

Displacement Sensors: Highly precise distance measurement



of great importance, for example in the automotive and electronic industries or in robotics.

Displacement sensors are used in production processes in these industries, especially for:

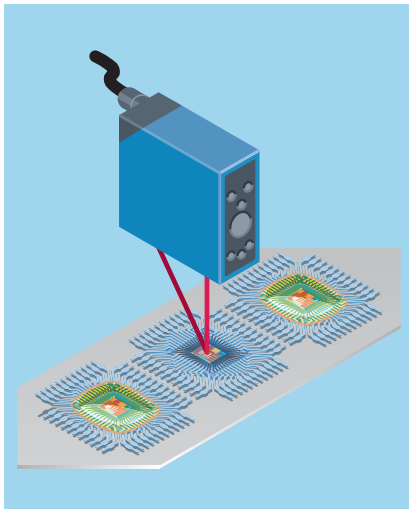
- Quality control,
- Classifying and sorting measurement objects,
- Process control (e.g. positioning).

Due to the wide product range, a suitable sensor can be found for any customer requirement.

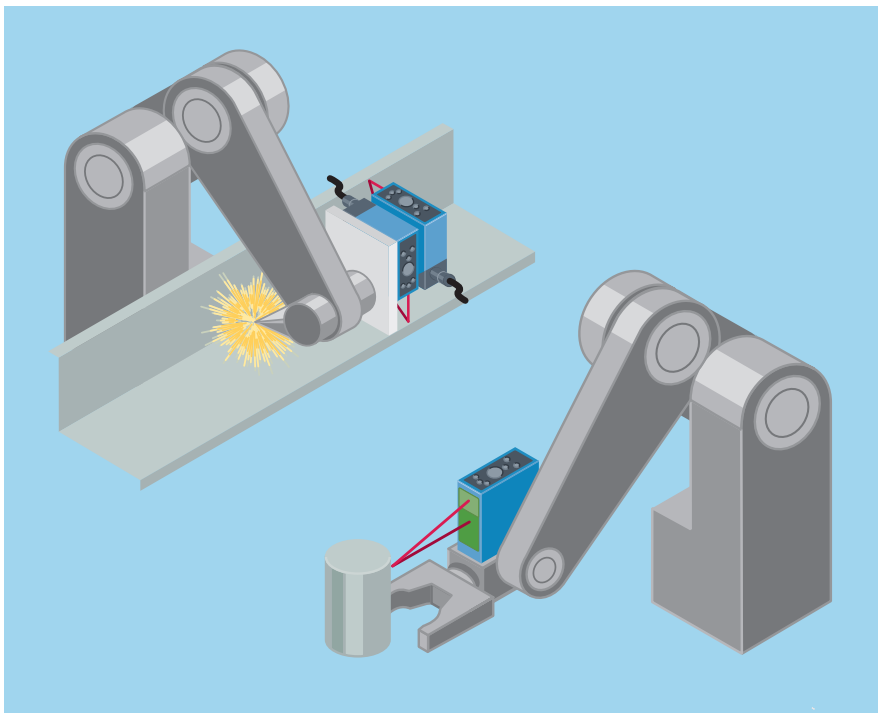
The OD series of displacement sensors are easy-to-operate optical distance sensors based on the triangulation measurement principle. They are mainly used to measure objects in production processes. In addition to measuring objects, their high reliability means that displacement sensors are often used for simple detection of very small objects.

In almost all areas of production, there are components which have to meet strictest requirements in terms of precision and optics. Displacement sensors immediately detect the smallest deviation, depression or unevenness – even to sub mm precision. For this reason, displacement sensors are widely used in industries where quality is

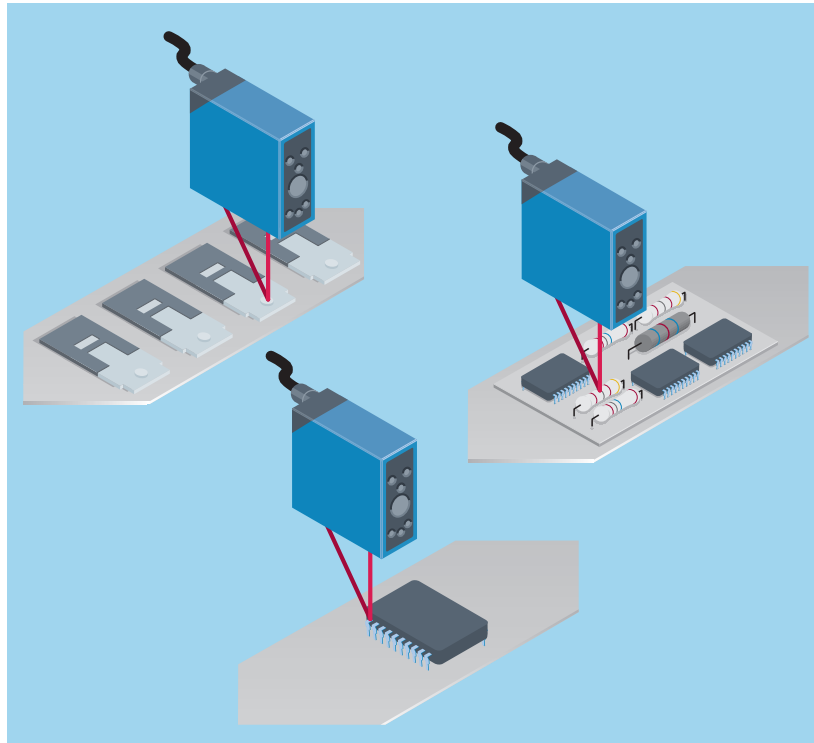
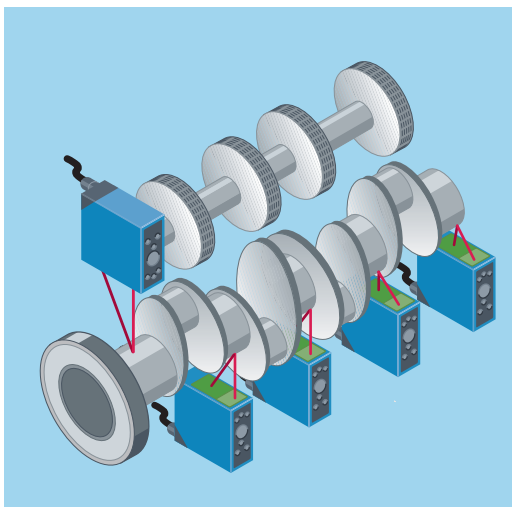
▼ **Semiconductor industry:** Measuring the epoxy resin deposit in IC manufacturing with the OD displacement sensor.



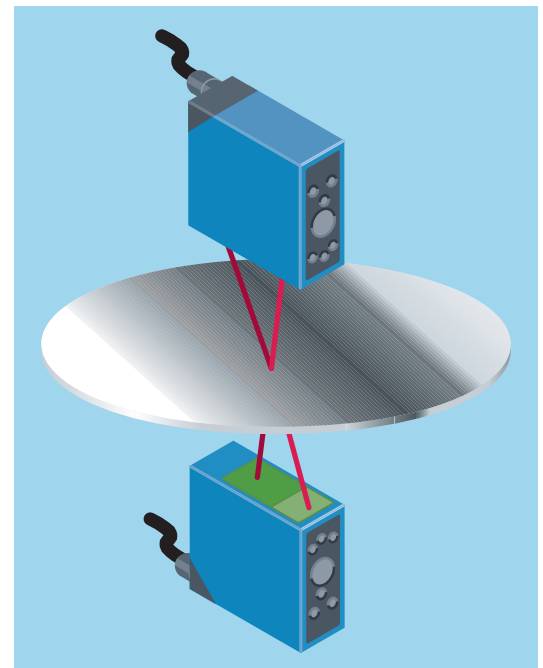
▼ **Robotics:** Alignment and targeted control of robot arms and control of welding robots in special purpose engineering or in mass production with an OD displacement sensor.



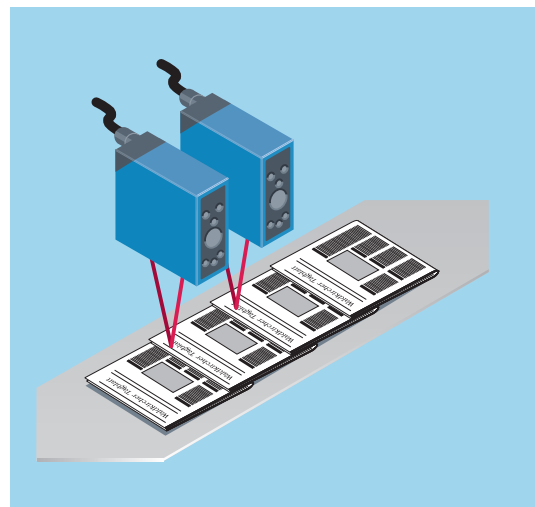
► **Automobile industry:** Tolerance checks of cams and crankshaft bearings with two or more OD displacement sensors in an engine factory.




◀ **Electronics industry:** Checking the IC contacts before assembling boards. Making sure whether electrical components are present.



▲ Thickness check of different materials.



◀ **Paper and packaging industry:** Checking and counting newspaper or (thin) brochures after the folding process.

 **Measuring range**
25 ± 5 mm

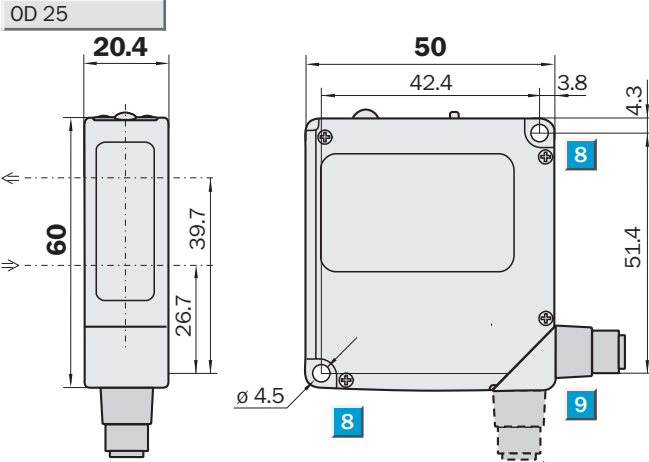
Displacement sensor

- **LED technology:**
Averaging via the light spot =
Measurement of rough surfaces
- **PSD technology:**
Measurement of diffusely reflective
surfaces



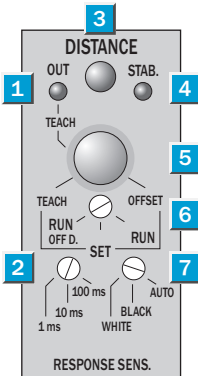
See chapter Accessories
 Cables and connectors

Dimensional drawing



Adjustments possible

- OD 25-05P132
- OD 25-05P830
- OD 25-05N132
- OD 25-05N830

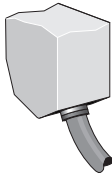


- 1 Teach-in indicator/output indicator
- 2 Response time selector
- 3 Distance indicator
- 4 Stable indicator
- 5 Teach-in button
- 6 Mode selector
- 7 Sensitivity selector
- 8 Mounting hole, \varnothing 4.5 mm
- 9 Connecting cable 2 m (optional 5 m) or M12 plug; 90° rotatable

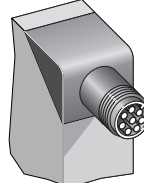
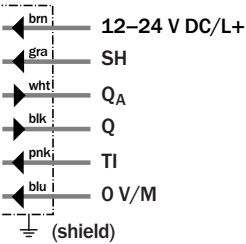
Connection type

- OD 25-05P132
- OD 25-05N132

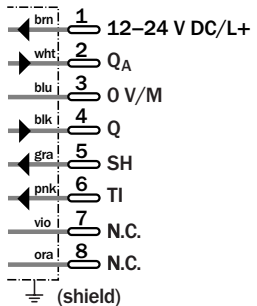
- OD 25-05P830
- OD 25-05N830



6 x 0.2 mm²



8-pin, M12



Technical data		OD	25-05 P132	25-05 N132	25-05 P830	25-05 N830					
Light source	LED, red light ¹⁾										
Measuring range	25 ± 5 mm										
Resolution ²⁾	30 µm at 1 ms										
	10 µm at 10 ms										
	3 µm at 100 ms										
Reproducibility ³⁾	90 µm at 1 ms										
	30 µm at 10 ms										
	9 µm at 100 ms										
Accuracy ⁴⁾	± 100 µm										
Effect of air temperature	±0.01 % FS ⁵⁾ /°C										
Response time ⁶⁾	100/10/1 ms										
Measuring frequency/Output rate	5 kHz										
In- and outputs	PNP										
	NPN										
Output											
1 Analogue current output	4 ... 20 mA ⁷⁾										
1 Control output	Max. 100 mA/DC 30 V										
Input											
1 Sample and Hold input	Synchronisation of the sensor										
1 Teach input	To reference the measurement										
Supply voltage U_S	12 ... 24 V DC, -5 %, +10 %										
Power consumption ⁸⁾	≤ 2.88 W										
Enclosure rating	IP 67										
VDE protection class	III										
Ambient temperature	Operation -10 °C ... +40 °C ⁹⁾										
	Storage -20 °C ... +60 °C										
Sensitivity to ambient light	Max. 3.000 lx (artificial light)										
	Max. 10.000 lx (sun)										
Vibration resistance	10/s ... 55/s ¹⁰⁾										
Shock resistance	50 G (500 m/s ²)										
Weight	150 g (plug), 250 g (cable)										
Material	Housing: PBT										
Connection type	2 m connecting cable (optional 5 m)										
	Plug M12, 8-pin ¹¹⁾										

¹⁾ Wavelength 650 nm

²⁾ Dependent on the selected response time with 6 ... 90% remission

³⁾ Dependent on the selected response time with 6 ... 90% remission and constant framework conditions

⁴⁾ For 18 ... 90% remission; equivalent ± 0.1 % of Full Scale (accuracy for 6% remission = ± 4% of Full Scale)

⁵⁾ Full Scale = Measuring range: OD25-05 ... = 10 mm

⁶⁾ Dependent on the selected response time

⁷⁾ Load impedance max. 300 Ω

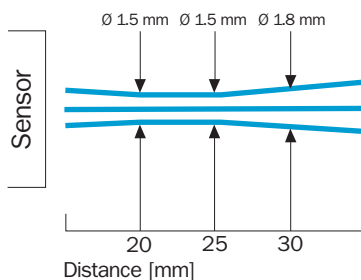
⁸⁾ Including analogue current output

⁹⁾ Non-condensing; do not bend below 0 °C

¹⁰⁾ Amplitude 1.5 mm; 2 h for axes XYZ

¹¹⁾ 2 m cable: 6020663
5 m cable: 6020664

Light spot diameter OD 25-05 (LED)



Order information

Type	Order no.
OD25-05P132	6020643
OD25-05P830	6020647
OD25-05N132	6020642
OD25-05N830	6020646

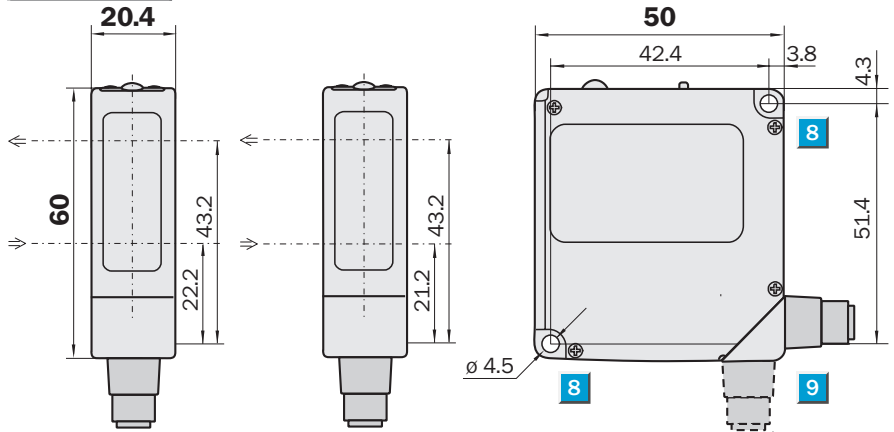
Displacement sensors from the OD series

	Measuring ranges 30 ± 4 50 ± 10 mm/100 ± 35 130 ± 50/250 ± 150 mm
Displacement sensor	

- **Laser technology:**
Measurement or detection of very small objects
- **PSD technology:**
Measurement of diffusely reflective surfaces

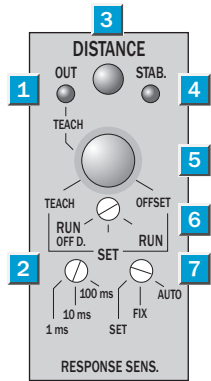


Dimensional drawing	
OD 30	OD 50
OD 100	
OD 130	
OD 250	



Adjustments possible

All types



- 1 Teach-in indicator/output indicator
- 2 Response time selector
- 3 Distance indicator
- 4 Stable indicator
- 5 Teach-in button
- 6 Mode selector
- 7 Sensitivity selector
- 8 Mounting hole, \varnothing 4.5 mm
- 9 Connecting cable 2 m (optional 5 m) or M12 plug; 90° rotatable

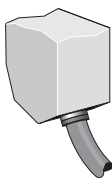
Connection type

OD 30-04P142	OD 50-10N142	OD 30-04P840	OD 50-10P840
OD 30-04N142	OD 100-35P142	OD 30-04N840	OD 50-10N840
OD 50-10P142	OD 100-35N142		

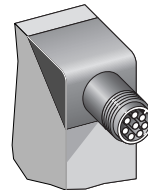
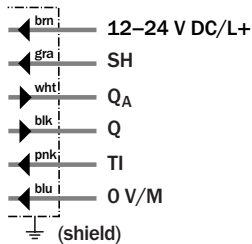


See chapter Accessories

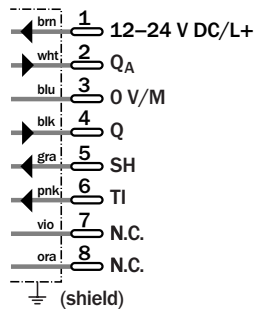
Cables and connectors



6 x 0.2 mm²



8-pin, M12



Technical data		OD	30-04 P142	30-04 N142	30-04 P840	30-04 N840	50-10 P142	50-10 N142	50-10 P840	50-10 N840	100-35 P142	100-35 N142
Light source	Red laser diode 2 (II) ¹⁾											
Measuring range	30 ± 4 mm											
	50 ± 10 mm											
	100 ± 35 mm											
Resolution ²⁾	1 µm											
	3 µm											
	15 µm											
Reproducibility ³⁾	3 µm											
	9 µm											
	45 µm											
Accuracy ⁴⁾	± 160 µm											
	± 400 µm											
	± 1.4 mm											
Effect of air temperature	±0.01 % FS ⁵⁾ /°C											
Response time ⁶⁾	100/10/1 ms											
Measuring frequency/Output rate	5 kHz											
In- and outputs	PNP											
	NPN											
Outputs												
1 Analogue current output	4 ... 20 mA ⁷⁾											
1 Control output	Max. 100 mA/30 V DC											
Inputs												
1 Sample and Hold input	Synchronisation of the sensor											
1 Teach input	To reference the measurement											
Supply voltage V_S	12 ... 24 V DC, -5 %, +10 %											
Power consumption ⁸⁾	≤ 1.8 W											
Enclosure rating	IP 67											
VDE protection class	III											
Ambient temperature	Operation -10 °C ... +40 °C ⁹⁾											
	Storage -20 °C ... +60 °C											
Sensitivity to ambient light	Max. 3.000 lx (artificial light)											
	Max. 10.000 lx (sun)											
Vibration resistance	10/s ... 55/s ¹⁰⁾											
Shock resistance	50 G (500 m/s ²)											
Weight	200 g (plug), 300 g (cable)											
Material	Housing: Zinc											
Connection type	2 m connecting cable (optional 5 m)											
	Plug M12, 8-pin ¹¹⁾											

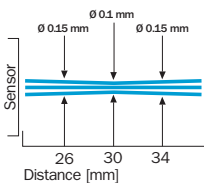
¹⁾ Wavelength 650 nm, max. output 1 mW
²⁾ At a selected response time of 100 ms with 90 % remission
³⁾ At a selected response time of 100 ms with 90 % remission and constant conditions

⁴⁾ For 18 ... 90 % remission; equivalent ± 2 % of Full Scale
⁵⁾ Full Scale = Measuring range:
 OD30-04 ... = 8 mm
 OD50-10 ... = 20 mm
 OD100-35 ... = 70 mm

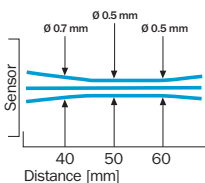
⁶⁾ Dependent on the selected response time
⁷⁾ Load impedance max. 300 Ω
⁸⁾ Including analogue current output
⁹⁾ Non-condensing; do not bend below 0 °C

¹⁰⁾ Amplitude 1.5 mm; 2 h for axes XYZ
¹¹⁾ 2 m cable: 6020663
 5 m cable: 6020664

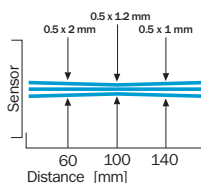
OD 30-04: Light spot diameter



OD 50-10: Light spot diameter



OD 100-35: Light spot diameter



Order information

Type	Order no.
OD30-04N142	6021840
OD30-04P142	6021839
OD30-04N840	6021842
OD30-04P840	6021841
OD50-10N142	6020636
OD50-10P142	6020637
OD50-10N840	6020640
OD50-10P840	6020641
OD100-35N142	6022477
OD100-35P142	6022476

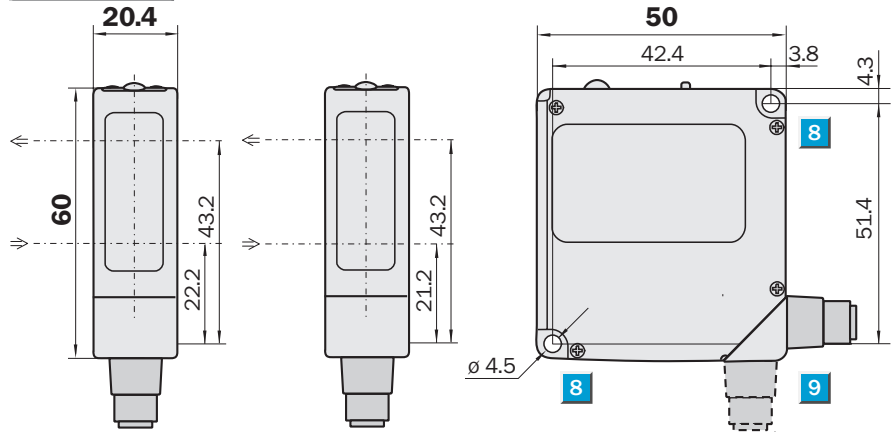
Displacement sensors from the OD series

	Measuring ranges 30 ± 4
	50 ± 10 mm/ 100 ± 35
	130 ± 50 / 250 ± 150 mm
Displacement sensor	

- **Laser technology:**
Measurement or detection of very small objects
- **PSD technology:**
Measurement of diffusely reflective surfaces

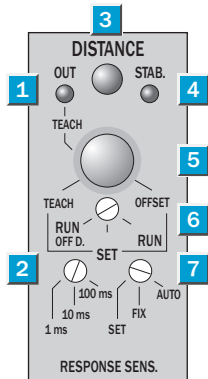


Dimensional drawing	
OD 30	OD 50
OD 100	
OD 130	
OD 250	



Adjustments possible

All types



- 1 Teach-in indicator/output indicator
- 2 Response time selector
- 3 Distance indicator
- 4 Stable indicator
- 5 Teach-in button
- 6 Mode selector
- 7 Sensitivity selector
- 8 Mounting hole, ϕ 4.5 mm
- 9 Connecting cable 2 m (optional 5 m) or M12 plug; 90° rotatable

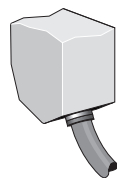
Connection type

OD 130-50P142	OD 250-150P142	OD 100-35P840	OD 130-50N840
OD 130-50N142	OD 250-150N142	OD 100-35N840	OD 250-150P840
		OD 130-50P840	OD 250-150N840

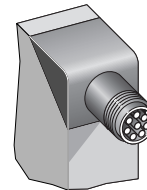
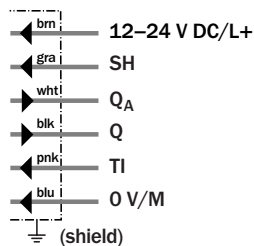


See chapter Accessories

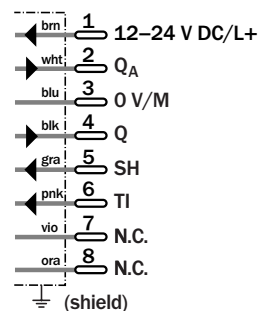
Cables and connectors



6 x 0.2 mm²



8-pin, M12



Technical data		OD	100-35 P840	100-35 N840	130-50 P142	130-50 N142	130-50 P840	130-50 N840	250-150 P142	250-150 N142	250-150 P840	250-150 N840
Light source	Red laser diode 2 (II) ¹⁾											
Measuring range	100 ± 35 mm											
	130 ± 50 mm											
	250 ± 150 mm											
Resolution ²⁾	15 µm											
	20 µm											
	150 µm											
Reproducibility ³⁾	45 µm											
	60 µm											
	450 µm											
Accuracy ⁴⁾	± 1.4 mm											
	± 2 mm											
	± 9 mm											
Effect of air temperature	±0.01 % FS ⁵⁾ /°C											
Response time ⁶⁾	100/10/1 ms											
Measuring frequency/Output rate	5 kHz											
In- and outputs	PNP											
	NPN											
Output												
1 Analogue current output	4 ... 20 mA ⁷⁾											
1 Control output	max. 100 mA/DC 30 V											
Inputs												
1 Sample and Hold input	Synchronisation of the sensor											
1 Teach input	To reference the measurement											
Supply voltage V_S	12 ... 24 V DC, -5 %, +10 %											
Power consumption ⁸⁾	≤ 1.8 W											
Enclosure rating	IP 67											
VDE protection class	III											
Ambient temperature	Operation -10 °C ... +40 °C ⁹⁾											
	Storage -20 °C ... +60 °C											
Sensitivity to ambient light	Max. 3.000 lx (artificial light)											
	Max. 10.000 lx (sun)											
Vibration resistance	10/s ... 55/s ¹⁰⁾											
Shock resistance	50 G (500 m/s ²)											
Weight	200 g (plug), 300 g (cable)											
Material	Housing: Zinc											
Connection type	2 m connecting cable (optional 5 m)											
	Plug M12, 8-pin ¹¹⁾											

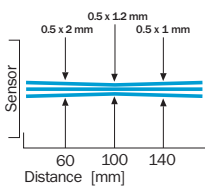
¹⁾ Wavelength 650 nm, max. output 1 mW
²⁾ At a selected response time of 100 ms with 90 % remission
³⁾ At a selected response time of 100 ms with 90 % remission and constant conditions

⁴⁾ For 6 ... 90 % (OD250-150, 16 ... 90 %) Remission; equivalent ± 2 % of Full Scale (bei OD250-150 ± 3 %)
⁵⁾ Full Scale = Measuring range:
 OD100-35 ... = 70 mm
 OD130-50 ... = 100 mm
 OD250-150 ... = 300 mm

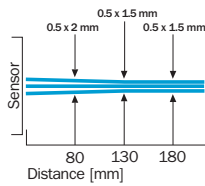
⁶⁾ Dependent on the selected response time
⁷⁾ Load impedance max. 300 Ω
⁸⁾ Including analogue current output
⁹⁾ Non-condensing; do not bend below 0 °C

¹⁰⁾ Amplitude 1.5 mm; 2 h for axes XYZ
¹¹⁾ 2 m cable: 6020663
 5 m cable: 6020664

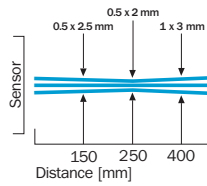
OD 100-35: Light spot diameter



OD 130-50: Light spot diameter



OD 250-150: Light spot diameter



Order information

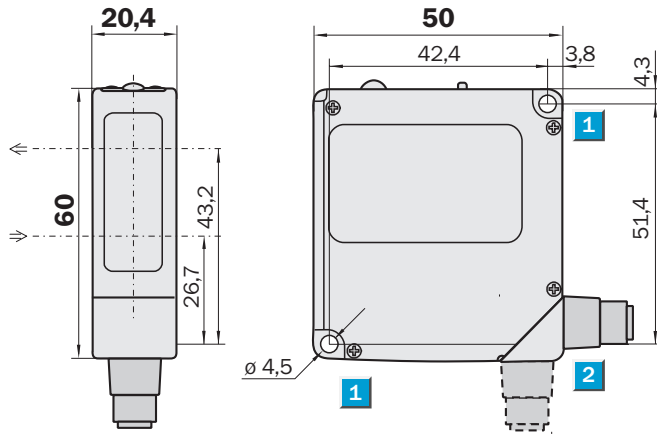
Type	Order no.
OD100-35N840	6022479
OD100-35P840	6022478
OD130-50N142	6021848
OD130-50P142	6021847
OD130-50N840	6021850
OD130-50P840	6021849
OD250-150N142	6021852
OD250-150P142	6021851
OD250-150N840	6021854
OD250-150P840	6021853

	Measurement ranges
	$30 \pm 4 / 50 \pm 10 / 80 \pm 15 / 100 \pm 40 / 250 \pm 150$ mm
Displacement sensor	

- **Laser Technology**
- **CMOS Technology:**
 - object independent measuring: shiny, dark
- **Stand-alone Device:**
 - no additional outlay caused by external controller necessary
- **Setting and display on the device – quick, fast and easy set up**

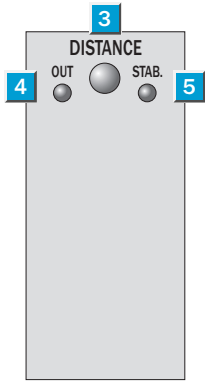


Dimensional drawing				
OD 30	OD 50	OD 80	OD 100	OD 250

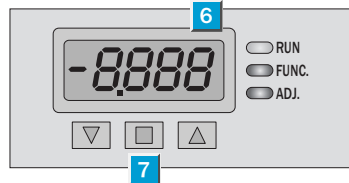


Adjustments possible

All types

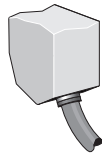


- 1 Mounting hole, \varnothing 4.5 mm
- 2 2 m cable (5 m optional) or M12 plug; 90° rotatable
- 3 Distance indicator
- 4 Output indicator (OUT)
- 5 Stability indicator
- 6 Display
- 7 Mode buttons

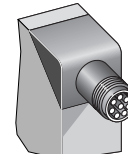


Connection type

OD 30-04P152	OD 30-04N152	OD 30-04P850	OD 30-04N850
OD 50-10P152	OD 50-10N152	OD 50-10P850	OD 50-10N850
OD 80-15P152	OD 80-15N152		



6 x 0.2 mm²

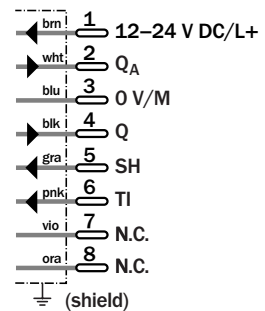
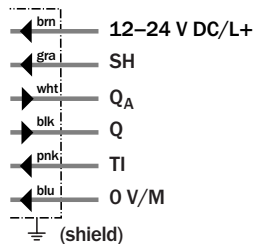


8-pin, M12



See chapter Accessories

Cables and connectors



Technical data		OD	30-04 P152	30-04 N152	30-04 P850	30-04 N850	50-10 P152	50-10 N152	50-10 P850	50-10 N850	80-15 P152	80-15 N152
Light source	Red laser diode 2 (II) ¹⁾											
Measuring range	30 ± 4 mm											
	50 ± 10 mm											
	80 ± 15 mm											
Resolution ²⁾	4 µm											
	10 µm											
	15 µm											
Reproducibility ³⁾	12 µm											
	30 µm											
	45 µm											
Accuracy ⁴⁾	± 80 µm											
	± 200 µm											
	± 300 µm											
Effect of air temperature	±0.08 % FS ⁵⁾ /°C											
Response time ⁶⁾	2 ms											
Measuring frequency/Output rate	1 kHz											
In- and outputs	PNP											
	NPN											
Output												
1 Analogue current output	4 ... 20 mA ⁷⁾											
1 Control output	max. 100 mA/30 V DC											
Inputs												
1 Sample and Hold input	Synchronisation of the sensor											
1 Teach input	To reference the measurement											
Display type	Alphanumeric display, 4-digit											
Additional features	Averaging functions											
	Autom./manual sensitivity setting											
	Timer functions											
	3 Memory banks											
Supply voltage V_S	12 ... 24 V DC, -5 %, +10 %											
Power consumption ⁸⁾	≤ 2.88 W											
Enclosure rating	IP 67											
VDE protection class	III											
Ambient temperature	Operation -10 °C ... +40 °C ⁹⁾											
	Storage -20 °C ... +60 °C											
Sensitivity to ambient light	Max. 3.000 lx (artificial light)											
	Max. 10.000 lx (sun)											
Vibration resistance	10/s ... 55/s ¹⁰⁾											
Shock resistance	50 G (500 m/s ²)											
Weight	200 g (plug), 300 g (cable)											
Material	Housing: Zinc											
Connection type	2 m connecting cable (optional 5 m)											
	Plug M12, 8-pin ¹¹⁾											

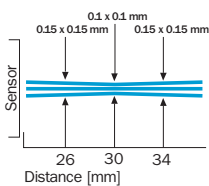
¹⁾ Wavelength 650 nm, max. output 1 mW
²⁾ Averaging: 64 measurements
 Object: 6 ... 90% remission
³⁾ With constant environmental conditions;
 Averaging: 64 measurements

⁴⁾ For 18 ... 90% remission; equivalent
 ± 1 % of Full Scale
⁵⁾ Full Scale = Measuring range:
 OD30-04 ... = 8 mm
 OD50-10 ... = 20 mm
 OD80-15 ... = 30 mm

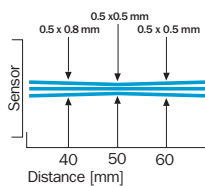
⁶⁾ Without averaging and manually selected
 sensitivity
⁷⁾ Load impedance max. 300 Ω
⁸⁾ Including analogue current output
⁹⁾ Non-condensing; do not bend below
 0 °C

¹⁰⁾ Amplitude 1.5 mm;
 2 h for axes XYZ
¹¹⁾ 2 m cable: 6020663
 5 m cable: 6020664

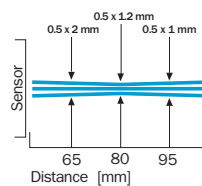
OD30-04: Light spot diameter



OD50-10: Light spot diameter



OD80-15: Light spot diameter



Order information

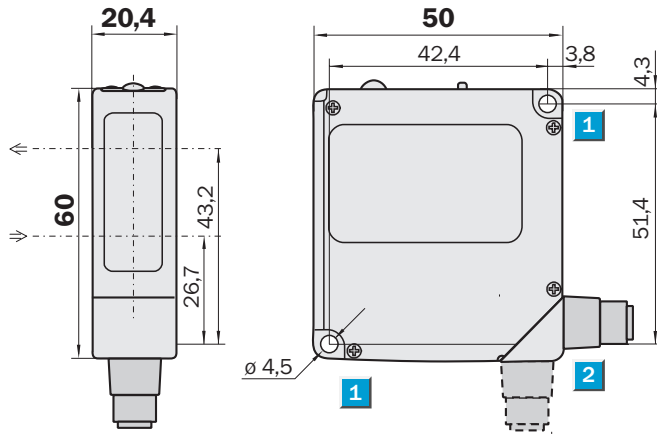
Type	Order no.
OD30-04N152	6025033
OD30-04P152	6025031
OD30-04N850	6025034
OD30-04P850	6025032
OD50-10N152	6025037
OD50-10P152	6025035
OD50-10N850	6025038
OD50-10P850	6025036
OD80-15N152	6025041
OD80-15P152	6025039

	Measurement ranges
	$30 \pm 4 / 50 \pm 10 / 80 \pm 15 / 100 \pm 40 / 250 \pm 150$ mm
Displacement sensor	

- **Laser Technology**
- **CMOS Technology:**
 - object independent measuring: shiny, dark
- **Stand-alone Device:**
 - no additional outlay caused by external controller necessary
- **Setting and display on the device – quick, fast and easy set up**

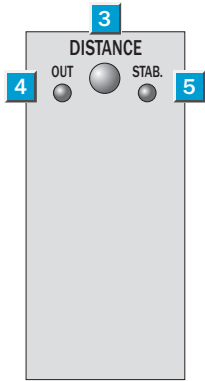


Dimensional drawing				
OD 30	OD 50	OD 80	OD 100	OD 250

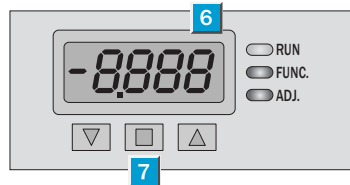


Adjustments possible

All types

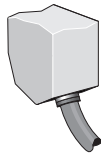


- 1 Mounting hole, $\varnothing 4.5$ mm
- 2 2 m cable (5 m optional) or M12 plug; 90° rotatable
- 3 Distance indicator
- 4 Output indicator (OUT)
- 5 Stability indicator
- 6 Display
- 7 Mode buttons

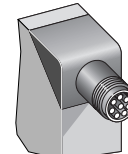


Connection type

OD100-40P152	OD100-40N152	OD 80-15P850	OD 80-15N850
OD250-150P152	OD250-150N152	OD 100-40P850	OD 100-40N850
		OD 250-150P850	OD 250-150N850



6 x 0.2 mm²

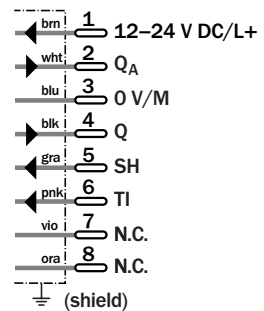
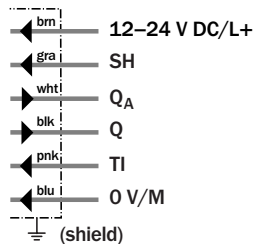


8-pin, M12



See chapter Accessories

Cables and connectors



Technical data		OD	80-15 P850	80-15 N850	100-40 P152	100-40 N152	100-40 P850	100-40 N850	250-150 P152	250-150 N152	250-150 P850	250-150 N850
Light source	Red laser diode 2 (II) ¹⁾											
Measuring range	80 ± 15 mm											
	100 ± 40 mm											
	250 ± 150 mm											
Resolution ²⁾	15 µm											
	35 µm											
	75 µm											
Reproducibility ³⁾	45 µm											
	105 µm											
	225 µm											
Accuracy ⁴⁾	± 300 µm											
	± 800 µm											
	± 6 mm											
Effect of air temperature	±0.08 % FS ⁵⁾ /°C											
Response time ⁶⁾	2 ms											
Measuring frequency/Output rate	1 kHz											
In- and outputs	PNP											
	NPN											
Output												
1 Analogue current output	4 ... 20 mA ⁷⁾											
1 Control output	max. 100 mA/DC 30 V											
Inputs												
1 Sample and Hold input	Synchronisation of the sensor											
1 Teach input	To reference the measurement											
Display type	Alphanumeric display, 4-digit											
Additional features	Averaging functions											
	Autom./manual sensitivity setting											
	Timer functions											
	3 Memory banks											
Supply voltage V_S	12 ... 24 V DC, -5 %, +10 %											
Power consumption ⁸⁾	≤ 2.88 W											
Enclosure rating	IP 67											
VDE protection class	III											
Ambient temperature	Operation -10 °C ... +40 °C ⁹⁾											
	Storage -20 °C ... +60 °C											
Sensitivity to ambient light	max. 3.000 lx (artificial light)											
	max. 10.000 lx (sun)											
Vibration resistance	10/s ... 55/s ¹⁰⁾											
Shock resistance	50 G (500 m/s ²)											
Weight	200 g (plug), 300 g (cable)											
Material	Housing: Zinc											
Connection type	2 m connecting cable (optional 5 m)											
	Plug M12, 8-pin ¹¹⁾											

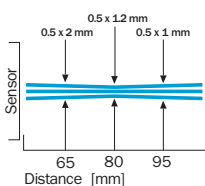
¹⁾ Wavelength 650 nm, max. output 1 mW
²⁾ Averaging: 64 measurements
 Object: 6 ... 90 % remission
³⁾ With constant environmental conditions;
 Averaging: 64 measurements

⁴⁾ For 18 ... 90 % remission; equivalent
 ± 1 % of Full Scale (for OD250-150 ± 2 %)
⁵⁾ Full Scale = Measuring range:
 OD80-15 ... = 30 mm
 OD100-40 ... = 80 mm
 OD250-150 ... = 300 mm

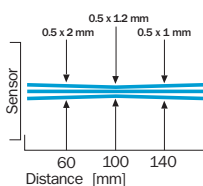
⁶⁾ Without averaging and manually selected
 sensitivity
⁷⁾ Load impedance max. 300 Ω
⁸⁾ Including analogue current output
⁹⁾ Non-condensing; do not bend below
 0 °C

¹⁰⁾ Amplitude 1.5 mm;
 2 h for axes XYZ
¹¹⁾ 2 m cable: 6020663
 5 m cable: 6020664

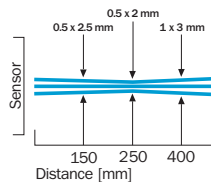
OD80-15: Light spot diameter



OD100-40: Light spot diameter



OD250-150: Light spot diameter



Order information

Type	Order no.
OD80-15N850	6025042
OD80-15P850	6025040
OD100-40N152	6025045
OD100-40P152	6025043
OD100-40N850	6025046
OD100-40P850	6025044
OD250-150N152	6028095
OD250-150P152	6028094
OD250-150N850	6028097
OD250-150P850	6028096

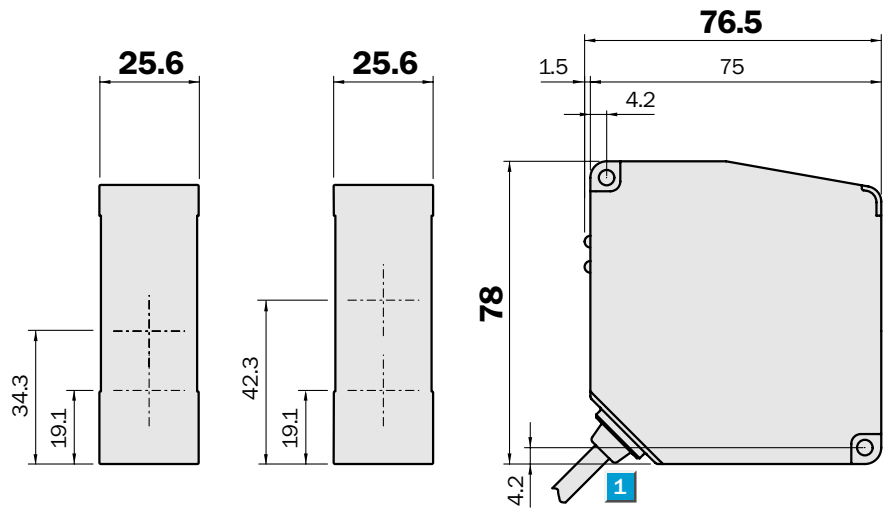
Displacement sensor OD Max, standard, sensor head

	Measurement range
	30 ± 5 / 85 ± 20 /
	350 ± 100 mm
Displacement Sensor	

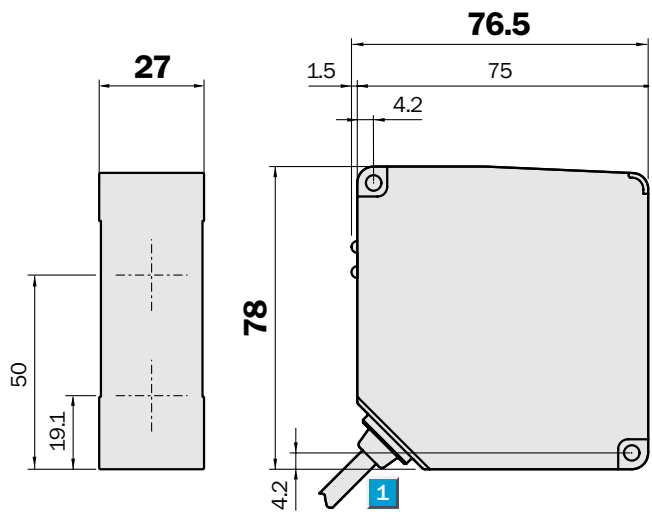
- Laser Technology
- CMOS Technology: object independent measuring from shiny to dark
- High measurement accuracy
- High-End-System: 1 or 2 sensor heads per amplifier unit
- 4 analogue outputs and 5 switching outputs
- RS 232C interface

Dimensional drawing

OD30-05T1	OD85-20T1
-----------	-----------



OD350-100T1



- 1** Cable Ø 5 mm/0.5 m with 10-pin connector
- 2** Distance indicator LED
- 3** Laser on LED

Adjustments possible

All types

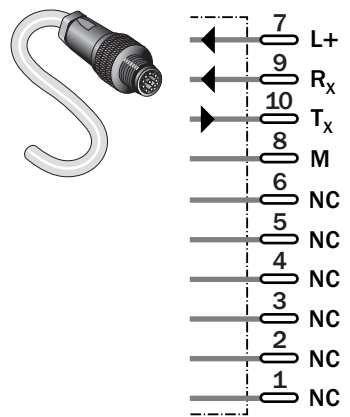
Displacement Sensor

DISTANCE **2**

LASER ON **3**

Connection types

All types	10-pin
-----------	--------



See chapter Accessories
Cables and connectors

Technical Data		OD	30-05T1	85-20T1	350-100T1							
Light source	Red laser diode 2 (II) ¹⁾											
Measuring range	30 ± 5 mm											
	85 ± 20 mm											
	350 ± 100 mm											
Measuring frequency	10 kHz											
Resolution ²⁾	1 µm											
	5 µm											
	50 µm											
Reproducibility ³⁾	3 µm											
	15 µm											
	150 µm											
Accuracy ⁴⁾	± 10 µm											
	± 40 µm											
	± 200 µm											
Supply voltage V _S	Supplied from the amplifier unit											
Temperature drift	±0.01 % FS ⁵⁾ /°C											
Enclosure rating	IP 67											
VDE protection class	III											
Ambient temperature T _A	Operation -10 °C ... +45 °C ⁶⁾											
	Storage -20 °C ... +60 °C											
Ambient light limit	max. 3.000 lx (fluorescent light)											
	max. 10.000 lx (sun light)											
Vibration resistance	10/s ... 55/s ⁷⁾											
Shock resistance	50 G (500 m/s ²)											
Weight	250 g (including 50 cm cable)											
Material	Sensor head housing: Diecast aluminium											
Cable extension	0.5 m pig tail with connector ⁸⁾											

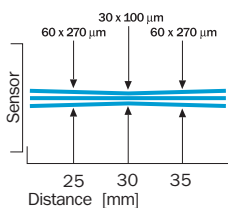
¹⁾ Wavelength 650 nm, max. output 1 mW
²⁾ Averaging: 256 measurement;
 Object: 90% remission;
 Distance: middle distance

³⁾ With constant environmental conditions;
 Averaging: 256 measurements;
 Object: 90% remission
⁴⁾ Equivalent ± 0.1 % of Full Scale for
 6 ... 90 % remission

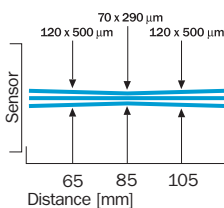
⁵⁾ Full Scale:
 OD30-05T1 = 10 mm
 OD85-20T1 = 40 mm
 OD350-100T1 = 200 mm
⁶⁾ Non-condensing

⁷⁾ Double amplitude 1.5 mm, 2 h for
 XYZ axes
⁸⁾ Extendable by cable to max. 10 m

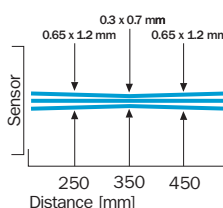
OD30-05T1: Lightspot diameter



OD85-20T1: Lightspot diameter



OD350-100T1: Lightspot diameter



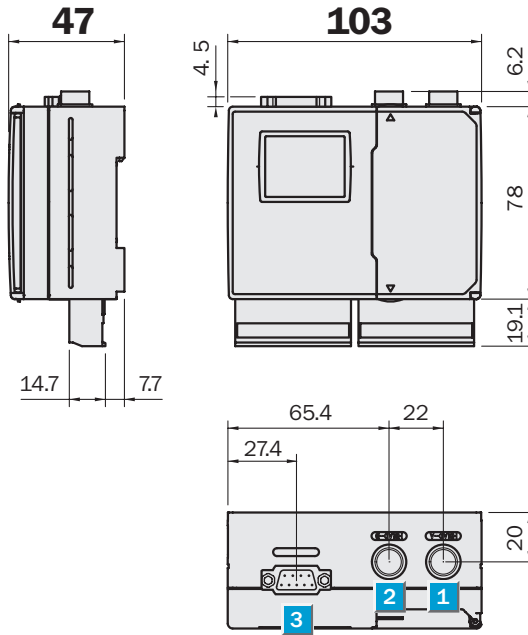
Order information

Type	Order no.
OD30-05T1	6028959
OD85-20T1	6028958
OD350-100T1	6028957

	Measurement range
	$30 \pm 5 / 85 \pm 20 /$
	$350 \pm 100 \text{ mm}$
Displacement Sensor	

- Laser Technology
- CMOS Technology: object independent measuring from shiny to dark
- High measurement accuracy
- High-End-System: 1 or 2 sensor heads and amplifier unit
- 4 analogue outputs and 5 switching outputs
- RS 232C interface

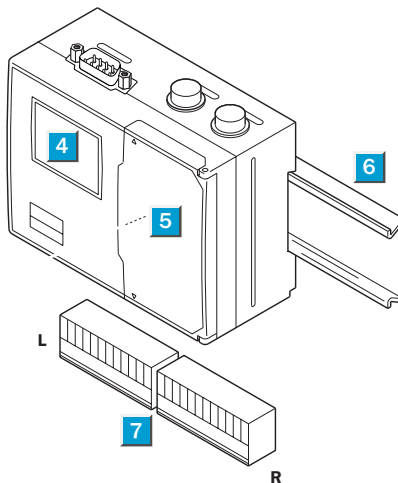
Dimensional drawing



Adjustments possible

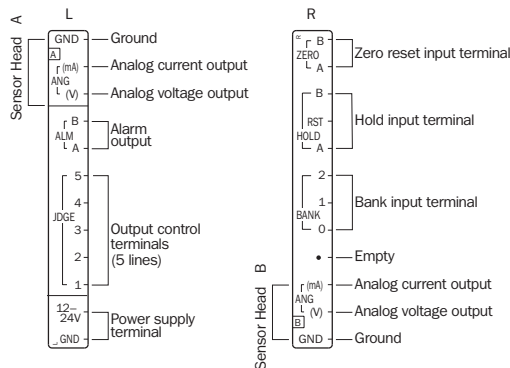
AOD-P1
AOD-N1

- 1 Sensor head A connection port
- 2 Sensor head B connection port
- 3 RS 232C interface
- 4 LCD display
- 5 Operation panel
- 6 DIN rail
- 7 Terminal board (detachable)

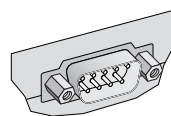


Connection terminal board

AOD-P1
AOD-N1



Connector pinning RS 232C



Female connector, 9-pin

- 1 DCD – Data Carrier Detect
- 2 RXD – Receive Data
- 3 TXD – Transmit Data
- 4 DTR – Data Terminal Ready
- 5 SG – Signal Ground
- 6 DSR – Data Set Ready
- 7 RTS – Request to Send
- 8 CTS – Clear to Send
- 9 RI – (Ring Indicator)

See chapter Accessories

Cables and connectors

Technical Data		AOD-	P1	N1								
In- and outputs	PNP											
	NPN											
Response time ¹⁾	0.5 ms											
Output rate	10 kHz											
Supply voltage V_S	12 ... 24 V DC \pm 10 %											
Power consumption ²⁾	6 W											
Outputs												
2 Analogue voltage outputs ³⁾	-5 ... + 5 V ⁴⁾											
2 Analogue current outputs ³⁾	4 ... 20 mA ⁵⁾											
5 Switching outputs ⁶⁾	Max. 100 mA/24 V DC ⁷⁾											
2 Alarm outputs	To indicate failed measurements											
Data interface	RS 232C (male)											
Inputs												
3 Bank inputs	External memory bank selection											
3 Hold inputs	Holding the measurement/Laser off											
2 Zero reset inputs	To reference the measurement											
Additional features												
	Arithmetical calculations											
	Averaging functions											
	Frequency filters											
	Autom./manual sensitivity setting											
	Timer functions											
	8 Memory banks											
	Hold functions											
Display type	LCD colour display											
Enclosure rating	IP 20											
VDE protection class	III											
Ambient temperature T_A	Operation -10 °C ... +45 °C ⁸⁾											
	Storage -20 °C ... +60 °C											
Vibration resistance	10/s ... 55/s ⁹⁾											
Shock resistance	20 G (196 m/s ²)											
Weight	240 g (including terminal board)											
Material	Housing	Polycarbonate										
	Terminal board	Nylon 66										
Connection type	Terminal board											

¹⁾ Without averaging and manually selected sensitivity

²⁾ 1 for each sensor head, or 1 for the calculation result.

³⁾ Output impedance max. 1 k Ω , Resolution 1 mV

⁴⁾ Output impedance max. 300, Resolution 1.5 μ A

⁵⁾ For the calculation result

⁶⁾ Residual voltage max. 1.8 V

⁷⁾ When connected with 2 sensor heads. Including analogue current output.

⁸⁾ Non condensing

⁹⁾ Double amplitude 1.5 mm, 2 h for XYZ axes


Order information

OD Max™ Amplifier unit

Type	Order no.
AOD-P1	6028960
AOD-N1	6028961

Accessories, extension cable

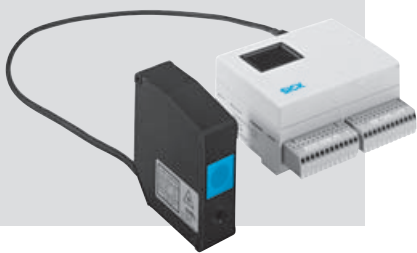
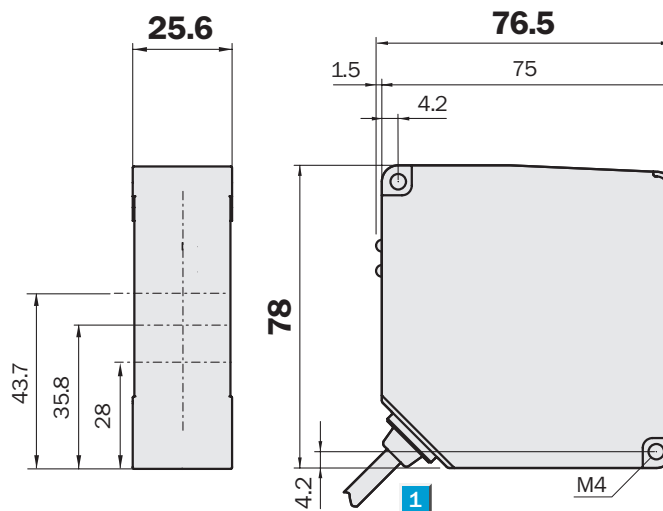
Type	Order no.	Cable length
DSL-1210-G02M	6028943	2 m
DSL-1210-G05M	6028944	5 m

	Measuring range 25 ± 1 mm
Displacement sensor	

- Laser Technology
- Measurement of transparent materials
- High measurement accuracy
- High-End-System: 1 or 2 sensor heads per amplifier unit
- 4 analogue outputs and 5 switching outputs
- RS 232C interface

Dimensional drawing

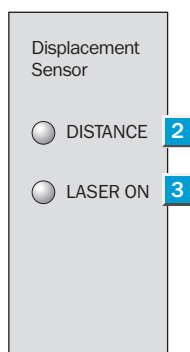
OD25-01T1



- 1** Cable Ø 5 mm/0.5 m with 10-pin connector
- 2** Distance indicator LED
- 3** Laser on LED

Adjustments possible

All types



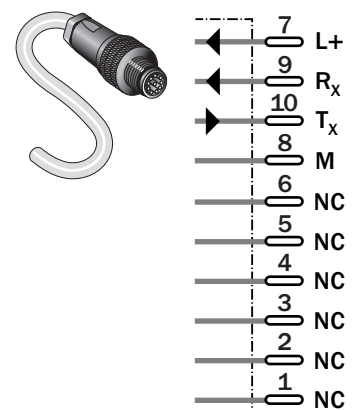
See chapter Accessories

Cables and connectors

Connection types

All types

10-pin



Technical data		OD	25-01T1										
Light source	Red laser diode 2 (II) ¹⁾												
Measuring range	25 ± 1 mm												
Resolution ²⁾	0.1 µm												
Reproducibility ³⁾	0.3 µm												
Accuracy ⁴⁾	± 2 µm												
Effect of air temperature	±0.05 % FS ⁵⁾ /°C												
Measuring frequency	10 kHz												
Supply voltage V_S	Supplied from the amplifier unit												
Enclosure rating	IP 67												
VDE protection class	III												
Ambient temperature	Operation -10 °C ... +45 °C ⁶⁾ Storage -20 °C ... +60 °C												
Sensitivity to ambient light	max. 3,000 lx (artificial light) max. 10,000 lx (sun)												
Vibration resistance	10/s ... 55/s ⁷⁾												
Shock resistance	50 G (500 m/s ²)												
Weight	250 g (incl. 50 cm cable)												
Material	Sensor-Housing: Diecast aluminium												
Connection type	0.5 m pig tail with connector ⁸⁾												

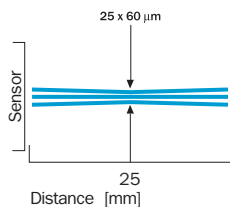
¹⁾ Wavelength 650 nm, max. output 390 µW
²⁾ Averaging: 256 measurement; Object: 90% remission; Distance: middle distance

³⁾ With constant environmental conditions; Averaging: 256 measurements; Object: 90% remission

⁴⁾ On Glass; Parallel alignment of the active sensor surface to the object surface; Equivalent ± 0.1 % of Full Scale
⁵⁾ Full Scale = Measuring range: OD25-01T1 = 2 mm

⁶⁾ Non-condensing
⁷⁾ Double amplitude 1.5 mm, 2 h for XYZ axes
⁸⁾ Extendable by cable to max. 10 m


Light spot diameter OD25-01T1



Order information

Type	Order no.
OD25-01T1	6030977

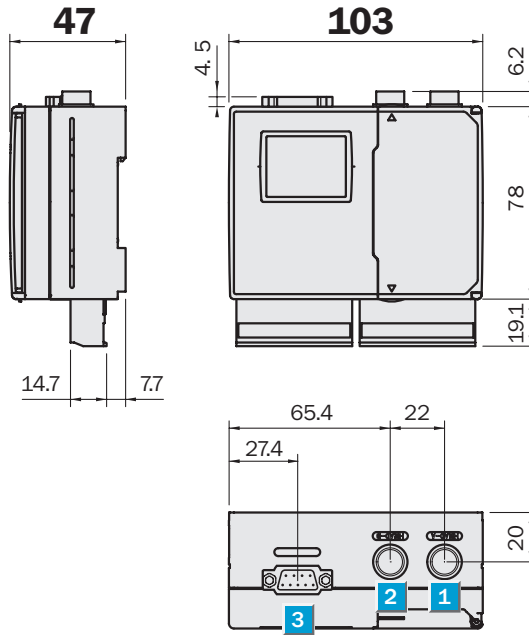
Displacement sensor OD Max Transparent, amplifier unit

 **Measuring range**
25 ± 1 mm

Displacement sensor

- Laser Technology
- Measurement of transparent materials
- High measurement accuracy
- High-End-System: 1 or 2 sensor heads and amplifier unit
- 4 analogue outputs and 5 switching outputs
- RS 232C interface

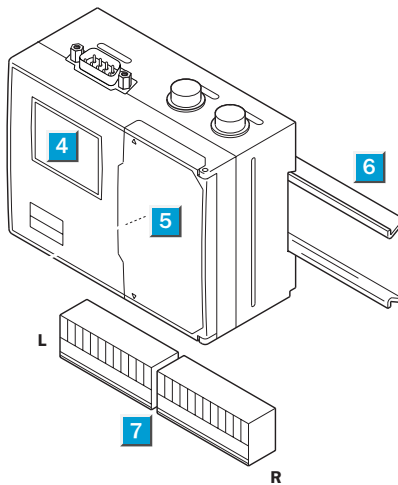
Dimensional drawing



Adjustments possible

- AODG-P1
- AODG-N1

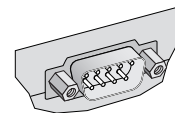
- 1 Sensor head A connection port
- 2 Sensor head B connection port
- 3 RS 232C interface
- 4 LCD display
- 5 Operation panel
- 6 DIN rail
- 7 Terminal board (detachable)



Connection terminal board

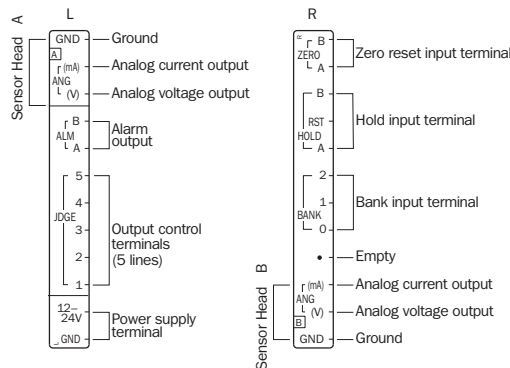
- AODG-P1
- AODG-N1

Connector pinning RS 232C



Female connector, 9-pin

- 1 DCD – Data Carrier Detect
- 2 RXD – Receive Data
- 3 TXD – Transmit Data
- 4 DTR – Data Terminal Ready
- 5 SG – Signal Ground
- 6 DSR – Data Set Ready
- 7 RTS – Request to Send
- 8 CTS – Clear to Send
- 9 RI – (Ring Indicator)



See chapter Accessories

Cables and connectors

Technical data		AODG-	P1	N1								
Response time ¹⁾	0.5 ms											
Output rate	10 kHz											
In- and outputs	PNP											
	NPN											
Outputs												
2 Analogue voltage outputs ³⁾	-5 ... + 5 V ⁴⁾											
2 Analogue current outputs ³⁾	4 ... 20 mA ⁵⁾											
5 Switching outputs ⁶⁾	Max. 100 mA/30 V DC ⁷⁾											
2 Alarm outputs	To indicate failed measurements											
Data interface	RS 232C (male)											
Inputs												
3 Bank inputs	External memory bank selection											
3 Hold inputs	Holding the measurement/Laser off											
2 Zero reset inputs	To reference the measurement											
Display type	LCD colour display											
Additional features	Arithmetical calculations											
	Averaging functions											
	Frequency filters											
	Autom./manual sensitivity setting											
	Timer functions											
	8 Memory banks											
	Hold functions											
Supply voltage V_S	12 ... 24 V DC -5%, + 10%											
Power consumption ⁷⁾	6 W											
Enclosure rating	IP 20											
VDE protection class	III											
Ambient temperature	Operation -10 °C ... +45 °C ⁸⁾											
	Storage -20 °C ... +60 °C											
Vibration resistance	10/s ... 55/s ⁹⁾											
Shock resistance	20 G (196 m/s ²)											
Weight	240 g (including terminal board)											
Material	Housing	Polycarbonate										
	Terminal board	Nylon 66										
Connection type	Terminal board											

¹⁾ Without averaging and manually selected sensitivity

²⁾ 1 for each sensor head, or 1 for the calculation result.

³⁾ Load impedance max. 1 kΩ, resolution 1 mV

⁴⁾ Load impedance max. 300, resolution 1,5 μA

⁵⁾ For the calculation result

⁶⁾ Residual voltage max. 1.8 V

⁷⁾ When connected with 2 sensor heads. Including analogue current output.

⁸⁾ Non-condensing

⁹⁾ Double amplitude 1.5 mm, 2 h for XYZ axes

Order information

OD Max™ Amplifier unit

Type	Order no.
AODG-P1	6030978
AODG-N1	6030979

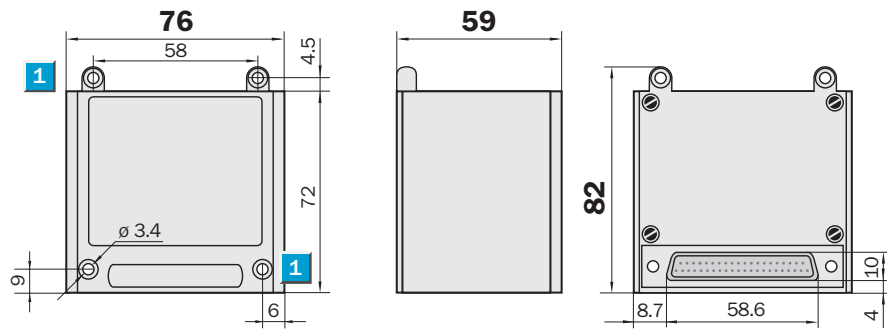
Accessories, extension cable

Type	Order no.	Kabellänge
DSL-1210-G02M	6028943	2 m
DSL-1210-G05M	6028944	5 m

Displacement sensor

- Measuring value processing for difficult applications
- RS 232 and Profibus

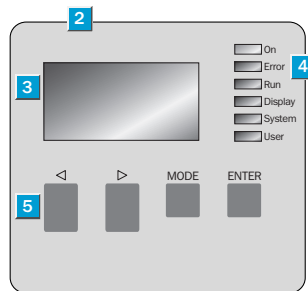
Dimensional drawing



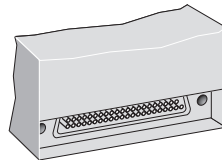
Adjustments possible

ODC 100-P120

- 1 Mounting hole, \varnothing 3.4 mm
- 2 Electronics module
- 3 LC Display
- 4 Status LEDs
- 5 Film keyboard



Connection type Plug 37-pin, Sub D connector



1	+24 V/L+
2	PE
3	In-Sig. 2 - (GND)
4	In-Sig. 2 + (Q _A)
5	Shield 2
6	Q 2
7	Autozero
8	Teach-Sen. 2 (TI)
9	Hold-Sen. 2 (SH)
10	H
11	L
12	Error

13	RTS
14	TxD
15	+24 V/L+
16	PE
17	PE
18	+5 V
19	PB +
20	GND/M
21	PE
22	In-Sig. 1 - (GND)
23	In-Sig. 1 + (Q _A)
24	Shield 1

25	Q 1
26	Sync
27	Teach sen. 1 (TI)
28	Hold sen. 1 (SH)
29	HH
30	LL
31	Go
32	CTS
33	RxD
34	GND/M
35	PE
36	GND/M
37	PB -



Technical data		ODC 100	-P120										
Accuracy	$\pm 0.05\%$ (FS) ¹⁾												
Response time Eingang	1 ms												
Measuring frequency	Max. 2 kHz												
In- and outputs	PNP												
Output													
5 Switching outputs	Max. 100 mA/30 V DC												
1 Alarm output	Output for invalid input signal												
2 Alarm outputs	Referencing of the sensors attached												
Data interface													
	RS 232												
	Profibus DB												
Inputs													
2 Analogue inputs	4 ... 20 mA												
1 Sample and Hold input	Synchronising/holding the calculation result												
1 Zero reset input	Referencing the calculation result												
Display type													
	Alphanumeric display, 8-digit												
Additional features													
	Arithmetical calculations												
	Averaging functions												
	Frequency filters												
	Timer functions												
	Measuring/Hold function												
	Scaling the analogue inputs												
Supply voltage V_S													
	24 V DC $\pm 10\%$												
Power consumption ²⁾													
	≤ 7.2 W												
Enclosure rating													
	IP 20 (IP 65 on request)												
VDE protection class													
	III												
Ambient temperature													
	Operation: 0 ... +50 °C												
	Storage: -30 ... +60 °C												
Vibration resistance													
	10 ... 55/s ³⁾												
Shock resistance													
	50 G (500 m/s ²)												
Weight													
	800 g												
Housing material													
	Zinc												
Connection type													
	Plug 37-pin												

¹⁾ FS = full scale = measurement range of the sensor, processed via the analogue input

²⁾ Excl. load

³⁾ Amplitude 1.5 mm, 2 h for XYZ axes

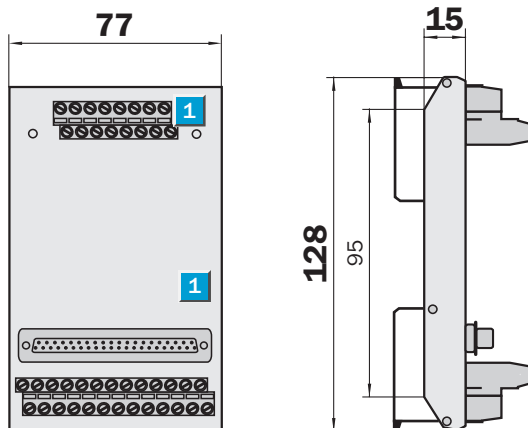
Order information	
Type	Order no.
ODC 100-P120	6022480

Mounting socket ODC-SOC



■ ODC-SOC: Mounting socket for tophat profile rail mounting

Dimensional drawing mounting socket ODC-SOC

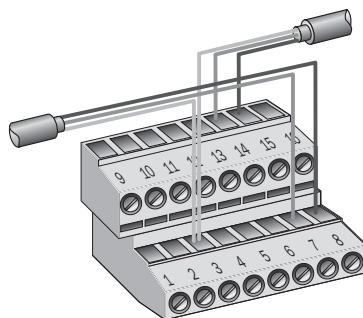


Connection option

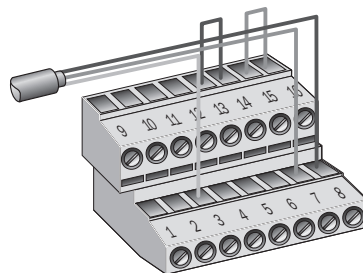
1 Taphole for screwing the ODC evaluation unit, M3

Terminal assignment X1

X1, Module not connected to the end of the field bus cable



X1, Module connected to the end of the field bus cable

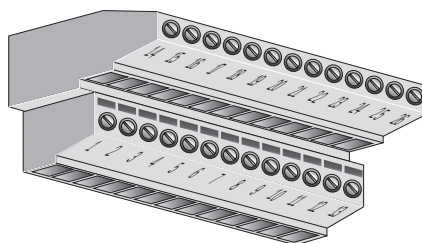


1	GND/M
2	GND/M
3	PE
4	GND/M
5	TxD
6	RxD
7	PB +
8	PB -
9	+24 V/L+
10	+24 V/L+
11	RTS
12	CTS
13	+5 V
14	PB +
15	PB -
16	GND/M



Order information	
Type	Order no.
ODC-SOC	6 020 985

Terminal assignment X2



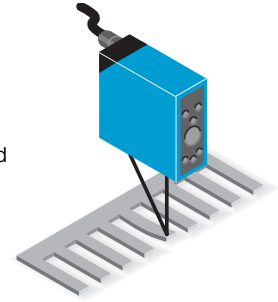
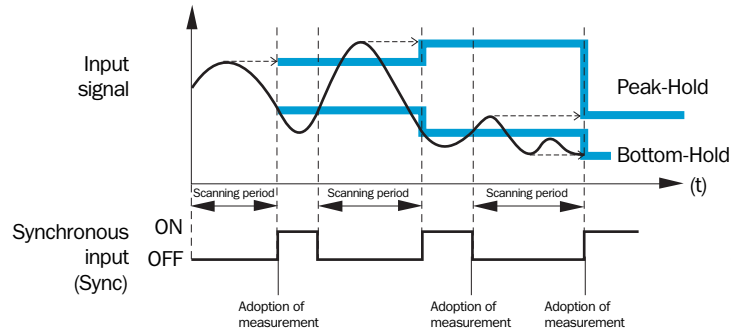
1	+24 V/L+	14	+24 V/L+
2	GND/M (0 V)	15	GND/M (0 V)
3	In-Sig. 1 - (GND)	16	In-Sig. 2 - (GND)
4	In-Sig. 1 + (Q _A)	17	In-Sig. 2 + (Q _A)
5	Shield 1	18	Shield 2
6	Q 1	19	Q 2
7	Sync	20	Autozero
8	Teach sen. 1 (TI)	21	Teach sen. 1 (TI)
9	Hold sen. 1 (SH)	22	Hold sen. 1 (SH)
10	HH	23	H
11	LL	24	L
12	Go	25	Error
13	GND/M	26	+24 V/L+

Zeitverlaufdiagramme

Measuring/Hold function (ODC/OD Max)

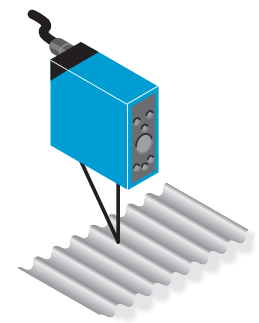
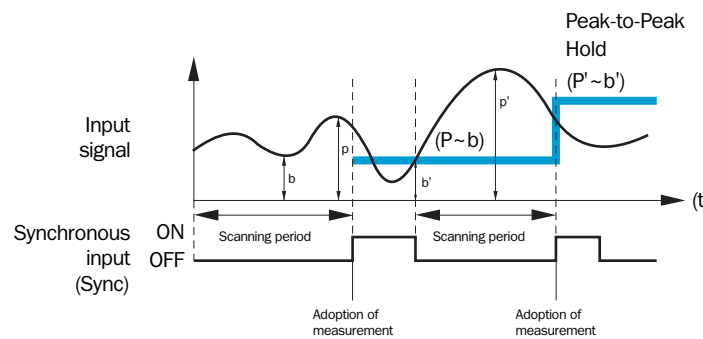
Peak-Bottom-Hold

The "Peak-(Bottom-)Hold" function is used for measuring the highest (lowest) value during a specific time period.



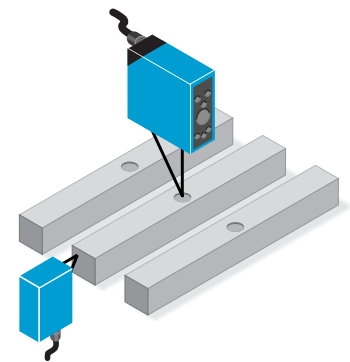
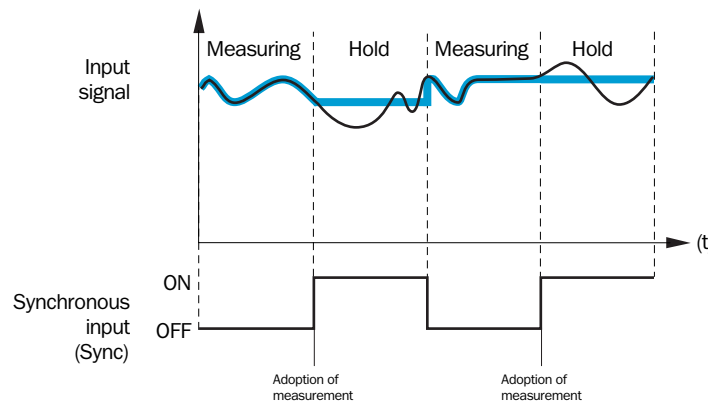
Peak-to-Peak-Hold

The "Peak-to-Peak" function is used for measuring the difference between the highest and lowest values during the preset time period.



Sample/Hold

The "Sample-and-Hold" function is used for measuring the value during a specific time period.



Automatic Peak-Bottom-Hold

The "Automatic Peak- and Bottom-Hold" function is used for measuring the highest (lowest) value from the beginning of the measurement.

