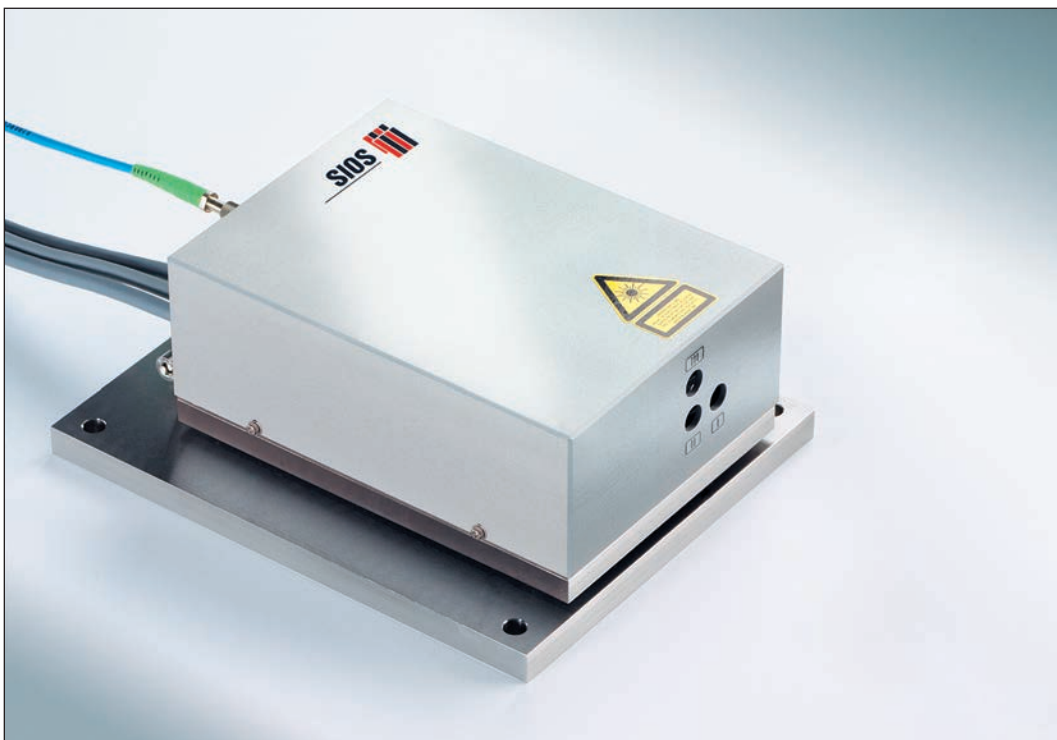


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# Triple-Beam Plane-Mirror Interferometer



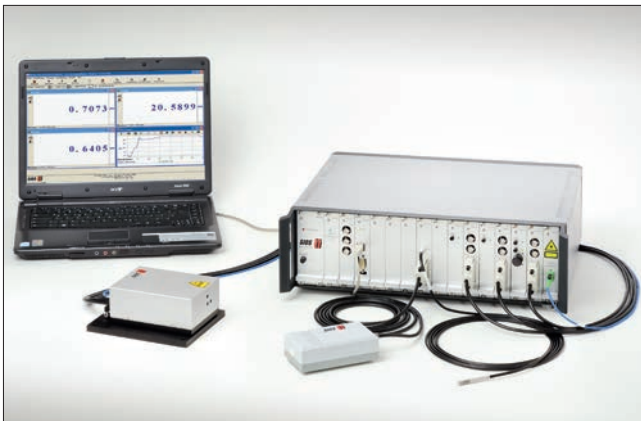
## SP-TR Series

## Design and Operation

The triple-beam interferometers are precision length measuring instruments, that combine three interferometers in one instrument. This enables three lengths to be measured simultaneously with nanometer accuracy. The corresponding angle can be calculated with great accuracy from the difference between two length values and the beam distance.

A HeNe laser with a highly stable frequency supplies all three interferometers. The three measuring systems all have the same wavelength standard. The laser beam is coupled with only one fiber-optic cable in the sensor head. The triple-beam interferometer converts the measuring movements into interference signals, which are transmitted to the electrical supply and evaluation unit.

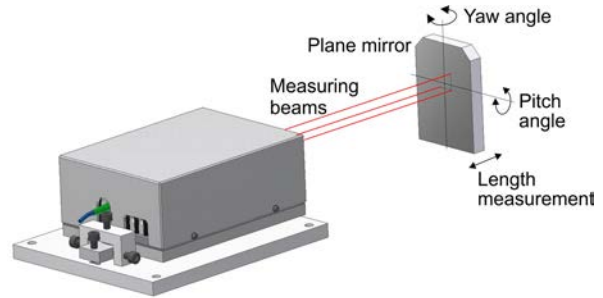
The high measurement accuracy is achieved by using an HeNe laser as the dimensional standard and by correcting environmental effects on the laser wavelength. Operation and display take place on a PC with optional data acquisition and display software.



## Major Performance Features

- Simultaneous, ultraprecise, triple-channel length measurements, as well as pitch and yaw angle measurements
- The same laser wavelength is used in all three measuring channels
- The beam distances are calibrated in the factory
- Fiber-optic coupling of the sensor head
- The sensor head may be made of aluminum, stainless steel or invar
- Open interfaces for OEM software under Windows and Linux

## Operating Principle



## Applications

- Laser-interferometric measurements on guides, measuring, microscope and positioning tables
- High precision pitch and yaw angle corrections at two or multicoordinate measurements
- Calibration of measuring machines and machine tools
- Difference measurements (dilatometry, material testing)
- Extension of the measuring range for angle measurement on request

Technical Data		Model SP 120 TR	Model SP 2000 TR
Length measuring range (max. distance from reflector to sensor head)	mm	70	2000
Length resolution	pm	20	20
Laser wavelength	nm	632.8	632.8
Frequency stability of the HeNe laser (after warm-up time)		$3 \cdot 10^{-7}$	$2 \cdot 10^{-8}$
Warm-up time of the HeNe laser	min	1	10...20
Horizontal and vertical beam distances	mm	12	
Pitch and yaw measuring ranges	arcmin	$\pm 1.5$	
Angular resolution at 0.1 nm length resolution	arcsec	0.002	
Operating temperature range	$^{\circ}\text{C}$	15...30	
Maximum displacement speed of the measuring reflector	mm/s	800	
Dimensions (L x W x H)			
Sensor head with adjustable mount	mm	142 x 102 x 50	
Electronic supply and evaluation unit	mm	450 x 400 x 150	
Mass			
Sensor head with adjustable mount	kg	2.3	
Electronic supply and evaluation unit	kg	9.5	
Interfaces	standard optional	RS232C, USB Digital 32-bit parallel interface Digital incremental signals (TTL level) Analog incremental signals ( $1V_{pp}$ )	
Cable length between sensor head and electronics unit	m	3, optionally up to 10	
Line voltage / frequency	VAC/Hz	100...240 / 47...60	
Laser safety class according to EN 60825-1:2007 and ANSI Z136.1 (CDRH)		2M II	

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Warning:

