



# DL1000-S11112

Dx1000

TIME-OF-FLIGHT SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

Type	part no.
DL1000-S11112	1099756

Other models and accessories → [www.sick.com/Dx1000](http://www.sick.com/Dx1000)



### Detailed technical data

#### Features

<b>Measurement principle</b>	HDDM <sup>+</sup>
<b>Measuring range</b>	0.2 m ... 1,500 m, on "diamond grade" reflective tape <sup>1) 2) 3)</sup>
<b>Target</b>	Reflector
<b>Resolution</b>	1 µm ... 100,000 µm, adjustable <sup>4)</sup>
<b>Repeatability</b>	≥ 1 mm, See repeatability characteristic lines <sup>1) 5) 6) 7)</sup>
<b>Measurement accuracy</b>	Typ. ± 15 mm, See measurement accuracy diagram <sup>8)</sup>
<b>Response time</b>	3 ms ... 384 ms <sup>7)</sup>
<b>Measurement cycle time</b>	1 ms 4 ms 16 ms
<b>Output time</b>	≥ 1 ms <sup>9)</sup>
<b>Emitted beam</b>	
Typ. light spot size (distance)	5 mm x 20 mm (at 1 m) <sup>10)</sup>
	20 mm x 20 mm (at 5 m) <sup>10)</sup>
	35 mm x 25 mm (at 10 m) <sup>10)</sup>
	150 mm x 50 mm (at 50 m) <sup>10)</sup>

<sup>1)</sup> With max. ambient light 100 kLux sunlight.

<sup>2)</sup> See measuring range diagram.

<sup>3)</sup> Dependent on reflector size and measuring cycle time.

<sup>4)</sup> Data interface resolution.

<sup>5)</sup> Statistical error 1 σ, environmental conditions constant, min. warm-up time > about 15 min.

<sup>6)</sup> On "diamond grade" reflective tape.

<sup>7)</sup> Dependent on selected filter settings and measuring cycle time.

<sup>8)</sup> At T = +23 °C and after warm-up time > about 15 min.

<sup>9)</sup> Depending on interface used.

<sup>10)</sup> See light spot size diagram.

<sup>11)</sup> Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

<sup>12)</sup> Measuring laser.

		290 mm x 80 mm (at 100 m) <sup>10)</sup>
		570 mm x 140 mm (at 200 m) <sup>10)</sup>
		4,200 mm x 920 mm (≥ 1,500 mm) <sup>10)</sup>
<b>Key laser figures</b>		
	Normative reference	IEC 60825-1:2014, EN 60825-1:2014
	Laser class	1 <sup>11)</sup>
	Average laser service life (at 25 °C)	100,000 h <sup>12)</sup>
<b>Filter</b>		Rain and snow filter Fog filter Moving average distance value Kalman filter Moving average speed value
<b>Additional function</b>		Selection of relevant distance and signal level range Selection of first or last echo in selected distance and signal level range
<b>Max. movement speed</b>		128 m/s
<b>Safety-related parameters</b>		
	MTTF <sub>D</sub>	101 years
	DC <sub>avg</sub>	0%

1) With max. ambient light 100 kLux sunlight.

2) See measuring range diagram.

3) Dependent on reflector size and measuring cycle time.

4) Data interface resolution.

5) Statistical error 1 σ, environmental conditions constant, min. warm-up time > about 15 min.

6) On "diamond grade" reflective tape.

7) Dependent on selected filter settings and measuring cycle time.

8) At T = +23 °C and after warm-up time > about 15 min.

9) Depending on interface used.

10) See light spot size diagram.

11) Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

12) Measuring laser.

## Interfaces

<b>Ethernet</b>		✓, TCP/IP
	Function	Parameterization, output of measurement data
	Data transmission rate	10/100 MBit/s
<b>Serial</b>		✓, RS-422
	Remark	Switchable to SSI
<b>SSI</b>		✓
	Remark	Switchable to RS-422
	Function	Output of measurement data
<b>PROFINET</b>		✓
	Function	Parameterization, output of measurement data
<b>Network load class</b>		III
<b>Inputs/outputs</b>		

1) Short-circuit protected, switching voltage  $U_V - 4$  V.

2) Internal pull-down switching, switching voltage HIGH: min. 13 V ... max. supply voltage, switching voltage LOW: max. 5 V.

3) Max. load =  $(U_V - 7 \text{ V}) / 21.5 \text{ mA}$ .

	In1/Q1	Digital input, digital output (Switchable)
	QA/Q2	Analog output, digital output (Switchable)
<b>Digital input</b>		Internal pull-down circuit HIGH switching voltage: min. 13 V ... max. supply voltage LOW switching voltage: max. 5 V Switching functions: deactivate measuring laser, activate alignment laser, preset
<b>Digital output</b>	Number	0 ... 2 <sup>1) 2)</sup>
	Type	Push-pull: PNP/NPN
	Maximum output current I <sub>A</sub>	≤ 100 mA
<b>Analog output</b>	Number	1
	Type	Current output
	Current	4 mA ... 20 mA <sup>3)</sup>
	Resolution	16 bit

<sup>1)</sup> Short-circuit protected, switching voltage U<sub>V</sub> - 4 V.

<sup>2)</sup> Internal pull-down switching, switching voltage HIGH: min. 13 V ... max. supply voltage, switching voltage LOW: max. 5 V.

<sup>3)</sup> Max. load = (U<sub>V</sub> - 7 V) / 21.5 mA.

## Electronics

<b>Supply voltage U<sub>B</sub></b>	DC 18 V ... 30 V, reverse polarity protected
<b>Power consumption</b>	≤ 22 W, With heating switched off <sup>1)</sup> ≤ 35 W, With heating switched on <sup>1)</sup>
<b>Ripple</b>	≤ 5 V <sub>pp</sub> <sup>2)</sup>
<b>Initialization time</b>	> 30 s
<b>Display</b>	Graphical, resistive touch display, status LEDs
<b>Enclosure rating</b>	IP65 <sup>3)</sup> IP67 <sup>3)</sup>
<b>Protection class</b>	III (EN 61140)
<b>Connection type</b>	Round connector M12 x 1

<sup>1)</sup> With external load.

<sup>2)</sup> May not fall short of or exceed V<sub>S</sub> tolerances.

<sup>3)</sup> When plugged in with a suitable mating connector.

## Mechanics

<b>Dimensions (W x H x D)</b>	84 mm x 104.4 mm x 140.5 mm
<b>Housing material</b>	Metal (Aluminum alloy (AlSi12))
<b>Window material</b>	Glass
<b>Weight</b>	1,000 g

## Ambient data

<b>Ambient temperature, operation</b>	-40 °C ... +55 °C <sup>1)</sup> -40 °C ... +95 °C, operation with cooling case
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<sup>1)</sup> At a temperature of -40 °C, a warm-up time of typ. 20 minutes is required (when supply voltage V<sub>S</sub> = 24 V).

<b>Ambient temperature, storage</b>	-40 °C ... +75 °C
<b>Max. rel. humidity (not condensing)</b>	≤ 95 %
<b>Effect of air pressure</b>	0.3 ppm/hPa
<b>Effect of air temperature</b>	-1 ppm/K
<b>Temperature drift</b>	Typ. 0.25 mm/K
<b>Typ. Ambient light immunity</b>	≤ 100,000 lx
<b>Mechanical load</b>	Shock: 30 g / 6 ms according to DIN EN 60068-2-27 (Ea), 6 axes Continuous shock: 25 g / 6 ms according to DIN EN 60068-2-27 (fatigue), 500 shocks, 6 axes

<sup>1)</sup> At a temperature of -40 °C, a warm-up time of typ. 20 minutes is required (when supply voltage  $V_s = 24$  V).

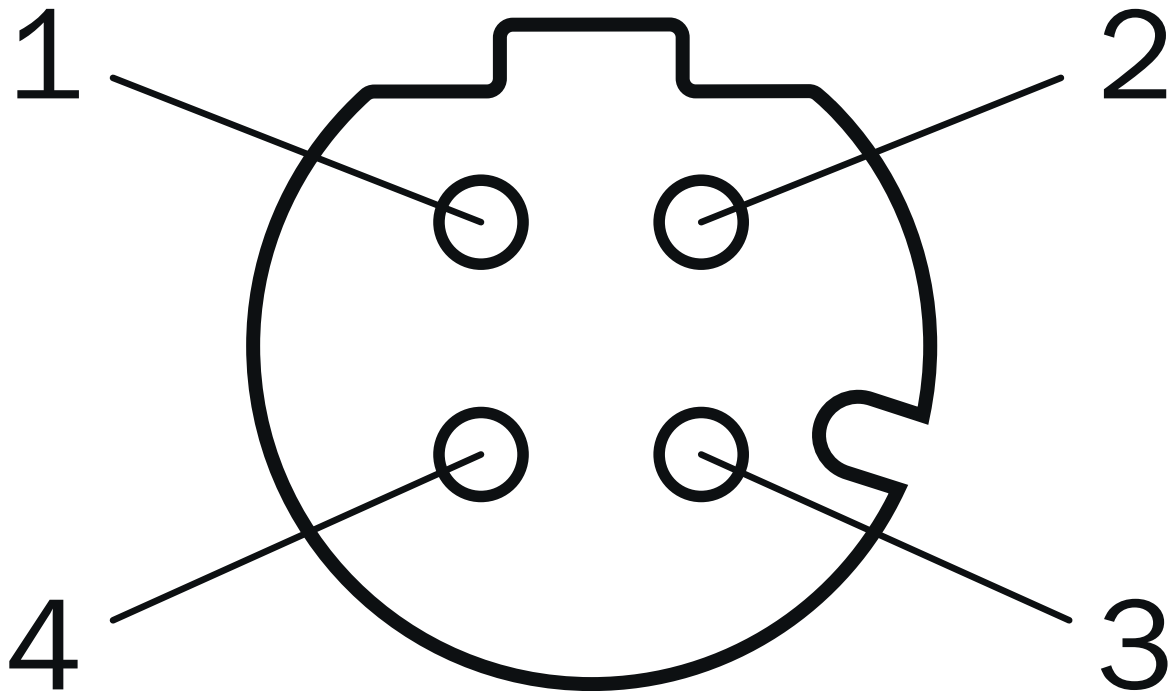
## Classifications

<b>ECLASS 5.0</b>	27270801
<b>ECLASS 5.1.4</b>	27270801
<b>ECLASS 6.0</b>	27270801
<b>ECLASS 6.2</b>	27270801
<b>ECLASS 7.0</b>	27270801
<b>ECLASS 8.0</b>	27270801
<b>ECLASS 8.1</b>	27270801
<b>ECLASS 9.0</b>	27270801
<b>ECLASS 10.0</b>	27270801
<b>ECLASS 11.0</b>	27270801
<b>ECLASS 12.0</b>	27270916
<b>ETIM 5.0</b>	EC001825
<b>ETIM 6.0</b>	EC001825
<b>ETIM 7.0</b>	EC001825
<b>ETIM 8.0</b>	EC001825
<b>UNSPSC 16.0901</b>	41111613

## Certificates

<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>Moroccan declaration of conformity</b>	✓
<b>China RoHS</b>	✓
<b>cULus certificate</b>	✓
<b>Information according to Art. 3 of Data Act (Regulation EU 2023/2854)</b>	✓

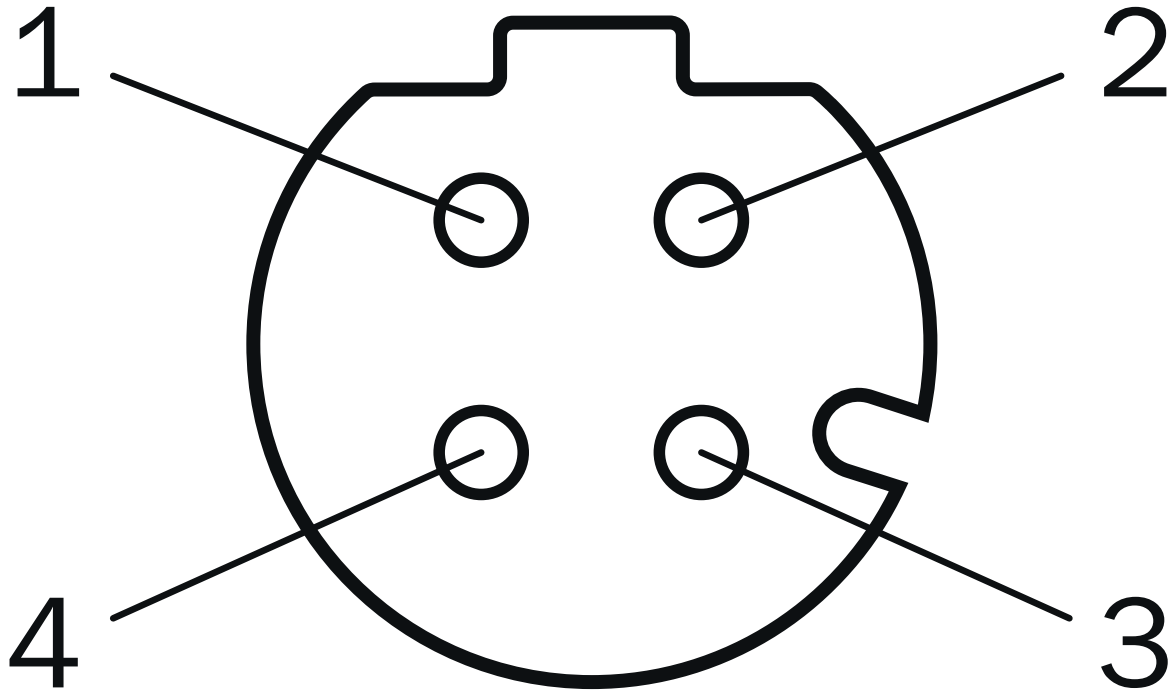
PIN assignment Connection 2: PROFINET (port 1)



M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

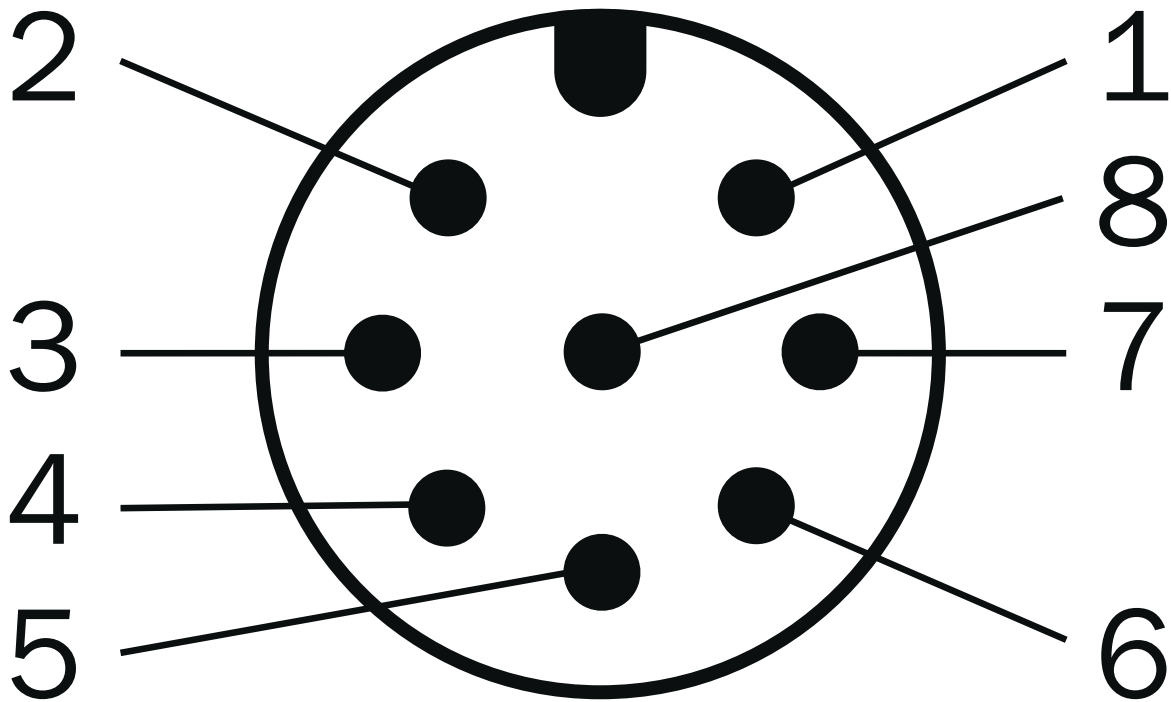
PIN assignment Connection 3: PROFINET (port 2)



M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

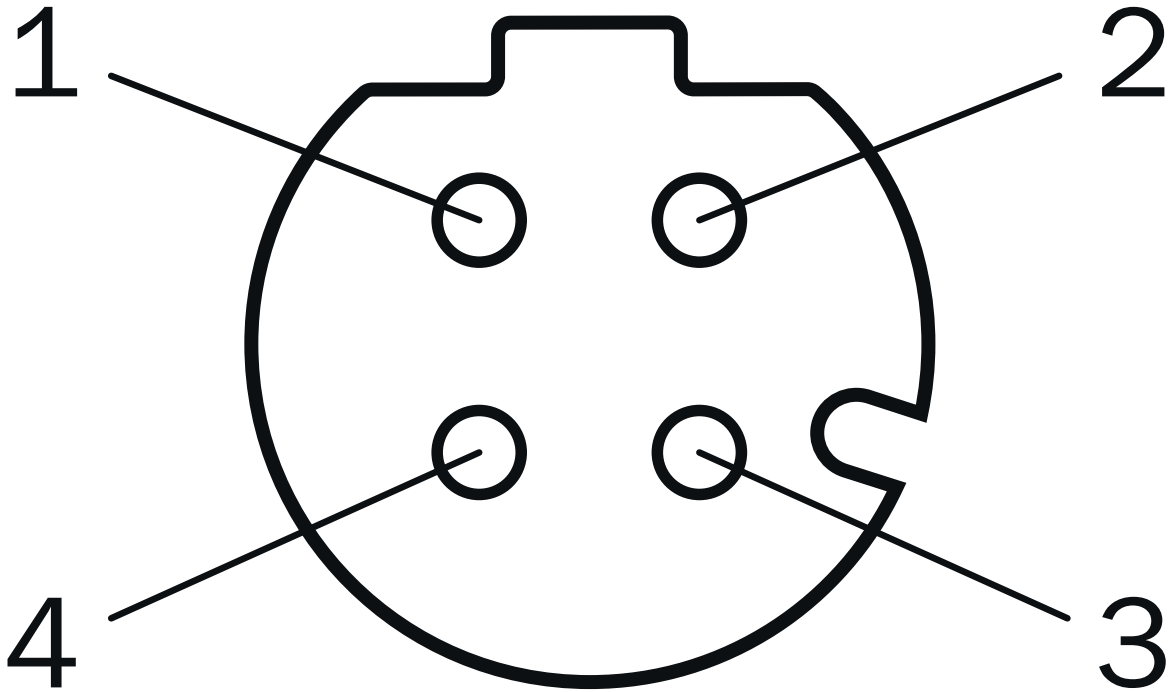
PIN assignment Connection 1: power, RS-422/SSI, Q1/In1, Q2/QA



Connector M12, 8-pin, A-coded

- ① Q1/In1
- ② L+
- ③ RX-/CLK-
- ④ RX+/CLK+
- ⑤ TX-/Data-
- ⑥ TX+/Data+
- ⑦ M
- ⑧ Q2/QA

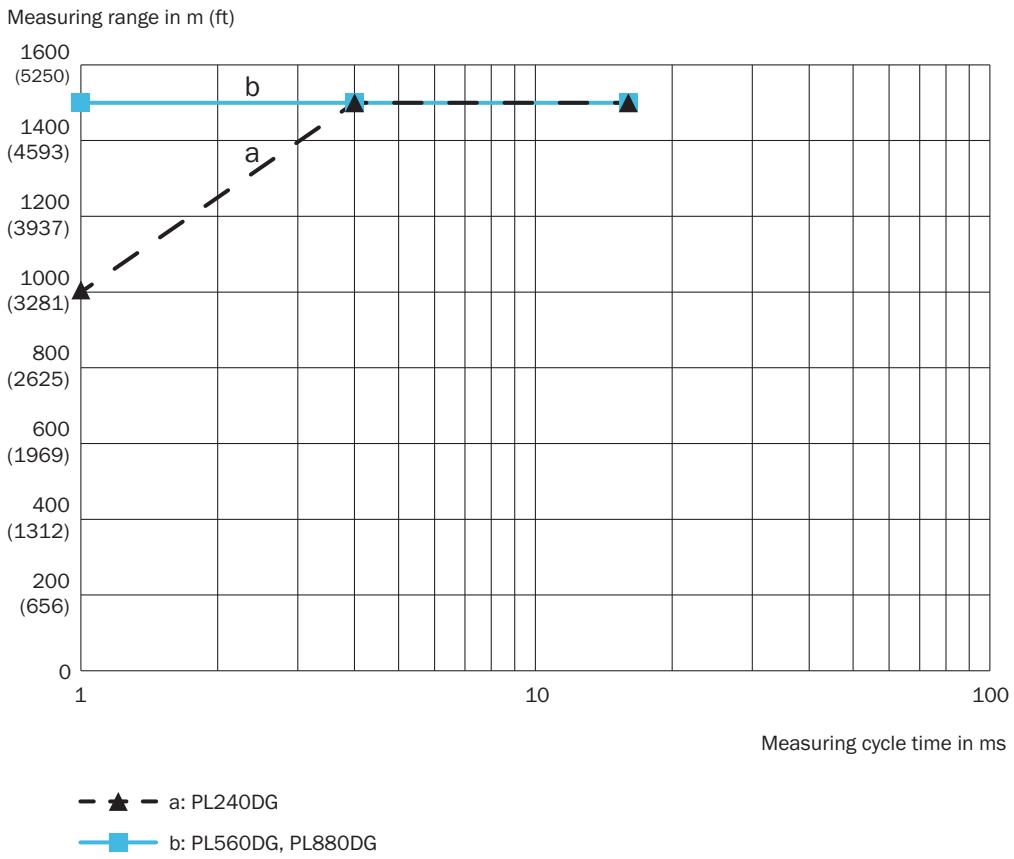
PIN assignment Connection 4: Ethernet



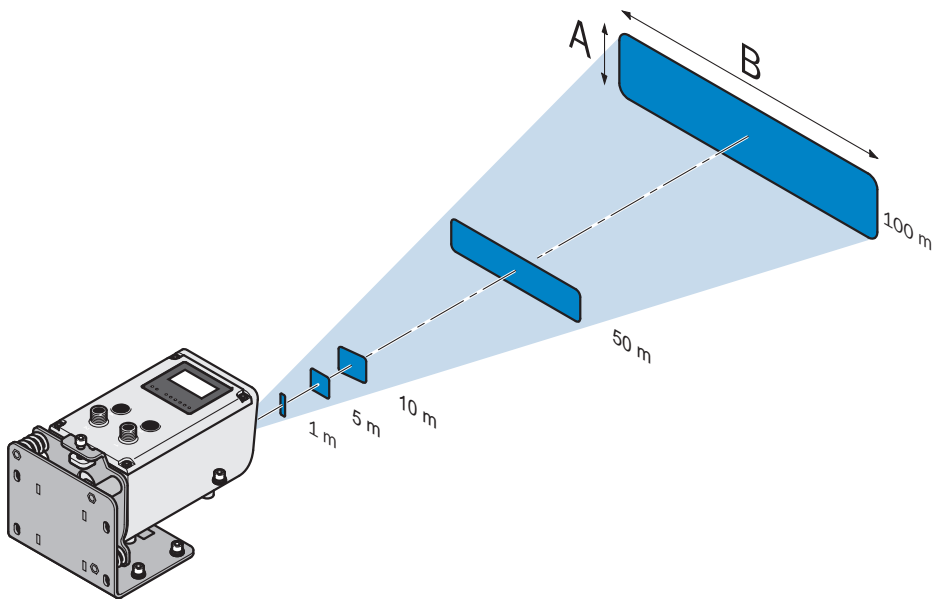
M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

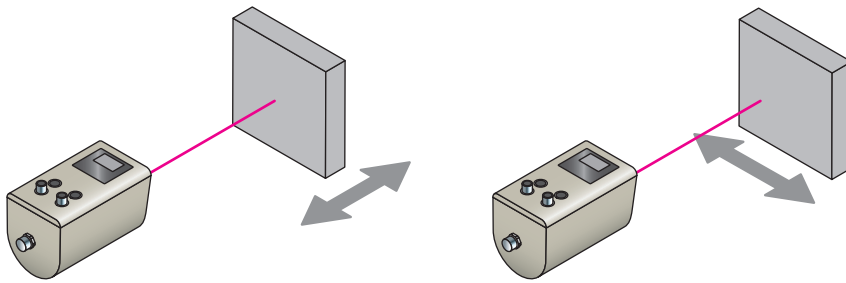
### Working range diagram DL1000 measuring range based on measurement cycle time and reflector type



### Light spot size

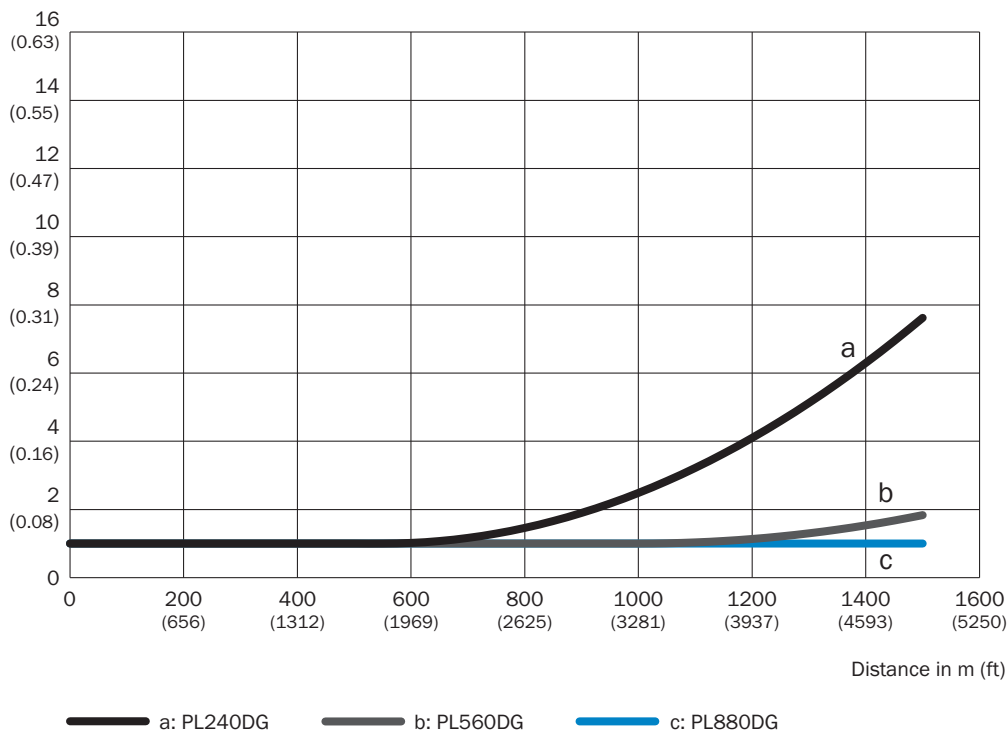


Functional principle



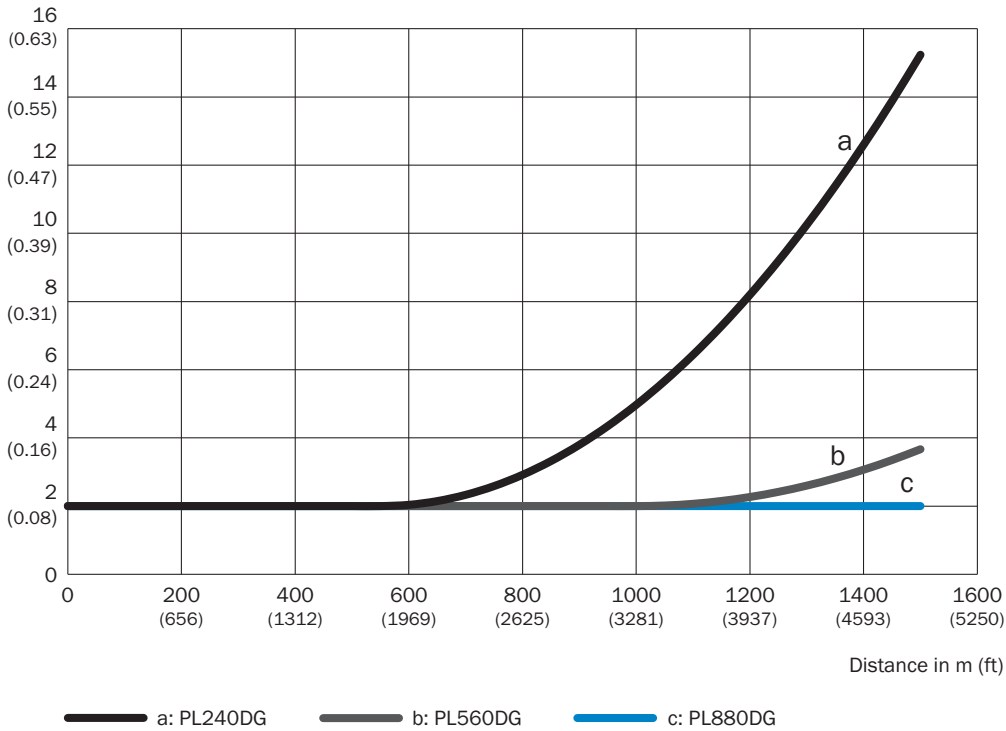
Repeatability DL1000 for various reflector types, with 16 ms measurement cycle time

Typ. repeatability in mm (inch)



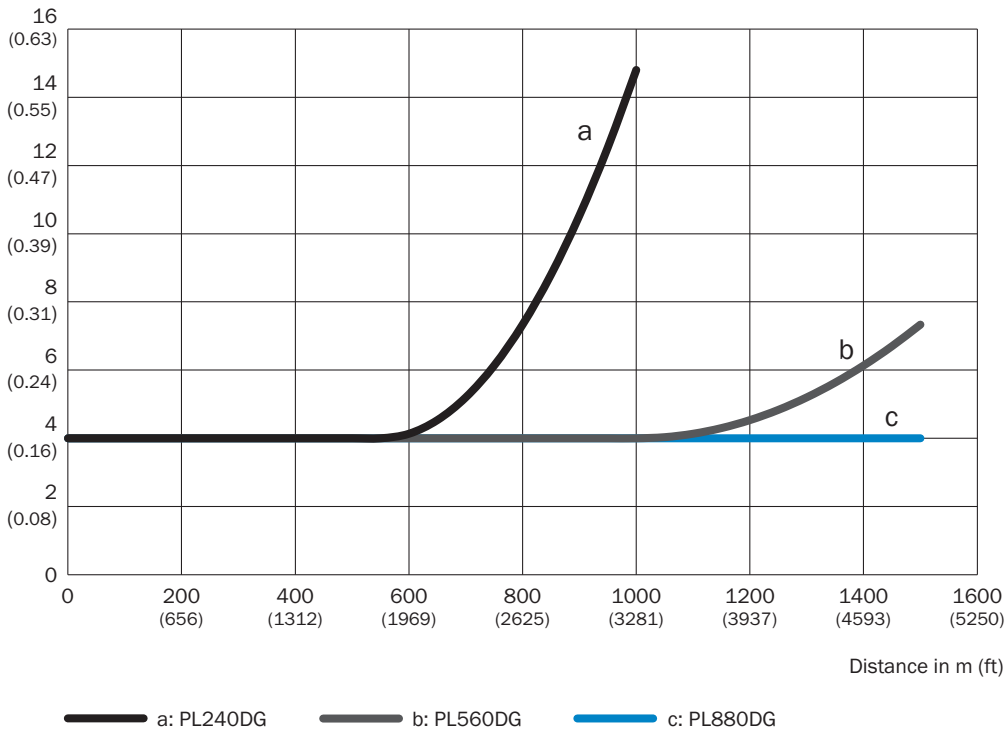
Repeatability DL1000 for various reflector types, with 4 ms measurement cycle time

Typ. repeatability in mm (inch)

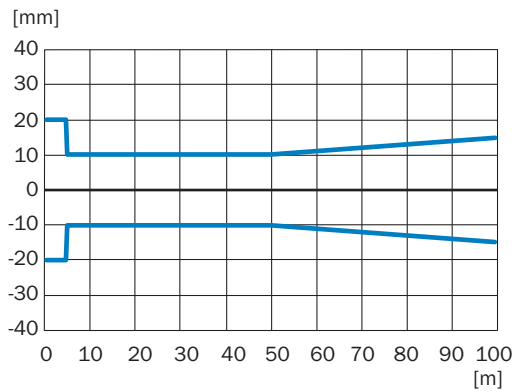


Repeatability DL1000 for various reflector types, with 1 ms measurement cycle time

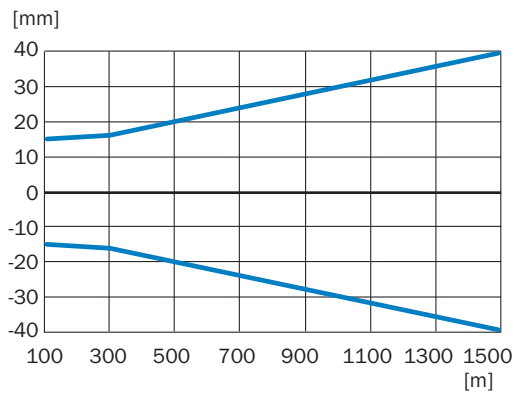
Typ. repeatability in mm (inch)



Measurement accuracy Typically DL1000, x-axis: Distance, y-axis: Typical measurement accuracy








Measurement accuracy Typically DL1000, x-axis: Distance, y-axis: Typical measurement accuracy



Recommended accessories

Other models and accessories → [www.sick.com/Dx1000](http://www.sick.com/Dx1000)

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 4-pin, angled, D-coded</li> <li><b>Connection type head B:</b> Male connector, RJ45, 4-pin, straight</li> <li><b>Signal type:</b> Ethernet, PROFINET</li> <li><b>Cable:</b> 10 m, 4-wire, PUR, halogen-free</li> <li><b>Description:</b> Ethernet, shielded, PROFINET</li> <li><b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>	YN2D24-100P-N1MRJA4	2106164
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> RS-422, SSI</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> RS-422, shielded, SSI</li> <li><b>Application:</b> Zones with oils and lubricants</li> </ul>	YG2A68-100XXXLECX	6051482

	Brief description	Type	part no.
device protection and care			
	<ul style="list-style-type: none"> <li><b>Description:</b> Can be opened upward without tools. Conductor for connections on the back. Due to space constraints, connecting cables with 90° angled, pre-assembled male connectors/female connectors are required.</li> <li><b>Items supplied:</b> Weatherproof housing (BEF-AH-DX1000, tube for weatherproof housing and rain cover for protective housing are not included with delivery)</li> </ul>	Weatherproof housing	2087690
Mounting systems			
	<ul style="list-style-type: none"> <li><b>Description:</b> Alignment bracket for mounting and precise alignment of the sensor in a horizontal and vertical direction</li> <li><b>Material:</b> Stainless steel</li> <li><b>Details:</b> Stainless steel</li> <li><b>Items supplied:</b> Mounting hardware included</li> </ul>	BEF-AH-DX1000	2080392
reflectors and optics			
	<ul style="list-style-type: none"> <li><b>Description:</b> Reflector plate, "diamond grade" reflective tape, 665 mm x 665 mm, base plate material: aluminum, screw connection</li> <li><b>Ambient operating temperature:</b> -25 °C ... +65 °C</li> </ul>	PL560DG	1016806

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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