MICRO-EPSILON

# thicknessCONTROL 8X01.CT
# Non-contact thickness measurement of strip material

## POTENTIAL APPLICATIONS

Thickness profile measurement in

- Tire installation, particularly innerliner lines
- Extrusion lines
- Rollerhead installations
- Melting calender lines

## MATERIAL PARAMETERS

- Material width up to 4000 mm
- Material thickness from <1mm to 20mm
- Measurement accuracy from ±10 µm
- Resolution <1µm

## SPECIAL FEATURES

- Material independent calibration
- No consequential costs due to isotopes / X-rays
- Integrated system for monitoring inspection

## FUNCTIONAL PRINCIPLE OF THICKNESS MEASURMENTS

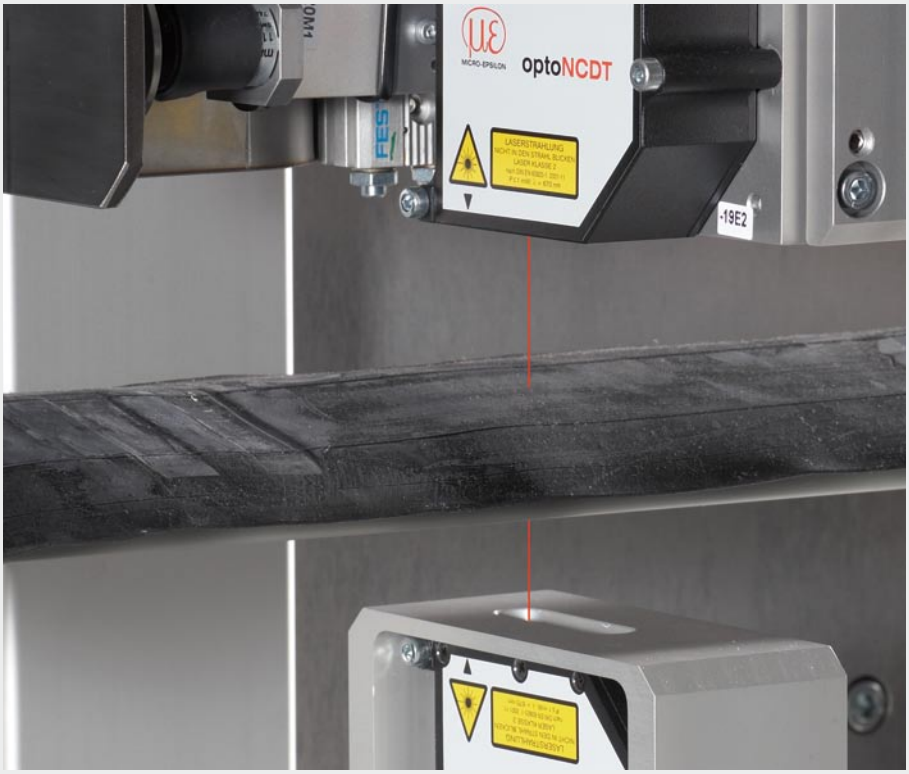
Laser triangulation sensors are integrated into the upper and lower belts of the thicknessCONTROL 8X01.T O-frame. The sensors use a laser diode that projects a visible light spot onto the target surface. If the light spot changes position, this change is displayed and analyzed in the sensor‘s receiver element. The unique RTSC (Real Time Surface Compensation) functionality helps to compensate for the target reflection factor during current exposure. Exposure time and the amount of light emitted by the laser are optimally adjusted for the current exposure cycle. The sensor distance signals for the upper and lower belts are always synchronized with each other during inline calibration, so that the thickness of the target material can be measured according to the differential principle (i.e. the difference between the sum of the sensor signals and the gap). For accurate thickness measurements, the two laser spots must be projected congruently onto the top and bottom of the material. To ensure this, the sensors are accurately adjusted at the factory using an optoelectronic tool and calibrated using software.

## AUTOMATIC CALIBRATION & TEMPERATURE COMPENSATION

The system contains an in-situ calibration check to compensate for the effects of temperature fluctuations. During this calibration, a spinning calibration element is moved into the measuring gap and then advanced along the entire traversing width of the system. The gap geometry for a temperature invariant compensation frame is recorded. Temperature-dependent changes to the gap geometry of the frame are measured and compensated using software. This creates a temperature-stable virtual measuring gap that ensures accurate measurements even in the most challenging environments

## MATERIAL-INDEPENDENT THICKNESS MEASUREMENTS

Numerous thickness measurement systems, including X-ray and isotope gauges or ultrasonic units, use material-dependent calibration because they use material characteristics to perform thickness measurements. This means that these systems also depend on temperature, humidity and other time-dependent properties. thicknessCONTROL 8X01.T performs 100% material-independent thickness measurements as two-dimensional signals are processed (as described above). This makes the device easy to use, and there is no need to produce and store large amounts of master parts, often a high cost factor.




## SYSTEM INTEGRATION

thicknessCONTROL 8X01.CT is equipped with a flexible interface in order to connect it to the control desk of a production process. Besides the support of different media (serial interfaces, field buses, network) – to allow an easy integration to the line – it is also possible to align the protocol to the customer or application.

## INTERFACES

EtherCAT Technology Group

INTERBUS

PROFIBUS PROCESS FIELD BUS

DeviceNet

## ANALYSIS AND CONTROL SOFTWARE

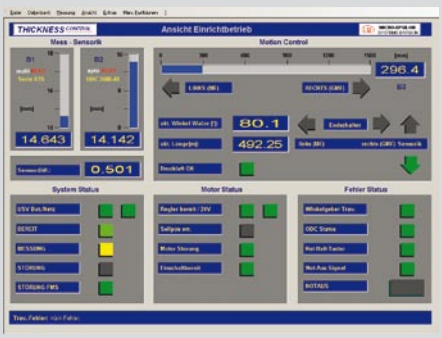
The thicknessCONTROL data collection and analysis software offers fully automated documentation and control of the manufacturing process using:

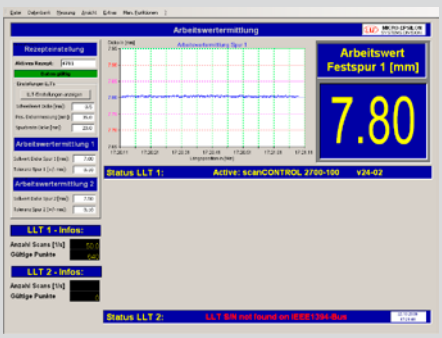
- an item and order database
- a production archive
- statistical evaluations
- threshold value monitoring, including feedback into production (optional fieldbus interfaces).

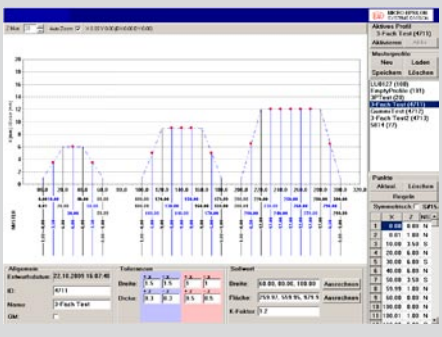
To ensure that the system can be used for different applications, displays and analysis features specially designed for individual customer processes can be provided.
The machine can then be used in various processes under different product names. Examples include:
TIP 8301.T for inner-liner plants
FTS 8101.T for extrusion and calender lines for flat film, in particular, thermoformable sheet films
RTP 8301.T for rubber thickness measurements


Combination profile8301.CT; vertical cursors show the points which are used for calender control

An optional module for controlling calender and extrusion nozzle thickness measurements can also be added to the software.

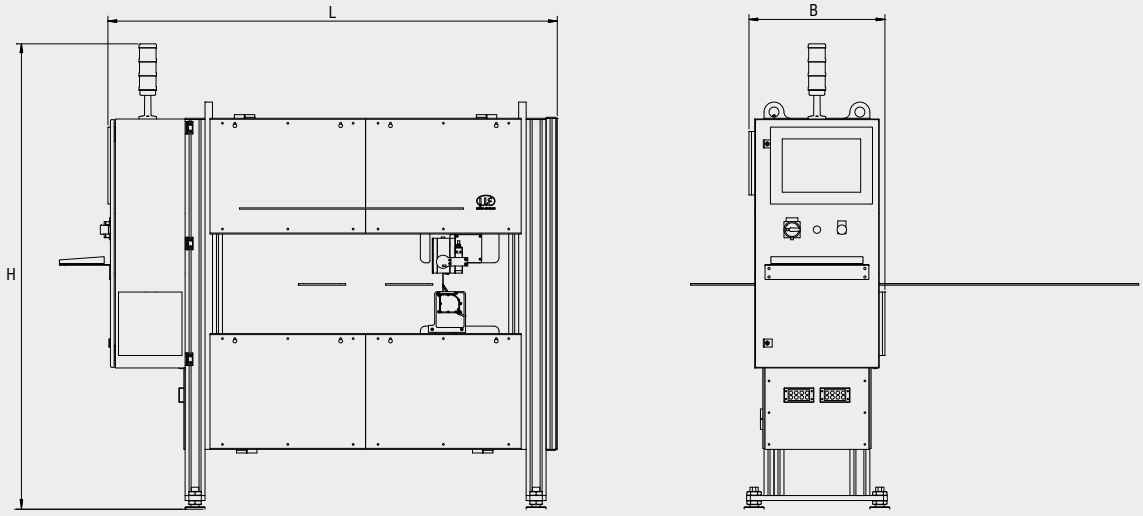


| thicknessCONTROL 8X01.CT | | | | | | |
|---|---|---|---|---|---|---|
| Description | -700 | -1200 | -1700 | -2200 | -2700 | -3200 |
| Article no. | 4350133.100 | 4350133.101 | 4350133.102 | 4350133.103 | 4350133.104 | 4350133.105 |
| Light source | Laser class 2M | | | | | |
| Traversing width | 750mm | 1250mm | 1750mm | 2250mm | 2750mm | 3250 mm |
| Material width max. (net width) | 700mm | 1200mm | 1700mm | 2200mm | 2700mm | 3200 mm |
| Threading gap | 400mm | | | | | |
| Measuring gap | 70mm | | | | | |
| Measuring range max. | 20mm | | | | | |
| Linearity in % nom. MR | 0.1% FSO | | | | | |
| Linearity nom. MR | ±10µm | | | | | |
| Sampling rate max. | ≤4kHz | | | | | |
| Traversing speed | 6,000 bis 15,000mm/min | | | | | |
| Lateral spatial resolution | 0.025mm | | | | | |
| Dimensions (LxWxH) | 2000 x 585 x 1869.4mm | 2500 x 585 x 1869.4mm | 3000 x 585 x 1869.4mm | 3500 x 585 x 1869.4mm | 4000 x 585 x 1869.4mm | 4500 x 585 x 1869.4mm |
| Weight appr. | 500kg | 560kg | 620kg | 680kg | 740kg | 800kg |
| Protection class | IP20 | | | | | |
| Ambient temperature | min. +15°C max. +40°C | | | | | |
| Relative air humidity | 75% max. within temperature range (without condensation) | | | | | |

MR = measuring range  FSO = Full Scale Output



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