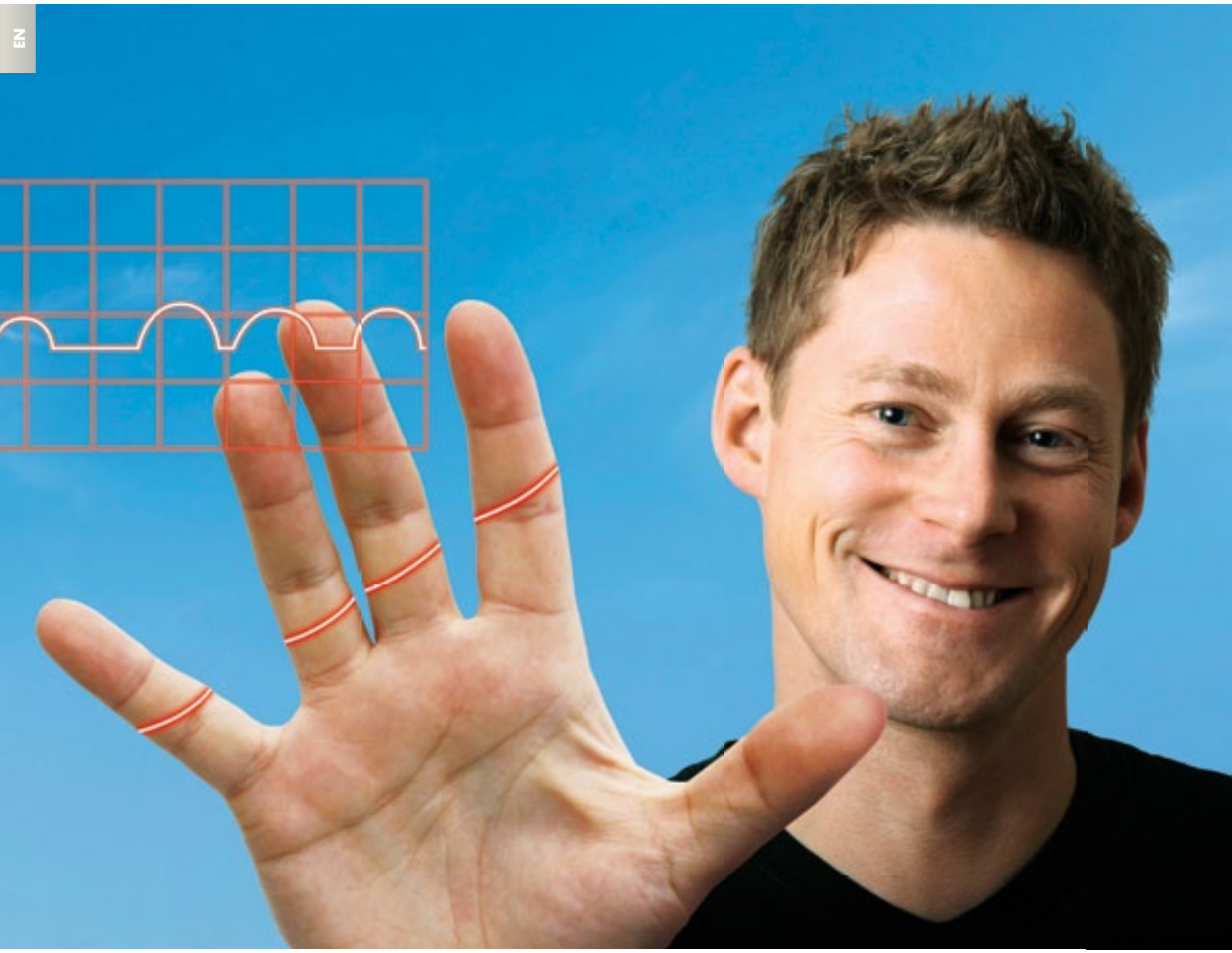
OPTARIS M

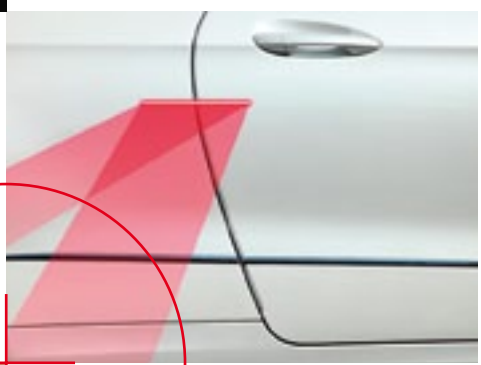
LASER LIGHT SECTION SENSORS

EN



PROFILE AND GAP MEASUREMENT FOR ALL INDUSTRIES

LAP LASER



Door clearance

Welded seam

Length

Parquet, laminate

Width

Tire pattern

Position

Printed circuit boards

Profile

Packing

Groove

Bar stock

Gap

Profiled sheet metal

Contour

CAM parts

Completeness

Surface

LAP LASER

PRECISE MEASUREMENT OF PROFILES AND CLEARANCE USING LASER LIGHT SECTION SENSORS

OPTARIS M is a family of laser light section sensors. They measure the hight profile of an object by projecting a laser line on its surface which is captured by a camera element from a certain angle. All geometrical changes of the surface, like edges, angles, gaps, grooves or curvatures generate deformations of the straight line from the cameras angle of view. The real coordinates can be calculated by the size of the deviation. For objects moving through the measuring field this process produces a complete 3D height profile.

Your production doesn't need to rely on spot checks or measuring tracks on moving objects - you get the complete 3D surface scan. No fault „disappears" because it's exactly in the non-monitored space of the measuring grid.

If you use OPTARIS M on a movable frame, e.g. on a robots arm, you may track welding seams or gaps (door clearance).

There are many applications for OPTARIS M sensors - too many to describe them all here. You have a measuring task, and OPTARIS M seams to be the solution? Don't hesitate to contact us! We will find the right solution for you in our sensor portfolio.

Take advantage of OPTARIS M laser light section sensors for your production and quality management:

AREA-WIDE
OPTARIS M doesn't only collect data at single spots or in lines - it covers whole areas, resulting in a 3D profile.

MULTIFUNCTIONAL
More than displacement, width or gap: Several joint sensors may cover all sides of an object for a 360° image of the surface.

MULTICOLOURED
OPTARIS M measure on every surface, no matter which colour, structure or material - as long as the laser light is reflected.

TOLERANT
OPTARIS M feel at home in all industries, and they are insensitive to ambient light.

PROFITABLE
No more crop in the „GOOD" basket, less returned goods, less reworking, less costs.

COMPLEX SOLUTIONS, SIMPLE CONFIGURATION

SYSTEM DESIGN

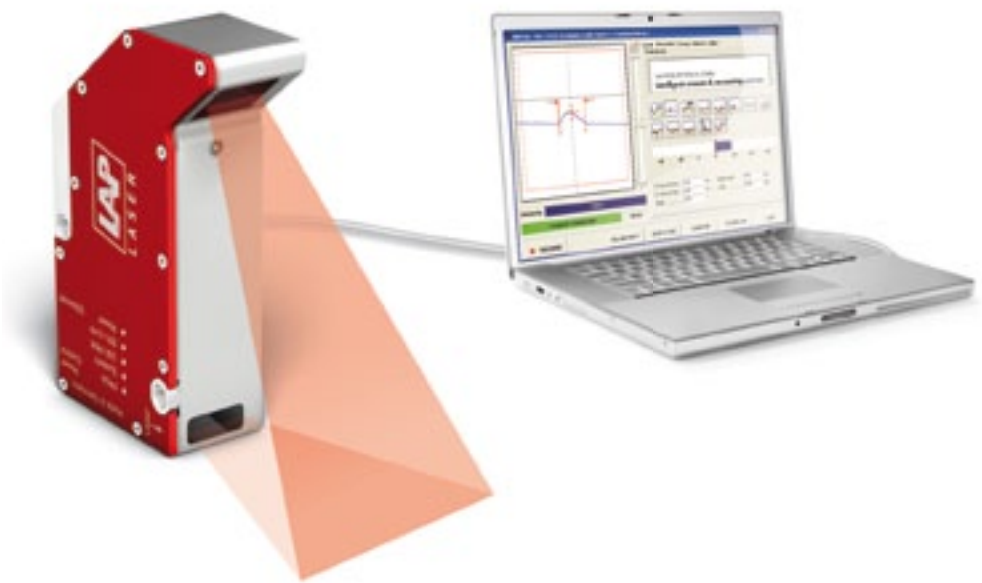
Single sensors may be connected to a computers network card via Ethernet. Using a 100 MBit Ethernet swich, up to 32 sensors can operate on one PC. If several sensors are used, there should be a seperate network card for them, to avoid negative interaction between the sensors and others network load. The separate sub-grid for the sensors is an additional safety measure.

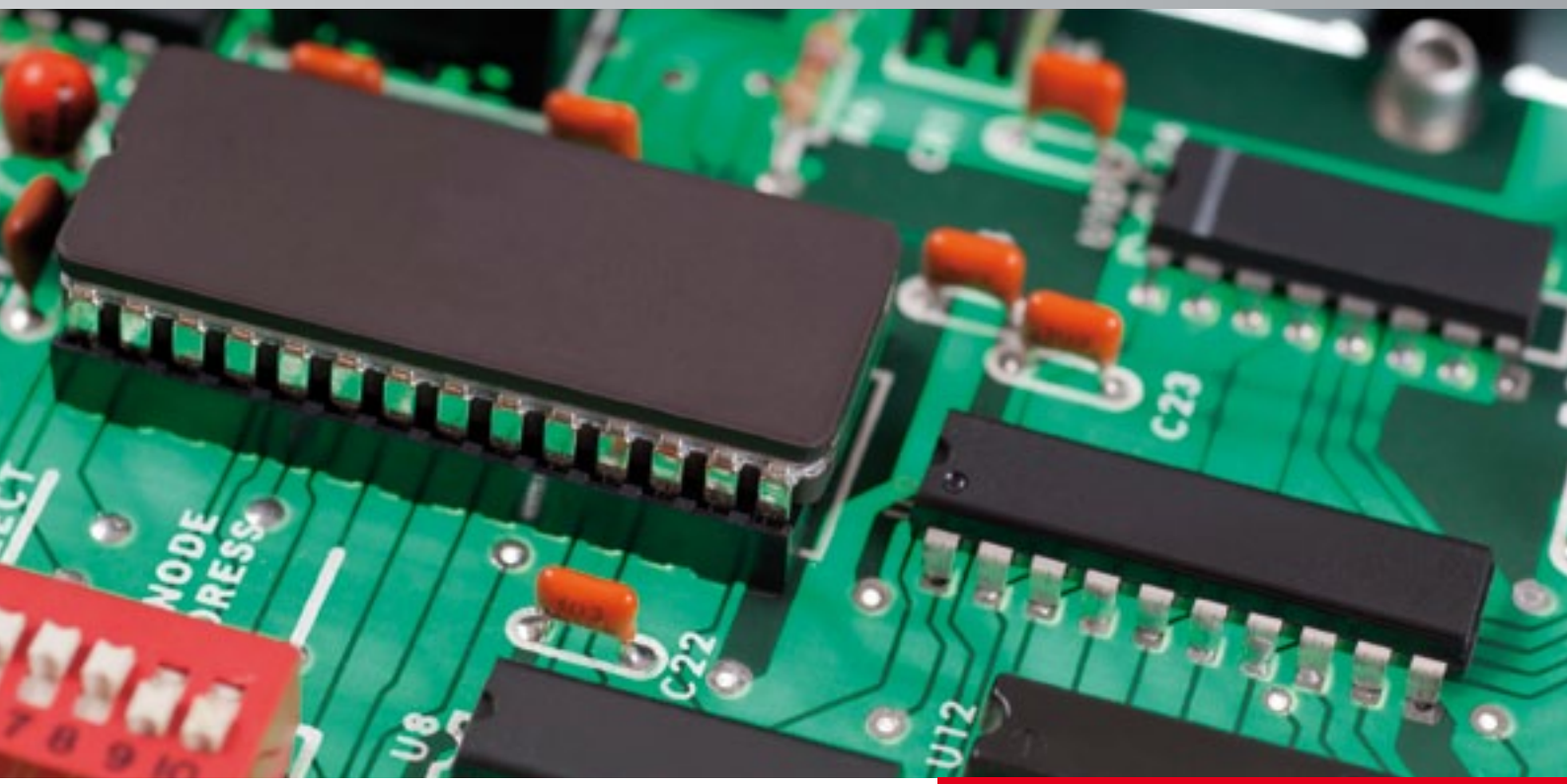
TECHNOLOGY

The laser sensors are connected to the 100MBit network card or the swich via shielded Ethernet cable (CAT-5e). The maximum length of the Ethernet cable is up to 200 m according to IEE 802.3 standard. Clean transmission over this distance is reached by high-quality, double-shielded cables according to CAT-5e or CAT-6 standard. As data transfer only uses 4 of 8 conductors, the other ones may be used for 24 V DC power supply. For several sensors at long distances separate local power supplies make sense.

Optaris M Laser Sensor

Notebook



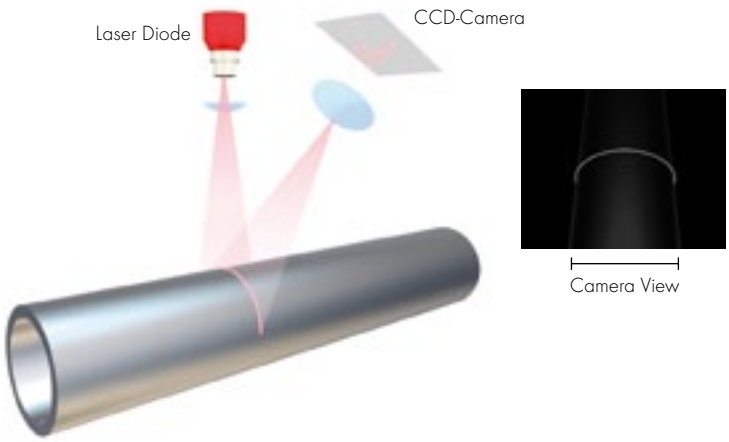


FUNCTIONAL PRINCIPLE

The sensor contains a line laser, a CCD camera and electronics to process the camera signals. The laser projects a straight line perpendicular to the surface to be measured. The camera is located at a fixed angle to the line. If the surface is not exactly plane, the laser line is deformed from the cameras point of view. Using basic calibration as a reference, the deviation of the line can be calculated into measurement values.

LASER LIGHT SECTIONING

For fast three-dimensional measurement laser light sectioning is particularly advantageous.

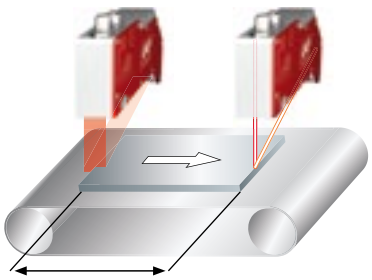


FIELDS OF APPLICATION

Wherever data of a complete surface needs to be collected, light section sensors are needed. If single spots or measurement tracks are not enough, the continuous laser line of light sectioning shows its strengths. Single sensors may measure gaps, seams or clearance, positioned and moved by a robot arm. Several sensors may be connected to cover large areas or to measure all sides of an object at the same time.

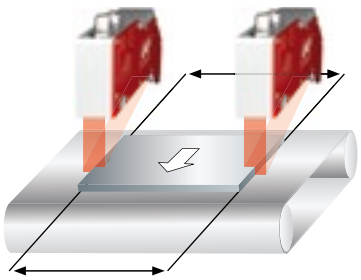
LENGTH MEASUREMENT

Determine the length of fast moving objects using a trigger.



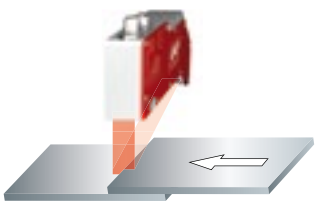
WIDTH MEASUREMENT

For precise detection of strip width.



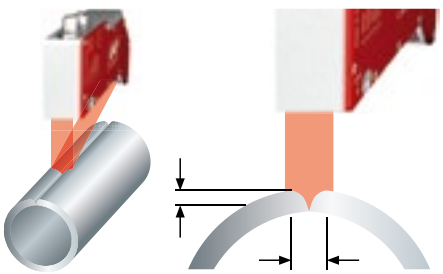
POSITION

Detection of workpiece position, e.g. overlap



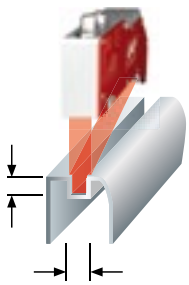
PROFILE MEASUREMENT

Checking size and position of grooves or seams.

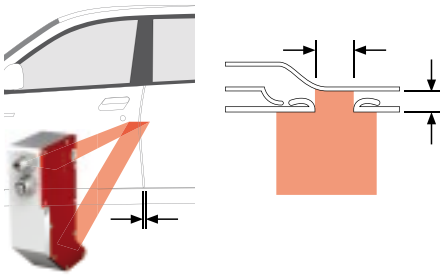


GAP MEASUREMENT

During gap measurement, two or more dimensions are captured simultaneously.

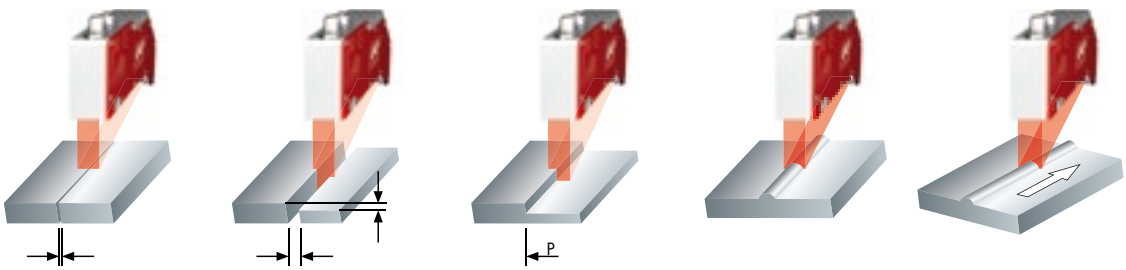


MEASUREMENT OF DOOR CLEARANCE



PROFILE MEASUREMENT FOR WELDING

Before welding, gap width and depth as well as position of overlapping parts can be detected. After welding, the welding seam can be inspected by moving the sensor in seam direction. Alternatively, the object may be moved. If the object moves fast, the laser line and the sensor may be put at an angle to the beam direction to increase measuring speed.



SPECIFICATIONS
LASER SENSORS
OPTARIS M

LASER SENSOR 100 Hz									
Type	**6 / 4**	**10 / 13**	**20 / 10**	**40 / 20**	**60 / 30**	**80 / 40**	**120 / 60**	**220 / 120**	**400 / 200**
Measuring Range Z (mm)	6	10	20	40	60	80	120	220	400
Offset (mm)	38	65	55	50	53	63	84	115	330
Measuring Range X(Z_0) (mm)	4	13	10	20	30	40	60	120	200
Measuring Range X(Z_{max}) (mm)	4.5	15	13	26	40	55	80	160	280
Resolution Z* (mm)	0.003	0.01	0.02	0.02	0.035	0.045	0.06	0.11	0.2
Resolution X* (mm)	0.008	0.025	0.02	0.04	0.07	0.09	0.14	0.27	0.48
Linearity	0.2 % of measuring range			0.2 % of measuring range			0.2 % of measuring range		
Sampling frequency	100 Hz			100 Hz			100 Hz		

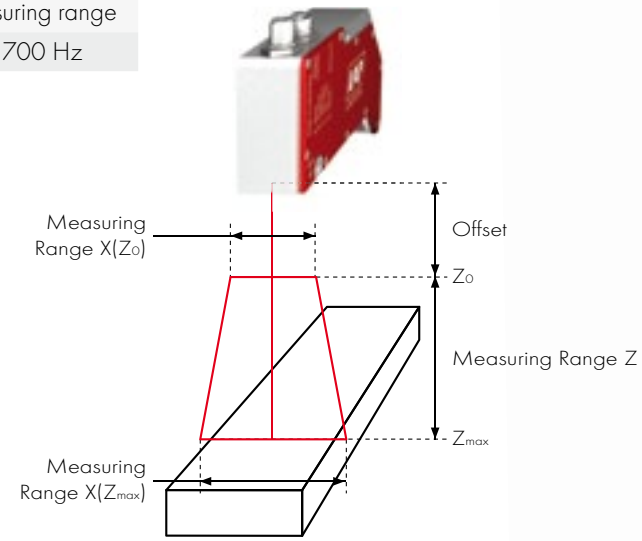
*Measurement on matt white, diffuse reflecting surface

LASER SENSOR 380 Hz / 700 Hz		
Typ	**80 / 40**	**220 / 120**
Measuring Range Z (mm)	80	220
Offset (mm)	74	140
Measuring Range X(Z_0) (mm)	40	120
Measuring Range X(Z_{max}) (mm)	55	180
Resolution Z* (mm)	0.045 (0.08)	0.11 (0.28)
Resolution X* (mm)	0.09	0.27
Linearity	0.2 % of measuring range	0.2 % of measuring range
Sampling frequency	380 Hz / 700 Hz	380 Hz / 700 Hz

*Measurement on matt white, diffuse reflecting surface

Interfaces:

- 100 MBit Ethernet
- Trigger / Encoder
- Sync In / Sync Out
- RS 232 Service / Programming



Technical Data	
Laser class	2 (3R: model 400/200)
Features	Temperature sensor, operation hour meter, serial number and sensor data readout
Laser type, wavelength	Diode, 658 nm, red
Allowable ambient light	5.000 Lux
Operating time	laser diode: > 30000 h
Maximum vibration	5 g up to 1 kHz
Ambient conditions	0° ... +40 °C, < 90 % rel. humidity
Storage temperature	-20° ... +70 °C
Enclosure rating	IP 64
Power supply	8 ... 30 V, Pw=3 W

Scope of delivery:

- sensor
- demonstration software
- manual

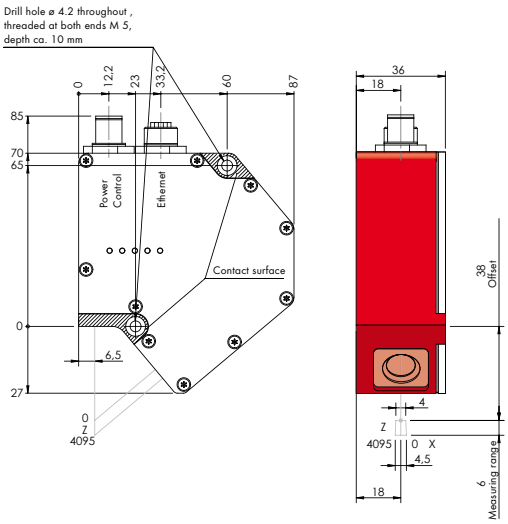
(separate order for cable and power supply)

Options:

- model -S with protective glass shield
- model -WS with protective glass shield and cooling
- synchronisation of two sensors

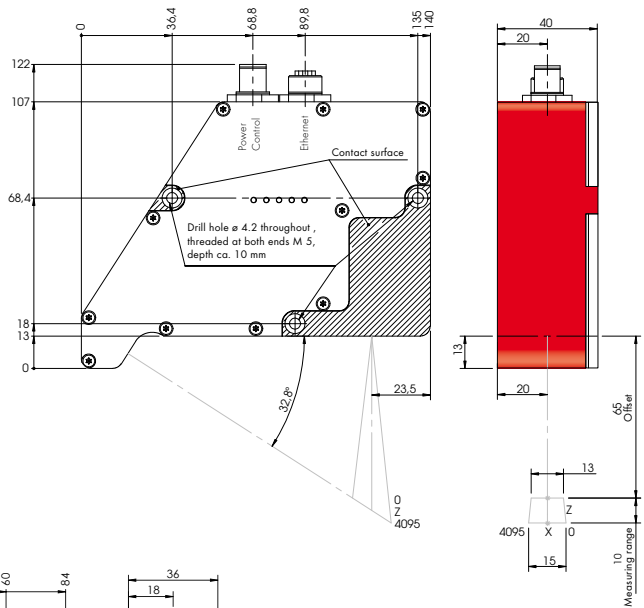
TYPE 6/4

DRAWING (1:3):



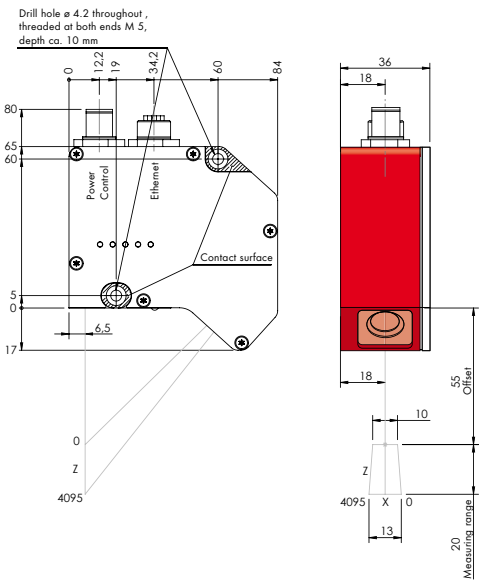
TYPE 10/13

DRAWING (1:3)



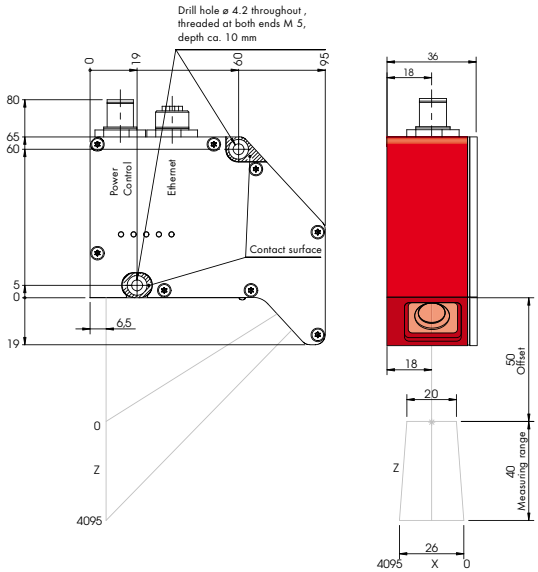
TYPE 20/10

DRAWING (1:3)



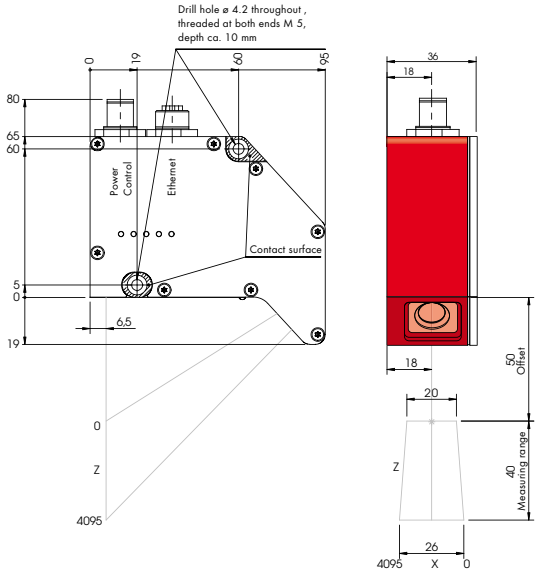
TYPE 40/20

DRAWING (1:3)



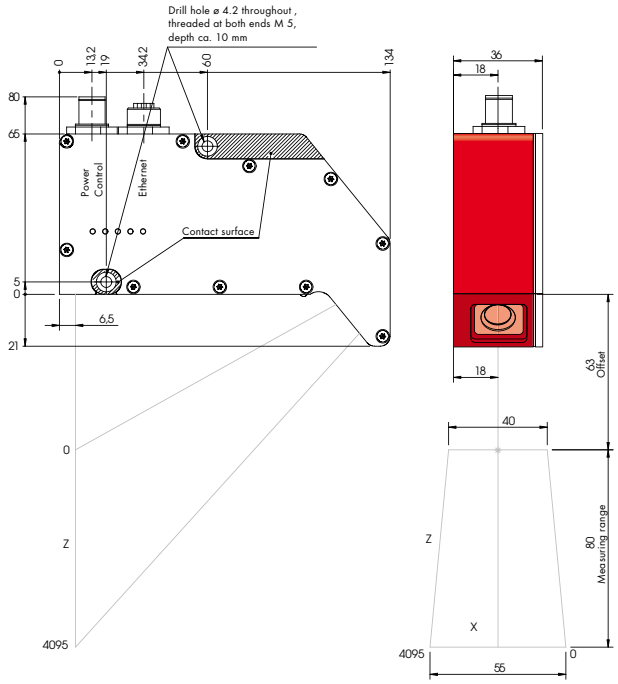
TYPE 60/30

DRAWING (1:3)



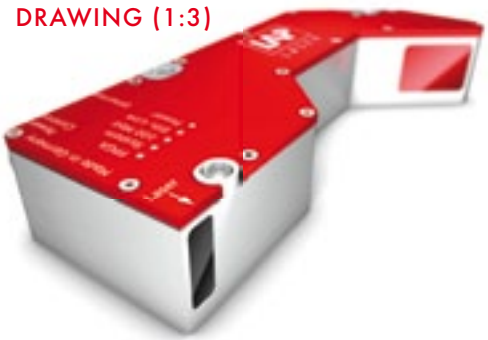
TYPE 80/40

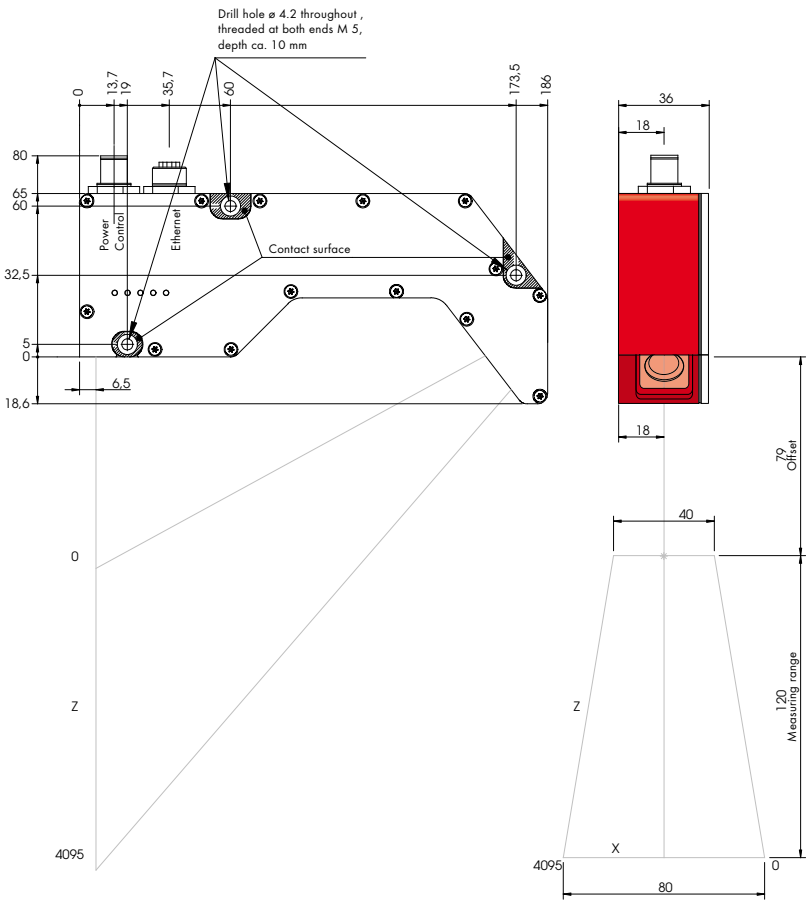
DRAWING (1:3)



TYPE 120/60

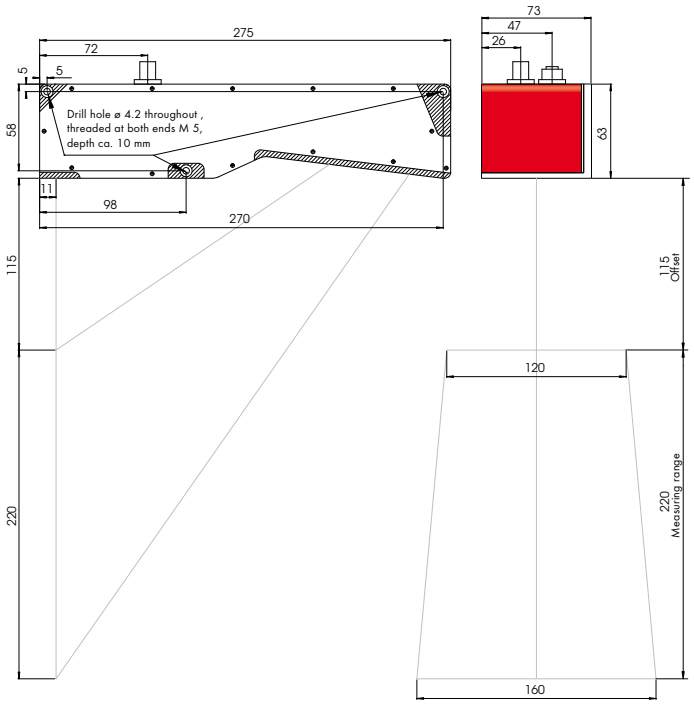
DRAWING (1:3)





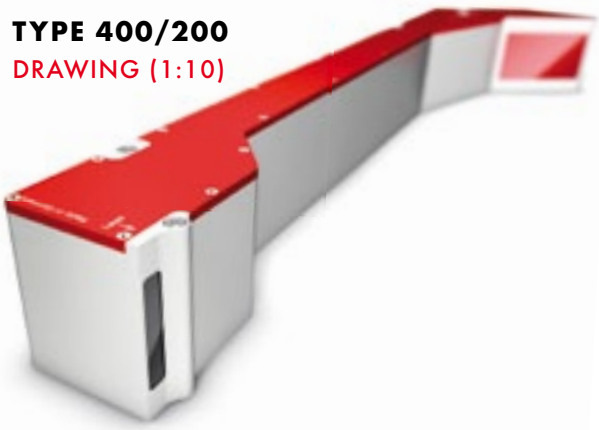
TYPE 220/120

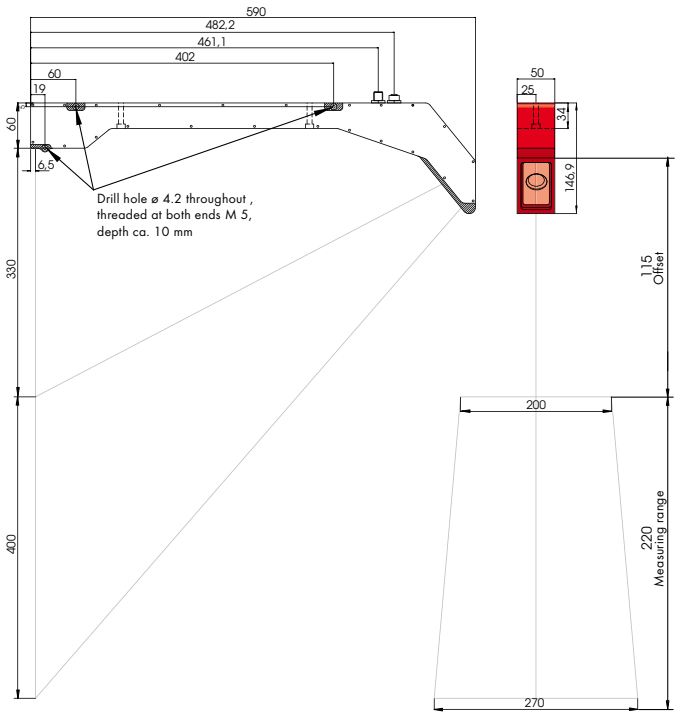
DRAWING (1:5)



TYPE 400/200

DRAWING (1:10)





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SERVICE PACKAGE

LAP stays right by your side before, during and after the installation of a LAP system. International experience acquired over decades in the installation and maintenance of laser systems across virtually all industries makes us a reliable and competent partner. Before you make your decision, we will give you plenty of advice and explain both the possibilities and also the limitations of the technology. We will support you in the planning and installation of the system onsite. After commissioning, we will stay with you during your first steps using the laser projection system until its use has been optimised. Each customer has different requirements regarding maintenance cycles, reaction times and protection from down times. LAP therefore offers each customer an individually tailored package, which can extend far beyond the guarantee and standard working hours. Do you want to have replacement equipment on site? Emergency service available at all times? A 24-hour hotline? Or is replacement within 24 hours, support during the working day, and regular training of your personnel sufficient for your needs? Just tell us what you want – we will find a suitable solution for you.

Customer-specific adaptations of the system

- Support during the planning of the work area(s)
- Supply of individual accessories closely related to the system (mounting options, pivot arms, traversing systems, ...)
- Software adaptations and extensions (connection to the company network, visualisation ...)

Installation and commissioning

Training

Maintenance

- Replacement equipment (loaners)
- Replacement of expendable parts
- Cleaning
- Adjustment

Updates for software and firmware

Repair

HIGH-TECH QUALITY SENSORS BY LAP

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, 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.

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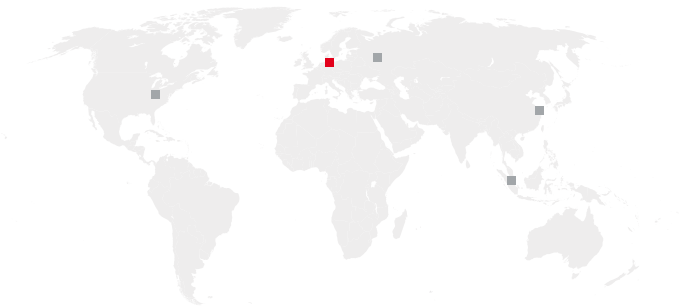

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