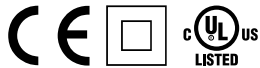


HIGH-PERFORMANCE COLOR SENSING

C



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Product description

The ability to teach up to four colors can lead to faster changeovers and shorter downtime. The CS8 series offers high switching speeds – as fast as 6 kHz (85 µsec) – enabling higher throughput. And, the sensor maintains the extreme precision of the lightspot; this sharp,

well-defined spot provides tighter process control and more consistent object detection. A bar graph display enables easy setup and provides information about the color quality and detection reliability.

At a glance

- One (CS8-1) or four (CS8-4) colors can be saved
- 12.5 mm or 60 mm sensing distance
- Fast response time up to 85 µs
- High resolution color
- Bar graph display shows the correlation of the colors
- Extremely precise light spot and high resolution
- Metal housing with two light exits (interchangeable)

Your benefits

- Identify and store up to four colors. No need to reprogram the sensor for changeovers, reducing downtime.
- High resolution colors can be matched exactly for better process reliability
- Maintains the extreme precision of the light spot, enabling a consistent object detection
- A bar graph display provides information about the color quality and detection reliability, ensuring simple process monitoring
- Broad spectrum of color tolerances enables more flexible use
- Fast response times at high speeds for reliable detection
- Detection reliability is not affected by varying temperatures

→ www.sick.com/de/en/CS8

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.



Detailed technical data

Features

Dimensions (W x H x D)	30.4 mm x 80 mm x 53 mm
Housing design (light emission)	Rectangular
Light source ¹⁾	LED
Type of light	RGB
Wave length	640 nm, 525 nm, 470 nm
Teach-in mode	Static 1-point teach-in

¹⁾ Average service life: 100,000 h at $T_U = +25\text{ °C}$.

Mechanics/electronics

Supply voltage ¹⁾	10 V DC ... 30 V DC
Ripple ²⁾	$< 5 V_{pp}$
Power consumption ³⁾	$< 120\text{ mA}$
Switching output	PNP: HIGH = $V_S - \leq 2\text{ V}$ / LOW approx. 0 V / NPN: HIGH = approx. V_S / LOW $\leq 2\text{ V}$ (depending on type)
Output current $I_{max.}$ ⁴⁾	$< 100\text{ mA}$
Input, teach-in (ET)	PNP Teach: $U = 10\text{ V} \dots < U_V$ Run: $U < 2\text{ V}$ NPN Teach: $U < 2\text{ V}$ Run: $U = 10\text{ V} \dots < U_V$
Input, blanking input (AT)	PNP Blanked: $U > 10\text{ V} \dots < U_V$ Free-running: $U < 2\text{ V}$ ⁵⁾ NPN Blanked: $U < 2\text{ V}$ Free-running: $U > 10\text{ V} \dots < U_V$ ⁵⁾
Retention time (ET)	25 ms, non-volatile memory
Time delay	Deactivation delay 20 ms, shiftable
Connection type	Connector M12, 5-pin, male connector M12, 8-pin (depending on type)
Protection class ⁶⁾	II
Circuit protection	V_S connections reverse-polarity protected, Output Q short-circuit protected, Interference suppression
Fieldbus interface	-
Enclosure rating	IP 67
Weight	400 g
Housing material	Metal, zinc diecast

¹⁾ Limit values; operation in short-circuit protected network max. 8 A.

²⁾ May not exceed or fall below U_V tolerances.

³⁾ Without load.

⁴⁾ Consumption count Q1 / Q2.

⁵⁾ AT > 200 μs .

⁶⁾ Reference voltage DC 32 V.

Ambient data

Ambient operating temperature	$-10\text{ °C} \dots +55\text{ °C}$
Ambient storage temperature	$-20\text{ °C} \dots +75\text{ °C}$
Shock load	According to IEC 60068
UL File No.	NRKH.E181493 & NRKH7.E181493

Ordering information

Other models → www.sick.com/de/en/CS8

CS8-1, 1 color

- **Switching frequency:** 1 kHz, 3 kHz, 6 kHz (adjustable, with light/dark ratio 1:1.)
- **Response time:** 500 µs, 160 µs, 85 µs (Signal transit time with resistive load.)
- **Connection type:** connector M12, 5-pin

Sensing distance ¹⁾	Sensing distance tolerance	Light spot size	Light spot direction	Output type	Connection diagram	Type	Part no.
12.5 mm	± 3 mm	2 mm x 4 mm	Vertical	PNP	Cd-313	CS81-P1112	1028224
				NPN	Cd-313	CS81-N1112	1028228
60 mm	± 9 mm	13 mm x 13 mm	-	PNP	Cd-313	CS81-P3612	1028225
				NPN	Cd-313	CS81-N3612	1028229

¹⁾ From front edge of lens.

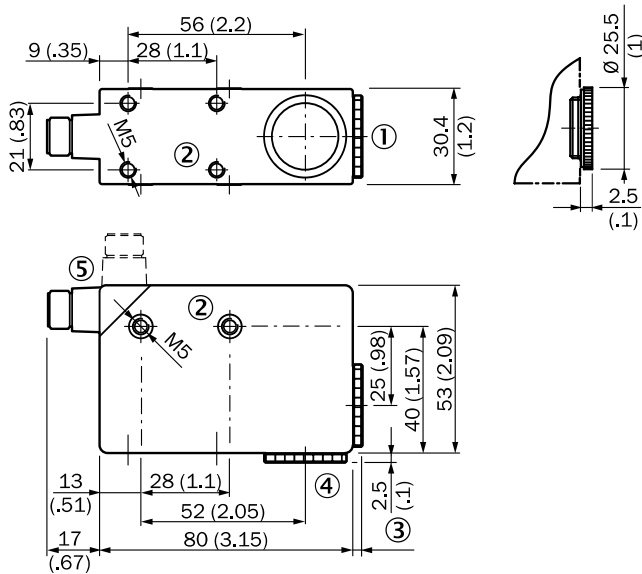
CS8-4, 4 colors

- **Switching frequency:** 0.5 kHz, 1 kHz, 3.5 kHz (adjustable, with light/dark ratio 1:1.)
- **Response time:** 1,000 µs, 500 µs, 145 µs (Signal transit time with resistive load.)
- **Connection type:** male connector M12, 8-pin

Sensing distance ¹⁾	Sensing distance tolerance	Light spot size	Light spot direction	Output type	Connection diagram	Type	Part no.
12.5 mm	± 3 mm	2 mm x 4 mm	Vertical	PNP	Cd-311	CS84-P1112	1028226
				NPN	Cd-311	CS84-N1112	1028230
60 mm	± 9 mm	13 mm x 13 mm	-	PNP	Cd-311	CS84-P3612	1028227
				NPN	Cd-311	CS84-N3612	1028231

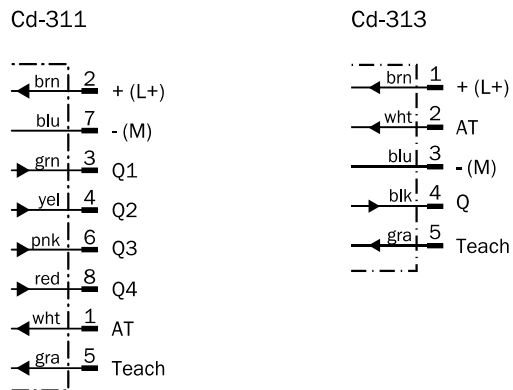
¹⁾ From front edge of lens.

Dimensional drawing (Dimensions in mm (inch))



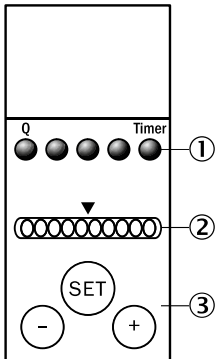
- ① Lens (light transmission)
- ② M5 threaded mounting hole, 5.5 mm deep
- ③ See dimensional drawing for lens
- ④ Blind screw can be replaced by lens
- ⑤ Connector M12 (rotatable up to 90°)

Connection diagram



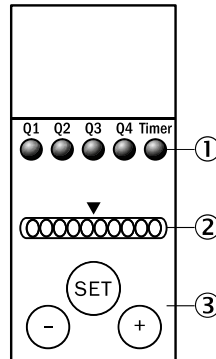
Adjustments

CS8-1



- ① Function signal indicators (yellow)
- ② Bar graph (green), Power on left LED
- ③ Teach-in button/"+" and "-" button

CS8-4



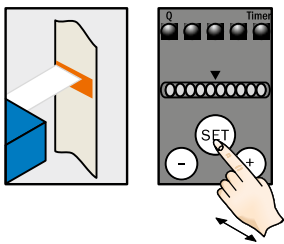
- ① Function signal indicators (yellow)
- ② Bar graph (green), Power on left LED
- ③ Teach-in button/"+" and "-" button

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Setting the switching threshold

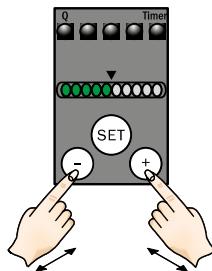
CS8-1

1. Trigger teach-in



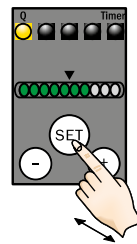
Position object in light field.
Press SET button > 1 s.

2. Select color tolerance



If necessary adapt tolerance with
"+" button (more coarse) or
"-" button (more precise).

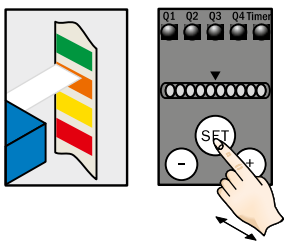
3. Confirm teach-in



Press SET button > 1 s.
Color correspondence is
visualized via bar graph display.

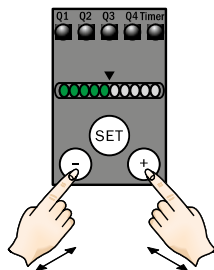
CS8-4

1. Trigger teach-in



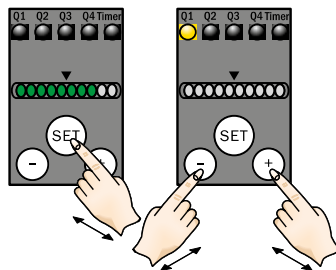
Position object in light field.
Press SET button > 1 s.

2. Select color tolerance



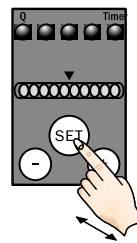
If requested adapt tolerance with
"+" button (more coarse) or
"-" button (more precise).
Press SET button > 1 s.

3. Allocate channel to color



Allocate channel for color with
"+" button (Q1 to Q4) or
"-" button (Q4 to Q1).
Press SET button > 1 s.

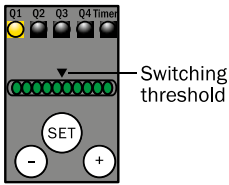
4. Confirm teach-in



Press SET button > 1 s.
Color correspondence is
visualized via bar graph
display.

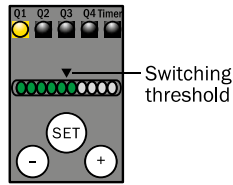
Display of the color correspondence

1. Full correspondence



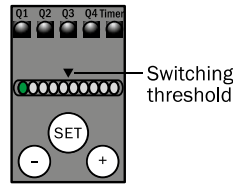
Color detected
= Q active.

2. Correspondence



Color just detected
= Q active.

3. No correspondence



Color not detected
= Q inactive.

Special settings

“Evaluation mode,” “Tolerance change during operation,” “Show quality,” “Time stage,” and “Output logic” can be set via a special menu (cf. appropriate operating instructions for the device).

(-) and (+)

> 1 s = enter/exit

(-) or (+)

< 1 s = navigate

(SET)

> 1 s = select/confirm

Recommended accessories

Universal bar clamp systems

Figure	Material	Description	Type	Part no.
	Steel, zinc coated	Plate G for universal clamp bracket	BEF-KHS-G01	2022464
		Plate K for universal clamp bracket	BEF-KHS-K01	2022718
		Universal clamp bracket for rod mounting	BEF-KHS-KH1	2022726
		Mounting bar, straight, 200 mm, steel	BEF-MS12G-A	4056054
		Mounting bar, straight, 300 mm, steel	BEF-MS12G-B	4056055
		Mounting bar, L-shaped, 150 mm x 150 mm, steel	BEF-MS12L-A	4056052
		Mounting bar, L-shaped, 250 x 250 mm, steel	BEF-MS12L-B	4056053

Plug connectors and cables


Connecting cables with female connector

M12, 5-pin, PVC, chemical resistant

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M12, 5-pin, straight, unshielded	Cable, open conductor heads	2 m, 5-wire	DOL-1205-G02M	6008899
			5 m, 5-wire	DOL-1205-G05M	6009868
			10 m, 5-wire	DOL-1205-G10M	6010544
	Female connector, M12, 5-pin, angled, unshielded	Cable, open conductor heads	2 m, 5-wire	DOL-1205-W02M	6008900
			5 m, 5-wire	DOL-1205-W05M	6009869
			10 m, 5-wire	DOL-1205-W10M	6010542

M12, 8-pin, PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M12, 8-pin, straight, shielded	Cable, open conductor heads	2 m, 8-wire	DOL-1208-G02MA	6020633
			5 m, 8-wire	DOL-1208-G05MA	6020993

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M12, 8-pin, angled, shielded	Cable, open conductor heads	2 m, 8-wire	DOL-1208-W02MA	6020992
			5 m, 8-wire	DOL-1208-W05MA	6021033

→ For additional accessories, please see page K-240

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