



# Laser Distance Measurement Photoelectric Sensors OPT25 Series



## Overview

The Wenglor triangulation laser distance sensors unleash their unique performance threefold, wherever complex shapes are measured, object surfaces and colors vary, maximum precision in the micrometer range or temperature-stable measured values are required.

### Adaptive Autoexposure

- Intelligent exposure control for optimal detection of challenging surfaces with changing reflection

### Active Temperature Control

- Several temperature sensors built into the housing guarantee optimal temperature monitoring

### Aspheric Dual Lens

- Two aspheric glass lenses integrated in the sensor offer a clear advantage in terms of precision

## Features

- Reliable detection of the smallest objects with reproducibility up to  $0.8\mu\text{m}$
- Highly accurate results due to a linearity deviation of just 0.08% from the measuring range
- Detection of very flat objects directly in front of the background
- Reliable measurements on dark, light or low reflecting objects
- Versatile use on different surfaces and shapes regardless of the degree of reflection
- Highly accurate switch points
- Small laser light spot measuring just 0.5 to 1.5mm in size and models available with either red or blue laser light
- Increased power for very dark objects and extremely high speeds available by selecting class 2 laser
- Suitable for measurement on polished metals, shiny plastic surfaces and dark paints
- Short-wave blue laser light for high accuracy and ideal for shiny, organic and red-hot surfaces

## Applications

- Woodworking industry
- Rail industry
- Battery industry
- Machinery manufacturing
- Electronics industry
- Automotive industry



Working range up to 1,000 mm



Parametrization with an app via Bluetooth



Robust aluminum housing



Measuring rate up to 2,500/s



Red and blue laser



Linearity deviation of 0.08%



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## Superior Laser Expertise

The laser distance sensors feature a small laser light spot measuring just 0.5 to 1.5mm in size and come with either red or blue laser light.

- Increased power for very dark objects and extremely high speeds by selecting models with class 2 laser
- Suitable for measurement on polished metals, shiny plastic surfaces and dark paints
- Short-wave blue laser light for high accuracy and ideal for shiny, organic, and red-hot surfaces

## User-Friendly and Easy Operation

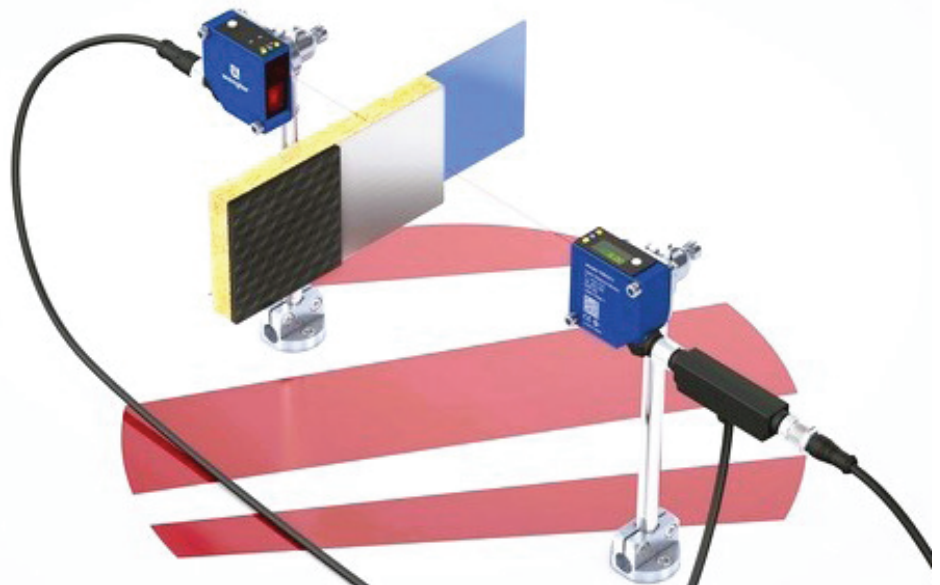
The various models can be configured directly via teach-in button actuation or OLED display. The weCon app also enables mobile setting and data transfer to the distance sensors. Parametrization can be carried out easily via the free Bluetooth app.

- Intuitive operating concept via two- or five-second button actuation
- Time savings thanks to easy initial start-up
- Display of distance value via the OLED display



Download the weCon app now free of charge from the Apple App Store or Google Play Store.

Automatic thickness measurement using two OPT25xx series sensors and accessory T-splitter [ZC4G004](#).





# Laser Distance Measurement Photoelectric Sensors OPT25 Series



OPT2500



OPT2518



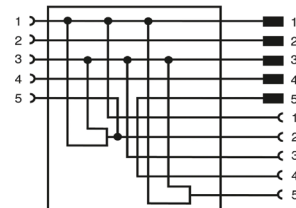
## Laser Distance Measurement Photoelectric Sensors OPT25 Series Selection Chart

| Part Number                          | Price      | Sensing Range                  | Light Emission     | Measuring Rate | Switching Frequency | Switching Output | Analog Output    | Setting Method   | Connection                 | Wiring              | Drawing Link        |
|--------------------------------------|------------|--------------------------------|--------------------|----------------|---------------------|------------------|------------------|------------------|----------------------------|---------------------|---------------------|
| Diffuse (50 x 50 x 20mm) Square      |            |                                |                    |                |                     |                  |                  |                  |                            |                     |                     |
| <a href="#">OPT2500</a>              | \$802.00   | 30-80mm<br>[1.18-3.15in]       | Class 1 red laser  | —              | 650 Hz              | (2) PNP          | —                | Teach-in         | 5-pin M12 quick-disconnect | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2501</a>              | \$1,317.00 |                                |                    | 2500/s         | —                   | 4-20 mA          | OLED             | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2502</a>              | \$1,368.00 |                                | Class 2 blue laser | 2500/s         | —                   | 4-20 mA          | (Bluetooth menu) | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2503</a>              | \$802.00   | 40-240mm<br>[1.57 - 9.44in]    | Class 1 red laser  | —              | 650 Hz              | (2) PNP          | —                | Teach-in         |                            | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2504</a>              | \$1,317.00 |                                |                    | 2500/s         | —                   | 4-20 mA          | OLED             | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2505</a>              | \$1,368.00 |                                | Class 2 blue laser | 2500/s         | —                   | 4-20 mA          | (Bluetooth menu) | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2506</a>              | \$802.00   | 50-350mm<br>[1.97-13.80in]     | Class 1 red laser  | —              | 650 Hz              | (2) PNP          | —                | Teach-in         |                            | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2507</a>              | \$1,317.00 |                                |                    | 2500/s         | —                   | 4-20 mA          | OLED             | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2508</a>              | \$1,368.00 |                                | Class 2 blue laser | 2500/s         | —                   | 4-20 mA          | (Bluetooth menu) | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2509</a>              | \$802.00   | 60-660mm<br>[2.36 - 25.98in]   | Class 1 red laser  | —              | 650 Hz              | (2) PNP          | —                | Teach-in         |                            | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2510</a>              | \$1,317.00 |                                |                    | 2500/s         | —                   | 4-20 mA          | OLED             | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2511</a>              | \$1,368.00 |                                | Class 2 blue laser | 2500/s         | —                   | 4-20 mA          | (Bluetooth menu) | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2512</a>              | \$802.00   |                                | Class 1 red laser  | —              | 650 Hz              | (2) NPN          | —                | Teach-in         |                            | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2513</a>              | \$905.00   |                                |                    | —              | 650 Hz              | (2) PNP          | —                | OLED             |                            | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2514</a>              | \$905.00   |                                | Class 2 blue laser | —              | 650 Hz              | (2) NPN          | —                | (Bluetooth menu) |                            | Diagram 1           | <a href="#">PDF</a> |
| Diffuse (71 x 63 x 30mm) Rectangular |            |                                |                    |                |                     |                  |                  |                  |                            |                     |                     |
| <a href="#">OPT2515</a>              | \$1,008.00 | 150-1000mm<br>[5.90 - 39.37in] | Class 1 red laser  | —              | 650 Hz              | (2) PNP          | —                | Teach-in         | 5-pin M12 quick-disconnect | Diagram 1           | <a href="#">PDF</a> |
| <a href="#">OPT2516</a>              | \$1,008.00 |                                |                    | —              | 650 Hz              | (2) NPN          | —                | Diagram 1        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2517</a>              | \$1,522.00 |                                |                    | 2500/s         | —                   | 4-20 mA          | OLED             | Diagram 2        |                            | <a href="#">PDF</a> |                     |
| <a href="#">OPT2518</a>              | \$1,574.00 |                                | Class 2 blue laser | 2500/s         | —                   | 4-20 mA          | (Bluetooth menu) | Diagram 2        |                            | <a href="#">PDF</a> |                     |

Mounting hardware included. Purchase cable separately.

## Accessory

The [ZC4G004](#) automatically creates thickness measurement output using two OPT25xx series sensors. One sensor must have OLED (Bluetooth menu).



## T-splitter for OPT25 Series

| Part Number             | Price   | Coding  | Cable Length      | Temperature Range               | Cable Jacket Material | Sleeve Nut Material | Protection Rating | Connector Type                                       | Weight   |
|-------------------------|---------|---------|-------------------|---------------------------------|-----------------------|---------------------|-------------------|------------------------------------------------------|----------|
| <a href="#">ZC4G004</a> | \$75.00 | A-coded | 0.6m<br>[23.62in] | -10 to 105 °C<br>[14 to 221 °F] | Plastic, PVC          | Metal               | IP67              | 5-pole male M12 barrel<br>(2) 5-pole female M12 nuts | 0.212 lb |

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## Wiring Diagrams

Diagram 1

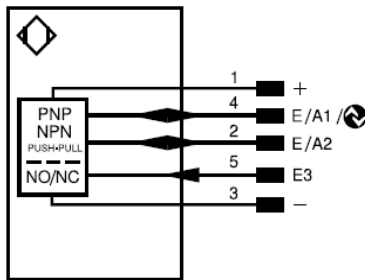
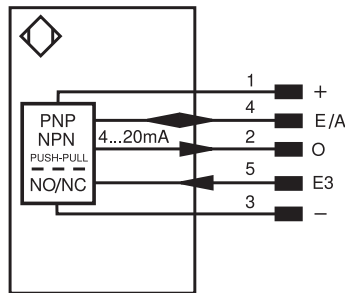
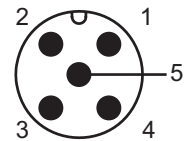


Diagram 2



M12 connector



### Legend

|                      |                                            |                      |                                |                                        |                           |
|----------------------|--------------------------------------------|----------------------|--------------------------------|----------------------------------------|---------------------------|
| +                    | Supply Voltage +                           | nc                   | Not connected                  | EN <sub>BRS422</sub>                   | Encoder B/ $\bar{B}$ (TL) |
| -                    | Supply Voltage 0 V                         | U                    | Test Input                     | EN <sub>A</sub>                        | Encoder A                 |
| ~                    | Supply Voltage (AC Voltage)                | $\bar{U}$            | Test Input Inverted            | EN <sub>B</sub>                        | Encoder B                 |
| A                    | Switching Output (N.O.)                    | W                    | Trigger Input                  | A <sub>MIN</sub>                       | Digital output MIN        |
| $\bar{A}$            | Switching Output (N.C.)                    | W-                   | Ground for the Trigger Input   | A <sub>MAX</sub>                       | Digital output MAX        |
| V                    | Contamination/Error Output (N.O.)          | O                    | Analog Output                  | A <sub>OK</sub>                        | Digital output OK         |
| $\bar{V}$            | Contamination/Error Output (N.C.)          | O-                   | Ground for the Analog Output   | SY IN                                  | Synchronization In        |
| E                    | Input (analog or digital)                  | BZ                   | Block Discharge                | SY OUT                                 | Synchronization OUT       |
| T                    | Teach Input                                | AMV                  | Valve Output                   | OLT                                    | Brightness output         |
| Z                    | Time Delay (activation)                    | a                    | Valve Control Output +         | M                                      | Maintenance               |
| S                    | Shielding                                  | b                    | Valve Control Output -         | rsv                                    | Reserved                  |
| RxD                  | Interface Receive Path                     | SY                   | Synchronization                | Wire Colors according to DIN IEC 60757 |                           |
| TxD                  | Interface Send Path                        | SY-                  | Ground for the Synchronization | BK                                     | Black                     |
| RDY                  | Ready                                      | E+                   | Receiver-Line                  | BN                                     | Brown                     |
| GND                  | Ground                                     | S+                   | Emitter-Line                   | RD                                     | Red                       |
| CL                   | Clock                                      | $\perp$              | Grounding                      | OG                                     | Orange                    |
| E/A                  | Output/Input programmable                  | SnR                  | Switching Distance Reduction   | YE                                     | Yellow                    |
|                      | IO-Link                                    | Rx+/-                | Ethernet Receive Path          | GN                                     | Green                     |
| PoE                  | Power over Ethernet                        | Tx+/-                | Ethernet Send Path             | BU                                     | Blue                      |
| IN                   | Safety Input                               | Bus                  | Interfaces-Bus A(+)/B(-)       | VT                                     | Violet                    |
| OSSD                 | Safety Output                              | La                   | Emitted Light Disengageable    | GY                                     | Gray                      |
| Signal               | Signal Output                              | Mag                  | Magnet Activation              | WH                                     | White                     |
| BI_D+/_              | Ethernet Gigabit bidirect. data line (A-D) | RES                  | Input Confirmation             | PK                                     | Pink                      |
| EN <sub>BRS422</sub> | Encoder 0-pulse $\bar{O}$ / TTL            | EDM                  | Contact Monitoring             | GNYE                                   | Green/Yellow              |
| PT                   | Platinum measuring resistor                | EN <sub>ARS422</sub> | Encoder A/ $\bar{A}$ (TTL)     |                                        |                           |



# Laser Distance Measurement Photoelectric Sensors OPT Series

## Specifications

| Laser Distance Measurement Photoelectric Sensors OPT25 Series Specifications |                           |                     |                      |            |                         |                                            |                   |                               |                                    |          |
|------------------------------------------------------------------------------|---------------------------|---------------------|----------------------|------------|-------------------------|--------------------------------------------|-------------------|-------------------------------|------------------------------------|----------|
| Part Number                                                                  | Reproducibility (maximum) | Linearity Deviation | Switching Hysteresis | Wavelength | Ambient Light (maximum) | Current Consumption (U <sub>b</sub> = 24V) | Temperature Drift | Switching Output Voltage Drop | Switching Output Switching Current | Weight   |
| <a href="#">OPT2500</a>                                                      | 13μm                      | 40μm                | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 2.5 μm/K        | < 1.5 V                       | 100mA                              | 0.158 lb |
| <a href="#">OPT2501</a>                                                      | 13μm                      | 40μm                | —                    | 655nm      | 20,000 Lux              | < 60mA                                     | < 2.5 μm/K        | —                             | —                                  |          |
| <a href="#">OPT2502</a>                                                      | 20μm                      | 40μm                | —                    | 405nm      | 5,000 Lux               | < 70mA                                     | < 2.5 μm/K        | —                             | —                                  |          |
| <a href="#">OPT2503</a>                                                      | 70μm                      | 200μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 15 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2504</a>                                                      | 70μm                      | 200μm               | —                    | 655nm      | 20,000 Lux              | < 60mA                                     | < 15 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2505</a>                                                      | 40μm                      | 200μm               | —                    | 405nm      | 5,000 Lux               | < 70mA                                     | < 15 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2506</a>                                                      | 100μm                     | 300μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 20 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2507</a>                                                      | 100μm                     | 300μm               | —                    | 655nm      | 20,000 Lux              | < 60mA                                     | < 20 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2508</a>                                                      | 100μm                     | 300μm               | —                    | 405nm      | 5,000 Lux               | < 70mA                                     | < 20 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2509</a>                                                      | 550μm                     | 900μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 50 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2510</a>                                                      | 550μm                     | 900μm               | —                    | 655nm      | 20,000 Lux              | < 60mA                                     | < 50 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2511</a>                                                      | 250μm                     | 900μm               | —                    | 405nm      | 5,000 Lux               | < 70mA                                     | < 50 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2512</a>                                                      | 550μm                     | 900μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 50 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2513</a>                                                      | 250μm                     | 900μm               | < 0.5 %              | 405nm      | 5,000 Lux               | < 60mA                                     | < 50 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2514</a>                                                      | 250μm                     | 900μm               | < 0.5 %              | 405nm      | 5,000 Lux               | < 60mA                                     | < 50 μm/K         | < 1.5 V                       | 100mA                              | 0.418 lb |
| <a href="#">OPT2515</a>                                                      | 350μm                     | 850μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 75 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2516</a>                                                      | 350μm                     | 850μm               | < 0.5 %              | 655nm      | 20,000 Lux              | < 50mA                                     | < 75 μm/K         | < 1.5 V                       | 100mA                              |          |
| <a href="#">OPT2517</a>                                                      | 350μm                     | 850μm               | —                    | 655nm      | 20,000 Lux              | < 60mA                                     | < 75 μm/K         | —                             | —                                  |          |
| <a href="#">OPT2518</a>                                                      | 250μm                     | 850μm               | —                    | 405nm      | 10,000 Lux              | < 70mA                                     | < 75 μm/K         | —                             | —                                  |          |

| Laser Distance Measurement Photoelectric Sensors OPT25 Series General Specifications |             |                            |
|--------------------------------------------------------------------------------------|-------------|----------------------------|
| Supply Voltage                                                                       |             | 18 to 30 VDC               |
| Response Time                                                                        |             | < 0.5 ms                   |
| Temperature Range                                                                    | Red Lasers  | -30 to 60°C [-22 to 140°F] |
|                                                                                      | Blue lasers | 0 to 60°C [0 to 140°F]     |
| Short Circuit Protection                                                             |             | Yes                        |
| Reverse Polarity Protection                                                          |             | Yes                        |
| Overload Protection                                                                  |             | Yes                        |
| Degree of Protection                                                                 |             | IP67                       |
| Interface                                                                            |             | IO-Link v1.1               |
| Baud Rate                                                                            |             | COM3                       |
| Housing Material                                                                     |             | Plastic, ABS               |
| Housing Material                                                                     |             | Aluminum anodized          |
| Optic Cover Material                                                                 |             | Plastic, PMMA              |
| Agency Approval                                                                      |             | CE, cULus E189727          |

| Laser Distance Measurement Photoelectric Sensors OPT25 Series Light Spot Diameter                                                                              |                     |       |       |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|-------|--------|
| <a href="#">OPT2500</a><br><a href="#">OPT2501</a><br><a href="#">OPT2502</a>                                                                                  | Working Distance    | 30mm  | 55mm  | 80mm   |
|                                                                                                                                                                | Light Spot Diameter | 1.5mm | 1.5mm | 1.5mm  |
| <a href="#">OPT2503</a><br><a href="#">OPT2504</a><br><a href="#">OPT2505</a>                                                                                  | Detection Range     | 40mm  | 140mm | 240mm  |
|                                                                                                                                                                | Light Spot Diameter | 1.5mm | 1mm   | 1mm    |
| <a href="#">OPT2506</a><br><a href="#">OPT2507</a><br><a href="#">OPT2508</a>                                                                                  | Detection Range     | 50mm  | 200mm | 350mm  |
|                                                                                                                                                                | Light Spot Diameter | 1.5mm | 1mm   | 1mm    |
| <a href="#">OPT2509</a><br><a href="#">OPT2510</a><br><a href="#">OPT2511</a><br><a href="#">OPT2512</a><br><a href="#">OPT2513</a><br><a href="#">OPT2514</a> | Working Distance    | 60mm  | 360mm | 660mm  |
|                                                                                                                                                                | Light Spot Diameter | 1.5mm | 1mm   | 0.5mm  |
| <a href="#">OPT2515</a><br><a href="#">OPT2516</a><br><a href="#">OPT2517</a><br><a href="#">OPT2518</a>                                                       | Working Distance    | 150mm | 575mm | 1000mm |
|                                                                                                                                                                | Light Spot Diameter | 1mm   | 1mm   | 1mm    |