



# More Precision

**colorSENSOR** // Colors sensors, LED Analyzers





- Color sensor of inhomogeneous surfaces and gloss suppression
- 31 colors can be saved
- Diffuse illumination reduces gloss effect
- Color and gray scale evaluation
- PC programming via RS232

#### Features:

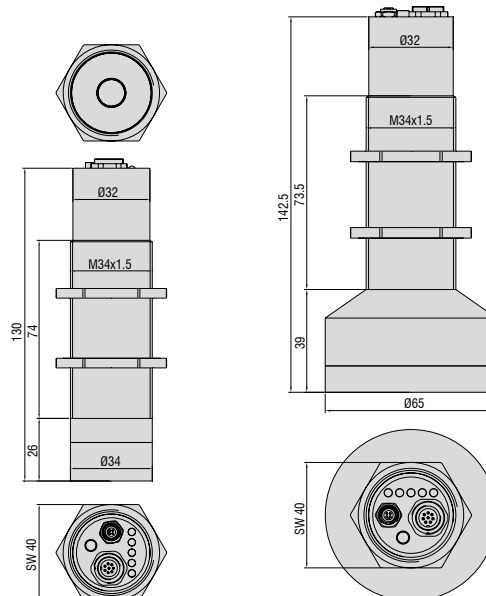
- White light LED ring with diffuser
- Object distance, typically 10 mm - 300 mm
- Gloss effect suppression through diffuse illumination
- Color memory: 31 colors per Teach-in and software
- RS232 interface (optional USB adapter)
- Insensitive to external light up to 5000 Lux
- Switchable brightness readjustment
- Max. switching frequency: 30 kHz
- Different evaluation algorithms can be activated, e.g. „BEST HIT“ mode
- Switching state display via 5 yellow LEDs
- Switchable averaging
- Color control of self-luminous objects

#### Application examples:

- Color recognition of structured and/or shiny surfaces
- Detection of color rings
- Color mark recognition in printing industry
- Packaging control
- Color sorting tasks
- Color control of self-luminous object (LEDs, displays, etc.)

#### Dimensions:

Dimensions in mm, not to scale



OT-3-GL-30-8/OT-3a-GL-30-16  
OT-3-GL-50-12.5/OT-3-GL-50-25

OT-3-GL-80-36

Model	OT-3-GL-30-8	OT-3-GL-30-16	OT-3-GL-50-12.5	OT-3-GL-50-25	OT-3-GL-80-36
Article number	10234073	10234074	10234075	10234076	10234077
Object distance	typ. 10 mm - 60 mm ideal distance 30 mm		typ. 20 mm - 80 mm ideal distance 50 mm		typ. 40 mm - 100 mm ideal distance 80 mm
Light spot	Ø 4 - 14 mm	Ø 8 - 28 mm	Ø 5 - 20 mm	Ø 10 - 40 mm	Ø 30 - 40 mm
Light spot diameter	Ø 8 mm with 30 mm	Ø 16 mm with 30 mm	Ø 12.5 mm with 50 mm	Ø 25 mm with 50 mm	Ø 36 mm with 80 mm
Repeatability <sup>1)</sup>	$\Delta E \leq 0.9$				
Color distance	$\Delta E \leq 1.8$				
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. 30 kHz (depending on number of colors learned and setting for averaging)				
Temperature drift X, Y	<0.01 % / K				
Light source	8x white light LEDs, AC/DC operation (adjustable or OFF for self-luminous objects, switchable via software)				12x white light LEDs, AC/DC operation (adjustable or OFF for self-luminous objects, switchable via software)
Type of illumination	diffuse				
Effect from illumination	gloss effect suppression				
Ambient light	up to 5000 Lux (AC mode)				
Alternating light operation	AC: typ. 10 kHz to 40 kHz (depending on amplification level AMP1 to AMP8) DC: switchable by PC software				
Power supply	+24 VDC ( $\pm 10\%$ ), reverse polarity protection, overload-proof				
Power consumption	typ. 320 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	power/PLC: 8-pole flange socket; (Binder series 712) PC: 4-pole flange socket (Binder series 712)				
Connection cable	to power/PLC: art. no. 11234091 to PC: 11234095 (RS232); art.no. 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				

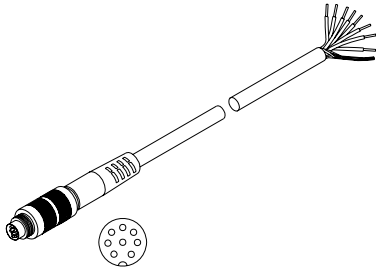
<sup>1)</sup> maximum color distance  $\Delta E$  of 250 successive measurements of the color value of a light gray reference tile (R = 61%), measured with sensor FAR-TA2.0-2,5-1200-67° at 1000 Hz and brightness adjustment with a white standard (R = 95%)

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; 2 m-PUR; open ends	colorSENSOR LT and OT series (power und PLC)
11234099	CAB-M9-8P-co-straight; 5 m-PUR; open ends	colorSENSOR LT and OT series (power und PLC)
11234093	CAB-M9-4P-co-straight; 2 m-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 30 mm zenith	colorSENSOR and colorCONTROL
11234695	White standard 30 mm zenith calibrated	colorSENSOR and colorCONTROL
11233482	White reference module	colorSENSOR LT-2-DU
2420065	PS2030 power supply 24 V / 24 W / 1 A; 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 6 mm	Fiber-optic thread fitting; M4
11253931	Fiber-optic thread fitting; 3 mm lens; M4	POF-2,2
11254108	Fiber-optic thread fitting; 90° lens, M5	POF-2,2
11253959	Reducing adapter 2.2/1 mm 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 1 mm	POF-1 mm
10824431	End sleeve 1 mm x 50 mm	POF-1 mm
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)

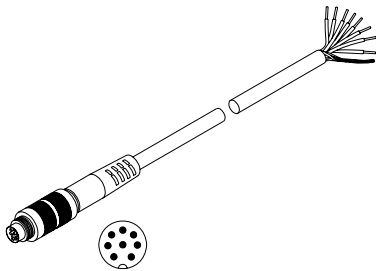
## Pin assignment

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



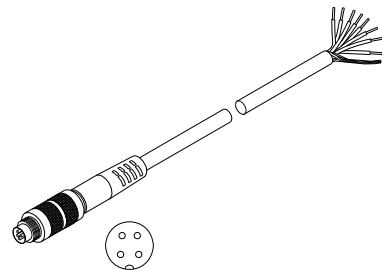
Pin	Color	CFO100/200
1	white	IN0
2	brown	+UB
3	green	TX
4	yellow	RX
5	gray	OUT0
6	pink	OUT1
7	blue	GND
8	red	OUT2

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



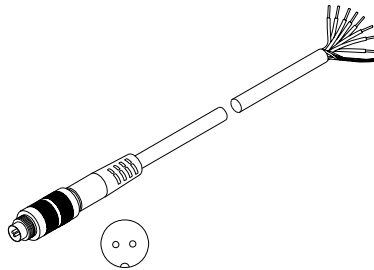
Pin	Color	LT-2-DU SB1	LT-2-DU SB2	OT-3-XX
1	white	OUT 0 / OUT A 0	OUT1	GND (0V)
2	brown	OUT 1 / OUT A 1	OUT2	+24 VDC ( $\pm 10\%$ )
3	green	IN1	OUT3	IN0
4	yellow	IN0	OUT4	OUT0
5	gray	CLK (OUT K)	OUT5	OUT1
6	pink	OUT 2 / OUT A 2	OUT6	OUT2
7	blue	GND (0V)	OUT7	OUT3
8	red	+24 VDC ( $\pm 10\%$ )	OUT0	OUT4

**CAB-M8-4P-fm-co-straight; Xm-PUR; open ends**  
(art.no.: 11234305; 11234306)  
Connection cable to Power/PLC  
(max. length 5 m, 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 10 m, 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

