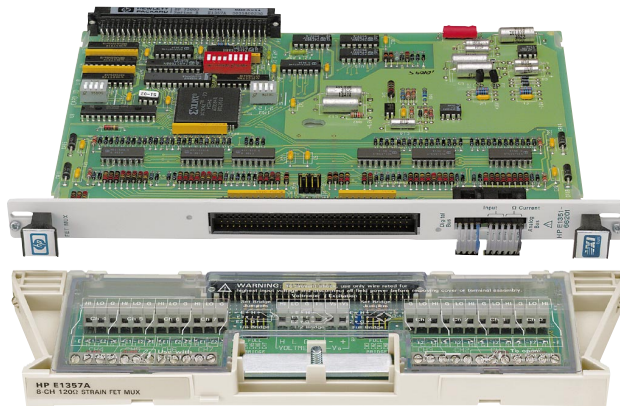


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# 8-Channel 120 $\Omega$ Strain FET Multiplexer HP E1357A Technical Specifications

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- Strain gage measurements with bridge completion
- + 4.6 V excitation circuitry for bridge configurations
- Automatic conversions for bridge configurations
- Strain, voltage, current, and ohm measurements



HP E1357A

## Description

The HP E1357A 120  $\Omega$  Strain FET Multiplexer is a **B-size, 1-slot, register-based VXI module**. This relay multiplexer provides bridge completion and excitation voltage (4.6 V) circuitry for eight channels. Each multiplexer module consists of a B-size component card (labeled E1351-66201) and a screw terminal block that plugs onto the component card. The HP E1357A is functionally similar to the HP E1351A, E1352A, E1353A, and E1358A.

You can perform dynamic strain gage measurements with automatic conversions to engineering units on multiple multiplexer channels by sending SCPI commands to either the HP E1326B or HP E1411B. Strain measurements supported by SCPI with the HP E1326B and E1411B DMMs include: Quarter, Bending, Half, Poisson Half, Bending Full, Poisson Full, Bending Poisson Full. The FET multiplexer cannot perform tension shunt nor compression shunt diagnostics.

Refer to the HP Website for instrument driver availability and downloading instructions, as well as for recent product updates, if applicable.

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## Strain Measurements

Example SCPI commands with engineering units conversions follow:

Specify the gage factors:

—STRain:GFACTOR 2.11E-6,(@100:107)

Measure the unstrained reference:

—CALibration:STRain (@100:107)

Measure a Half Poisson bridge:

—MEASure:STRain:HPOisson (@100:103)

Strain measurements supported in SCPI with the above HP DMMs include:

- Quarter
- Bending Half
- Poisson Half
- Bending Full
- Poisson Full
- Bending Poisson Full

Diagnostics include:

- Leadwire Resistance
- Internal Half Bridge Voltage
- Guard Voltage
- Bridge Excitation Voltage
- Tension Shunt Diagnostic (not available)
- Compression Shunt Diagnostic (not available)

## Configuration

One analog bus cable is shipped with each module, making it easy to connect multiplexer common outputs together for slot-adjacent modules. If you are using a B-size mainframe, HP E1300A/B or HP E1301A/B, use the analog bus cable shipped with the HP E1326B DMM to connect it to the multiplexer(s).

## C-size Adapter

For installing the HP E1357A in a C-size mainframe, the HP E1403C active adapter is recommended.

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## Product Specifications

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### Input

**Maximum voltage (any terminal to any other terminal or chassis):**

<b>DC:</b>	16 Vpk
<b>AC rms:</b>	16 Vpk
<b>Maximum current (per channel common, non-inductive):</b>	1 mA

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### DC

**Maximum thermal offset per channel, differential**

<b>Hi-Lo:</b>	25 $\mu$ V (0 to 28 °C), 250 $\mu$ V (28 to 55 °C)
<b>Closed channel resistance:</b>	<3.1 k $\Omega$
<b>Insulation resistance (between any two points):</b>	10E8 $\Omega$ , 10E3 $\Omega$ $\pm$ 10% guard to chassis
<b>Insulation resistance (Hi to Lo, power off):</b>	>1 k $\Omega$ for  Vin  <14 V, >220 $\Omega$ for  Vin  >14 V

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### AC

**Minimum bandwidth**

<b>(-3 dB, 50 <math>\Omega</math> source/load):</b>	500 kHz (1 M $\Omega$    10 pF termination)
<b>Closed channel capacitance:</b>	<2000 pF Hi/Lo-Chassis, <200 pF Hi-Lo

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### General

<b>Relays:</b>	FETs Break-before-make
<b>Power down state:</b>	FETs open on power down
<b>Power up state:</b>	FETs open on power up
<b>Minimum relay life:</b>	
<b>No load:</b>	Unlimited
<b>Rated load:</b>	Unlimited
<b>Reference junction measurement accuracy (18 to 28 °C operating):</b>	n/a
<b>Screw terminal wire size:</b>	16 to 26 AWG (1.5, 1.2, 0.9, 0.75, 0.5 mm)
<b>Strain gage excitation:</b>	4.63 V $\pm$ 10%, <400 mA
<b>Scanning rate:</b>	13,000 channels/s typ.

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## General Specifications

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### VXI Characteristics

<b>VXI device type:</b>	Register based, A16, slave only
<b>Size:</b>	B
<b>Slots:</b>	1
<b>Connectors:</b>	P1
<b>Shared memory:</b>	None
<b>VXI busses:</b>	None
<b>C-size compatibility:</b>	Requires HP E1403C

## Instrument Drivers

See the HP Website ([http://www.hp.com/go/inst\\_drivers](http://www.hp.com/go/inst_drivers)) for driver availability and downloading.

Command module firmware:	Downloadable
Command module firmware rev:	A.03
I-SCPI Win 3.1:	Yes
I-SCPI Series 700:	Yes
C-SCPI LynxOS:	Yes
C-SCPI Series 700:	Yes
HP Panel Drivers:	Yes
VXIplug&play Win Framework:	Yes
VXIplug&play Win 95/NT Framework:	Yes
VXIplug&play HP-UX Framework:	No

## Module Current

	$I_{PM}$	$I_{DM}$
+5 V:	0.53	0.01
+12 V:	0.13	0.01
-12 V:	0	0
+24 V:	0	0
-24 V:	0	0
-5.2 V:	0	0
-2 V:	0	0

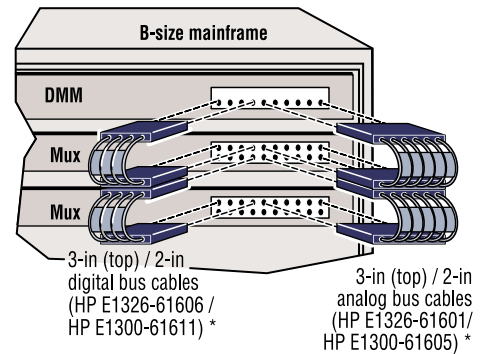
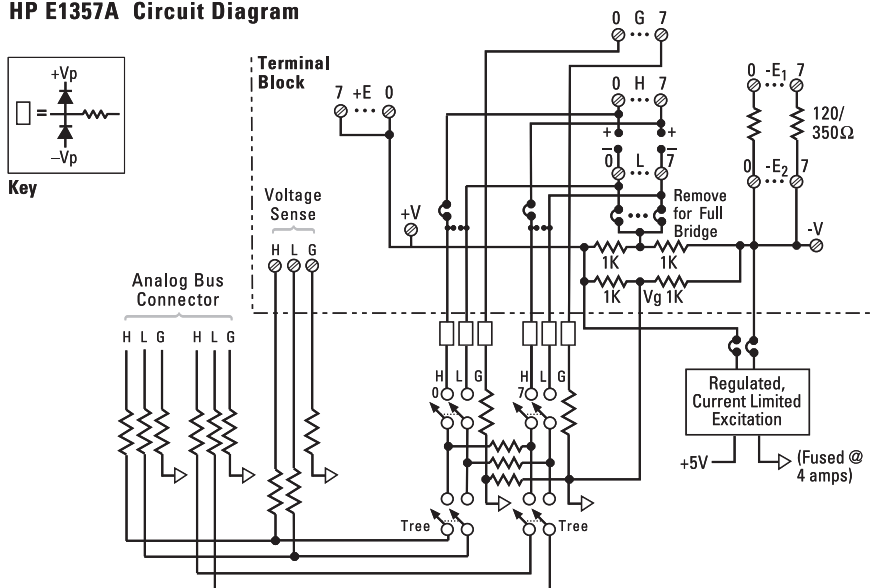
## Cooling/Slot

Watts/slot:	2.00
$\Delta P$ mm H <sub>2</sub> O:	0.02
Air Flow liter/s:	0.10

## Ordering Information

Description	Product No.
8-Channel 120 Ohm Strain FET Multiplexer Service Manual	HP E1357A
3 Yr. Retn. to HP to 1 Yr. OnSite Warr.	HP E1357A 0B3
Term Card 8 Chan 120 Ohm Strain FET MUX	HP E1357A W01
Cable Kit, VM To B-Size FET Multiplexer	HP E1357-80001
	HP E1411-80001

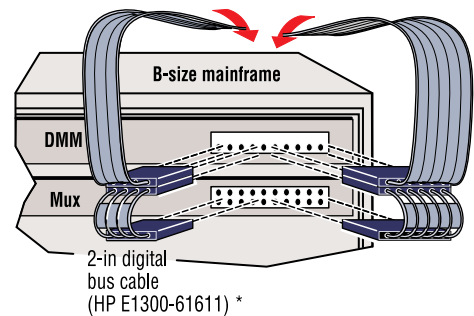
## HP E1357A Circuit Diagram



## Analog and Digital Bus Cables for MUX-to-MUX and MUX-to-Multimeter Connections

19.5-in digital cable to internal multimeter (HP E1326-61608) \*\*

19.5-in analog cable to internal multimeter (HP E1326-61611) \*\*



\* DMM-to-Mux and Mux-to-Mux analog and digital bus cables are provided with the purchase of the DMM and Mux modules, respectively.

\*\* 19.5-in analog and digital bus cable is provided with the purchase of HP E1300/01A Series B mainframe with internal DMM option.

## Analog and Digital Bus Cables for MUX-to-MUX and MUX-to-Multimeter Connections

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## Related Literature

*1998 Test System and VXI Products Data Book*,  
HP Pub. No. 5966-2812E

*1998 Test System and VXI Products Catalog*,  
HP Pub. No. 5966-2815

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## Warranty

Standard Hewlett-Packard VXIbus hardware products are warranted against defects in materials and workmanship for a period of three years unless otherwise noted. HP software and firmware products that are designated by HP for use with a hardware product, when properly installed on that hardware product, are warranted not to fail to execute their programming instructions due to defects in materials and workmanship.

For a complete and detailed warranty statement please see the *HP Test System and VXI Products Data Book* or visit the HP Website at <http://www.hp.com/go/vxi>.

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## HP Website Directory

Main HP Website  
<http://www.hp.com>

HP Test and Measurement  
<http://www.hp.com/go/tmdir>

HP VXI Product Information  
<http://www.hp.com/go/vxi>

HP VXI Channel Partners  
<http://www.hp.com/go/vxichanpart>

HP VEE Application Website  
<http://www.hp.com/go/hpvee>

Data Acquisition and Control Website  
[http://www.hp.com/go/data\\_acq](http://www.hp.com/go/data_acq)

HP Instrument Driver Downloads  
[http://www.hp.com/go/inst\\_drivers](http://www.hp.com/go/inst_drivers)

**For more information about Hewlett-Packard test & measurement products, applications, services, and for a current sales office listing, visit our website, <http://www.hp.com/go/tmdir>. You can also contact one of the following centers and ask for a test and measurement sales representative.**

### United States:

Hewlett-Packard Company  
Test and Measurement Call Center  
P.O. Box 4026  
Englewood, CO 80155-4026  
1 800 452 4844

### Canada:

Hewlett-Packard Canada Ltd.  
5150 Spectrum Way  
Mississauga, Ontario L4W 5G1  
(905) 206 4725

### Europe:

Hewlett-Packard  
European Marketing Centre  
P.O. Box 999  
1180 AZ Amstelveen  
The Netherlands  
(31 20) 547 9900

### Japan:

Hewlett-Packard Japan Ltd.  
Measurement Assistance Center  
9-1, Takakura-Cho, Hachioji-Shi,  
Tokyo 192, Japan  
Tel: (81) 426 56 7832  
Fax: (81) 426 56 7840

### Latin America:

Hewlett-Packard  
Latin American Region Headquarters  
5200 Blue Lagoon Drive, 9th Floor  
Miami, Florida 33126  
U.S.A.  
Tel: (305) 267-4245  
(305) 267-4220  
Fax: (305) 267-4288

### Australia/New Zealand:

Hewlett-Packard Australia Ltd.  
31-41 Joseph Street  
Blackburn, Victoria 3130  
Australia  
1 800 629 485

### Asia Pacific:

Hewlett-Packard Asia Pacific Ltd.  
17-21/F Shell Tower, Times Square,  
1 Matheson Street, Causeway Bay,  
Hong Kong  
Tel: (852) 2599 7777  
Fax: (852) 2506 9285

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