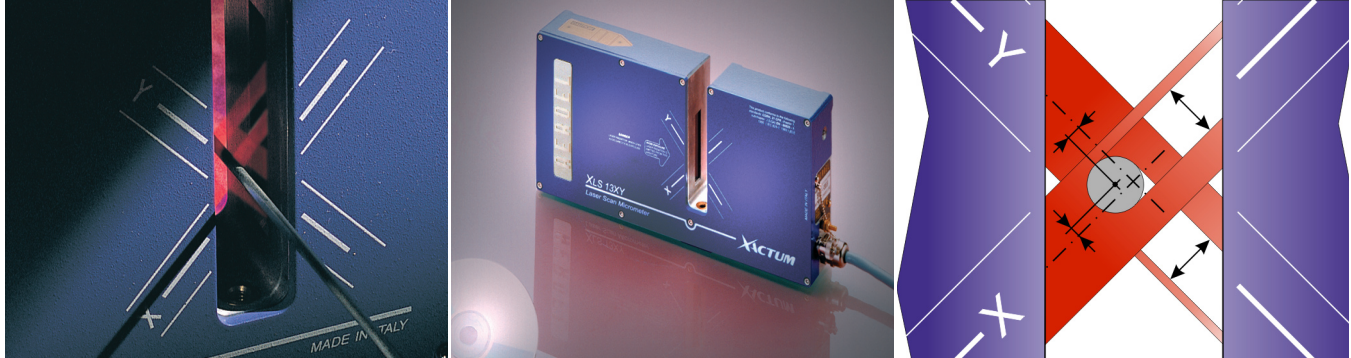


## Laser Micrometer for very high accuracy diameter measurement



### General Description

Xactum Laser Sensors represent a quantum leap in laser micrometer technology. Digital Signal Processing (DSP) accuracies never before achieved are now available. No other laser micrometer on the market today is as advanced.

With the completely built in electronics, the Xactum laser sensors can be used as a stand alone smart laser micrometer. It can also be connected directly to a PC, PLC or NC via its internal RS 232, RS 485 and Ethernet serial interface. In either the RS 485 or Ethernet mode numerous sensors can be networked on a common line.

The patented autocalibration feature eliminates drift. As a result the Xactum laser sensor never requires recalibration.

### Features

- Dual axis gauge
- 13 x 13 mm measuring range
- 0.03  $\mu\text{m}$  repeatability
- 1200 Hz scanning frequency
- Outstanding single shot repeatability
- Excellent linearity
- Permanent self calibration
- Compact size
- 3 years guarantee
- Fully re-programmable
- Direct connection to PC, PLC and NC

### Typical Applications

- Extruded tubes and profiles
- Drawn metal wires
- Medical tubes
- Electric cables and conductors
- Optical fibres

### Measurement Modes

**Free-Running:** it processes continuously groups of k Instant Values to compute the related Extreme Values.

**On-Command, Single-Shot:** after an external command, it processes only 1 group of k Instant Values to compute the related Extreme Values. The external command is a rising edge on a digital input or a command message via Ethernet.

**On-Command, Continuous:** during a time interval set by an external command, it processes all the measured Instant Values, to compute their Extreme Values. The measuring time is set by a logic high level on a digital input and / or by Start/Stop messages via Ethernet.

**Auto-Sync:** like On-Command, Single-Shot, but the measurement is automatically triggered by a valid measurement condition (1 part in the measuring field), after a programmable delay.

### Measurement Types with Standard Built-in Software

- **Only 1 part in the measuring field**, opaque or transparent
- **Measured dimensions:** X / Y diameter and X / Y center position

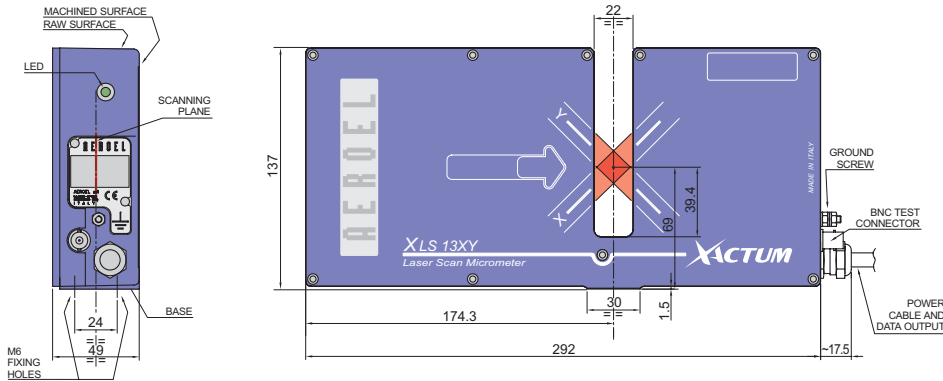
Note: other types of measures are possible by downloading dedicated software

### Measurement Processing

- **Instant Values:** simple average over n scans, programmable with  $n \geq 1$
- **Extreme Values:** Average, Max, Min and Range = (Max - Min) over k Instant Values, being  $k \geq 1$  programmable

### Input / Output

- 2 digital inputs / RS232 and RS485, max 115.2 kbaud / Ethernet 10 Base-T / ALS Binary Video



This product conforms to the following standards:  
21 CFR 1040.10 (USA) • CEI EN-60825-1; 2003-4-1 (EU)

| Type of gauge   |   | XLS13XY/200/A   | XLS13XY/200/B        | XLS13XY/1200/A         | XLS13XY/1200/B       |
|---|---|---|----------------------|------------------------|----------------------|
| Measuring Field   | (mm)                                      | 13 x 13 <sup>(1)</sup>                                      | 4 x 4 <sup>(2)</sup> | 13 x 13 <sup>(1)</sup> | 4 x 4 <sup>(3)</sup> |
| Measurable Diameters  | (mm)                                      | 0.1 - 10  | 0.03 - 3             | 0.1 - 10               | 0.05 - 3             |
| Resolution (Selectable)   | ( $\mu\text{m}$ )                         | 10 / 1 / 0.1 / 0.01   |                      |                        |                      |
| Linearity (Centered Product) <sup>(4)</sup>                                     | ( $\mu\text{m}$ )                         | $\pm 0.5$ <sup>(5)</sup>                                    |                      |                        |                      |
| Linearity (Full Range) <sup>(6)</sup>   | ( $\mu\text{m}$ )                         | $\pm 1.5$   | $\pm 0.8$            | $\pm 1.5$              | $\pm 0.8$            |
| Linearity (Reduced Field) <sup>(7)</sup>  | ( $\mu\text{m}$ )                         | $\pm 1$   | $\pm 0.5$            | $\pm 1$                | $\pm 0.5$            |
| Repeatability (T=1s, $\pm 3$ sigma) <sup>(4)</sup>                              | ( $\mu\text{m}$ )                         | $\pm 0.15$  | $\pm 0.08$           | $\pm 0.05$             | $\pm 0.03$           |
| Single Shot Repeatability ( $\pm 3$ sigma)                                      | ( $\mu\text{m}$ )                         | $\pm 0.75$  |                      |                        |                      |
| Beam Spot Size (s,l) <sup>(8)</sup>   | (mm)                                      | 0.1 x 4   | 0.04 x 0.1           | 0.05 x 4               | 0.05 x 0.1           |
| Scanning Frequency  | (Hz)                                      | 200 (X) + 200 (Y)   |                      | 1200 (X) + 1200 (Y)    |                      |
| Scanning Speed  | (m/s)                                     | 65  |                      | 98                     |                      |
| Gauge Thermal Coefficient <sup>(9)</sup>  | ( $\mu\text{m}/\text{mm}^\circ\text{C}$ ) | -0.0180   |                      |                        |                      |
| Power Supply  |   | 24 VDC; 0.3 A (1 A peak)                                    |                      |                        |                      |
| Laser Source  |   | VLD (Visible Laser Diode); $\text{Lambda} = 650 \text{ nm}$ |                      |                        |                      |
| Dimensions  | (mm)                                      | 292 x 137 x 49  |                      |                        |                      |
| Weight  | (kg)                                      | 2.5   |                      |                        |                      |
| Operating Temperature Range   | ( $^\circ\text{C}$ )                      | 0 - 50  |                      |                        |                      |
| Storage Temperature   | ( $^\circ\text{C}$ )                      | -20 to +70  |                      |                        |                      |
| Atmospheric Humidity  |   | Max 85% (non-condensing)                                    |                      |                        |                      |
| Altitude  | (m)                                       | 0 - 3000 over sea level                                     |                      |                        |                      |
| Protection  |   | IP65 (optical windows not included)                         |                      |                        |                      |
| <b>SPECIFICATIONS IN ALS MODE, CONNECTED TO A CE-10 OR IBU-10 EXTERNAL UNIT</b> |   |   |                      |                        |                      |
| Type of ALS compatible gauge  |   | ALS13XY/100/A   | ALS13XY/100/B        |                        |                      |
| Resolution (Selectable)   | ( $\mu\text{m}$ )                         | 10 / 1 / 0.1  |                      |                        |                      |
| Linearity (Full Range) <sup>(6)</sup>   | ( $\mu\text{m}$ )                         | $\pm 2$   | $\pm 1$              |                        |                      |
| Repeatability (T=1s, $\pm 3$ Sigma)   | ( $\mu\text{m}$ )                         | $\pm 0.3$   | $\pm 0.2$            |                        |                      |
| Single Shot Repeatability ( $\pm 3$ Sigma)                                      | ( $\mu\text{m}$ )                         | not specified   |                      |                        |                      |
| Scanning Frequency  | (Hz)                                      | 100 (X) + 100 (Y)   |                      |                        |                      |
| Scanning Speed  | (m/s)                                     | 65  |                      |                        |                      |

Notes

(1) For dia.  $\geq 0.3 \text{ mm}$ ; for smaller diameters the field is proportionally reduced up to 4x4 mm for dia. = 0.1 mm.

(2) For dia.  $\geq 0.1 \text{ mm}$ ; for smaller diameters the field is proportionally reduced up to 1x1 mm for dia. = 0.03 mm.

(3) For dia.  $\geq 0.1 \text{ mm}$ ; for smaller diameters the field is proportionally reduced up to 1x1 mm for dia. = 0.05 mm.

(4) Related to the average diameter (X+Y)/2.

(5) For dia.  $\leq 1 \text{ mm}$ . For dia.  $> 1 \text{ mm}$  the linearity is  $\pm 1 \mu\text{m}$

(6) Maximum measurable shift of the average diameter (X+Y)/2, when a master is moved along the two X and Y axes crossing the centre of the field, checked with dia. = 3 mm (/A) or dia. = 1 mm (/B).

(7) The field is 5x5 mm for /A gauges and 2x2 mm for /B gauges.

(8) The smaller dimension is the spot thickness or diameter.

(9) Typical value. It states the measurement drift due to the room temperature change, when measuring a master with null coefficient of expansion (INVAR).

Data subject to change without notice. 06/05/06



**AEROEL** AEROEL S.R.L.  
Via Cussignacco 47, Z.I.  
Pradamano (UD)  
33040 - ITALY  
Phone +39 0432 671301  
Fax +39 0432 671543  
e-mail: [aeroel@aeroel.it](mailto:aeroel@aeroel.it)  
http://www.aeroel.it



D00090\_E rev. 1.1 - 27.01.2006  
Copyright © 2006 Aeroel s.r.l. - All rights reserved

Distributed By:  
**Freedom Technologies, LLC.**  
PO Box 117  
E. Glastonbury, CT 06025  
Tel: (860) 659 9662  
Fax: (860) 633 0281  
Website: [www.freedomlaser.com](http://www.freedomlaser.com)  
Email: [sales@freedomlaser.com](mailto:sales@freedomlaser.com)