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PACKARD

HP LogicDart
Advanced Logic Probe

Technical Data
February 1997

HP E2310A Advanced Logic Probe

- **Superior probing for fine pitch circuitry**
- **100 MSa/s logic timing for TTL / CMOS / ECL / Custom**
- **3 channel timing display with tristate**
- **Logic monitor with 15 ns glitch detect**
- **3 1/2 digit dc voltage to 35 volts**
- **Continuity, frequency, resistance, & diode test**

The HP LogicDart advanced logic probe takes many of the advantages of the traditional logic probe... good probing, quick checkout of a circuit...then moves performance to a whole new level. Now from a single probe tip you can monitor logic activity, get timing diagrams, measure dc voltages and frequency, measure resistance and continuity, even compare waveforms to known good ones. You can store up to ten waveform displays, get both audible and visual feedback of logic activity, and even get hard copy output from an optional HP portable thermal printer.

Single Probe Operation

In the Investigate function, you can monitor logic activity while at the same time measuring voltage, frequency, and making timing measurements. You do all this without having to change probes or instrument setup. Triggering can be set for edge, level or don't care.

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.
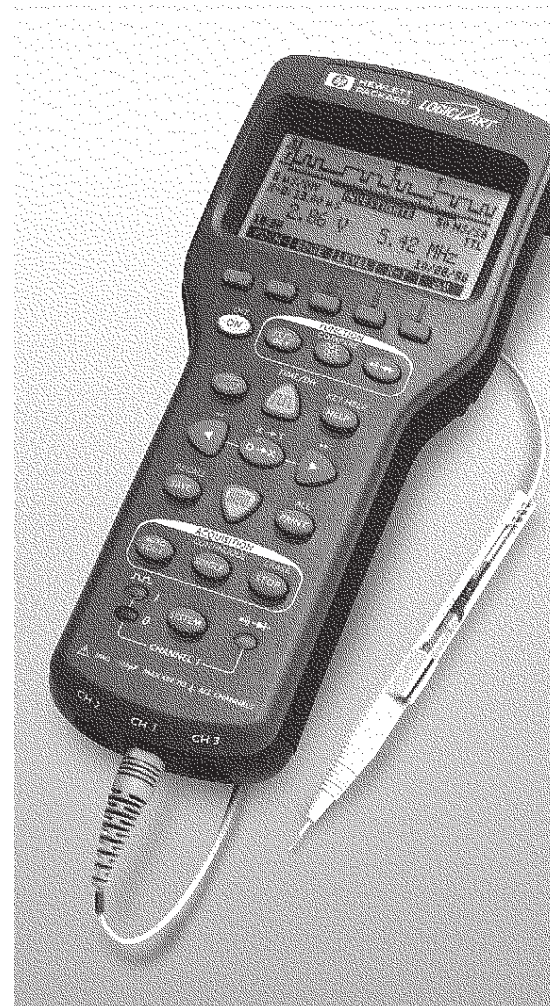
Compare Waveforms

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.

Specifications (One Year)

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

DC Voltage (3^1/$_2$ 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 tristate 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		Low	
	Min	**Max**	**Min**	**Max**
TTL, 3.3V CMOS	1.65 V	2.40 V	0.40 V	1.52 V
5V 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).
** tristate 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:
HP E2310A Advanced Logic Probe
Includes carrying case, probe kit, User's Guide, nameplate, AC adapter,
alkaline batteries, and Certificate of Calibration
HP E2320A   Assembled Probe w/ Browser
HP E2321A   Replacement Probe
HP E2322A   Probe Accessory Kit
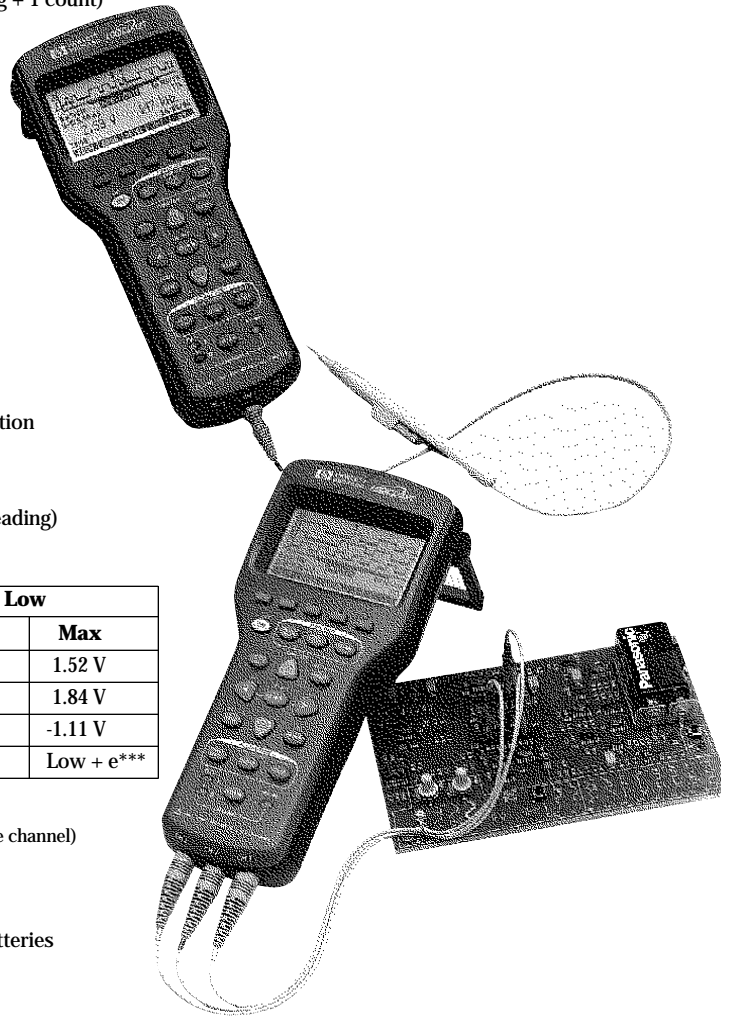
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