HP 10897B

High Resolution Laser Axis Board

$3995.00

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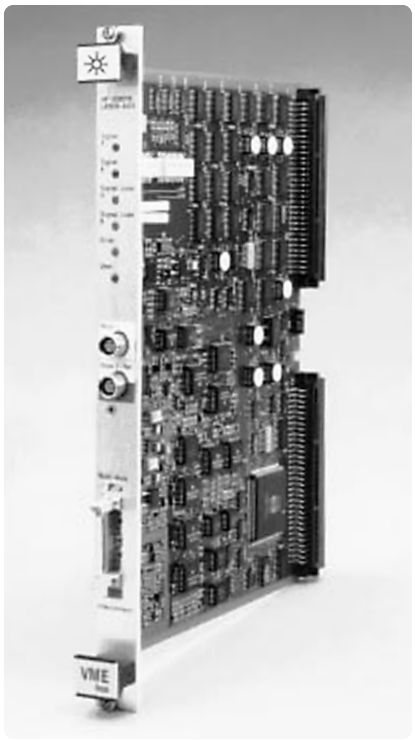
Agilent 10897B High Resolution Laser Axis Board

- **Highest resolution**
- **10 MHz data transfer**
- **Low variable data age**



Get the highest positioning accuracy and repeatability available with the Agilent 10897B High Resolution Laser Axis Board for VMEbus.

High Performance for Advanced Applications

The new 10897B High Resolution Laser Axis Board provides the highest performance ever offered by Agilent Technologies. The improved position resolution—compared to previous laser systems—and low noise offer the ultimate positioning repeatability and accuracy for advanced products such as IC fabrication equipment. The Agilent 10897B provides measurement resolution up to λ/2048, or 0.3 nm (3 Angstroms), the highest resolution commercially available.

The 10897B is tested at frequencies equivalent to 700 mm/s plane mirror slew rates, double that of the 10897A. To provide unsurpassed positioning accuracy for dynamic measurements, the 10897B provides dramatically reduced data age ambiguity compared with previous Agilent systems. Data age ambiguity, the unknown variation in data age, has been reduced to less than 1 ns. This provides high accuracy when compensating moving systems for the delay between the position measurement and the time the position information is available. This improved dynamic accuracy is especially important for E-beam machines and step and scan IC fabrication cameras.

The 10897B contains an onboard, low-pass filter which may be enabled to provide more stable operation in low signal-tonoise conditions. This filter is programmable to provide the most stable positioning for your specific application. The 10897B High Resolution Laser Axis Board 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. The 10897B offers very high data rates to provide high bandwidth, high-performance closed-loop positioning for critical applications.

Flexible VMEbus Electronics Speed System Integration

The 10897B High Resolution Laser Axis Board is a 6U-size board that complies electrically and mechanically with Revision C.1 of the VMEbus specifications. The 10897B's standard VMEbus interface speeds system integration, saving valuable time and money. The heart of the 10897B is a proprietary, CMOS IC specifically designed for this application. Surface mount technology is used to provide a compact, reliable design. Like all VMEbus laser electronics from Agilent, the 10897B has a three-year warranty.

To further simplify and speed system layout, the 10897B also 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 10897B uses the Agilent 10880A/B/C Receiver Cable and 10881A/B/C/D/E/F Laser Head Cable.

Specifications

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

Fixed: After a synchronous sample operation, the value in the position register will reflect the actual position that occurred approximately X ns before the sample operation was initiated. There are two user-selectable values of X, 290 ns and 790 ns.

Variable (typically)

<800 ps over the full power supply voltage specification, and <60 ps/°C.

Delay

When X=290 ns is selected, the position data is available to be read on the VMEbus 600 ns after the sampling operation. For X=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
2's Complement: 36-bit parallel binary
Positive Logic
Least Significant Bit (or one count) equals resolution

Data Update Rate

10 MHz (Hardware included to synchronize to slower clocks)

Data Age

Fixed: There is a 1190 ±20 ns time lag between actual position and the position at the hardware output lines (located on rows A and C of P2 connector).

Variable (typically)

<800 ps over the full power supply voltage specification, and <60 ps/°C.

General Information

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

Power Requirements

5 Vdc +0.25 V/–0.125 V at less than 3.5 A
+12 V ±0.5 V at less than 0.1 A
–12 V ±0.5 V at less than 0.025 A

Cooling Requirements

19 linear meters (60 linear feet) per minute min. for 0–40°C operation
76 linear meters (250 linear feet) per minute min. for 0–55°C operation

Cables

10880A/B/C Receiver Cable
10881A/B/C/D/E/F Laser Head Cable

Axis Cabling:

Specify	for
Option 002	2 axis system
Option 003	3 axis system
Option 004	4 axis system
Option 005	5 axis system
Option 006	6 axis system
Option 007	7 axis system

Weight: 0.45 kg (1 lb)

System Performance with the Agilent 10897B

			Maximum Axis Velocity*			
			Laser Head			
Optics	**Resolution**	**Range**	**5517A**	**5517B**	**5517C**	**5517D†**
Linear or Single Beam	λ/512 or 1.2 nm (0.05 µ in)	±21.2 m (69.9 ft.)	406 mm/s (16 in/s)	508 mm/s (20 in/s)	711 mm/s (28 in/s)	1000 mm/s (39.4 in/s)
Plane Mirror	λ/1024 or 0.6 nm (0.025 µ in)	±10.6 m (34.8 ft.)	203 mm/s (8 in/s)	254 mm/s (10 in/s)	356 mm/s (14 in/s)	500 mm/s (19.7 in/s)
High Resolution	λ/2048 or 0.3 nm (0.012 µ in)	±5.3 m (17.4 ft.)	102 mm/s (4 in/s)	127 mm/s (5 in/s)	178 mm/s (7 in/s)	250 mm/s (9.84 in/s)

* Maximum axis velocity depends on the combination of laser head and optics used for the axis.
† Agilent 10780C or 10780F receivers used at this velocity must have serial prefix 3546 or higher.