

## Agilent L4433A Dual/Quad 4x8 Reed Matrix

### Data Sheet



- LXI compliance includes built-in Ethernet connectivity
- Fully-featured graphical Web interface
- Dual 4x8, 8x8, or 4x16 2-wire configurations
- 64 2-wire or 128 1-wire cross-points
- High speed reed relays
- Analog bus connection
- Relay counter
- $\pm 150$  V peak, 0.5 A switch, 1.5 A carry current
- Software drivers for most common programming environments

#### **Dual/quad 4x8 Matrix offers high-performance signal switching wherever your application needs it**

The Agilent L4433A is a high-speed reed relay matrix that is LXI Class C compliant. With its small size and Ethernet connectivity, this matrix can be placed wherever your application needs it.

The Agilent L4433A offers a flexible connection path between your device under test and your test equipment, allowing different instruments to be connected to multiple points on your device under test at the same time. This instrument

can be configured as a 2-wire or a 1-wire matrix, increasing the number of crosspoints. Multiple matrices can be combined through the analog buses connector to create a larger matrix.

Using this LXI instrument, you'll get all the benefits of an Ethernet connection, instrument Web server, standard software drivers and more. The LXI standard is supported by multiple vendors, enabling lower cost of test with accelerated test integration and development.



### Switch features for flexible and reliable connections

The L4433A features a full cross-point matrix that allows you to connect any row to any column. This is a convenient way to connect multiple test instruments to multiple points on a device under test. With its high-speed reed relays you are ensured a fast response.

Each cross-point in the matrix switch has two wires—a high and a low for the measurement. Or, if you prefer, you can configure the L4433A as a single-wire matrix, increasing the number of crosspoints to 128. The L4433A also has in-rush resistors on each column for added protection. Expand your matrix using the analog bus connector to create a larger matrix, or easily connect to an external measurement device like a DMM.

The sequence feature defines switch closures and controls and can be used to easily change between different switch setups. Assign a sequence, give it a name and then execute it with the custom name you created.

External trigger capabilities make it easy for you to time and synchronize switch closures and openings.

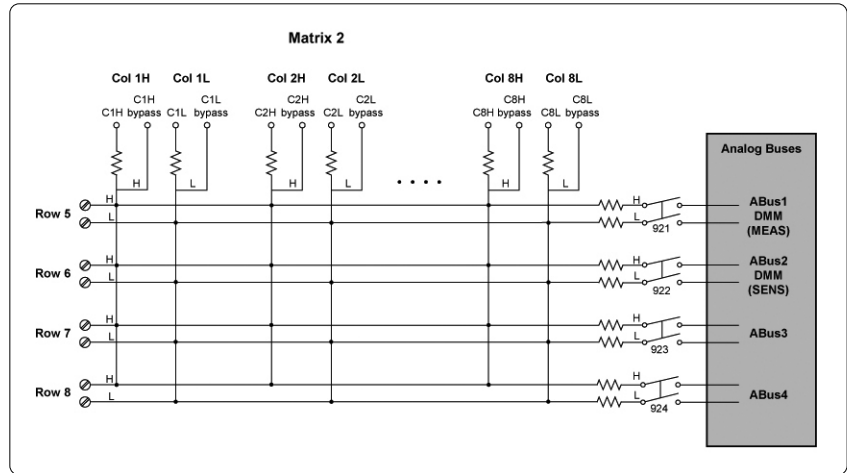


Figure 1. L4433A Dual/Quad 4 x 8 Real Matrix

The L4433A also includes a relay counter to monitor and help predict when relays are nearing their end of life.

### Easily route signals to an external DMM

The L4433A switches support signals up to  $\pm 150$  V and 0.5 A so that no external signal conditioning is required. The analog bus connector can be used to easily route your matrix switch signals to an external device.

### System connections you can trust

The L4433A comes with 2 heavy duty 50-pin Dsub connectors that allow for simple, reliable connection options. Each connector uses 30 micro-inches of

gold to ensure a repeatable, accurate measurement. Flexible connection options include:

- Detachable terminal blocks with strain relief
- Low-cost, standard 50-pin Dsub connector kits and cables
- Mass interconnect solutions

### Ethernet connectivity enables simple connection to the network and remote access to measurements

The Ethernet interface offers high-speed connections that allow for remote access and control. You can set up a private network to filter out unwanted LAN traffic and speed up the I/O throughput, or take advantage of the remote capabilities and distribute your tests worldwide. Monitor, troubleshoot, or

debug your application remotely. Ethernet communication also can be used with the support of LAN sockets connections.

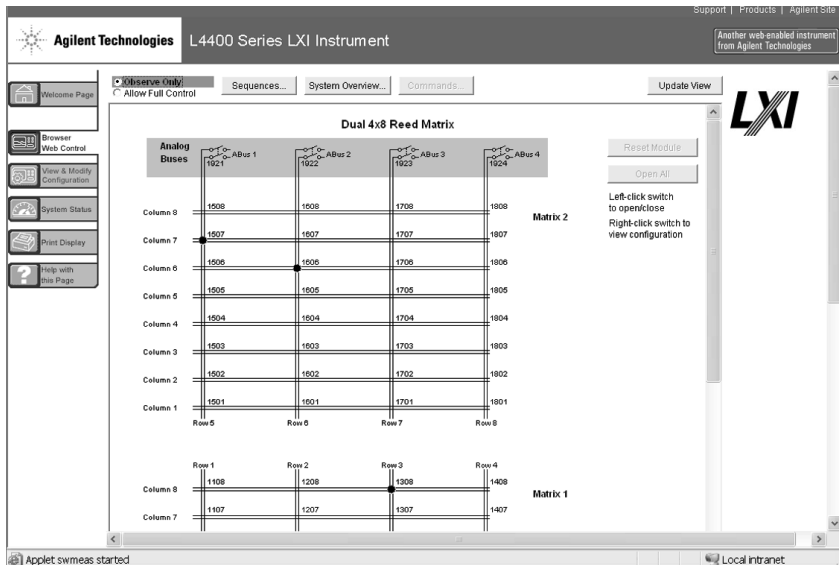
The optional GPIB interface has many years of proven reliability and can be used for easy integration into existing applications.

The L4433A ships with the Agilent E2094N I/O Libraries Suite making it easy for you to configure and integrate instruments into your system – even if your system includes instruments from multiple vendors.

**Fully-featured graphical Web interface makes it easy to set-up and troubleshoot your tests from anywhere in the world**

The built-in Web browser interface provides remote access and control of the instrument via a Java-enabled browser such as Internet Explorer. Using the Web interface, you can set up, troubleshoot, and maintain your instrument from remote locations.

- View and modify instrument setup
- Open or close switches
- Send, receive or view SCPI commands



**Figure 2.** The Web interface makes it easy to set up, troubleshoot and maintain your test remotely

- Define and execute switch sequences
- View error queue
- Get status reports on relay counts, firmware revisions, and more

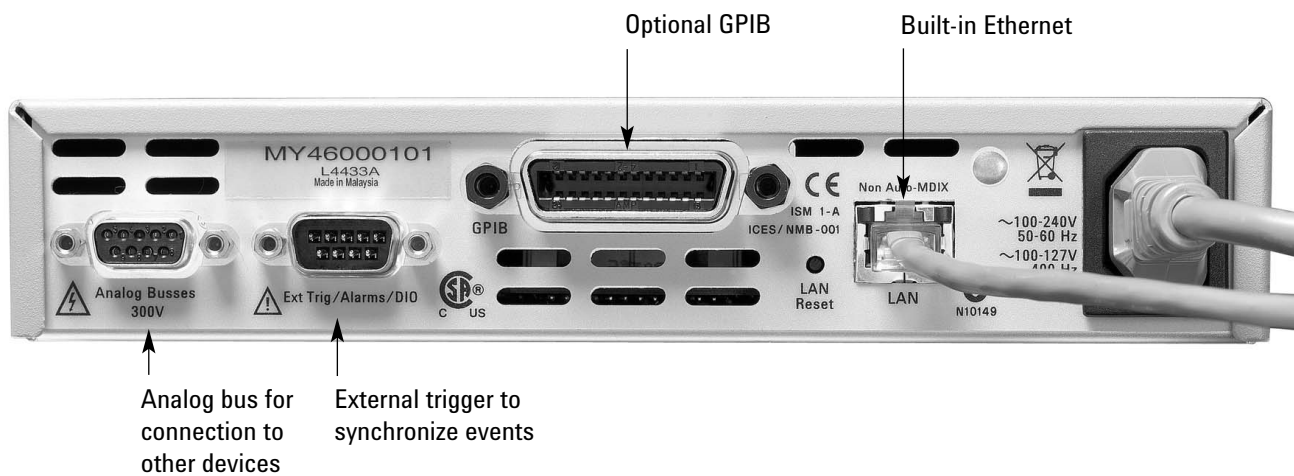
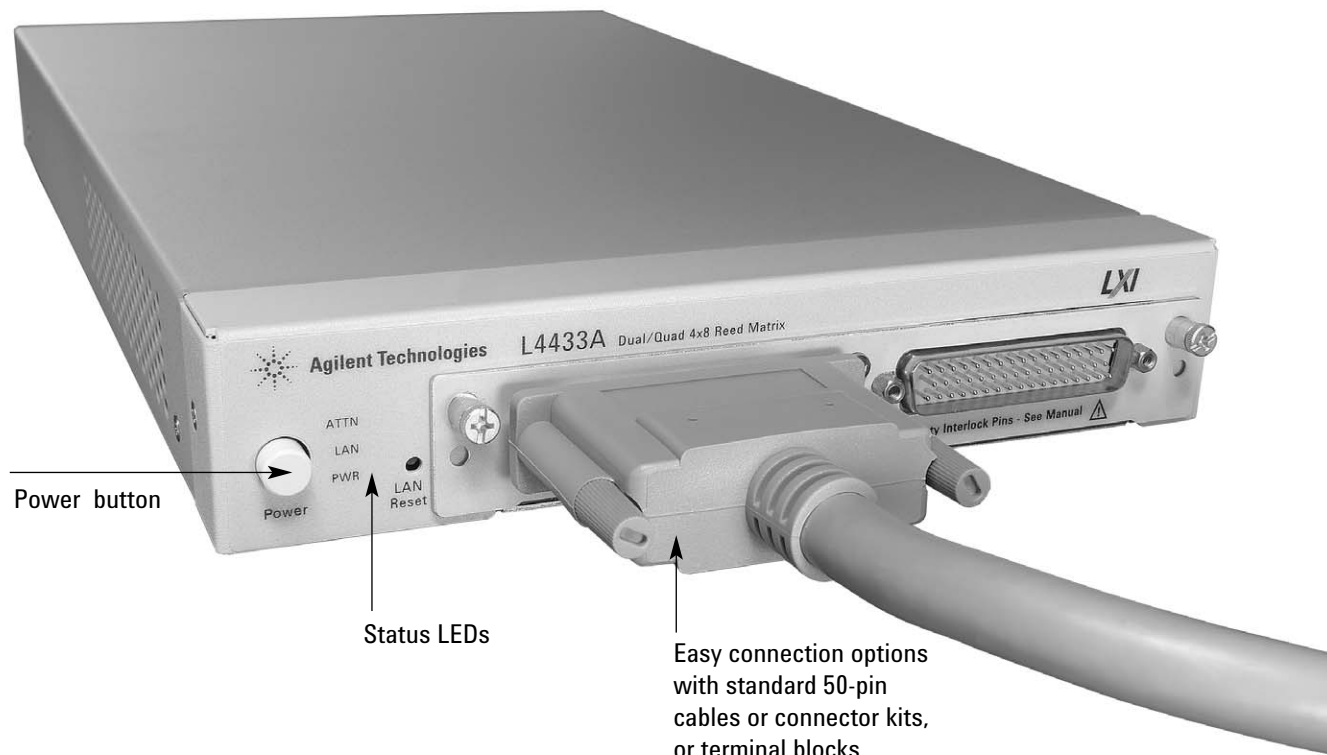
Additionally, since the Web server is built into the instrument, you can access it on any operating system that supports the Web browser without having to install any special software. Password protection and LAN lockout are also provided to limit access for additional security.

**Software for most popular programming environments**

Full support for standard programming environments ensures compatibility and efficiency. You can use direct I/O with the software you already have and know, or use standard IVI and LabVIEW™ software drivers that provide compatibility with the most popular development environments:

- Agilent T&M Toolkit for Microsoft Visual Studio®.NET and Agilent VEE Pro
- National Instruments LabVIEW, LabWindows/CVI, TestStand, and Switch Manager
- Microsoft C/C++® and Visual Basic®

**High-performance switching wherever your application needs it**



# Product Specifications

## Specifications and Characteristics

Channels/configurations	dual 4x8 8x8, 4x16 quad 4x8, 1-wire
Switch type	Reed non-latching
<b>Input characteristics (per channel)</b>	
Max volts <sup>1</sup>	± 150 V peak <sup>2</sup>
Max current (DC, AC RMS)	Switch current Carry current
	0.5 A <sup>5</sup> /0.05 A <sup>8</sup> 1.5 A <sup>5</sup> /0.05 A <sup>8</sup>
Power (W, VA) <sup>2,6</sup>	10 W <sup>7</sup>
Volt-Hertz limit	10 <sup>8</sup>

## General specifications

Offset voltage <sup>3</sup>	< 50 µV < 100 µV 1-wire
Initial closed channel resistance <sup>3</sup>	< 1.5 Ω <sup>5</sup> /200 Ω <sup>8</sup>
DC Isolation (ch-ch, ch-earth)	>10 GΩ

## AC characteristics

Bandwidth at terminal block <sup>4</sup>	30 MHz <sup>5</sup> /4 MHz <sup>8</sup> 2 MHz 1-wire
Crosstalk at terminal block (ch-ch) <sup>4</sup>	300 kHz -65 dB 1 MHz -65 dB 20 MHz -40 dB
Capacitance at terminal block	HI-LO 80 pF LO – earth 75 pF

## General characteristics

Relay life typical	No load 10 V, 100 mA Rated load	1000 M 10 M 10 k
Open /close time, typical		0.5 ms/0.5 ms
Analog bus connection		Yes

<sup>1</sup> DC or AC RMS voltage, channel-to-channel or channel-to-earth

<sup>2</sup> Peak voltage, channel-to-channel or channel-to-earth

<sup>3</sup> Into analog bus connector

<sup>4</sup> 50 Ohm source, 50 Ohm load, differential measurements verified (Sdd21)

<sup>5</sup> With input resistors bypassed. Bypassing resistors will reduce lifetime of relays.

See the rated load relay life characteristics.

<sup>6</sup> Limited to 6 W channel resistance power loss per module

<sup>7</sup> Power restrictions allow only 20 channels to be closed at one time

<sup>8</sup> With 100 Ohm input protection resistors

**Measurement Accuracy** For accuracy measurement specification, combine the DMM offset with the switch offset. Bandwidth of the switch may offset the accuracy of the AC measurement.

## Product Specifications (continued)

### General specifications

Power supply	Universal 100 V to 240 V $\pm$ 10%
Power line frequency	50 Hz to 60 Hz $\pm$ 10% automatically sensed
Power consumption	15 VA
Operating Environment	Full accuracy for 0°C to 55°C Full accuracy to 80% R.H. at 40 °C Pollution degree 1 of IEC 61010-1
Storage environment	-40°C to 70°C
Dimensions (H x W x L)	40.9 x 212.3 x 379.3 mm 1.61 x 8.36 x 14.93 in
Weight	3.9 kg, 8.6 lbs
Safety conforms to	CSA, UL/IEC/EN 61010-1
EMC conforms to	IEC/EN 61326-1, CISPR 11
Warranty	1 year

### Memory

States	5 instrument states with user label in non-volatile memory
--------	--

## Product Specifications (continued)

### Software

Agilent connectivity software included	Agilent I/O Libraries Suite 14 or greater (E2094N)
--	--

### Minimum system requirements

PC hardware	Intel Pentium 100 MHz, 64 Mbyte RAM, 210 Mbyte disk space Display 800x600, 256 colors, CD-ROM drive
Operating system <sup>1</sup>	Windows <sup>®</sup> 98 SE/NT/2000/XP

### Computer interfaces

Standard LAN 10BaseT/100BaseTx
Optional IEEE 488.2 GPIB

### Software driver support for programming languages

Software drivers	IVI-C and IVI-COM for Windows NT <sup>®</sup> /2000/XP LabVIEW
------------------	---

### Compatible with programming tools and environments

Agilent	VEE Pro T&M Toolkit (reqs Visual Studio.NET)
National Instruments	TestStand Measurement Studio LabWindows/CVI LabVIEW Switch Executive
Microsoft	Visual Studio.NET <sup>®</sup> C/C++ Visual Basic 6 <sup>®</sup>

<sup>1</sup> Load I/O Libraries Version M for Windows NT support or version 14.0 for Windows 98 SE support

## Ordering information

### **L4433A Dual/quad 4x8 Reed Matrix**

Includes User's guide on CD, power cord, and Quick Start package

### **Option - GPIB**

Adds GPIB interface

### **Option 0B0**

Deletes printed manual set, full documentation included on CD ROM

### **Option ABA**

English printed manual set

## Connection Options

Select terminal block for discrete wiring, cables or connector kits. Cables and connector kits require 2 per instrument.

### **34933T**

Terminal block for 34933A and L4433A dual 4x8 Matrix

### **Y1135A**

1.5 m 50-pin Dsub, M/F twisted pair with outer shield cable – 300 V

### **Y1136A**

3 m 50-pin Dsub, M/F twisted pair with outer shield cable – 300 V

### **Y1139A**

Solder cup connector kit with female 50-pin Dsub

## Other accessories

### **Y1160A**

**Rack mount kit for L4400 series instruments- racks 2 instruments side-by-side with sliding tray**

For additional information please visit:

<http://www.agilent.com/find/L4433A>

## Related Agilent literature

### **Data Sheets**

**5988-6302EN**

Agilent VEE Pro

**5989-1441EN**

Agilent W1140A-TKT

T&M Toolkit 2.0 with Test Automation

**5989-1439EN**

Agilent E2094N

I/O Libraries Suite 14

**Agilent Technologies' Test and Measurement Support, Services, and Assistance**

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

**Our Promise**

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

**Your Advantage**

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.



**Agilent Email Updates**

[www.agilent.com/find/emailupdates](http://www.agilent.com/find/emailupdates)

Get the latest information on the products and applications you select.



**Agilent Direct**

[www.agilent.com/find/agilentdirect](http://www.agilent.com/find/agilentdirect)

Quickly choose and use your test equipment solutions with confidence.



**Agilent Open**

[www.agilent.com/find/open](http://www.agilent.com/find/open)

Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.



**Agilent Technologies**