: $\pm(20\%$ setting + 500 ps) 20 ns - 160 ms: $\pm(3\%$ setting + 2 ns)	
Video Triggering	525 lines/60 Hz (NTSC), 625 lines/50 Hz (PAL), 875 lines/60 Hz. Trigger on Field 1 or Field 2, any line. User defined triggering: User can specify sync pulse level, width and polarity, edge number.	
Display		
Display	8.4 inch diagonal color active matrix LCD module incorporating amorphous silicon TFTs.	
Annotation	Up to 12 labels, with up to 100 characters each, can be inserted in the waveform display area. Labels can be saved to and recalled from image files and setup files.	
Active Display Area	6.73"x 5.04" (33.92 sq. in.) 171 mm x 128 mm (21,888 sq. mm)	
Waveform Viewing Area	4.10"x 6.25" (25.6 sq. in.) 104 mm x 159 mm (16,536 sq. mm) in Full screen mode	
Display Resolution	640 pixels horizontally x 480 pixels vertically	
Waveform Colors	Select from 100 hues, 0-100% saturation and 0-100% luminosity.	
Dual Intensity Infinite Persistence	Previous sweeps are stored in half-bright display and recent sweeps in full-bright. This allows easy differentiation of current and historic information.	
Waveform Overlap	When two waveforms overlap, a third color distinguishes the overlap area.	
Full screen mode	On/Off selectable	
Connect-the-dots	On/Off selectable	
Persistence	Minimum, Variable (Up to 6 levels of gray scale, 100 ms to 40 s), Infinite	
Graticule	On/Off (Grid/Frame)	
Grid Intensity	0 to 100%	
Display Update Rate	Real Time mode, minimum persistence display mode, triggered sweep mode, no interpolation, markers off, math off, connect the dots off, 1 channel acquisition, 50 ns/div, statistics off	
Measurement Conditions	512 pt record (2GSa/s) Waveforms/sec > 1,750 V _{pp} Measurements/sec > 65	512 pt record (2GSa/s) Waveforms/sec > 1,950 V _{pp} Measurements/sec > 65
Measurements		
Automatic Parametrics	27 automatic measurements: V _{pp} , V _{min} , V _{max} , V _{avg} , V _{amptd} , V _{base} , V _{top} , V _{rms} , Preshoot, Overshoot, V _{upper} , V _{middle} , V _{lower} , Rise Time, Fall Time, Period, Frequency, Positive Width, Negative Width, Duty Cycle, Delta Time, T _{max} , T _{min} , FFT Frequency, FFT Magnitude, FFT Delta Frequency, FFT Delta Magnitude. Over HP-IB only: VTime, TVolt	
Threshold Definition	Selectable 10%, 50%, 90% or 20%, 50%, 80% or Custom (% or absolute voltage)	
Top-Base Definition	Standard or Custom (in absolute voltage)	
Statistics	On/Off selectable. Current measurement, mean and standard deviation	
Measurement Toolbar	16 Drag and Drop automatic measurement icons.	
QuickMeas	Activates 4 preselected automatic measurements	
Markers Modes	Manual Markers, Track Waveform Data, Track Measurements	
Waveform Math	4 functions f1-f4. Select from Add, Subtract, Multiply, Divide, Invert, Magnify, Vs, Min, Max, Integrate, Differentiate, FFT Magnitude	

Performance Characteristics

* Denotes Warranted Specifications, all others are typical. Specifications are valid after a 30-minute warm-up period, and $\pm 10^{\circ}\text{C}$ (models HP 54810A/15A/20A/25A) or $\pm 5^{\circ}\text{C}$ (model HP 54845A) from calibration temperature.

	HP 54810A, 54815A, 54820A and 54825A	HP 54845A
FFT		
Frequency Range ⁵	54820A/54825A: dc to 1 GHz (Sample rate/2) 54810A/54815A: dc to 500 MHz (Sample rate/2)	2 channel mode: dc to 4 GHz (Sample rate/2) 4 channel mode: dc to 2 GHz (Sample rate/2)
Frequency Resolution	Sample rate/Memory depth	Sample rate/Memory depth
Best Resolution	15.3 μHz (Sample rate _{min} /32,768 pts)	2 channel mode: 7.63 μHz (Sample rate _{min} /65,536 pts) 4 channel mode: 15.3 μHz (Sample rate _{min} /32,768 pts)
Best resolution at Sample rate _{max}	54820A/54825A: 61.0 kHz (Sample rate _{max} /32,768 pts) 54810A/54815A: 30.5 kHz (Sample rate _{max} /32,768 pts)	2 channel mode: 122 kHz (Sample rate _{max} /65,536 pts) 4 channel mode: 122 kHz (Sample rate _{max} /32,768 pts)
Frequency Accuracy	(1/2 frequency resolution) + (5×10^{-5}) (signal frequency)	(1/2 frequency resolution) + (7×10^{-5}) (signal frequency)
Amplitude Display	Power in dBm	
Signal-to-noise ratio	70 dB at 32K memory depth. Noise floor varies with memory depth and with averaging.	
Window Modes	Hanning, Flattop, Rectangular	
Computer System/Storage		
CPU	AMD-K6™ 200 MHz Microprocessor	
Disk Drives	1.4 GByte internal hard drive. Storage capacity is limited only by disk space. 3.5" MS-DOS® compatible, high-density, floppy disk drive. Store and recall setups, waveforms, and store screen images to both the hard drive and the floppy drive.	
File types: Waveforms Images	Internal, Y values; and X, Y values BMP, EPS, GIF, PCX, PS (Postscript)	
Mouse	Standard mouse supplied. Supports any Microsoft® mouse-compatible pointing device, serial or PS/2	
Waveform Memories	4 nonvolatile waveform memories	
I/O		
LAN	Enables data/setup file transfers and use of network printers; supports popular network operating systems including Novell NetWare, Microsoft, Banyan VINES, SCO UNIX and IBM; 10 MBPS operation that complies with IEEE 802.3 Ethernet and ISO/IEC 8802-3 Ethernet standards; TCP/IP protocol; RJ-45, BNC, and AUI connectors.	
HP-IB	Fully programmable, complies with IEEE 488.2	
RS-232 (serial)	2 ports: COM1, COM2. Printer and pointing device support	
Centronics	Printer support	
Printers and Plotters	Supports printers and plotters compatible with Microsoft Windows®95. Includes but is not limited to HP DeskJet- and LaserJet-series printers. HP-IB devices not supported.	
PS/2 port	For PS/2 mouse	
Keyboard port	For optional keyboard	
Video Output	15 pin VGA, full color	
Auxiliary Output	DC ($\pm 2.5\text{V}$); square wave (715 Hz [$\pm 5\%$], 350 mV _{pp} [$\pm 5\%$]); trigger output (350 mV _{pp} [$\pm 5\%$], frequency varies with occurrence of trigger)	

General Characteristics

Meets Hewlett-Packard's Environmental Specification (section 750) for class B-1 products with exceptions as described for temperature. Indoor use only.

Temperature Operating:	0°C to +50°C	10°C to +40°C
Nonoperating:	-40°C to 70°C	
Humidity Operating:	Up to 95% relative humidity (noncondensing) at +40°C	
Nonoperating:	Up to 90% relative humidity at +65°C	
Altitude Operating:	Up to 4,600 meters (15,000 ft.)	
Nonoperating:	Up to 15,300 meters (50,000 ft.)	
Vibration Operating:	Random vibration 5-500 Hz, 10 minutes per axis, 0.3g(rms)	
Nonoperating:	Random vibration 5-500 Hz, 10 minutes per axis, 2.41g(rms); resonant search 5-500 Hz, swept sine, 1 octave/minute sweep rate, (0.75g), 5 minute resonant dwell at 4 resonances per axis.	
Power	Voltage: 100-240VAC, +/- 10%, Cat II, 47 to 440 Hz; Max power dissipation: 390 W	
Weight	Net: 10.6 kg (23.4 lb), Shipping: 13.6 kg (30 lb)	Net: 12.0 kg (26.5 lb), Shipping: 15 kg (33 lb)
Dimensions (excluding handle)	Height: 216 mm (8.50 in); Width: 437 mm (17.19 in); Depth: 440 mm (17.34 in)	
Safety	Meets IEC1010-1 +A2, CSA certified to C22.2 No.1010.1, Self certified to UL 3111	

Notes

¹Rise time figures are calculated from $\tau_r = 0.35/\text{bandwidth}$

²HP 54810A/15A/20A/25A: Magnification is used below 7 mV/div range. Below 7 mV/div, full scale is defined as 56 mV. HP 54845A: Magnification is used below 10 mV/div range and between major attenuation settings. Full scale is defined as the major attenuator setting above an intermediate setting. (Major settings 50 Ω : 10 mV, 20 mV, 50 mV, 100 mV, 200 mV, 500 mV, 1 V, 1 M Ω : all of the above plus 2 V)

³HP 54810A/15A/20A/25A: The dc gain accuracy decreases 0.08% of full scale per degree C from the firmware calibration temperature.

⁴For bandwidth limited signals, $\tau_r \geq 1.4 \times \text{sample interval}$

⁵FFT amplitude readings are affected by input amplifier roll-off; HP 54810A/15A/20A/25A: (-3 dB at 500 MHz, with amplitude decreasing as frequency increases above 500 MHz). HP 54845A: (-3 dB at 1.5 GHz, with amplitude decreasing as frequency increases above 1.5 GHz).



Ordering Information

	US List
HP 54810A Infinium Oscilloscope	\$9,995
HP 54815A Infinium Oscilloscope	\$15,995
HP 54820A Infinium Oscilloscope	\$12,495
HP 54825A Infinium Oscilloscope	\$18,995
HP 54845A Infinium Oscilloscope	\$29,995

All of the above models include:

- 1 Mouse (C3751-60201)
- 1 Infinium Mouse Pad (54810-85901)
- 1 Keyboard (E2610A)
- 1 User's Quick Start Guide, English language* (54810-97000)
- 1 Service Guide
- 1 Programmer's Guide
- 1 Programmer's Quick Reference Guide
- Information System in English, French, German, Japanese, Korean and Chinese (for Taiwan)
- 2 1160A 10:1 10 M Ω passive probes (54810A, 54820A)
- 4 1160A 10:1 10 M Ω passive probes (54815A, 54825A)
- 4 1161A 10:1 10 M Ω passive probes (54845A)
- 1 Accessory Pouch (54810-68701)
- 1 US power cord
- Three-year warranty

* Other languages also available

Options

090 Delete standard probes	
2 1160A probes for the 54810A/20A	\$470
4 1160A probes for the 54815A/25A	\$940
4 1161A probes for the 54845A	\$940
001* Additional standard probes	
2 1160A probes for the 54810A/15A/20A/25A	\$470
2 1161A probes for the 54845A	\$470
002* Add 1 1162A 1:1 passive probe	\$145
003* Add 1 1163A 10:1 500 Ω , low C passive probe	\$235
006* Add 1 1152A 2.5 GHz, .6 pF active probe (for HP 54845A)	\$2,450
008* Add 1 1153A 200 MHz differential probe	\$1,810
1BP Mil Std 45662A and ANSI/NCSS Z-540 calibration with test data	\$150 to \$250
1CL* Add 1 Keyboard (E2610A)	\$49
1CM* Add 1 Rackmount kit (E2609A)	\$425
UL5* Add 1 Touchpad pointing device (E2612A)	\$77
UL6* Add 1 Clip-on track ball pointing device (E2611A)	\$59
W50 Five-year, customer-return, repair coverage (additional 2 years)	\$250 to \$750

* Multiple options can be ordered

Additional Probes

Probes listed above as options can also be ordered by model numbers

HP 1144A 800 MHz Active Probe	\$730
(requires HP 1142A power supply)	\$852
HP 01144-61604 probe power extender (required when using more than 2 HP 1144A active probes)	\$42
HP 1145A 2-channel, 750 MHz SMT active probe	\$995
(requires HP 1142A power supply)	\$852
HP 1146A Oscilloscope AC/DC Current Probe	\$407
HP 1137A 5kV, 1000:1 High Voltage Probe	\$215
HP E2613B Wedge Probe Adapter	\$79

Accessories

HP 1182A Testmobile	\$490
HP-IB cables	
HP 10833A 1 m (3.3 ft.)	\$90
HP 10833B 2 m (6.6 ft.)	\$100
HP 10833C 4 m (13.2 ft.)	\$110
HP 10833D 0.5 m (1.6 ft.)	\$90
Centronics Printer cable C2951A 3 m (9.9 ft.)	\$18

Upgrade Kits

HP E2650A Do-it-yourself LAN upgrade kit	\$95
HP E2651A Return-to-HP LAN upgrade kit	\$195

Call HP DIRECT at 1-800-452-4844

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Probes and accessories

If you'd like information on probes
and accessories that are compatible
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