



# More Precision.

**DISPLACEMENT, POSITION AND PROFILE  
MEASUREMENT IN WOOD PROCESSING**





## DISPLACEMENT AND PROFILE MEASUREMENT USING LASER SENSORS

### Solutions for the wood industry

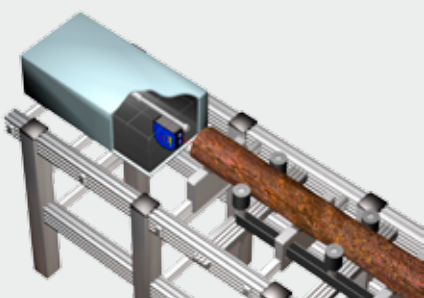
Micro-Epsilon has been providing innovative measurement solutions for the wood industry for more than 10 years. These solutions are now being used across the complete wood processing supply chain. Optical sensors from Micro-Epsilon provide precision measurements from the sawing of a trunk to the dimensional inspection post-machining. The different series available provide suitable sensors for almost every conceivable application and have already proven themselves in harsh industrial environments. These high quality sensors are developed and manufactured in Europe.

### Laser triangulation measuring principle

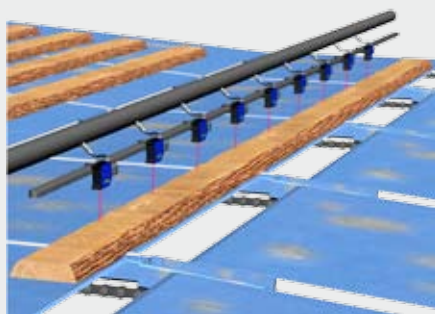
Laser triangulation sensors operate using a laser diode, which projects a visible light spot onto the surface of the target. The reflected light is thereby replicated on a light-sensitive element using a receiving optical system. If the light spot changes its position, this change is replicated on the receiving element and evaluated. A CMOS or CCD array is used as the position-sensitive measuring element.

### Decisive benefits

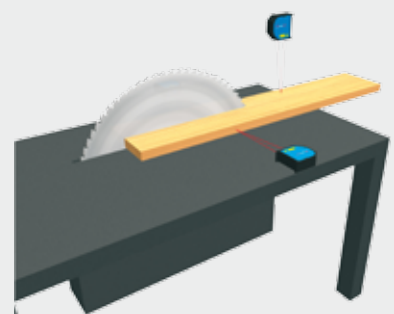
- price/performance ratio
- low space requirements
- large distance to the target
- measuring ranges up to 1,000mm
- high measuring rate
- protective housing for special requirements
- robust sensor design



Quality inspection of wood



Profile measurement before wane removing



Plank position at circular saws

Laser sensors are ideally suited to wood machining and processing applications. The sensors are very compact and operate with an integrated controller. The sophisticated electronics enable very fast adjustment of the exposure on changing surface characteristics for dry, wet or frozen wood. All sensor models are protected to IP67 and can be fitted with an additional protective housing if required. In the case of a dusty environment, an air jet unit is provided, which removes any sawdust or wood chips from the beam path. The optoNCDT 1402-2005C is protected to IP69K and because of its stainless steel housing is suitable for very harsh environments.

### Application examples

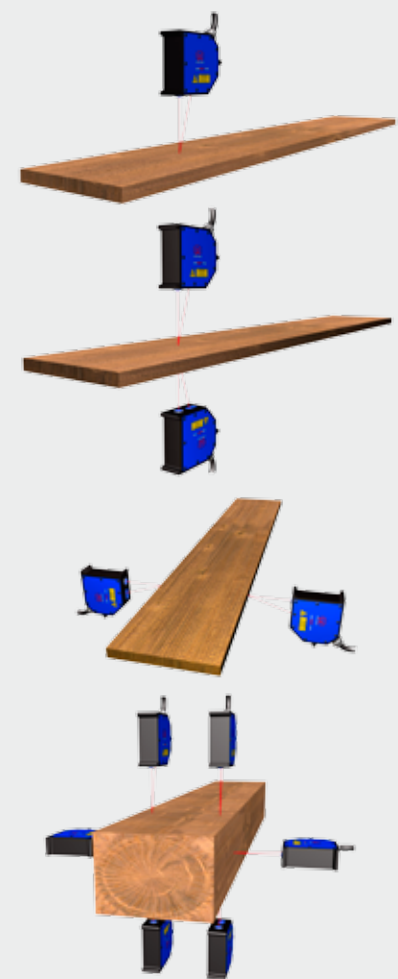
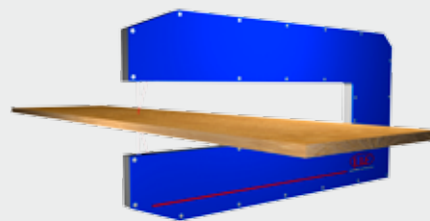
The optoNCDT series of laser sensors is used in a variety of applications within the wood processing sector. These sensors help to increase production yields, ensure quality standards are met, provide high process reliability and protect machine tools against possible damage.

Two optoNCDT sensors are normally used for thickness measurement of boards, planks or beams. A fully synchronous measuring method

is required for precise, error-free measurement. The width or the thickness can be measured using this arrangement. If the design is supplemented by additional sensors, torsion inspection and a dimensional check can be carried out in a single measure

Several optoNCDT 1402 sensors are used for checking the wane of the wood before trimming. The sensors measure the profile of the plank in the flow path and enable optimization of cutting widths.

Other potential applications include wood sorting, classification and dimensional inspection. optoNCDT sensors are also used in downstream machining operations, including multiple track planarity inspection of doors, windows and boards.



## MODEL OVERVIEW



**optoNCDT 1302**  
 750 Hz measuring rate  
 4 measuring ranges from 20mm to 200mm  
 Peak selection  
 fixed measuring rate  
 Trigger input, RS422  
 scaleable analogue output



**optoNCDT 1402**  
 1.5kHz measuring rate  
 Trigger input, RS422  
 Peak selection  
 Eight measuring ranges from 5mm to 600mm  
 Measuring rate can be adjusted in five stages  
 Scalable analogue output



**optoNCDT 1700**  
 2.5kHz measuring rate  
 10 measuring ranges  
 Can be synchronised  
 Measuring rate can be adjusted in four stages  
 Trigger input, RS422  
 Adapts to changing surfaces in real-time

The low cost series provides an optimum entry point for common measurement tasks. Measuring ranges between 20mm and 200mm cover a wide range of applications. The sensor operates with an integrated controller and has an extremely compact design. The analogue and digital outputs provide multiple possibilities for further signal processing.

The optoNCDT 1402 is a laser sensor with an integrated digital signal processor. The non-contact sensor measures distances against a wide variety of surfaces due to its automatic exposure regulation. This adapts to the measurement task by using a swivelling cable connector, analogue output and RS422.

The standard on the market for precise distance measurement using laser sensors. The well-conceived design with integrated controller, adjustable measuring rate and exposure time, provides a multitude of potential uses. The integrated RTSC feature changes the exposure time of the sensor in real time, enabling it to operate reliably in the case of changing surfaces.

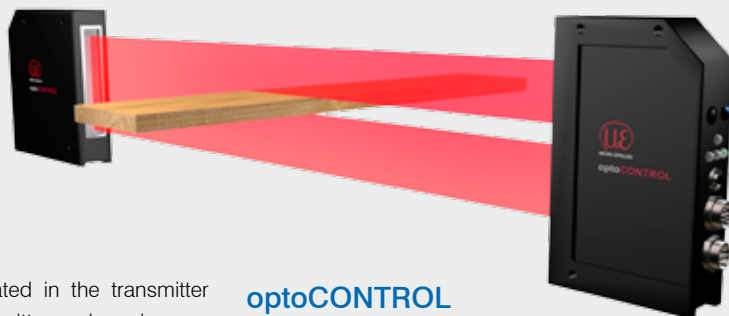
## THICKNESS MEASUREMENT AND POSITIONING WITH OPTOCONTROL

optoCONTROL optical micrometers are used in wood processing for the dimensional inspection of boards, laminate, veneer and panels. The thickness can be measured using a single optoCONTROL. Several optoCONTROL measuring devices are used for larger objects.

optoCONTROL measuring devices are used for controlling the plate position when printing wood with attractive decorations. Basically, this prevents a collision between the printing head and the board. The measuring devices are used for both measurement directly on the wood and for tool monitoring.

Multiple interfaces provide flexibility in terms of integration with different systems. The elec-

tronics are fully integrated in the transmitter or receiver. As the transmitter and receiver are separate from one another, mounting of the measuring device is extremely flexible. The various optoCONTROL micrometer designs and models provide suitable solutions for a wide range of applications.



### optoCONTROL

- measuring ranges up to 98mm
- light source to receiver distance up to 5m
- measurement by laser or LED
- for fast measurements
- resolution up to 0.1µm

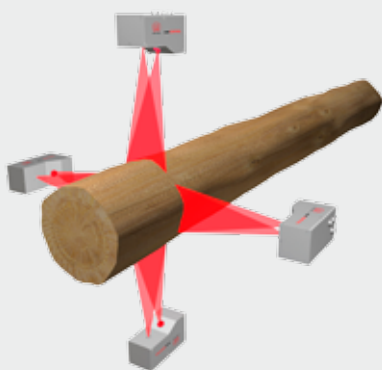
## PROFILE MEASUREMENT WITH SCANCONTROL

scanCONTROL is used for two-dimensional measurement of surface profiles. To do this, the laser line is projected onto the surface. A high quality receiving optical system projects the diffuse reflected light from this laser line onto a highly sensitive sensor matrix. In addition to the distance information (z-axis), the integrated sensor controller also uses this matrix image to calculate the position along the laser line (x-axis). In the case of moving objects or a traversing sensor, it is therefore also possible to obtain 3D measured values.

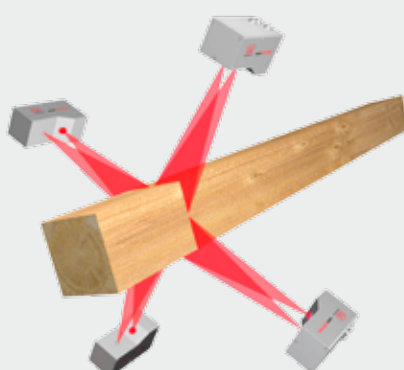
The measuring devices are used in the wood industry for the optimisation of cutting profiles. An optimum cutting pattern for each trunk can be calculated using a 3D model. The dimensions achieved after cutting are checked using scanCONTROL. In doing so, an inspection of squareness or distortion is possible. In the case of milled wood, a fast and simple profile check after the machining operation is possible using scanCONTROL. The production of high quality products is therefore guaranteed.

### scanCONTROL 2700 / 2710

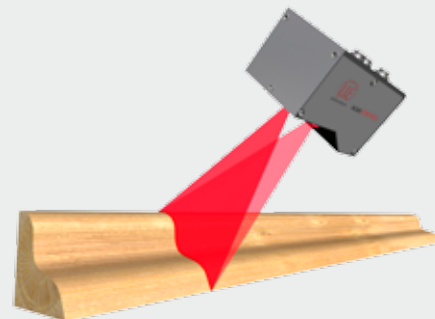
- compact, with integrated controller
- data rate 64,000 points per second
- 100Hz profile frequency, at full resolution
- attractive price/performance ratio
- can be synchronised for multi-scanner applications
- measuring ranges x-axis: 25mm to 300mm



Surface profile of a tree trunk



Control of a sawn geometries



Profile measurement of shaped wood

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