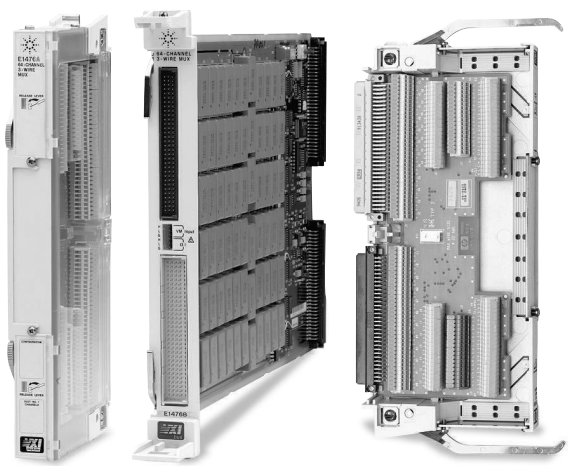
Agilent E1476A
64-Channel 3-Wire T/C Relay Multiplexer

Data Sheet

- **1-Slot, C-size, register based**
- **Low-thermal offset relay <2 μV**
- **64 channels of temperature with compensation**
- **64 channels of voltage — 3-wire high, low, and guard**
- **64 channels 2-wire and 32 channels 4-wire resistances**
- **Includes QUIC easy-to-use terminal block**



Agilent E1476A

Description

The Agilent E1476A High-Density Reed Relay Multiplexer is a **C-size, 1-slot, register-based VXI module.** This low-offset, thermocouple compensated multiplexer is dynamically configurable providing 64 channels of two-, three- or four-wire (32 channels) of switching. This multiplexer module consists of a component card with switches and a QUIC spring clamp terminal block that plugs onto the component card. The E1476A is ideal for applications needing a relay multiplexer that is dynamically configurable, and makes maximum high-quality, high-point count measurements.

High-integrity voltage measurements are possible with three-wire high, low, and guard switching. In addition to making two-wire resistance and precision four-wire resistance measurements, you can make up to 64 channels of thermocouple temperature measurements with automatic cold junction compensation.

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

Temperature Measurements

The reference thermistor is also accessible by both banks, each bank having a control switch allowing for either a two-wire or four-wire resistance measurement of the 5000 Ω reference thermistor mounted on the isothermal plane located in the terminal block. Using a scanning multimeter configuration, the channel relays and five control relays are programmed by SCPI commands or by register read/writes. SCPI command syntax to make a temperature scan of K type thermocouples is:

MEAS:TEMP? TC, K, (@100:163)

Configuration

Each of the 64 channels provides separate high, low, and guard connections, all easily accessible via the quick connect screwless terminals on the companion terminal block. The multiplexer is organized in two banks of 32 with each bank having its own voltage sense control switch and one bank having a current source control switch. This dual bank configuration makes it possible to use half the channels as sense channels, while the other half are used as current source channels, thus obtaining 32 four-wire measurement channels, each with high, low, and guard connections.

One 6 cm (2.5-in) analog bus cable (E1400-61605) is shipped with each module to allow you to interconnect the E1411B 5.5-digit multimeter to one or more E1476A multiplexers via its front panel analog bus connector. For connection to an external voltmeter or other VXI multimeter with conventional front panel connectors, access to the analog bus lines is available in the terminal block. This allows you to connect the analog bus signal lines to the multimeter inputs using ordinary hookup wire.

Product Specifications

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):	35 mA
Maximum power per channel:	4 VA

DC

Maximum thermal offset per channel, differential Hi-Lo:	<4 μV, <2 μV (10 samples averaged)
Closed channel resistance:	100 Ω ± 5 Ω
Insulation resistance (between any two points):	10E9 Ω, 40 °C, 95% RH
Insulation resistance (Hi to Lo, power off):	n/a

AC

Minimum bandwidth (–3 dB, 50 Ω source/load):	100 kHz
Crosstalk (channel-to-channel):	
100 kHz:	–70 dB
10 MHz:	–45 dB
Both:	n/a
Closed channel capacitance:	<175 pf H-L, <300 pf L-G, <1500 pf G-C

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:	5x10E9 operations
Rated load:	10E7 operations
Reference junction measurement accuracy (18 to 28 °C operating):	0.38 °C
Strain gage excitation:	n/a
Screw terminal wire size:	22 to 26 AWG (0.5, 0.75, 0.9 mm)
Scanning rate:	333 channels/s typ.

General Specifications

VXI Characteristics

VXI device type:	Register based, A16, slave only
Size:	C
Slots:	1
Connectors:	P1/2
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.

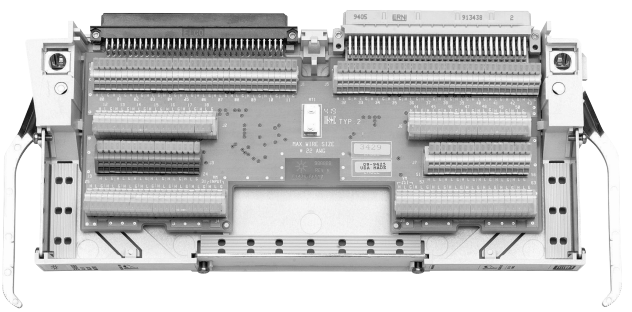
Command module firmware:	Downloadable
Command module firmware rev:	A.06
I-SCPI Win 3.1:	Yes
I-SCPI Series 700:	Yes
C-SCPI LynxOS:	Yes
C-SCPI Series 700:	Yes
Panel Drivers:	Yes
VXI*plug&play* Win Framework:	Yes
VXI*plug&play* Win 95/NT Framework:	Yes
VXI*plug&play* HP-UX Framework:	No

Module Current

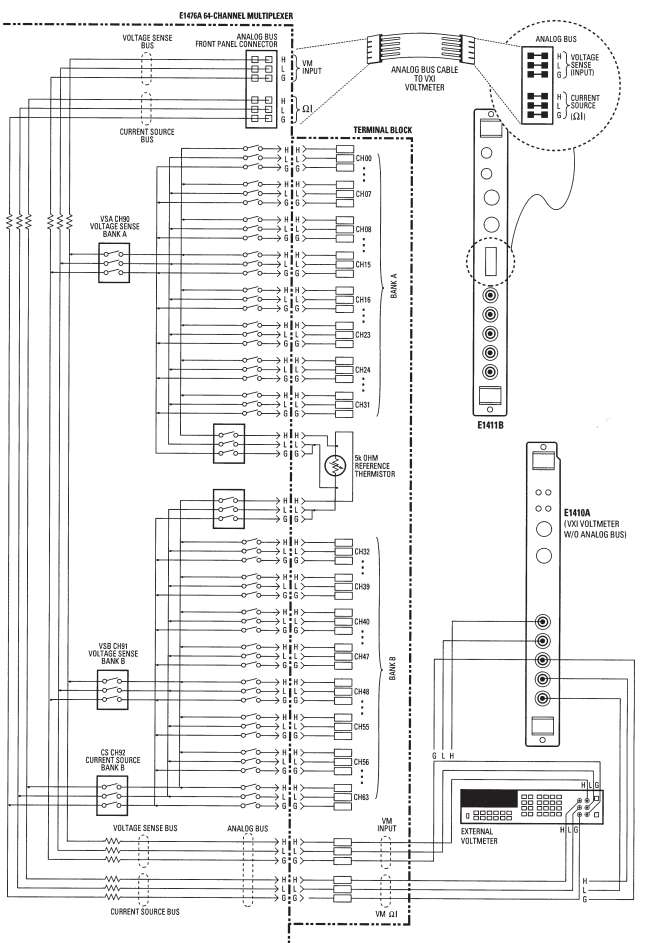
	I_{PM}	I_{DM}
+5 V:	0.1	0.1
+12 V:	0	0
–12 V:	0	0
+24 V:	0	0
–24 V:	0	0
–5.2 V:	0	0
–2 V:	0	0

Cooling/Slot

Watts/slot:	4.00
ΔP mm H_2O:	0.10
Air Flow liter/s:	0.30



Agilent E1476A Terminal Block



Agilent E1476A Circuit Diagram

Ordering Information

Description	Product No.
64-Channel 3-Wire T/C Relay Multiplexer	E1476A
Pre-QUIC-type Terminal Block	E1476A 106
Crimp-and-Insert Terminal Block **	E1476A A3E **
Service Manual	E1476A 0B3
3 Yr. Retn. to Agilent to 1 Yr. OnSite Warr.	E1476A W01
Extra Pre-QUIC-type Terminal Block (if ordered separately)	E1476-80000
Extra QUIC-type Terminal Block (if ordered separately)	E1476-80010
Extra Crimp-and-Insert Terminal Block (if ordered separately) **	E1476-80011 **

**** Crimp-and-Insert Contacts are not included. See the Interconnect and Wiring section for information on ordering Crimp-and-Insert Contacts.**

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
www.agilent.com/find/data_acq

Agilent Technologies Instrument Driver Downloads
www.agilent.com/find/inst_drivers

Agilent Technologies Electronics Manufacturing Test Solutions
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