



More Precision

Color sensors colorSENSOR
LED Analyzers colorCONTROL



colorSENSOR OT-3-MA

Color sensor for large distances and matt surfaces



- ▶ 31 colors can be saved
- ▶ Focused illumination for rapidly changing object distances
- ▶ Color and grey scale evaluation
- ▶ PC programmable via RS232 / USB

Features:

- White light LED ring, focused, with clear glass covering
- Object distance typ. 10mm - 400mm
- Large dynamic range through focused white light operation
- Color memory: 31 colors 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
- Color control of self-luminous objects

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

Application examples:

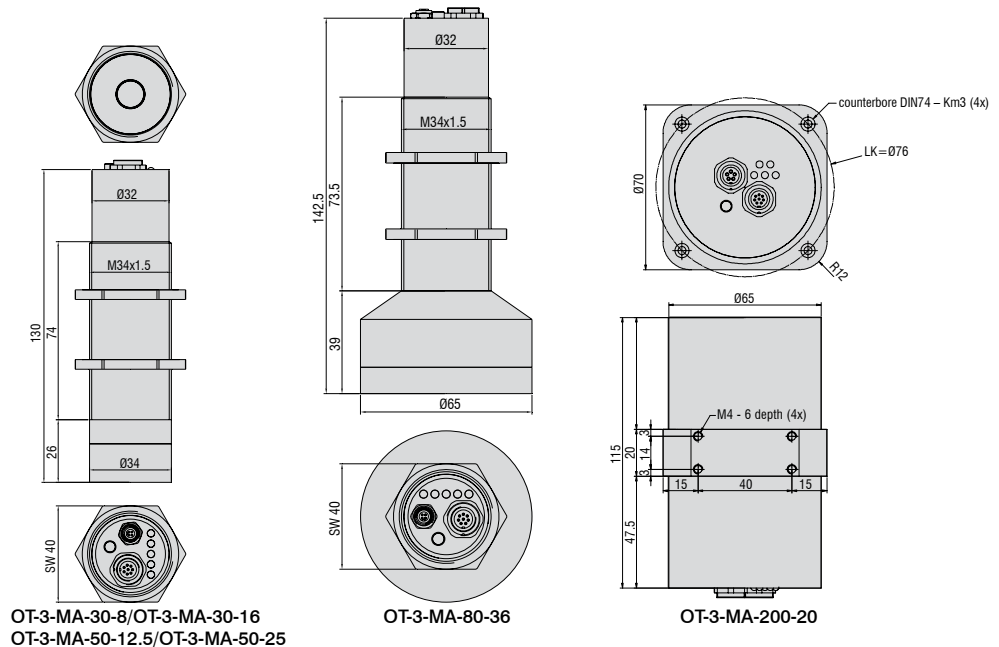
- Color recognition of matt surfaces at a distance of up to 400mm
- Detection of color rings
- Recognizing color markings in the printing industry
- Inspection of packaging
- Sorting tasks on the basis of color
- Color control of self-luminous objects (LEDs, displays, etc.)
- Illumination recognition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

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
Color difference	$\Delta E \geq 0.5$					$\Delta E \geq 1.5$
Color spaces	X/Y INT; s/i M (Lab)					
Averaging	more than max. 32768 values					
Size of the color memory	max. 31 colors in non-volatile EEPROM with parameter sets					
Switching frequency	max. 30kHz (depending on number of colors being taught and the setting for the averaging)					
Reproducibility	In the x,y color 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 ¹⁾ (adjustable or OFF for self-luminous objects, software-switchable)				12x white light LED, AC-, DC mode ¹⁾ (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 ($\pm 10\%$), 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 color 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) to power/PLC: art. no. 11234091 to PC: art. no. 11234092
Connection cable	to power/PLC: art. no. 11234091 / to PC: art. no. 11234095 (RS232); 11234096 (USB).					
Receiver	3-color filter detector (TRUE COLOR detector, color filter curve as per CIE 1931)					
Software	colorCONTROL S					Sicolor 4
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					

¹⁾ suitable for illumination testing

Dimensions:

Dimensions in mm, not to scale



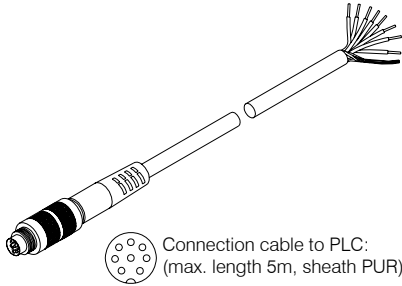
Cables and other accessories

colorSENSOR accessories		
Art. no.	Description	suitable for:
11234089	CAB-M23-19P-Bu-ge; 2m-PUR; open	colorSENSOR WLCS M-41 (power and PLC)
11234090	CAB-M9-3P-St-ge; 2m-PUR; RS232	colorSENSOR WLCS M-41 (RS232)
11234091	CAB-M9-8P-St-ge; 2m-PUR; open	colorSENSOR LT and OT series (power and PLC)
11234092	CAB-M9-5P-St-ge; 2m-PUR; RS232	colorSENSOR OT-3-XX-200 (RS232)
11234093	CAB-M9-4P-St-ge; 2m-PVC; RS232	colorSENSOR LT-1-ST; LT-2-XX (RS232)
11234094	CAB-M9-4P-St-ge; 2m-PVC; USB	colorSENSOR LT-1-ST; LT-2-XX (USB)
11234095	CAB-M5-4P-St-ge; 2m-PUR; RS232	colorSENSOR LT-1-LC-20; LT-3; OT-3 series (RS232)
11234096	CAB-M5-4P-St-ge; 2m-PVC; USB	inc. RS232 to USB adapter suitable for: colorSENSOR LT-1-LC-20; LT-3; OT-3 series (USB)
11234097	CAB-M23-19P-Bu-ge; 5m-PUR; open	colorSENSOR WLCS M-41 (power and PLC)
11234098	CAB-M9-3P-St-ge; 5m-PUR; RS232	colorSENSOR WLCS M-41 (RS232)
11234099	CAB-M9-8P-St-ge; 5m-PUR; open	colorSENSOR LT and OT series (power and PLC)
11234100	CAB-M9-5P-St-ge; 5m-PUR; RS232	colorSENSOR OT-3-XX-200 (RS232)
11234101	CAB-M9-4P-St-ge; 5m-PVC; RS232	colorSENSOR LT-1-ST; LT-2-XX (RS232)
11234102	CAB-M9-4P-St-ge; 5m-PVC; USB	colorSENSOR LT-1-ST; LT-2-XX (USB)
11234103	CAB-M5-4P-St-ge; 5m-PUR; RS232	colorSENSOR LT-1-LC-20; LT-3; OT-3 series (RS232)
11234104	CAB-M5-4P-St-ge; 5m-PVC; USB	inc. RS232 to USB adapter suitable for: colorSENSOR LT-1-LC-20; LT-3; OT-3 series (USB)

colorCONTROL accessories		
Art. no.	Description	suitable for:
10814105	POF-2.2mm optical fiber	colorCONTROL MFA
11251112	Threaded ferrule; LWL; M4	POF-2.2
11251113	Mounted lens 6mm	Threaded ferrule; LWL; M4
11253931	Threaded ferrule; 3mm lens; LWL; M4	POF-2.2
11254108	Threaded ferrule; 90° optics; LWL; M5	POF-2.2
11294106	CAB-M9-8P-Bu-ge; 2m-PUR; open	colorCONTROL MFA-55/100 (power and PLC)
11294107	CAB-M9-5P-Bu-ge; 2m-PUR; Ethernet	colorCONTROL MFA-55/100 (Ethernet)
11294109	CAB-M9-8P-Bu-ge; 5m-PUR; open	colorCONTROL MFA-55/100 (power and PLC)
11294110	CAB-M9-5P-Bu-ge; 5m-PUR; Ethernet	colorCONTROL MFA-55/100 (Ethernet)
11293227	Connection cable, Cross Ethernet Adapter; 0.5m	colorCONTROL MFA-55/100
11293624	colorCONTROL MFA 55 exchange adapter	colorCONTROL MFA-55
11293519	colorCONTROL MFA 100 exchange adapter	colorCONTROL MFA-100
11294205	CAB-M9-2P-Bu-ge; 2m-PUR; open	colorCONTROL MFA-5 (power)
11294206	CAB-M9-2P-Bu-ge; 5m-PUR; open	colorCONTROL MFA-5 (power)
11234094	CAB-M9-4P-St-ge; 2m-PVC; USB	colorCONTROL MFA-5 (USB)
11234102	CAB-M9-4P-St-ge; 5m-PVC; USB	colorCONTROL MFA-5 (USB)
11234095	CAB-M5-4P-St-ge; 2m-PUR; RS232	colorCONTROL MFA-5 (RS232)
11234103	CAB-M5-4P-St-ge; 5m-PUR; RS232	colorCONTROL MFA-5 (RS232)
11294203	CAB-female connector strip-6P-ge; 1m-PVC; 2P-open	colorCONTROL MFA-5-P (power)
11294054	CAB-female connector strip-6P-ge; 1m-PVC; USB	colorCONTROL MFA-5-P (USB and power)
11294204	CAB-female connector strip-6P-ge; 1m-PVC; RS232	colorCONTROL MFA-5-P (RS232)

Pin assignment

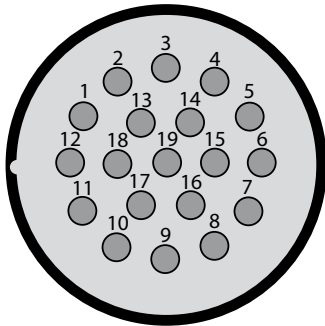
CAB-M9-8P-St-ge; Xm-PUR; open
(Anr.: 11234091; 11234098)



Connection cable to PLC:
(max. length 5m, sheath PUR)

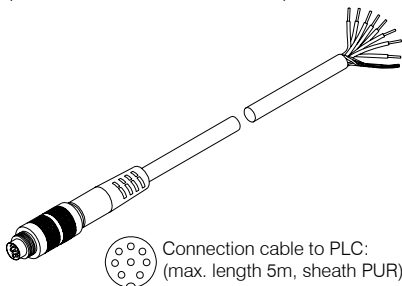
Pin	Color	LT-1- LC-10 / ST	SB1 LT-2- ST / DU	SB2 LT-2- ST / DU	LT-1-LC-20 LT-3-XX OT-3-XX
1	white	OUT 0	n.c. / OUT A 0	OUT 1	GND (0V)
2	brown	OUT 1	n.c. / OUT A 1	OUT 2	+24VDC ($\pm 10\%$)
3	green	IN 1	IN 1	OUT 3	IN 0
4	yellow	IN 0	IN 0	OUT 4	OUT 0
5	grey	n.c. / OUT 4	CLK (OUT K)	OUT 5	OUT 1
6	pink	OUT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

CAB-M23-19P-Bu-ge; Xm-PUR; open
(Anr.: 11234089; 11234097)



Pin	Color	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	+24VDC ($\pm 10\%$)

CAB-M9-8P-Bu-ge; Xm-PUR; open
(Anr.: 11294106; 11294109)



Connection cable to PLC:
(max. length 5m, sheath PUR)

Pin	Color	MFA 55/100
1	white	IN 0
2	brown	+24VDC ($\pm 10\%$)
3	green	n.c.
4	yellow	OUT 0
5	grey	OUT 1
6	pink	OUT 2
7	blue	GND (0V)
8	red	OUT 3

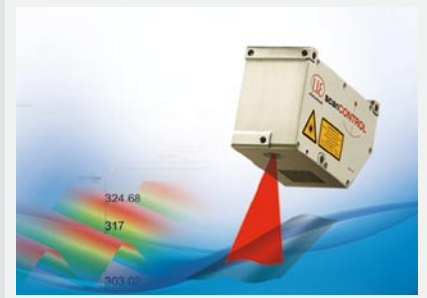
High performance sensors made by Micro-Epsilon



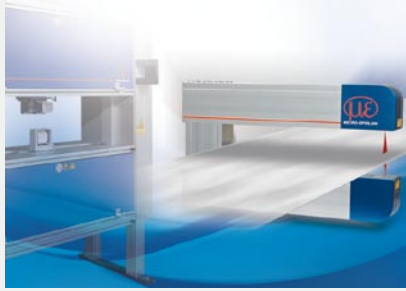
Sensors and systems for displacement and position



Sensors and measurement devices for non-contact temperature measurement



2D/3D profile sensors (laser scanner)



Measurement and inspection systems for quality assurance



Optical micrometers and optical fibers



Color recognition sensors and LED analyzers

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