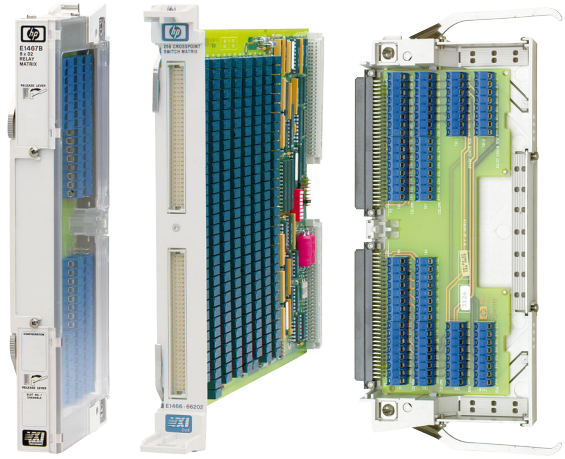
8x32 Relay Matrix Switch
HP E1467A

Technical Specifications

- **8x32 2-wire switching matrix, Latching relays**
- **Rows expand to make larger matrixes**
- **Downloadable channel lists into onboard memory**
- **Includes HP QUIC easy-to-use terminal blocks**
- **Latching armature relay**



Description

The HP E1467A relay matrix is a **C-size, 1-slot, register-based VXI module.** This 8x32 matrix switches each crosspoint- both high and low. The HP E1467A features easy expansion to larger matrixes via a chaining cable that allows you to interconnect rows and columns on different modules. A full HP E1401B 13-slot mainframe can have up to 3072 2-wire crosspoints. The HP E1467A module provides the best cost-per-crosspoint for large matrix applications.

The HP E1467A shares the same switch card with the HP E1465A and E1466A; each product's unique terminal block determines the matrix configuration. Therefore, you can change matrix topology simply by plugging in the various terminal blocks. The terminal blocks can be obtained separately.

Creating a matrix as large as 8x96 requires three matrix modules and interconnected rows and columns on the terminal blocks. All the HP E1465/66/67A matrix modules offer similar densities, with different row/column sizes and identical performance specifications. All specifications are identical for this family, except for crosstalk.

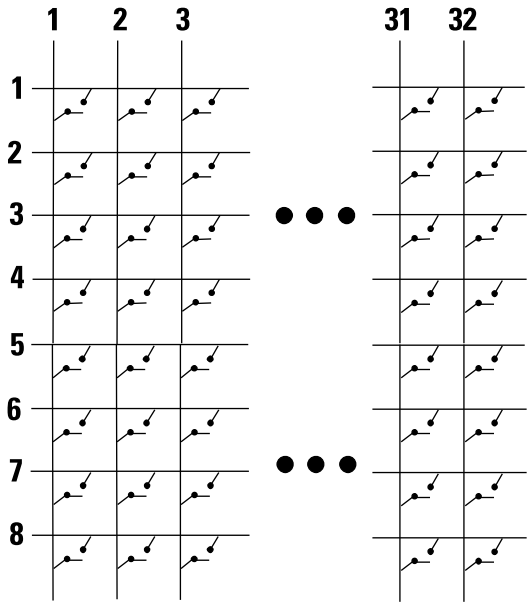
Refer to the HP Website for instrument driver availability and downloading instructions.

Configuration

You can create a larger matrix by adding one or more matrix modules and interconnecting the HP E1467A rows on the terminal blocks with the 280 mm HP E1466-80002 daisy-chain expansion cable. You can interconnect the HP E1467A rows with the rows of another HP E1467A or an HP E1466A. To create an 8x96 matrix with four HP E1467A modules requires four daisy-chain expansion cables connected as shown.

A preferable solution for large matrixes is to use the HP E1467A with an expansion terminal block (Option 211) and Z2220A series cables. Both the Option 211 and Z2220A are nonstandard products and HP must be contacted for information, price and delivery. The expansion terminal block is specially designed for the HP E1467A and has convenient interconnect features and coax cable connector accessories.

The HP E1467A Option 211 matrix expansion terminal blocks provide an 8x32 matrix configuration that can easily be expanded. Compared to the daisy-chain cable (which requires each wire to be screwed into the screw terminal), the HP E1467A Opt 211 terminal blocks give you quicker access and easier cable connections.



Specifications

AC Performance

AC specifications apply with no more than one crosspoint closed per row or column. Specifications are for 8 x 32 matrix, for Z(load) = Z(source) = 50 Ω. Note: Specifications are for worst crosspoint. Matrix expansion degrades crosstalk and bandwidth performance. Typical is defined as the worst crosspoint test from one or two matrix modules. If guaranteed specifications are neccessary, contact your local sales representative.

Crosstalk (dB) within a card (worst path):

	<10 kHz	<100 kHz	<1 MHz
Closed Path to Closed Path (typical)	−72 dB	−51 dB	−33 dB
Open row to open row (typical):	−91 dB	−59 dB	−43 dB
Open row to open column (typical):	−85 dB	−64 dB	−47 dB
Open column to open column (typical):	−92 dB	−71 dB	−54 dB

Crosstalk (dB) module-to-module (represents 8 x 64 configuration):
Note: *Chaining cable used to connect modules (HP P/N E1466-80002).*

	<10 kHz	<100 kHz	<1 MHz
Closed Path to Closed Path (typical)	−72 dB	−51 dB	−33 dB
Open row to open row (typical):	−74 dB	−53 dB	−38 dB
Open row to open column (typical):	−92 dB	−72 dB	−56 dB
Open column to open column (typical):	−82 dB	−64 dB	−50 dB

Closed channel capacitance (<10 kHz):

Hi to Lo:	<270 pF
Hi to Ground:	<430 pF
Lo to Ground:	<440 pF
Minimum bandwidth (−3 dB, $Z_L = Z_x =$ 50 Ω):	10 MHz

Input

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

DC:	200V
AC rms:	170 V
Peak:	238 V p-p

Maximum current (per channel common, non-inductive): n/a

Maximum power:

Per channel:	30 W
Per module:	62.5 VA (resistive load)

DC

Maximum thermal offset per channel, differential Hi-Lo: 5 μV

Closed channel resistance (per channel):

Initial:	<4.0 Ω (worst crosspoint) <1.8 Ω (best crosspoint)
End of life:	<10.0 Ω

Insulation resistance (between any two points):

≤40 °C, ≤95% RH:	>10E8 Ω
≤40 °C, ≤65% RH:	n/a
≤25 °C, ≤40% RH:	>10E9 Ω

General

Time to close one channel: 8.9 ms *(HP V/743 and C-SCPI)*

Note: *When downloading a channel list to card memory, you can close all columns in one row in 8.9 ms.*

Power-down state: Relay states are unchanged at power-down.

Power-up state: Relays open at power-up.

Minimum relay life:

No load:	10E7 operations

Screw terminal wire size: 18 to 26 AWG (1.2, 0.9, 0.75, 0.6, 0.5 mm)

VXI Characteristics

VXI device type:	Register-based, A16, slave only
Size:	C
Slots:	1
Connectors:	P1
Shared memory:	None
VXI busses:	None
C-size compatibility:	n/a

Instrument Drivers

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

Command module firmware:	ROM
Command module firmware rev:	A.08
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*plug&play* Win Framework:	Yes
VXI*plug&play* Win95/NT Framework:	Yes
VXI*plug&play* HP-UX Framework:	No (not available at time of publication)

Module Current

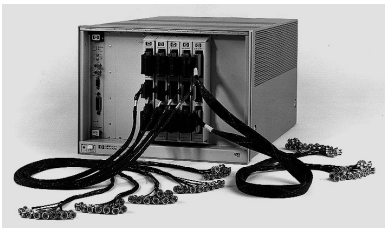
	I_{PM}	I_{DM}
+5 V:	0.1	0.01
+12 V:	0.18	0.01
−12 V:	0	0
+24 V:	0	0
−24 V:	0	0
−5.2 V:	0	0
−2 V:	0	0

Cooling/Slot

Watts/slot:	5.00
ΔP mm H_2O:	0.08
Air Flow liter/s:	0.42

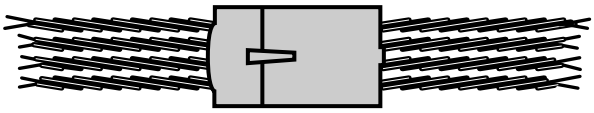
Ordering Information

Description	Product No.
8x32 relay matrix switch	HP E1467A
Service manual	HP E1467A 0B3
3 yr. retn. to HP to 1 yr. OnSite warr.	HP E1467A W01
CBL KIT, DAISY CHAIN	HP E1466-80002

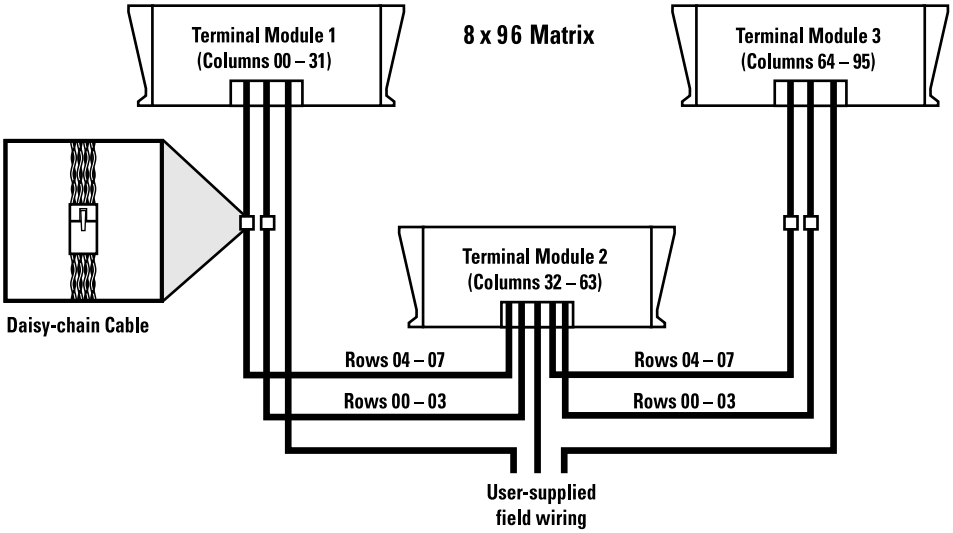


Example 32 x 40 Matrix (5-module row expansion)

HP E1467A Opt 211 Matrix Expansion Terminal Block

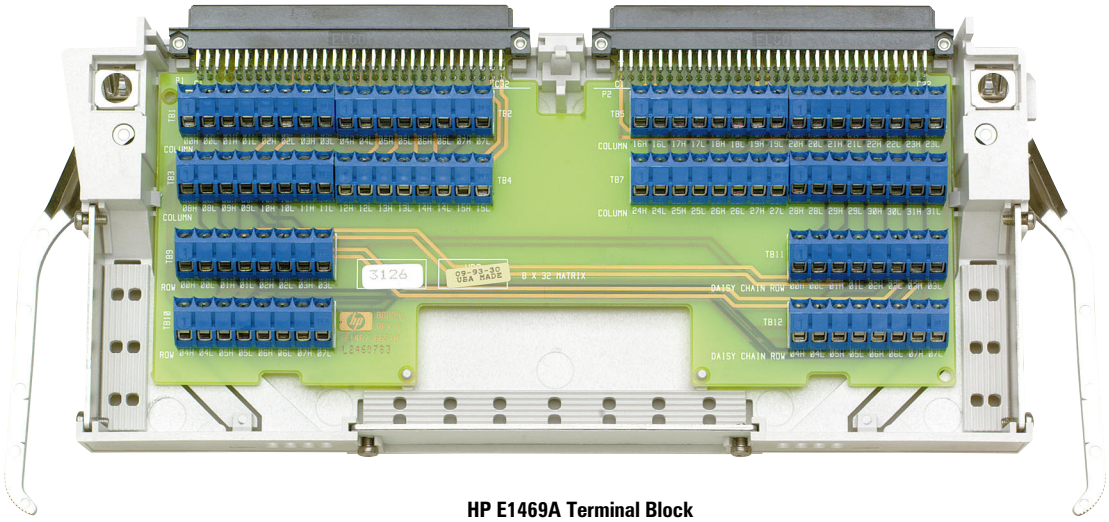


Daisy Chain Cable: HP E1468-80002



Three HP E1467A matrix terminal blocks wired as an 8x96 matrix

HP Publication No.: 5965-5593E



HP E1469A Terminal Block