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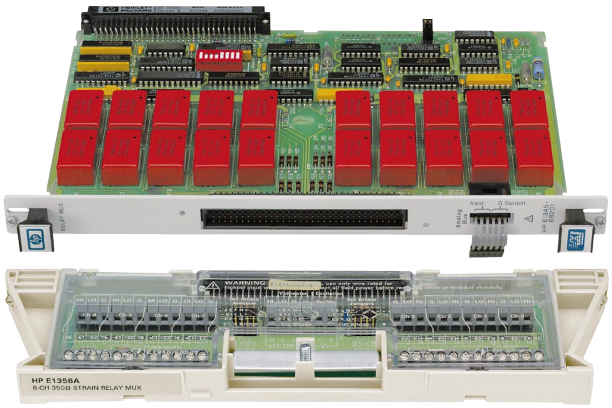
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Find the *Keysight / Agilent E1356A* at our website: *Click HERE*

8-Channel 350 Ω Strain Relay Multiplexer HP E1356A

Technical Specifications

- **8-Channel 350 Ω strain gage relay multiplexer**
- **Strain gage measurements with bridge completion**
- **+ 5 V excitation circuitry-quarter, half, and full bridge**
- **Strain, voltage, current, and Ω measurements**
- **Automatic conversions for bridge configurations**



HP E1356A

Description

The HP E1356A 350 Ω Strain Relay Multiplexer is a **B size, 1-slot, register-based VXI module.** This relay multiplexer provides bridge completion and excitation voltage circuitry for up to eight channels. The multiplexer module consists of a B-size component card (labeled E1345-66201) and a screw terminal block that plugs onto the component card. The HP E1356A is functionally similar to the HP E1345A, E1347A, and E1355A.

You can perform strain gage measurements with automatic conversions to engineering units on multiple multiplexer channels by sending SCPI commands to the HP E1326B or E1411B DMMs. Strain measurements supported in SCPI with these DMMs are quarter, bending half/full, poisson half/full, and bending poisson full.

Diagnostics for the HP E1356A include Tension Shunt, Compression Shunt, Leadwire Resistance, Internal Half Bridge Voltage, Guard Voltage and Bridge Excitation Voltage.

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:
—Tension Shunt Diagnostic
—Compression Shunt Diagnostic
—Leadwire Resistance
—Internal Half Bridge Voltage
—Guard Voltage
—Bridge Excitation Voltage

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 E1356A in a C-size mainframe, the HP E1403C active adapter is recommended.

Product Specifications

Strain Gage

Full bridge resolution:	
5 V:	0.01 με
1 V:	0.05 με
0.1 V:	0.5 με
Half bridge resolution:	
5 V	0.02 με
1 V	0.1 με
0.1 V	1 με
Quarter bridge resolution:	
5 V	0.04 με
1 V	0.2 με
0.1 V	2 με
Bridge excitation requirements:	Use the internal 5 V excitation power supply or external supply such as the HP 6214C.
Max rippple and noise requirement for excitation voltage:	1 mV peak-to-peak (20 Hz to 20 MHz)

Reference Junction Measurement

Accuracy (18 to 28 °C operating):	0.3 °C

Input

DC:	
Maximum voltage (any terminal to any other terminal or chassis):	120 Vdc
AC rms:	
Maximum voltage (any terminal to any other terminal or chassis):	120 V rms
Maximum current (per channel common, non-inductive):	50 mA
Maximum power per channel:	1 VA

DC

Maximum thermal offset per channel, differential Hi-Lo:	4 μV
Closed channel resistance:	100 Ω ± 10%
Insulation resistance (between any two points):	10E9 Ω
Insulation resistance (Hi to Lo, power off):	n/a

AC

Minimum bandwidth (–3 dB, 50 Ω source/load):	10 MHz (protection resistors shorted)
Crosstalk (channel-to-channel):	
100 kHz:	–80 dB (Protection resistors, shorted, low and guard tied to chassis)
10 MHz:	–40 dB (Protection resistors shorted, low and guard tied to chassis)
Both:	n/a
Closed channel capacitance:	<150 pF Hi-Lo, <150 pF Lo-Guard, <2000 pF Guard-Chassis

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General Characteristics

Relays:	Reed relays Break-before-make
Power down state:	Relays open on power down
Power up state:	Relays open on power up
Minimum relay life:	
No load:	10E8 operations
Rated load:	10E7 operations
Strain gage excitation:	≤5.4 V
Screw terminal wire size:	16 to 26 AWG (1.5, 1.2, 0.9, 0.75, 0.5 mm)
Scanning rate:	600 channels/s typ.

General Specifications

VXI Characteristics

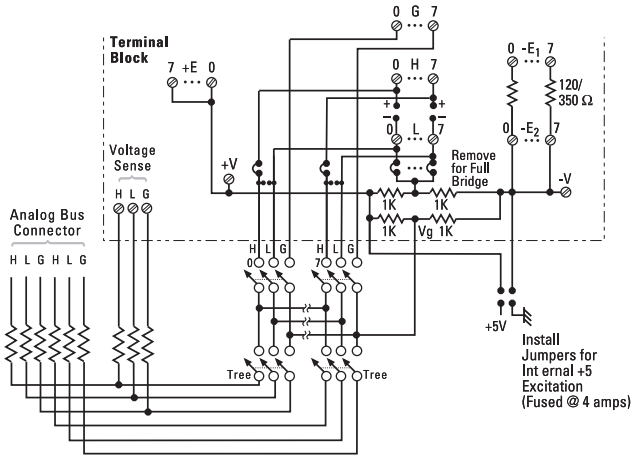
VXI device type:	Register based, A16, slave only
Size:	B
Slots:	1
Connectors:	P1
Shared memory:	None
VXI busses:	None
C-size compatibility:	Requires HP E1403C

Instrument Drivers

See the HP Website (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
VXI*plug&play* Win Framework:	Yes
VXI*plug&play* Win 95/NT Framework:	Yes
VXI*plug&play* HP-UX Framework:	No

HP E1355A/E1356A Circuit Diagram



Module Current

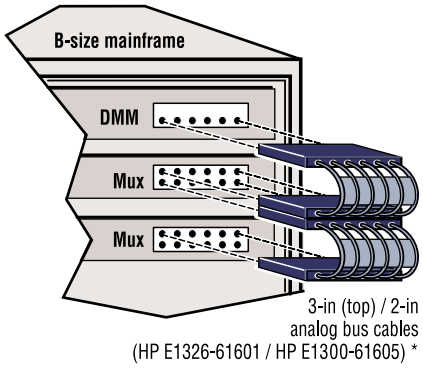
	I_{PM}	I_{DM}
+5 V:	0.53	0.01
+12 V:	0.13	0.01
–12 V:	0	0
+24 V:	0	0
–24 V:	0	0
–5.2 V	0	0
–2 V:	0	0

Cooling/Slot

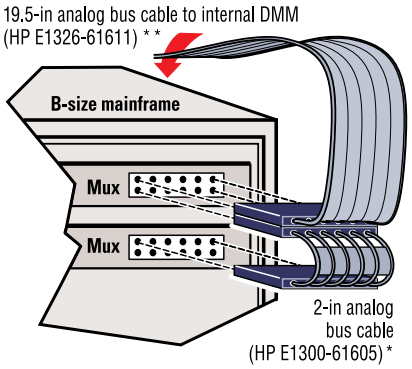
Watts/slot:	2.00
ΔP mm H_2O:	0.02
Air Flow liter/s:	0.10

Ordering Information

Description	Product No.
8-Ch 350 Ω Strain Relay Multiplexer	HP E1356A
Service Manual	HP E1356A 0B3
3 Yr. Retn. to HP to 1 Yr. OnSite Warr.	HP E1356A W01
Term Card 8 Chan	HP E1356-80001



Analog bus cabling for MUX-to-MUX and MUX-to-multimeter



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

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

Analog bus cabling for MUX-to-MUX and MUX-to-multimeter

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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

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.

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

HP Instrument Driver Downloads
http://www.hp.com/go/inst_drivers

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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.**

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Test and Measurement Call Center
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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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