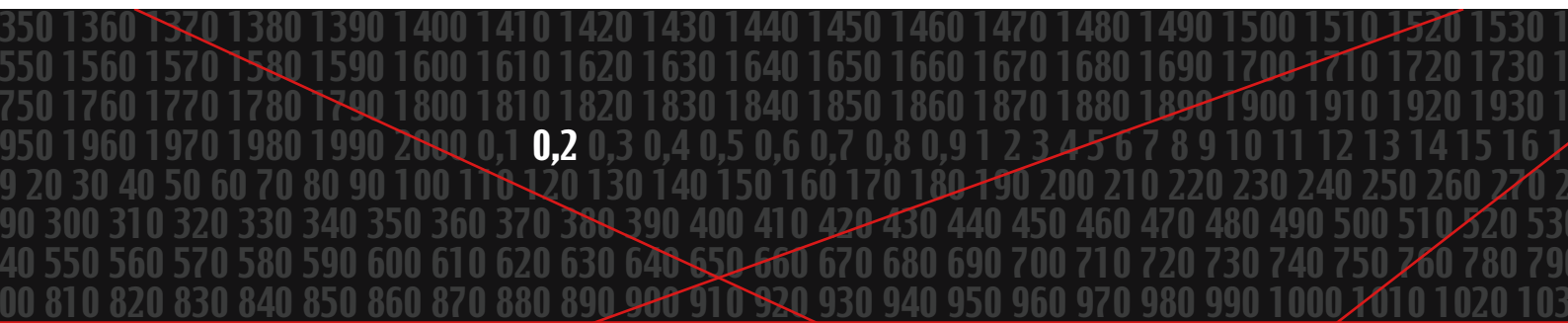




METIS

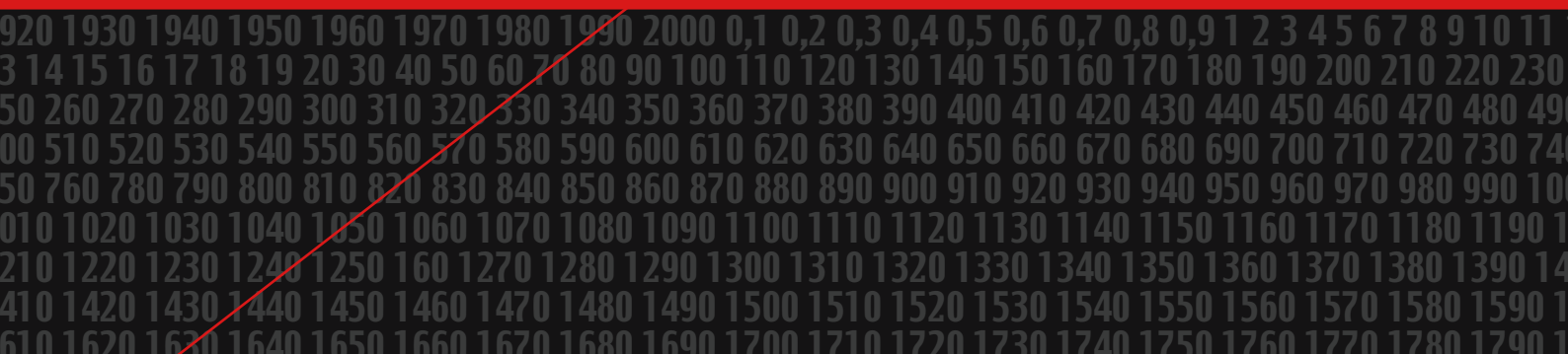
 **DIGITAL LASER SENSORS**

for diameter and gap measurements of 0.2 mm to 2000 mm



2000

**non-contact
laser measurement**



LAP METIS LASER SCAN MICROMETER.



HIGHLIGHTS.

- high measuring frequency:
800 Hz, 1.6 kHz optional
- high resolution: from 5 nm
- detection and simultaneous measurement
of up to 10 edges
- synchronized measurement of various sensors
- measurement of complex profiles with
multi-axes systems

NON-CONTACT MEASUREMENT: LAP METIS laser sensors measure cross-section and gap without touching the surface. Mechanical micrometers, that may scratch the material, are no longer necessary. There is no wear or tear, neither on the object nor on the sensor. No operator influence affects the measurement.

FAST MEASUREMENT: Laser scan micrometers may check 100% in the production line. At 800 values per second or even 1600 values per second. No more time consuming samples and offline checks. Instead of momentary images you get errors or tendencies displayed during production, enabling you to react before crop is produced.

PRECISE MEASUREMENT: LAP METIS measure at repeatabilities of 2 μm to 8 μm (depending on model) due to calibration and linearisation for every single mirror of the rotating prism. Transparent material can be measured as well as shiny metal or soft and sticky rubber.

SYNCHRONIZED MEASUREMENT: Sensors are synchronized in multi-axes measurement. Even at high production speeds, there is no mismatch or offset between measurement values in transport direction.

FLEXIBLE MEASUREMENT: LAP METIS measure precisely up to 10 edges (transitions object - space or space - object). Multi-axes systems also measure non-round profiles as square or polygonal profiles.

SAVE TIME, SAVE MATERIAL, SAVE MONEY.

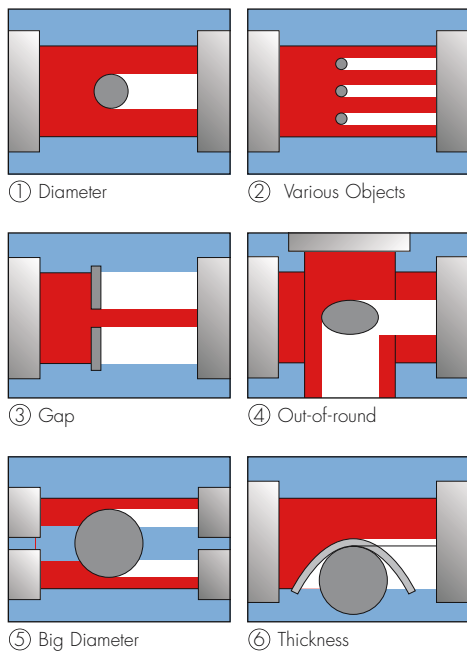
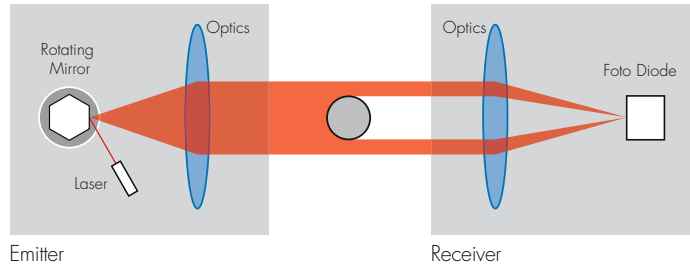
LAP METIS laser scan micrometers offer 100%-check for many measuring tasks at higher material throughput. They prevent crop and let you prove quality - for your own production and for your customers.

SOLUTIONS FOR YOUR COMPANY.

THE OPERATING PRINCIPLE.

Laser sensors of LAP METIS series work by laser scanning. One sensor consists of emitter and receiver. In the emitter, the laser beam of a diode laser is reflected by a rotating prism in the focus of a precision lens. The lens changes angular beams to a parallel beam that traverses the measuring range cyclical (virtual laser band). The moving beam is focussed on a photo diode in the receiver. If there is an object between emitter and receiver, the photo diode gets no laser light for a certain period. This period defines the dimension of the object.

Laser Scanning



SOLUTIONS AND APPLICATIONS.

Single systems measure diameter (1), position or displacement of various objects (2) or gaps (3), e. g. roll gap.

Two sensors, positioned at 90°, may measure out-of-round (4) or define the position of an object on a plane. For diameters that exceed the measuring range of a single sensor, two sensors with fixed distance may be used - the "big diameter" setting (5). You add upper and lower displacement value with the known distance of the sensors to get the final diameter.

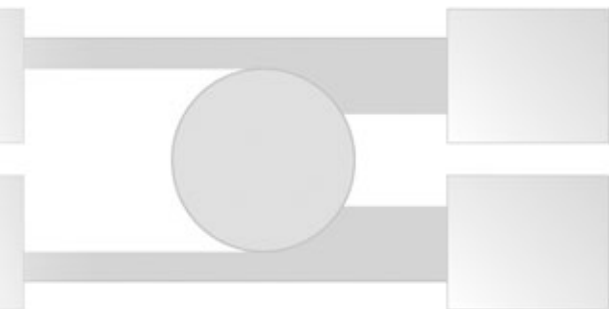
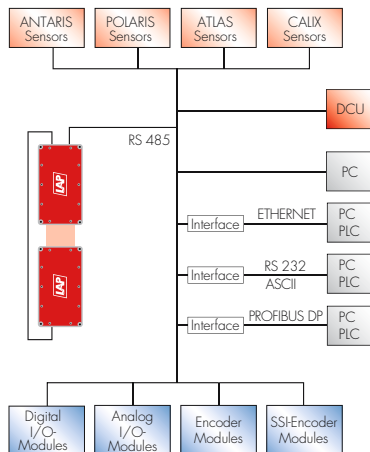
Multi-axes systems offer measurement of convex polygons. For width or straightness measurement, three sensors at fixed intervals on one side and one opposite sensor are combined. You may measure thickness of strips against a roller by using one or two sensors to measure on the roller and one or several sensors to measure on the strip (6). This way, changes in roller diameter and excentricity are compensated for.

SYSTEM INTEGRATION

THE LAP MEASURING SYSTEM.

LAP sensors reach optimum performance, when measuring data is transmitted and evaluated via RS485. LAP developed "SynchroNet" protocol for high data transmission bandwidth, little protocol overhead, highest flexibility and a guaranteed future. All LAP sensors, the Digital Control Unit "DCU", interfaces to Ethernet, Profibus DP and RS232 as well as digital or analog I/O-modules may participate on this bus.

Data evaluation and visualisation takes place on an IPC, PLC or by DCU. DCU offers simple mathematical operations and visualisation directly at the production line. Measurement values may be transferred to big displays. Please see the related brochures for details on further sensors, DCU and products with RS485/SynchroNet connection.



EASY INTEGRATION.

LAP METIS sensors are equipped with:

- RS485 serial interface

Additional interface modules are available for:

- RS232 ASCII
- Ethernet UDP
- Profibus DP

DATA ACQUISITION AND SOFTWARE.

LAP offers standard software for data collection, visualization and documentation.

For archiving it can be provided with a SQL database, or it can be linked to existing customer databases.



L A S E R

Sensors, Line Lasers, Projectors
Systems & Solutions

TECHNICAL DATA.

EXAMPLES.

	METIS 45	METIS 90	METIS 120	METIS 150	METIS 180
Measuring range	0.2 - 45 mm	0.5 - 90 mm	1 - 120 mm	1 - 150 mm	1 - 180 mm
Resolution	5.4 nm	10.8 nm	14.4 nm	18 nm	22 nm
Repeatability	± 2 µm	± 3 µm	± 4 µm	± 6 µm	± 8 µm
Linearity	± 8 µm	± 15 µm	± 20 µm	± 25 µm	± 30 µm
Measuring field	45 x 45 mm	90 x 90 mm	120 x 120 mm	150 x 150 mm	180 x 180 mm
Standard Distance Emitter-Receiver	300 mm	650 mm	840 mm	840 mm	800 mm
Weight	1.5 kg	2.6 kg	5.3 kg	8.9 kg	11.5 kg
Dimensions (W x H x D, mm)					
Emitter	135 x 75 x 60	165 x 102 x 61	235 x 164 x 62	300 x 180 x 85	336.5 x 220 x 85
Receiver	135 x 75 x 60	165 x 102 x 61	235 x 164 x 62	270 x 180 x 85	197 x 220 x 85

GENERAL DATA.

Measuring principle	Laser scanning
Laser type, wavelength	Diode 650 nm (red)
Laser power	≤ 1 mW
Laser class	2
Measuring frequency	800 Hz, optional 1600 Hz
Interface	RS485, up to 1.8 MBaud
Power supply	24 VDC ± 20 %
Consumption	< 500 mA (per sensor pair)
Enclosure rating	IP 65
Operating conditions	0 - 45 °C / 35 - 85 % rel. humidity, non-condensing



L A S E R

Sensors, Line Lasers, Projectors
Systems & Solutions



LAP Laser LLC.

Sales, Service

7669 Wooster Pike
Cincinnati, OH 45227
USA

Phone +1 (513) 271-4529
Fax +1 (513) 271-3821
Email info-us@lap-laser.com

**LAP GmbH
Laser Applikationen**

Headquarter: Production, Sales, Service

Zeppelinstr. 23
21337 Lueneburg
Germany

Phone +49 (0)4131 9511-95
Fax +49 (0)4131 9511-96
Email info@lap-laser.com

**LAP Laser Applications
Asia Pacific Pte Ltd**

Sales, Service

Block 750A, #07-02 Suite 8
Technopark at Chai Chee
Singapore 469001
Singapore

Phone +65 6536 9990
Fax +65 6533 6697
Email info-asia@lap-laser.com

**LAP GmbH
Laser Applikationen
Представительство в Москве**

1, Казачий переулк 7
119017 Москва
Российская Федерация

Тел. +7 495 7304043
Факс +7 495 7304044
Email info-russia@lap-laser.com

**LAP Laser Applications
Asia Pacific Pte Ltd
Shanghai Representative Office**

Sales, Service

31/F Haitong Securities Tower
689 Guang Dong Road
Shanghai 200001
China

Phone +86 (21) 5047-8881
Fax +86 (21) 5047-8887
Email info-asia@lap-laser.com

 Partners

www.LAP-LASER.com



L A S E R

Sensors, Line Lasers, Projectors
Systems & Solutions