



# More Precision

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





- Colour sensor for large distances
- 31 colours can be saved
- Coaxial optics for large working distance up to 900mm
- Colour and grey scale evaluation
- PC programmable via RS232

#### Features:

- Object distance typ. 50mm - 900mm
- Integrated receiver and transmitter optics (coaxial)
- Colour memory: 31 colours via Teach-in and software
- RS232 interface (USB adapter optional)
- Super-bright white light LED
- Colour, contrast and grey-scale detection
- Insensitive to external light up to 5000Lux
- Switchable brightness readjustment
- Switching frequency max. 35kHz
- A variety of evaluation algorithms can be activated e.g. „BEST HIT“ mode
- Switching state display via 5 yellow LEDs
- Temperature compensated ( $< 0.01\% /K$ )
- Switchable averaging
- Colour control of self-luminous objects

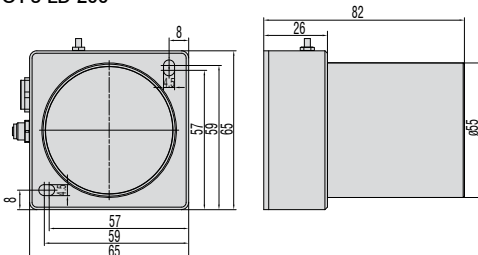
#### Application examples:

- Colour recognition from long distances up to 900mm
- Correct insertion of product in production machinery
- Inspection of packaging
- Sorting tasks on the basis of colour
- Colour assignment on automobiles
- Detecting drink crates
- Paper, recycling recognition
- Illumination recognition as per colour and intensity

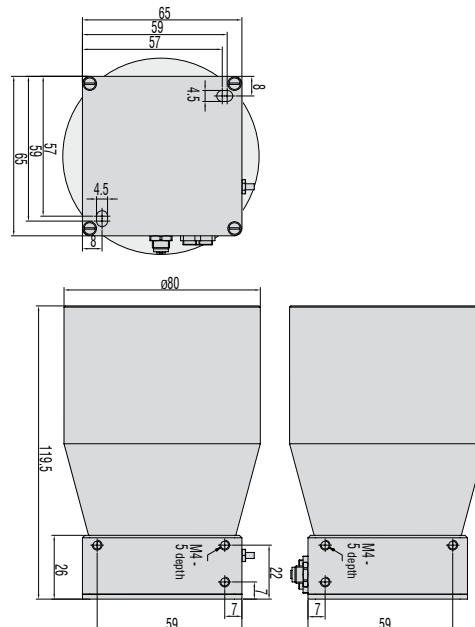
#### Dimensions:

Dimensions in mm, not to scale

#### OT-3-LD-200



#### OT-3-LD-500



Typ	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 - 700mm ideal distance 200mm	typ. 50 - 500mm ideal distance 200mm	typ. 50 - 500mm ideal distance 200mm	typ. 100 - 900mm ideal distance 500mm	typ. 100 - 900mm ideal distance 500mm
Light spot	Ø 4 - 28mm	Ø 4 - 32mm	Ø 6 - 70mm	Ø 6 - 46mm	Ø 8 - 105mm
Light spot diameter	Ø 6mm at 200mm	Ø 12mm at 200mm	Ø 26mm at 200mm	Ø 25mm at 500mm	Ø 58mm at 500mm
Colour difference	$\Delta E \geq 1$	$\Delta E \geq 1$	$\Delta E \geq 1$	$\Delta E \geq 1,5$	
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. 35kHz (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	< 0,0% / K				
Light source	super-bright white light LED; AC-, DC- oder PULSE mode (adjustable or OFF for self-luminous objects, software-switchable) <sup>1)</sup>				
Type of illumination	coaxial				
Effect through illumination	large object distance				
Ambient light	to 5000Lux (in AC and PULSE mode)				
Intermittent light operation	AC: typ. to 20kHz (depending on amplification level AMP1 to AMP8) DC: typ. to 35kHz PULSE: typ. to 5kHz switchable by PC software				
Power supply	+24VDC ( $\pm$ 10%), inverse polarity protected, overload-proof				
Current consumption	typ. 160mA				
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)				
Connection cable	to power/PLC: art. no. 11234091 / to PC: art. no 11234095 (RS232); 11234096 (USB)				
Receiver	3-colour filter detector (TRUE COLOR detector, colour filter curve as per CIE 1931)				
Software	colorCONTROL S				
Pulse extension	adjustable 0ms-100ms				
Signal amplification	8 steps (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)				
EMC test according	DIN EN 60947-5-2				

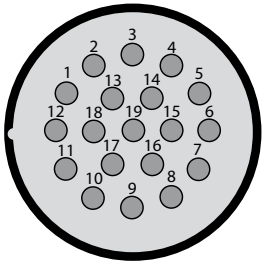
<sup>1)</sup> suitable for illumination testing

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)

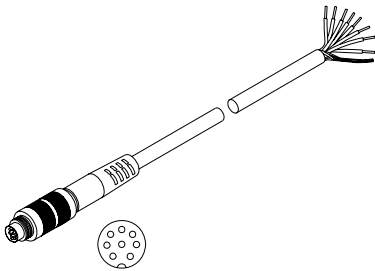
**Pin assignment**

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



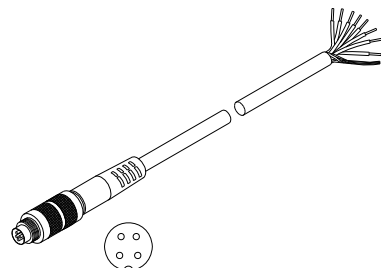
Pin	Colour	WLCS-M-41
1	green	IN TF
2	grey	OUT Int. OK
3	pink	n.c.
4	red	OUT 4
5	white	OUT 2
6	blue	GND (0V)
7	violet	n.c.
8	grey/pink	n.c.
9	red/blue	IN HOLD
10	white/green	IN 1
11	brown/green	IN 2
12	yellow	PE
13	white/yellow	Common
14	-	-
15	black	OUT 1
16	yellow/brown	OUT 3
17	white/grey	IN 3
18	grey/brown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



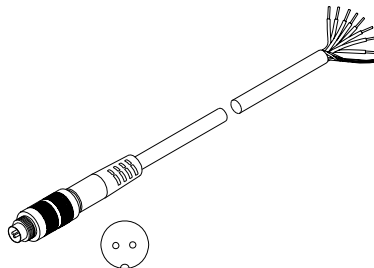
Pin	Colour	LT-1- LC-10 / ST	SB1 LT-2- ST/DU	SB2 LT-2- ST/DU	LT-1-LC-20 LT-3-XX/OT-3-XX
1	white	OUT 0	OUT 0 / OUT A 0	OUT 1	GND (0V)
2	brown	OUT 1	OUT 1 / OUT A 1	OUT 2	+24V DC (±10%)
3	green	IN 1	IN 1	OUT 3	IN 0
4	yellow	IN 0	IN 0	OUT 4	OUT 0
5	grey	n.c. / OUT 4	CLK (OUT K)	OUT 5	OUT 1
6	pink	OUT 3	OUT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