

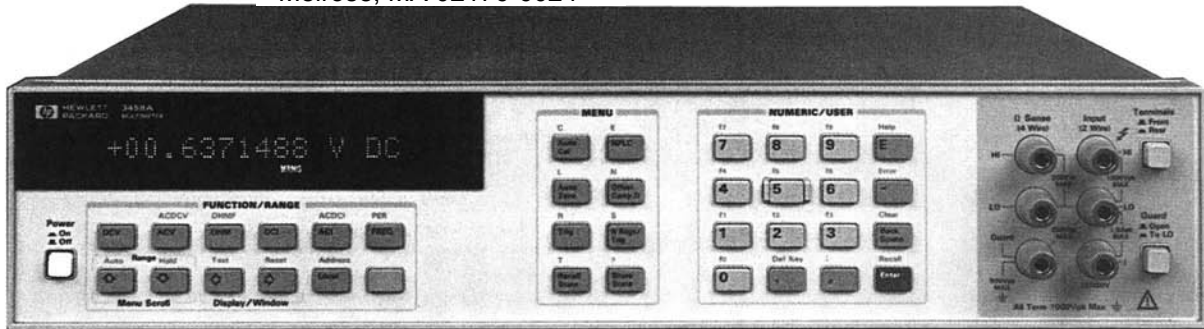
DIGITAL MULTIMETERS

A System Multimeter with Both High Speed and High Accuracy

HP 3458A

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Melrose, MA 02176-6024

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DESIGNED FOR
MATE
SYSTEMS



HP 3458A

The HP 3458A multimeter shatters longstanding performance barriers of speed and accuracy on the production test floor, in research and development, and in the calibration lab. The HP 3458A is the fastest, most flexible, and most accurate multimeter offered by Hewlett-Packard. In your system or on the bench, the HP 3458A saves you time and money with unprecedented test system throughput and accuracy, seven-function measurement flexibility, and low cost of ownership.

Select a rate of 100,000 readings per second for maximal test throughput. Or achieve highest levels of precision with up to 8½ digits of measurement resolution and 0.1 part per million transfer accuracy. Add to this programming compatibility through the Hewlett-Packard Multimeter Language (HPML) and the HP 3458A's simplicity of operation, and you have the ideal multimeter for your most demanding applications.

High-Test System Throughput

Faster Testing

- Up to 100,000 readings/s
- Internal test setups > 340/s
- Programmable integration times from 500 ns to 1 s

Greater Test Yield

- More accuracy for tighter test margins
- Up to 8½ digits resolution

Longer Uptime

- Two-source (10 V, 100 k Ω) calibration, including ac
- Self-adjusting, self-verifying autocalibration for all functions and ranges, including ac

High-Resolution Digitizing

Greater Waveform Resolution and Accuracy

- 16 to 24 bits resolution
- 100,000 to 0.2 samples/sec
- 12 MHz bandwidth
- Timing resolution to 10 ns
- Less than 100 ps time jitter
- Over 75,000 reading internal memory

Flexible Digitizing Software

- Powerful, easy-to-use analysis software for HP 9000 Series 200/300 computers or HP Vectra with measurement coprocessor
- Subprograms for waveform acquisition, data transfer, FFT, IFT, and data presentation

Calibration Lab Precision

Superb Transfer Measurements

- 8½ digits resolution
- 0.1 ppm dc volts linearity
- 0.1 ppm dc volts transfer capability
- 0.01 ppm rms internal noise

Extraordinary Accuracy

- 0.6 ppm for 24 hours in dc volts
- 2.2 ppm for 24 hours in ohms
- 100 ppm mid-band ac volts
- 8 ppm (4 ppm optional) per year voltage reference stability

HP 3458A Multimeter Performance Features

dc Volts

- 5 ranges: 0.1 V to 1000 V
- 8½ to 4½ digits resolution
- Up to 100,000 readings/s (4½ digits)
- Maximum sensitivity: 10 nV
- 0.6 ppm 24-hour accuracy
- 8 ppm (4 ppm optional)/year voltage reference stability

Ω

- 9 ranges: 10 Ω to 1 G Ω
- 2-wire and 4-wire Ω with offset compensation
- Up to 50,000 readings/s (5½ digits)
- Maximum sensitivity: 10 $\mu\Omega$
- 2.2 ppm 24-hour accuracy

ac Volts

- 6 ranges: 10 mV to 1000 V
- 1 Hz to 10 MHz bandwidth
- Up to 50 readings/s with all readings to specified accuracy
- Choice of sampling or analog true rms techniques
- 100 ppm best accuracy

dc Current

- 8 ranges: 100 nA to 1 A
- Up to 1,350 readings/s (5½ digits)
- Maximum sensitivity: 1 pA
- 14 ppm 24-hour accuracy

ac Current

- 5 ranges: 100 μ A to 1 A
- 10 Hz to 100 kHz bandwidth
- Up to 50 readings/s
- 500 ppm 24-hour accuracy

Frequency and Period

- Voltage or current ranges
- Frequency: 1 Hz to 10 MHz
- Period: 100 ns to 1 s
- 0.01 % accuracy
- ac or dc coupled

Throughput

Maximum Reading Rates

- 100,000 readings/s at 4½ digits (16 bits)
- 50,000 readings/s at 5½ digits
- 6,000 readings/s at 6½ digits
- 60 readings/s at 7½ digits
- 6 readings/s at 8½ digits

Measurement System Speed

- 100,000 readings/s over HP-IB or with internal memory
- 110 autoranges/s
- 340 function or range changes/s
- Postprocessed math from internal memory

Abbreviated Technical Specifications

dc Voltage

Range	Full Scale	Maximum Resolution	1-Year* Accuracy	Transfer Accuracy 10 min, Tref ± 0.5° C	Input Impedance
			ppm of reading + ppm of range		
100 mV	120.00000	10 nV	9(5) + 3	0.5 + 0.5	> 10 G Ω
1 V	1.2000000	10 nV	8(4) + 0.3	0.3 + 0.1	> 10 G Ω
10 V	12.0000000	100 nV	8(4) + 0.05	0.05 + 0.05	> 10 G Ω
100 V	120.000000	1 μV	10(6) + 0.3	0.5 + 0.1	10 M Ω ± 1%
1000 V	1050.00000	10 μV	10(6) + 0.1	1.5 + 0.05	10 M Ω ± 1%

One-year specifications for NPLC 100 within 24 hours and ± 1° C of last ACAL, Tcal ± 5° C, MATH NULL, fixed range. Add 2 ppm of reading additional error for HP factory traceability of 10 V dc to US NIST. Traceability error is the absolute error relative to National Standards associated with the source of last external calibration. Transfer specifications for NPLC 100, following 4-hour warm-up. Full scale to 10% of full scale. Measurements on the 1000 V range are within 5% of the initial measurement value and following measurement settling. Tref is the starting ambient temperature. Measurements are made on a fixed range using accepted metrology practices. *High stability (Option 002) ppm of reading in parentheses.

Noise Rejection (dB)¹

	ac NMR ²	ac ECMR	dc ECMR
NPLC < 1	0	90	140
NPLC ≥ 1	60	150	140
NPLC ≥ 10	60	150	140
NPLC ≥ 100	70	160	140
NPLC = 1000	80	170	140

¹ Applies for 1 kΩ unbalance in the LO lead and ± 0.1% of the line frequency currently set for LFREQ.

² For line frequency ± 1%, ACNMR is 40 dB for NPLC ≥ 1, or 80 dB for NPLC ≥ 100. For line frequency ± 5%, ACNMR is 65 dB for NPLC ≥ 100.

Maximum Input

	Rated Input	Nondestructive
HI to LO	± 1000 V pk	± 1200 V pk
LO to guard	± 200 V pk	± 350 V pk
Guard to earth	± 500 V pk	± 1000 V pk

True rms ac Voltage

(Synchronous Subsampled Mode)

Range	Full Scale	Maximum Resolution	Accuracy* 24 hour-2 year 40 Hz to 1 kHz % of reading + % of range	Input Impedance
10 mV	12.00000	10 nV	0.02 + 0.011	1MΩ ± 15% with <140 pf
100 mV	120.00000	10 nV	0.007 + 0.002	1MΩ ± 15% with <140 pf
1 V	1.2000000	100 nV	0.007 + 0.002	1MΩ ± 15% with <140 pf
10 V	12.000000	1 μV	0.007 + 0.002	1MΩ ± 2% with <140 pf
100 V	120.000000	10 μV	0.02 + 0.002	1MΩ ± 2% with <140 pf
1000 V	700.0000	100 μV	0.04 + 0.002	1MΩ ± 2% with <140 pf

*Specifications apply for full scale to 10% of full scale, dc < 10% of ac, sine wave input, crest factor of 1.4. Within 24 hours and ± 1° C of last ACAL. Peak (ac + dc) input limited to 5 × full scale for all ranges. Add 2 ppm of reading additional error for HP factory traceability of 10 V dc to US NIST.

Maximum Input

	Rated Input	Nondestructive
HI to LO	± 1000 V pk	± 1200 V pk
LO to guard	± 200 V pk	± 350 V pk
Guard to earth	± 500 V pk	± 1000 V pk
Volt-Hz product	1 × 10 ⁸	

Resistance

Range	Full Scale	Maximum Resolution	Current through Unknown	1-Year Accuracy* (4-wire ohms) ppm of rdg + ppm of range
10 Ω	12.00000	10 μΩ	10 mA	15 + 5
100 Ω	120.00000	10 μΩ	1 mA	12 + 5
1 k Ω	1.2000000	100 μΩ	1 mA	10 + 0.5
10 k Ω	12.000000	1 m Ω	100 μA	10 + 0.5
100 k Ω	120.00000	10 m Ω	50 μA	10 + 0.5
1 M Ω	1.2000000	100 m Ω	5 μA	15 + 2
10 M Ω	12.000000	1 Ω	500 nA	50 + 10
100 M Ω	120.00000	10 Ω	500 nA	500 + 10
1 G Ω	1.2000000	100 Ω	500 nA	0.5% + 10

*Specifications for 100 NPLC, offset compensation on, within 24 hours and ± 1° C of last ACAL, Tcal ± 5° C. Add 3 ppm of reading additional error for HP factory traceability of 10kΩ to US NIST.

Memory

	Standard		Option 001	
	Readings	Bytes	Readings	Bytes
Reading storage (16 bit) Non-volatile, for subprograms and/or state storage	10,240	20 k	+ 65,536	+ 128 k
		14 k		

Math Functions: The HP 3458A performs the following math functions on measurements: NULL, SCALE, OFFSET, RMS FILTER, SINGLE POLE FILTER, THERMISTOR LINEARIZATION, DB, DBM, % ERROR, PASS/FAIL LIMIT TESTING, and STATISTICS. Two math functions may be used at one time.

General Specifications

Operating Temperature: 0° to 55° C

Warmup Time: Four hours to all specifications except where noted

Humidity Range: 95% RH, 0° to 40° C

Storage Temperature: -40° to +75° C

Power: 100/120 V, 220/240 V ± 10%, 48 to 66 Hz, 360 to 420 Hz automatically sensed. Fused at 1.5 A @ 115 V or 0.5 A @ 230 V. < 30 W, < 80 VA (peak).

Size: 88.9 mm H × 425.5 mm W × 502.9 mm D (3.5 in × 16.75 in × 19.8 in)

Net Weight: 12 kg (26.5 lb)

Shipping Weight: 14.8 kg (32.5 lb)

Ordering Information

HP 3458A Multimeter (with HP-IB, 20 KB reading memory, and 8 ppm stability) **Price** \$6,595

Opt 001 Extended Reading Memory (expands total to 148 kB) \$570

Opt 002 High Stability (4 ppm/year) Reference \$1,080

Opt 005 Waveform Analysis Library for HP Series \$430

300 computers with BASIC 4.0 or greater and HP Vectra with Measurement Coprocessor

Opt 1BN MIL-STD-45662A Certificate of Calibration \$200

Opt 1BP MIL-STD-45662A Certificate of Calibration with data \$300

Opt W30 Two additional years return-to-HP hardware support. See page 671. \$160

Opt W32 Three-year customer return calibration coverage

Opt 700 CHIL Language \$1,080

Opt 907 Front Handle Kit \$60

Opt 908 Rack Flange Kit \$40

Opt 909 Rack Flange Kit (with handles) \$90