

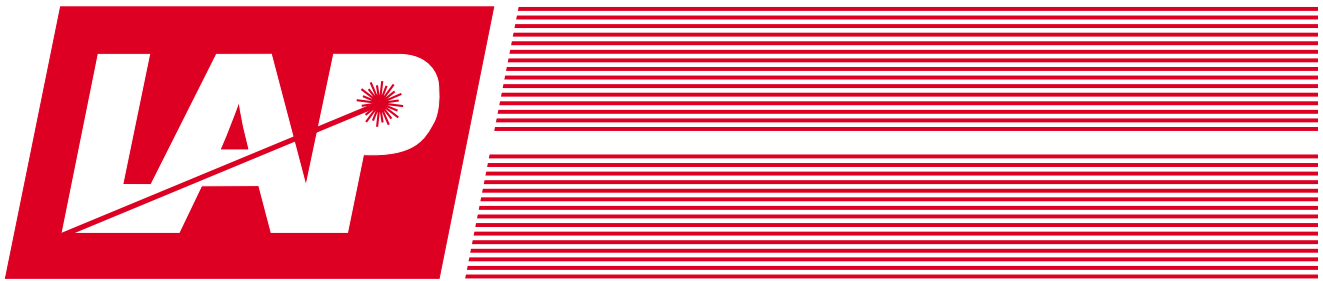
LASER
APPLIKATIONEN

LAP



Laser distance sensor »Polaris«

Industrial Design • Fast Response • Independent of Color and Surface Texture
• Measuring Ranges: 0.33 – 13.2 ft (10 – 400 mm)



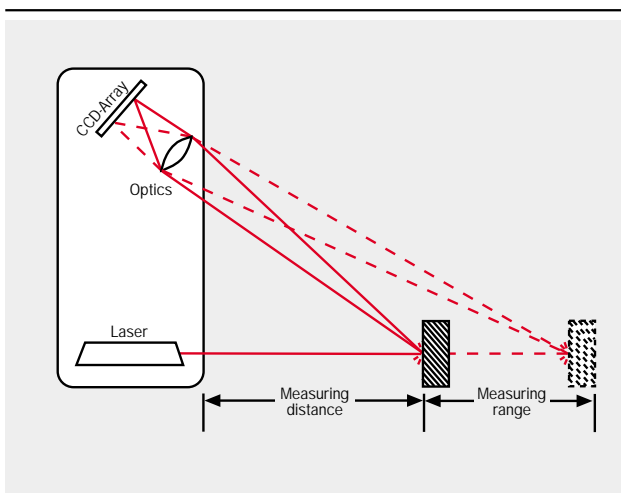
Non-contact Measurement

Non-contact measurement provides a new approach to production and quality control. Sensitive materials previously considered difficult or even impossible to measure because they are hot, soft, sticky, elastic, and sterile or moving fast, can now be measured precisely. The rapid response of these non-contact measuring systems insures their easy integration into production processes and industrial control systems. 100% on-line quality control can be guaranteed.

Measuring Principle

POLARIS sensors use triangulation as the principle of operation. The measured object is illuminated by projecting a light beam from the probe to form a focussed spot on the measured surface. Some of this light is reflected back from the surface through the sensor optic to a Charge-Coupled-Device (CCD) line array mounted inside the probe. The position of the spot on the array changes proportionally to the distance between sensor and surface. The internal data processing system recognizes the position, which is a direct indication for the distance.

Any material which gives diffused reflection can be measured, such as wood, plaster, rubber, plastics, metal, paper, concrete, asphalt and stone. Changing reflectivity of the surfaces is compensated by the integrated electronics. Mirror-like surfaces and transparent materials cannot be measured; translucent objects may show deviations caused by the penetration of the beam into the material, but the use of an offset compensates for this.



Measuring Performance

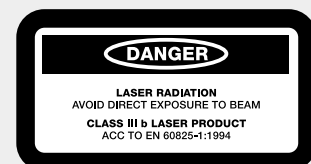
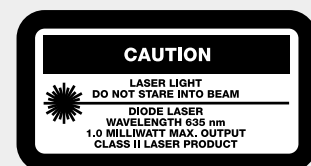
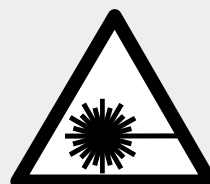
The entire data processing method is based on a Digital Signal Processor (DSP). This provides automatic control for both the laser power and for the exposure time of the CCD-array. The combination of the CCD line array and special data processing gives extremely high resolution over much greater distances. The POLARIS sensor is capable of previously unattainable precision over larger measuring ranges. Additional benefits of this concept include highly accurate measurement of objects with various colours and reflection characteristics.

For data transmission, the sensor provides an analog output 4-20 mA and a RS485 as standard serial interface. Connection to a PLC or any other control unit, is typically made using the analog output. The digital interface is used to integrate one or more sensors to Local Area Network or any other supervisory computer.

Applications for POLARIS vary from single sensor installations to complex projects with a combination of several sensors. A single pair of sensors can be connected directly for thickness measurement, by operating them in Master/Slave Mode. Thickness values are calculated directly from the single measurements of each sensor. In this configuration, the Master is used to provide the calculated thickness as an analogue signal.

Options

- Brackets and measuring frames tailored to customer specifications
- Protection houses with heating, air purge or water cooling
- Large display, limit switches, min./max.-monitor
- Customer specific software
- Data processing and statistic process control (SPC) with protocols on PC
- Complete branch / customer specific solutions



Technical Data

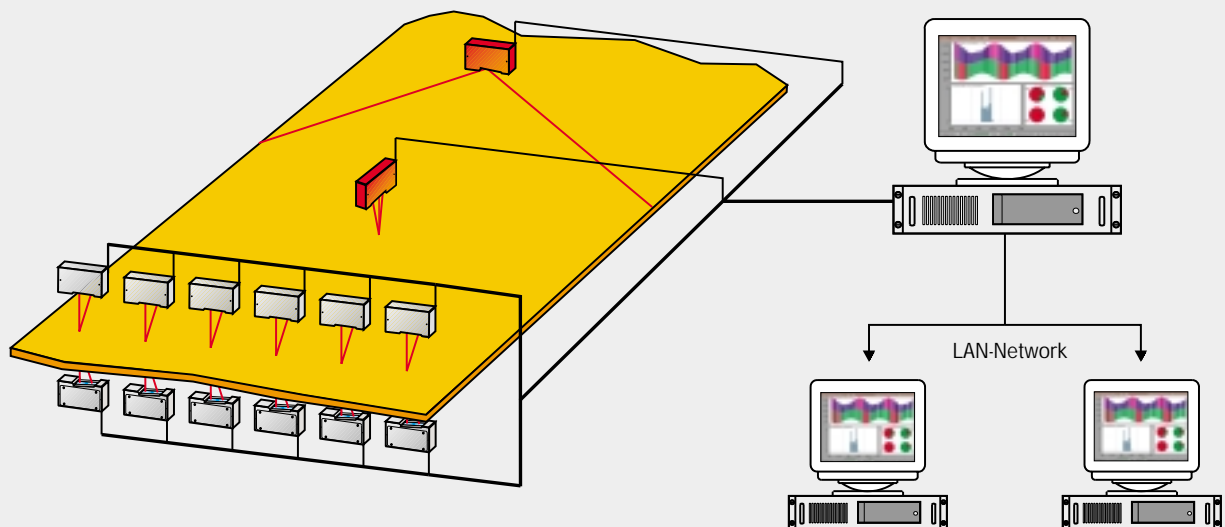
numbers in red updated 25 OCT 02 microinch = 0.000 001 inch

Model	Measuring range	Measuring distance	Resolution	Repeatability'	Linearity'
Polaris 10	0.4 inch	2.0 inch	6.6 µin	±0.00018 inch	±0.00028 inch
	10 mm	51 mm	0,2 µm	±4,5 µm	±7 µm
Polaris 30	1.2 inch	3.9 inch	19.7 µin	±0.00039 inch	±0.00079 inch
	30 mm	100 mm	0,5 µm	±10 µm	±20 µm
Polaris 70	2.75 inch	7.5 inch	45.9 µin	±0.0008 inch	±0.0018 inch
	70 mm	190 mm	1.2 µm	±20 µm	±45 µm
Polaris 130	5.1 inch	12.4 inch	85.3 µin	±0.0018 inch	±0.0033 inch
	130 mm	315 mm	2.2 µm	±45 µm	±85 µm
Polaris 250	9.8 inch	15 inch	164.0 µin	±0.0028 inch	±0.0059 inch
	250 mm	380 mm	4.2 µm	±70 µm	±150 µm
Polaris 400	15.7 inch	17.3 inch	236.5 µin	±0.0055 inch	±0.0098
	400 mm	440 mm	6.6 µm	±140 µm	±250 µm

'Measuring conditions: 52 °F, surface white mat, integration 50 ms, 2θ

Measuring frequency	<= 4 kHz
Output / Interface	Analogue 4-20 mA, Digital RS485
Measuring principle	Laser triangulation
Light Source	Laser diode, 670 nm/red
Laser Class	2/3B
Supply voltage	24 V DC
Dimensions	1.54 x 4.29 x 6.61" (39 x 109 x 168 mm)
Weight	2.45 lbs (1.1 kg)
Protection	IP 65
Ambient conditions	32-104°F (0-40 °C) / 35-85 % rel. H., not condensed

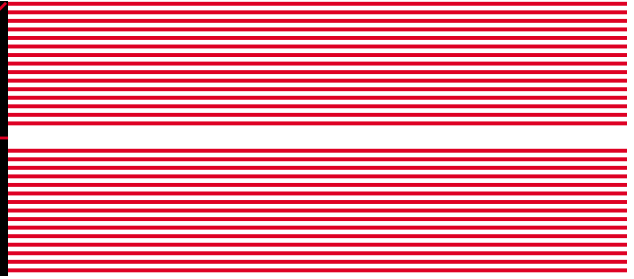
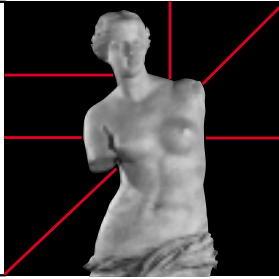
Technical changes possible



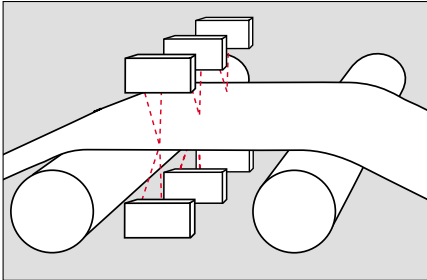
Complete solution:
Thickness, Width, Length Measurement

Touches nothing,
measures everything:
distance, thickness,
length, width, diameter,
velocity ...

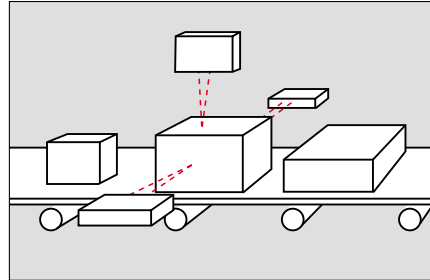
Measures all dimensions!



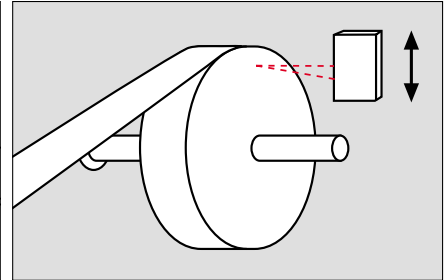
Applications



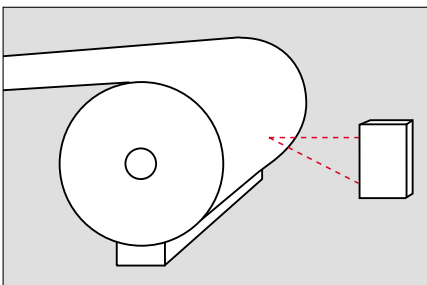
Thickness measurement in several tracks:
Rubber, Sheets, Tape



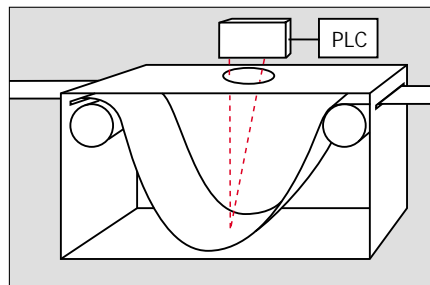
Width, Height, Sorting, Classification



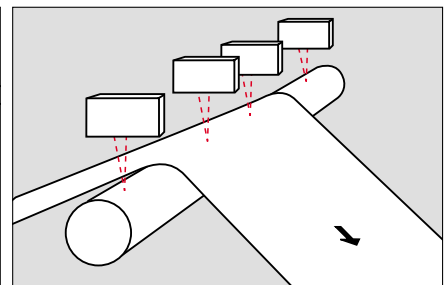
Coil: Edge profile measurement



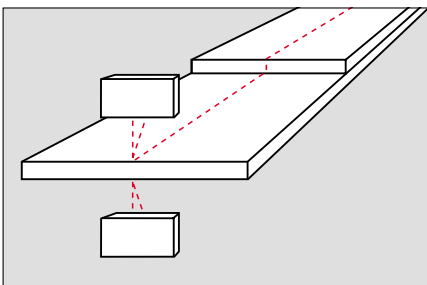
Distance measurement, Diameter of Coil
and Drums



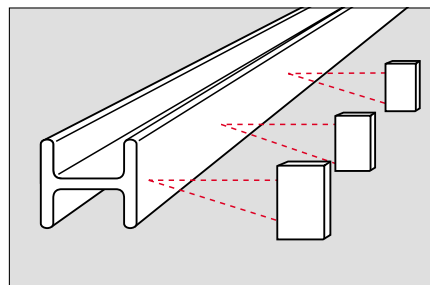
Loop control



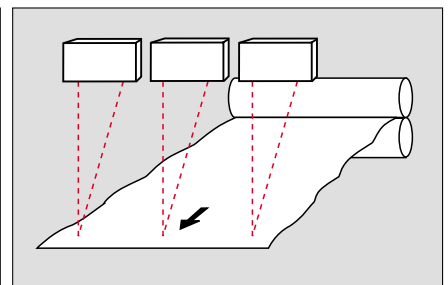
Thickness against roller, compensation
wobble, detection of wedges



Thickness, Recognition of Doubling and
Folds, Length profile



Straightness



Edge waviness, Flatness: e.g. Aluminium
and cold strip



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service and expertise, based on over a
decade of innovation.*

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Measures all dimensions!