Personal Troubleshooting Tools

HP LogicDart Advanced Logic Probe

HP E2310A

- Logic monitor (high, low, toggling, tristate)
- 3 ½ 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/pat-
tern combinations. And with 100 MSa/s, you will have up to 10 ns reso-
lution. 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 fre-
quency are displayed simultaneously, without needing to switch modes.
You can measure up to 35 volts with 3 ½ digits of resolution, and frequen-
cies 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 exper-
iment 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 MΩ, approx. 13 pF,
maximum 40 V to ground
DC Voltage (3 ½ digits):
    Accuracy: ±(0.5% of reading + 2 counts)* at 23° C ± 5° C
    Range: ±35.00 V
    Temperature Coefficient: Accuracy x 0.1/°C (for dc voltage
    and resistance) (0° C to 18° C, 28° C to 55° C)

Resistance
    Accuracy: 0.00 kΩ to 1.19 kΩ: ± (1.5% of reading + 1 count);
    1.2 kΩ to 11.9 kΩ: ± (2.0% of reading + 1 count);
    12 kΩ to 120 kΩ: ± (7.9% of reading + 1 count)
Continuity
    Threshold: 80 Ω minimum, 140 Ω typical
Frequency
    Accuracy: ± (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: ≥ 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: ≥ 15 ns
    Minimum Input: 0.50 V p-p
    Time Base Range: 10 ns/div to 20 s/div
    Cursor Accuracy: ±(1 sample period + 2 ns + 0.1% of reading)
    Dual Threshold Range: ±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: ±(0.5% of reading + 5 counts).
** Tri-state is not defined for the ECL logic family.
***e = 0.2 x (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

	Price
HP E2310A Advanced Logic Probe	$795
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	$50
HP E2320A Assembled Probe w/Browser	$60
Includes: 1 probe, 1 browser, 1 – 30.5 cm (12 in) ground lead, and 1 IC clip	
HP E2321A Replacement Probe	$45
HP E2322A Probe Accessory Kit	$75
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	$135