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Typical miniature 10:1 divider probe, bottom, and 50Ω probe, top (accessories shown are supplied with each probe).

Minature oscilloscope probes

Hewlett-Packard's series of miniature oscilloscope probes easily access test points in densely populated circuits. These small, lightweight probes, which fit in the hand much like a pencil, simplify previously difficult measurements. The basic probe is a small (2.4 mm diameter, 25 mm long) cylinder with a needle-like tip which is used with a variety of interfacing/insulating accessories to meet a variety of testing situations. The narrow body provides easier access to test points in congested areas without worrying about accidental shorts to adjacent leads.

Conventional probing

An insulating sleeve added to the basic probe provides a miniature version of the traditional oscilloscope probe. In this configuration, the probe looks and handles like a small-scale version of the traditional oscilloscope probe except that the forward barrel insulator is retractable which makes the traditional slip-on insulators for protection against shorts unnecessary. With the barrel insulator retracted, the ground spring configures the probe with a very short ground lead for high-frequency point-to-point probing.

With the barrel insulator in the forward position, the probe is used with the 20 cm flexible ground lead for probing where this type of grounding allows adequate response fidelity. The probe tip makes positive metallic contact to narrow conductors and penetrates commonly-used protective coatings while the extended insulating sleeve prevents shorts to closely-spaced adjacent leads.

With the barrel insulator retracted and using the flexible ground lead, the probe may be used with the slip-on hook tip (figure 1) for attaching to various component leads. For monitoring signals on dual in-line packages, a slip-on IC probe tip adapter allows connection to closely spaced leads without shorting (figure 3).

DIP probing

By removing the probe's insulating sleeve and using the accessory clip (10024A), you can monitor points on 14- and 16-pin DIP's with improved pulse fidelity (figure 3) and without worrying about shorting adjacent pins.

In this application, the clip is installed on the DIP, a circuit interface pin is inserted into the appropriate position, and one or more

OSCILLOSCOPE/MINIATURE PROBE COMPATIBILITY AND PROBE CHARACTERISTICS								
HP Oscilloscope/ Plug-In Model No. and Bandwidth	Probe Model No.	Approx Overall Length in Metres (ft)	Division Ratio	Input R	Shunt Capacitance	Compensates Scope Input C	Max DC Volts	Price
1725A/275 MHz 1722A/275 MHz	10017A	1 m (3.3)	10:1	1 MΩ	8 pF	9 to 14 pF	300	$90.
1715A/200 MHz 1809A/100 MHz 1085A/100 MHz	10018A	2 m (6.6)	10:1	1 MΩ	10 pF	9 to 14 pF	300	$90.
1741A/100 MHz	10040A	1 m (3.3)	10:1	1 MΩ	9 pF	20 to 30 pF	300	$90
1741A/100 MHz1740A/100 MHz	10041A	2 m (6.6)	10:1	1 MΩ	12 pF	20 to 24 pF	300	$90
1743A/100 MHz	10042A	3 m (9.8)	10:1	1 MΩ	15 pF	20 to 26 pF	300	$90
All Scopes with high Z inputs (may reduce bandwidth)	10021A	1 m (3.3)	1:1		36 pF		300	$45.
	10022A	2 m (6.6)	1:1		62 pF		300	$45.
All Scopes with 50Ω inputs and signal sources with a 50Ω source impedance	10026A	1 m (3.3)	1:1	50Ω Z			2 Amps	$45.
	10027A	2 m (6.6)	1:1	50Ω Z			2 Amps	$45.

Accessories supplied with each probe: one retractable hook tip, one alligator clip, one 20 cm (8") ground lead, four indicator sleeves (A, B C, D), one grounding spring, and one Operating Note.
*These miniature probes may be used with other oscilloscopes and test instruments with the proper input capacitance with no noticeable bandwidth degradation. However, due to variations of input characteristics, the probes may require recalibration for optimum performance.



10024A IC Test Clip



BNC-to-probe Adapter

probes are inserted to contact the desired package leads. The circuit interface pin contacts reference planes in the clip to provide a ground reference for any probe inserted in the clip. This grounding arrangement is extremely effective: high-speed pulse fidelity achieves a level previously associated only with probe-to-BNC adapters or high frequency, point-to-point probing. In addition, the clip makes it extremely easy to monitor two channel signals while using a third probe to provide an external trigger signal.

The circuit interface pins have a section of insulation which allows them to be inverted from the grounding position for using other types of probes to couple signals into or out of an IC. When the circuit interface pins are used in this position they are isolated from the ground bus in the IC clip.

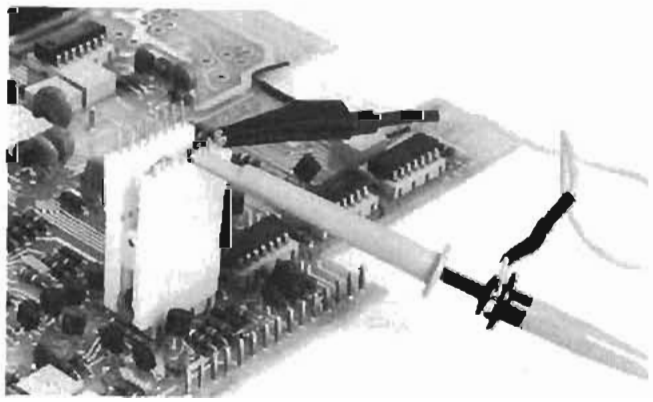


Figure 1. With the slip-on hook tip and flexible ground lead in place, the minature probe can be used like a conventional probe for attachment to test points or component leads.

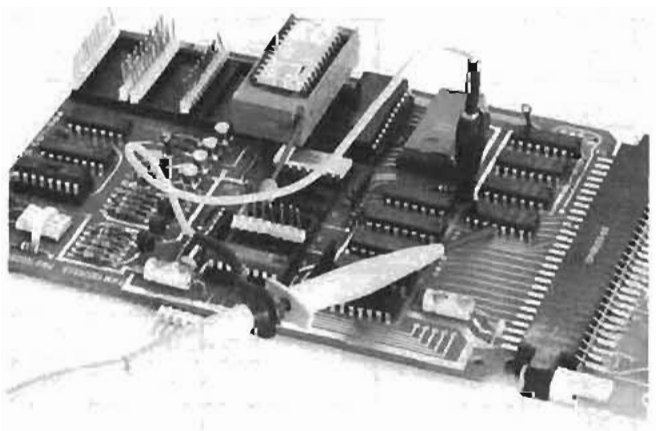


Figure 2. The slip-on IC probe tip adapter provides convenient connection to closely spaced leads on DIP's without shorting.

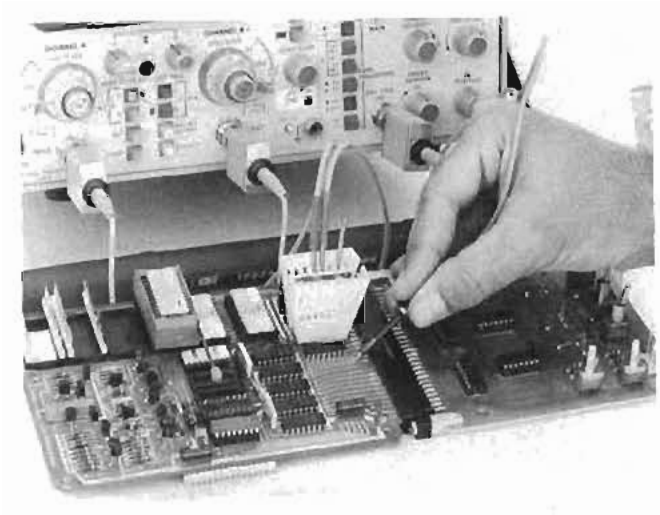


Figure 3. Minature probe with insulating sleeves removed is held in place on an IC lead by the optional IC clip. The circuit interface pin in the right hand corner of the clip can be inserted at any lead position to ground reference planes that contact the barrel of the probe(s). Rise times as short as 1.3 ns are preserved by this arrangement. The hand held probe's insulating tip has been retracted to allow the spring ground tip to establish a ground-reference point at the end of the barrel for measurements of high speed signals.

By using the 50Ω, 1:1 probes, you can insert signals from a pulse generator to determine the IC's response. In other applications, the circuit containing the IC may be removed from the instrument and it can be powered through the 50Ω probes, the IC clip, and the interface pins. This means that the IC clip, circuit interface pins, and miniature probes provide you with a complete testing system for locating IC faults.

Additional circuit interface pins are available in packages of 12 pins so that the clip can be used with other instruments. Each pin has a tip on each end so that probes such as those on HP Logic State Analyzers can be connected for fast, functional checks of circuit operation.

Digital trigger probes

Model 10250A (TTL) 4-bit Trigger Probe is a useful service, production, and design trouble-shooting tool that offers digital pattern triggering to enhance the use of oscilloscopes, logic analyzers, and other test equipment.

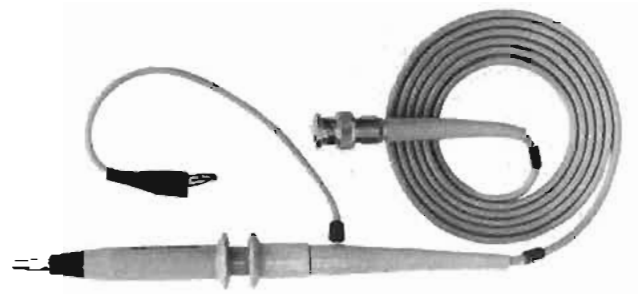
The compact Model 1230A 8-bit Logic Trigger unit generates a trigger output pulse (TTL compatible) from parallel digital pattern recognition with digital delay capability for oscilloscopes or other externally triggered test equipment.

For 4 and 8 bit parallel trigger probe specifications and prices refer to page 127.

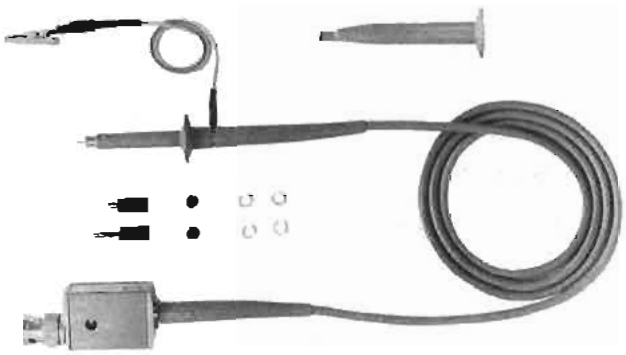
Miniature probe accessories

Probe tip kits: to increase probing versatility Models 10036B and 10037B probe tip adapter kits are supplied with slip-on 6/32 screw adapter for interfacing with any 6/32 probe adapter tip. This means that your present supply of 6/32 adapter tips, as well as future adapter tips, may be used with these miniature probes. Refer to page 176 for ordering information.

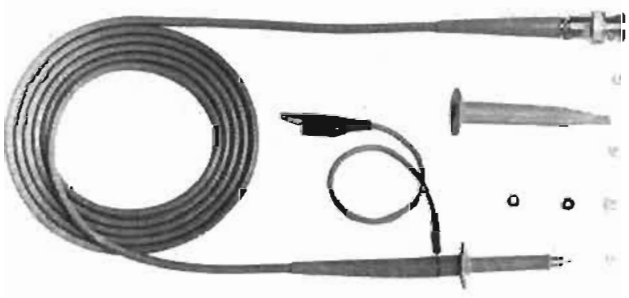
Ordering Information	Price
10024A IC Test Clip for easy probing of dual in-line packages; includes 4 insulated circuit interface pins.	$15
10024-69501 interface Pin Kit for 10024A; includes 12 interface pins.	$10
1250-1454 BNC to probe adapter permits the miniature probes to be connected to BNC connectors to maintain fast pulse response.	$8.25



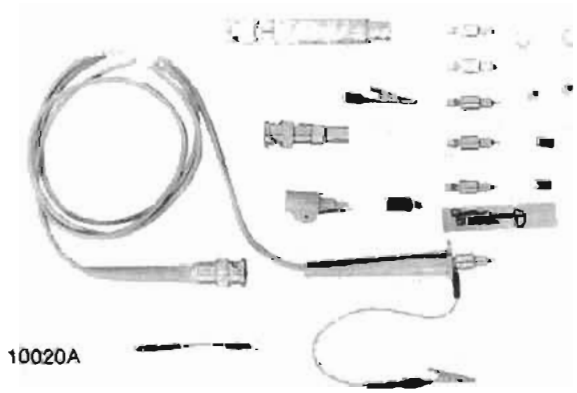
10001–10003A



10004D–10006D, 10014A, 10015A, 10016B



10007B, 10008B



10020A

Standard probe/instrument compatibility

Scope/ Plug-In	1200 Series	1220 Series	1715A/1725A	1722B	1740A, 1741A, 1743A	1801 thru 1804A	1805A	1808A	1809A	1810A	1811A	1815B
Probe												
10001A	X	X			L	L		X				
10001B	X	X			L	L		X				
10002A	X	X			L	L		X				
10002B	X	X			L	L		X				
10003A	X	X			L	L		X				
10004D		X			X	X						
10005D		X			L	X						
10006D		X			X	X						
10007B	X	X	L	L	L	L	L	X	L			
10008B	X	L	L	L	L	L	L	X	L			
10013A	X	X				L		X				
10014A			X	X			X		X			
10015A			X	X			X		X			
10016B			X	X			X		X			
10020A			X	X	X		X		X	L	L	L
1120A			X	X	X		X		X	L	L	L
1124A			L	L	L		L		L	L	L	L
1125A			X	L	X		X		X	L	L	L

Notes:
X indicates that probe will maintain the bandwidth of the instrument.
L indicates that probe may limit the bandwidth of the instrument.

Standard divider probe specifications

Model No.	Division Ratio	Resistance MΩ	Shunt Capacitance	Compensates Scope Input Capacities	Max DC Volts	Overall Length m (ft)	Price
10001A	10:1	10	10 pF	15–55	600	1.5 (5)	$60
10001B	10:1	10	20 pF	15–45	600	3.0 (10)	$60
10002A	50:1	9	2.5 pF	15–55	1000	1.5 (5)	$60
10002B	50:1	9	5 pF	15–55	1000	3.0 (10)	$60
10003A	10:1	10	10 pF	15–55	600	1.3 (4)	$60
10004D	10:1	10	10 pF	20–30	500	1.1 (3.5)	$65
10005D	10:1	10	17 pF	20–30	500	3.0 (10)	$65
10006D	10:1	10	14 pF	20–30	500	1.8 (6)	$65
10007B	1:1	—	40 pF	—	600	1.1 (3.5)	$32
10008B	1:1	—	60 pF	—	600	1.8 (6)	$32
10013A	10:1	10	13 pF	24–45	500	1.8 (6)	$39
10014A	10:1	10	10 pF	9–13	500	1.1 (3.5)	$85
10015A	10:1	10	10 pF	9–13	500	2.7(9)	$85
10016B	10:1	10	14 pF	9–13	500	1.8 (6)	$85

10020A Resistive dividers

Division Ratio	Input R* (ohms)	Division Accuracy	Max V** (rms)	Input C (pF)
1:1	50	—	6	—
5:1	250	±3%	9	<0.7
10:1	500	±3%	12	<0.7
20:1	1000	±3%	15	<0.7
50:1	2500	±3%	25	<0.7
100:1	5000	±3%	35	<0.7

*When terminated in 50 ohms.
**Limited by power dissipation of resistive element

Probe length (overall): approx. 121.9 cm (4 ft).
Weight: net, 0.45 kg (1 lb). Shipping, 1.36 kg (3 lb).
Accessories supplied: blocked capacitor, BNC adapter tip, 6-32 adapter tip, alligator tip, boot extension, cable assy's 5.1 cm (2 in.) and 15.2 cm (6 in.) ground, spanner tip, insulating cap, colored sleeve.

10020A Resistive Divider Probe Kit **$140**

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