Laser Micrometer Product Overview

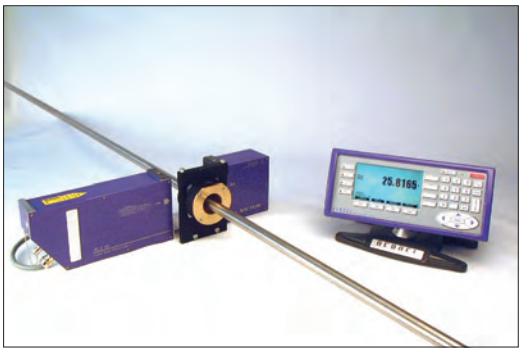
Freedom Technologies offers the complete line of Aeroel™ laser non contact optical micrometers . The design of these optical micrometers is based on the latest developments in scanning laser technology, resulting in an optical micrometer which provides stable measurements to a very high degree of accuracy. These laser micrometers can measure round, and non round parts while in process. The "quadraline" optical micrometer is designed specifically for the measurement of non round and rectangular parts.

The optical micrometers are grouped into major industrial categories. Within each category, appropriate application software, hardware, fixtures and accessories are available, making the product line complete for each specific application. As a result we offer the user a complete solution and not just a laser micrometer. The categories are; mechanical, extrusion, wire and cable, specialty (magnet) wire, and Intelligent (OEM) laser micrometers.

A Super Meclab 40 bench top laser micrometer

Mechanics

The Mechanics category includes laser micrometers for both bench top and on-line diameter measurements. The machine tool industry requires sophisticated feedback systems to obtain a constant process accuracy. The laser micrometer has proven itself to be a necessity in improving efficiency of NC lathes and centerless grinding machines.



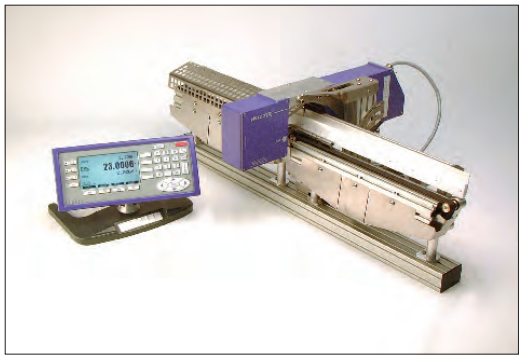
A Barline laser micrometer

Meclab

The Meclab Series is designed for bench top operation. It can be used to measure a wide variety of parts on a sample inspection basis and also gauge pins for calibration. It can measure parts up to 149mm (5.87") in diameter and to a repeatability of ± 0.1μm (0.000004"). A complete line of fixtures are available for supporting parts.

Barline Series

The Barline series provides for on-line diameter control of bars and tubes. Both single and dual axis micrometers are available. Diameters up to 300mm can be measured on-line. A repeatability of ± 0.1μm (0.000004") is achievable with the Barline series.



A Grindline 40 laser micrometer

Grindline Series

The Grindline series is designed especially for single and multiple diameter measurements on through-feed and plunge type centerless grinders. Parts up to 80mm in diameter can be measured. Part cleaning and transportation belts are provided. A repeatability of 0.1μm (0.000004") is achievable with the Grindline series.

Laser View Micrometer (LVM) Software

Frequently customers want to use a PC with the laser micrometer. The XLS series of laser micrometers can be connected directly to the LVM software since all XLS laser gauge heads have a built in PC running Linux. Standard outputs include Ethernet, RS 232 and RS 485. The (LVM) software can be used with all bench top and in process applications.

Laser View Micrometer (LVM) software

Extrusion

For the extrusion market, we offer both single axis and dual axis laser micrometers. All of these laser micrometers are designed to provide on-line control of extruded products. A special version (Quadraline) enables the measurement of extruded or rolled products with rectangular shapes.

The two families of laser micrometers designed for the extrusion process are called the Extruline and Quadraline laser micrometers. Each laser micrometer includes a laser gauge head and a micro control unit. Both families are briefly discussed below.

Application of the Extruline dual axis laser micrometer

Extruline Series

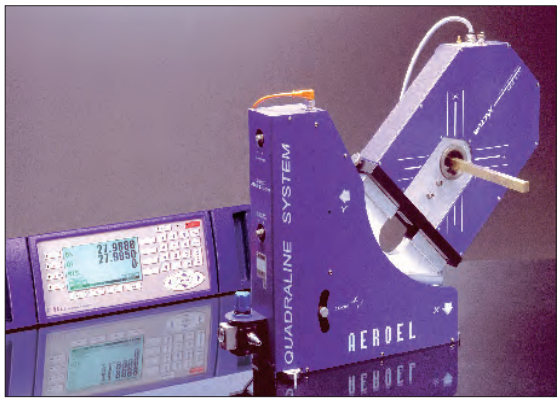
The Extruline series offers both a single axis and dual axis laser micrometer. The single axis micrometer is offered in three standard diameter measurement ranges; 40, 80 and 200mm. Repeatability for the Extruline 40, is ± 0.1μm (0.000004"). The Extruline dual axis (x,y) gauge is offered in three standard sizes, 13mm, 35mm and 80mm. Repeatability for the 13mm micrometer is 0.08μm (0.000003").

An Extruline single axis laser micrometer

For the extrusion process, each laser micrometer comes with standard extrusion software inside the controller. The software is designed to control the diameter and automatically regulate the extrusion process. The software provides for process regulation and statistics. Function keys and menus are used in a simplified manner to select the desired functions and for entering numerical values. By adding the transparent software module, the Extruline series can also measure glass pipes and medical tubing.

Quadraline Series

The Quadraline series is designed to control the two dimensions of extruded or rolled products featuring rectangular-like cross section profiles. Metal straps, plastic profiles and ribbon cables are examples of the products which can be measured with the Quadraline series. Two different models are available in the Quadraline series, the Quadraline 13xy and Quadraline 35xy. The measurement ranges are 13 x 13 and 35 x 35mm. Repeatability for the 13mm micrometer is ± 0.2μm (0.000008").



A Quadraline dual axis laser micrometer

The Quadraline software enables the measurement of the two dimensions of rectangular shaped extrusions and automatic process regulation. The "quad" laser micrometer utilizes the vibration of the part to compute the required two minimum measurements.The process regulation module can be used to regulate the individual axis by enabling speed control or maintaining the distance between rolling rolls. Likewise the statistics module performs the necessary standard industry statistics.

All of the necessary process control, regulation, and statistical features are included in the standard or optional software modules available with both the Extruline and Quadraline series.

Application of a Quadraline laser micrometer

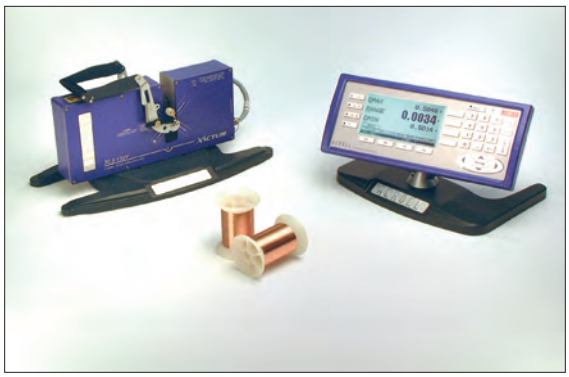
Wire and Cable Industry

On-line diameter measurements are performing a very important role in the wire industry today. With the ever increasing demands on higher tolerances, measurement techniques which yield real-time diameter and ovality measurements to a high degree of accuracy are necessary. To meet that demand, the laser micrometer is rapidly becoming a required instrument in the production process of wire and cable products. The laser micrometer offers wire drawing operations a solution to enhance the process, reduce scrap and improve the quality of the end product. Several system configurations are offered to accommodate both dry or wet drawing machines, single or multiple lines, and ferrous or non ferrous wire.

Applicationof a Wireline dual axis laser micrometer with dry-wire fixture

W-Lab Bench Top Micrometer

The W-Lab.13xy laser micrometer is a bench top version for use in the wire laboratory. It utilizes a high performance dual axis laser micrometer to get fast and repeatable measurements over a broad range of diameters. It can measure wire diameters as small as 0.03mm (0.001") up to 3mm (0.118") to a repeatability of 0.08μm (0.000003") and at ± 3 sigma. The basic system includes the scanning laser optical micrometer, control unit, Wirelab software, foot switch and a rotating hand driven wire fixture.



W-lab dual axis bench-top laser micrometer

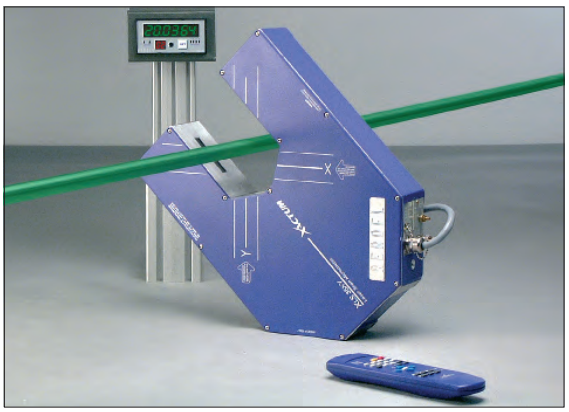
Wireline Series

The Wireline series includes two on-line diameter and ovality measurement laser micrometers. This series is especially well suited for steel wires (tires) and copper wire for electrical cables. Both micrometers are in a dual axis configuration. Wires as small as 0.1mm (0.004") and as large as 32mm (1.26") can be measured with the Wireline series. The Wireline series offers a repeatability of ± 0.15μm (0.000006") at ± 3 sigma. In addition to the basic functions of diameter gauging, the Wireline software is designed to monitor drawn wire. It includes weight and length measurements, statistics, and networking. Since the software is modular, advanced software functions can be disabled for maximum simplicity of use by an operator.

Wireline dual axis laser micrometer with dust protection

Xploreline Series

The Xploreline series is a cost effective solution for making continuous measurements on product while in process. Any XLS single or dual axis laser micrometer can be used in the Xploreline configuration. The single axis lasers can measure diameters up to 150mm while the dual axis lasers can measure diameters up to 80mm. Up to 1000 different products can be stored in the XLS laser gauge memory for instant recall. Like the Wireline series above, the Xploreline can also be used for wire drawing. The same performance specifications are included in the Xploreline. The main difference in the Xploreline as compared to the Wireline is in the display. The Xploreline includes a small remote display while the Wireline includes the CE 100 three line display as pictured with the Wireline.



Xploreline dual axis laser micrometer

Laser Micrometer Product Overview

Automatic Laser Measuring Station

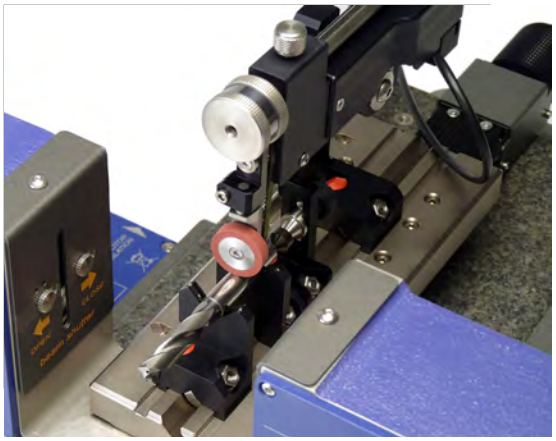
Because of the high accuracy, Digital Signal Processing (DSP) and high scanning frequency of the XLS laser micrometers, a fast and very accurate automatic measuring station is available. This Profilab system is the most advanced automated measuring system on the market today. The Profilab system is built upon the Super Meclab and an automated linear slide system. The Profilab can measure diameter, roundness, taper and runout of cylindrical sections. In addition effective cutting diameter of fluted cutting tools and straightness of parts can be measured. You can position the part to a specific desired location to a resolution of ± 5 μm.

The top photo to the right shows the scan of a spool valve. The spool valve is held on centers and was scanned in seconds. The resulting measurement locations are depicted in red lines. To scan a part like a spool valve, it takes approximately 10 seconds. Up to 250 measurements can be made on a part. Parts can be held with a variety of fixtures, centers, adjustable V blocks, and rotating fixtures, etc..

Profilab System shown measuring a shaft

Cutting Tool Measurement System

A complete cutting tool system utilizing the Super Meclab and a manual position slide makes up a cutting tool measurement system. You can measure maximum diameter, minimum diameter, average diameter, diameter range, effective cutting diameter, concentricity and measurement position. The cutting tool is rotated by a stepping motor. Both odd and even fluted tools can be measured with the system.

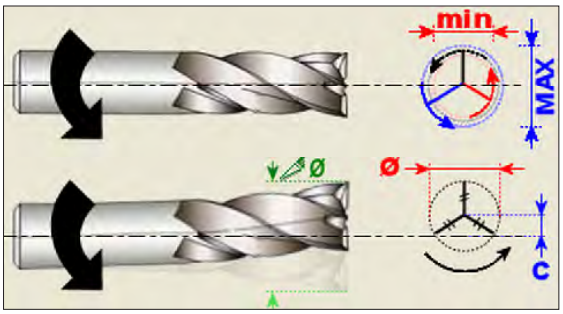


Cutting tool fixture mounted on precision linear slide

Summary

The XLS laser micrometers have a number of exclusive features which enable these high precision measurement systems. These exclusive features included in the Super Meclab are:

- Permanent auto calibration, the laser gauge never needs calibration due to drift.
- Auto compensation due to thermal drift of ambient changes. This includes the ability to store thermal calibrations for any material.
- Multi point calibration. The user can use an infinite number of masters to put in his or her own calibration, which also will not drift.
- A digital oscilloscope is included to see the waveform of the laser.



Freedom Technologies, LLC.
P.O. Box 117
E. Glastonbury, CT 06025-0117
Tel: (860) 659 9662
Fax: (860) 633 0281
Website: www.freedomlaser.com
Email: sales@freedomlaser.com