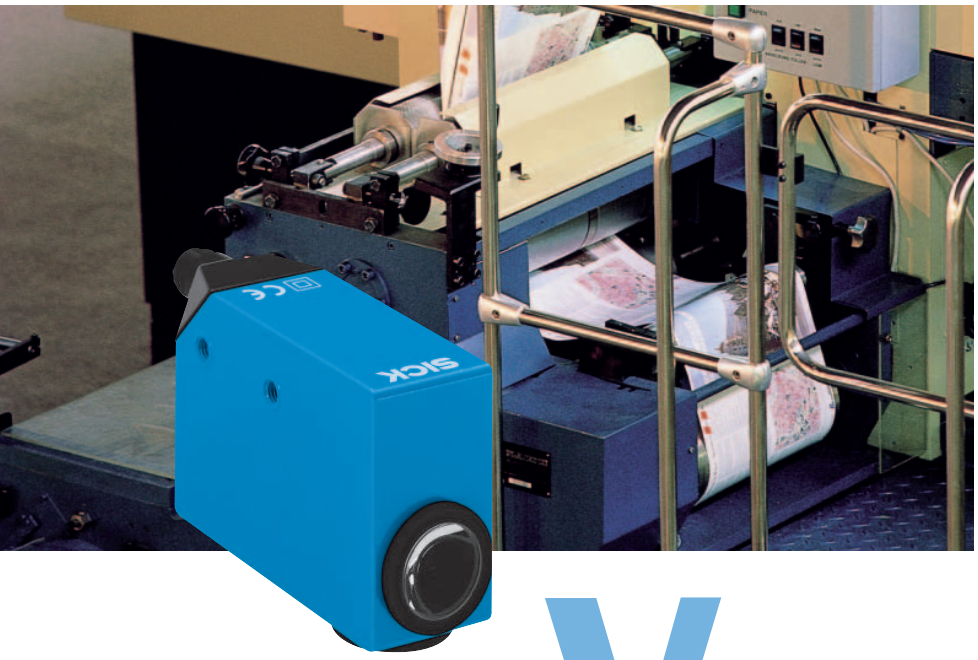
KT10-2: for high-speed applications

DATA SHEET



Contrast scanner

Very high speeds, poor contrasts and reflective materials put high demands on a sensor. When you need precise positioning, the KT10-2 is the right choice.

Simple operation is a focus in the 2nd generation of the KT10. During the teach-in procedure, the sensor selects the emission colour, which fits the existing contrast best. If print marks are to be detected on shiny foils, the sensor is automatically set for them. Thanks to the automatic drift correction, the KT10-2 adjust its switching threshold during operation. Consequently, changing environmental conditions cannot influence the performance of the sensor.

The optional light exits provide flexibility for many installation situations. The robust metal housing ensures long service life.

The very short and constant response time of 20 µs is the basis for high speed applications. The precise light spot provide high reproducibility and a high geometric resolution. Consequently, accurate positioning is ensured.

The reliability of detection is displayed on the bar display. If the print quality during production deteriorates, this also can be visualised by the KT10-2.

In addition, up to five sensor parameters for different contrasts can be stored in the sensor and retrieved when required.

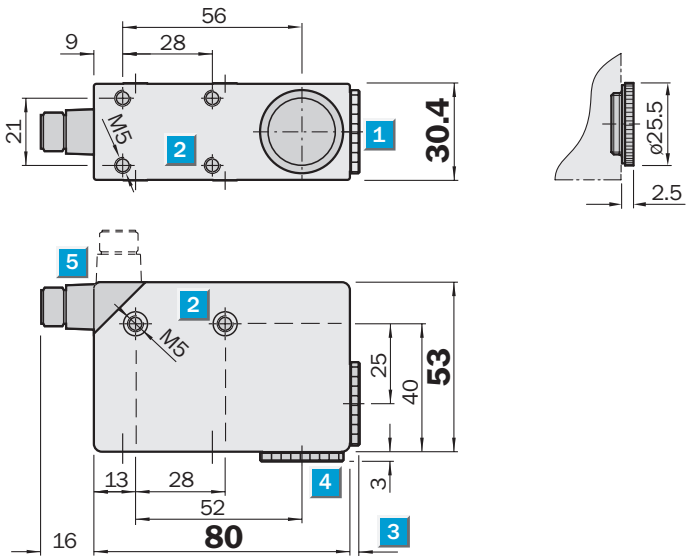
SICK

Scanning distance
10 mm ± 3 mm

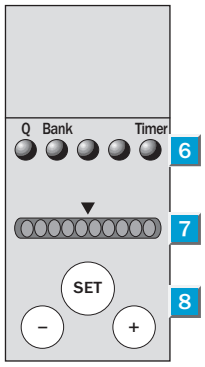
Contrast scanner

- 20 µs response time (jitter < 10 µs) for fast applications
- Precise light spot for high repeatability
- RGB emission LED (automatic selection)
- 2 light exits (changeable)
- 5 bank memory
- Automatic drift correction

Dimensional drawing



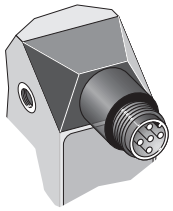
Adjustments possible



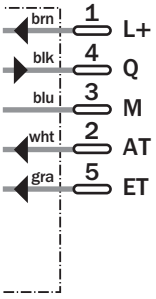
1 Lens (light transmission)
2 M5 mounting holes, 5.5 mm deep
3 See dimensional drawing of lens
4 Blind screw can be replaced by lens
5 5-pin, M12 x 1 plug (rotatable trough 90°)
6 Status indicators (yellow)
7 Bar display
8 Teach-in button, “+” and “–” button

Connection type

KT10W-2N1115
KT10W-2N2115
KT10W-2P1115
KT10W-2P2115



M12, 5-pin



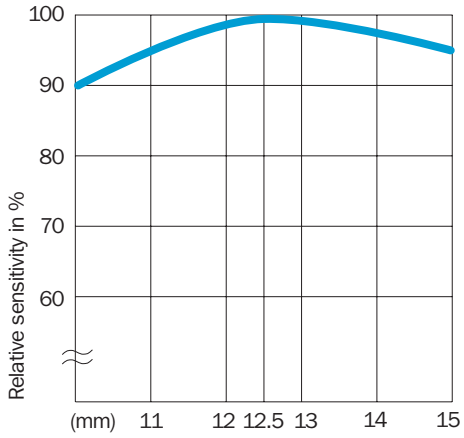
Accessories

Connector, M12, 5-pin

Technical data	KT10W-2	N1115	N2115	P1115	P2115
Scanning distance	10 mm ± 3 mm[1]	■	■	■	■
Light source, light type	LED, red, blue, green[2]	■	■	■	■
Wave length	640, 525, 470 nm	■	■	■	■
Light spot size	4 x 0.8 mm (at 10 mm)	■	■	■	■
Light spot direction	Longitudinal	■		■	
	Transverse		■		■
Supply voltage V_S	DC 10 ... 30 V[3]	■	■	■	■
Residual ripple	< 5 mV[4]	■	■	■	■
Power consumption	< 80 mA[5]	■	■	■	■
Switching outputs	NPN	■	■		
	PNP			■	■
Switching mode	Light/dark switching, adjustable via teach-in	■	■	■	■
Signal voltage PNP HIGH/LOW	V_S - < 2 V / 0 V			■	■
Signal voltage NPN HIGH/LOW	V_S / < 2 V	■	■		
Output current $I_a$max	< 100 mA	■	■	■	■
Response time	20 µs[6]	■	■	■	■
Switching frequency	25,000 Hz[7]	■	■	■	■
Jitter	< 10 µs	■	■	■	■
Teach-in input (ET), PNP	Teach > 10 V ... < V_S Run 0 V or unswitched[8]			■	■
Teach-in input (ET), NPN	Teach > 10 V ... < V_S Run V_S or unswitched[8]	■	■		
Adjustment	Teach-in dynamic (min/min) 2-point teach-in, static	■	■	■	■
Time delay	Deactivation delay (adjustable): 20 ms	■	■	■	■
Blanking input (AT), blanked, PNP	AT > 10 V[9]			■	■
Blanking input (AT), blanked, NPN	AT < 2 V[9]	■	■		
Blanking input (AT), free running, PNP	AT < 2 V or unswitched[9]			■	■
Blanking input (AT), free running, NPN	AT > 10 V or unswitched[9]	■	■		
Connection type	Connector, M12, 5-pin	■	■	■	■
VDE protection class	⧈[10]	■	■	■	■
Circuit protection	V_S connections reverse-polarity protected / Output Q and Q not short-circuit protected / Interference pulse suppression / Outputs overcurrent and short-circuit	■	■	■	■
Enclosure rating	IP 67	■	■	■	■
Ambient temperature operation	-10 °C ... +55 °C	■	■	■	■
Ambient temperature storage	-25 °C ... +75 °C	■	■	■	■
Shock load	According to IEC 68	■	■	■	■
Weight	Approx. 400 g	■	■	■	■
Housing material	Zinc die-cast	■	■	■	■

[1] From front edge of lens
[2] Average service life 100,000 h at T_A = +25 °C
[3] Limit values
[4] May not exceed or fall short of V_S tolerances
[5] Without load
[6] Signal transit time with resistive load
[7] With light/dark ratio 1:1
[8] ET > 2 ms
[9] AT > 200 µs
[10] Reference voltage 50 V DC

Scanning distance

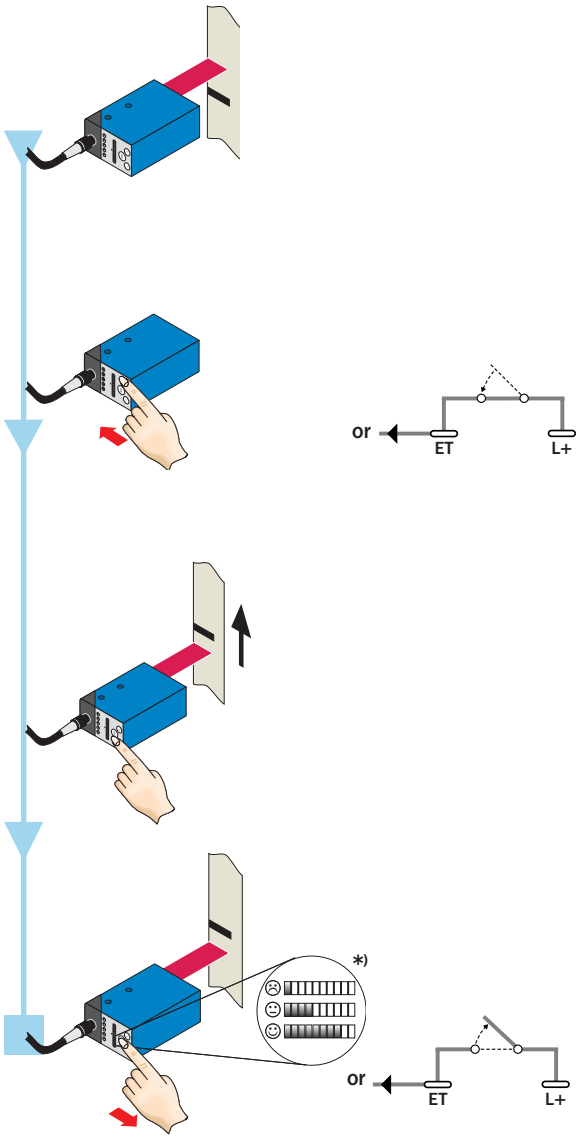


Ordering information

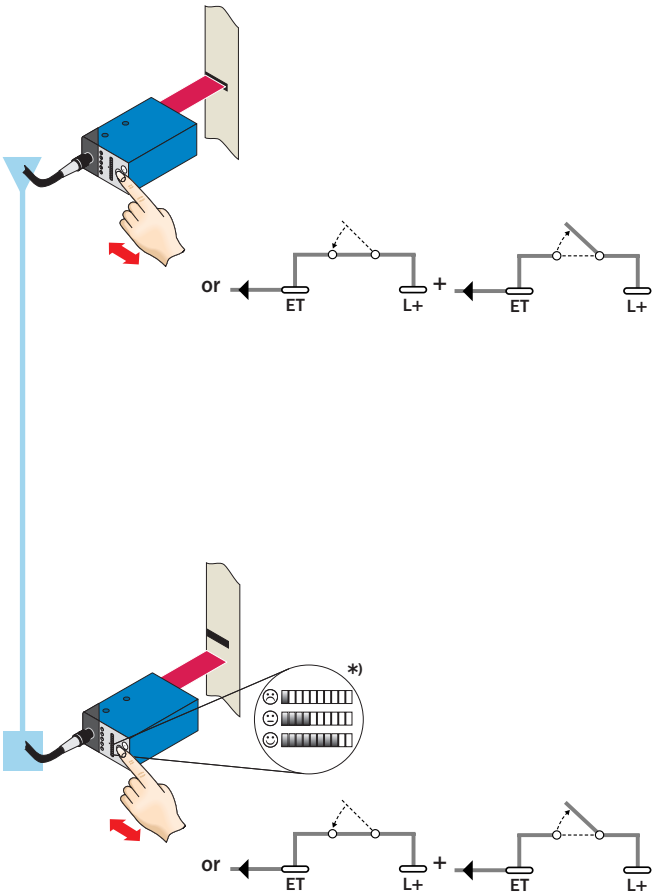
Type	Part Number
KT10W-2N1115	1 028 233
KT10W-2N2115	1 029 071
KT10W-2P1115	1 028 232
KT10W-2P2115	1 029 070

Teach-in: Setting the switching threshold

Dynamic teach-in (min/min)



Static 2-point teach-in

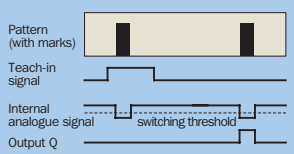


*) **Detection reliability:**

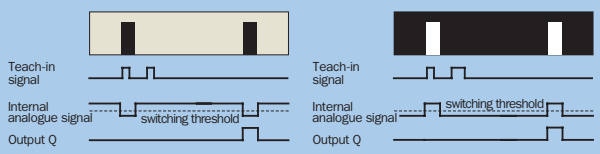
1 LED on: No reliable operation – minimum contrast difference
≤ 4 LEDs on: Capable operation – sufficient contrast difference
> 4 LEDs on: Reliable operation – high contrast difference

Status

- The switching threshold is in the middle between the reception signals from the background and mark and is stored permanently.
- The optimum transmission light was selected automatically.



- After the first teach-in procedure, the red transmitter light and the status indicator blink and signal that a second teach-in procedure must be triggered.
- The optimum transmission light was selected automatically.



Notes

- The material speed during the teach-in procedure must be slower than 10 m/minute when there are smaller marks.
- Only teach-in one mark if possible.
- If the teach-in procedure was unsuccessful, the output switches at approx. 5/s and the yellow LED display blinks. The reception signal was too weak, too strong (possibly due to shiny reflectance) or the contrast difference was too slight.

- Light-/dark-switching not required: equipment switches for the material to be scanned, which was under the light spot at the first teach-in procedure (mark or background)
- The material speed must be zero during teach-in (machine is idle).

Special settings

My settings (☑)

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Notes

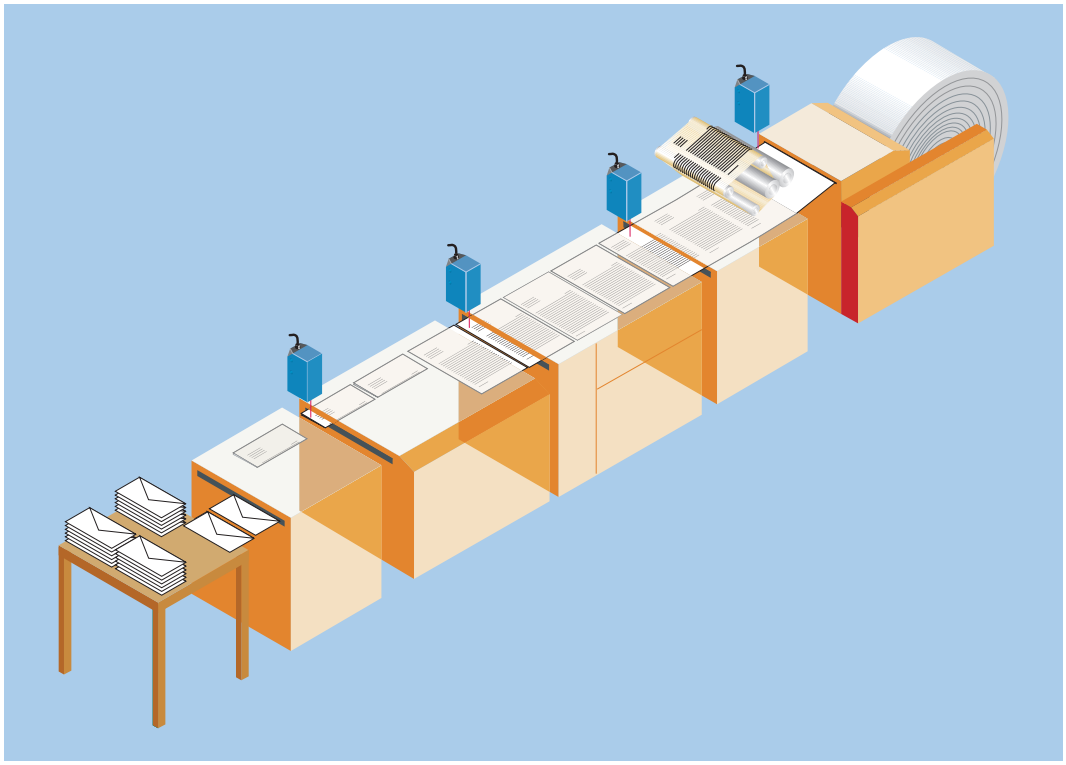
- **Navigation of special settings:**
  - "–" and "+" button > 1 s → Enter/Exit.
  - "–" or "+" button → Navigate.
  - "SET" button → Select/Confirm.
- **Restore defaults:**
  - "–" and "+" button, press both > 1 s and release (Enter special mode).
  - "–" and "+" button, press both > 5 s until five status LEDs (Q ... Timer) flash two times.

  Reset does not delete the stored parameters under bank 1 to 5.
- **Job memory:**

  Up to five different jobs can be stored in the sensor and called up. The sensor stores the job that was last pre-programmed under the selected bank.
- **Drift correction/Bar display:**
  - Automatic/detection security: the sensor controls the switching threshold independently according to the background and the marking. The bar display visualises the contrast quality (1 LED = weak contrast, 10 LEDs = strong contrast).
  - Manual/signal strength: the switching threshold can be readjusted during operation:
    - press "+" button > 1 s and release,
    - adaption of tolerance with "+" or "–" button
    - confirm with "Set" .
- **Teach-in:** refer to page 4
- **Output logic:**

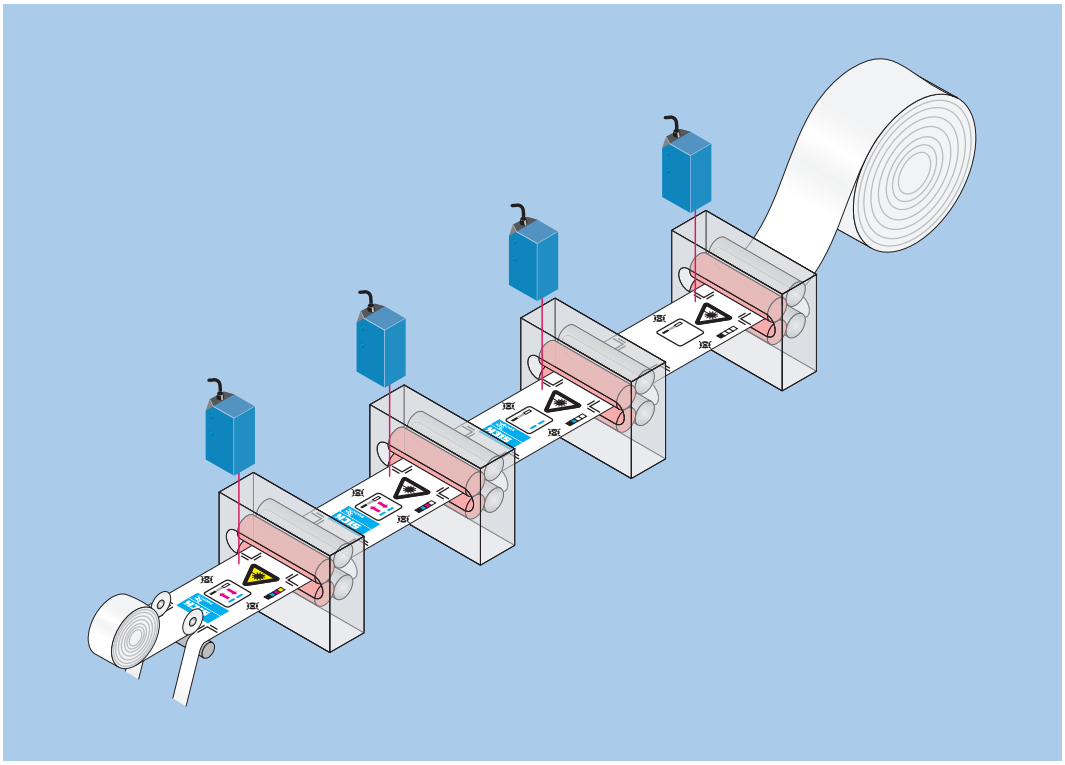
  Via the teach-in sequence, it is possible to determine whether the switching output is active on the lighter or darker contrast element (LO/DO). The logic (light/dark switching) can be selected irrespective of teach-in.

► Controlling cutting, folding and inserting into envelopes



Precise detection of printing, folding and reference marks as well as high processing speed is a matter of course for the contrast scanner, as is the great reproducibility required in printing machines, high performance copiers and in continuous form systems for printing, cutting, folding and inserting letters into envelopes. Of course, the contrast scanner can also be used for other applications, i.e. packaging, which place great demands on contrast detection and speed.

▼ Synchronisation of a printing process



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