



# OPTICAL DISTANCE SENSORS

 **di-soric**

# OPTICAL DISTANCE SENSORS FOR VARIOUS REQUIREMENTS

## THE OPTICAL DISTANCE SENSORS MEASURE DISTANCES QUICKLY AND PRECISELY WITH A RED LIGHT LASER.

The LAT-52 with IO-Link is suited for distances up to 500 mm, is used in applications in the mm and sub-mm range and is available for three different measuring ranges. Perfectly harmonized components enable precise detection of small changes in distance.

The LVHT-52 is suited for applications that are meant to have a high degree of precision in switching. With a detection range of 50 to 500 mm and a window mode precisely adjustable via keyboard or IO-Link, it is a very efficient solution.



### LAT-52 COMPACT MEASURING

30 – 500 mm

- For precise distance measurement
- Universal through 3 measuring ranges
- Sensor modes, filters for optimal measuring results
- Operation using keys or via IO-Link



### LVHT-52 COMPACT SWITCHING

50 – 500 mm

- For precise distance detection
- Compact, large measuring range
- Foreground and background suppression
- Operation using keys or via IO-Link

## OPTICAL DISTANCE SENSORS WITH RESOLUTIONS IN THE MICRO-METER RANGE AND UP TO 10 METER RANGE

Highly precise, fast distance measurements are the area of application of the LAT-61. Its small and precise laser spot makes determination of distances into the micrometer range possible.

The LAT-45 features a large range of up to 10 m and is equally well suited for measuring and switching applications. A good color and surface independence makes distance measurement possible on many surfaces.



### LAT-61 PRECISE

26 – 180 mm

- For highly precise, quick measurements
- Resolution in the micrometer range
- Up to 5,000 measurements per second
- Operation with keys and displays



### LAT-45 LONG RANGE

200 - 10,000 mm

- Large range of up to 10 m
- Ideal for dark surfaces
- High ambient light immunity
- Operation using a display or via IO-Link

# OPTICAL DISTANCE SENSORS

## LAT-52 COMPACT WITH IO-LINK

### FOR MANY MEASURING APPLICATIONS – 3 DIFFERENT MEASURING RANGES IN AN IDENTICAL DESIGN

di-soric develops and produces powerful distance sensors that set new standards. Immediately available, our optical distance sensors with an innovative dual operating concept, whereby adjustments can be made with via IO-Link or manually via the operating panel. With IO-Link, specific settings can be configured, stored in the IO-Link master and reloaded as needed – even with a swapped device.

#### 3 measuring ranges:

- High resolution: 30 – 80 mm / 0.01 mm resolution\*
- Short distance: 50 – 200 mm / 0.01 mm resolution\*
- Universal: 50 – 500 mm / 0.1 mm resolution\*

#### Precise, fast and safe

thanks to perfectly coordinated components that make optimal use of the triangulation method and thanks to use of a laser from the hazard-free Laser Class 1 according to EN 60825-1

#### Universal:

- Analog current and voltage output in one device
- pnp or npn function in one device
- available with axial or radial plug connection



#### Ready-to-run

3 preconfigured sensor modes:

- Standard: for a wide variety of applications
- Power: For dark objects
- Speed: For quick measurements

#### IO-Link

- Digital, loss-free transmission of measured values
- Diagnostic functions
- Identification
- Localization function
- Average and median filter
- IO-Link relative measurement

#### Robust design

- Metal plug connector
- Powder-coated die-cast zinc housing with IP67

#### Very easy operation

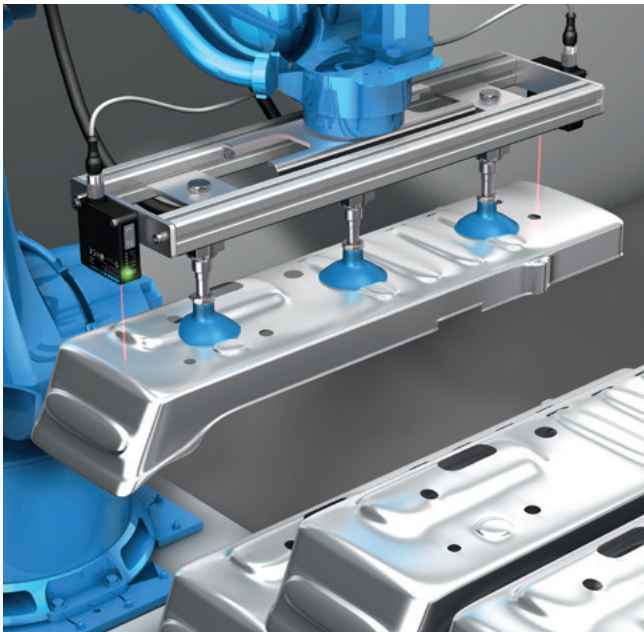
- Large, easy-to-operate keys
- Important functions can be operated intuitively
- 3 readily visible diagnostic LEDs
- Teach analog output
- Teach switching output
- NO/NC changeover
- Current/voltage switching
- Selection of sensor mode



# FAST AND EXTREMELY PRECISE: PRECISE MEASUREMENT WITH LAT-52

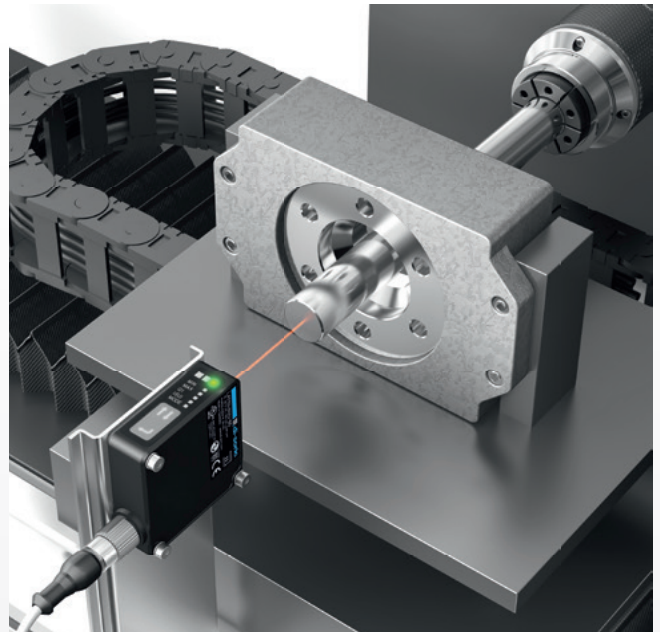
## MORE FLEXIBLE, FASTER, MORE PRECISE, SIMPLER – 3 DIFFERENT MEASURING RANGES WITH SMALL BLIND RANGES

The three measuring ranges in the variants High-resolution, Short distance and Universal allow for implementation of an extremely wide variety of applications. Due to the small blind ranges, the LAT-52 can be integrated into machines with little installation space. Three selectable sensor modes and additional filters ensure precise and optimal measurement results.



### Sheet transport using robots

Two LAT52-500 units control the suction gripper of the robot. The speed is adapted to the working distance with simultaneous collision avoidance, and thus the entire gripping process is time-optimized.



### Position tappet

In an assembly process, the impression depth must be determined with high precision. The high-resolution variant LAT52-80 with a measuring range starting at 30 mm ensures space-saving installation.

## SAFE FUNCTION IN PERFORMING APPLICATIONS – LAT-52 WITH IO-LINK.

### 3 SENSOR MODES AND FILTER FUNCTIONS

#### Standard

- Standard setting for many applications
- Measuring rate: 500 Hz – 750 Hz – 1000 Hz\*



#### Speed

- Quick measurement with 1200 Hz

#### Power

- Safe detection of dark objects

#### Filters

- Average and median filters for optimization of measurement

### QUALITATIVE AND QUANTITATIVE DIAGNOSTICS



- Signal quality with diagnostic LED and IO-Link, device status (qualitative)
- Current process values, min/max, teaching, switching point, object reflectivity, operating hours (quantitative)

### EASY MAINTENANCE



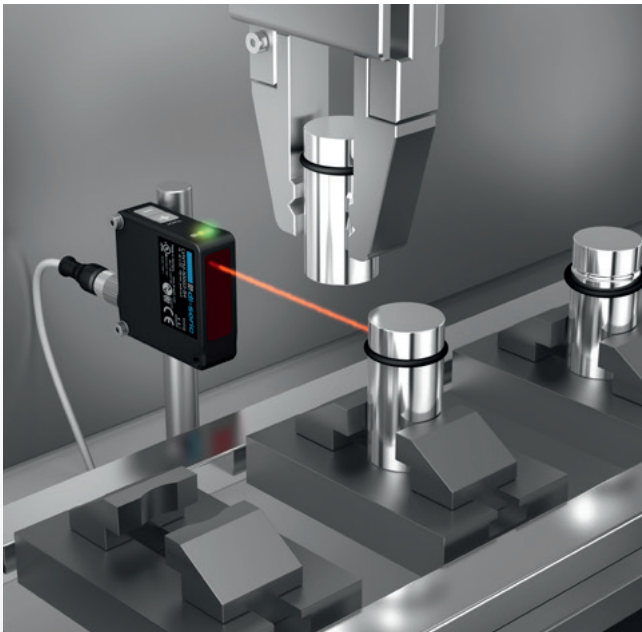
- Device swapping without manual intervention or specialized knowledge thanks to IO-Link 1.1 with data storage in the master
- Smart Sensor Profile – Fully compliant with standards

\* Exemplary values LAT52-500IU-B5 – LAT52-200IU-B5 – LAT52-80IU-B5 in factory setting: Sensor mode Standard

# THE SWITCHING ALTERNATIVE WITH IO-LINK PRECISE DETECTION WITH LVHT-52

## THE LASER LIGHT BUTTON WITH WINDOW FUNCTION AND A WORKING RANGE OF 50 - 500 MM

The LVHT-52 features a large detection range and a precisely adjustable window mode. This makes it a very efficient solution for applications that are meant to have a high degree of precision in switching but not measuring. Its extremely intuitive adjustment via the plus/minus keys ensures fast commissioning.



### Presence check for O-ring

The LVHT-52 is versatile thanks its large detection range and safely detects the presence of an O-ring via the switching point precisely taught with the plus/minus keys.

### Precise and safe

- Perfectly coordinated components
- Safe thanks to laser class 1



### Very easy operation

- Large, easy-to-operate keys
- Important functions can be operated intuitively
- 3 diagnostic LEDs
- Teach object detection
- Teach windows
- Adaptation of switching point
- NO/NC changeover

### Robust design

- Metal plug connector
- Powder-coated die-cast zinc housing with IP67

### Push-pull output

- npn or npn function in one device
- available with axial or radial plug connection



### IO-Link

- Switching point and hysteresis can be set down to the millimeter
- Diagnostic functions
- Identification
- Localization function

# DETAILS AND FUNCTIONS

## LAT-52 / LVHT-52 WITH IO-LINK

	High resolution: LAT52-80IU		Short distance: LAT52-200IU		Universal: LAT52-500IU		Universal: LVHT52-500G3	
	-B5	-RB5	-B5	-RB5	-B5	-RB5	-B4	-RB4
								
Plug connection	axial	radial	axial	radial	axial	radial	axial	radial
Housing dimensions H/W/D	51 / 51 / 17 mm		51 / 51 / 17 mm		51 / 51 / 17 mm		51 / 51 / 17 mm	
Measuring range	30 to 80 mm		50 to 200 mm		50 to 500 mm		50 to 500 mm	
Resolution IO-Link	0.01 mm		0.01 mm		0.1 mm		0.1 mm	
Resolution <sup>1</sup>	0.01 mm		0.02 mm (50 to 100 mm) 0.05 mm (100 to 200 mm)		0.3 mm (50 to 300 mm) 0.5 mm (300 to 500 mm)		0.3 mm (50 to 300 mm) 0.5 mm (300 to 500 mm)	
Reproducibility <sup>1</sup>	0.02 mm		0.05 mm (50 to 100 mm) 0.1 mm (100 to 200 mm)		0.5 mm (50 to 300 mm) 1 mm (300 to 500 mm)		0.5 mm (50 to 300 mm) 1 mm (300 to 500 mm)	
Linearity error <sup>1</sup>	± 0.05 mm		± 0.1 mm (50 to 100 mm) ± 0.2 mm (100 to 200 mm)		± 1 mm (50 to 300 mm) ± 2 mm (300 to 500 mm)		-	
Measuring frequency	1000 Hz (max. 1200 Hz) <sup>2</sup>		750 Hz (max. 1200 Hz) <sup>2</sup>		500 Hz (max. 1200 Hz) <sup>2</sup>			
Switching frequency							100 Hz (max. 600 Hz) <sup>2</sup>	
Switching output					Push-pull/pnp/npn, 100 mA, NO/NC			
Analog output			Current/voltage				-	
Interface			IO-Link V1.1, COM 2   Smart Sensor Profile					
Adjustment Scanning range			Using an operating panel or IO-Link				using   -keys or via IO-Link	
Sensor modes			Standard: General applications Speed: Quick measurement (measuring rate 1200 Hz) Power: For dark objects					
Filters			Average, median – For optimization of measurement					
Laser class			1 in accordance with EN 60825- 1					
Plug connector			M12, 5-pin				M12, 4-pin	

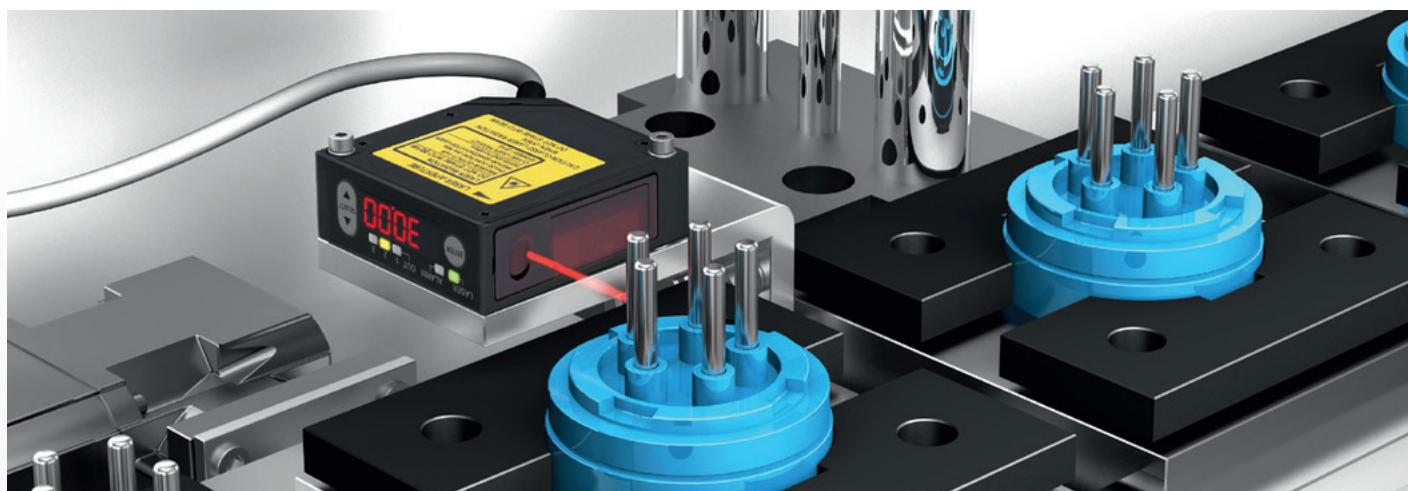
<sup>1</sup> Sensor mode: Standard, average 16

<sup>2</sup> In sensor mode Speed without filter

# FAST AND PRECISE TO THE MICROMETER: MEASURING WITH LAT-61 PRECISE

## HIGHLY PRECISE, FAST DISTANCE MEASUREMENTS INTO THE MICROMETER RANGE ARE THE AREA OF APPLICATION OF THE LAT-61

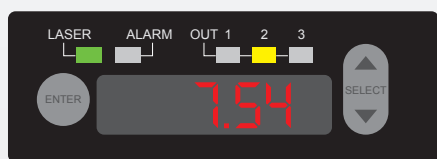
The very small and precise laser spot of LAT-61 distance sensors makes highly precise and fast determination of distances into the micrometer range possible. The integrated display helps with the configuration of the sensor and the display of measured values. Additional LEDs signal the state of the switching outputs.



### Measuring plug contacts

High current plug contacts are mounted in a plastic carrier. The LAT-61 is moved with a linear axis and detects the position of the contacts with high precision.

### Operation directly at the sensor, fast commissioning



- Intuitive configuration via two buttons
- Direct measured value display
- 5 display LEDs for status display
- Fast commissioning

### Electrical connection





- Analog current and voltage output in one device
- pnp or npn function in one device
- 3 switching outputs
- Multifunction input
- Connection line 5 m





# DETAILS AND FUNCTIONS

## LAT-61 PRECISE

	High resolution: LAT 61 K 30/8 IUPN	High resolution: LAT 61 K 50/20 IUPN	High resolution: LAT 61 K 85/40 IUPN	Short distance: LAT 61 K 120/120 IUPN
				
Housing dimensions H/W/D	60 / 57 / 20 mm	60 / 57 / 20 mm	60 / 57 / 20 mm	60 / 57 / 20 mm
Measuring range	26 to 34 mm	40 to 60 mm	65 to 105 mm	60 to 180 mm
Resolution *	0.0005 mm	0.0015 mm	0.0025 mm	0.008 mm
Linearity error*	± 0.008 mm	± 0.02 mm	± 0.04 mm	± 0.12 mm
Measuring frequency	500 to 5000 Hz			
Switching output	pnp/npn (3x), 50 mA, NO/NC			
Analog output	Current/voltage			
Input	Timing/ and multifunction input			
Adjustment scanning range	Using operating panel and display directly at sensor			
Filters	Average – For optimization of measurement			
Laser class	2 in accordance with EN 60825- 1			
Connection	Cable, 5.0 m, 10-pin (shielded, open end)			

\* median value 1024

### SAFE FUNCTION IN PERFORMING APPLICATIONS – LAT-61 PRECISE.

#### HIGHLY PRECISE AND FAST



- Perfectly harmonized optics and electronics
- Distance measurement up to the micrometer range
- Measuring frequencies up to 5,000 Hz

#### 4 MEASURING RANGES



- High resolution: 26 – 34 mm / 0.005 mm resolution
- Short distance: 40 – 60 mm / 0.015 mm resolution
- Universal: 65 – 105 mm / 0.025 mm resolution
- Long distance: 60 – 180 mm / 0.08 mm resolution

#### 4 MEASURING RANGES



- Individual measurement
- Profile measurement
- Extreme value measurement
- Relative measurement

#### DIAGNOSTICS

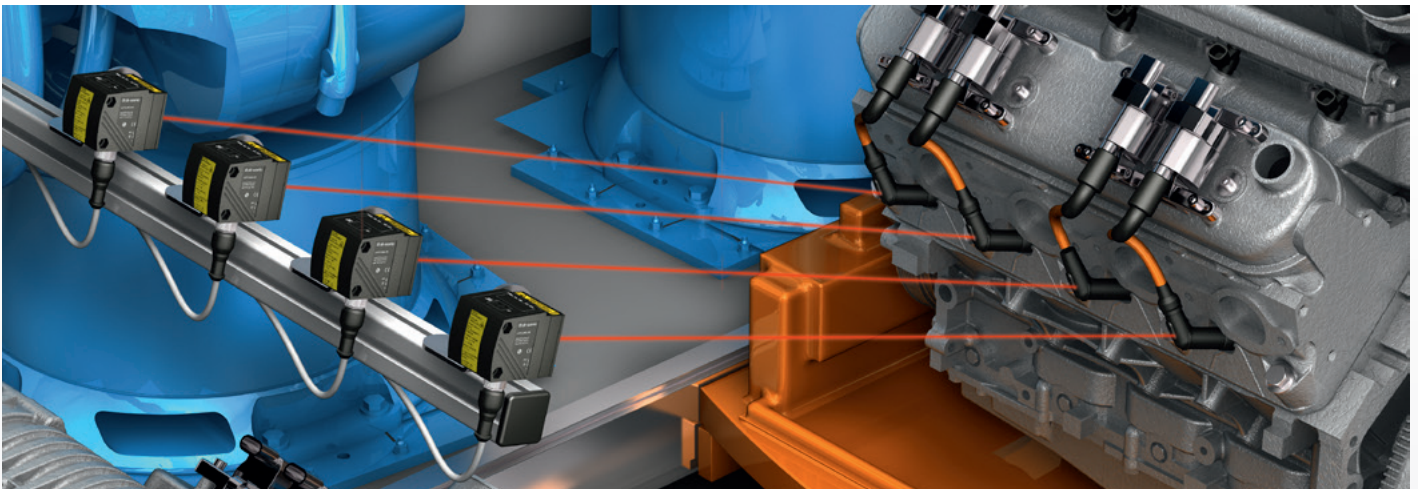


- Measured value display via display
- Display of intensity of measurement signal via display
- Alarm output, display LED alarm

# FOR LONG OPERATING DISTANCES: LAT-45 OPTICAL DISTANCE SENSORS

## OUR UNIVERSAL OPTICAL DISTANCE SENSORS FOR LONG OPERATING DISTANCES UP TO 10,000 MM

The sensors in the LAT-45 series obtain good measurement results for nearly all objects, whether they have bright or dark surfaces. The large measuring range from 200 - 10,000mm and the high level of ambient light security ensure simple orientation and adjustment with the clearly visible laser light spot. The dual operation concept via IO-Link and the operating field guarantees quick commissioning.



### Assembly control on engine block in robot cell

The small laser spot and the high functional safety of the LAT-45 enable distance detection and assembly control of dark spark plugs.

### Operation and measured values display directly on the sensor

- Complete functional scope and configuration via a display
- Quick commissioning (ready to use)
- Simple adjustment and alignment through measured value display
- 6 display LEDs for status display

### Electrical connection

- Analog current and voltage output in one device
- 2 independent switching outputs with window function
- Parallel operation: Switching output and IO-Link communication
- Deactivation of the laser via binary input at pin 5

### Robust

Thanks to a metallic housing and metal plugs - protection class IP67



# TECHNICAL DATA

## LAT-45 WITH IO-LINK

### Laser class 2 LAT45-10MIU-B5

### Laser class 1 LAT45-6MIU-B5

### Switching LAT45-MP3-B5



Housing dimensions H/W/D	45 / 42 / 52 mm	45 / 42 / 52 mm	45 / 42 / 52 mm
Measuring range <sup>1</sup>	200 to 10,000 mm	300 to 6,000 mm	200 to 10,000 mm
Resolution IO-Link	1 mm	1 mm	1 mm
Resolution <sup>2</sup>	1 mm	1 mm	1 mm
Reproducibility <sup>2</sup>	4.5 to 50 mm	11 to 145 mm	4.5 to 50 mm
Linearity error <sup>2</sup>	± 15 to ± 65 mm	± 31 to ± 165 mm	
Measuring frequency	1 to 33 Hz	1 to 33 Hz	
Switching frequency	0.3 to 11 Hz	0.3 to 11 Hz	5 Hz
Switching outputs	2	2	1
	pnp, each 200 mA, NO/NC		
Analog output	Current/voltage		-
Interface	IO-Link V1.1, COM 2   Smart Sensor Profile		
Adjustment scanning range	Using an operating panel or IO-Link		
Laser class	2	1	2
Plug connector	M12, 5-pin		

<sup>1</sup> 90 % Remission    <sup>2</sup> 90 % Remission, measuring frequency 15 Hz

## SAFE FUNCTION IN PERFORMING APPLICATIONS – LAT-45 WITH IO-LINK.



### CONVENIENT CONFIGURATION

- with PLC, remote maintenance, PC or IOL-portable
- Configure switching outputs with mm-precision



### PROCESS DATA

- Measured value in mm and reflectivity on measured object %



### DIAGNOSTICS

- Reflectivity on measured object in %
- Assessment of expected reproducibility in mm



### EASY MAINTENANCE

- Device swapping without manual intervention or specialized knowledge thanks to IO-Link 1.1 with data storage in the master
- Smart Sensor Profile – Fully compliant with standards

**SOLUTIONS. CLEVER. PRACTICAL.**

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