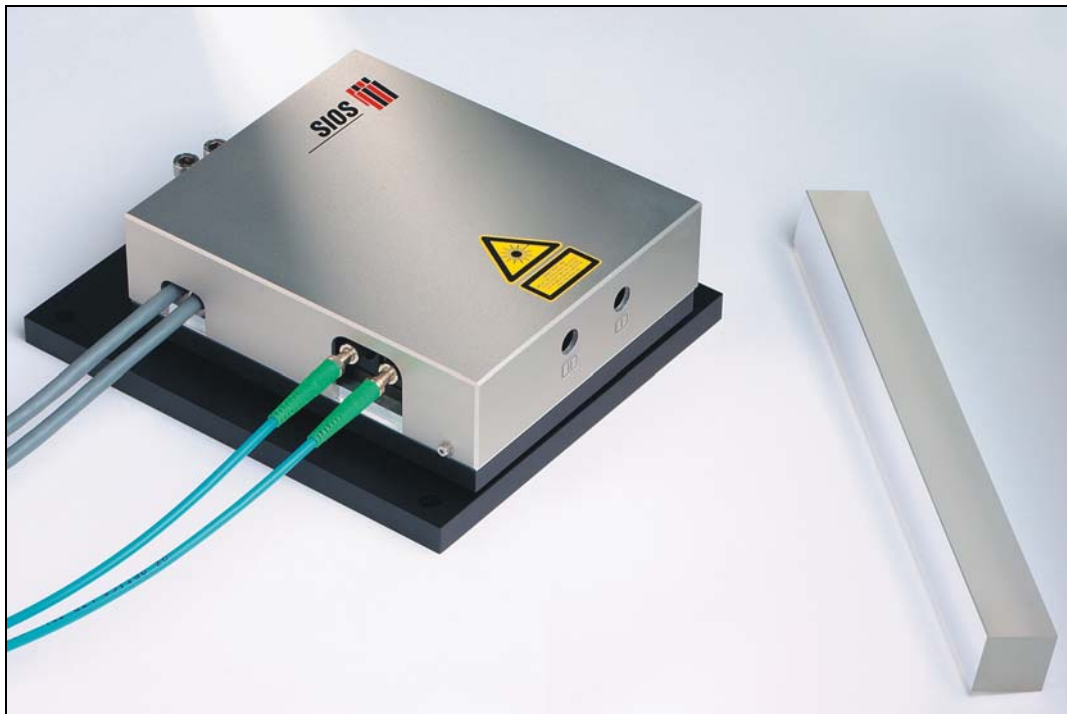

Miniature Double Plane Mirror Interferometer

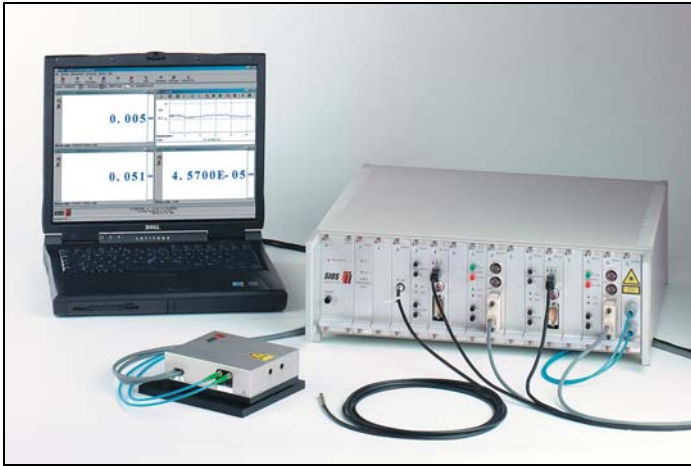


SP-D Series

Design and Operation

Our Series SP-D double plane mirror interferometers are designed for incorporation into customer supplied systems, and are used for simultaneously making pairs of nanoprecision length measurements. The differences in these pairs of length measurements and the separations between their two beams are then used for accurately determining the associated angles involved, where the angular measurement range is approximately two minutes of arc and independent of beam separation. In cases involving small length changes, focusing their external beams on the objects being measured increases the angular measurement range up to ± 30 minutes of arc.

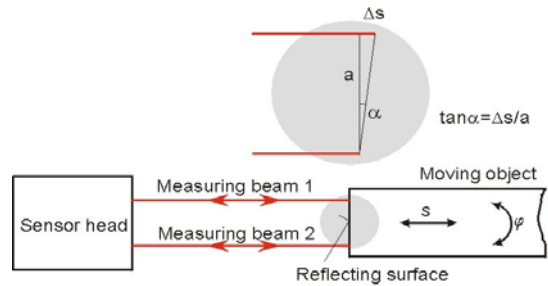
Laser light sources are coupled to the sensor heads via fiberoptic cables. The miniature interferometers convert motions of moving mirrors into pairs of optical interference signals that are transmitted to electronic power supply/signal processing modules for processing. HeNe lasers serve as light sources for the interferometer and are frequency stabilized on models with large dynamic ranges. Compensation of environmental influences form the basis for high metric precisions and are achieved through the correction of laser wavelengths. A PC running a custom software package is employed for operating the electronic modules and displaying measurement results.



Major Performance Features

- Makes ultraprecise simultaneous length and angular measurements.
- Employs highly frequency stabilized HeNe lasers as light sources.
- Fiberoptic coupled sensor heads
- The beam separations may be tailored to suit customers' special requirements.
- Compensates for shifts in laser wavelength due to environmental influences.

Operating Principle



Applications

- Making measurements on plane tables, microscope stages, positioning systems, coordinate-measuring machines, or machine tools.
- Correcting angular errors on dual-axis and multi-axis coordinate measuring machines.
- Measuring linear displacements relative to reference points
- Deformation studies
- Noncontact surface profiling
- Materials testing, e.g., dilatometry

Technical Data	Model SP 120-D	Model SP 2000-D
Length measurement range	100	2,000
Length Resolution	1	1
Length Resolution, optional at extra cost	0.1	0.1
Beam separation	2...4, ≥ 10	2...4, ≥ 10
Angular measurement range	± 2	± 2
Angular Resolution at length resolution of 1 nm:		
Beam separation: 2 mm	0.1	0.1
Beam separation: 4 mm	0.05	0.05
Beam separation: 12.7 mm	0.02	0.02
Beam separation: 25.4 mm	0.01	0.01
Angular measurement range with beam focussing	30	30
Nominal laser wavelength	632.8	632.8
Laser frequency stability (after warm-up period)	$3 \cdot 10^{-7}$	$2 \cdot 10^{-8}$
Laser warm-up period	1	10...20
Operating temperature range	15...30	15...30
Maximum moving-reflector translation range	600	600
Interface:	RS 232 C USB	RS 232 C USB
serial		
optional at extra cost		
Cable length between sensor head and electronics module	3, optionally up to 25	3, optionally up to 25
Line voltage / frequency	100...240 / 47...60	100...240 / 47...60

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