



# More Precision

**colorSENSOR** // Colour Sensors, LED Analyzers





- Colour sensor for large distances and matt surfaces

- 31 colours can be saved

- Focused illumination for rapidly changing object distances

- Colour and grey scale evaluation

- PC programmable via RS232

#### Features:

- White light LED ring, focused, with clear glass covering
- Object distance typ. 10mm - 400mm
- Large dynamic range through focused white light operation
- Colour memory: 31 colours per Teach-in and software
- RS232 interface (USB adapter optional)
- Switchable brightness readjustment
- Switching frequency max. 30kHz
- A variety of evaluation algorithms can be activated, e.g. „BEST HIT“ mode
- Switching state display via 5 yellow LEDs
- Switchable averaging
- Colour control of self-luminous objects

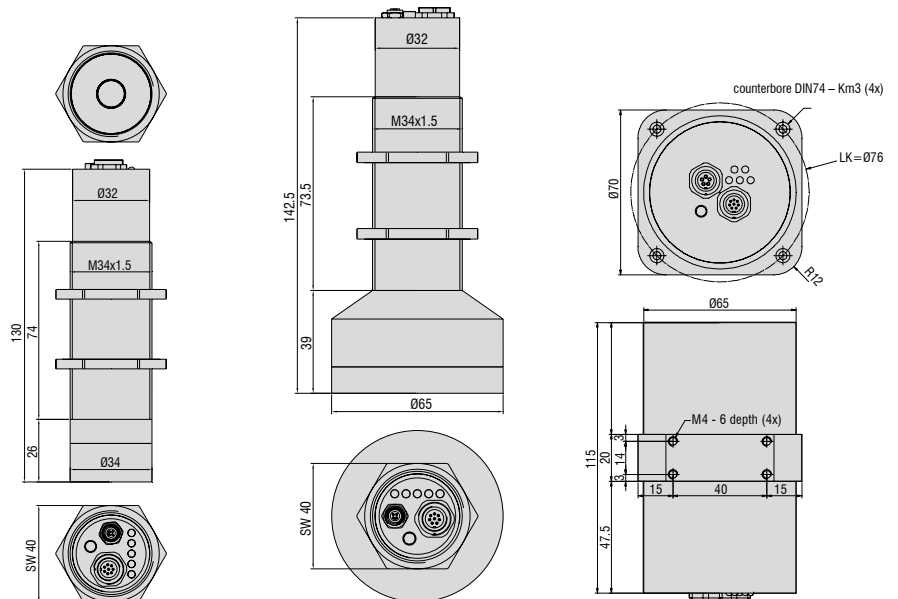
#### Application examples:

- Colour recognition of matt surfaces at a distance of up to 400mm
- Detection of colour rings
- Recognising colour markings in the printing industry
- Inspection of packaging
- Sorting tasks on the basis of colour
- Colour control of self-luminous objects (LEDs, displays, etc.)
- Illumination recognition as per colour and intensity

colorSENSOR OT colour sensors are fixed lens sensors with True-Colour detection. The sensor automatically illuminates the surface with white light and records the reflected colour values. Aside from the optics, the models are almost identical. The illumination can be disabled by software. OT sensors are then suitable for the colour detection of self-luminous sources.

#### Dimensions:

Dimensions in mm, not to scale



OT-3-MA-30-8/OT-3-MA-30-16  
OT-3-MA-50-12.5/OT-3-MA-50-25

OT-3-MA-80-36

OT-3-MA-200-20

Type	OT-3-MA-30-8	OT-3-MA-30-16	OT-3-MA-50-12.5	OT-3-MA-50-25	OT-3-MA-80-36	OT-3-MA-200-20
Article number	10234067	10234068	10234069	10234070	10234071	10234072
Object distance	typ. 10mm-100mm ideal distance 30mm		typ. 20mm-120mm ideal distance 50mm		typ. 40mm-150mm ideal distance 80mm	typ. 50mm-400mm ideal distance 200mm
Light spot	Ø 5-16mm	Ø 10-31mm	Ø 4-24mm	Ø 8-48mm	Ø 30-48mm	Ø 5-40mm
Light spot diameter	Ø 8mm at 30mm	Ø 16mm at 30mm	Ø 12.5mm at 50mm	Ø 25mm at 50mm	Ø 36mm at 80mm	Ø 20mm at 200mm
Colour difference	ΔE ≥ 0.5					ΔE ≥ 1.5
Colour spaces	X/Y INT; s/i M (Lab)					
Averaging	more than max. 32768 values					
Size of the colour memory	max. 31 colours in non-volatile EEPROM with parameter sets					
Switching frequency	max. 30kHz (depending on number of colours being taught and the setting for the averaging)					
Reproducibility	in the x,y colour range, 1 digit each with 12-Bit-A/D conversion					
Temperature drift X,Y	< 0.01% /K					
Light source	8x white light LED, AC-, DC mode <sup>1)</sup> (adjustable or OFF for self-luminous objects, software-switchable)				12x white light LED, AC-, DC mode <sup>1)</sup> (adjustable bzw. OFF for self-luminous objects, software-switchable)	10x white light LED, modulated 30kHz
Type of illumination	focused					
Effect through illumination	large dynamic range for matt/dark surfaces					
Ambient light	to 5000Lux (AC mode)					to 5000Lux
Intermittent light operation	AC: typ. 10kHz to 40kHz (depending on amplification level AMP1 to AMP8) DC: switchable by PC software					30kHz
Power supply	+24VDC (± 10%), inverse polarity protected, overload-proof					
Current consumption	typ. 320mA					
Max. switching current	100mA, short-circuit protected					
TEACH button/inputs	1 button and IN0 for external teaching of the colour references					
Outputs	OUT 0 - OUT 4, digital (0V/+Ub), short-circuit protected, 100mA max. switching current npn-, pnp-capable (bright or dark switching, switchable)					
Switching state display	visualisation by means of 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)					to PLC: 8-pole flange socket (binder 712) to PC: 5-pole flange socket (binder 712)
Connection cable	to power/PLC: art. no. 11234091 / to PC: art. no. 11234095 (RS232); 11234096 (USB).					to power/PLC: art. no. 11234091 to PC: art. no. 11234092
Receiver	3-colour filter detector (TRUE COLOR detector, colour filter curve as per CIE 1931)					
Software	colorCONTROL S					colorCONTROL C4
Pulse extension	adjustable 0ms-100ms					
Signal amplification	8 stage (AMP1 - AMP8), adjustable					-
Housing material	aluminium, black anodised					
Operating temperature	-20°C - +55°C					
Storage temperature	-20°C - +85°C					
Protection class	IP67 (lens), IP64 (electronics)					IP64
EMC test according	DIN EN 60947-5-2					

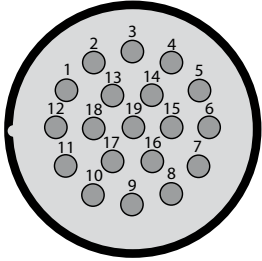
<sup>1)</sup> suitable for illumination testing

colorSENSOR accessories		
Art. no.	description	suitable for:
11234089	CAB-M23-19P-co-fm-straight; 2m-PUR; open ends	colorSENSOR WLCS M-41 (power and PLC)
11234097	CAB-M23-19P-co-fm-straight; 5m-PUR; open ends	colorSENSOR WLCS M-41 (power and PLC)
11234090	CAB-M9-3P-co-straight; 2m-PUR; RS232	colorSENSOR WLCS M-41 (RS232)
11234098	CAB-M9-3P-co-straight; 5m-PUR; RS232	colorSENSOR WLCS M-41 (RS232)
11234091	CAB-M9-8P-co-straight; 2m-PUR; open ends	colorSENSOR LT and OT series (power and PLC)
11234099	CAB-M9-8P-co-straight; 5m-PUR; open ends	colorSENSOR LT and OT series (power and PLC)
11234092	CAB-M9-5P-co-straight; 2m-PUR; RS232	colorSENSOR OT-3-XX-200 (RS232)
11234100	CAB-M9-5P-co-straight; 5m-PUR; RS232	colorSENSOR OT-3-XX-200 (RS232)
11234093	CAB-M9-4P-co-straight; 2m-PVC; RS232	colorSENSOR LT-1-ST; LT-2-XX (RS232)
11234101	CAB-M9-4P-co-straight; 5m-PVC; RS232	colorSENSOR LT-1-ST; LT-2-XX (RS232)
11234094	CAB-M9-4P-co-straight; 2m-PVC; USB	colorSENSOR LT-2-XX (USB)
11234102	CAB-M9-4P-co-straight; 5m-PVC; USB	colorSENSOR LT-2-XX (USB)
11234095	CAB-M5-4P-co-straight; 2m-PUR; RS232	colorSENSOR LT-1-LC-20; LT-3; OT-3 series (RS232)
11234103	CAB-M5-4P-co-straight; 5m-PUR; RS232	colorSENSOR LT-1-LC-20; LT-3; OT-3 series (RS232)
11234096	CAB-M5-4P-co-straight; 2m-PVC; USB	incl. RS232 to USB adapter suitable for: colorSENSOR LT-1-LC-20; LT-3; OT-3 series (USB)
11234104	CAB-M5-4P-co-straight; 5m-PVC; USB	incl. RS232 to USB adapter suitable for: colorSENSOR LT-1-LC-20; LT-3; OT-3 series (USB)
11234368	CAB-M5-4P-co-straight; 2m-PVC; RJ45-co-fm-Eth	incl. RS232 to Ethernet adapter suitable for: colorSensor LT-1-LC-20; LT-3; OT-3 series (Ethernet)
11234274	reflectance standard 1.25" Fluorilon	colorSENSOR and colorCONTROL
11233482	white reference modul	colorSENSOR LT-2-DU
2420065	PS2030 power supply 24V/24W/ 1A; 2m-PVC; terminal-2P-co-fm-straight	Power supply of all sensors with 24 V DC

colorCONTROL MFA accessories		
Art. no.	description	suitable for:
10814105	POF-2.2mm plastic fibre optic cable	colorCONTROL MFA
11251112	thread fitting; LWL; M4	POF-2.2
11251113	lens optic 6mm	thread fitting; LWL; M4
11253931	thread fitting; 3mm lens; LWL; M4	POF-2.2
11254108	thread fitting; 90° optics; LWL; M5	POF-2.2
11253959	reducer sleeve 2.2/1mm POF; 2 pcs.	colorCONTROL MFA for use of POF-1mm
10813842	POF-1mm fibre optic cable	colorCONTROL MFA in connection with the reducer sleeve 2.2/1mm POF
11253906	guide sleeve 1mm	POF-1mm
10824431	guide sleeve 1 mm x 50 mm	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)

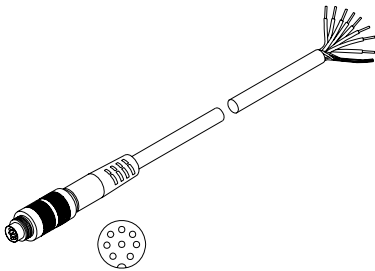
### Pin assignment

**CAB-M23-19P-co-fm-straight; Xm-PUR; open ends**  
(Art. no.: 11234089; 11234097)



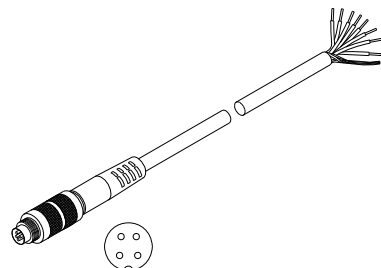
Pin	Colour	WLCS-M-41
1	green	IN TF
2	grey	OUT Int. OK
3	pink	n.c.
4	red	OUT 4
5	white	OUT 2
6	blue	GND (0V)
7	violet	n.c.
8	grey/pink	n.c.
9	red/blue	IN HOLD
10	white/green	IN 1
11	brown/green	IN 2
12	yellow	PE
13	white/yellow	Common
14	-	-
15	black	OUT 1
16	yellow/brown	OUT 3
17	white/grey	IN 3
18	grey/brown	IN 4
19	brown	+24V DC ( $\pm 10\%$ )

**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, sheath PUR)



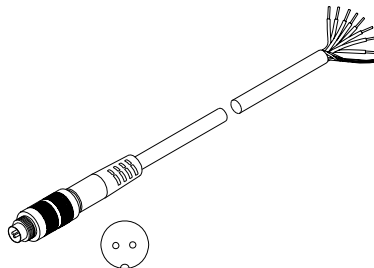
Pin	Colour	LT-1- LC-10 / ST	SB1 LT-2- ST/DU	SB2 LT-2- ST/DU	LT-1-LC-20 LT-3-XX/OT-3-XX
1	white	OUT 0	OUT 0 / OUT A 0	OUT 1	GND (0V)
2	brown	OUT 1	OUT 1 / OUT A 1	OUT 2	+24V DC ( $\pm 10\%$ )
3	green	IN 1	IN 1	OUT 3	IN 0
4	yellow	IN 0	IN 0	OUT 4	OUT 0
5	grey	n.c. / OUT 4	CLK (OUT K)	OUT 5	OUT 1
6	pink	OUT 3	OUT 2 / OUT A 2	OUT 6	OUT 2
7	blue	GND (0V)	GND (0V)	OUT 7	OUT 3
8	red	+24V DC ( $\pm 10\%$ )	+24V DC ( $\pm 10\%$ )	OUT 0	OUT 4

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



Pin	Colour	MFA-1
1	brown	+ 24V DC
2	white	Extern Teach
3	blue	GND
4	black	NPN/PNP

**CAB-M9-2P-co-fm-straight; Xm-PUR; open ends**  
(Art. no.: 11294205; 11294206)  
Connection cable to power  
(max. length. 10m, sheath PUR)



Pin	Colour	MFA-5
1	white	+24V DC
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, fibre optic sensors and fibre optics



Colour recognition sensors, LED analyzers and colour online spectrometer



Measurement and inspection systems