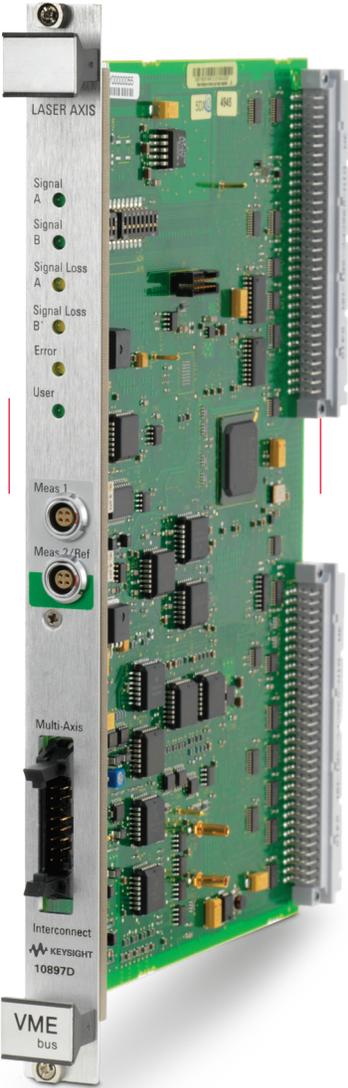


# Keysight Technologies 10897D High Resolution VME Laser Axis Board

Data Sheet



The new 10897D High Resolution VME Laser Axis Board offers the outstanding performance for which Keysight Technologies, Inc. is known. The excellent resolution and low noise performance of the Keysight 10897D provide the ultimate in repeatable and accurate positioning for advanced applications such as IC fabrication.

The 10897D offers very high data rates to provide exceptional bandwidth and high-performance closed-loop positioning for critical applications. The 10897D's standard VMEbus interface speeds system integration, saving valuable time and money. To further simplify and speed system layout, the 10897D also offers programmable signal routing. Like all VMEbus laser electronics from Keysight, the 10897D has a three-year warranty.

# Keysight 10897D High Resolution VME Laser Axis Board

## High Performance for Advanced Applications

The Keysight 10897D High Resolution VME Laser Axis Board offers outstanding position resolution and low noise, resulting in unsurpassed positioning repeatability and accuracy compared to previous laser systems. The Keysight 10897D provides measurement resolution up to 1/2048, or 0.3 nm (3 Å) with the high resolution plane mirror interferometer. The Keysight 10897D is tested at frequencies equivalent to 700 mm/s plane mirror slew rates.

Systems generally can compensate for data age, the constant time lag between triggering a measurement and receiving the data, but not for variable data age, the portion that changes and translates directly into stage position error. For example, a stage moving at 500 mm/s with 800 ps of variable data age has a minimum 0.4 nm position error due to variable data age.

The unique Keysight 10897D design has improved dynamic positioning accuracy by reducing the variable data age to less than 1 nanosecond for most applications. This results in unsurpassed positioning accuracy when compensating moving systems for the delay between the position measurement and the time the position information is available. Dynamic accuracy is especially important for E- beam machines and step and scan IC fabrication tools.

The 10897D contains an onboard, lowpass filter which may be enabled to provide more stable operation in low signal- to-noise conditions. This filter is programmable to provide the most stable positioning for your specific application.

The 10897D is a register- programmed position axis board that provides a 36- bit position word in fractional wavelengths. The position word is readable over the VMEbus and is also available from a real- time hardware output on the A and C rows of the P2 connector.

## Flexible VMEbus Electronics Speed System Integration

The Keysight 10897D is a 6U- size board that complies electrically and mechanically with Revision C.1 of the VMEbus specifications. The heart of the 10897D is a proprietary interpolator specifically designed for this application. Surface mount technology is used to provide a compact, reliable design.

To further simplify and speed system layout, the 10897D offers programmable signal routing. Cable routing is flexible; the reference and measurement signals can come from either the front panel connectors, the rear P2 connector, or the multiaxis interconnect cable.

The 10897D uses Keysight 10880A/B/C or N1250A/B/E Receiver Cables, and 10881A/B/C/D/E/F Laser Head Cables. Contact your Keysight representative for more information about cable options.

# Keysight Technologies 10897D High Resolution VME Laser Axis Board

<b>General System Specifications</b>	
Number of measurement channels	One channel
Maximum number of boards in system	Seven boards (for larger board groups, consult your Keysight representative)
Measurement resolution	Linear Optics            1.2 nm ( $\lambda/512$ ) Plane Mirror Optics    0.6 nm ( $\lambda/1024$ ) High Resolution Optics  0.3 nm ( $\lambda/2048$ )
Velocity range (using plane mirror)	$\pm 0.670$ m/s with Keysight 5517GL laser head $\pm 0.700$ m/s with Keysight 5517FL laser head $\pm 0.790$ m/s with Keysight 5517EL laser head $\pm 0.670$ m/s with Keysight 5517DL laser head $\pm 0.500$ m/s with Keysight 5517D laser head $\pm 0.356$ m/s with Keysight 5517C laser head $\pm 0.254$ m/s with Keysight 5517B laser head $\pm 0.203$ m/s with Keysight 5517A laser head  (Consult your Keysight representative for help in selecting the correct receiver that corresponds to the velocity for your laser head.)
Working range with plane mirror optics	$\pm 10.6$ m
<b>General VME Characteristics</b>	
VME Compliance	Complies with VME Specification Rev. C.1 6U size A16 Data Transfer Cycles D16 Data Transfer Cycles A24 Data Transfer Cycles D32 Data Transfer Cycles D08 (O) Interrupt Acknowledge Cycles
<b>Power Requirements</b>	
Power requirements	5 Vdc $\pm 0.25$ V/ $-0.125$ V at less than 3.5 A $+12$ V $\pm 0.5$ V at less than 0.1 A $-12$ V $\pm 0.5$ V at less than 0.025 A
<b>Environmental Requirements</b>	
Operating temperature range	0 to 40°C or 0 to 55°C (see airflow requirements)
Airflow requirements for 0–40°C operation for 0–55°C operation	19 linear meters (60 linear feet) per minute minimum 76 linear meters (250 linear feet) per minute minimum
<b>Physical Characteristics</b>	
Weight	0.45 kg (1 lb)

# Keysight Technologies 10897D High Resolution VME Laser Axis Board

VMEbus Position Output	
Data format	Units: fractions of a wavelength 2's Complement: choose any 32 of 35 bits to read Positive Logic Least Significant Bit (or one count) equals resolution
Data rate over backplane	>100 kHz
Sample data age and delay (typical)	Fixed After a synchronous sample operation, the value in the position register will reflect the actual position that occurred approximately N ns before the sample operation was initiated. There are two user-selectable values of N, 290 ns and 790 ns.  Variable <800 ps over the full power supply voltage specification, and <60 ps/°C  Delay When N=290 ns is selected, the position data is available to be read on the VMEbus 600 ns after the sampling operation. For N=790 ns, position data is available on the VMEbus 100 ns after the sampling operation.
P2 Connector Hardware Position Output	
Data format	Units: fractions of a wavelength <b>either</b> 2's Complement: 36 parallel binary <b>or</b> signed magnitude (bit 35 is sign bit) Positive Logic Least Significant Bit (or one count) equals resolution
Data update rate	10 MHz (hardware included to synchronize to slower clocks)
Data age (typical)	Fixed There is a time lag of approximately 1.2 $\mu$ s between the actual position and the position at the hardware output lines (located on rows A and C of P2 connector).  Variable <800 ps over the full power supply voltage specification, and <60 ps/°C

**myKeysight**

**myKeysight**

[www.keysight.com/find/mykeysight](http://www.keysight.com/find/mykeysight)

A personalized view into the information most relevant to you.



[www.axiestandard.org](http://www.axiestandard.org)

AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA for general purpose and semiconductor test. Keysight is a founding member of the AXIe consortium. ATCA®, AdvancedTCA®, and the ATCA logo are registered US trademarks of the PCI Industrial Computer Manufacturers Group.



[www.lxistandard.org](http://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 consortium.



[www.pxisa.org](http://www.pxisa.org)

PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.



**Keysight Assurance Plans**

[www.keysight.com/find/AssurancePlans](http://www.keysight.com/find/AssurancePlans)

Up to five years of protection and no budgetary surprises to ensure your instruments are operating to specification so you can rely on accurate measurements.



[www.keysight.com/quality](http://www.keysight.com/quality)

Keysight Technologies, Inc.  
DEKRA Certified ISO 9001:2008  
Quality Management System

**Keysight Channel Partners**

[www.keysight.com/find/channelpartners](http://www.keysight.com/find/channelpartners)

Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

[www.keysight.com/find/lasers](http://www.keysight.com/find/lasers)

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

**Americas**

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

**Asia Pacific**

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

**Europe & Middle East**

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	0800 000154
Sweden	0200 882255
Switzerland	0800 805353
	Opt. 1 (DE)
	Opt. 2 (FR)
	Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:  
[www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)  
(BP-07-10-14)

