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# Miniature Retroreflector Interferometer



**MI-Series**

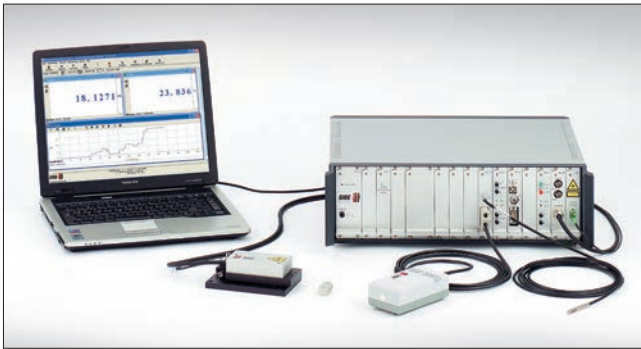
## Design and Operation

Series MI miniature retroreflector interferometers are precision length measuring instruments with a wide range of applications. They can be adapted geometrically and functionally to specific tasks.

The miniaturized sensor head and corner cube reflector enable the instrument to be used both as a permanently installed measuring system as well as a transportable calibration system. The fiber-optic coupled sensor head makes the systems easy to use.

The miniature interferometer converts the measuring movement of the corner cube reflector into an interference signal. This optical signal is transmitted through fiber-optic cables to the optoelectronic supply and evaluation unit, and output as a length value. The basis for the high measurement accuracy and linearity is achieved by using an HeNe laser as the metrological standard, and by correcting environmental effects on the laser wavelength.

Operation and display take place optionally on a separate display unit or on a PC with optional software.



## Major Performance Features

- Flexible, ultraprecise length measuring system
- Adaptable to specific customer requirements
- Easy adjustment
- High maximum displacement speed of the measuring reflector
- Large permissible tilting of the measuring reflector
- Fiber-optic coupling of the sensor head
- No thermal effects on the measurement environment
- Not sensitive to electromagnetic fields
- HeNe laser with high frequency stability as the metrological standard
- Correction of environmental influences on the wavelength of the laser light
- Traceable to national standards
- The sensor head may be made of aluminum, stainless steel or invar
- Data acquisition and display software
- Open interfaces for OEM software under Windows and Linux

## Applications

- Laser interferometric precision length measuring system for installation in single and multi-axis measuring tables, microscope stages, machine tools and positioning tables
- Calibration of machine tools and coordinate measuring machines
- Precision length measurements in research and development

Technical Data		Model MI 60	Model MI 150	Model MI 5000
Measurement range (Max. distance reflector - sensor head)	mm	60	150	5000
Resolution	pm	20	20	20
Laser wavelength	nm	632.8	632.8	632.8
Frequency stability of the HeNe laser (after warm-up time)		$3 \cdot 10^{-7}$	$3 \cdot 10^{-7}$	$2 \cdot 10^{-8}$
Warm-up time of the HeNe laser	min	1	1	10...20
Operating temperature range	°C	15...30		
Maximum tilting angle of measuring reflector (Center of rotation in center of reflector)	degree	±1.5		
Maximum displacement speed of the measuring reflector	mm/s	800		
Dimensions (L x W x H):				
Sensor head with alignment base	mm	140 x 90 x 47		
Corner cube reflector	mm	30 x 15 x 13		
Optoelectronic supply and evaluation unit	mm	450 x 400 x 150		
Mass:				
Sensor head with alignment base	g	800		
Corner cube reflector	g	12		
Optoelectronic supply and evaluation unit	kg	ca 8		
Interfaces	standard optional	RS232C, USB Digital 32-bit parallel interface Digital incremental signals (TTL level) Analog incremental signals (1V <sub>pp</sub> )		
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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