



More Precision

Color sensors colorSENSOR
LED Analyzers colorCONTROL



colorSENSOR WLCS-M-41

The all-round talent for color recognition



- ▶ 4 color memory „Teach-in“
- ▶ Optical fiber with focus lenses to 100mm
- ▶ Color and intensity evaluation
- ▶ High color resolution
- ▶ „Plug & Play“ operating concept

Features:

- Multi-Teach by buttons on the sensor
- Separation of sensor and sampling point (explosion-protected for hazardous areas)
- Switch Output, 4x potential-free
- Adaption of optical fibers for every application
- Working distance 2-100mm, depending on optical fiber and lens
- Protection class IP65
- Solid enclosure concept for rugged industrial applications
- Independent of distance due to color and intensity evaluation (C and C+ I)
- Resolution
 - Color \leq 12bit
 - Intensity \leq 12bit
- External teaching
- Perceptive color processing
- White light LED as light source
- RS232 interface
- 4 color grouping can be saved
- Four-stage signal amplification
- Color spaces: C, C+I

Advantages:

- Application-oriented teaching of tolerances through „multiple teaching“ per channel
- Separate tolerance setting via potentiometer for each color memory is also possible
- Genuine three sector device
- Optical fiber adaption
- Universal operation
- No selectivity gaps in the color range

Application examples:

- Color sorting and inspection
- Recognizing similar colors
- Recording color codes
- Recognizing positions
- Recognizing locking compounds
- All color recognition tasks (between 390 and 750nm)
- Recognition of intensity

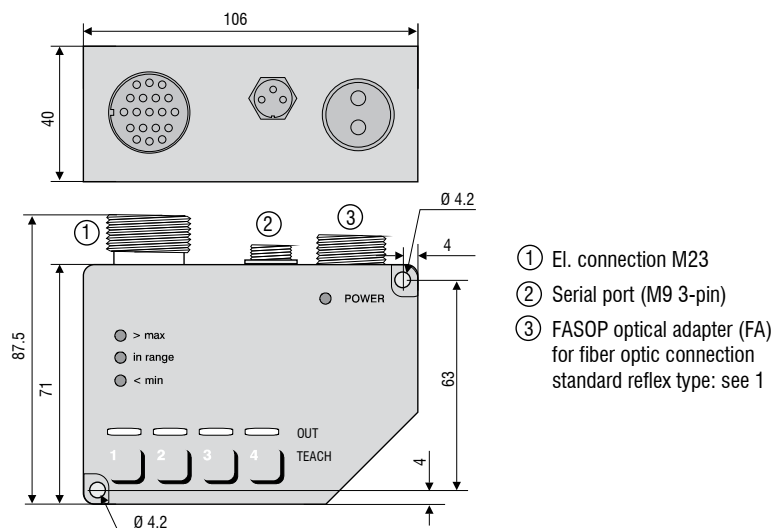
Type	WLCS-M-41
Article number	10234062
Object distance	Dependent on the optical fibers used and the optical heads Reflex mode fiber optical cables typically 2mm-25mm with lens, typically 5mm-100mm ¹⁾
Light spot diameter	Dependent on the optical fibers used and the optical heads Reflex mode fiber optical cables, typically Ø 0.6mm-30mm ¹⁾
Color difference	$\Delta E \geq 1.5$
Color spaces	C, C+I
Averaging	more than 32 values
Size of the color memory	max. 4 colors in non-volatile EEPROM with tolerance level via potentiometer
Switching frequency	1kHz, 32Hz with averaging
Reproducibility	in the C+I color range ≤ 12 Bit-A/D conversion
Temperature drift X,Y	0.1% / K
Light source	White light LED, AC mode
Type of illumination	via optical fiber
Effect through illumination	suitable for flexibility
Ambient light	up to 5000Lux
Intermittent light operation	AC: typ. 20kHz
Power supply	+18 - 30VDC
Current consumption	typ. 240mA
Max. switching current	240mA
TEACH button/inputs	4 buttons and IN1 - IN4 for external teaching of the color reference
Outputs	OUT 1-OUT 4, digital (0V/+Ub), short-circuit protected, 100mA max. switching current
Switching state display	Visualisation by means of 4 yellow LEDs
Interface	RS232
Type of connector	to PLC: 19-pole flange socket (Harting) to PC: 3-pole flange socket
Connection cable	to power/PLC: art no. 11234089 / to PC: art.no. 11234090 (RS232)
Receiver	3-PIN photodiodes with color filter
Software	-
Pulse extension	-
Signal amplification	-
Housing material	Aluminium, black anodised
Operating temperature	0°C - +50°C
Storage temperature	0°C - +80°C
Protection class	IP65
Optical fiber	p. 34 onwards

¹⁾ Type: FAR-T-A2.0-2,5-1200-67° reflex

Type: FAD-T-A2.0-2,5-1200-67° transmitted light (p. 34 onwards)

Dimensions:

Dimensions in mm, not to scale



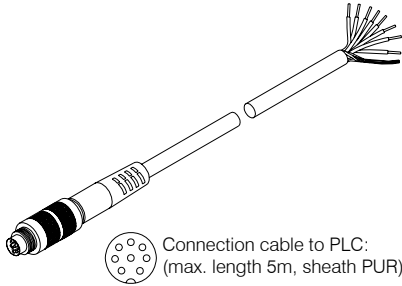
Cables and other accessories

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

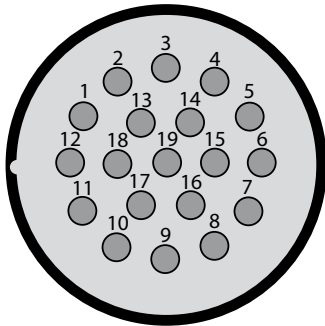
CAB-M9-8P-St-ge; Xm-PUR; open
(Anr.: 11234091; 11234098)



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

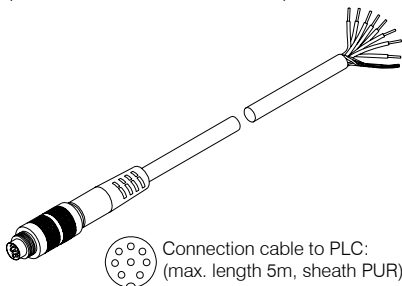
Pin	Color	LT-1- LC-10 / ST	SB1 LT-2- ST / DU	SB2 LT-2- ST / DU	LT-1-LC-20 LT-3-XX OT-3-XX
1	white	OUT 0	n.c. / OUT A 0	OUT 1	GND (0V)
2	brown	OUT 1	n.c. / OUT A 1	OUT 2	+24VDC ($\pm 10\%$)
3	green	IN 1	IN 1	OUT 3	IN 0
4	yellow	IN 0	IN 0	OUT 4	OUT 0
5	grey	n.c. / OUT 4	CLK (OUT K)	OUT 5	OUT 1
6	pink	OUT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

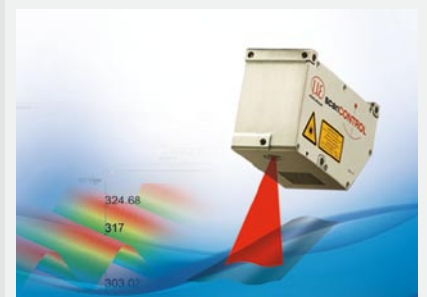
High performance sensors made by Micro-Epsilon



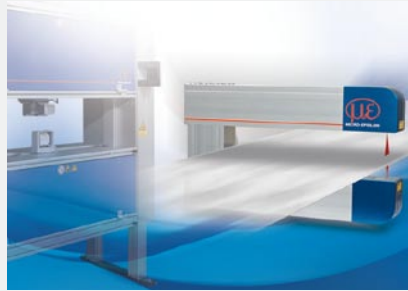
Sensors and systems for displacement and position



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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