Keysight Technologies
L4452A Multifunction with Digital I/O, D/A, Totalizer

Data Sheet

![Keysight Technologies logo]

KEYSIGHT
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Introduction

Multifunction instrument offers your system control functionality wherever your application needs it

The Keysight Technologies, Inc. L4452A is a multi-function instrument that is LXI Class C compliant. With its small size and Ethernet connectivity, this multifunction instrument can be placed wherever your application needs it.

The Keysight L4452A allows great flexibility for a variety of sense and control applications. It combines four 8-bit channels of digital input and output, a 100 kHz gated totalizer, and two ±12 V analog outputs all on a single earth-referenced module.

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

– LXI compliance includes built-in Ethernet connectivity

– Fully-featured graphical web interface

– 32-bits of digital I/O up to 42 V

– 100 kHz gated totalizer

– Two ±12 V analog outputs with 1 mV of resolution

– Software drivers for most common programming environments

Digital I/O, D/A converter and totalizer for your most common test requirements

The L4452A combines digital I/O, analog outputs and a gated totalizer for your most common system control needs.

The digital I/O supports output levels up to 42 V. These channels can be used with an external power supply to control external devices or to sense limit switch and digital bus status with no complex handshake modes.

You can use the totalizer input to count events. The digital inputs and totalizer inputs may be included in a scan. Alarm limits for the digital and event counter inputs are evaluated continuously, capturing and logging alarm conditions even between scans.

The analog outputs can output up to ±12 V or 10 mA DC with 1 mV of resolution. They can be used to source bias voltages to your device under test, to control your analog programmable power supplies, or use the outputs as set points for your control systems.

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 a scan.

System connections you can trust

The L4452A comes with one heavy duty 50-pin Dsub connector that allows for simple, reliable connection options. Each connector uses 30 micro-inches of gold to ensure a repeatable, accurate measurement. Other 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.
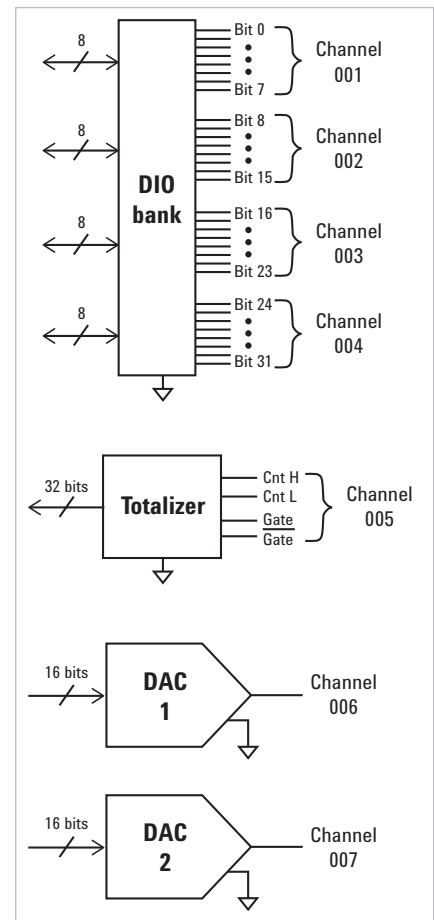

Figure 1. L4452A Multifunction Digital I/O, D/A, totalizer.

The L4452A ships with the Keysight E2094N I/O Libraries Suite, which enables connections for Keysight and non-Keysight modular and traditional instruments. This makes it easy for you to configure and integrate instruments into your system.

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

The built-in web 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 monitor your instrument from remote locations.

- View and modify instrument setup
- Configure I/O channels, analog outputs, totalizer and alarms
- Read and write I/O channels
- Output analog channels
- View error queue
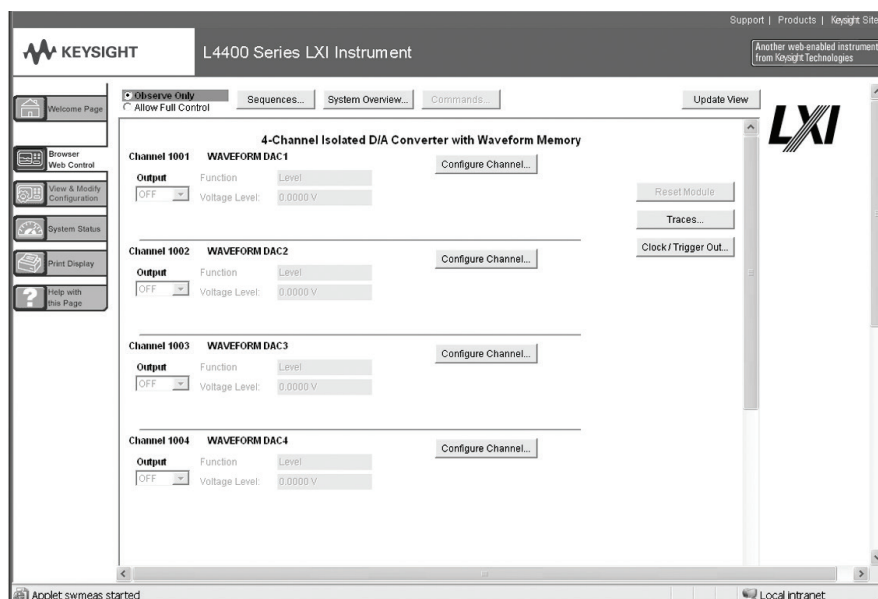- Get status reports, current configuration, firmware revisions, and more

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

Additionally, since the web interface 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 your own software, or use standard IVI and LabVIEW software drivers that provide compatibility with the most popular development environments:

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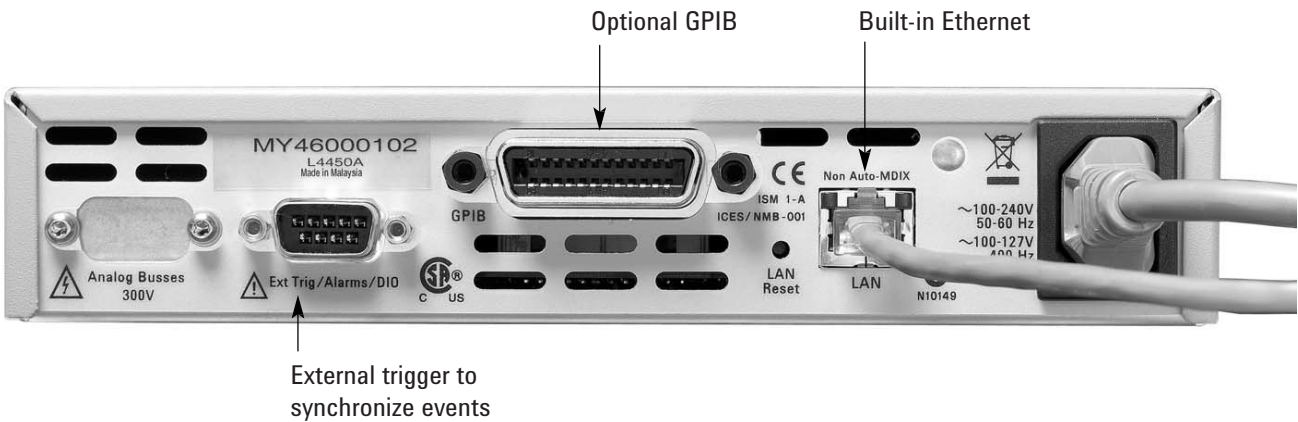- Microsoft C/C++ and Visual Basic

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High-performance switching wherever your application needs it

Power
button

Status LEDs

Easy connection options
with terminal blocks,
standard 50-pin cables or
connector kits

Optional GPIB

Built-in Ethernet

External trigger to
synchronize events

Product specifications

Digital input/output characteristics		
Four 8-bit channels, 8-bits wide, input or output, non-isolated	Vin(L)	< 0.8 V (TTL)
	Vin(H)	> 2.0 V (TTL)
	Vout(L)	< 0.8 V @Iout = -400 mA per output
	Vout(H)	> 2.4 V @ Iout = 1 mA
	Vin(H) max	< 42 V with external open drain pull-up
	Alarm	Maskable pattern match or state change
	Speed	4 ms (max) alarm sampling
	Latency	5 ms (typ) to 34980A alarm output
	Read/write speed	95/s
Totalize input characteristics		
	Max count	2^{26} - 1
	Totalize input	100 kHz (max) rising or falling edge, programmable
	Signal level	1 Vp-p (min) 42 Vpk (max)
	Threshold	0 V or TTL
	Gate input	TTL-Hi, TTL-Lo, or none
	Count reset	Manual or read + reset
	Read speed	85 rdgs/s
Analog output characteristics		
	DAC 1, 2	±12 V, non-isolated
	Resolution	1 mV
	IOUT	10 mA max
	Settling time	1 ms to 0.01% of output
	Accuracy 1 year	±(% of output + mV) (0.25% + 20 mV)
	Temp. coefficient	±(0.015% + 1 mV)/°C

Product specifications (continued)

Data out of memory to LAN or GPIB			
(Data transfers rate with 1000 channel blocks)		**GPIB** **rds/s**	**LAN** (w/ VXI 11) **rds/s**
	Readings	2560	3542
	Readings with timestamp	1304	1826
	Readings with all format options ON	980	1361
Scan triggering			
	Source	Internal, external, software, or on monitor channel alarm	
	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. With monitor on <200 ms	
	External trig jitter	<2 ms	
Alarms			
	Digital inputs	Digital in maskable pattern match or state change frequency and totalize: Hi limit only	
	Alarm on channel	Alarm evaluated each reading	
	Alarm outputs	2 TTL compatible Selectable TTL logic Hi or Lo on fail	
	Latency	5 ms (typical)	
Memory			
	Type	Volatile	
	Readings	500,000 with timestamp readable during scan	
	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	3.6 kg, 8 lbs	
	Safety conforms to	CSA, UL/IEC/EN 61010-1	
	EMC conforms to	IEC/EN 61326-1, CISPR 11	
	Warranty	3 years	

Product specifications (continued)

Software		
	Keysight connnectivity software included	Keysight 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 interface		
		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	
	Keysight	VEE Pro
		T&M Toolkit (requires VisualStudio.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

Related literature

L4452A Multifunction instrument with digital I/O, D/A converters and totalizer

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 kit requir one per instrument.

34952T

Terminal block for 34951A and L4451A 4-Ch D/A converter

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

Y1141A

Solder cup connector kit with male 50-pin Dsub

Other accessories

Y1160A

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

Note: when using the L4400 Series Rack Mount Kit, use the Y1139A solder cup connector kit rather than the 34921T terminal block.

For additional information please visit:
http://www.keysight.com/find/L4452A

Data sheets

5988-6302EN, *Keysight VEE Pro*

5989-1441EN, *Keysight W1130B T&M Toolkit 2.1 with Test Automation*

5989-1439EN, *Keysight E2094N I/O Libraries Suite 15.5*

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www.lxistandard.org
LAN eXtensions for Instruments puts the power of Ethernet and the
Web inside your test systems. Keysight is a founding member of the LXI
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www.pxisa.org

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