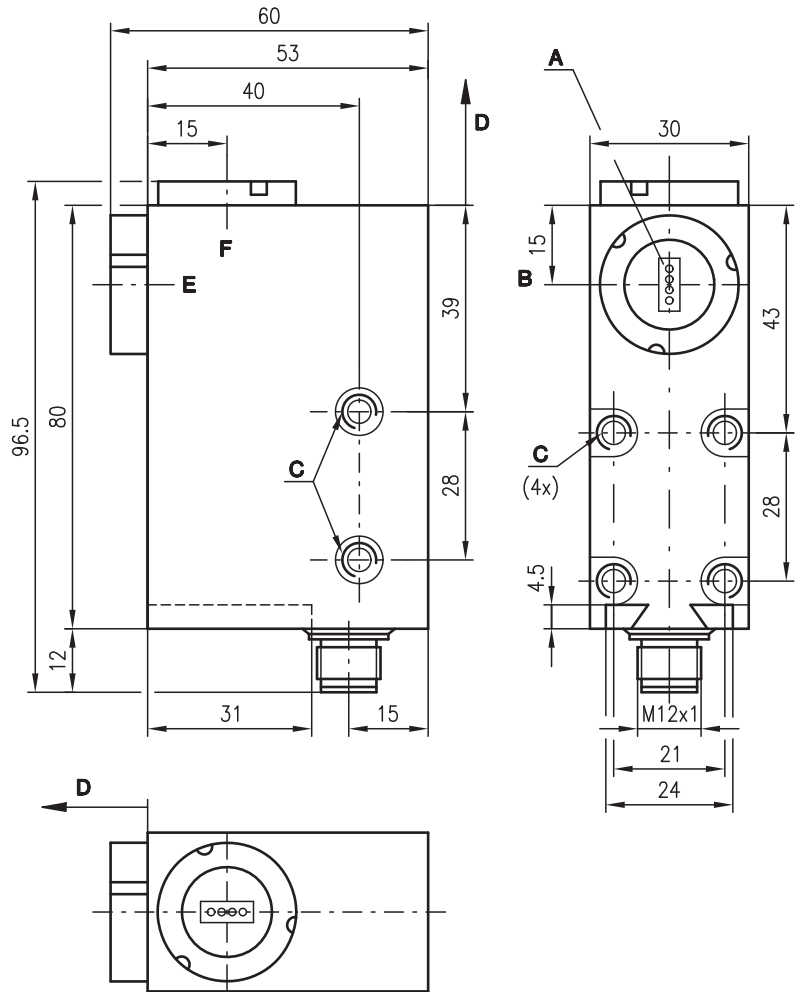


KRTM 20

High Resolution Multicolor Contrast Scanner



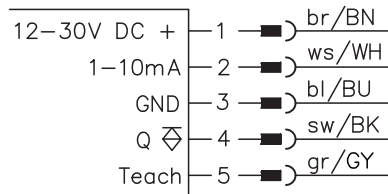
Dimensioned drawing



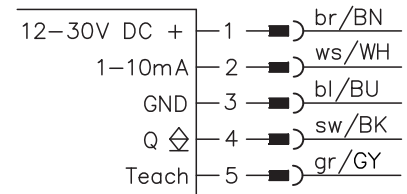
- A** Light spot orientation vertical
- B** Optical axis
- C** M5/5.5mm deep
- D** Scanning range
- E** Front
- F** Head

Electrical connection

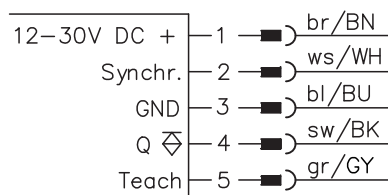
PNP + analog



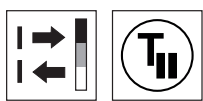
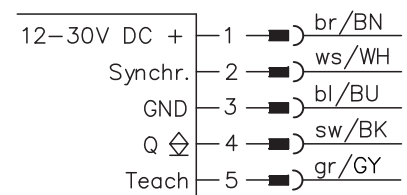
NPN + analog



PNP



NPN



**12mm
20mm
50mm**



- **Dynamic** teach-in
- RGB transmitter
- Response time analog/digital (10µs/10µs or 10µs/20µs)
- Digital switching frequency 50kHz or 25kHz
- Resolution of 70 gray levels at the digital output
- Resolution of 400 gray levels at the analog output
- Analog output 1 ... 10mA
- Changeover to the switching threshold
- Changeover to the analysis depth
- L/D switching
- Pulse stretching



Accessories:

(available separately)

- M12 connectors, 5-pin (KD ...)
- Ready-made cables (K-D ...)
- Interchangeable objectives
- Tool for changing objectives

We reserve the right to make changes • DS_KRTM20M_hr_Tdyn_en.fm

Specifications

Optical data

Scanning range with objective 1 ¹⁾	12 mm ± 1 mm
Scanning range with objective 2 ²⁾	20 mm ± 2 mm
Scanning range with objective 3 ¹⁾	50 mm ± 5 mm
Light spot dimension with objective 1 ¹⁾	3.0mmx1.0mm or round light spot D = 0.5mm
Light spot dimension with objective 2 ²⁾	4.0mmx1.2mm or round light spot D = 0.6mm
Light spot dimension with objective 3 ¹⁾	10.0mmx2.0mm or round light spot D = 1.0mm
Light spot orientation	vertical or horizontal
Light source	LEDs (red, green, blue)

Timing

Switching frequency digital output	25 kHz/50 kHz reversible (see remarks)
Response time digital output	20 µs/10 µs reversible (see remarks)
Response jitter digital output	10 µs
Response time of analogue output	10 µs
Delay before start-up	≤ 250 ms

Electrical data

Operating voltage U_B	12 ... 30 VDC (incl. residual ripple)
Residual ripple	≤ 15% of U_B
Switching output	PNP, NPN
Function characteristics	light or dark switching, reversible via button
Analog output	1 ... 10 mA
Signal voltage high/low	≥ ($U_B - 2V$) / ≤ 2V
Output current	max. 100 mA
Open-circuit current	≤ 60 mA

Indicators

After power-on:	
ON LED on	device set to factory settings
ON LED flashing slowly	device not set to factory settings (display only for approx. 10s after power-on)

After teach-in:

ON LED on	switching threshold set to factory settings
ON LED flashing slowly	-> switching threshold in center switching threshold was reconfigured -> switching threshold close to the mark teaching error

Q/T LED flashing quickly

In run mode:	
ON LED on	ready
Delay LED	pulse stretching on/off
L/D LED	light/dark switching
Q/T LED on	mark detected
Q/T LED flashing quickly	device error
In configuration mode:	
ON LED flashing quickly	device is in configuration mode
Delay LED off	2x analysis depth (response time 20 µs)
Delay LED on	1x analysis depth (response time 10 µs)
L/D LED off	switching threshold in center
L/D LED on	switching threshold close to the mark

Mechanical data

Housing	diecast zinc
Optics cover	glass
Weight	300 g
Connection type	M12 connector, stainless steel, 5-pin

Environmental data

Ambient temp. (operation/storage)	-25 °C ... +60 °C / -40 °C ... +70 °C
Protection class	IP 67
LED class	1 (acc. to EN 60825-1)
VDE safety class	II
Protective circuit ³⁾	2, 3
Standards applied	IEC 60947-5-2

Options

Synchronous input

PNP: Stop/Start measurement	$U_B/0V$ or not connected
NPN: Stop/Start measurement	$0V/U_B$ or not connected
Synchronization delay	≤ 0.5 ms

Teach input

PNP: active / not active	$U_B/0V$ or not connected
NPN: active/not active	$0V/U_B$ or not connected
Teach delay	≤ 10 ms

Pulse stretching

Device configuration	20 ms, can be activated via button
Changeover switching threshold	continue to press the teach button during power-on
Changeover response time	see remarks

1) Interchangeable objective, available as accessory

2) Standard objective, state on delivery

3) 2=polarity reversal protection, 3=short-circuit protection for all outputs

Remarks

- **Approved purpose:**
This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.
- With shiny objects, the sensor is to be mounted at an angle to the object surface.
- **Device configuration:**
 1. Configuration mode is activated by holding down the teach button during power-on (ON LED flashes).
 2. The analysis depth is changed over using the Delay button:
Delay LED off =
2x analysis depth
(response time 20 µs)
Delay LED on =
1x analysis depth
(response time 10 µs)
 3. The switching threshold is changed over using the L/D button:
L/D LED off=
Switching threshold in center
L/D LED on=
Switching threshold close to the mark
 4. Press the teach button to end device configuration.
 5. Back to factory settings: Simultaneously hold down the Delay button and the L/D button during power-on to reset the sensor to factory settings.

Order guide

See section **Preferred types**

Calibration - analog output 1 ... 10mA

This is an uncalibrated measurement value. The current value that is output is proportional to the last contrast ascertained by means of teach-in.

For rough calibration of the analog output, a teach-in with the following sequence is recommended .

1. **Teach point on background** -> on white paper.
2. **Teach point on mark** -> without object (into open space).

Preferred types

Selection table		Order code →								
Equipment ↓		KRTM 20M/P-12-6420-S12 Part No. 50116474								
Scanning range	12mm	●								
	20mm									
	50mm									
Light spot orientation	vertical	●								
	horizontal									
	round									
Optical outlet	front									
	head	●								
Output wiring	PNP	●								
	NPN									
	analogue current									
Other features	static teach-in									
	dynamic teach-in	●								
	synchronous input	●								

Additional types on request