

DS 500/DT 500

Laser sensor measures distances to 18 m – on black material in proximity mode



DS 500 – distance sensor with two user taught switch outputs. Suitable for precise and reliable detection of objects – even with black surfaces – at a distance of up to 18 m. The high resolution of the sensor enables exact background suppression even in the presence of bright surfaces in the background.

Typical applications are:

- Anti-collision control,
- detection of small parts over a large scanning distance,
- part detection in material handling applications.

The sensors within the DS/DT 500 series are ideal for applications in rough environmental conditions due to their robust metal housing. Using the time of flight principle, a red laser detects the precise distance to the target object. The measurement laser is clearly visible on the target even at large distances, similar to a laser pointer. An integrated display on the housing of the sensor illustrates the current measurement value and enables easy set-up of switch positions. For outdoor applications, versions are available with integrated heating and a weather protection hood.

DT 500 – distance sensor with an analogue output or serial RS 422 data output. A universal sensor for distance measurement of black objects at a distance of up to 18 m. The user can teach the sensor the start and end of the sensors measuring, i.e. it can be adapted optimally to the task.


With a resolution of 1 mm and an accuracy of 3 mm, the DT 500 can be used for precise measurement tasks.

Typical applications are:

- Contour detection,
- diameter measurement,
- difference measurements,
- positioning of parts,
- stack height measurement/classification.



▲ A DT 500 laser sensor ensures the central positioning of mattresses and prepares them for bonding on the top layer of the mattress.

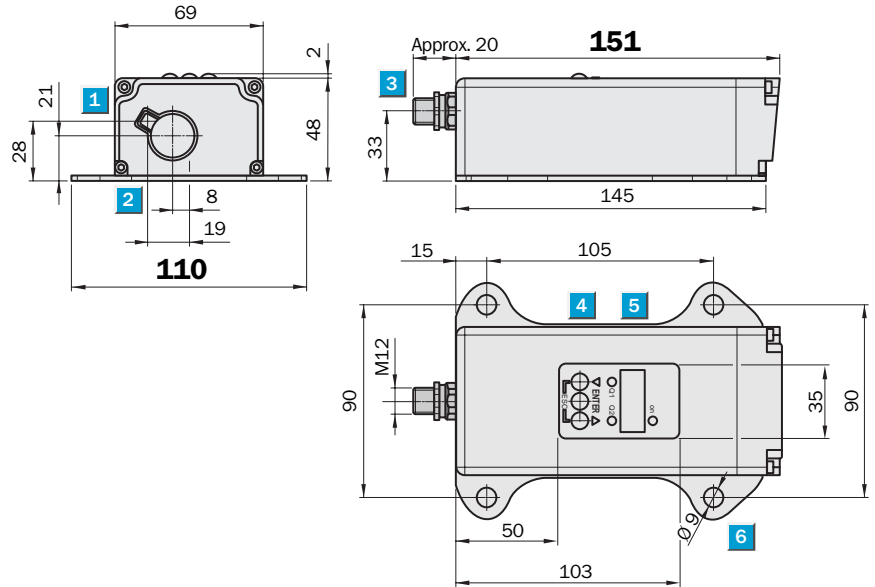


Scanning distance
0.2 ... 18 m

Distance sensor

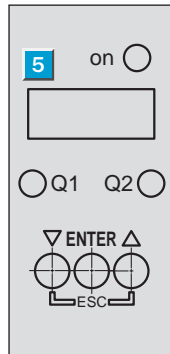
- High measurement accuracy thanks to time of flight measurement
- Simple alignment using red laser light
- Two distance switching outputs
- Metal housing with integral heating option
- Weather protection housing optional
- Alignment bracket optional

Dimensional drawing



Adjustments possible

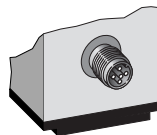
All types



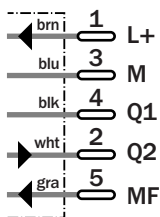
- 1 Optical axis – sender
- 2 Optical axis – receiver
- 3 M12 plug, 5-pin
- 4 Operating components
- 5 Indicator
- 6 Mounting hole

Connection type

All types



5-pin, M12



See chapter Accessories

- Cables and connectors
- Mounting systems
- Special accessories

Teach-in	MF active	Model
Q1	100 ms	Current measurement value is
Q̄1	200 ms	
Q2	300 ms	used as switching threshold
Q̄2	400 ms	

Technical data		DS500-	P111	P211	N111	N211						
Scanning distance		0.2 ... 18 m (black), 6 % remission										
		0.2 ... 30 m (white), 90 % remission										
Light spot diameter		30 mm at 20 m										
Light source ¹⁾, light type		Laser diode, red light										
Laser class		2 (EN 60825/21 CFR 1040)										
Supply voltage V_S ²⁾		10 ... 30 V DC ³⁾										
Residual ripple ⁴⁾		5 V _{pp}										
Power consumption typ. without heating		2 W										
	with heating	22 W										
Response time		250 ms										
Switching accuracy		± 3 mm										
Temperature drift		Typ. 0.05 mm/K										
Switching outputs Q1, Q2		PNP										
		NPN										
External Teach ET		Teach: > 12 V < V _S										
		Teach: < 2 V										
		Free-running < 2 V or unswitched										
		Free-running > 12 V < V _S										
VDE protection class ⁵⁾		<input type="checkbox"/>										
Enclosure rating		IP 65										
Ambient temperature	without heating	Operation -10 °C ... +50 °C										
	with heating	Operation -40 °C ... +50 °C ³⁾										
		Storage -25 °C ... +75 °C										
Weight		Approx. 1000 g										
Initialisation period		Typ. 500 ms										
EMC		EN 61000-6-2, EN 55011										
Mechanical load		Shock: EN 600 86-2-27/-2-29										
		Sine: EN 600 68-2-6										
		Noise: EN 600 68-2-64										

¹⁾ Average service life 50,000 h
at T_A = +25 °C


²⁾ Reverse-polarity protected

³⁾ V_S ≥ 24 V DC for DS500-P2xx
with heating

⁴⁾ May not exceed or fall short of
V_S tolerances

⁵⁾ Reference voltage 32 V DC

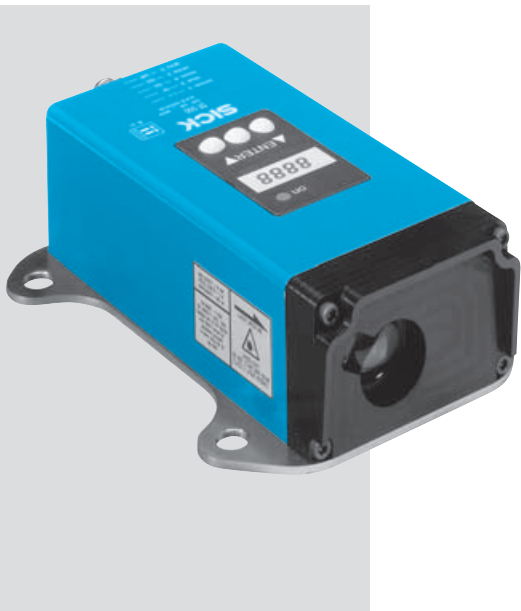
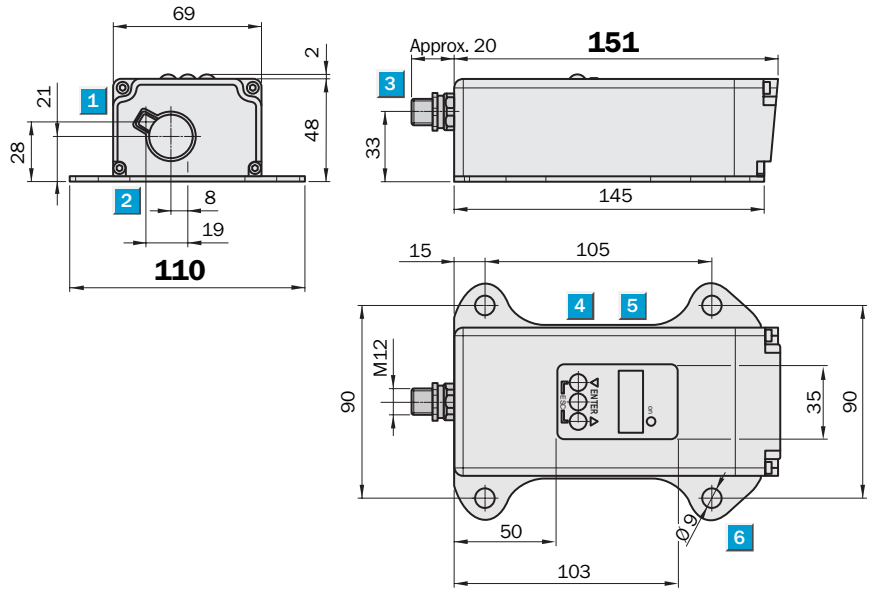
Error performance or no object in visibility field		Order information	
		Type	Order no.
Error:	Measurement value output display: 0.000	DS500-P111	1 026 519
	Switching outputs: Switching stage ≅ measurement value 0 m	DS500-P211	1 026 520
No object in visibility field:	Measurement value output display: 99.99	DS500-N111	1 026 512
	Switching outputs: Switching stage ≅ measurement value 99.99 m	DS500-N211	1 026 522

 **Measurement range**
0.2 ... 18 m

Distance sensor

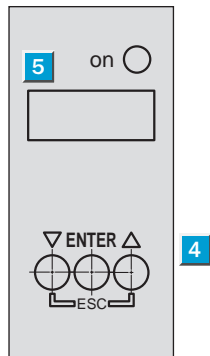
- High measurement accuracy thanks to time of flight measurement
- Simple alignment using red laser light
- Analogue current interface
- Serial RS 422 data output
- Metal housing with integral heating option
- Weather protection housing optional
- Alignment bracket optional

Dimensional drawing



Adjustments possible

All types

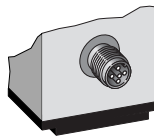
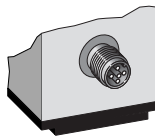


- 1 Optical axis – sender
- 2 Optical axis – receiver
- 3 M12 plug, 5-pin
- 4 Operating components
- 5 Indicator
- 6 Mounting hole

Connection type

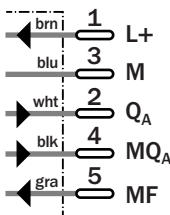
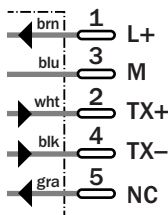
Serial (-A .. 2)

Analogue (-A .. 1)



5-pin, M12

5-pin, M12



See chapter Accessories

Cables and connectors

Mounting systems

Special accessories

Technical data		DT500-	A111	A211	A112	A212						
Measuring range	0.2 ... 18 m (black), 6 % remission											
	0.2 ... 30 m (white), 90 % remission											
Accuracy	±3 mm											
Reproducibility 1)	1 mm											
Measured value output	250 ms											
Temperature drift	Typ. 0.05 mm/K											
Light spot diameter	30 mm at 20 m											
Resolution	1 mm											
Light source 2), light type	Laser diode, red light											
Laser class	2 (EN 60825/21 CFR 1040)											
Supply voltage V_S 3)	10 ... 30 V DC 4)											
Residual ripple 5)	5 V _{PP}											
Power consumption typ. without heating	2 W											
with heating	22 W											
Analogue output (adjustable)	0 ... 20 mA/4 ... 20 mA											
Serial interface	RS 422; 19,2 kBd; 8, n, 1											
Measurement value display in mm 6)	20.000 CR LF											
VDE protection class 7)	□											
Enclosure rating	IP 65											
Ambient temperature	without heating	Operation	-10 °C ... +50 °C									
	with heating	Operation	-40 °C ... +50 °C 4)									
		Storage	-25 °C ... +75 °C									
Weight	Approx. 1000 g											
Initialisation period	Typ. 500 ms											
EMC	EN 61000-6-2, EN 55011											
Mechanical load	Shock:	EN 600 86-2-27/-2-29										
	Sine:	EN 600 68-2-6										
	Noise:	EN 600 68-2-64										

1) Statistical error 1 σ , environmental conditions constant

2) Average service life 50,000 h at T_A = +25 °C

3) Reverse-polarity protected
4) V_S ≥ 24 V DC for DT500-A2xx with heating

5) May not exceed or fall short of V_S tolerances

6) Without point, example output 20,000 mm

7) Reference voltage 32 V DC

Error performance or no object in visibility field

Error: Measurement value output display: 0.000
Analogue interface: 0/3.5 mA
Serial interface: 00000 CR LF

No object in visibility field:
Measurement value output display: 99.99
Analogue interface: 20.5 mA
Serial interface: 99999 CR LF

Order information

Type	Order no.
DT500-A111	1 026 515
DT500-A211	1 026 516
DT500-A112	1 026 517
DT500-A212	1 026 518