Agilent L4421A
40-Channel Armature Multiplexer

Data Sheet

- LXI compliance includes built-in Ethernet connectivity
- Fully-featured graphical Web interface
- 40 2-wire latching armature relays
- Thermocouple reference junction for temperature measurements (reqs ext DMM)
- Relay counter
- Scan up to 100 ch/s
- 300 V, 1 A switch; 2 A carry current
- Software drivers for most common programming environments

40-channel multiplexer offers high-performance signal switching wherever your application needs it

The Agilent L4421A is a high-performance 40-channel armature multiplexer that is LXI Class C compliant. With its small size and Ethernet connectivity, this switch can be placed wherever your application needs it.

The L4421A is a versatile multiplexer for general purpose scanning. The low thermal offset characteristics and built-in thermocouple reference on the terminal block, make it ideal for temperature measurements with an external DMM. The dense, multi-function switching with 100 channel/second scan rates addresses a broad spectrum of data acquisition, design verification and functional test applications. The Ethernet connection also simplifies distributed data acquisition so that you can collect data from multiple locations.

Four additional fused inputs (44 channels total) can route up to 1 A of current to an external DMM, allowing for AC and DC current measurements without the need for external shunt resistors.

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.

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Switch features for flexible and reliable connections

Connect one of many different points to a single point or create your own custom configuration with multiple connections. When configured as a multiplexer, the L4421A features break-before-make connections to ensure that no two signals are connected to each other during a scan.

The sequence feature defines switch sequences and controls complex signal routing to ensure the order of switch closures. 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 measurements and other events. This can help you determine when to begin or end an acquisition.

The L4421A also includes a relay counter to monitor and help predict when relays are nearing their end of life.

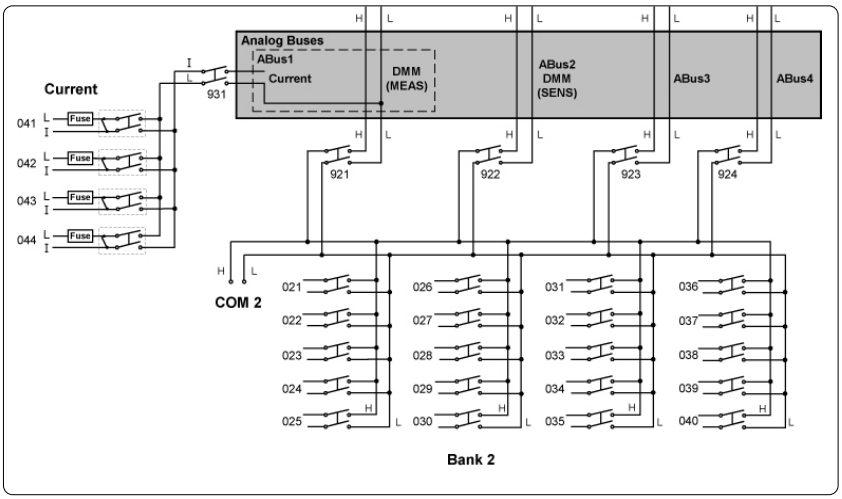


Figure 1. L4421A 40-channel armature multiplexer with low thermal offset (bank 2)

Easily route signals to an external DMM

The L4421A switches support signals up to 300 V and 1 A so that no external signal conditioning is required. The 34921T features a built-in thermocouple reference that allows for scanning temperature measurements with an external DMM. The analog bus connector can be used to easily route your multiplexed signals to an external DMM.

Hardware handshake with an external DMM is supported through a Channel closed trigger output and a Channel advance trigger input.

System connections you can trust

The L4421A 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 L4421A 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 and view SCPI commands

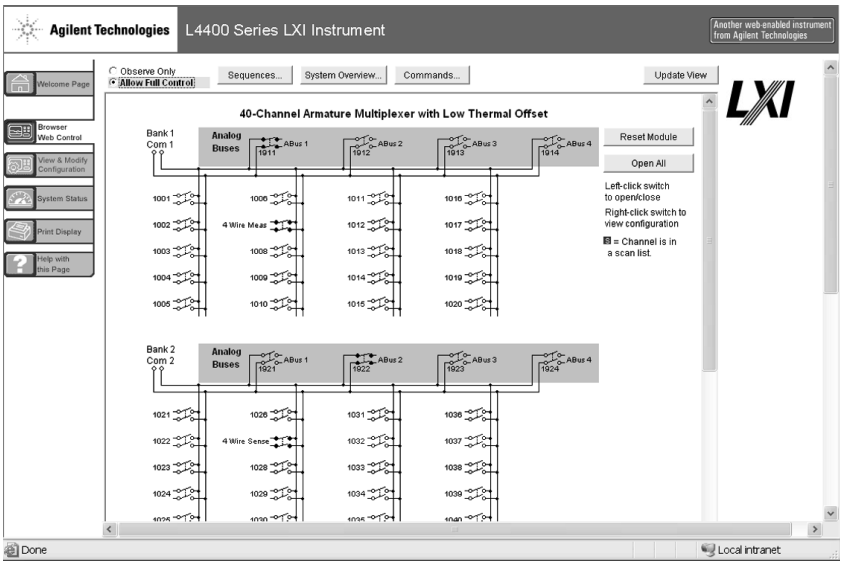


Figure 2. The Web interface makes it easy to set up, troubleshoot and maintain your test remotely

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

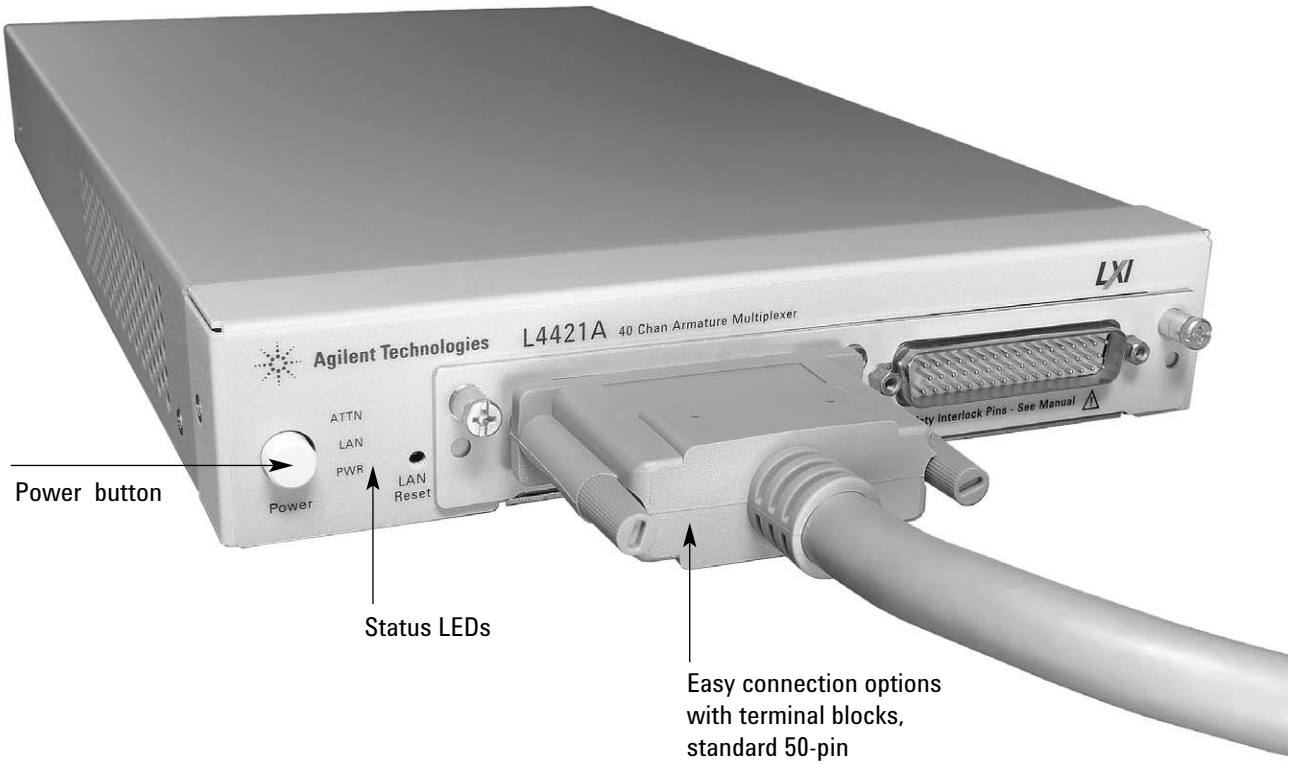
Additionally, since the Web server is built into the instrument, you can access it on any operating system that supports the Web browser without having to install any special software. Password protection and LAN lockout are also provided to limit access for additional security.

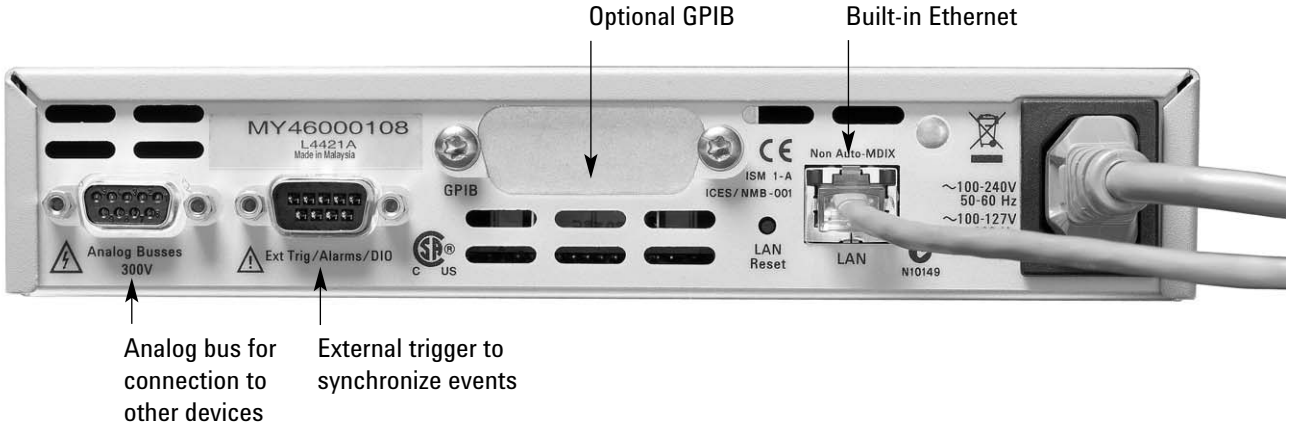
Software for most popular programming environments

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		40 2-wire 20 4-wire 4-current (1.5 A fused)
	Switch type		Armature Latching
Input characteristics (per channel)			
	Max volts (DC, AC RMS)[1]		±300 V
	Max current (DC, AC RMS)		
		Switch current	1 A
		Carry current	2 A
	Power (W, VA)[4]		60 W
	Volt-Hertz limit		10^8
General specifications			
	Offset voltage[2]		<3 uV
	Initial closed channel resistance[2]		< 1.5 Ω
	DC Isolation (ch-ch, ch-earth)		>10 GΩ
	T/C cold junction accuracy[2,6]		< 0.8 °C
AC characteristics			
	Bandwidth at terminal block[3]		45 MHz
	Crosstalk at terminal block (ch-ch)[3]		
		300 kHz	-75 dB
		1 MHz	-75 dB
		20 MHz	-50 dB
		45 MHz	-40 dB
	Capacitance at terminal block		
		HI-LO	150 pF
		LO – earth	150 pF
General characteristics			
	Relay life typical		
		No load	100 M
		10 V, 100 mA	10 M
		Rated load =	100 k
	Scanning speeds[5]		100 ch/s
	Open /close time, typical		4 ms/4 ms
	Analog bus connection		Yes

[1] DC or AC RMS voltage, channel-to-channel or channel-to-earth
[2] At analog bus connector
[3] 50 Ohm source, 50 Ohm load, differential measurements verified with 4-port network analyzer (Sdd21)
[4] Limited to 6 W of channel resistance power loss per module
[5] Speeds are with an external DMM with 4-1/2 digits, delay 0, display off, autozero off, and within bank
[6] Includes 0.5°C error temperature reference sensor and 0.3°C terminal block isothermal gradient error. See User's Guide for information on supported external reference sensors.

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)

Command Execution Time in msec:

	GPIB	LAN
Open or Close	4.7	5.3
Init/*WAI	1.9	3
Close/Init/Open	12.4	14

Scanning rates with external DMM (includes switch, DMM measure time and I/O time with Agilent 34401A, 34410A, 34411A)

Scanning channels	GPIB ch/s	LAN (w/ VXI 11) ch/s
Scanning DCV or Ohms	100	100
Scanning ACV	75	75
Scanning temperature	100	100

Scan triggering

Source	Interval, external, software
Scan count	1 to 50,000 or continuous
Scan interval	0 to 99 hours; 1 ms step size
Channel delay	0 to 60 seconds per channel; 1 ms step size
External trig delay	<2 ms.
External trig jitter	<2 ms

Memory

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

General specifications

Power supply	Universal 100 V to 240 V ±10%
Power line frequency	50 Hz to 60 Hz ±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	3.8 kg, 8.4 lbs
Safety conforms to	CSA, UL/IEC/EN 61010-1
EMC conforms to	IEC/EN 61326-1, CISPR 11
Warranty	1 year

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[1]	Windows® 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®/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®
		C/C++
		Visual Basic 6®

[1] Load I/O Libraries Version M for Windows NT support or version 14.0 for Windows 98 SE support

Ordering information

L4421A 40-chan armature multiplexer
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.

34921T
Terminal block with temp reference for 34921A and L4421A 40-Ch Multiplexer

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 on sliding tray

34307A
10-pack of J-type thermocouples

34308A
5-pack of 10 k thermistors

For additional information please visit:
http://www.agilent.com/find/L4421A

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

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