Applications

- Presence check of etiquettes in a bottling plant
- Presence check of wafers in a wafer baking systems after the decapper
- Coating inspection of primer (adhesion agent) in the quality assurance of automotive supplier
- Print mark detection for controlling the register controls, in banderoling machines, and in cutting tools
- Color inspection of taillight systems in final assembly
- Color inspection for assurance of color matching of enamel insets for washing basins
- Coating inspection of foam material on one side through color difference sensor, position detection is possible by means of differential principle
- Color inspection of belt buckle, belt and eyelet for color matching before final assembly
- Color inspection of PET-bottle preforms in a bottling plant using through beam principle

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CROMLAVIEW® series

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The CROMLAVIEW® family consists of color sensors that process colors in a perceptual way (i.e. according to human perception). They are suitable for industrial applications that demand high standards of the sensor technology. The integrated stabilization channel technology CROMLASTAB® ensures reliable operation during the whole life cycle and protects it from temperature drift as well. These qualities are underlined through the visible robustness of the housing.

**High performance color sensors**
- Finest color differences can be detected ($\Delta E < 1$)
- Long-term stability of color recognition without new teach-in by CROMLASTAB®-technology
- Up to 350 colors can be stored
- Quick response time from 50 µs

**Intuitive control concept**
- Signal settings and teach-in of colors via buttons
- PC software CR-Tool for parameterization and validation of color recognition
- Easy adjustment to the recognition task through optical fibers and optics

**Flexible integration through industrial interfaces**
- Up to 12 channels, with binary encoding up to 4096 output combinations
- Push-pull-outputs (24 V / 100 mA)
- Standard interfaces: USB, RS232
- Optional fieldbus interfaces: Profibus DP, Fast Ethernet, CANopen
- Release of color recognition via trigger

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**Advantages**

### Technical Data

<table>
<thead>
<tr>
<th></th>
<th>CR50</th>
<th>CR100</th>
<th>CR200</th>
<th>CR210</th>
<th>CR500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensing channels</strong></td>
<td>1 sensing channel, 1 internal stabilization channel</td>
<td>2 sensing channels ¹</td>
<td>1 sensing channel, 1 internal stabilization channel</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distance compensation</strong></td>
<td>no</td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td><strong>Color processing</strong></td>
<td>perceptive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Receiving detector</strong></td>
<td>three range photo diode</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity steps</strong></td>
<td>20, 40, 80, 200</td>
<td>1, 4, 20, 40, 80, 200, 400, 800</td>
<td>fixed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Light source ²</strong></td>
<td>power white light LED, 1 W</td>
<td>high-power white light LED, 4 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient light compensation</strong></td>
<td>permanent</td>
<td>can be switched off</td>
<td></td>
<td></td>
<td>permanent</td>
</tr>
<tr>
<td><strong>Standard interfaces</strong></td>
<td>4 switch outputs, 1 control input</td>
<td>4 switch outputs, 2 control inputs, serial (RS232)</td>
<td>12 switch outputs, 2 control inputs, serial (RS232), USB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional interfaces</strong></td>
<td>-</td>
<td></td>
<td></td>
<td>Profibus, Profinet, Ethernet</td>
<td></td>
</tr>
<tr>
<td><strong>Parameterization</strong></td>
<td>3 button teach-in</td>
<td>3 button teach-in, Software CR-Tool</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Color resolution</strong></td>
<td>$\Delta E_{lab} &lt; 1$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>10 ms, 1 ms</td>
<td>$\geq 50$ µs</td>
<td>$\geq 250$ µs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Color value memory cells</strong></td>
<td>4</td>
<td>350</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Color output channels</strong></td>
<td>4</td>
<td>4 (15 bin. cod.)</td>
<td>12 (350 bin. cod.)</td>
<td>12 (100 bin. cod.)</td>
<td></td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>18 ... 28 VDC, max. 500 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acceptable case temp.</strong></td>
<td>-10 °C ... 55 °C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coupling in signal path</strong></td>
<td>via optical fiber</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fixed optic version</strong></td>
<td>CR50-FO</td>
<td>CR100-FO</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Case size</strong></td>
<td>50 mm × 50 mm × 21 mm</td>
<td>100 mm × 70 mm × 30 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>80 g</td>
<td>260 g</td>
<td>350 g</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Sensing channel 2 can be used for stabilization
² Self shining objects can be measured by switching off the illumination
Applications

- Process monitoring in steel and rolling mills
- Distance measurement on hot glowing steel up to 1300 °C
- Level measurement in silos and heaps
- Monitoring and positioning of cranes and conveying systems
- Position monitoring of vehicles and vessels
- Monitoring of lifting plants / lifting height measurement and positioning of elevators
- General distance measurement and position monitoring
- Diameter measurement of rolls / coils
- Distance measurement in mining, building, forestry and material-handling technology
- Thickness, length and width detection
- Diameter measurement of steel coils
- Detection of fast moving objects
- Use as proximity switch
- 2D and 3D scanning applications
- Altimeter

Contact

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LDM series

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Non-contact measurement with light

Laser distance measurement

ASTECH Angewandte Sensortechnik GmbH

LDM series
The meters of the LDM series are able to measure the distance between themselves and nearly every solid surface or liquid.

**Wide distance ranges**
- Up to 300 m without reflector
- Distances up to 3000 m with suitable reflective targets

**High accuracy**
- High end opto-electronic measurement methods
- Accuracy down to ±1 mm
- Constant accuracy independent from measured value

**Easy integration**
- Flexible parameterization
- Easy adaptation to the application
- Different industrial-suitied interfaces
- 4 mA ... 20 mA, Profibus, Industrial Ethernet, RS422, RS485, RS232

**Reliable and robust**
- Aluminum housings with IP 65 or IP 67
- Integrated heating for outdoor applications
- Use in bright outdoor environments with high percentage of constant or stray light

**Safe and harmless**
- Visible and infrared laser radiation
- Laser class 1 or 2
- No special safeguards necessary

---

### Advantages

- **Wide distance ranges**
  - Up to 300 m without reflector
  - Distances up to 3000 m with suitable reflective targets

- **High accuracy**
  - High end opto-electronic measurement methods
  - Accuracy down to ±1 mm
  - Constant accuracy independent from measured value

- **Easy integration**
  - Flexible parameterization
  - Easy adaptation to the application
  - Different industrial-suitied interfaces

- **Reliable and robust**
  - Aluminum housings with IP 65 or IP 67
  - Integrated heating for outdoor applications
  - Use in bright outdoor environments with high percentage of constant or stray light

---

### Technical Data

<table>
<thead>
<tr>
<th>LDM4x</th>
<th>LDM51 Lumos</th>
<th>LDM30xA</th>
<th>LDS30A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring principle</strong></td>
<td>phase comparison</td>
<td>impulse back-mixing</td>
<td>pulsed time-of-flight</td>
</tr>
<tr>
<td><strong>Max. range without reflector</strong></td>
<td>0.1 m ... 30 m</td>
<td>0.15 m ... 100 m</td>
<td>0.5 m ... 300 m</td>
</tr>
<tr>
<td><strong>100 m</strong></td>
<td>500 m</td>
<td>3000 m</td>
<td>250 m</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>0.1 mm (freely scalable)</td>
<td>± 1 mm (max. 20 Hz)</td>
<td>± 20 mm (100 Hz)</td>
</tr>
<tr>
<td><strong>Measuring accuracy</strong></td>
<td>± 2 mm</td>
<td>± 2,5 mm (max. 100 Hz)</td>
<td>± 60 mm (2000 Hz)</td>
</tr>
<tr>
<td><strong>Reproducability</strong></td>
<td>± 0,5 mm</td>
<td>± 10 mm</td>
<td>± 20 mm</td>
</tr>
<tr>
<td><strong>Max. measuring frequency</strong></td>
<td>LDM41A: 10 Hz</td>
<td>LDM301A: 2000 Hz</td>
<td>LDM302A: 100 Hz</td>
</tr>
<tr>
<td><strong>LDM42A: 50 Hz</strong></td>
<td>100 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type of laser</strong></td>
<td>650 nm, visible, red</td>
<td>905 nm, invisible, IR</td>
<td></td>
</tr>
<tr>
<td><strong>Laser class (EN60825-1:2007)</strong></td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Laser divergence</strong></td>
<td>0.6 mrad</td>
<td>0.2 mrad</td>
<td>1.7 mrad</td>
</tr>
<tr>
<td><strong>Analogue output</strong></td>
<td>4 mA ... 20 mA, programmable range, failure indicator</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital output</strong></td>
<td>1× high-side-switch</td>
<td>3× high-side-switch</td>
<td>2× high-side-switch</td>
</tr>
<tr>
<td><strong>Serial interface</strong></td>
<td>RS232 or RS422</td>
<td>RS232, RS422, RS485</td>
<td>RS232 or RS422</td>
</tr>
<tr>
<td><strong>Optional interfaces</strong></td>
<td>Profibus, SSI, Ethernet</td>
<td>Profibus, SSI</td>
<td></td>
</tr>
<tr>
<td><strong>Trigger</strong></td>
<td>1× input / output, adjustable delay and switching logic</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control and display elements</strong></td>
<td>OLED-Display, 4 touch-buttons, 2 status-LEDs</td>
<td></td>
<td>5 status-LEDs</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>10 V ... 30 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>&lt; 1,5 W</td>
<td>&lt; 10 W</td>
<td>&lt; 5 W</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-10 °C ... +50 °C</td>
<td>-10 °C ... +60 °C</td>
<td>-40 °C ... +60 °C</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 65</td>
<td>IP 67</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions [mm]</strong></td>
<td>212 × 96 × 50</td>
<td>120 × 76,5 × 40</td>
<td>136 × 57 × 104</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>750 g</td>
<td>700 g</td>
<td>800 g</td>
</tr>
</tbody>
</table>

1) adjustable threshold and hysteresis
Applications

- Recoiling lines for metal strips, paper, textiles or non-wovens
- Tube inspection lines
- Length measurement of pre-cut tubes, profiles or plates
- Slitting lines
- Inspection lines
- Coating plants
- Cold rolling mills
- Hot rolling mills
- Wire mills
- Tube production
- Cut-to-length control for flying saws
- Mass-flow-measurement
- Plate mill and slab finishing lines
- Speed measurement on abrasive materials
- Process control

Contact person

VLM series

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Non-contact measurement with light

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Measurement of velocity and length
**Advantages**

Based on a CCD sensor the VLM500 implements the spatial filter technology for the optical determination of velocity and length of moving objects. The VLM500 works optically and contactless.

**Dynamic and accurate**
- Measuring range up to 50 m/s
- Accuracy < 0.025%

**Contactless and harmless**
- Working distance 170 mm, 185 mm or 240 mm
- No slip
- No damage/contamination of measured object surface
- No dangerous laser radiation

**Robust and reliable**
- Rugged design for reliable use in harsh industry environments
- Immune to dirt and dust

**Flexible and versatile**
- Comprehensive parameterization for flexible operation
- Independent from object surface properties
- Versatile industrial interfaces
- Synchronous triggering of multiple gauges for mass-flow applications

**Autonomic and easy-to-use**
- Automatic adaption to properties of object surface
- Integrated sensor, lighting, optics, signal processing and interfaces – no external components
- Easy integration into existing processes and plants
- Easy mechanical installation
- No wear and free of maintenances

**High Quality and cost-efficient**
- Calibrated for lifetime
- 5 years warranty
- Made in Germany
- Expected lifetime > 20 years

---

**Technical Data**

<table>
<thead>
<tr>
<th></th>
<th>VLM500A</th>
<th>VLM500D</th>
<th>VLM500L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal distance and working range</strong></td>
<td>(185 ± 7.5) mm</td>
<td>(240 ± 15) mm</td>
<td>(170 ± 7.5) mm</td>
</tr>
<tr>
<td><strong>Extended working range</strong></td>
<td>(185 ± 15) mm</td>
<td>(240 ± 30) mm</td>
<td>(170 ± 10) mm</td>
</tr>
<tr>
<td><strong>Speed measuring range</strong></td>
<td>0.01 ... 25 m/s</td>
<td>0.008 ... 15 m/s</td>
<td>0.004 ... 3.0 m/s</td>
</tr>
<tr>
<td>– with extended working range</td>
<td>0.02 ... 50 m/s</td>
<td>0.016 ... 30 m/s</td>
<td>0.008 ... 6.0 m/s</td>
</tr>
<tr>
<td>– with special filter FB2V</td>
<td>0.006 ... 3.5 m/s</td>
<td>0.005 ... 3 m/s</td>
<td>0.001 ... 1.5 m/s</td>
</tr>
<tr>
<td>– in extended working range and FB2V</td>
<td>0.012 ... 7 m/s</td>
<td>0.012 ... 5.5 m/s</td>
<td>0.002 ... 3 m/s</td>
</tr>
<tr>
<td><strong>Measuring uncertainty</strong></td>
<td>&lt; 0.025 % at nominal working distance</td>
<td>&lt; 0.025 % at nominal working distance</td>
<td>&lt; 0.025 % at nominal working distance</td>
</tr>
<tr>
<td><strong>Reproducibility</strong></td>
<td>&lt; 0.025 %</td>
<td>&lt; 0.025 %</td>
<td>&lt; 0.025 %</td>
</tr>
<tr>
<td><strong>Length measuring range</strong></td>
<td>internal measuring range up to 1,000,000 km</td>
<td>internal measuring range up to 1,000,000 km</td>
<td>internal measuring range up to 1,000,000 km</td>
</tr>
<tr>
<td><strong>Detector</strong></td>
<td>CCD sensor/spatial filter</td>
<td>LED</td>
<td>LED</td>
</tr>
<tr>
<td><strong>Light source</strong></td>
<td>LED</td>
<td>24 VDC</td>
<td>24 VDC</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>max. 25 W</td>
<td>max. 25 W</td>
<td>max. 25 W</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>0 °C ... 50 °C</td>
<td>0 °C ... 50 °C</td>
<td>0 °C ... 50 °C</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 65</td>
<td>IP 65</td>
<td>IP 65</td>
</tr>
<tr>
<td><strong>EMC</strong></td>
<td>Industrial standard in compliance with CE</td>
<td>Industrial standard in compliance with CE</td>
<td>Industrial standard in compliance with CE</td>
</tr>
<tr>
<td><strong>Case size without connectors</strong></td>
<td>260 mm x 160 mm x 90 mm ²</td>
<td>260 mm x 160 mm x 90 mm ²</td>
<td>260 mm x 160 mm x 90 mm ²</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>3.3 kg</td>
<td>3.3 kg</td>
<td>3.3 kg</td>
</tr>
</tbody>
</table>

---

¹ DIN 1319 / ISO 3534, related to measured length test conditions: measuring length 10 m, constant conditions in: temperature (20 °C), distance, velocity, illumination depending on the version and configuration
² < 0.05 % within the working distance range and < 0.2 % within the extended working range