

OF340143

OPTICAL SENSORS • COLOR SENSORS

The functioning of the color sensors is based on the evaluation of the red, green and blue components of the light reflected by the objects to be measured, or from the emitted radiation of the 'self-luminous' object (for example, LEDs, automobile tail lights, halogen lamps, fluorescent lamps, etc.). For this purpose, a so-called 3-fold receiver is integrated in the unit next to an on / off switchable white light or UV-light. This receiver works according to the True Color principle. This means that the evaluation of the light hitting the receiver is similar to the color perception of the human eye. This is a prerequisite for the reliable differentiation of objects or luminous objects by their color and brightness. For testing fluorescent materials the use of sensors with UV-light source is recommended. The



use under adverse environmental conditions is possible through the use of additional fiber optics. The interaction between a precise detection and a high switching frequency distinguishes the devices. Thus, they are an ideal tool for process and quality control.

MECHANICAL DATA

Ambient temperature	-20 °C 55 °C
Degree of protection (IP)	IP64
Degree of protection (IP) of evaluation electronics	IP64
Degree of protection (IP), front side	IP67
For damp environments	Yes
For glossy/reflecting surfaces	Yes
Housing coating	Anodised
Housing design	Cylinder, screw-thread
Housing material	Aluminium
Material of optical surface	Glass
Sensor diameter	34 mm
Sensor length	130 mm
Storage temperature	85 °C
Storage temperature	-20 °C
Thread pitch	1.5 mm
Thread size, metric	34

ELECTRICAL DATA

EMC test in acc. with	DIN EN 60947-5-2
Equipment protection class	Protection class 3
Max. number of measurements for averaging	32768
Max. output current	100 mA
Measurement frequency in alternating light operation	20000 Hz
Measurement frequency in constant light operation	35000 Hz
Measurement frequency in flash mode	5000 Hz
No-load current	220 mA
Number of digital inputs	1



ELECTRICAL DATA

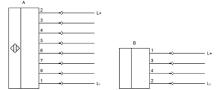
Number of pins 8 Number of pins of the communication interface 4 Number of switching outputs 5 Operating voltage 21.6 V 26.4 V Overload protection Yes Pulse stretching 100 ms Rated control supply voltage Us at DC 21.6 V 26.4 V Reverse polarity protection Yes Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔX/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C) Type of communication interface Connector M5 Type of plug-in contact, communication interface Female (socket) Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 Yes With external trigger Yes With LPD display Yes	Number of LEDs	5
Number of switching outputs 5 Operating voltage 21.6 V 26.4 V Overload protection Yes Pulse stretching 100 ms Rated control supply voltage Us at DC 21.6 V 26.4 V Reverse polarity protection Yes Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Number of pins	8
Operating voltage 21.6 V 26.4 V Overload protection Yes Pulse stretching 100 ms Rated control supply voltage Us at DC 21.6 V 26.4 V Reverse polarity protection Yes Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔX/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Number of pins of the communication interface	4
Overload protection Yes Pulse stretching 100 ms Rated control supply voltage Us at DC 21.6 V 26.4 V Reverse polarity protection Yes Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Number of switching outputs	5
Pulse stretching 100 ms Rated control supply voltage Us at DC 21.6 V 26.4 V Reverse polarity protection Yes Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Operating voltage	21.6 V 26.4 V
Rated control supply voltage Us at DC Reverse polarity protection Selectable amplifier stages Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces Switching frequency Temperature drift ΔX/ΔT; ΔΥ/ΔT typ. 0.2 digits/°C (< 0.01% / °C) Type of communication interface Type of electrical connection Type of plug-in contact, communication interface Type of switching function Push-pull Type of switching output Voltage type DC With communication interface, RS-232 With external trigger Yes With external trigger	Overload protection	Yes
Reverse polarity protection Selectable amplifier stages Sensing range Setting procedure Setting procedure Standard for interfaces Switching frequency Temperature drift Type of communication interface Type of electrical connection Type of plug-in contact, communication interface Type of switching function Type of switching output Voltage type With communication interface, RS-232 With external trigger Yes Parameterization RS-232 Swy-Man 80 mm AX/ΔT; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C) Connector M5 Connector M5 Tonnector M9 Female (socket) Push-pull PNP/NPN Voltage type DC With communication interface, RS-232 Wes With external trigger	Pulse stretching	100 ms
Selectable amplifier stages 8 Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Rated control supply voltage Us at DC	21.6 V 26.4 V
Sensing range 15 mm 80 mm Setting procedure Parameterization Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C) Type of communication interface Connector M5 Type of electrical connection Connector M9 Type of plug-in contact, communication interface Female (socket) Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach Yes With external trigger Yes	Reverse polarity protection	Yes
Setting procedure Standard for interfaces RS-232 Switching frequency 60000 Hz Temperature drift ΔX/ΔT; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C) Type of communication interface Connector M5 Type of electrical connection Type of plug-in contact, communication interface Female (socket) Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach With external trigger Yes	Selectable amplifier stages	8
Standard for interfacesRS-232Switching frequency60000 HzTemperature driftΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Sensing range	15 mm 80 mm
Switching frequency60000 HzTemperature driftΔΧ/ΔΤ; ΔΥ/ΔΤ typ. 0.2 digits/°C (< 0.01% / °C)	Setting procedure	Parameterization
Temperature drift ΔX/ΔT; ΔΥ/ΔT typ. 0.2 digits/°C (< 0.01% / °C) Type of communication interface Connector M5 Type of electrical connection Type of plug-in contact, communication interface Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach Yes With external trigger AX/ΔT; ΔΥ/ΔT typ. 0.2 digits/°C (< 0.01% / °C) Connector M5 Connector M9 Female (socket) Push-pull PNP/NPN Yes	Standard for interfaces	RS-232
Type of communication interface Type of electrical connection Connector M9 Type of plug-in contact, communication interface Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach With external trigger Connector M5 Connector M9 Female (socket) Push-pull PNP/NPN PNP/NPN Voltage type DC With communication interface, RS-232 Yes With external trigger Yes	Switching frequency	60000 Hz
Type of electrical connection Connector M9 Type of plug-in contact, communication interface Type of switching function Push-pull Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach Yes With external trigger Yes	Temperature drift	$\Delta X/\Delta T$; $\Delta Y/\Delta T$ typ. 0.2 digits/°C (< 0.01% / °C)
Type of plug-in contact, communication interface Type of switching function Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach With external trigger Female (socket) Push-pull PNP/NPN PNP/NPN Ves Yes	Type of communication interface	Connector M5
Type of switching function Type of switching output PNP/NPN Voltage type DC With communication interface, RS-232 With external teach Ves With external trigger Yes	Type of electrical connection	Connector M9
Type of switching output Voltage type DC With communication interface, RS-232 With external teach With external trigger Yes With external trigger	Type of plug-in contact, communication interface	Female (socket)
Voltage type DC With communication interface, RS-232 Yes With external teach Yes With external trigger Yes	Type of switching function	Push-pull
With communication interface, RS-232 With external teach With external trigger Yes	Type of switching output	PNP/NPN
With external teach With external trigger Yes	Voltage type	DC
With external trigger Yes	With communication interface, RS-232	Yes
	With external teach	Yes
With LED display	With external trigger	Yes
Title LES display	With LED display	Yes
With time function Yes	With time function	Yes

OPTICAL DATA

OI HEAL DAIA	
Alternating light operation	Yes
Color distance	$\Delta E \ge 0.5$
Color spaces	X Y INT siM (Lab)
Constant light operation	Yes
Diffuse	Yes
Flash mode	Yes
Light source	White light
Light spot	28.27 mm²
Light spot diameter	6 mm
Max. ambient light	5000 lx
Measuring method for color detection	Active tristimulus method
Nominal sensing range	30 mm
True color	Yes



CONNECTION



Colors: A: M9: 1 = WH (white), 2 = BN (brown), 3 = GN (green), 4 = YE (yellow), 5 = GY (gray), 6 = PK (pink), 7 = BU

(blue), 8 = RD (red)

Functions: A: M9: 1 = L-, 2 = L+, 3 = In 0, 4 = OUT 0, 5 = OUT 1, 6 = OUT 2, 7 = OUT 3, 8 = OUT 4

B: M5: 1 = L+, 2 = L-, 3 = RxD, 4 = TxD

DIMENSIONAL DRAWING

INSTALLATION DISPOSAL



Mounting / Installation may only be carried out by a qualified electrician!



SAFETY WARNINGS

Before initial operation, please make sure to follow all safety instructions that may be provided in the product information!