

# $\mu$ Line

Probably the fastest and most precise interferometer currently available

- with Compensation unit
- this is all there is
- no additional boxes
- wireless sensors
- 3D and really fast
- remarkable!



# $\mu$ Line



## What does the $\mu$ Line offer you?

- Rugged High End System
- Automatic measurement and compensation
- Integrated Compensation unit
- Integrated file converter for Siemens, Heidenhain etc. (compensation tables)
- Speed up to 6m/s
- Easy Position measurement
- Possibility to measure displacement, velocity, vibration, straightness, flatness rectangularity, rotational axis, parallelism
- Twin frequency stabilized Helium Neon source
- Automatic generation of G-codes
- direct mounting via Magnets is possible
- small and rugged case → easy transport

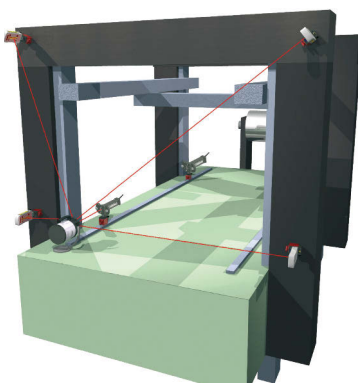
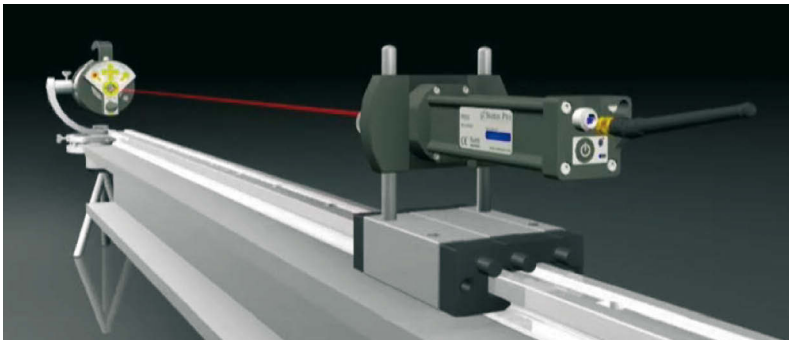
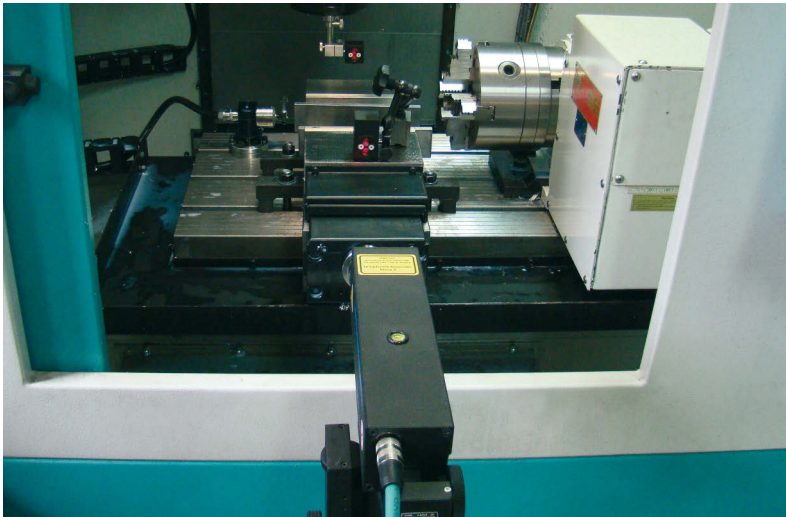
## Why talk to Status Pro?

Status Pro has years of experience in machine geometry measurement techniques. Straightness flatness or squareness can be measured in many different ways. For it to be practical we must consider what is being measured by whom and for

what purpose. For example, one would use completely different equipment when measuring the flatness of a flange on a wind tower compared to measuring the flatness of two guides on a tooling machine in a lab. All the different methods : Interferometers, PSD\* or CCD\* based systems also Wires and spirit

levels: have advantages and disadvantages. They are not good or bad they are more or less appropriate for the application. See for example: ProLine, ProLevel, ProFlange, and  $\mu$ Line.

*Talk to us about your application, not just about the instrument you want.*



\*PSD = position sensitive device.

A system using a laser beam as a measurement reference. The distance to a measurement object will be measured along the laser beam. Find more at [www.statuspro.com/machine\\_geometry/straightness/](http://www.statuspro.com/machine_geometry/straightness/)



**The Laser interferometer Line is a complete device designed especially for CNC device compensation and CMM device calibration. Its industrial design is small and light.**

### **Main applications of the system**

- Positioning of CNC and CMM machines
- Vibration measurements machine geometry inspection
- Straightness measurements
- Rapid assessment of machine geometry
- Squareness measurements
- Flatness measurements
- Dynamic measurements with internal axes
- parallelism measurements or external strobe

- Angular positioning
- Small angle measurements
- Messung rechter Winkel
- Ball screw inspection
- Machine servicing

### **Surprising features of the μLine**

Interferometer, compensation and weatherstation all integrated into a single slim and lightweight housing. If you have ever used a traditional interferometer for machine calibration in the field you will know what

getting everthing inside a small lightweight housing means. All you need is this slim unit and a power supply. All other sensors are wireless.

### **Open Architecture for easy remote control**

We have a 20 pin external connector which we can programme at will to allow us to integrate the unit into external processes. We can define Digital I/O s and Analog I/Os. Using the AquadB input we can ensure timesynchronous measurements.

## High performance at high speed

The Line measures with an accuracy of 0.1  $\mu\text{m}$ . This is in itself quite remarkable but we can do this at a speed of 6 m/s. We have a special version which can measure at 30 m/s however we have no method to calibrate the accuracy at this speed because we have no other instrument that can do this.

## The Software package offers extensive support for the typical applications

The Software is an integral part of the package and carries no additional cost.

For example reporting according to the following norms is a standard software feature.

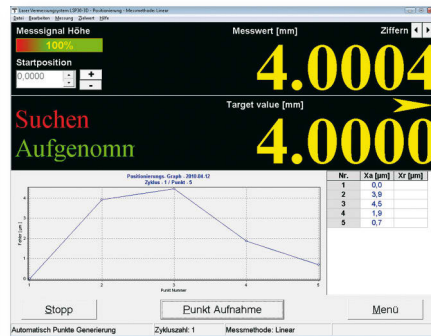
ISO 230-2, VDI 3441, BSI BS 4656,

PN -81/M-55551.32, JIS B6330, JIS B6192, ASME B5.54, GB/T 1721.2.

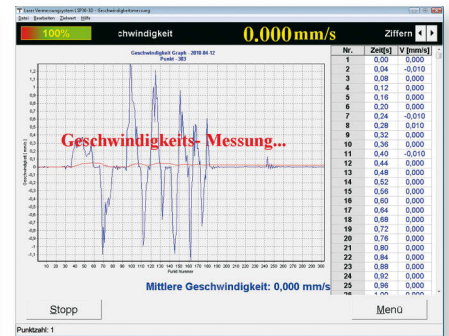
## Straightness



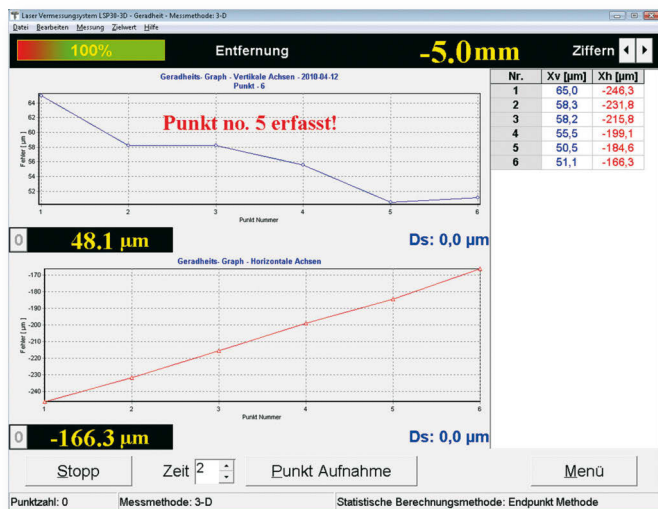
## Positioning



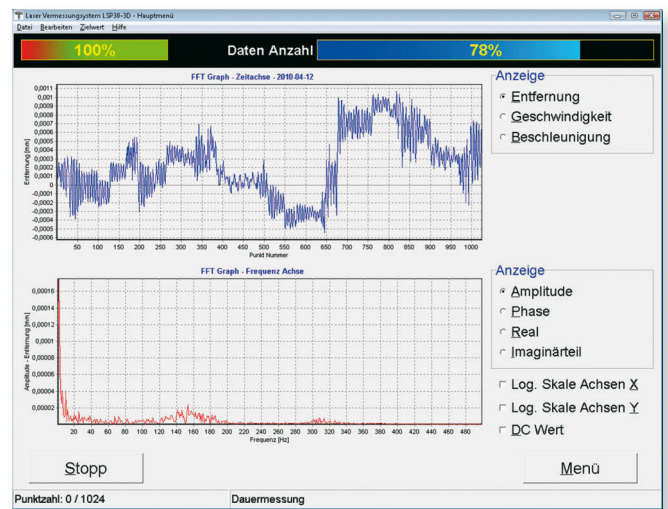
## Velocity / FFT



## 3D Measurements



## FFT Analysis



## Specification

### Laser

Laser Source:	Zeeman Helium Neon Laser (HeNe), frequency stabilised
Wavelength accuracy:	$\pm 0.005$ ppm
Laser Power:	$< 1$ mW
Short term laser stability:	$< 0.001$ ppm
Long term laser stability:	$< 0.001$ ppm
Operating temperature:	0-40 °C
Humidity:	0-90 % non-condensing
PC interface:	USB 2.0 or Bluetooth
Max Velocity:	6 m/s
MTBF:	$> 20.000$ hours
Weight:	1.5 kg
Dimensions:	60 x 60 x 245 mm

### Compensation Unit

Air Temperature Range:	0 – 40 °C
Accuracy:	0,1 °C
Air Pressure Range:	920 – 1060 hPa
Accuracy:	$\pm 1$ hPa
Humidity Range:	10 – 90 %
Accuracy:	$\pm 5$ %
Material Temperature Range:	0 – 40 °C
Accuracy:	0.05 °C

### Technical Data

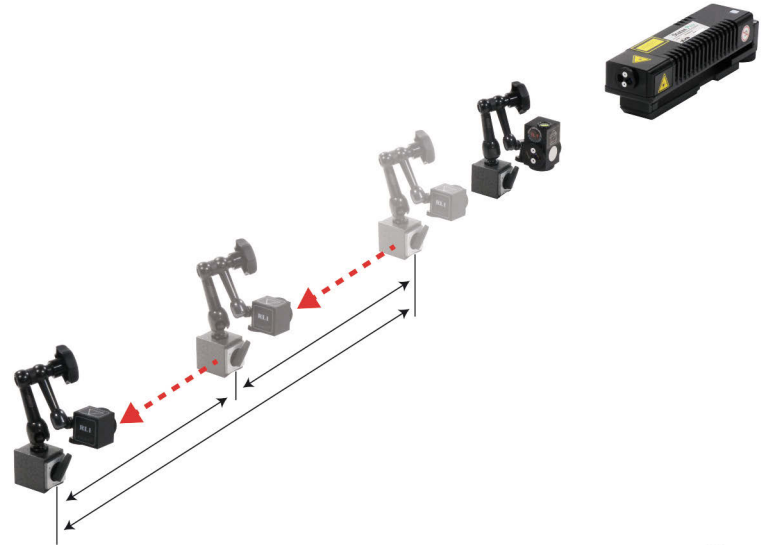
Measurement Type	Measurement Range	Resolution	Accuracy
Positioning	0 – 30 m	100 pm (0.0001 $\mu\text{m}$ )	0.4 $\mu\text{m}/\text{m}$
Velocity	0 – 6 m/s	0.25 $\mu\text{m}/\text{s}$	0.1 %
Angle	$\pm 5^\circ$	0.04 arcsec	$\pm 0.2$ %
Straightness measurement using angular	0 – 20 m	0.02 $\mu\text{m}$ (for a 100 mm baseline)	$\pm 1$ %
Flatness	0 – 15 m vertical area $\pm 2$ mm	0.02 $\mu\text{m}$ (for a 100 mm baseline)	$\pm 0.5$ %
Straightness measurement using a Wollstone Prism	0 – 3 m	0.5 $\mu\text{m}$	$\pm 1$ % $\pm (0.5 \pm 0.15 L_2)$ in metres
3D Straightness Measurement	0 – 5 m	0.1 $\mu\text{m}$	20 $\mu\text{m}$ $\pm$ 15 $\mu\text{m}/\text{m}$
Rectangularity	$\pm 1000$ arcsec	0.4 arcsec	$\pm 1$ % $\pm (1.5$ arcsec)
Angular Measurement	0 – 3600 arcsec	0.04 arcsec	$\pm 0.2$ %

# *$\mu$ Line 10*

Laser-Interferometer Starter Package

## Contents of the package:

- $\mu$ Line – Laser 1D (BT 840205)
- Compensation unit with wireless temperature sensors (BT 840290 + BT 840295)
- Interferometer element IL1 (BT 840270)
- Retro-Reflector element RL1 (BT 840280)
- $\mu$ Line PC Software base (SW 840200)

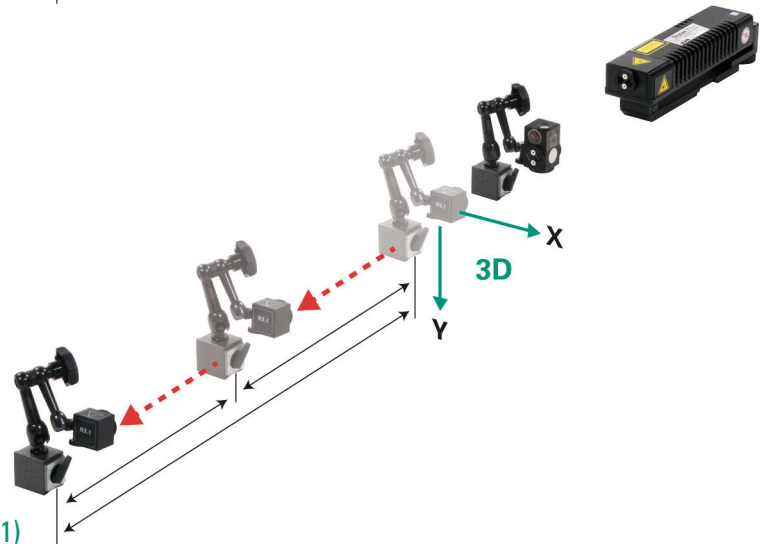


# *$\mu$ Line 20*

Laser-Interferometer Professional package

## Contents of the package:

- $\mu$ Line – Laser 3D (BT 840205 + BT 840410)
- Compensation unit with wireless temperature sensors (3x BT 840290 + BT 840295)
- Interferometer element IL1 (BT 840270)
- Retro-Reflector element RL1 (BT 840280)
- Manual Trigger cable STROBE (BT 840310)
- Line PC Software complete with module 1-5 (SW 840200/1/2/3/4/5)
- Tripod complete with alignment head (BG 840231)

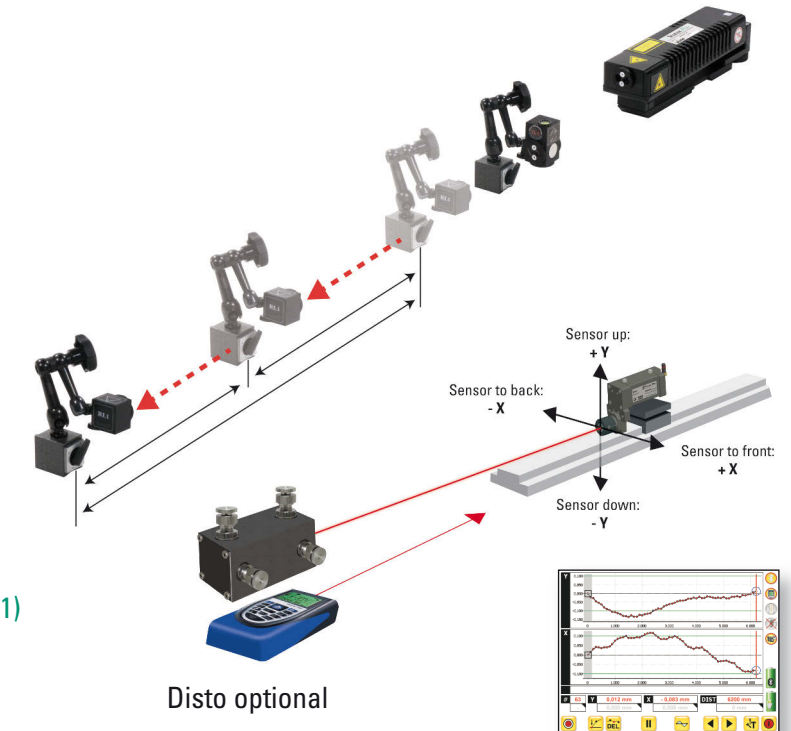


# *$\mu$ Line 30*

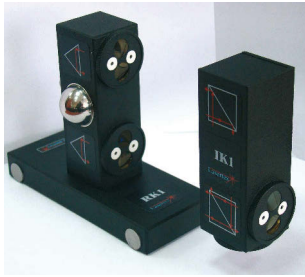
Laser-Interferometer High-End package

## Contents of the package:

- $\mu$ Line – Laser 1D (BT 840205)
- Compensation unit with wireless temperature sensors (BT 840290 + BT 840295)
- Interferometer element IL1 (BT 840270)
- Retro-Reflector element RL1 (BT 840280)
- $\mu$ Line PC Software base + vibrations module and dynamic module (SW 840200/2/5)
- Tripod complete with alignment head (BG 840231)
- Complete ProLine 10 Package for straightness measurement (SP ProLine 10)



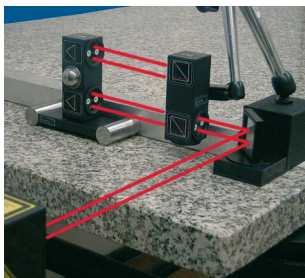
Also for the  $\mu$ Line available: many extension kits for rotary table, roll and nick, straightness, flatness or right angle measurement. Please contact us for more information.



**Optional Extension kit for Roll and Nick measurement  
Autocollimation type straightness (BG 840210)**

Content:

- 1 x Angle Interferometer Prism IK1
- 1 x Angle unit with Retro Reflector RK1, base length 100 mm



**Optional Extension kit  
for Flatness Measurement for surfaces up to 15 x 15 m (BG 840270)**

Content:

- 1 x Tilted Mirror BB2

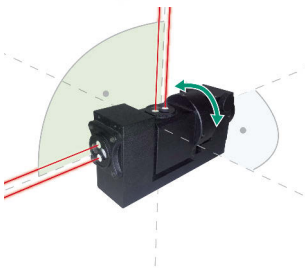


**Rotary kit for the precise measurement of turn tables (BG 840240)**

The indexer allows a precise measurement and compensation of turn tables.  
The measurement requires the BG 840210.

Content:

- 1 x Rotary indexer
- 1 x BT Module
- 1 x Rugged case



**Extension kit for angular measurements (BG 840260)**

3D Etalon for the measurement of 90° with the mentioned 3D precision.

**$\mu$ Line** is a co-operation project between the University Wrocław  
(Breslau), Lasertex Co. Ltd. and Status Pro Maschinenmesstechnik GmbH.



Status Pro Maschinenmesstechnik GmbH  
Mausegatt 19 · D-44866 Bochum  
Phone: + 49 (0) 2327 - 9881 - 0  
Fax: + 49 (0) 2327 - 9881 - 81  
www.statuspro.com · info@statuspro.com

Distributor