Data sheet

DT1000-S11110

Dx1000

TIME-OF-FLIGHT SENSORS

SICK
Sensor Intelligence.

Ordering information

Type	part no.
DT1000-S11110	1100074

Other models and accessories ➜ www.sick.com/Dx1000

Detailed technical data

Features

Measurement principle	HDDM$^+$
Measuring range	0.2 m ... 155 m, 6% remission factor [1) 2) 3)] 0.2 m ... 460 m, 90% remission factor [1) 2) 3)]
Target	Natural objects
Resolution	0.001 mm ... 100 mm, adjustable [4)]
Repeatability	≥ 1 mm, See repeatability characteristic lines [1) 5) 6) 7)]
Measurement accuracy	Typ. ± 15 mm [8) 9)]
Response time	3 ms ... 384 ms [7)]
Measurement cycle time	1 ms 4 ms 16 ms 64 ms 128 ms
Output time	≥ 1 ms [10)]
Light source	Infrared light (905 nm, measuring laser) Visible red light (650 nm, Adjustment aid)

1) With max. ambient light 100 kLux sunlight.
2) See measuring range diagram.
3) Dependent on remission and measuring cycle time.
4) Data interface resolution.
5) Statistical error 1 σ, environmental conditions constant, min. warm-up time > about 15 min.
6) 6% ... 90% remission factor.
7) Dependent on selected filter settings and measuring cycle time.
8) See measurement accuracy diagram.
9) At T = +23 °C and after warm-up time > about 15 min.
10) Depending on interface used.
11) See light spot size diagram.
12) For object temperatures > +1,200 °C, the use of the additional filter is required for high-temperature applications. The additional filter reduces the measuring range limit by approx. 25%.
13) Measuring laser.

Laser class	1, even with simultaneous operation of measurement and alignment laser (IEC 60825-1:2014, EN 60825-1:2014)
Typ. light spot size (distance)	5 mm x 20 mm (at 1 m) [11)] 20 mm x 20 mm (at 5 m) [11)] 35 mm x 25 mm (at 10 m) [11)] 150 mm x 50 mm (at 50 m) [11)] 290 mm x 80 mm (at 100 m) [11)] 570 mm x 140 mm (at 200 m) [11)]
Filter	Rain and snow filter Fog filter Moving average distance value Kalman filter Moving average speed value
Max. object temperature	+1,400 °C [12)]
Additional function	Selection of relevant distance and signal level range Selection of first or last echo in selected distance and signal level range
Average laser service life (at 25 °C)	100,000 h [13)]
Max. movement speed	128 m/s
Safety-related parameters	
$MTTF_D$	101 years
DC_{avg}	0%

[1)] With max. ambient light 100 kLux sunlight.
[2)] See measuring range diagram.
[3)] Dependent on remission and measuring cycle time.
[4)] Data interface resolution.
[5)] Statistical error 1 σ, environmental conditions constant, min. warm-up time > about 15 min.
[6)] 6% ... 90% remission factor.
[7)] Dependent on selected filter settings and measuring cycle time.
[8)] See measurement accuracy diagram.
[9)] At T = +23 °C and after warm-up time > about 15 min.
[10)] Depending on interface used.
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[13)] Measuring laser.

Interfaces

Ethernet	✓ , TCP/IP
Function	Parameterization, Measurement data output (not real-time capable; transmission characteristics depend on external network)
Data transmission rate	10/100 MBit/s
Serial	✓ , RS-422
Remark	Switchable to SSI
SSI	✓
Remark	Switchable to RS-422
Function	Output of measurement data
EtherNet/IP™	✓

[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 V) / 21.5 mA.

Function	Parameterization, Measurement data output (distance output value, device status, signal level)
Inputs/outputs	
In1/Q1	Digital input, digital output (Switchable)
QA/Q2	Analog output, digital output (Switchable)
Digital input	Internal pull-down circuit HIGH switching voltage: min. 13 V ... max. supply voltageLOW switching voltage: max. 5 Vswitching functions: deactivate measuring laser, activate alignment laser, preset
Digital output	
Number	0 ... 2 [1) 2)]
Type	Push-pull: PNP/NPN
Maximum output current I_A	≤ 100 mA
Analog output	
Number	1
Type	Current output
Current	4 mA ... 20 mA [3)]
Resolution	16 bit

[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 V) / 21.5 mA.

Electronics

Supply voltage U_B	DC 18 V ... 30 V, reverse polarity protected
Power consumption	≤ 22 W, With heating switched off [1)] ≤ 35 W, With heating switched on [1)]
Ripple	≤ 5 V_{pp} [2)]
Initialization time	> 30 s
Indication	Graphical, resistive touch display, status LEDs
Enclosure rating	IP65 [3)] IP67 [3)]
Protection class	III (EN 61140)

[1)] With external load.

[2)] May not fall short of or exceed V_S tolerances.

[3)] When plugged in with a suitable mating connector.

Mechanics

Dimensions (W x H x D)	84 mm x 104.4 mm x 140.5 mm
Housing material	Metal (Aluminum alloy (AlSi12))
Window material	Glass
Weight	1,000 g
Connection type	Round connector M12 x 1

Ambient data

Ambient temperature, operation	–40 °C ... +55 °C [1)] –40 °C ... +95 °C, operation with cooling case

[1)] At a temperature of –40 °C, a warm-up time of typ. 20 minutes is required (when supply voltage V_S = 24 V).

Ambient temperature, storage	–40 °C ... +75 °C
Max. rel. humidity (not condensing)	≤ 95 %
Effect of air pressure	0.3 ppm/hPa
Effect of air temperature	–1 ppm/K
Temperature drift	Typ. 0.25 mm/K
Typ. Ambient light immunity	≤ 100,000 lx
Mechanical load	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

[1] At a temperature of –40 °C, a warm-up time of typ. 20 minutes is required (when supply voltage V_S = 24 V).

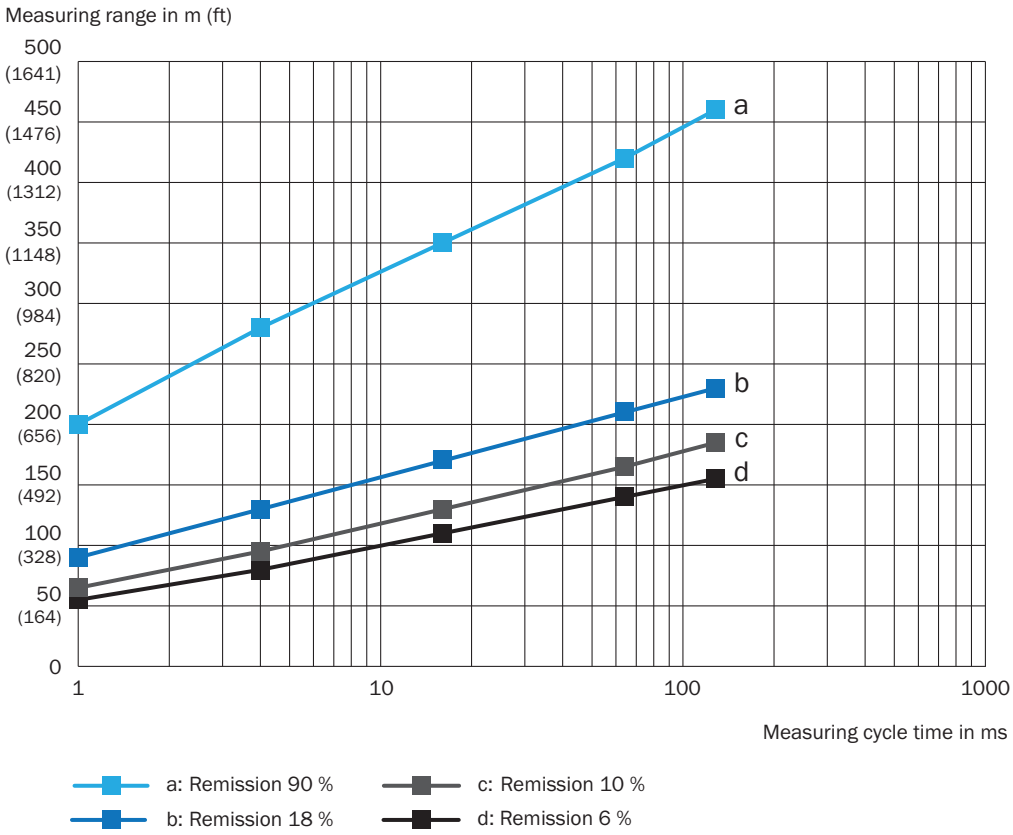
Certificates

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

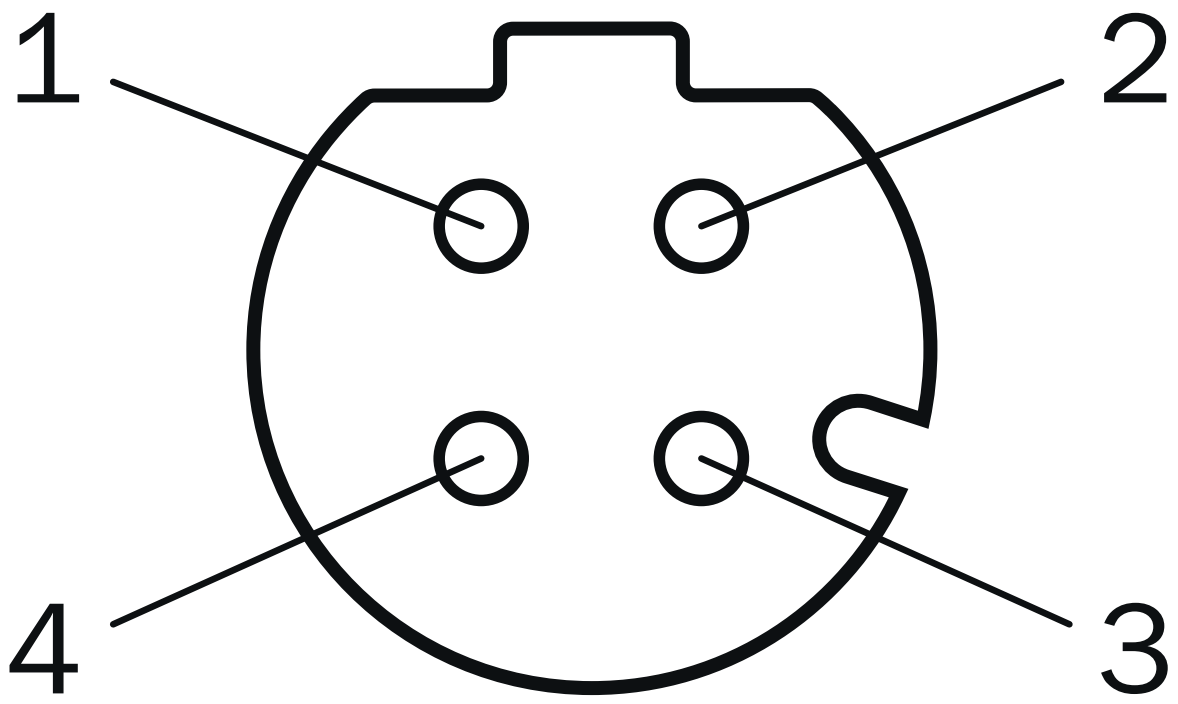
Classifications

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

Working range diagram DT1000 measuring range based on measurement cycle time and object remission

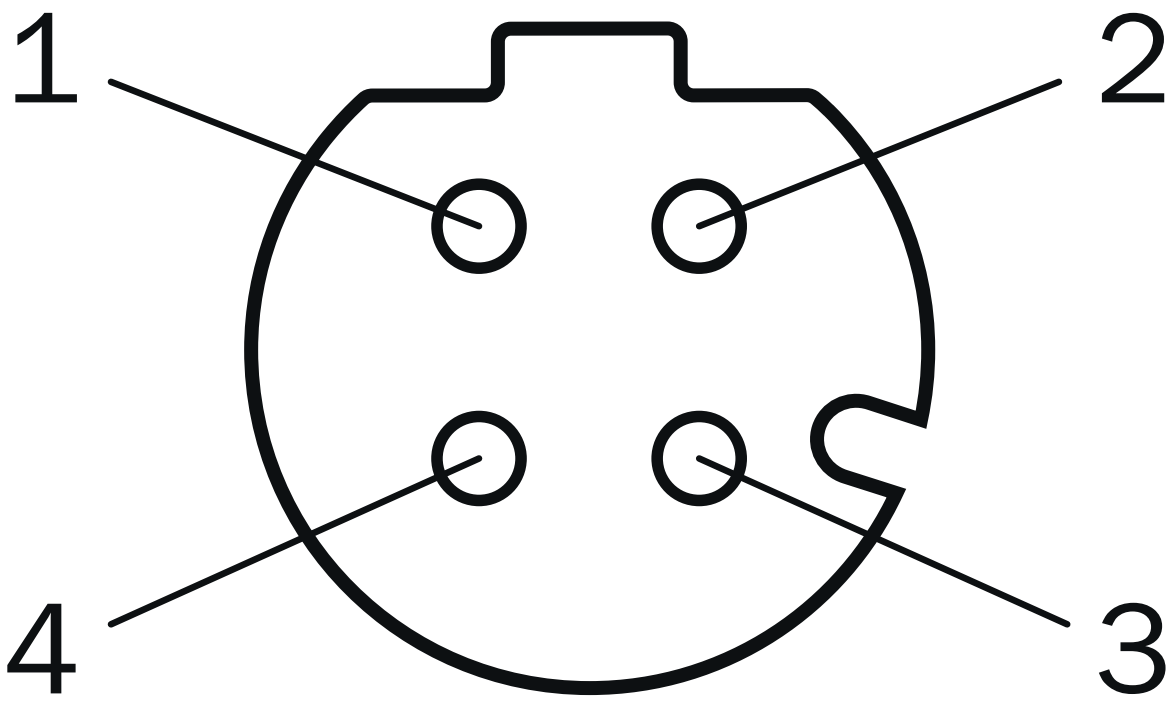


PIN assignment Connection 2: Ethernet/IP (port 1)



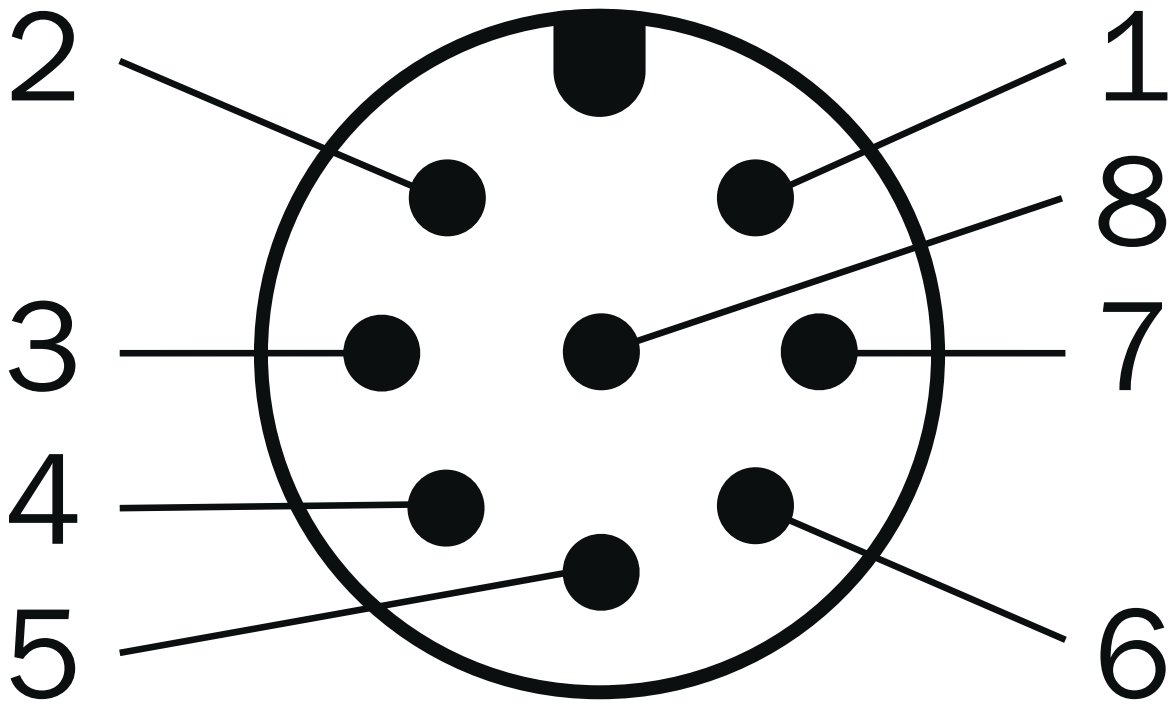
M12 female connector, 4-pin, D-coded
① TX+
② RX+
③ TX-
④ RX-

PIN assignment Connection 3: Ethernet/IP (port 2)



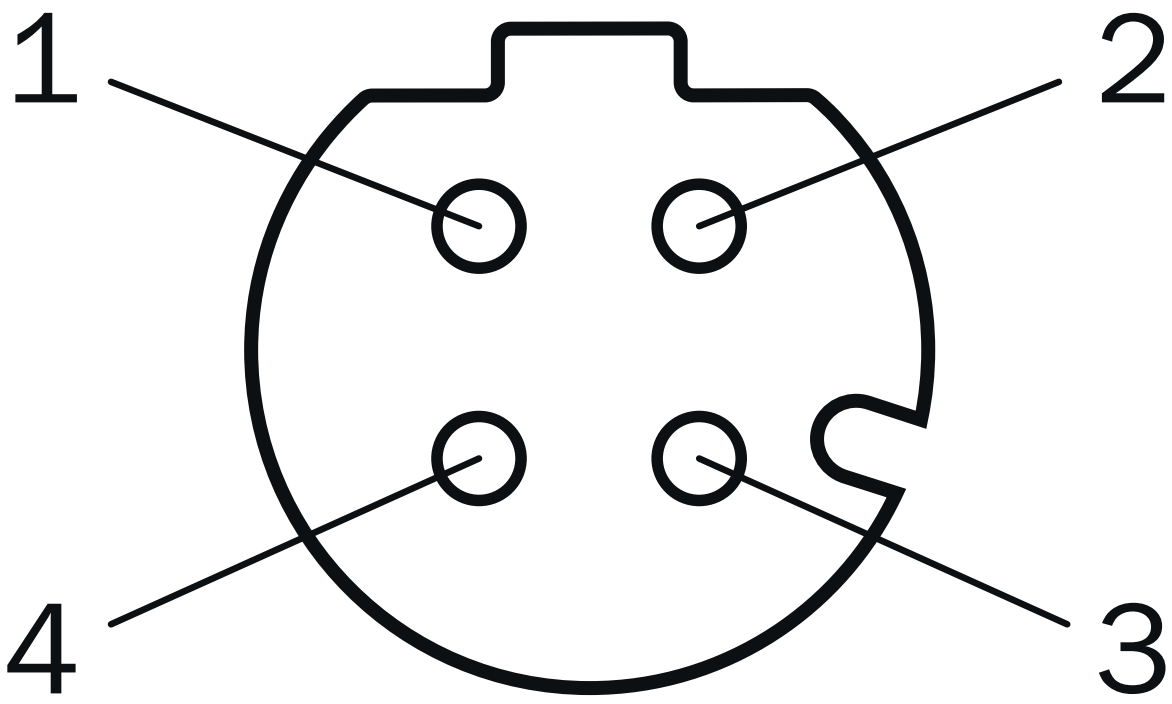
M12 female connector, 4-pin, D-coded
① TX+
② RX+
③ TX-
④ RX-

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



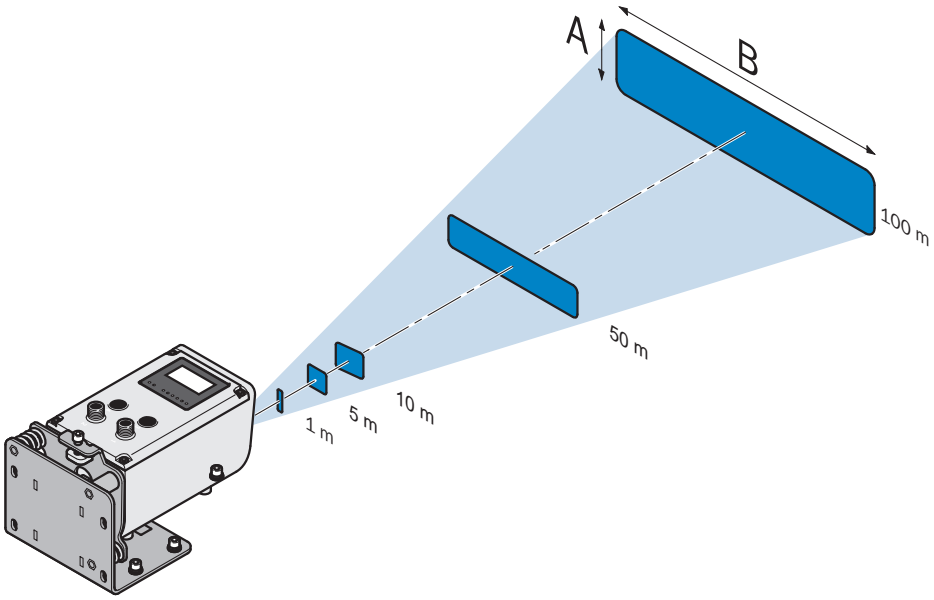
Connector M12, 8-pin, A-coded
① Q1/In1
② L+
③ RX-/CLK-
④ RX+/CLK+
⑤ TX-/Data-
⑥ TX+/Data+
⑦ M
⑧ Q_2/Q_A

PIN assignment Connection 4: Ethernet

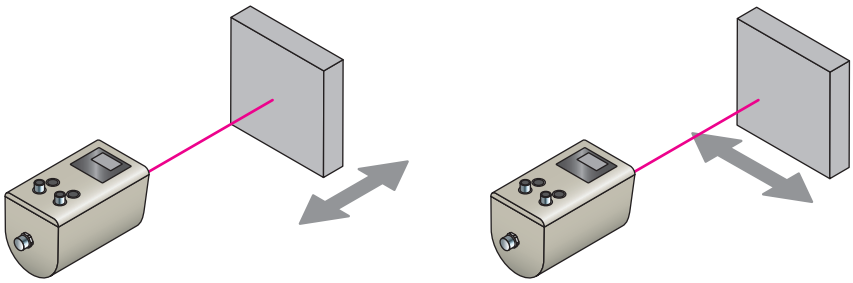


M12 female connector, 4-pin, D-coded
① TX+
② RX+
③ TX-
④ RX-

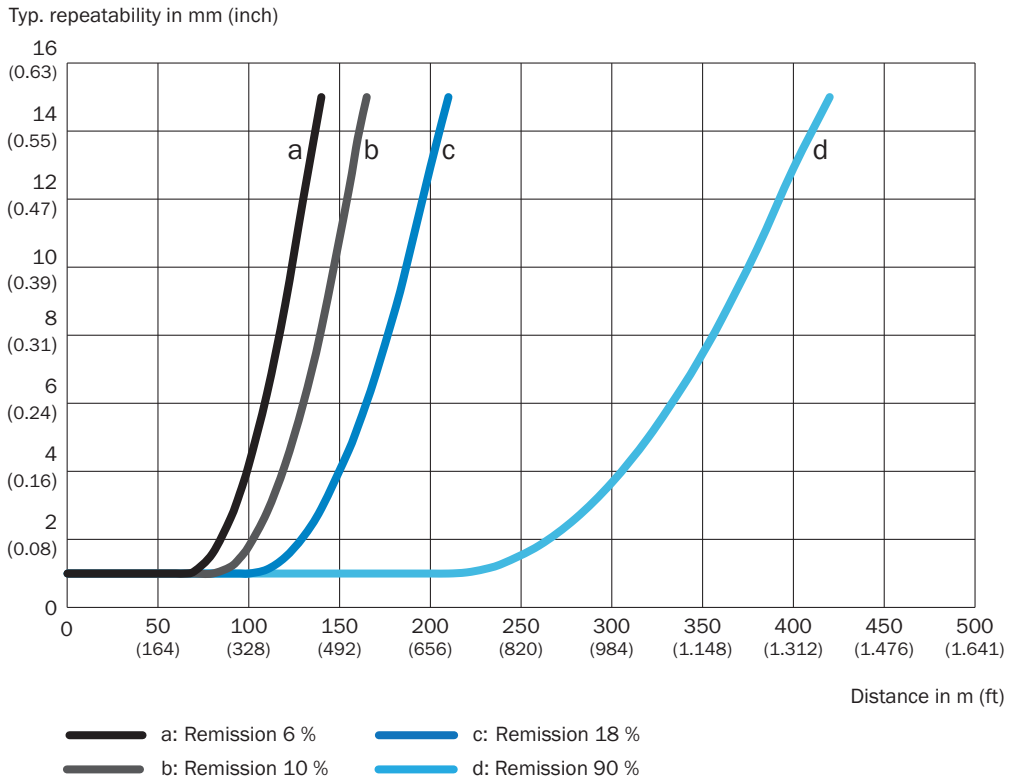
Light spot size



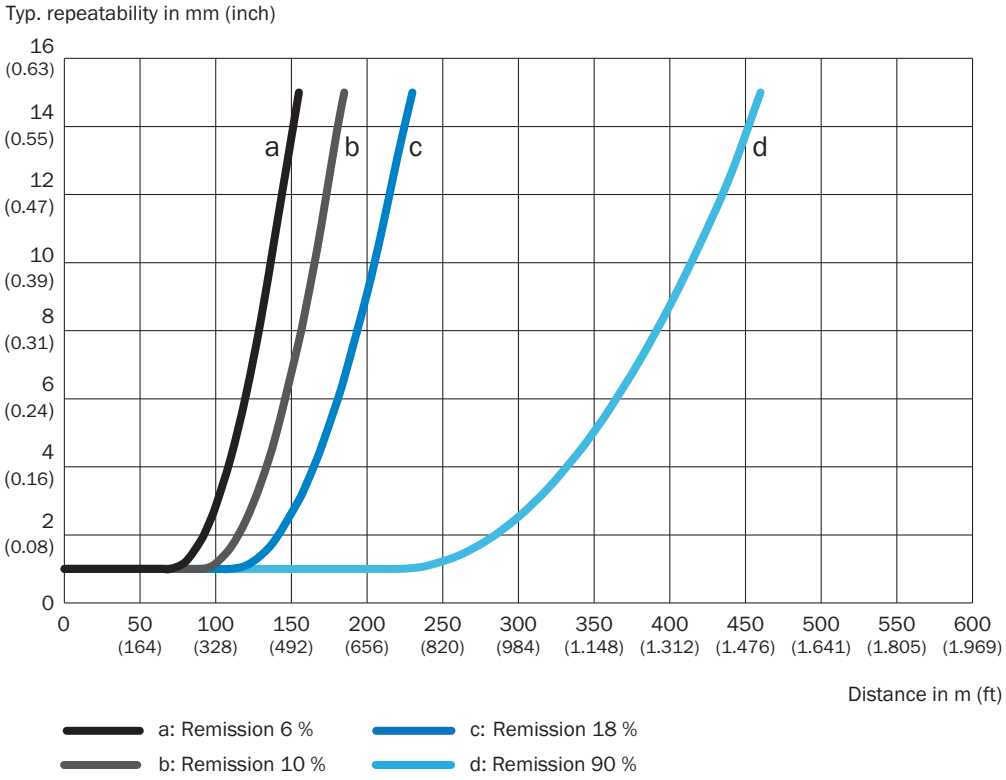
Functional principle



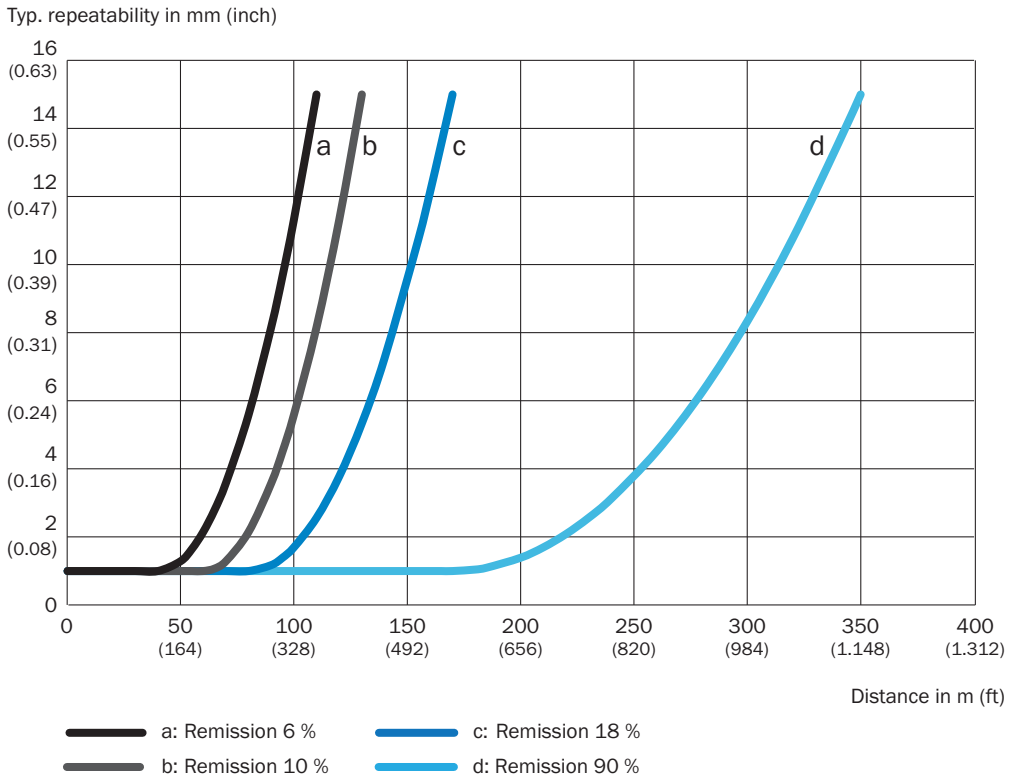
Repeatability DT1000, with 64 ms measurement cycle time



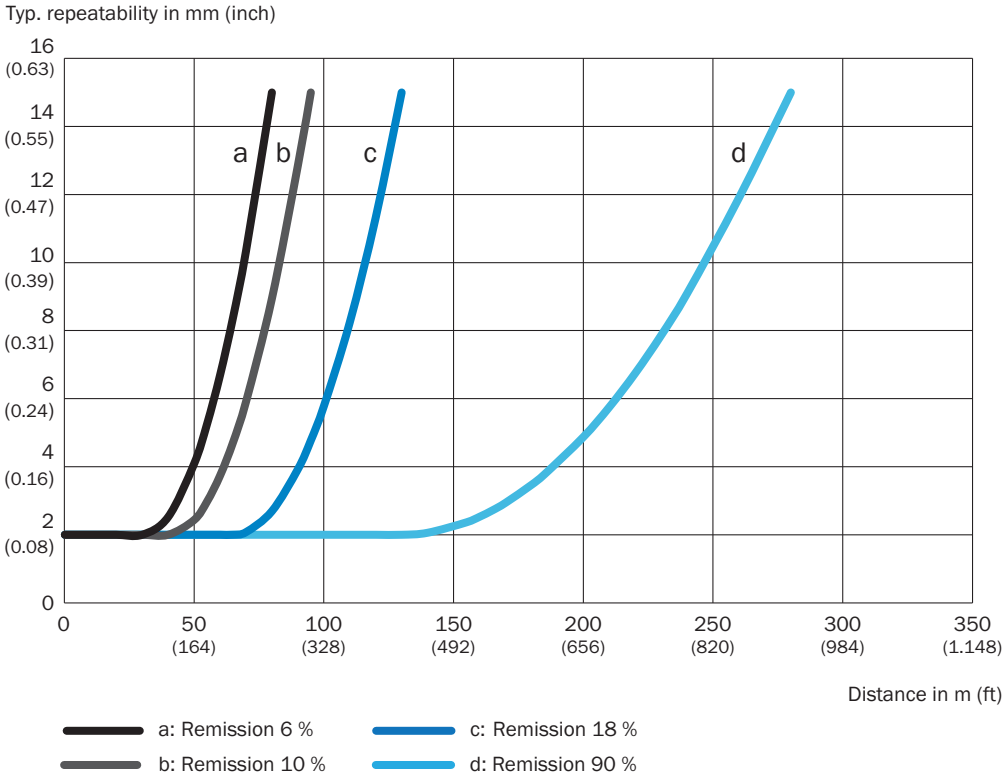
Repeatability DT1000, with 128 ms measurement cycle time



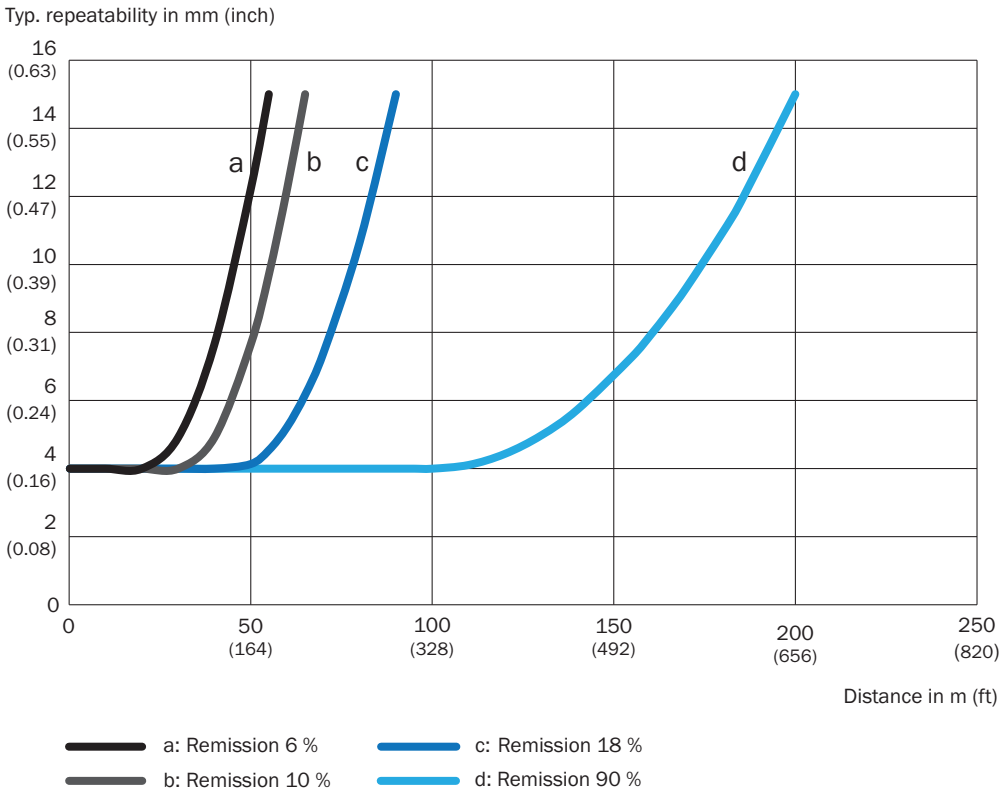
Repeatability DT1000, with 16 ms measurement cycle time



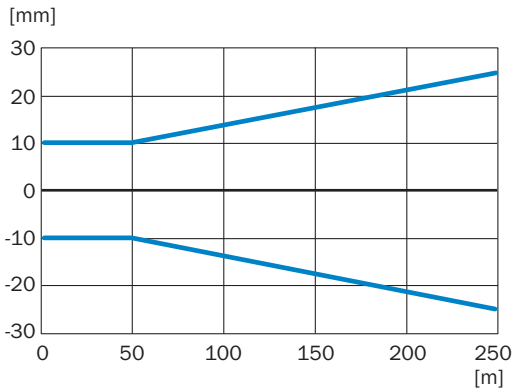
Repeatability DT1000, with 4 ms measurement cycle time



Repeatability DT1000, with 1 ms measurement cycle time



Measurement accuracy Typically DT1000, x-axis: Distance, y-axis: Typical measurement accuracy



Recommended accessories

Other models and accessories ➜ www.sick.com/Dx1000

	Brief description	Type	part no.
device protection and care			
	• **Description:** 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. • **Items supplied:** Weatherproof housing (BEF-AH-DX1000, tube for weatherproof housing and rain cover for protective housing are not included with delivery)	Weather-proof housing	2087690
connectors and cables			
	• **Connection type head A:** Female connector, M12, 8-pin, angled • **Connection type head B:** Flying leads • **Signal type:** RS-422, SSI • **Cable:** 10 m, 8-wire, PUR, halogen-free • **Description:** RS-422, shielded, SSI	YG2A68-100XXXXLECX	6051482
Mounting systems			
	• **Description:** Alignment bracket for mounting and precise alignment of the sensor in a horizontal and vertical direction • **Material:** Stainless steel • **Details:** Stainless steel • **Items supplied:** Mounting hardware included	BEF-AH-DX1000	2080392

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