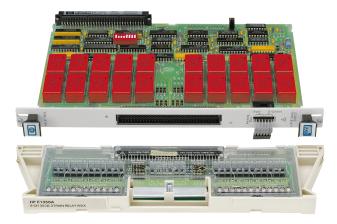


# 8-Ch 350 Ohm Strain Relay Multiplexer HP E1356A

# **Technical Specifications**

- 8-Channel 120 ohm Strain Gage Relay Multiplexer
- Strain gage measurements with bridge completion
- +5 V excitation circuitry -quarter, half, and full bridge
- Strain, voltage, current, and ohm measurements
- Automatic conversions for bridge configurations



# Description

The HP E1356A 350 Ohm strain gage FET 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 either of the HP DMMs, HP E1326B or HP E1411B. Strain measurements supported in SCPI with HP 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.

### **Strain Measurements**

Example SCPI commands with engineering units conversions follow: Specify the gage factors: STRain:GFAC 2.11E-6,(@100:107)

Measure the unstrained reference: CAL:STR (@100:107)

Measure a Half Poisson bridge: MEAS:STR: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 or HP E1301A, 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 E1343A in a C-size mainframe, the HP E1403B active adapter is recommended.

# **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 of
· • · · · · · · · · · · · · · · · · · ·	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 Junctio	n Measurement
Accuracy (18 to 28 °C	
operating):	0.3 °C
Input	
DC:	
Maximum voltage (any	
terminal to any other	100.1/1
terminal or chassis):	120 Vdc
AC rms:	
Maximum voltage (any	
terminal to any other	120 V rms
terminal or chassis): Maximum ourrent (por	120 V 11115
Maximum current (per channel common,	
non-inductive):	50 mA
Maximum power per	
channel:	1 VA
DC	
Maximum thermal	
offset per channel,	<b>A</b> . M
differential Hi-Lo:	4 μV
Closed channel	100 Ohm + 10%
resistance:	100 0hm ±10%
Insulation resistance	
(between any two	10E9 Ohm
points): Insulation resistance (Hi	
Insulation resistance (Hi to Lo, power off):	n/a
to 10, power on/.	iyu
AC	
Minimum bandwidth	
(-3 dB, 50 Ohm source/	10 MHz (protection registers shorted)
load): Crosstalk (obannal to oban	10 MHz (protection resistors shorted)
Crosstalk (channel-to-chan	
100 kHz:	<ul> <li>80 dB (Protection resistors, shorted, low an guard tied to chassis)</li> </ul>
10 MU	guard tied to chassis) —40 dB (Protection resistors shorted, low and
10 MHz:	-40 dB (Protection resistors shorted, low and quard tied to chassis)
Both:	n/a
	11/ a
Closed channel capacitance:	<150 pF Hi-Lo, <150 pF Lo-Guard, <2000 p
vuvuvuuub6.	
	Guard-Chassis

#### **General Characteristics**

Relays:	Reed relays Break-before-make Relays open on power down Relays open on power up
Minimum relay life:	
No load:	10E8 operations
Rated load:	10E7 operations
Reference junction measurement accuracy	
(18 to 28 °C operating):	n/a
Strain gage excitation: Screw terminal wire	≤5.4 V
size:	16 to 26 AWG (1.5, 1.2, 0.9, 0.75, 0.5 mm)
Scanning rate:	600 channels/s typ.

#### **VXI Characteristics**

VXI device type:	Register-based, A16, slave only	
Size:	В	
Slots:	1	
Connectors:	P1	
Shared memory:	None	
VXI busses:	None	
C-size compatibility:	Requires E1403B	

# 1 one one equires E1403B

## **Instrument Drivers**

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

Command module firmware:	ROM
Command module	nom
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 VEE Drivers:	Yes
VXI <i>plug&amp;play</i> Win	
Framework:	Yes
VXI <i>plug&amp;play</i> Win95/NT	
Framework:	Yes
VXI <i>plug&amp;play</i> HP-UX	
Framework:	No (not available at time of publication)

#### **Module Current**

	I <sub>PM</sub>	I <sub>DM</sub>
+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

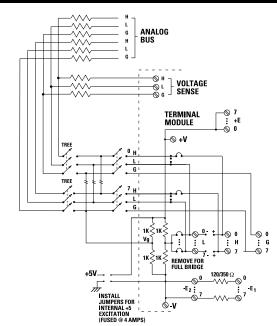
### **Cooling/Slot**

Watts/slot:	2.00
∆P mm H₂O:	0.02
Air Flow liter/s:	0.10

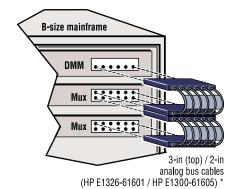
# **Ordering Information**

Description **Product No.** 8-channel 350 ohm strain relay mux Service manual HP E1356A 0B3 3 yr. retn. to HP to 1 yr. OnSite warr. HP E1356A W01 TERM CARD 8 CHAN OHM STRAIN FET MUX HP E1356-80001

HP E1356A



Circuit Diagram for HP E1355A/1356A



#### Analog bus cabling for Mux-to-Mux and Mux-to-multimeter

19.5-in analog bus cable to internal DMM (HP E1326-61611) B-size mainframe Mux Mux 👬 2-in analog

bus cable (HP E1300-61605)\*

\* 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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