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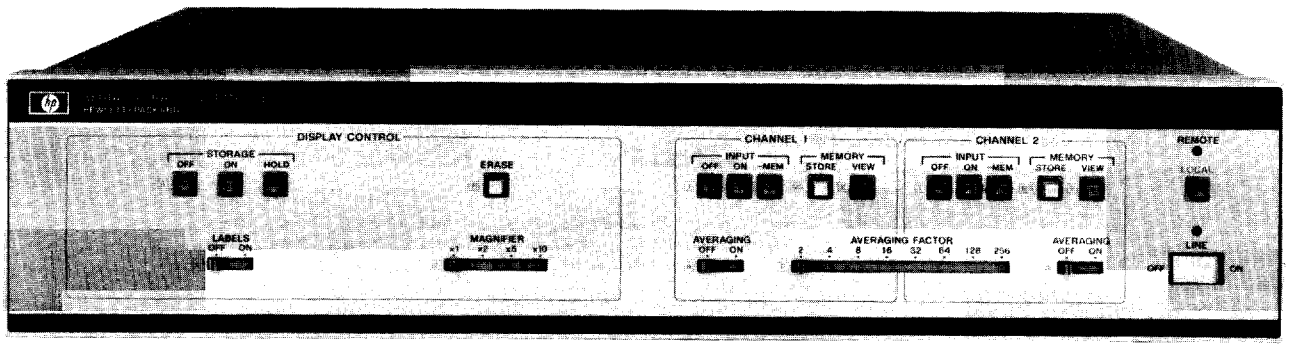
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HP 8501A

DESIGNED FOR HP-IB SYSTEMS

Description

The HP 8501A high performance Storage-Normalizer is a dedicated accessory that extends the measurement capability of your HP 8505A RF Network Analyzer (500 kHz to 1.3 GHz). Flicker-free displays with digital storage and CRT annotation of major control settings provide convenient easy documentation. Using normalization, frequency response errors are simply removed. In addition, the HP 8501A can digitally average signals to dramatically improve signal-to-noise ratios and magnify the display for high accuracy measurements. With a desktop computing controller, computer graphics capability is added to the HP 8505A for displaying corrected data, operator messages, or computer programs.

HP 8501A Specifications

Display

Rectangular Displays

Horizontal display resolution: two display channels, 500 points per channel (0.2% of full scale, 0.24 mm).

Vertical display resolution: 500 points displayed full scale (0.2% of full scale) plus a 50% overrange (250 points) both above and below full screen.

Polar Displays

Display resolution: two display channels, 250 points per polar display (0.2% of full scale, 0.2 mm in X and Y).

Display tracking: visual offsets between direct HP 8505A and stored displays are approximately ±½ CRT minor division (±1 mm).

Horizontal input sweep times: 100 s max/10 ms min.

Conversion time: 10 ms max for 500 ±2 data points (20 μs per point).

Display refresh time: nominally 20 ms depending upon information displayed.

Line generator: a line generation technique is used to connect points on a CRT display, yielding a smooth continuous trace.

Markers: all five markers are also available in the digital display mode.

Output

Auxiliary outputs XYZ: (BNC female connectors on rear panel).
X—1 V full screen, 83 mV/div (12 div).
Y—1 V full screen, 100 mV/div (10 div).
Z—−1 volt blanks display, +2 volts unblank display. (Signal compatible for all HP CRT displays such as 1332, 1304, or 1310.

Offsets: the X, Y, and polar display offsets can be adjusted over a ±10% range of screen by means of potentiometers on the rear panel of the HP 8501A.

Labeling interface: all major control settings of the HP 8505A, the HP 8503A and phase-lock indication are displayed on the CRT.

HP-IB Interface

HP-IB Interface Capabilities

Remote Programming

Learn mode: this feature provides the ability to output the current instrument state to a computing controller.

Input data: data for graphics or other purposes can be sent to the HP 8501A at a rate of:

ASCII mode: 600 points per second.

Binary mode: 10000 points per second.

Output data: data can be read from the HP 8501A at a rate of:

ASCII mode: 800 points per second.

Binary mode: 9000 points per second.

Graphics: data for graphics can be read into the HP 8501A and viewed in two types of displays.

Text displays: 22 lines of text with 54 characters per line can be displayed on the CRT.

Vector display: lines can be drawn on the display between any two points with a resolution of 432 points in X and 360 points in Y (nominal).

General

Display Controls

Storage off: the HP 8501A is bypassed so the display returns to normal analog operation.

Storage on: turns on digitally stored display.

Storage hold: the current display is not updated and is frozen for CRT photography or further analysis.

Erase: display and memory are erased.

Labels: switches all display labeling on or off.

Magnifier: expands the display by a factor of 1, 2, 5, or 10.

Processing Functions (channel 1 and 2)

Input off: display of channel 1 (2) is blanked.

Input on: channel 1 (2) measurement is displayed.

Input mem: the difference between the channel 1 (2) measurement and the stored memory content is displayed (normalization).

Memory store: the current measurement is stored in memory.

Memory view: the stored memory content is displayed.

Averaging: the data averaging function for channel 1 (2) is switched on or off.

Averaging factor: the degree of averaging is selectable from 2, 4, 8 . . . to 256. The current averaged trace is always displayed and updated at the sweep rate.

Local: returns the HP 8501A control to the front panel from remote HP-IB control.

Includes: 0.5 m HP-IB cable and the processor interconnect cable.

Accessories: the HP 11864A Accessory Kit provides the labeling interface boards and connectors for retrofitting the HP 8505A. Labeling interface now standard on the HP 8505A.

Power: selection of 100, 120, 220, or 240 V +5%–10%, 50 to 60 Hz and <140 VA (<140 watts).

Size: 90 H x 426 W x 534 mm D (3.5″ x 16.75″ x 21.0″.).

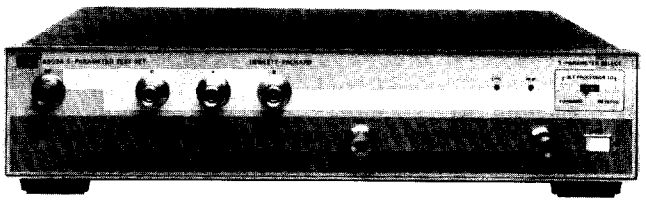
Weight: net, 12.25 kg (27 lb); shipping, 14 kg (31 lb).

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NETWORK ANALYZERS

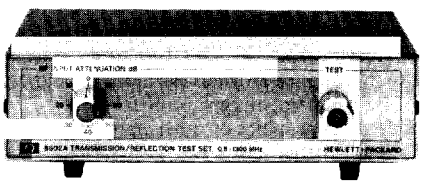
RF Network Analyzer, 500 kHz to 1.3 GHz (cont.)

Models 8503A/B, 8502A/B, 11850A/B, 11851A-11858A, 11857B, 1121A

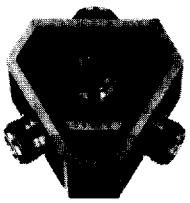


HP 8503A

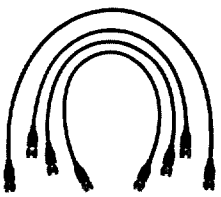
DESIGNED FOR HP-IB SYSTEMS



HP 8502A



HP 11850A



HP 11851A

HP 8502A 50 Ω Transmission/Reflection Test Set
HP 8502B 75 Ω Transmission/Reflection Test Set

Frequency range: 500 kHz to 1.3 GHz.
Impedance: HP 8502A, 50 Ω; HP 8502B, 75 Ω.
Directivity: ≥40 dB.
Frequency Response
Transmission: ≤±0.8 dB and ≤±8°.
Reflection: ≤±1.5 dB and ≤15° from 0.5–1300 MHz; ≤±10° from 2–1300 MHz.
Port Match
Test port: ≥26 dB return loss from 2–1300 MHz (≥24 dB for HP 8502B); ≥20 dB return loss from 0.5–2 MHz (≥18 dB for HP 8502B).
Test port open/short ratio: ±0.75 dB and ±6° from 2–1000 MHz (±0.9 dB and ±7.5° for HP 8502B); ±0.9 dB and ±7.5° from 1000–1300 MHz; ±1.25 dB and ±10° from 0.5–2 MHz.
Reference and reflection ports: ≥25 dB return loss from 2–1000 MHz; ≥23 dB return loss from 0.5–1300 MHz.
Input port: ≥23 dB return loss.
Nominal Insertion Loss
Input to test port: 13 dB (HP 8502A), 19 dB (HP 8502B).
Input to reference port: 19 dB (HP 8502A), 19 dB (HP 8502B).
Input to reflection port: 19 dB (HP 8502A), 31 dB (HP 8502B).
Maximum operating level: +20 dBm.
Damage level: 1 watt CW.
RF attenuator range: 0 to 70 dB in 10-dB steps.
Connectors test port: 50 Ω Type N Female for HP 8502A and 75 Ω Type N Female for HP 8502B; all other RF ports 50 Ω Type N Female; Bias input, BNC Female.
DC bias input: ±30 V dc and ±200 mA.
Includes: HP 8502B includes 50 Ω/75 Ω minimum loss pad.
Recommended accessory: HP 11851A RF Cable Kit for either HP 8502A or 8502B.
Size: 61.5 H x 101 W x 204 mm D (2.44″ x 7.5″ x 8.0″).
Weight: net, 1.7 kg (3.25 lb); shipping, 3.1 kg (7 lb).

HP 8503A 50 Ω S-Parameter Test Set
HP 8503B 75 Ω S-Parameter Test Set

Frequency range: 500 kHz to 1.3 GHz.
Impedance: HP 8503A, 50 Ω; HP 8503B, 75 Ω.
Directivity: ≥40 dB.
Frequency Response
Transmission (S_{12}, S_{21}): ±1 dB, ±12° from 0.5–1300 MHz.
Reflection (S_{11}, S_{22}): ±2 dB, ±20° from 0.5–1300 MHz; ±15° from 2–1300 MHz.
Port Match
Test ports 1 and 2: ≥26 dB return loss from 2–1300 MHz (≥24 dB for HP 8503B), ≥20 dB return loss from 0.5–2 MHz (≥18 dB for HP 8503B).
Test port 1 and 2 open/short ratio: ≤±0.75 dB and ±6° from 2–1000 MHz (±0.9 dB and ±7.5° for HP 8503B); ≤±0.9 dB and 7.5° from 1000–1300 MHz; ±1.25 dB and ±10° from 0.5–2 MHz.
Reference and return ports: ≥23 dB return loss from 2–1000 MHz; ≥20 dB return loss from 0.5–2 MHz and 1000 –1300 MHz.
RF input port: 20 dB return loss from 0.5–1300 MHz.
Maximum operating level: +20 dBm.
Damage level: 1 watt CW.
Connectors: test ports, 50 Ω APC-7 for HP 8503A and 75 Ω Type-N Female for HP 8503B; all other RF connectors, 50 Ω Type-N Female; Bias inputs BNC Female.
DC bias input: 30 V dc, ±200 mA.
Includes: four 19 cm (7.5″) cables for connection to HP 8505A.
Recommended accessory: HP 11857A 50 Ω Test Port Extension Cables or HP 11857B/C 75 Ω Test Port Extension Cables.
Programming: programming via HP-IB; 0.5 m HP-IB cable included.
Power: 100, 120, 220, or 240 V +5%–10%, 50 or 60 Hz; approx. 10 watts (15 watts for HP 8503B).
Size: 90 H x 426 W x 553 mm D (3.5″ x 16.75″ x 21.0″).
Weight: net, 9.1 kg (20 lb); shipping, 11.3 kg (25 lb).

Accessories

HP 11850A 50 Ω Power Splitter
HP 11850B 75 Ω Power Splitter

Frequency range: dc to 1.3 GHz.
Impedance: HP 11850A, 50 Ω; HP 11850B, 75 Ω.
Tracking between any two output ports: ≤0.1 dB and ≤1.5°.
Equivalent source match (ratio or leveling): ≥32 dB return loss (≤1.05 SWR).
Input port match: ≥20 dB return loss.
Nominal insertion loss: 9.54 dB for HP 11850A; 7.78 dB for HP 11850B.
Frequency response absolute: input to output ≤0.2 dB.
Maximum operating level: +20 dBm.
Burn-out level: ≥1 watt CW.
Connectors: HP 11850A, 50 Ω Type N female; HP 11850B, three outputs 75 Ω Type N female; RF input, 50 Ω Type N female.
Recommended accessory: HP 11851A RF Cable Kit.
Includes: HP 11850B includes three 50 Ω/75 Ω Minimum Loss Pads
Size: 46 H x 67 W x 67 mm D (1.88″ x 2.63″ x 2.63 ″).
Weight: net, 1.8 kg (4 lb); shipping, 3.1 kg (7 lb).

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HP 11851A RF Cable Kit
General: three 610 mm (24 in.) 50 Ω cables phase matched to 4° at 1.3 GHz and one cable 860 mm (34 in.). Connectors are Type N Male. Recommended for use with HP 8502A/B Transmission/Reflection Test Set and HP 11850A/B Power Splitter.
Weight: net, 0.91 kg (2 lb); shipping, 1.36 kg (3 lb).

HP 11852A 50 Ω/75 Ω Minimum Loss Pad
General: the HP 11852A is a low SWR minimum loss pad required for transmission measurements on 75 Ω devices with HP 8505A receiver (50 Ω).
Frequency range: dc to 1.3 GHz.
Insertion loss: 5.7 dB.
Return loss: 75 Ω side, 50 Ω side terminated: typically ≥34 dB (≤1.04 SWR). 50 Ω side, 75 Ω side terminated: typically ≥30 dB (≤1.06 SWR).
Typical flatness: ≤0.1 dB from dc to 1.3 GHz.
Maximum input power: 250 mW (+24 dBm).
Connectors: 50 Ω Type N female and 75 Ω Type N male.
Size: 14 D x 70 mm L (0.56″ x 2.75″).
Weight: net, 0.11 kg (4 oz); shipping, 0.26 kg (9 oz).

HP 11853A 50 Ω Type N Accessory Kit
General: the HP 11853A furnishes the RF components required for measurement of devices with 50Ω Type N Connectors using the HP 11850A, 8502A, or 8503A (8503A also requires the HP 85032A). Kit contains a Type N Female short, a Type N Male short, two Type N Male barrels, two Type N Female barrels and storage case.
Weight: net, 0.91 kg (2 lb); shipping, 1.36 kg (3 lb).

HP 11854A 50 Ω BNC Accessory Kit
General: the HP 11854A furnishes the RF components required for measurement of devices with 50Ω BNC Connectors using the HP 11850A, 8502A, or 8503A (8503A also requires the HP 85032A). Kit contains two Type N Male to BNC Female adapters, two Type N Male to BNC Male adapters, two Type N Female to BNC Female adapters, two Type N Female to BNC Male adapters, a BNC Male short and storage case.
Weight: net, 1.13 kg (2½ lb).

HP 11855A 75 Ω Type N Accessory Kit
General: the HP 11855A provides the RF connecting hardware generally required for measurement of devices with 75 Ω Type N connectors using the HP 8502B, 8503B or 11850B. Kit contains two 75 Ω Type N Male barrels, two Type N Female barrels, a 75 Ω Type N Female short, a 75 Ω Type N Male short, a 75 Ω Type N Male termination, and storage case.
Weight: net, 0.91 kg (2 lb); shipping, 1.36 kg (3 lb).

HP 11856A 75 Ω BNC Accessory Kit
General: the HP 11856A provides the RF connecting hardware generally required for measurement of devices with 75 Ω BNC connectors using the HP 8502B, 11850B, or 8503B. Kit contains two Type N Male to BNC Female adapters, two Type N Male to BNC Male adapters, two Type N Female to BNC Female adapters, two Type N Female to BNC Male adapters, a BNC Male short, a 75 Ω BNC Male termination, and storage case.
Weight: net, 0.91 kg (2 lb); shipping, 1.36 kg (3 lb).

HP 11857A 50 Ω APC-7 Test Port Extension Cables
General: two precision 61 cm (24 in.) cables, phase matched to 2° at 1.3 GHz for use with HP 8503A S-parameter test set. Connectors are 50 Ω APC-7.
Weight: net, 0.91 kg (2 lb); shipping, 2.3 kg (5 lb).

HP 11857B 75 Ω Type N Test Port Extension Cables
General: two precision 61 cm (24 in.) cables, phase matched to 2° at 1.3 GHz for use with HP 8503B S-parameter test set. One cable has 75 Ω Type N Male connectors on both ends; the other has one Type N Male and one Type N Female connector.
Weight: net, 0.91 kg (2 lb); shipping, 2.3 kg (5 lb).

HP 11858A Transistor Fixture Adapter
General: the HP 11858A adapts the HP 11600B and 11602B transistor fixtures (vertical test port configuration) to the HP 8503A S-parameter test set. Connectors are APC-7.
Weight: net, 0.91 kg (2 lb); shipping, 1.36 kg (3 lb).

Ordering Information	Price
HP 8505A* RF Network Analyzer	$40,370
Opt 005: Phase Lock	$1,505
Opt 908: Rack Mounting Kit (for use without front handles)	$50
Opt 910: Extra Manual	$150
Opt 913: Rack Mounting Kit	$62
HP 8503A* 50 Ω S-Parameter Test Set	$7,170
Opt 908: Rack Mounting Kit (for use without front handles)	$30
Opt 910: Extra Manuals	$12
Opt 913: Rack Mounting Kit	$30
HP 8503B* 75 Ω S-Parameter Test Set	$7,270
Opt 908: Rack Mounting Kit (for use without front handles)	$30
Opt 910: Extra Manual	$12
Opt 913: Rack Mounting Kit	$30
HP 8501A* Storage Normalizer	$7,770
Opt 908: Rack Mounting Kit (for use without front handles)	$30
Opt 910: Extra Manual	$25
Opt 913: Rack Mounting Kit	$30
HP 8502A 50 Ω Transmission/Reflection Test Set	$3,010
Opt 910: Extra Manual	$6
HP 8502B 75 Ω Transmission/Reflection Test Set	$3,410
Opt 910: Extra Manual	$6
HP 11850A 50 Ω Power Splitter	$805
HP 11850B 75 Ω Power Splitter	$1,405
HP 11851A RF Cable Kit	$955
HP 11852A 50 Ω to 75 Ω Minimum Loss Pad	$205
HP 11853A 50 Ω Type N Accessory Kit	$230
HP 11854A 50 Ω BNC Accessory Kit	$195
HP 11855A 75 Ω Type N Accessory Kit	$230
HP 11856A 75 Ω BNC Accessory Kit	$330
HP 11857A 50 Ω APC-7 Test Port Extension Cables	$1,005
HP 11857B 75 Ω Type N Test Port Extension Cables	$1,455
HP 11858A Transistor Fixture Adapter	$980
HP 11864A Labeling Interface Kit	$945

*Front Handles are standard

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