PRODUCT OVERVIEW
MEASUREMENT AND PROJECTION

STATIC AND DYNAMIC LASER SYSTEMS FOR ALIGNMENT, POSITIONING AND MEASURING IN INDUSTRY AND CRAFTS
ALIGNMENT
USING LAP LASERS AND PROJECTORS

LINES, CROSSES, POINTS
Linelasers are used in industry and crafts for alignment of workpieces or machines. They are used instead of rulers, set-squares, limit stops or similar equipment. Most of the times lasers help at places you can’t use mechanical guiding. Or at places where you need both hands for work.

MOBILE LINES
Besides static guidelights LAP also offers systems with movable and fixed line laser modules.

OUTLINES, TEMPLATES, PATTERNS
Laser projectors display precise outlines, templates, patterns or other shapes on virtually all surfaces by projecting laser lines. Measurement equipment or physical templates are substituted by a 1:1 outline, displayed by a bright laser line.

MEASUREMENT
USING LAP LASER SENSORS

DISTANCE, POSITION, THICKNESS, WIDTH, HEIGHT, LENGTH, STRAIGHTNESS, FLATNESS
Laser triangulation sensors measure the distance to an object without touching it. This includes dynamically changing distances like deflection, sag, eccentricity and the like. By comparison to a reference or by using two sensors, you may measure thickness, width, height or length. With three or more sensors in a line you may detect straightness or flatness. If you move the sensors or the object, you receive complete cross or length profiles. Scanning triangulation sensors offer a local line profile of a surface.

DIAMETER, OVALITY, GAP, WIDTH
Laser scan micrometers detect the shadowing of an object in the measuring field. One sensor consists of one emitter and one receiver in separate housings. The object to be measured must be in between. If there are several objects, their edges and the space in between may be detected. This method prefers round objects, like cubes, change their shadow size with the slightest change of their angle in relation to the measuring field.

CURVATURE, PROFILE, CONTOUR, FLUTE
Light section sensors are mainly used to capture contours. Depending on constellation they can determine diameter, surface profile and even detect surface imperfections.
DYNAMIC PROJECTION
SERVOLASER AND LASER PROJECTORS

MOVABLE LINES WITH SERVOLASER

LAP SERVOLASER is a flexible laser positioning system with movable and fixed line laser modules. It can be connected to PCs or PLCs. The movable modules move to positions defined by the control system. Possible configurations:

- Two parallel lines moving symmetrically, fixed center line optional
- Two parallel lines moving asymmetrically, fixed center line optional
- Two parallel lines, both movable along the complete movement range
- Further configurations on request

OUTLINES, TEMPLATES, SHAPES

CAD PRO is a laser system for projection of polylines or outlines onto working surfaces, workpieces or moulds. Laser lines are generated based upon CAD data. The projected shapes are true to scale. Laser outlines replace mechanical templates, rulers or the intricate use of measuring aids.

SOLUTIONS FOR INDUSTRIES:

- COMPOSITE PRO - FOR CARBON FIBRE AND COMPOSITES
- WOOD PRO - FOR WOODWORKING
- STONE PRO - FOR STONE FABRICATORS
- CONCRETE PRO - FOR PREFABRICATED CONCRETE PARTS
- TEMPLATE PRO - FOR ASSEMBLY, NESTING, KITTING, PAINTJOBS...
**DIMENSIONAL MEASUREMENT**

**LASER SENSORS AND SYSTEMS**

**LASER TRIANGULATION**

Laser triangulation sensors use a fixed or scanning laser spot to determine the distance to an object. Using two or more sensors, you may measure thickness, width, height, length, straightness, flatness and more. On a moving object, you get length or cross profiles.

**TRIANGULATION SENSORS:**
- ATLAS
- POLARIS
- ANTARIS
- CALIX

**SHADOWING METHOD**

Laser scan micrometer work by detecting the shadowing caused by objects in the measuring field between emitter and receiver. These sensors are used for measuring diameters, ovality, gap width or edge position of flat objects to determine width or straightness.

**LASER SCAN MICROMETER:**
- METIS

**LASER LIGHT SECTION**

Single light section sensors offer a two-dimensional view of the surface of an object. They measure edges, grooves, angles and curvatures producing a line profile. Using several sensors you may get the complete object outline. If you move the object or the sensors, you receive the complete surface geometry including imperfections.

**LIGHT SECTION SENSORS:**
- OPTARIS M

---

**SENSORS AND SYSTEMS:**

LAP doesn’t only supply sensors, but also solutions. We develop your individual measurement system, from hardware to interfacing to your control system.

<table>
<thead>
<tr>
<th>Model</th>
<th>Measuring ranges</th>
<th>Measurement uncertainty</th>
<th>Output</th>
<th>Enclosure rating</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLAS</td>
<td>10 - 100 mm</td>
<td>± 2 µm</td>
<td>4 ... 20 mA, RS 485, Ethernet UDP*, Profibus DP*</td>
<td>IP 67</td>
<td>Small housing, high precision, fast measurement (up to 4 kHz), parametrizable</td>
</tr>
<tr>
<td>POLARIS</td>
<td>10 - 400 mm</td>
<td>± 3 µm</td>
<td>4 ... 20 mA, RS 485, Ethernet UDP*, Profibus DP*</td>
<td>IP 67</td>
<td>High precision, fast measurement (up to 4 kHz), parametrizable</td>
</tr>
<tr>
<td>ANTARIS</td>
<td>customized, 500 ... 4000 mm</td>
<td>± 140 µm</td>
<td>4 ... 20 mA, RS 485, Ethernet UDP*, Profibus DP*</td>
<td>IP 67</td>
<td>Large measuring ranges and offsets, scanning version available</td>
</tr>
<tr>
<td>CALIX</td>
<td>10 mm, 30 mm</td>
<td>± 2.5 µm</td>
<td>RS 485, Ethernet UDP*, Profibus DP*</td>
<td>IP 65</td>
<td>Thickness measurement in one housing, highest stability</td>
</tr>
<tr>
<td>METIS</td>
<td>45 - 230 mm</td>
<td>± 8 µm</td>
<td>RS 485, Ethernet UDP*, Profibus DP*</td>
<td>IP 65</td>
<td>Fast measurement (up to 2 kHz) for diameters from 0.2 to 2000 mm</td>
</tr>
<tr>
<td>OPTARIS M</td>
<td>6 × 4 ... 400 × 200 mm (x × z)</td>
<td>± 12 µm</td>
<td>Ethernet</td>
<td>IP 64</td>
<td>Can be synchronized, versions with protective glass shield and cooling</td>
</tr>
</tbody>
</table>

* via interface
For more than 25 years, LAP has been developing, manufacturing and distributing laser measurement systems, line lasers and laser template projectors for industrial and medical applications. LAP products are high-precision devices Made in Germany.

Using LAP laser systems, our customers improve performance and increase the quality of their products as well as the effectiveness of their processes.

As a result of continuous product innovation, LAP has become a world leader in lasers for projection and measurement. LAP products are setting the standards in a wide range of markets from manufacturing to heavy industrial environments and medical applications.

Environmental protection is important to us. We use solar panels, green electricity, roofs planted with grass and rain water. Our production is planned by standards of sustainability.

Quality has always been part of our commitment. We are content if you are. We know your high demands. To meet your requirements, the quality management of LAP is certified by DIN EN ISO 9001:2008 for industrial products and by EN ISO 13485:2007 for medical engineering products.

www.lap-laser.com/INDUSTRY
CONTATO

Endereço
Rua Sete de Setembro, 2656 - Centro
13560-181 - São Carlos - SP - Brasil

Telefone
+ 55 (16) 3371-0112
+ 55 (16) 3372-7800

Internet
www.metrolog.net
metrolog@metrolog.net