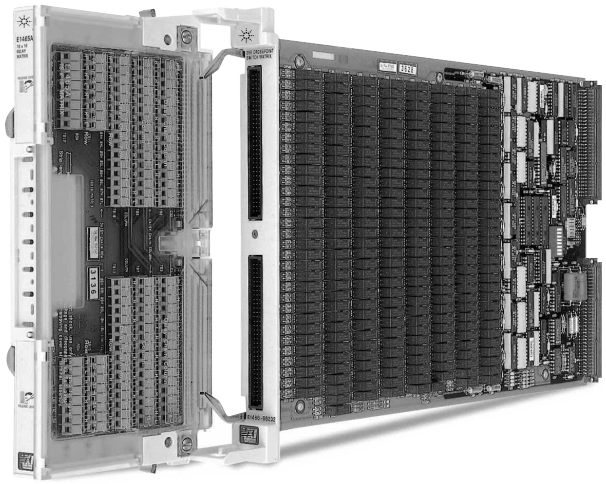
Agilent E1465A

16x16 Relay Matrix Switch

Data Sheet

- **1-Slot, C-size, register based**
- **16x16 two-wire switching matrix**
- **Rows and columns expand to make larger matrixes**
- **1 A, 200-V signal switching**
- **Downloadable channel lists into onboard memory**
- **Includes QUIC easy-to-use terminal blocks**



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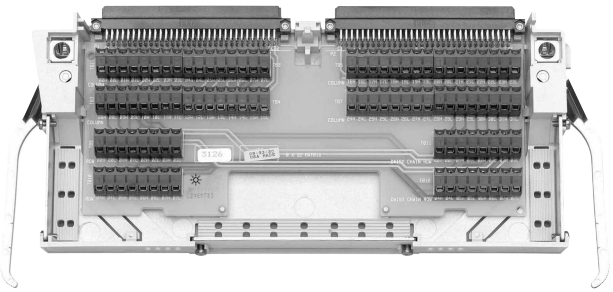

Description

The Agilent E1465A Relay Matrix Switch is a **C-size, 1-slot, register-based VXI module.** This 16x16 matrix switches each crosspoint both high and low. The E1465A features easy expansion to larger matrixes via a chaining cable that allows you to interconnect rows and columns on different modules. A full E1401B 13-slot mainframe can have up to 3072 two-wire crosspoints.

The E1465A module provides the best cost-per-crosspoint for large matrix applications. It shares the same switch card with the E1466A and E1467A; 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 32x32 requires four matrix modules and interconnected rows and columns on the terminal blocks. All the 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 Agilent Technologies Website for instrument driver availability and downloading instructions, as well as for recent product updates, if applicable.

Configuration

You can create a larger matrix by adding one or more matrix modules and interconnecting either the E1465A rows or columns on the terminal blocks with the E1466-80002 daisy-chain expansion cable. You can interconnect the E1465A rows with the rows of either the E1466A or E1467A. (Only the E1465A allows column expansion.) To create a 32x32 matrix with four E1465A modules requires 16 daisy-chain expansion cables connected together.

A preferable solution for a large matrix with easier cable access is to purchase the E1467A with an expansion terminal block (Option 201/211) and Z2220A series cables.

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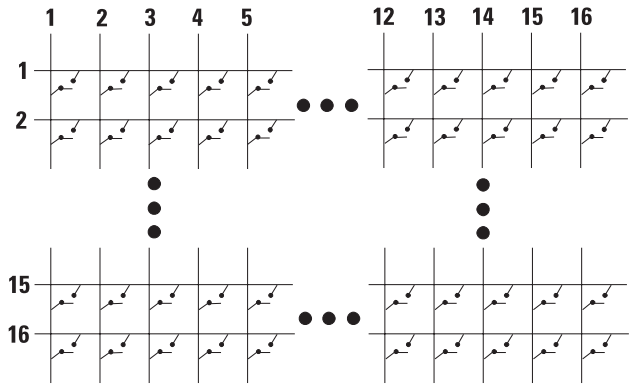
The E1467A Option 201/211 Matrix Expansion Terminal Block provides an 8x32 matrix configuration that can easily be expanded. Compared to the daisy-chain cable (which requires each wire to be screwed into the screw terminal), the E1467A Opt 201/211 terminal block gives you quicker access and easier cable connections.



E1465A Each crosspoint switches Hi and Lo

Product Specifications

AC Performance

AC specifications apply with no more than one crosspoint closed per row or column. Specifications are for 16 x 16 matrix, for Z(load) = Z(source) = 50 Ω. Specifications are for worst crosspoint. Matrix expansion degrades crosstalk and bandwidth performance. Typical is defined as the worst crosspoint test result from one or two matrix modules. If guaranteed specifications are necessary, contact your local sales representative.

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

	<10 kHz	**<100 kHz**	**<1 MHz**
Closed path to closed path (typical):	–78 dB	–57 dB	–41 dB
Open row to open row (typical):	–93 dB	–73 dB	–56 dB
Open row to open column (typical):	–84 dB	–63 dB	–47 dB
Open column to open column (typical):	–86 dB	–65 dB	–48 dB

Crosstalk (dB) module-to-module (represents 16 x 32 configuration):

Chaining cable used to connect modules (P/N E1466-80002).

	<10 kHz	**<100 kHz**	**<1 MHz**
Closed path to closed path (typical):	–78 dB	–58 dB	–43 dB
Open row to open row (typical):	–84 dB	–66 dB	–52 dB
Open row to open column (typical):	–84 dB	–63 dB	–48 dB
Open column to open column (typical):	–93 dB	–72 dB	–48 dB

Crosstalk (dB) Closed channel capacitance (<10 kHz):

Hi to Lo:	<270 pF
Hi to Ground:	<430 pF
Lo to Ground:	<440 pF

Input

Maximum voltage (any terminal to any other terminal or chassis):	
DC:	200 V
AC rms:	170 V
Peak:	238 V p-p
Maximum current (per channel common, non-inductive):	1 Adc; 1 Aac peak
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
Minimum bandwidth (–3 dB, $Z_L = Z_X = 50$ Ω):	10 MHz

General

Time to close one channel:	8.9 ms *(Agilent 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:	10E7 operations
Screw terminal wire size:	18 to 26 AWG (1.2, 0.9, 0.75, 0.6, 0.5 mm)

General Specifications

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 Agilent Technologies Website (http://www.agilent.com/find/inst_drivers) for driver availability and downloading.

Command module firmware:	Downloadable
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
Panel Drivers:	Yes
VXI*plug&play* Win Framework:	Yes
VXI*plug&play* Win 95/NT Framework:	Yes
VXI*plug&play* HP-UX Framework:	No

Module Current

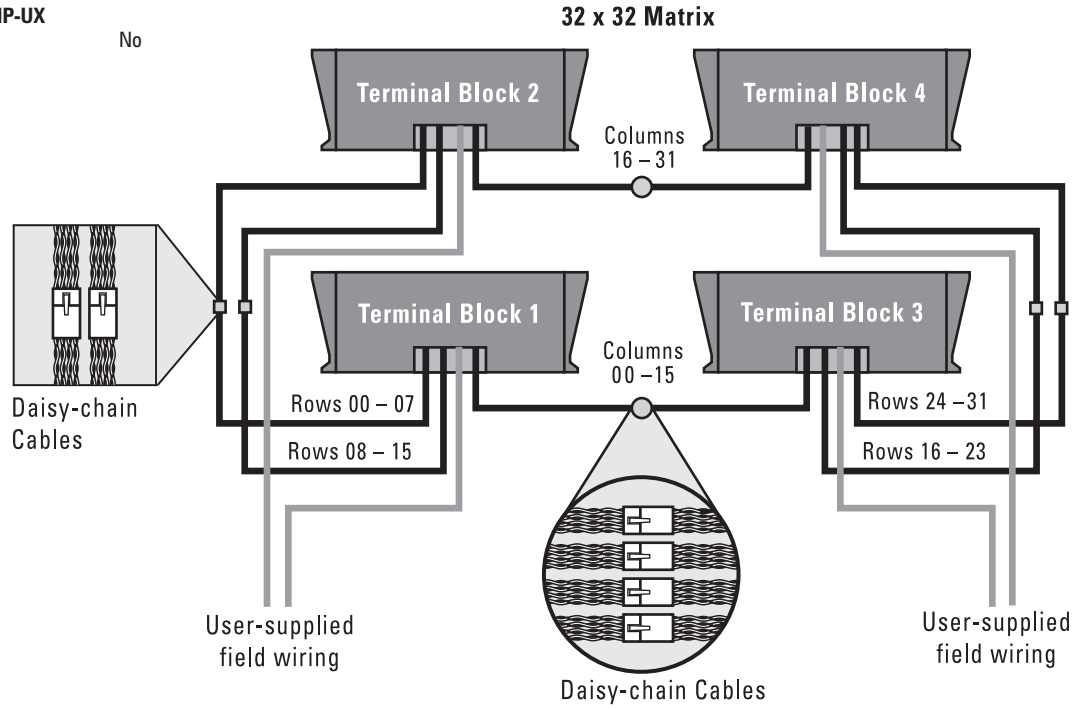
	I_{PM}	I_{DM}
+5 V:	0.1	0.01
+12 V:	0.18	0.01
–12 V:	0	0
+24 V:	0	0
–24 V:	0	0
–5.2 V:	0	0
–2 V	0	0

Cooling/Slot

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

Ordering Information

Description	Product No.
16x16 Relay Matrix Module	E1465A
Service Manual	E1465A 0B3
Extra Terminal Block, 16 x 16 Relay Matrix	E1465-80010
CBL Kit, Daisy Chain	E1466-80002



Four E1465A matrix terminal blocks wired as 32 x 32 matrix

Related Literature

2000 Test System and VXI Catalog CD-ROM,
Agilent Pub. No. 5980-0308E (detailed specifications for VXI products)

2000 Test System and VXI Catalog,
Agilent Pub. No. 5980-0307E (overview of VXI products)

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

Online

Internet access for Agilent product information, services and support
www.agilent.com/find/tmdir

VXI product information
www.agilent.com/find/vxi

Defense Electronics Applications
www.agilent.com/find/defense_ATE

Agilent Technologies VXI Channel Partners
www.agilent.com/find/vxichanpart

Agilent Technologies' HP VEE Application Website
www.agilent.com/find/vee

Agilent Technologies Data Acquisition and Control Website
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Agilent Technologies Instrument Driver Downloads
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United States:
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Canada:
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(fax) (905) 282 6495

China:
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(fax) 800 820 2816

Europe:
(tel) (31 20) 547 2323
(fax) (31 20) 547 2390

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Korea:
(tel) (82 2) 2004 5004
(fax) (82 2) 2004 5115

Latin America:
(tel) (305) 269 7500
(fax) (305) 269 7599

Taiwan:
(tel) 0800 047 866
(fax) 0800 286 331

Other Asia Pacific Countries:
(tel) (65) 6375 8100
(fax) (65) 6836 0252
(e-mail) tm_asia@agilent.com

Data Subject to Change

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