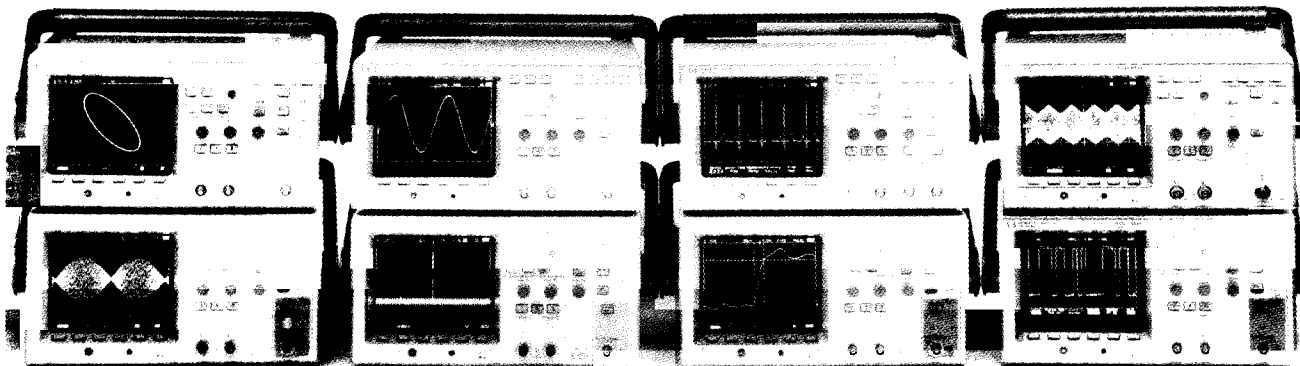


HP 54600
Family

- Analog look and feel
- 1 Meg of memory (HP 54645A)
- Automatic and cursor-based measurements of frequency, time, and voltage
- Up to 2 GSa/s sample rates
- Glitch detection
- Add-on interface and enhancement modules for hard copy, remote programming, and FFT

- 60 to 500 MHz bandwidth
- Up to 1 ns peak detect
- Up to 3 million points per second update rate
- Color (54616C)



HP 54600 Family of Oscilloscopes

The HP 54600 family of oscilloscopes offers you the comfortable feel of analog scopes and the measurement power of digital scopes, all at a price you can afford. This family of oscilloscopes gives you the ability to view waveforms you can't see with your analog scope, and they provide the familiar controls and interactive displays you've grown accustomed to. To solve your most difficult test problems, these scopes provide powerful digital features, such as pre-trigger viewing, peak detect, waveform storage, and measurement automation.

This class of oscilloscopes, made possible through HP's advanced integrated circuit technology, presents this power in a small, light-weight package and at a price that fits your budget. The display update rate of up to one and a half million points per second provides a display with unprecedented interactivity.

Eight Models: One Is Right for You

With eight models to choose from, you will be able to pick the oscilloscope that best meets your measurement and troubleshooting needs while meeting the constraints of your budget. The dual-channel 60 MHz HP 54603B is ideally suited for classroom use and other situations where budgets are tight. The HP 54600B offers dual-channel 100 MHz performance for field service and production test applications. With its 150 MHz bandwidth, 1 mV/division sensitivity, and triggering to 250 MHz, the HP 54602B is the "lab quality" general-purpose scope for your bench today, and in the years to come.

The HP 54610B may be the lowest priced 500 MHz oscilloscope on the market, but it does not compromise on measurement quality. The HP 54615B boosts the sample rate to 1 GSa/s while preserving the intuitive analog feel and instantaneous response, common in all the members of the HP 54600 family. At the top of the HP 54600 line, the HP 54616B (monochrome) and the HP 54616C (color) provide 500 MHz bandwidth and 2 GSa/s sample rate. The HP 54645A, 100 MHz MegaZoom oscilloscope, brings deep memory to the family. MegaZoom technology makes using the one megabyte of memory effortless.

Powerful, Efficient and Compact

When you think about powerful digital scopes, the first thing that might come to mind is large and complicated. The HP 54600 family has four models that are neither, making them ideal troubleshooting and debugging oscilloscopes. These scopes are compact (can fit under a plane seat) and weigh under 15 pounds. They also retain some of the attributes that were valued in analog scopes. Knobs that allow direct access control of vertical and horizontal scaling and positioning are just one of the many features that make these scopes easy to use. High update rate and a real-time vector display respond instantly to changes in your waveform. This powerful combination will help you get answers fast.

Multiple-Processor Architecture

HP uses a multiple-processor architecture in the HP 54600 series of oscilloscopes. This is one of the ways in which HP delivers ease of use, with a responsive high update-rate oscilloscope. The parallel processing utilized in the HP 54600 series allows acquisition and display systems of the oscilloscope to function independent of the human interface and measurement systems. This makes for a general-purpose troubleshooting scope that is responsive to changes in your waveform, as well as responding to changes initiated from the front panel.

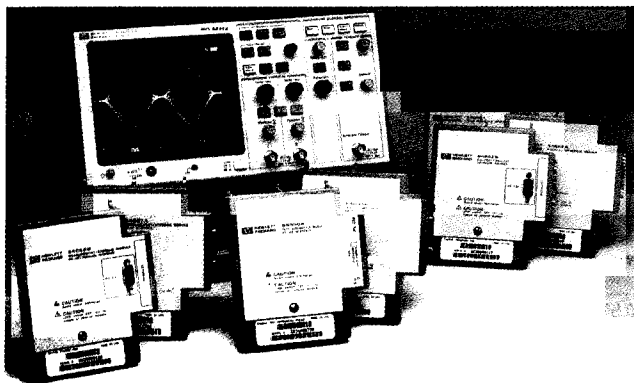
HP 54645A MegaZoom Oscilloscope

The HP 54645A oscilloscope makes deep memory highly usable. The HP 54645A is a dual channel 100 MHz oscilloscope with 200 MSa and a full 1 MB of memory behind each of its channels. Through the application of MegaZoom technology, this deep-memory oscilloscope has a high speed/low dead time display and a highly-responsive front panel. Unlike all other deep memory scopes which force the user to choose between fast response and deep memory, MegaZoom technology gives you a scope that is always fast and deep. Pan-and-zoom operation is as simple as turning the time/division knob. No special menus or controls are required to take full advantage of the HP 54645A's deep memory.

A powerful glitch trigger extends the power of MegaZoom technology in solving your toughest troubleshooting problems. Simply set up the desired pulse width that represents a worse case situation and after the scope finds it, pan and zoom through the deep waveform record to find out exactly what was going on in your circuit that caused the problem.

Model	Bandwidth	Chs	Sensitivity	Maximum Sample Rate
54603B	60 MHz	2	2 mV to 5 V/div	20 MSa/s
54600B	100 MHz	2	2 mV to 5 V/div	20 MSa/s
54645A	100 MHz	2	1 mV to 5 V/div	200 MSa/s
54602B	150 MHz	4 (2 + 2)	1 mV to 5 V/div	20 MSa/s
54610B	500 MHz	2	2 mV to 5 V/div	20 MSa/s
54615B	500 MHz	2	2 mV to 5 V/div	1 GSa/s
54616B/C	500 MHz	2	2 mV to 5 V/div	2 GSa/s

- Hard-copy output to printer or plotter
- Remote instrument control
- Enhanced automatic measurements
- Extended trace storage, math operations, and FFT
- Unattended signal monitoring



A Full Family of Add-On Interface and Enhancement Modules

The HP 54600 series scopes use a complete range of optional interface modules for hard-copy output, remote programmability, and custom test functionality. These modules plug into the back of most HP 54600 series scopes, adding advanced capability to your general-purpose, trouble-shooting scope.

HP 54650A HP-IB Interface Module

This module provides full remote control and hard-copy output to HP-IB printers and plotters. Programming is in accordance with IEEE-488.2.

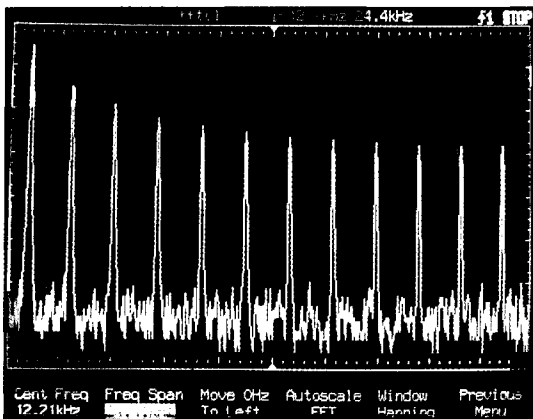
HP 54652B RS-232/Parallel Interface Module

This module provides computer interface via RS-232 and printing via parallel in one module. The RS-232 interface also can be configured for printing when not being used for remote programming.

HP 54657A HP-IB and 54659B RS-232/Parallel Measurement/Storage Modules

The HP 54657A and 54659B measurement/storage modules bring enhanced measurement and storage power to your HP 54600 scope. Added features include:

- FFT
- Up to 100 non-volatile trace memories
- New automatic measurements with user-defined levels
- New channel-to-channel delay and phase measurements
- Real-time clock for time- and date-tagging of hard copy and stored traces
- Unattended pass/fail signal monitoring



HP 54600 Series Software and Accessories

HP 34810B BenchLink Scope Windows Software (Option 106)

HP BenchLink Scope makes it easy to move important information from scope to PC. You'll be able to transfer:

Screen Images: You can transfer a bitmap picture of the scope screen to your PC for viewing, annotation, storage or printing. HP BenchLink Scope provides convenient annotation tools, and Windows makes it easy to cut and paste your annotated image into other applications. You can also save your image in PCX and TIF formats.

Waveform Data: HP BenchLink Scope transfers the actual waveforms on screen to your PC for further review and analysis. You can simultaneously capture scope and logic waveforms, and, once captured, use waveform markers in HP BenchLink Scope to review your data.

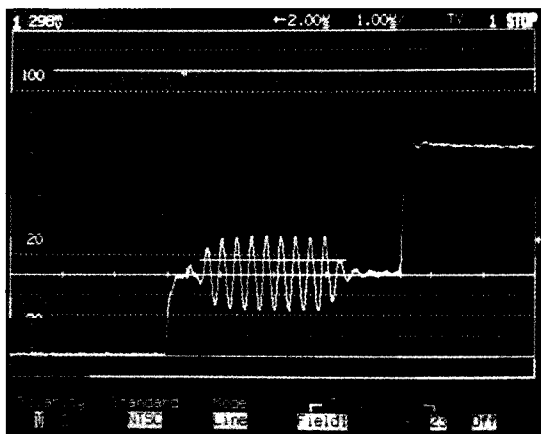
Instrument Setups: The full front-panel setup of your scope can be saved in the PC for later use.

HP 54654A Operator's Training Kit (Option 103)

The operator's training kit consists of a training signal board and lab workbook. The signal board provides 12 signals that show various operating modes and features of an HP 54600 series oscilloscope. Nineteen logic analyzer test points are also provided to demonstrate the features of the HP 54600 series logic analyzers or mixed signal oscilloscope. After completing the labs, the user can operate the instrument and make measurements with no extra training. This kit is ideal for the educational environment and can also be an excellent tool for training new employees.

Enhanced Performance for Video Applications (Option 005)

With the addition of Option 005, enhanced TV/video triggering, to the HP 54602B, HP 54610B, HP 54615B, HP 54616B/C or HP 54645A oscilloscopes, you will be able to trigger on any specified line of video in either NTSC, PAL, PAL-M, SECAM or generic video formats. With this additional triggering, you will be able to easily view signals that are often very dim or invisible on most analog scopes. Once you have the signal of interest displayed, you can measure it with digital precision.



Live NTSC broadcast video

HP 10098A Pouch and Front Panel Cover (Option 101)

The pouch provides probe and accessory storage on top of the scope and is easily removable for rackmounting. The front panel cover provides sturdy protection of the front panel display and knobs when transporting the scope.

HP 1185A Carrying Case (Option 104)

The HP 1185A carrying case makes transporting and shipping your HP 54600 series oscilloscope safe and simple. A scope, optional module, and other accessories fit neatly inside the padded shell of hard plastic, and the case is lockable for shipment.

Oscilloscopes

118

General Purpose and Troubleshooting

HP 54600 Series

Product Specific Performance Characteristics

Vertical system	HP 54603B	HP 54600B	HP 54602B	HP 54610B	HP 54615B/ HP 54616B/C	HP 54645A
Bandwidth (BW) Ch. 1 and 2	dc to 60 MHz	dc to 100 MHz	dc to 150 MHz 100 MHz @ 1, 2, & 5 mV/div	dc to 500 MHz ⁷	dc to 500 MHz ⁷	dc to 100 MHz 75 MHz @ 1, 2 and 5 mV/div
Ch. 3 and 4	N/A	N/A	dc to 250 MHz	N/A	N/A	N/A
Rise time (calculated) Ch. 1 and 2	5.8 ns	3.5 ns	2.3 ns	700 ps	700 ps	3.5 ns
Ch. 3 and 4	N/A	N/A	1.4 ns	N/A	N/A	N/A
Input R & C	1 M Ω , \approx 13 pf	1 M Ω , \approx 13 pf	1 M Ω , \approx 13 pf	1 M Ω , \approx 9 pf	1 M Ω , \approx 9 pf	1 M Ω , \approx 13 pf
Dynamic range (from center screen)	\pm 8 divisions	\pm 8 divisions	\pm 8 divisions	\pm 12 divisions	\pm 12 divisions	\pm 8 divisions
Sensitivity (per division) Ch. 1 and 2	2 mV to 5 V	2 mV to 5 V	1 mV to 5 V	2 mV to 5 V	2 mV to 5 V	1 mV to 5 V
Ch. 3 and 4	N/A	N/A	0.1 V and 0.5 V	N/A	N/A	N/A
Accuracy	\pm 2%	\pm 1.5%	\pm 1.5%	\pm 2%	\pm 2%	\pm 1.5%
Vernier accuracy	\pm 3.5%	\pm 3%	\pm 3%	\pm 2%	\pm 2%	\pm 3%
Maximum input dc + peak ac	400 V	400 V	400 V	250 V or 5 V RMS in 50 Ω mode	250 V or 5 V RMS in 50 Ω mode	400 V
Selectable BW limit Ch. 1 and 2	20 MHz	20 MHz	20 MHz	30 MHz	30 MHz	20 MHz
Horizontal system						
Accuracy	\pm 0.01%	\pm 0.01%	\pm 0.01%	\pm 0.01%	\pm 0.005%	\pm 0.01%
Vernier accuracy	\pm 0.05%	\pm 0.05%	\pm 0.05%	\pm 0.05%	NA	\pm 0.05%
Resolution	100 ps	100 ps	100 ps	25 ps	20 ps	40 ps
Delay jitter	10 ppm	10 ppm	10 ppm	10 ppm	1 ppm	10 ppm
Sweep speed	5 s/div to 5 ns/div	5 s/div to 2 ns/div	5 s/div to 2 ns/div	5 s/div to 1 ns/div	5 s/div to 1 ns/div	50 s/div to 2 ns/div
Acquisition system						
Max. sample rate	20 MSa/s	20 MSa/s	20 MSa/s	20 MSa/s	1 GSa/s ¹⁰ /2 GSa/s	200 MSa/s ¹⁰
Single shot BW	2 MHz	2 MHz	2 MHz	2 MHz	250 MHz/500 MHz ¹⁰	50 MHz ¹⁰
Peak detect (single chan.)	50 ns	50 ns	50 ns	50 ns	1 ns ¹⁰	5 ns ¹⁰
Record length (pts. vectors off/on)	4k/2k	4k/2k	4k/2k	4k/2k	5k/2k	1 Meg
Max. update rate vectors off	1.5 M pts/s	1.5 M pts/s	1.5 M pts/s	1.5 M pts/s	0.5 M pts/s	3 M pts/s
Trigger system						
Sensitivity Ch. 1 and 2	dc to 25 MHz, 0.35 div or 3.5 mV dc to 60 MHz, 1 div or 10 mV	dc to 25 MHz, 0.35 div or 3.5 mV dc to 100 MHz, 1 div or 10 mV	dc to 25 MHz, ⁹ 0.35 div or 3.5 mV dc to 150 MHz, 1 div or 10 mV	dc to 25 MHz, 0.35 div or 3.5 mV dc to 500 MHz, 1 div or 10 mV	dc to 100 MHz, 0.5 div or 5.0 mV dc to 500 MHz, 1 div or 10 mV	dc to 25 MHz, 0.35 div or 3.5 mV dc to 100 MHz, 1 div or 10 mV
Sensitivity Ch. 3 and 4	N/A	N/A	dc to 250 MHz 1 div or 10 mV	N/A	N/A	N/A
External trigger range	\pm 18 V	\pm 18 V	N/A	\pm 18 V	\pm 2 V	\pm 18 V
External trigger sensitivity	dc to 25 MHz, 50 mV dc to 60 MHz, 100 mV	dc to 25 MHz, 50 mV dc to 100 MHz, 100 mV	N/A	dc to 100 MHz, 75 mV dc to 500 MHz, 150 mV	dc to 100 MHz, 75 mV dc to 500 MHz, 150 mV	dc to 25 MHz, 50 mV dc to 100 MHz, 100 mV
External trigger input R&C	1 M Ω , \approx 13pf	1 M Ω , \approx 13pf	N/A	1 M Ω , \approx 12pf or 50 Ω	1 M Ω , \approx 12pf or 50 Ω	1 M Ω , \approx 13pf
External trigger input maximum input	400 V (dc + peak ac)	400 V (dc + peak ac)	N/A	250 V (dc + peak ac) or 5 V rms in 50 Ω	250 V (dc + peak ac) or 5 V rms in 50 Ω	400 V (dc + peak ac)

¹Temperature is $\pm 10^\circ$ C from calibration.

²Use full scale of 80 mV for 2 mV/div and 5 mV/div ranges on HP 54600B, HP 54615B, HP 54616B/C and HP 54603B. Use full scale of 40 mV for 2 mV/div range on HP 54610B. Use full scale of 56 mV for 2 mV/div range on HP 54615B, HP 54616B/C. Use full scale of 16 mV for 1 mV/div or HP 54602B.

³Use full scale of 50 ns for 2 ns/div.

⁴Tested to Hewlett-Packard environmental specification section 758 for Class B-1 products.

⁵Characteristic for the HP 54602B only.

⁶Characteristic for HP 54610B and HP 54615B, HP 54616B/C only.

⁷Upper BW reduces by 2 MHz per degree C above +35 $^\circ$ C.

⁸Characteristic for HP 54603B only.

⁹1, 2, 5 mV/div dc to 25 MHz, 1 div or 2 mV.

¹⁰Simultaneous on both channels.

Product Specific Performance Characteristics**Vertical System—All Models**

Math Functions: Channel 1 \pm Channel 2
Cursor Accuracy: $\pm 1/2$ Single Cursor: Vertical accuracy $\pm 1.2\%$ of full scale $\pm 0.5\%$ of position value
Dual Cursor: Vertical accuracy $\pm 0.4\%$ of full scale
Inversion: Channel 1 and Channel 2
CMRR: -20 dB at 50 MHz

Vertical System (HP 54610B, 54615B, 54616B/C)

50 Ω Protection: Protects 50 Ω load from excessive voltage
Probe Sense: Automatic readout of 1X, 0X, 20X, and 100X probes

Horizontal System—All Models

Cursor Accuracy (t and 1/t): $\pm 0.01\%$ reading $\pm 0.2\%$ screen width ± 200 ps
Pre-Trigger Delay (negative time): 10 div
Post-Trigger Delay (trigger to start of sweep): At least 2560 div or 50 ms. Not to exceed 100 s.
Time Skew (HP 54610B, HP 54615B, 54616B/C): Each channel adjustable over a range of ± 25 ns to remove effects of cabling

Delayed Sweep

Main Sweep 5 s/div to 10 ms/div: Delayed sweep; up to 200 x main
5 ms/div and Faster: Up to 2 ns/div/1 ns/div⁴/5 ns/div⁴

Trigger System**Sources**

HP 54602B: Channels 1, 2, 3, 4, or line
HP 54600B, 54603B, 54610B, 54615B, 54616B/C 54645A: Channels 1, 2, line, and external

Coupling: ac, dc, LF reject, HF reject, and noise reject.
 LF and HF: -3 db at 50 kHz.

Modes: Auto, Auto-level, Normal, Single, and TV
TV Triggering: TV line and field. Requires 0.5 div of composite sync for stable display (Channels 1 and 2).
Holdoff: Adjustable from 200 ns to 13 s from 300 ns (HP 54615B, 54616B/C)

External Trigger (HP 54600B, HP 54603B, HP 54610B, HP 54615B, HP 54616B/C, HP 54645B)

Coupling: dc, HF reject and noise reject

External Trigger (HP 54610B only)

Coupling: ac and dc
Trigger View: External trigger is viewable
Bandwidth: ≥ 350 MHz

X-Y Operation—All Models

Z-Blanking: TTL high-blanks trace (Not available on HP 54615B, HP 54616B/C)
Bandwidth: X and Y same as vertical system
Phase Difference: $\pm 3^\circ$ at 100 kHz, $\pm 3^\circ$ at 10 MHz (HP 54615B, HP 54616B/C), $\pm 1.8^\circ$ at 1 MHz (HP 54645A)

Display System—All Models Except HP 54616C

Display: 7-inch raster CRT
Resolution: 255 vertical x 500 horizontal points
Controls: Front-panel intensity control
Graticule: 8 x 10 grid or frame
Auto-Store: Saves previous sweeps in half-bright display and the most recent sweep in full-bright display

Acquisition System—All Models

Resolution: 8 bits
Simultaneous Channels: Channels 1 and 2 or Channels 3 and 4 (HP 54602B)
Average: Number of averages selectable from 8, 64, 256

Advanced Functions—All Models

Automatic Measurements: Continuously updated
Voltage: V avg, V rms, V p-p, V top, V base, V min, and V max
Time: Frequency, period, + width, - width, duty cycle, rise time, and fall time
Cursors: Manually or automatically placed
Setup Functions Autoscale: Sets the vertical and horizontal deflection and the trigger level
Save/Recall: 15 front-panel setups; 10 front-panel setups (HP 54645A)
Trace Memory: 2 volatile pixel memories
TV Functions/Line Counting: Delay time calibrated in NTSC and PAL line numbers
All-Field Trigger (both fields selected): Oscilloscope triggers on the vertical sync pulse in both fields, allowing use with fields, allowing use with noninterlaced video

General**Power Requirements**

Line Voltage Range: 100 Vac to 240 Vac
Line Voltage Selection: Automatic

Line Frequency: 45 Hz to 440 Hz

Max. Power Consumption: 220 VA, 300 VA (HP 54615B, HP 54616B/C)

Environmental Characteristics: Meets the requirements of MIL-T-28800D for Type III, Class 3, Style D equipment as described later in this table

Ambient Temperature

Operating: -10° C to $+55^\circ$ C
Nonoperating: -51° C to $+71^\circ$ C

Humidity⁴

Operating: 95% RH at 40° C for 24 hrs.
Nonoperating: 90% RH at 65° C for 24 hrs.

Altitude

Operating: To 4,500 m (15,000 ft)
Nonoperating: To 15,000 m (50,000 ft)

EMI (Commercial) (MIL-T-28800D): Meets FTZ 1046 Class B. Meets requirements in accordance with paragraph 3.8.3 EMI Type III and MIL-STD-461C as modified by Table XII.

CE01: Part 2 narrow band requirements up to 15 kHz

CE03: Part 4

CS01: Part 2

CS02: Part 2

CS06: Part 5 limited to 300 V

RE01: Parts 5 and 6 measured @ 12-inch, 15 dB relaxation to 20 kHz exceptioned from 20 kHz to 50 kHz

RE02: Part 2 (limited to 1 GHz) full limits of Class A1C and A1F with Option 002 installed. Without Option 002 installed, 10 dB relaxation, 14 kHz to 1 GHz.

RS02: Part 2, Part I and Part 2, Part II, exceptioned

RS03: Part 2, limited to 1 V/meter from 14 kHz to 1 GHz (with Option 001 installed); slight trace shift from 80 MHz to 200 MHz.

Vibration: Operating 15 min. along each of the 3 major axes; 0.025-inch peak-to-peak displacement, 10 Hz to 55 Hz in 1-min. cycles. Held for 10 min. at 55 Hz (4 g at 55 Hz).

Shock: Operating 30 g, 1/2 sine, 11-ms duration, 3 shocks/axis along major axis. Total of 18 shocks.

Size (excluding handle): 322 mm W x 172 mm H x 317 mm D (12.7 in x 6.8 in x 12.5 in)

Weight: 6.2 kg (14 lbs)

Safety: CSA certification, IEC-348, UL-1244 listed

HP 54600 Series

Product Specific Performance Characteristics

HP 54650A HP-IB Interface Module

Provides full remote control and hard copy to HP-IB printers and plotters. Programming is in accordance with IEEE-488.2. With the addition of this module, the scope's two pixel memories become non-volatile. An operating and programming manual and a programming examples disk are supplied.

Specifications: The interface capabilities of the HP 54600 series oscilloscope with this module installed are as defined by IEEE-488.1 as SH1, AH1, T5, L4, SR1, RL1, PP1, DC1, DT1, C0 and E2.

HP Printer/Plotter Supported: HP ThinkJet, HP QuietJet, HP PaintJet, HP DeskJet, and HP LaserJet; HP-GL compatible plotters.

HP 54652B RS-232/Parallel Interface Module

Provides full remote control via RS-232 and printing via parallel in one module. The RS-232 can also be configured for printing when not being used for remote control.

Specifications

Connector Type: 9 pin (m) DTE Port, works with HP 34398A RS-232 cable

Protocols: Xon/Xoff, hardwire

Data Bits: 8

Parity: None

Baud Rates: 1200, 2400, 9600, or 19200

HP Printer/Plotter Supported: HP ThinkJet, HP QuietJet, HP PaintJet, HP DeskJet, and HP LaserJet; HP-GL compatible plotters.

Connector Type: 25 pin (F) connector, works with HP C2950A parallel printer cable

Other Supported Printers: Epson FX-80 or HP PCL compatible printers

HP 54657A and 54659B Measurement/Storage Modules

With the the addition of either the HP 54657A module with HP-IB interface or the HP 54659B module with RS-232 and parallel interface, the HP 54600 series oscilloscope will provide all of the following features:

19 Automatic Measurements consisting of:

Voltage: Vamp, Vavg, Vrms, Vpp, Vpre, Vovr, Vtop, Vbase, Vmin, and Vmax

Time: Delay, Duty Cycle, Frequency, Period, Phase Angle, Rise Time, Fall Time, + width, and -width

Thresholds: User selectable among 10%/90%, 20%/80%, or absolute voltage levels

Cursor Readout: Voltage or percentage

Modes: Time or phase angle

HP 54600-Series Scope Interface and Enhancement Modules

Ordering Information Product	Description	Price	HP-IB	RS-232 and Parallel	FFT and Advanced Meas.	BenchLink Software
1. HP 54650A	HP-IB Interface Module	\$295	•			
HP 54652B	RE-232 and Parallel Interface Module	\$295		•		
2. HP 54657A	HP-IB Measurement/Storage Module	\$495	•		•	
HP 54659B	RS-232 Measurement/Storage Module	\$495		•	•	
3. HP E2657A	Measurement/Connectivity Kit for HP-IB	\$695	•		•	•
HP E2659A	Measurement/Connectivity Kit for RS-232	\$695		•	•	•

(Note that the HP 54620A/C logic analyzers can use any of these modules, but they use the modules for I/O only.) HP 34810B BenchLink Scope software for Windows is available separately. See page 97.

1. Basic Connectivity

If all you need is a PC interface, add HP-IB with the HP 54650A or both RS-232 and parallel connections with the HP 54652B.

2. Connectivity and Advanced Measurements

For high-performance tools usually found only in much more expensive scopes—including the FFT to view signals in the frequency domain—add the HP 54657A (HP-IB) or HP 54659B (RS-232 and parallel) measurement/storage module.

Waveform Math Functions

Function 1: Addition, subtraction, and multiplication

Function 2: Differentiation, integration, and FFT

FFT

Windows: Exponential, flat top, Hanning and rectangular

Samples: 1024 points

Storage

Trace Memory: Up to 100 nonvolatile memories

Memories 1-3: High speed storage without compression

Memories 4-100: Storage with compression. Storage time is approximately 7 seconds. Number of traces that can be stored is a function of complexity, with the minimum being 4 highly complex traces and the maximum being 96.

Memory Labeling: An onscreen text editor is provided for creating labels up to 20 characters. Each label contains the date and time it was saved.

Real-Time Clock: 24-hour format with battery back-up. Can be set from front panel.

Unattended Waveform Monitoring

Testing Method: Comparison to waveform mask

Number of Masks: 2

Mask Generation and Operation: Automask, controlled from the front panel, generates mask from displayed wave-form with selectable tolerance. Mask editor function allows pixel-by-pixel editing and line drawing. Smoothing function performs a running average of 3 pixels.

Action on Failure:

Save failed trace to memory with date and time of the failure

Print failed trace with date and time of the failure

Count the failure and maintain pass/fail statistics while continuing the test

Hard Copy and Programmability Interface: HP 54657A: HP-IB (for HP-IB specifications, see HP 54650A)

HP 54659B: RS-232/Parallel (for RS-232/Parallel specifications, see HP 54652B)

This module also provides many other features to make your work easier, including unattended signal monitoring and failure detection, measurements of channel-to-channel delay and phase, user-definable voltage levels for timing measurements, and extended math functions and cursor readouts.

3. Complete Connectivity, Including Software

Get the complete package, including HP BenchLink Scope software for documenting and analyzing measurement results (see page 163 for more information on HP BenchLink).

Ordering Information

HP 54600B Two-Channel 100-MHz Oscilloscope Includes two 1.5 m 10X probes (HP 10071A), operating and service guide, and line cord	\$2,550	☞
HP 54602B Four-Channel 150-MHz Oscilloscope Includes two 1.5 m 10X probes (HP 10071A), operating and service guide, and line cord	\$3,295	☞
HP 54603B Two-Channel 60-MHz Oscilloscope Includes two 1.5 m 10X probes (HP 10071A), operating and service guide, and line cord	\$1,995	☞
HP 54610B Two-Channel 500-MHz Oscilloscope Includes two 1.5 m 10X probes (HP 10073A), operating and service guide, and line cord	\$4,995	☞
HP 54615B Two-Channel 500 MHz Oscilloscope Includes two 1.5 m 10X probes (HP 10073A), operating and service guide, and line cord	\$5,695	☞
HP 54616B Two-Channel 500 MHz Oscilloscope Includes two 1.5m 10X probes (HP 10073A), operating and service guide, and line cord	\$6,995	☞
HP 54616C Two-Channel 500 MHz Color Oscilloscope Includes two 1.5m 10X probes (HP 10073A), operating and service guide, and line cord	\$7,995	☞
HP 54645A Two-Channel 100 MHz MegaZoom Oscilloscope Includes two 1.5m 10X probes (HP 10074A), operating and service guide, and line cord	\$3,495	☞

Accessories

HP 54650A HP-IB Interface Module	\$295	☞
HP 54652B RS-232 and Parallel Interface Module	\$295	☞
HP 54654A Operator's Training Kit	\$208	☞
HP 54657A Measurement/Storage Module with HP-IB Interface	\$495	☞
HP 54659B Measurement/Storage Module with RS-232 and Parallel	\$495	☞
HP 1146A Oscilloscope AC/DC Current Probe	\$407	☞
HP 1137A 1000:1 High Voltage Divider Probe	\$215	☞
HP 10070A 1.5 m 1X Probe	\$59	☞
HP 10071A 1.5 m 10X 150 MHz Probe	\$79	☞
HP 10072A SMT Probe Tip Kit for HP 10070A family of probes	\$67	☞
HP 10073A 1.5 m 10X 500 MHz Probe	\$156	☞
HP 10074A 1.5 m 10X 150 MHz Probe with Probe Sense	\$84	
HP 10075A 0.5 mm SMT Probe Accessory Kit for the HP 10070A family of probes	\$152	
HP 34397A DC to AC Inverter	\$163	
HP 85901A AC Power Source	\$1,340	

Options

Opt 001 Display EMI Shield (HP 54600-68703) Provides extra shielding for the CRT. For MIL standards or harsh magnetic environments (see page 119 for more details).	+\$105	
Opt 002 Display Filter Provides additional reduction in radiated emissions. For MIL standards or measurement environments sensitive to radiated emissions (see page 119 for more details).	+\$362	
Opt 005 Enhanced Video Trigger (not available on HP 54600B or HP 54603B) Adds the ability to trigger on a specified line of NTSC, PAL, PAL-M, SECAM, or general format video. IRE graticule, IRE cursor readout, video autoscale, and rear-panel outputs for trigger and channel input are added with this option.	+\$520	☞
Opt 101 Accessory Pouch and Front-Panel Cover (HP 10073A)	+\$52	☞
Opt 102 Two Additional 10071A Probes (54602B only)	+\$158	
Opt 103 Operator's Training Kit (HP 54654A) Consists of a training signal board and lab workbook. After completing these labs, an operator will be able to make measurements and operate the oscilloscope without any additional training.	+\$208	☞

Price

Opt 104 Carrying Case (HP 1185) Designed to protect the oscilloscope for shipment or for checking as airline baggage	+\$218	☞
Opt 106 BenchLink Software (HP 34810B) Windows software that interfaces the scope (with either HP-IB or RS-232 module installed) to a PC for storage, analysis, or easy integration of waveform data into desktop publishing software	+\$300	☞
Opt 090 Delete Probes for HP 54600B, 54602B, 54603B	-\$114	
Opt 090 Delete Probes for HP 54610B, HP 54615B, HP 54616B/C	-\$306	
Opt 090 Delete Probes for HP 54645A	-\$130	
Opt 1CM Rackmount Kit (HP 5062-7345) 7-inch EIA standard rack	+\$265	☞
Opt W50 Additional Two-Year Warranty (for a total of five years)		
HP 54600B	+\$71	☞
HP 54602B	+\$87	☞
HP 54603B	+\$56	☞
HP 54610B	+\$128	☞
HP 54615B	+\$163	☞
HP 54616B	+\$189	☞
HP 54616C	+\$194	☞
HP 54645A	+\$102	☞

For the Educators

These oscilloscopes are ideally suited for classroom use. Contact the HP Call Center in your region for details on specific education discount programs.

HP 54600 Interfacing and Hard Copy Output Information Compatibility Chart

The following table describes the devices supported by the HP 54600 series oscilloscopes:

	HP-IB modules	RS-232 modules	Parallel modules
Hewlett-Packard Printers (LaserJet, DeskJet)	N/A	N/A	Yes
Epson Printers (FX-80 or Compatible)	N/A	Yes	Yes
Computers	Yes	Yes	Yes
HP-PCL Printers	Yes	Yes	Yes
HP-GL Plotters	Yes	Yes	N/A

HP-IB Cables for HP 59650A and HP 59657A

HP 10833A 1 m Cable	\$90
HP 10833B 2 m Cable	\$100
HP 10833C 4 m Cable	\$110
HP 10833D 0.5 m Cable	\$90

RS-232 Cables for HP 54652B and HP 54659B

For connection to printers and plotters:

HP 34398A 2.5 m, 9 Pin (f) to 9 Pin (f)	\$20
HP 34399A Adapter Kit	\$27

For connection to PCs:

HP 34398A 2.5 m, 9 Pin (f) to 9 Pin (f) Plus 9 Pin (m) to 25 Pin (f) Adapter	\$20
---	------

RS-232 Cables for HP 54656A and HP 54658A

For connection to printers and plotters:

HP 13242G 5 m, 25 Pin (m) to 25 Pin (m)	\$49
---	------

For connection to IBM PC/XT computers:

HP C2913A 1.2 m, 25 Pin (m) to 25 Pin (f)	\$18
---	------

For connection to PCs:

HP 24542G 3 m, 25 Pin (m) to 9 Pin (f)	\$45
--	------

Parallel Cable

HP C2950A 2 m, Parallel Printer Cable	\$14
---------------------------------------	------

☞ Indicates QuickShip availability.