



More Precision

color**SENSOR** // Color sensors, LED Analyzers





- Color sensor for large distances and mat surfaces
- 31 colors can be saved
- Focused illumination for rapidly changing object distances
- Color and gray scale evaluation
- PC programming via RS232

Features:

- White light LED ring, focused, covered with clear glass
- Object distance, typically 10 mm - 400 mm
- Focused white light operation enables large dynamic range
- Color memory: 31 colors per Teach-in and software
- RS232 interface (optional USB adapter)
- 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

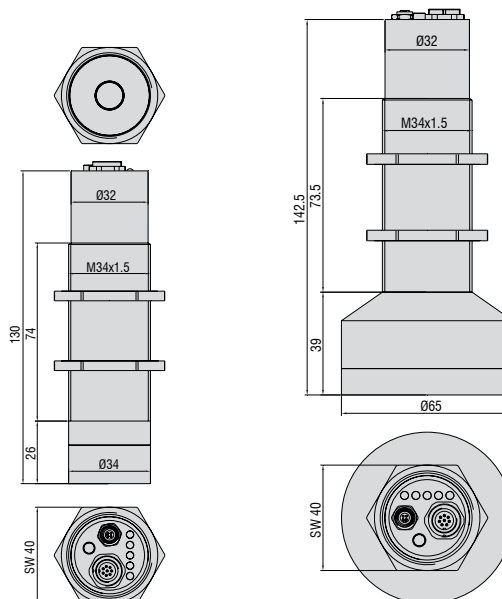
Application examples:

- Color recognition of mat surfaces at a distance of up to 400 mm
- Detection of color rings
- Color mark recognition in printing industry
- Packaging control
- Color sorting tasks
- Color control of self-luminous objects (LEDs, displays, etc.)
- Illumination recognition as per color and intensity

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.

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

| Model | 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 |
|-----------------------------|--|--------------------|---|--------------------|--|
| Article number | 10234067 | 10234068 | 10234069 | 10234070 | 10234071 |
| Object distance | typ. 10 mm - 100 mm ideal distance 30 mm | | typ. 20 mm - 120 mm ideal distance 50 mm | | typ. 40 mm - 150 mm ideal distance 80 mm |
| Light spot | Ø 5 - 16 mm | Ø 10 - 31 mm | Ø 4 - 24 mm | Ø 8 - 48 mm | Ø 30 - 48 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 ¹⁾ | $\Delta E \leq 0.9$ | | | | |
| 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 ²⁾ (adjustable or OFF for self-luminous objects, switchable via software) | | | | 12x white light LEDs, AC/DC operation ²⁾ (adjustable or OFF for self-luminous objects, switchable via software) |
| Type of illumination | focused | | | | |
| Effect from illumination | Large dynamic range for mat/dark surfaces | | | | |
| 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 | 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-TA2.0-2,5-1200-67" 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; 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)



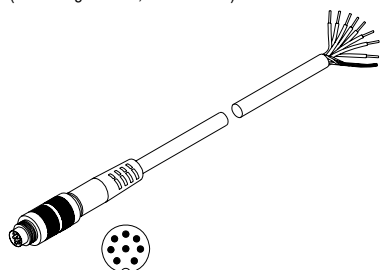
| Pin | Color | CFO100/200 |
|-----|--------|------------|
| 1 | white | IN0 |
| 2 | brown | +UB |
| 3 | green | TX |
| 4 | yellow | RX |
| 5 | gray | OUT0 |
| 6 | pink | OUT1 |
| 7 | blue | GND |
| 8 | red | OUT2 |

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)



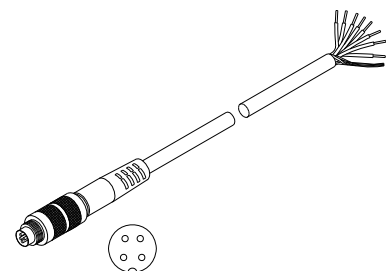
| Pin | Color | LT-2-DU SB1 | LT-2-DU SB2 | OT-3-XX |
|-----|--------|----------------------|-------------|----------------------|
| 1 | white | OUT 0 / OUT A 0 | OUT1 | GND (0V) |
| 2 | brown | OUT 1 / OUT A 1 | OUT2 | +24 VDC (\pm 10%) |
| 3 | green | IN1 | OUT3 | IN0 |
| 4 | yellow | IN0 | OUT4 | 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)



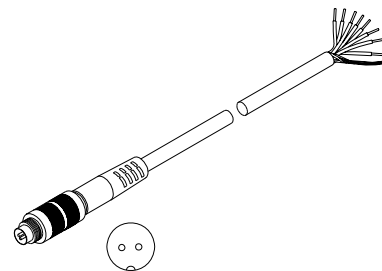
| Pin | Color | MFA-1 |
|-----|-------|----------------|
| 1 | brown | + 24 VDC |
| 2 | white | External Teach |
| 3 | blue | GND |
| 4 | black | NPN/PNP |

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

