

HP E2310A

- Logic monitor (high, low, toggling, tristate)
- 3 1/2 digit dc voltage to 35 volts
- 3 channels of 100 MSa/s timing analysis, 2048 samples per channel
- 33 MHz frequency counter
- Measure continuity and resistance
- Check diodes

First-Level Troubleshooting

The HP LogicDart (HP E2310A)

A “personal digital troubleshooting tool” for bench and field-site work—LogicDart takes logic probe capabilities to an unprecedented level of sophistication. It’s an advanced logic probe that not only performs basic logic monitoring, but also tests continuity, dc voltage, frequency, and does timing analysis. Quickly check digital systems for stuck bits, tri-state conditions, proper supply voltages, clock distribution, shorts, opens, pulse width, clock symmetry, bus contention, skew, setup and hold time violations, and propagation delays. This eliminates the hassle of switching tools and keeps you focused on solving problems while doing first-level troubleshooting.

Form Enhances Function

You no longer have to fumble around hooking up different probes for different instruments. And HP LogicDart’s precise probe tip allows you to confidently probe fine-pitch surface mount circuitry. LogicDart easily supports multiple locations and even hard-to-access worksites. Conveniently control display viewing distance and angle while using magnifiers and microscopes.

Three Channels of Timing

In the Analyze function, you can look at up to three channels of logic activity simultaneously. You can trigger on edge, pattern, or edge/pattern combinations. And with 100 MSa/s, you will have up to 10 ns resolution. Movable cursors and pan-and-zoom allow you to easily measure the time between different events. Logic levels are displayed as high, low, or tristate.

Logic Monitoring

Logic activity is clearly displayed by two LEDs, plus an audible beeper. You can check for high, low, and toggling. Plus, you can select several different logic families, including TTL, CMOS, and ECL. Or you can set up your own thresholds for custom logic.

DC Voltage and Frequency

Check out power supplies and clocks quickly. Both dc voltages and frequency are displayed simultaneously, without needing to switch modes. You can measure up to 35 volts with 3 1/2 digits of resolution, and frequencies up to 33 MHz.

Resistance, Diode Test, and Continuity

Check for opens, shorts, and misloads using HP LogicDart. More than just continuity, you get resistance measurements, plus the ability to check diodes.

Compare Waveforms

Compare a known good waveform to a second waveform, and HP LogicDart will indicate any of the 2048 points that are different.

Save and Recall

You can store up to ten waveform displays, and later recall them for further analysis or comparison.

Optional Printer

An optional HP portable printer gives you hard copy of the waveforms you have been monitoring using HP LogicDart.

Get a free measurement demo of LogicDart at our website at (<http://www.hp.com/info/LogicDart>). This robust website is an experiment in state-of-the-art website design. Please experience this website and let us know if it makes the grade. Complete specifications available at the website.

Specifications

Input Characteristics (all channels): 1 M Ω , approx. 13 pF, maximum 40 V to ground

DC Voltage (3 1/2 digits):

Accuracy: $\pm(0.5\%$ of reading + 2 counts)* at 23° C \pm 5° C

Range: \pm 35.00 V

Temperature Coefficient: Accuracy \times 0.1/°C (for dc voltage and resistance) (0° C to 18° C, 28° C to 55° C)



Resistance

Accuracy: 0.00 k Ω to 1.19 k Ω : \pm (1.5% of reading + 1 count);

1.2 k Ω to 11.9 k Ω : \pm (2.0% of reading + 1 count);

12 k Ω to 120 k Ω : \pm (7.9% of reading + 1 count)

Continuity

Threshold: 80 Ω minimum, 140 Ω typical

Frequency

Accuracy: \pm (0.1% of reading + 1 count)

Display: 1 Hz to 9 Hz: one digit; 10 Hz to 99 Hz: two digits;

100 Hz to 33.0 MHz: three digits

Logic Monitor

Sample Rate: 100 MSa/s

States: High, low and tri-state indicators**

Glitch Detect: \geq 15 ns

Timing Analyzer

Maximum Sample Rate: 100 MSa/s

Number of Channels: 3

Number of Samples: 2048 per channel

Triggering Modes: Edge, pattern, edge/pattern combination

Trigger Glitch Detect: \geq 15 ns

Minimum Input: 0.50 V p-p

Time Base Range: 10 ns/div to 20 s/div

Cursor Accuracy: \pm (1 sample period + 2 ns + 0.1% of reading)

Dual Threshold Range: \pm 8.20 V

Dual Threshold Accuracy:

Logic Family	High Min	Max	Low Min	Max
TTL, 3.3V CMOS	1.65 V	2.40 V	0.40 V	1.52 V
5 V CMOS	3.23 V	4.50 V	0.50 V	1.84 V
ECL**	-1.50 V	-1.00 V	-1.60 V	-1.11 V
USER 1, USER 2	High - e***	High	Low	Low + e***

* For USER 1 and USER 2: \pm (0.5% of reading + 5 counts).

** Tri-state is not defined for the ECL logic family.

***e = 0.2 \times (High - Low) + 0.43 (high and low threshold will never overlap for the same channel)

Power Supply

Battery: 3 x 1.5 V AA alkaline (R6/LR6) or

AA lithium batteries (FR6/15LF)

Battery Life: 15 to 20 hours typical for alkaline batteries (depending on use)

AC Adapter: Included

Physical

Dimensions: 8.9 cm x 19.8 cm x 3.8 cm (3.5 in x 7.8 in x 1.5 in)

Weight: 0.4 kg (12 oz)

Operating Environment: Full accuracy from 0° C to 55° C;

Full accuracy to 80% RH (non-condensing) at 30° C

Storage Environment: -40° C to 65° C

Ordering Information

HP E2310A Advanced Logic Probe

Includes: carrying case, 3 probes, 2 browsers, 6 IC clips, 3 contact pins, user’s guide, AC adapter, 3 -1.5 V AA alkaline batteries, and Certificate of Calibration

Opt 001 Security Lock and Cable

HP E2320A Assembled Probe w/Browser

Includes: 1 probe, 1 browser, 1 -30.5 cm (12 in) ground lead, and 1 IC clip

HP E2321A Replacement Probe

HP E2322A Probe Accessory Kit

Includes: 1 browser, 3 -30.5 cm (12 in) ground leads, 6 -10.2 cm (4 in) ground leads, 4 IC clips, 6 contact pins, 6 ground extenders, and 3 browser replacement pins

HP 82240B Portable Thermal Printer