

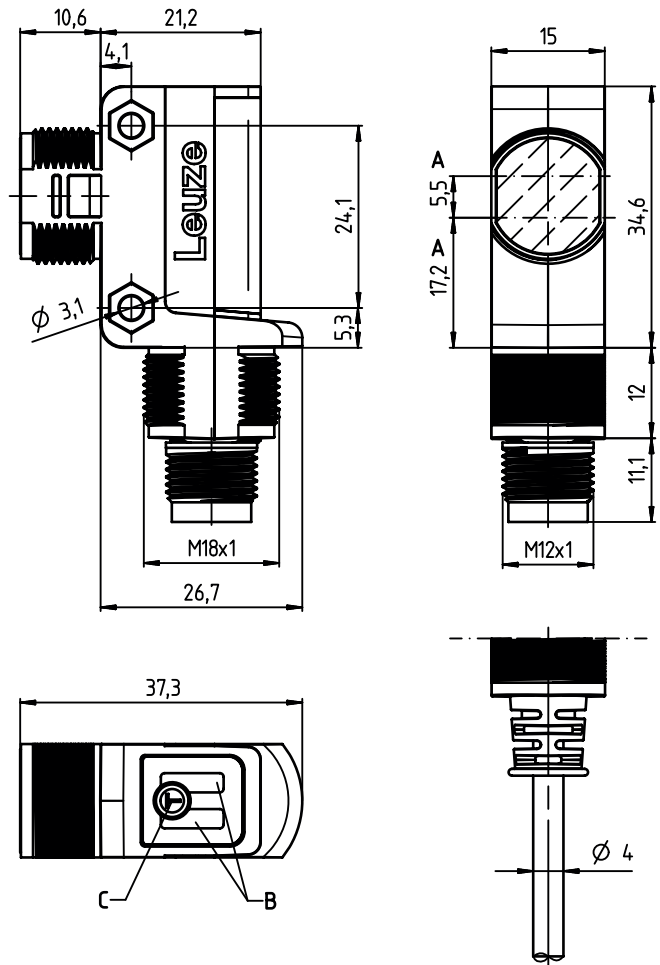
FT 28

Reflection light scanners with fading

en 01-2013/06 50123662

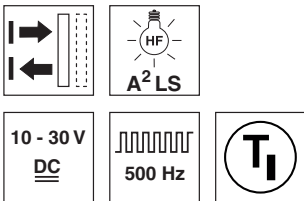


Dimensioned drawing



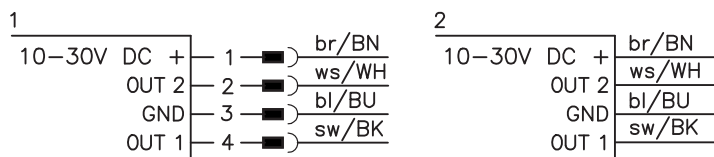
- A Optical axis
- B Indicator diodes
- C Teach button

1 ... 250 mm



- Diffuse reflection light scanners with fading
- V-optics allow for reliable detection of dark objects in the short range
- Scanning range adjustment via teach-in
- Visible red light
- Active suppression of extraneous light A<sup>2</sup>LS
- Fast alignment through *brightVision*<sup>®</sup>
- Universal option for M18 hole mounting at the front and connector side
- Easy through-hole assembly with anti-rotation protection for mounting nuts on the housing
- Full control through green and yellow indicator LEDs
- Robust plastic housing acc. to IP 67 for industrial application

Electrical connection

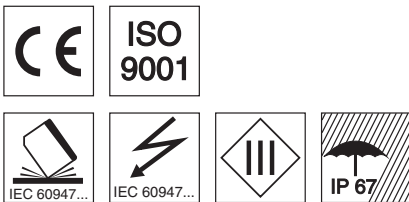


Accessories:

(available separately)

- Mounting systems (BTU 200 ..., BT 200...)
- M12 connectors (KD ...)
- Ready-made cables (K-D ...)

We reserve the right to make changes • DS\_FT28\_en\_50123662.fm



## Specifications

### Optical data

Scanning range limit <sup>1)</sup>	1 ... 250mm
Scanning range <sup>2)</sup>	see tables
Light source	LED (modulated light)
Wavelength	620nm (visible red light)

### Timing

Switching frequency	500Hz
Response time	1ms
Delay before start-up	≤ 300ms

### Electrical data

Operating voltage $U_B$	10 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of $U_B$
Open-circuit current	≤ 20mA
Switching output	.../4P... 2 PNP transistor outputs pin 2: PNP dark switching, pin 4: PNP light switching .../2N... 2 NPN transistor outputs pin 2: NPN dark switching, pin 4: NPN light switching
Signal voltage high/low	≥ ( $U_B - 2.5V$ ) ≤ 2.5V
Output current	max. 100mA <sup>3)</sup>

### Indicators

Green LED	ready
Yellow LED	reflection (object detected)
Yellow LED, flashing	reflection, no performance reserve

### Mechanical data

Housing	plastic
Optics cover	plastic
Weight	25g with M12 connector 45g with 200mm cable and M12 connector 75g with 2m cable
Connection type	M12 connector, 4-pin cable 200mm with M12 connector, 4-pin cable 2m, 4x0.20mm <sup>2</sup>

### Environmental data

Ambient temp. (operation/storage)	-40°C ... +60°C / -40°C ... +70°C
Protective circuit <sup>4)</sup>	2, 3
VDE safety class	III
Protection class	IP 67
Light source	exempt group (in acc. with EN 62471)
Standards applied	IEC 60947-5-2

- 1) Scanning range limit: typical scanning range
- 2) Scanning range: ensured scanning range
- 3) Sum of the output currents for both outputs, 50mA when ambient temperatures > 40°C
- 4) 2=polarity reversal protection, 3=short circuit protection for all outputs



**Fading:** black/white error < 50%

### Example:

Adjustment 160mm, white 90%

- **Detection:**  
Black object, 6%, is detected at approx. 90mm

Adjustment 120mm, black 6%

- **Situation in the background:**  
White object, 90%, is no longer detected at a distance > 210mm

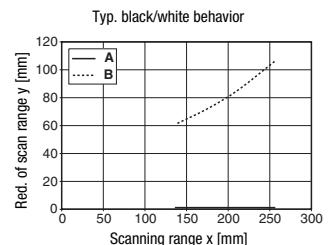
## Tables

1	1	210	250
2	5	125	150

1	white 90%
2	black 6%

Scanning range [mm]
Typ. scanning range limit [mm]

## Diagrams



## 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 the set scanning range, a tolerance of the scanning range limits is possible depending on the reflection properties of the material surface.

**FT 28**

**Reflection light scanners with fading**

**Order guide**

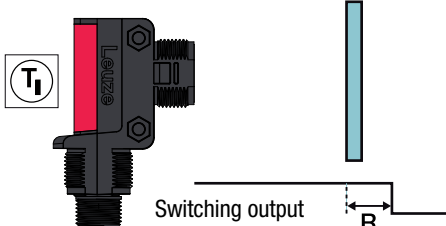
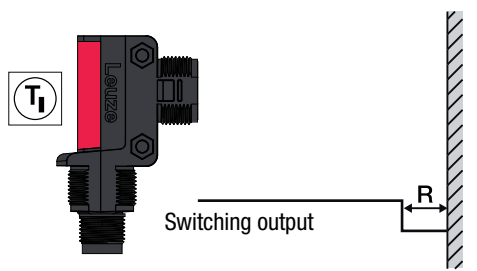
The sensors listed here are preferred types; current information at [www.leuze.com](http://www.leuze.com).

		Designation	Part no.
<b>With 4-pin M12 connector</b>	Pin 4: PNP light switching, pin 2: PNP dark switching	FT28.3/4P-M12	50122590
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT28.3/2N-M12	50122593
<b>With 200mm cable and M12 connector</b>	Pin 4: PNP light switching, pin 2: PNP dark switching	FT28.3/4P-200-M12	50122591
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT28.3/2N-200-M12	50122594
<b>With cable, cable length 2m</b>	Pin 4: PNP light switching, pin 2: PNP dark switching	FT28.3/4P	50122592
	Pin 4: NPN light switching, pin 2: NPN dark switching	FT28.3/2N	50122595

**Part number code**

		F	T	2	8	.	3	/	4	P	-	2	0	0	-	M	1	2
<b>Operating principle</b>																		
FT	Diffuse reflection light scanners with fading																	
<b>Series</b>																		
28	28 Series																	
<b>Equipment</b>																		
.3	Teach-in via teach button																	
<b>Switching output/function /OUT1OUT2 (OUT1 = Pin 4, OUT2 = Pin 2)</b>																		
4	PNP, light switching																	
P	PNP, dark switching																	
2	NPN, light switching																	
N	NPN, dark switching																	
X	Pin not used																	
<b>Electrical connection</b>																		
-M12	M12 connector, 4-pin																	
N/A	Cable, standard length 2 m																	
-200-M8	200 mm cable with M8 connector																	
-200-M12	200 mm cable with M12 connector																	

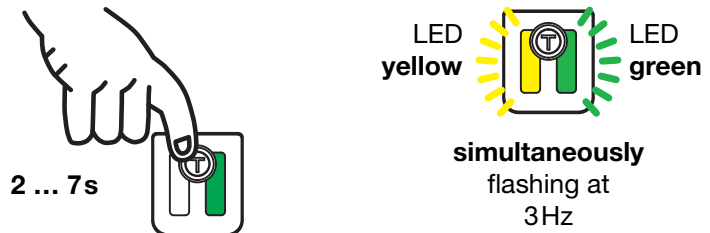
**Teach-in method**

Teach	Operating level 1	Operating level 2
Standard Teach	<p><b>Teach on object:</b></p> <p>In this teach version, the switching distance is set so that the object that is in the beam path during the teach is detected with a tight reserve. The additional distance by which the scanning range is increased in relation to the distance to the teach object is designated as reserve <b>R</b>. All objects up to a bit above the distance of the object used in the teach are thus detected.</p> 	<p><b>Teach on background:</b></p> <p>This teach is only suitable for applications with a fixed background. The teach is carried out without an object. The scanning range is placed in front of the teach object with reserve <b>R</b>. The scanning range is set by the teach so that detection stops just short of the background.</p> 

**Operation via teach button**

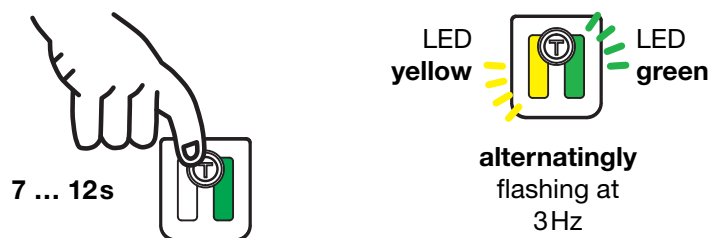
**Teach in operating level 1**

- Press teach button until both LEDs flash **simultaneously**.
- Release teach button.
- Ready.



**Teach in operating level 2**

- Press teach button until both LEDs flash **alternatingly**.
- Release teach button.
- Ready.

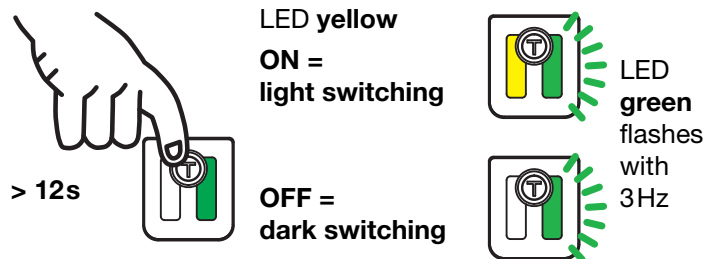


**Adjusting the switching behavior of the switching output – light/dark switching**

This function permits inversion of the sensors' switching logic.

- Press the teach button until only the green LED flashes. The yellow LED then shows the inverted switching logic:

- ON** = switching outputs light switching (in the case of complementary sensors, Q1 (pin 4) light switching, Q2 (pin 2) dark switching), this means output active when object is detected.
- OFF** = switching outputs dark switching (in the case of complementary sensors, Q1 (pin 4) dark switching, Q2 (pin 2) light switching), this means output inactive when object is detected.



- Release teach button.
- Ready.