ONLINE DATA SHEET
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Contrast sensors
KTM Prime, KTM Prime

KTM-MP31181P

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Model Name > KTM-MP31181P
Part No. > 1065756

At a glance

- Small, tried-and-tested housing, also available in stainless steel
- High grayscale resolution
- Very large dynamic range means reliable detection of contrasts on glossy materials
- Static and dynamic teach-in
- Switching frequency: 15 kHz
- RGB light source
- Remote monitoring and rapid analysis thanks to IO-Link function (version 1.1)

Your benefits

- Small housing allows installation even where space is limited
- Powerful, fast contrast sensor ensures high machine throughput
- Three-color LED technology allows a reliable process, with contrast marks detected even in conditions with weak contrast ratios
- Good contrast resolution and a very large dynamic range ensure good detection performance on glossy materials, thus increasing the range of application possibilities
- Various teach-in methods enable more flexible commissioning
- IO-Link provides easy data access from the PLC
- Quick and easy configuration
- Long service life, even in harsh environments, thanks to stainless steel housing; as a result, excellent system throughput and low spare parts costs

Features

Sensing distance:	12.5 mm
Sensing distance tolerance:	± 3 mm
Light source [1]:	LED
Light spot size:	2 mm x 2 mm
Light spot direction [2]:	Vertical
Output function:	Light/dark switching
Max. web speed tech-in (dynamic):	1 m/s [3]
Type of light:	Visible white light
Dimensions (W x H x D):	31.5 mm x 21 mm x 12 mm
Housing design (light emission):	Rectangular
Teach-in mode:	2-point teach-in static/dynamic + proximity to mark

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[1] Average service life: 100,000 h at T_U = +25 °C [2] In relation to long side of housing [3] At a mark size of 4 mm

Mechanics/electronics

Ripple [1]:	≤ 5 Vpp
Power consumption [2]:	< 50 mA
Switching frequency [3]:	15 kHz
Response time [4]:	35 µs
Jitter:	15 µs
Output type:	PNP: HIGH = VS- ≤ 2 V/LOW approx. 0 V
Switching mode:	PNP
Input, teach-in (ET):	PNP: Teach: U = 10,8 V ... < U_V, Run: U < 2 V or open
Retention time (ET):	28 ms, non-volatile memory
Connection type:	Connector M8, 4-pin
Protection class:	III
Circuit protection:	Output Q short-circuit protected, Interference suppression, VS connections reverse-polarity protected
Enclosure rating:	IP 67, IP 67
Weight:	20 g
Housing material:	ABS, Plastic
Output current Imax.:	50 mA [5]
Supply voltage:	12 V DC ... 24 V DC [6]
Fieldbus interface:	-

[1] May not exceed or fall below U_v tolerances [2] Without load [3] With light/dark ratio 1:1 [4] Signal transit time with resistive load [5] At supply voltage > 24 V, I_{max} = 30 mA. I_{max} is consumption count of all Q_n [6] Limit values: DC 12 V (-10 %) ... DC 24 V (+20 %). Operation in short-circuit protected network max. 8 A

Ambient data

Shock load:	According to IEC 60068
UL File No.:	NRKH.E348498 & NRKH7.E348498
Ambient temperature operation:	-10 °C ... +55 °C
Ambient storage temperature:	-20 °C ... +75 °C

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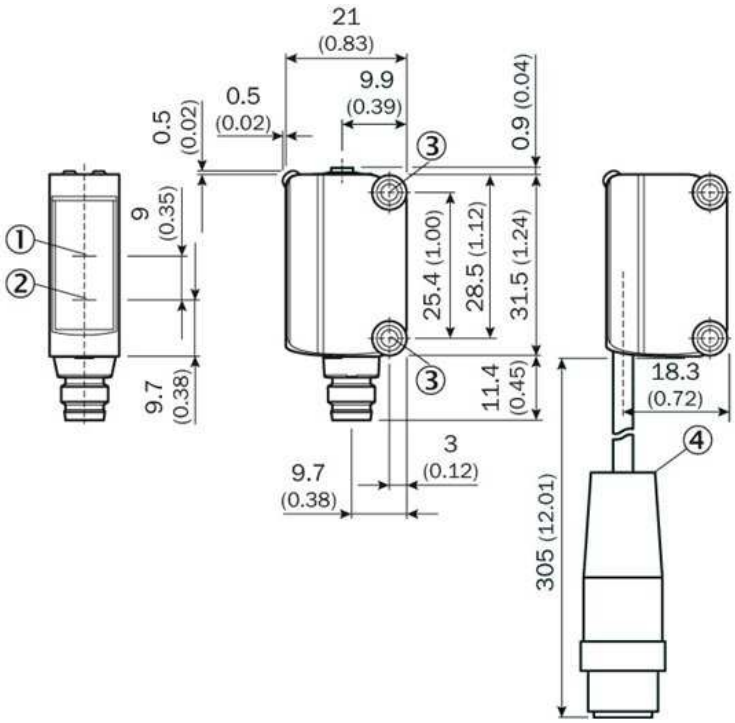
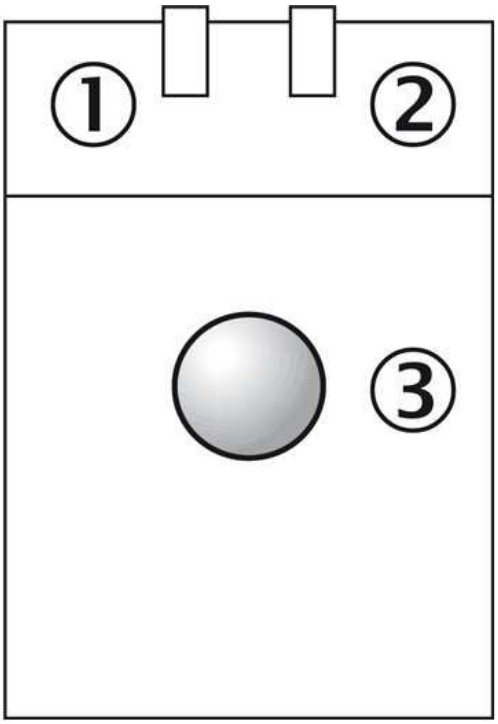
Dimensional drawing



|1| Optical axis receiver
|2| Optical axis sender
|3| Fixing hole M3
|4| Cable with male connector M12 (only KTM-xxxxx2x)

Adjustments



|1| Status indicator LED, yellow:
Status switching output Q (dark switching)
|2| Status indicator LED green: supply voltage on
|3| Teach-in button

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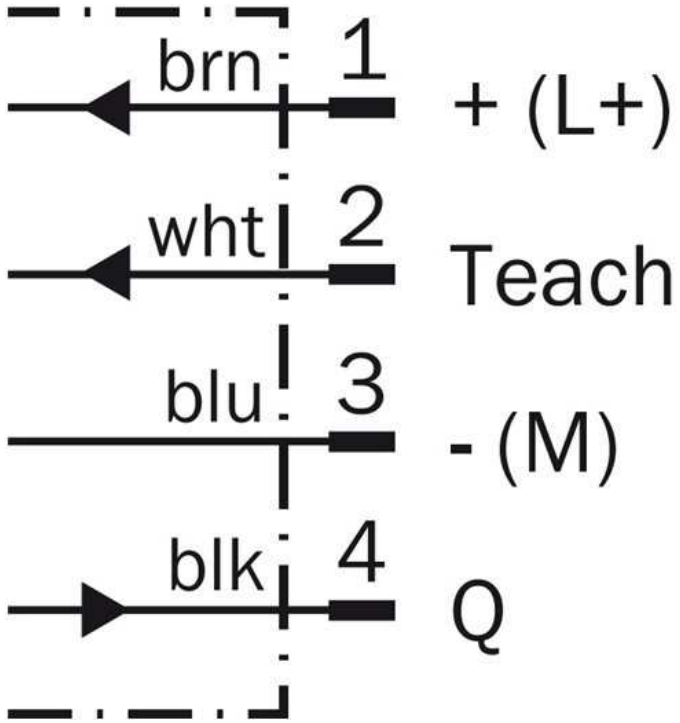
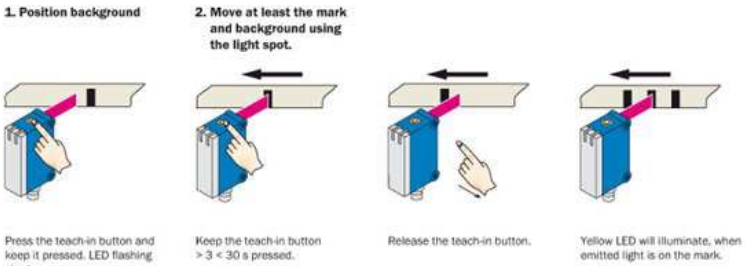
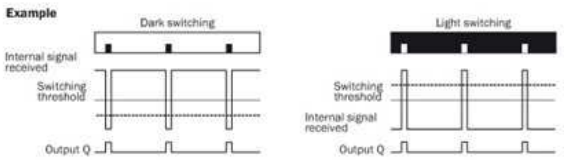
Connection diagram



Setting the switching threshold (dynamic)





Switching characteristics
The optimum emitted light is selected automatically (at RGB variants).
Static teach-in: light/dark setting is defined using teach-in sequence.
Dynamic teach-in: switching output active on mark, if background is longer in the field of view during the teach-in.
The switching threshold is set in the center between the background and the mark.

If the button is pressed again within 10 s of the teach (> 20 ms < 10 s), the relative switching threshold is placed 75 % between mark (100 %) and background (0 %) (dotted line in Figure).
Teach-in can also be performed using an external control signal (only dynamic teach-in).

Keylock activation and deactivation: hold down teach-in button > 30 s.

Teach-in failure: yellow LED indicator and the transmitted light of the sensor flashing quickly.
For dynamic teach-in with ET signal (5 Hz) via switching output Q.

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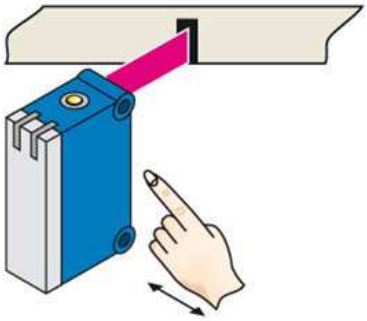
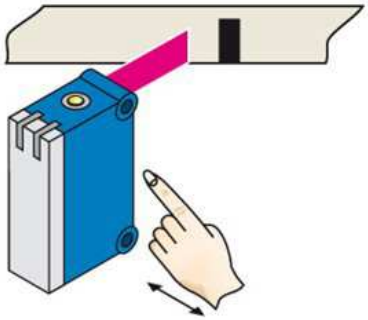
Setting the switching threshold (static)

1. Position mark



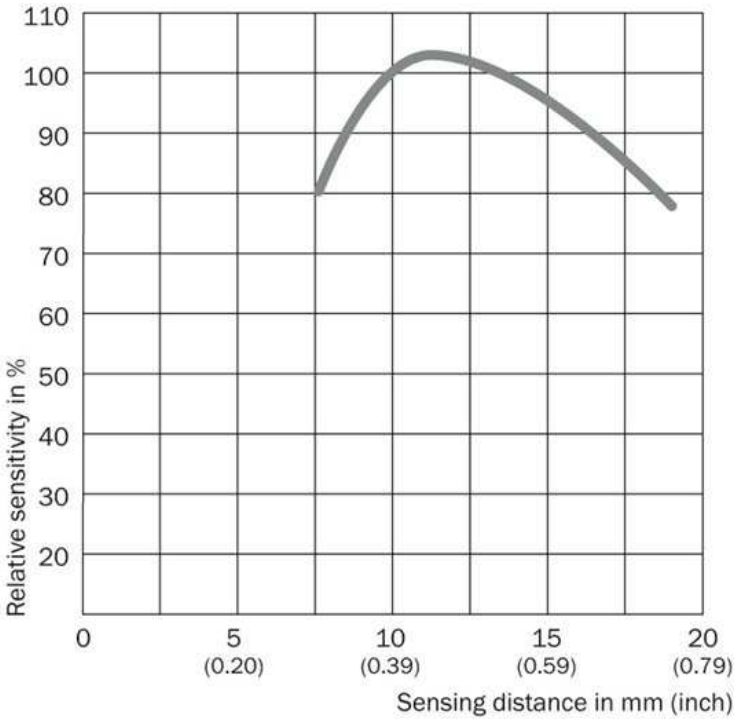
Press and hold teach-in button > 1 < 3 s.
Yellow LED flashes slowly.

2. Position background



Press and hold teach-in button < 3 s.
Yellow LED goes out.

Sensing distance



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