MICRO-EPSILON

More Precision

colorSENSOR // Color Sensors, LED Analyzers

colorSENSOR OT-3-LD

- *Color sensor for large distances*

- *31 colors can be saved*

- *Coaxial lens for large working distances up to 900 mm*

- *Color and gray scale evaluation*

- *PC programming via RS232*

Features:
- Object distance typ. 50 mm - 900 mm
- Integrated transmitter and receiving optics (coaxial)
- Color memory: 31 colors via Teach-in and software
- RS232 interface (optional USB adapter)
- Super bright white light LED
- Color, contrast and gray-scale detection
- Insensitive to external light up to 5000 Lux
- Switchable brightness readjustment
- Max. switching frequency: 35 kHz
- Different evaluation algorithms can be activated
  e.g. „BEST HIT" mode
- Switching state display via 5 yellow LEDs
- Temperature compensation (<0.01% / K)
- Switchable averaging function
- Color control of self-luminous objects

Application examples:
- Color recognition from a large distance up to 900 mm
- Correct product positioning in production machines
- Packaging control
- Color sorting tasks
- Color assignment with cars
- Detection of bottle crates
- Paper recycling recognition
- Illumination recognition as per color and intensity

OT-3-LD-500

Dimensions:
Dimensions in mm, not to scale

Model	OT-3-LD-200-6	OT-3-LD-200-12	OT-3-LD-200-26	OT-3-LD-500-23	OT-3-LD-500-50
Article number	10234434	10234437	10234438	10234085	10234086
Object distance	typ. 100 - 700 mm ideal distance 200 mm	typ. 50 - 500 mm ideal distance 200 mm	typ. 50 - 500 mm ideal distance 200 mm	typ. 100 - 900 mm ideal distance 500 mm	typ. 100 - 900 mm ideal distance 500 mm
Light spot	Ø 4 - 28 mm	Ø 4 - 32 mm	Ø 6 - 70 mm	Ø 6 - 46 mm	Ø 8 - 105 mm
Light spot diameter	Ø 6 mm with 200 mm	Ø 12 mm with 200 mm	Ø 26 mm with 200 mm	Ø 25 mm with 500 mm	Ø 58 mm with 500 mm
Repeatability [1]		$\Delta E \leq 0.9$		$\Delta E \leq 1.5$	
Color distance		$\Delta E \leq 1.8$		$\Delta E \leq 3.0$	
Color spaces			X/Y INT; s/i M (Lab)		
Averaging			over a maximum of 32,768 values		
Size of color memory			max. 31 colors in non-volatile EEPROM with parameter sets		
Switching frequency			max. 35kHz (depending on number of colors learned and setting for averaging)		
Temperature drift X, Y			<0.01 % / K		
Light source			ultra-bright white light LED, AC/DC/PULSE modes (adjustable or OFF for self-luminous objects, switchable via software) [2]		
Type of illumination			coaxial		
Effect from illumination			large object distance		
Ambient light			up to 5000 Lux (in AC and PULSE modes)		
Alternating light operation			AC: typ. up to 20 kHz (depending on amplification level AMP1 to AMP8) DC: typ. up to 35 kHz PULSE: typ. switchable by PC software up to 5 kHz		
Power supply			+24 VDC (± 10 %), reverse polarity protection, overload-proof		
Power consumption			typ. 160 mA		
Max. switching current			100 mA, short circuit proof		
TEACH key/inputs			1 key and IN0 for external teaching of the color references		
Outputs			OUT 0 - OUT 4, digital (0 V/+Ub), short circuit proof, 100 mA max. switching current npn/pnp capable (switchable light/dark switching)		
Switching state display			visualization with 5 yellow LEDs		
Interface			RS232 (optional USB)		
Type of connector			to PLC: 8-pole flange socket (Binder series 712) to PC: 4-pole flange socket (Binder series 707)		
Connection cable			power/PLC: art.no. 11234091 / PC: art.no. 11234095 (RS232); 11234096 (USB)		
Receiver			3-color filter detector (XYZ TRUE COLOR Detector, color filter curve according to CIE1931)		
Software			colorCONTROL S		
Pulse extension			adjustable from 0 ms to 100 ms		
Signal amplification			8 stages (AMP1 - AMP8), adjustable		
Housing material			Aluminum, anodized black		
Operating temperature			-20 ... +55 °C		
Storage temperature			-20 ... +85 °C		
Protection class			IP67 (lens), IP64 (electronics)		
EMC test according to			DIN EN60947-5-2		

[1] maximum color distance ΔE of 250 successive measurements of the color value of a light gray reference tile (R = 61%), measured with sensor FAR-T-A2.0-2,5-1200-67° at 1000 Hz and brightness adjustment with a white standard (R = 95%)
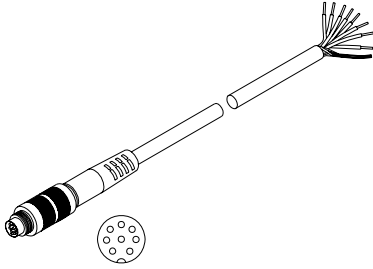[2] suitable for illumination testing

colorSENSOR Accessory

Art. No.	Description	suitable for:
11234717	CAB-M12-8P-co-fm-straight; 2m-PUR; open ends	colorSENSOR CFO (SYS; power and PLC)
11234718	CAB-M12-8P-co-fm-straight; 5m-PUR; open ends	colorSENSOR CFO (SYS; power and PLC)
11234722	CAB-M12-8P-co-straight; 2m-PUR; open ends	colorSENSOR CFO200 (digital I/O; PLC)
11234723	CAB-M12-8P-co-straight; 5m-PUR; open ends	colorSENSOR CFO200 (digital I/O; PLC)
11234735	CAB-M12-4P-co-straight; 2m-PUR-Cat5e; RJ45-Eth	colorSENSOR CFO (Ethernet)
11234736	CAB-M12-4P-co-straight; 5m-PUR-Cat5e; RJ45-Eth	colorSENSOR CFO (Ethernet)
11234713	CFO mounting adapter	colorSENSOR CFO
11234762	CFO DIN rail mounting kit	colorSENSOR CFO
11234763	CFO DIN rail mounting adapter	colorSENSOR CFO
11234091	CAB-M9-8P-co-straight; 2m-PUR; open ends	colorSENSOR LT and OT series (power und PLC)
11234099	CAB-M9-8P-co-straight; 5m-PUR; open ends	colorSENSOR LT and OT series (power und PLC)
11234093	CAB-M9-4P-co-straight; 2m-PVC; RS232	colorSENSOR LT-2-DU (RS232)
11234101	CAB-M9-4P-co-straight; 5m-PVC; RS232	colorSENSOR LT-2-DU (RS232)
11234094	CAB-M9-4P-co-straight; 2m-PVC; USB	colorSENSOR LT-2-DU (USB)
11234102	CAB-M9-4P-co-straight; 5m-PVC; USB	colorSENSOR LT-2-DU (USB)
11234095	CAB-M5-4P-co-straight; 2m-PUR; RS232	colorSENSOR OT-3 Serie (RS232)
11234103	CAB-M5-4P-co-straight; 5m-PUR; RS232	colorSENSOR OT-3 series (RS232)
11234096	CAB-M5-4P-co-straight; 2m-PVC; USB	incl. RS232/USB converter suitable for: colorSENSOR OT-3 series (USB)
11234104	CAB-M5-4P-co-straight; 5m-PVC; USB	incl. RS232/USB converter suitable for: colorSENSOR OT-3 series (USB)
11234368	CAB-M5-4P-co-straight; 2m-PVC; RJ45-fm-Eth	incl. RS232/Ethernet converter suitable for: colorSENSOR OT-3 series (Ethernet)
11234694	White standard 30mm zenith	colorSENSOR and colorCONTROL
11234695	White standard 30mm zenith calibrated	colorSENSOR and colorCONTROL
11233482	White reference module	colorSENSOR LT-2-DU
2420065	PS2030 power supply 24 V / 24 W / 1A; 2m-PVC; terminal-2P-co-fm-straight	Power supply of all sensors with 24 VDC

colorCONTROL MFA Accessory

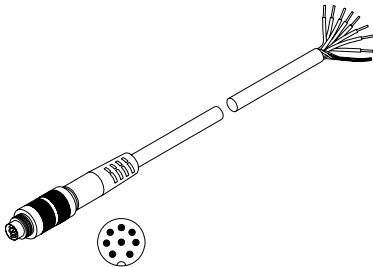| Art. No.	Description	suitable for:
10814105	POF-2.2mm fiber optics	colorCONTROL MFA
11251112	Fiber-optic thread fitting; M4	POF-2,2
11251113	Mountable lens 6mm	Fiber-optic thread fitting; M4
11253931	Fiber-optic thread fitting; 3mm lens; M4	POF-2,2
11254108	Fiber-optic thread fitting; 90° lens, M5	POF-2,2
11253959	Reducing adapter 2.2/1mm POF; 2 pc.	colorCONTROL MFA for use of POF-1mm
10813842	POF-1mm fiber optics	colorCONTROL MFA in connection with the reducing adapter 2.2/1mm POF
11253906	End sleeve 1mm	POF-1mm
10824431	End sleeve 1mm x 50mm	POF-1mm
11234305	CAB-M8-4P-co-fm-straight; 2m-PUR; open ends	colorCONTROL MFA-1 (power and PLC)
11234306	CAB-M8-4P-co-fm-straight; 5m-PUR; open ends	colorCONTROL MFA-1 (power and PLC)
11294205	CAB-M9-2P-co-fm-straight; 2m-PUR; open ends	colorCONTROL MFA-5 (power)
11294206	CAB-M9-2P-co-fm-straight; 5m-PUR; open ends	colorCONTROL MFA-5 (power)
11234094	CAB-M9-4P-co-straight; 2m-PVC; USB	colorCONTROL MFA-5 (USB)
11234102	CAB-M9-4P-co-straight; 5m-PVC; USB	colorCONTROL MFA-5 (USB)
11234095	CAB-M5-4P-co-straight; 2m-PUR; RS232	colorCONTROL MFA-5 (RS232)
11234103	CAB-M5-4P-co-straight; 5m-PUR; RS232	colorCONTROL MFA-5 (RS232)
11294243	Assembly kit MFA-10	colorCONTROL MFA-5 + MFA-5-M
11294244	Assembly kit MFA-15	colorCONTROL MFA-5 + 2 x MFA-5-M
11294245	Assembly kit MFA-20	colorCONTROL MFA-5 + 3 x MFA-5-M
11294203	CAB-socket board-6P-co-fm-straight; 2m-PVC; 2P-open ends	colorCONTROL MFA-5-P (power)
11294054	CAB-socket board-6P-co-fm-straight; 1m-PVC; USB	colorCONTROL MFA-5-P (USB and power)
11294204	CAB-socket board-4P-co-fm-straight; 2.5m-PVC; RS232	colorCONTROL MFA-5-P (RS232)

Pin assignment

CAB-M12-8P-co-fm-straight; Xm-PUR; open ends
(art.no.: 11234717; 11234718)
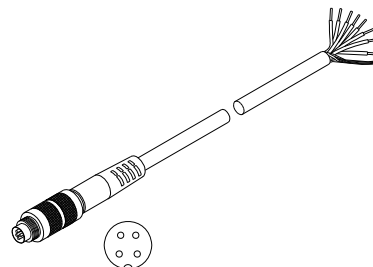Connection cable SYS; Power and PLC
(max. length 10m, PUR sheath)

Pin	Color	CFO100/200
1	white	IN0
2	brown	+UB
3	green	TX
4	yellow	RX
5	gray	OUT0
6	pink	OUT1
7	blue	GND
8	red	OUT2

CAB-M9-8P-co-straight; Xm-PUR; open ends
(art.no.: 11234091; 11234098)
Connection cable to power/PLC or digital I/O
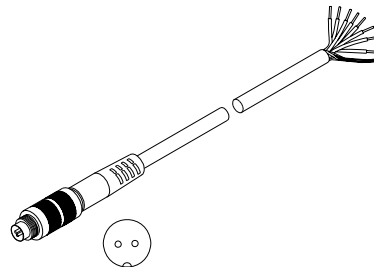(max. length 10m, PUR sheath)

Pin	Color	LT-2-DU SB1	LT-2-DU SB2	OT-3-XX
1	white	OUT 0 / OUT A 0	OUT1	GND (0V)
2	brown	OUT 1 / OUT A 1	OUT2	+24 VDC (±10%)
3	green	IN1	OUT3	IN0
4	yellow	IN0	OUT4	OUT0
5	gray	CLK (OUT K)	OUT5	OUT1
6	pink	OUT 2 / OUT A 2	OUT6	OUT2
7	blue	GND (0V)	OUT7	OUT3
8	red	+24 VDC (±10%)	OUT0	OUT4

CAB-M8-4P-fm-co-straight; Xm-PUR; open ends
(art.no.: 11234305; 11234306)
Connection cable to Power/PLC
(max. length. 5m, PUR sheath)

Pin	Color	MFA-1
1	brown	+ 24 VDC
2	white	External Teach
3	blue	GND
4	black	NPN/PNP

CAB-M9-2P-co-fm-Straight; Xm-PUR; open ends
(Art.-No.: 11294205; 11294206)
Connection cable Power
(max. length 10m, PUR sheath)

Pin	Color	MFA-5
1	white	+24 VDC
2	brown	GND

High performance sensors made by Micro-Epsilon

Sensors and systems for displacement
and position

Sensors and measurement devices for
non-contact temperature measurement

2D/3D profile sensors (laser scanner)

Optical micrometers, fiber
optic sensors and fiber optics

Color recognition sensors, LED analyzers
and color inline spectrometer

Measurement and inspection systems