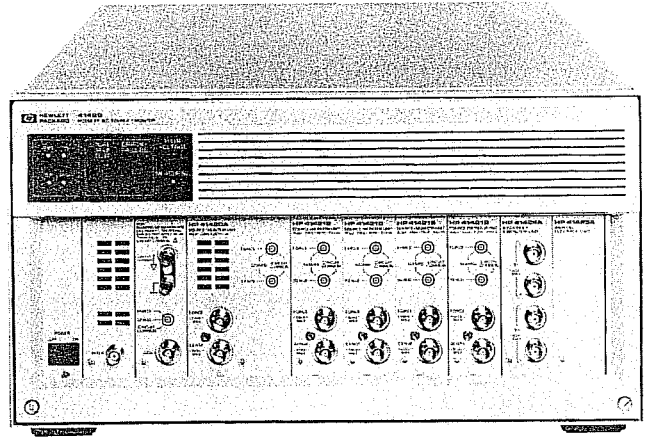


- Flexible, Modular Architecture
- Wide Measurement Range with High Resolution  
 $V: \pm 4\mu V - \pm 200V, 0.05\%$   
 $I: \pm 20fA - \pm 1A, 0.2\%$
- Pulse Measurement Capabilities  
 Pulse Width 1ms - 50 ms, 100 $\mu s$  Resolution
- High Speed Measurements (Typical)  
 Sourcing or Monitoring: 4ms  
 $V_{th}$ , hFE extracting: 12ms
- Internal Memory  
 Program Memory: > 500 Commands (Typical)  
 Data Memory: 4004 Measurement Points



**Description**

Offering a wide measurement range and excellent sensitivity, the HP 4142B Modular DC Source/Monitor is a system-use DC measurement instrument especially designed for high throughput DC semiconductor testers. A completely user-definable system component, the HP 4142B's modular architecture allows you to build a custom-configuration to suit your measurement needs.

Eight plug-in module slots can accommodate any combination of the four presently available modules, and as new modules become available, you can upgrade your measurement capabilities with ease. Choose from two types of Source/Monitor Units (SMUs) to force or measure up to  $\pm 200V$  and  $\pm 1A$ ; a Voltage Source/Voltage Monitor Unit (VS/VMU); and an Analog Feedback Unit (AFU).

The pulsed voltage and current output and measurement capabilities of the SMUs and the VS/VMU allow you to virtually eliminate the effects of test device thermal drift when testing high power devices. By using enhanced analog feedback technology (the AFU), you can optimize throughput by minimizing extraction times for such parameters as  $V_{th}$  and hFE.

Also, the HP 4142B's instrument command and measurement data storage capabilities, coupled with the high speed HP-IB interface, minimize computer loading, enhance throughput, and simplify systemization.

**Specifications**

**Measurement unit**

**41420A Source/Monitor Unit (SMU)**

$V: 40\mu V - 200 V \pm 0.05\%$   
 $I: 20fA - 1A \pm 0.2\%$

**SMU Range, Resolution and Accuracy (at 18°C - 28°C)**

Voltage Range	Set Res.	Meas Res.	Accuracy	Max. Current
$\pm 2V$	100 $\mu V$	40 $\mu V$	$\pm 0.05\% \pm 1mV$	1A
$\pm 20V$	1mV	400 $\mu V$	$\pm 0.05\% \pm 10mV$	1A ( $V \leq 14V$ ) 0.7A ( $V > 14V$ )
$\pm 40V$	2mV	800 $\mu V$	$\pm 0.05\% \pm 20mV$	350mA
$\pm 100V$	5mV	2mV	$\pm 0.05\% \pm 50mV$	125mA
$\pm 200V$	10mV	4mV	$\pm 0.05\% \pm 100mV$	50mA

Current Range	Set Res.	Meas Res.	Accuracy	Max. Voltage
$\pm 1nA$	50fA	20fA	$\pm 1\% \pm (0.1 + 0.2 \times V_0/100)\% \pm 5pA$	200V
$\pm 10nA$	500fA	200fA	$\pm 0.5\% \pm (0.1 + 0.2 \times V_0/100)\%$	
$\pm 100nA$	5pA	2pA		
$\pm 1\mu A$	50pA	20pA	$\pm 0.2\% \pm (0.1 + 0.2 \times V_0/100)\%$	
$\pm 10\mu A$	500pA	200pA		
$\pm 100\mu A$	5nA	2nA		
$\pm 1mA$	50nA	20nA		
$\pm 10mA$	500nA	200nA	$\pm 0.5\% \pm (0.1 + 0.2 \times V_0/100)\%$	
$\pm 100mA$	5 $\mu A$	2 $\mu A$		
$\pm 1A$	50 $\mu A$	20 $\mu A$		
				100V ( $I > 50mA$ )
			40V (350mA $\geq I > 125mA$ )	
			20V (0.7A $\geq I > 350mA$ )	
14V ( $I > 0.7A$ )				



HP 4142B

**41421B Source/Monitor Unit (SMU)**

$V: 40\mu V - 100V, \pm 0.05\%$   
 $I: 20fA - 100mA, \pm 0.2\%$

**41424A Voltage Source/Voltage Monitor Unit (VS/VMU)**

Source: 1mV-40V,  $\pm 0.1\%$   
 Monitor: 4 $\mu V$ -40V,  $\pm 0.05\%$

**41425A Analog Feedback Unit (AFU)**

Search Voltage Range: 2V, 20V

**Ground Unit:** Max Sink 1.6A

**No. of Plug-in Module Slots:** 8 max.

**Measurement Modes:**

Spot/Sweep (log/linear)/Pulse/Pulsed Sweep/Analog feedback for either voltage or current

**Program Memory:** Approx. 500 steps

**Data Buffer Memory:** 4004 (binary format)/1001 (ASCII format)

**BASIC Subprograms (Furnished):**

Test Instruction Set (34 Sub's); Parameter Meas. Library (8 Sub's)

**General Information**

**Power:** 100/120/220V  $\pm 10\%$ , 240V-10%+5%; 48-66Hz, 750VA max  
**Size:** 426mmW X 235mmH X 676mmD (16.8" X 9.5" X 26.6")  
**Weight:** 4142B 23kg(50.71b), 41420A 4kg(8.81b), 41421B/4A/5A 2kg(4.41b)

**Ordering Information**

**HP 4142B** Modular DC Source/Monitor

**Opt. 001** System Cable for Use with 16058A

**Opt. 002** Accessory Kit for System Use GDU/ Interlock Cables, Conn. Plate

**Opt. 400** Install 41420A (needs 2 slots)

**Opt. 401** Triaxial Cable for 41420A

**Opt. 402** Quadaxial Cable for 41420A

**Opt. 410** Install 41421B (needs 1 slots)

**Opt. 411** Triaxial Cable for 41421B

**Opt. 412** Quadaxial Cable for 41421B

**Opt. 440** Install 4142A (needs 1 slot)

**Opt. 442** Vs/Vm Cables (coaxial)

**Opt. 450** Install 41425A (needs 1 slot)

**HP 41420A** Source/Monitor Unit

**Opt. 402** Quadaxial Cable

**HP 41421B** Source/Monitor Unit

**Opt. 402** Quadaxial Cable

**HP 41424A** Voltage source/Voltage Monitor

**Opt. 442** Vs/Vm Cables (coaxial)

**HP 41425A** Analog Feedback Unit

**16058A** Test Fixture

**Opt. 001** System Cable for 4142B