



# DL1000-S11110

Dx1000

**LONG RANGE DISTANCE SENSORS**

**SICK**  
Sensor Intelligence.



## Ordering information

| Type          | Part no. |
|---------------|----------|
| DL1000-S11110 | 1100075  |

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



## Detailed technical data

### Features

|                              |                   |
|------------------------------|-------------------|
| <b>Measurement principle</b> | HDDM <sup>+</sup> |
|------------------------------|-------------------|

### Mechanics/electronics

|  |   |
|--|---|
| <b>Supply voltage <math>V_s</math></b> | DC 18 V ... 30 V, reverse polarity protected  |
| <b>Ripple</b>                          | $\leq 5 V_{pp}$ <sup>1)</sup>   |
| <b>Power consumption</b>               | $\leq 22$ W, With heating switched off <sup>2)</sup><br>$\leq 35$ W, With heating switched on <sup>2)</sup> |
| <b>Initialization time</b>             | > 30 s  |
| <b>Housing material</b>                | Metal (Aluminum alloy (AlSi12))   |
| <b>Window material</b>                 | Glass   |
| <b>Connection type</b>                 | Round connector M12 x 1   |
| <b>Indication</b>                      | Graphical, resistive touch display, status LEDs   |
| <b>Weight</b>                          | 1,000 g   |
| <b>Dimensions (W x H x D)</b>          | 84 mm x 104.4 mm x 140.5 mm   |
| <b>Enclosure rating</b>                | IP65 <sup>3)</sup><br>IP67 <sup>3)</sup>  |
| <b>Protection class</b>                | III (EN 61140)  |

<sup>1)</sup> May not fall short of or exceed  $V_s$  tolerances.

<sup>2)</sup> With external load.

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

### Safety-related parameters

|                         |           |
|-------------------------|-----------|
| <b>MTTF<sub>D</sub></b> | 101 years |
| <b>DC<sub>avg</sub></b> | 0%        |

## Performance

|  |  |
|--|--|
| <b>Measurement principle</b>                 | HDDM <sup>+</sup>  |
| <b>Measurement range min ... max:</b>        | 0.2 m ... 1,500 m, on "diamond grade" reflective tape <sup>1) 2) 3)</sup>  |
| <b>Target</b>                                | Reflector  |
| <b>Resolution</b>                            | 0.001 mm ... 100 mm, adjustable <sup>4)</sup>  |
| <b>Repeatability</b>                         | ≥ 1 mm, See repeatability characteristic lines <sup>1) 5) 6) 7)</sup>  |
| <b>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<br>4 ms<br>16 ms  |
| <b>Output time</b>                           | ≥ 1 ms <sup>9)</sup>   |
| <b>Light source</b>                          | Infrared light (905 nm, measuring laser)<br>Visible red light (650 nm, Adjustment aid)   |
| <b>Laser class</b>                           | 1, even with simultaneous operation of measurement and alignment laser (IEC 60825-1:2014, EN 60825-1:2014)   |
| <b>Typ. light spot size (distance)</b>       | 5 mm x 20 mm (at 1 m) <sup>10)</sup><br>20 mm x 20 mm (at 5 m) <sup>10)</sup><br>35 mm x 25 mm (at 10 m) <sup>10)</sup><br>150 mm x 50 mm (at 50 m) <sup>10)</sup><br>290 mm x 80 mm (at 100 m) <sup>10)</sup><br>570 mm x 140 mm (at 200 m) <sup>10)</sup><br>4,200 mm x 920 mm (≥ 1,500 mm) <sup>10)</sup> |
| <b>Filter</b>                                | Rain and snow filter<br>Fog filter<br>Moving average distance value<br>Kalman filter<br>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>Average laser service life (at 25 °C)</b> | 100,000 h <sup>11)</sup>   |
| <b>Max. movement speed</b>                   | 128 m/s  |

<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> Measuring laser.

## Interfaces

|                 |           |
|-----------------|-----------|
| <b>Ethernet</b> | ✓, TCP/IP |
|-----------------|-----------|

<sup>1)</sup> Short-circuit protected, switching voltage  $U_V - 4$  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 =  $(U_V - 7$  V) / 21.5 mA.

|                       |                                       |   |
|-----------------------|---------------------------------------|---|
|                       | Function                              | Parameterization, Measurement data output (not real-time capable; transmission characteristics depend on external network)  |
|                       | 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>EtherNet/IP™</b>   |                                       | ✓   |
|                       | Function                              | Parameterization, Measurement data output (distance output value, device status, signal level)  |
| <b>Inputs/outputs</b> |                                       |   |
|                       | In1/Q1                                | Digital input, digital output (Switchable)  |
|                       | QA/Q2                                 | Analog output, digital output (Switchable)  |
| <b>Digital input</b>  |                                       | Internal pull-down circuit<br>HIGH switching voltage: min. 13 V ... max. supply voltage<br>LOW switching voltage: max. 5 V<br>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.

## Ambient data

|  |  |
|--|--|
| <b>Ambient temperature, operation</b>      | -40 °C ... +55 °C <sup>1)</sup><br>-40 °C ... +95 °C, operation with cooling case  |
| <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<br>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<sub>S</sub> = 24 V).

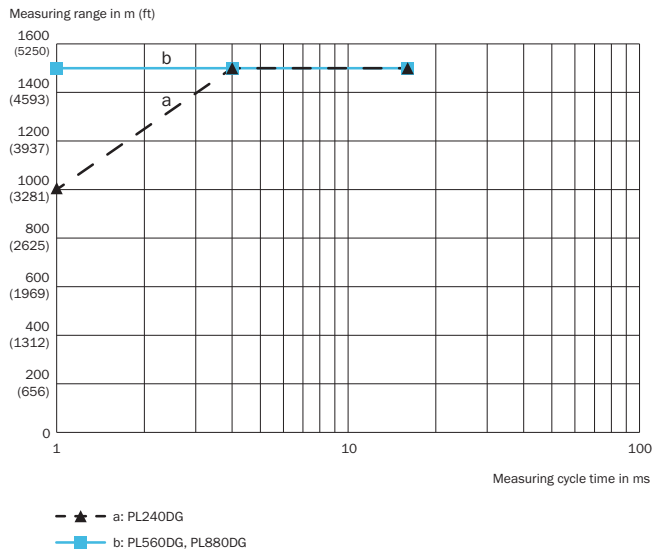
## Classifications

|                   |          |
|-------------------|----------|
| <b>eCl@ss 5.0</b> | 27270801 |
|-------------------|----------|

|                       |          |
|-----------------------|----------|
| <b>eCl@ss 5.1.4</b>   | 27270801 |
| <b>eCl@ss 6.0</b>     | 27270801 |
| <b>eCl@ss 6.2</b>     | 27270801 |
| <b>eCl@ss 7.0</b>     | 27270801 |
| <b>eCl@ss 8.0</b>     | 27270801 |
| <b>eCl@ss 8.1</b>     | 27270801 |
| <b>eCl@ss 9.0</b>     | 27270801 |
| <b>eCl@ss 10.0</b>    | 27270801 |
| <b>eCl@ss 11.0</b>    | 27270801 |
| <b>eCl@ss 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 |

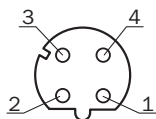
### Working range diagram

DL1000 measuring range based on measurement cycle time and reflector type



### PIN assignment

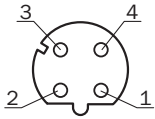
Connection 2: Ethernet/IP (port 1)



M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

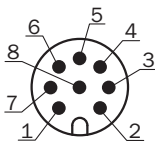
Connection 3: Ethernet/IP (port 2)



M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

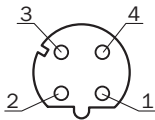
Connection 1: power, RS-422/SSI, Q1/In1, Q2/QA



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

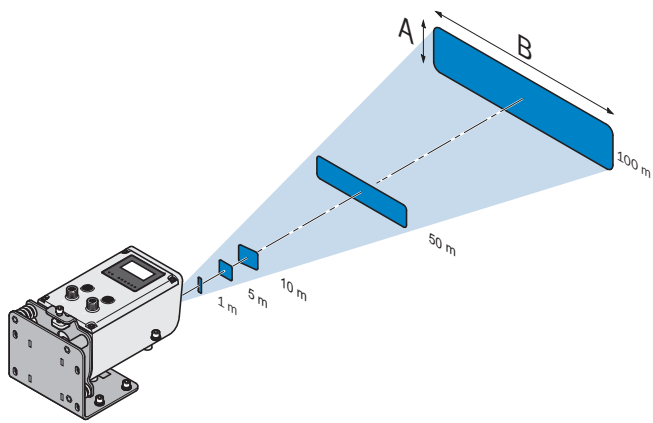
Connection 4: Ethernet



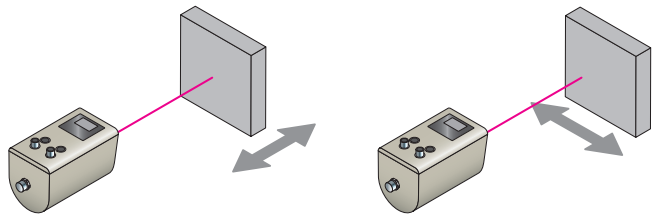
M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

### Light spot size

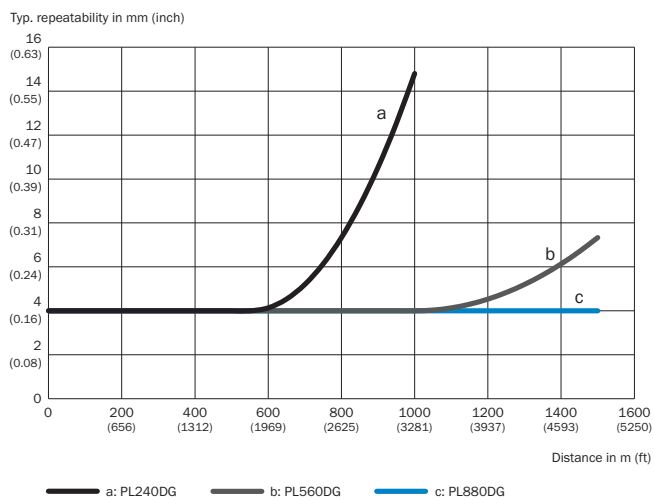


### Functional principle

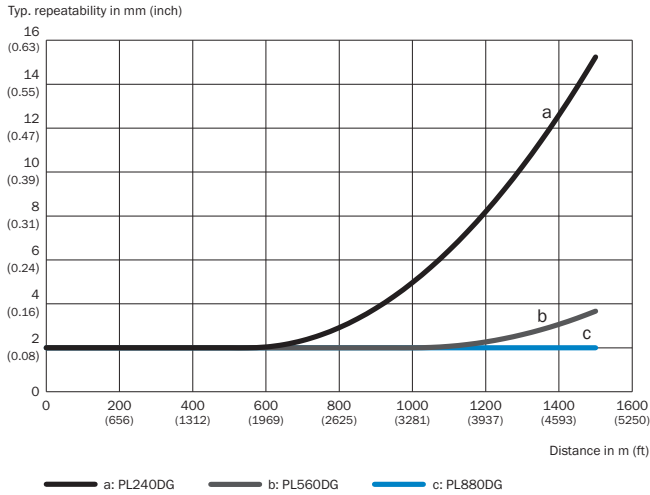


### Repeatability

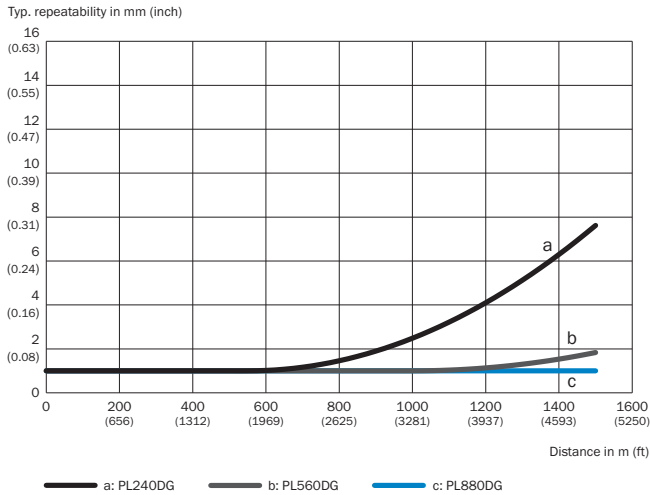
DL1000 for various reflector types, with 1 ms measurement cycle time



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

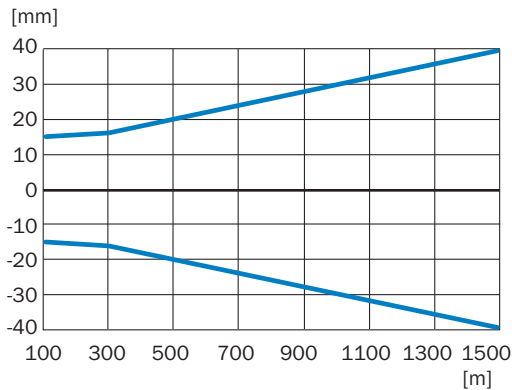


DL1000 for various reflector types, with 16 ms measurement cycle time



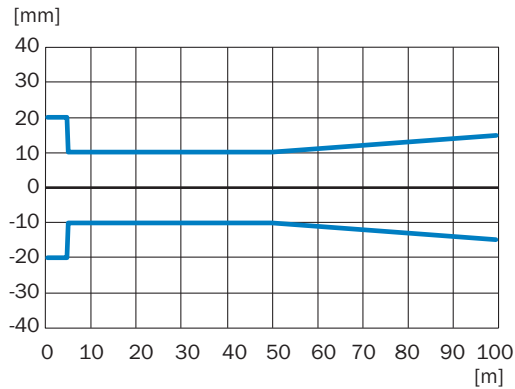
### Measurement accuracy

Typically DL1000, x-axis: Distance, y-axis: Typical 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. |
|---|---|----------------------|----------|
| <b>Device protection (mechanical)</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., Weatherproof housing (BEF-AH-DX1000, tube for weatherproof housing and rain cover for protective housing are not included with delivery) | Weatherproof housing | 2087690  |
| <b>Plug connectors and cables</b>   |   |                      |          |
|  | Head A: female connector, M12, 8-pin, angled<br>Head B: Flying leads<br>Cable: RS-422, SSI, PUR, halogen-free, shielded, 10 m   | YG2A68-100XXXXLECX   | 6051482  |
| <b>Reflectors</b>   |   |                      |          |
|  | Reflector plate, "diamond grade" reflective tape, 665 mm x 665 mm, base plate material: aluminum, screw connection, Screw-on, 4 hole mounting   | PL560DG              | 1016806  |
| <b>Terminal and alignment brackets</b>  |   |                      |          |
|  | Alignment bracket for mounting and precise alignment of the sensor in a horizontal and vertical direction, stainless steel, mounting hardware included  | BEF-AH-DX1000        | 2080392  |

### Recommended services

Additional services → [www.sick.com/Dx1000](http://www.sick.com/Dx1000)

|  | Type   | Part no. |
|--|--|----------|
| Extended warranty  |  |          |
| <ul style="list-style-type: none"><li>• <b>Product area:</b> Identification solutions, machine vision, Distance sensors, Detection and ranging solutions</li><li>• <b>Range of services:</b> The services correspond to the scope of the statutory manufacturer warranty (SICK general terms of delivery).</li><li>• <b>Duration:</b> Five-year warranty from delivery date.</li></ul> | Extended warranty for a total of five years from delivery date | 1680671  |

## 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.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)