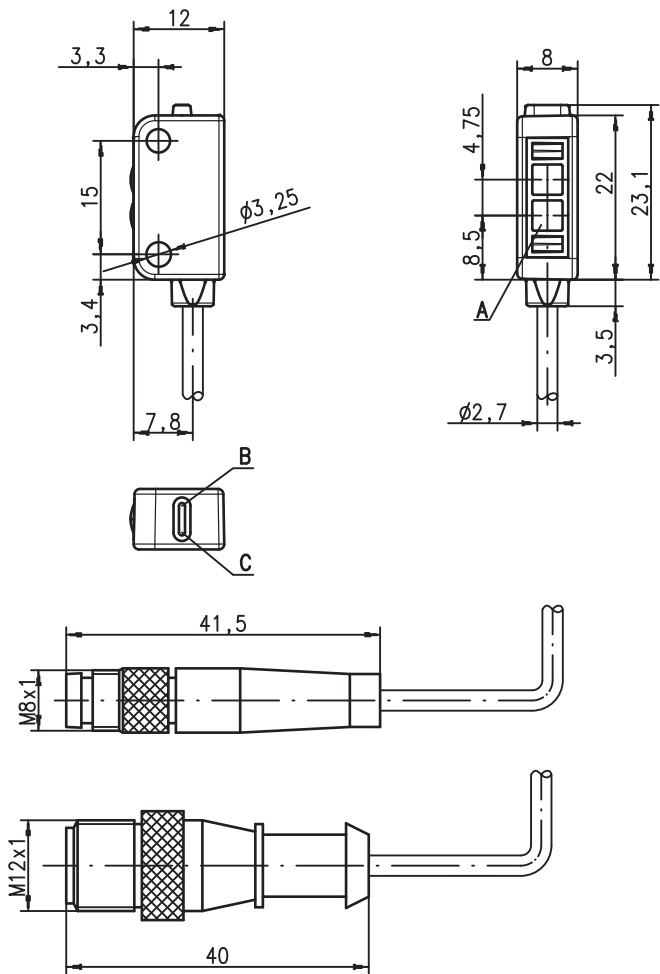


**HRTR 2 Miniature diffuse reflection light scanner with background suppression**

en 03-2012/08 50112211



**Dimensioned drawing**



- A Transmitter
- B Yellow indicator diode
- C Green indicator diode

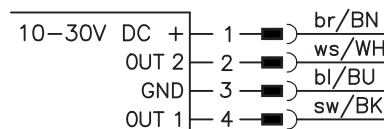
**15mm (fixed)**  
**30mm (fixed)**  
**50mm (fixed)**

**10 - 30 V**  
**DC**

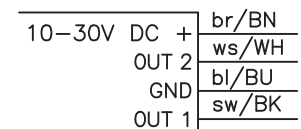
- Miniature diffuse reflection light scanner with visible red light
- Homogenous, focussed light beam with a very small, laser-like light spot
- Very good background suppression
- 3 permanently set scanning ranges: 15mm, 30mm or 50mm
- Miniature construction with temperature-stable plastic housing with protection class IP 67 and 2 inlaid metal fastening sleeves for secure mounting

**Electrical connection**

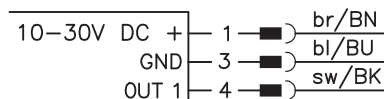
Plug connection, 4-pin



Cable, 4 wires



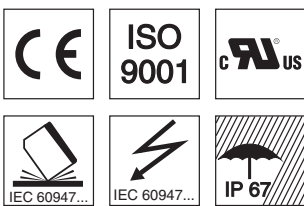
Plug connection, 3-pin



**Accessories:**

(available separately)

- Mounting device BT 002 M.5 (50112206)
- Cable with M8 or M12 connector (K-D ...)



We reserve the right to make changes • DS\_HRTR2\_en\_50112211.fm

## Specifications

### Optical data

Typ. scanning range limit <sup>1)</sup>  
 Scanning range <sup>2)</sup>  
 Light beam characteristic  
 Light spot at focal point  
 Light source<sup>3)</sup>  
 Wavelength

<b>HRTR 2...-15F...</b>	<b>HRTR 2...-30F...</b>	<b>HRTR 2...-50F...</b>
15mm	30mm	50mm
see tables	focussed at 16mm	focussed at 16mm
focussed at 10mm	focussed at 16mm	focussed at 16mm
typ. < 1mm		
LED (modulated light)		
640nm (visible red light)		

### Timing

Switching frequency  
 Response time  
 Repeatability  
 Delay before start-up

700Hz  
 0.72ms  
 175µs  
 ≤ 120ms

### Electrical data

Operating voltage  $U_B$  <sup>4)</sup>  
 Residual ripple  
 Open-circuit current  
 Switching output

10 ... 30VDC (incl. residual ripple)  
 ≤ 10% of  $U_B$   
 ≤ 20mA

.../42 OUT1 (pin 4): PNP light switching  
 OUT2 (pin 2): NPN light switching  
 .../42D OUT1 (Pin 4): PNP dark switching  
 OUT2 (Pin 2): NPN dark switching  
 .../2 OUT1 (pin 4): NPN light switching  
 bipolar transistor with open collector,  
 leakage current (OFF):  
 PNP=10µA, NPN=200µA,  
 saturation voltage (ON, at 50mA):  
 PNP=1.45V, NPN=1.25V  
 max. 50mA (per output and total)  
 C ≤ 2.2µF

Output configuration

Output current  
 Load

### Indicators

Green LED in continuous light  
 Green LED, flashing  
 Yellow LED in continuous light  
 Yellow LED, flashing

ready  
 output overloaded  
 object detected - reflection  
 object detected - reflection, performance reserve too low

### Mechanical data

Housing  
 Optics cover  
 Fastening  
 Weight

plastic (TPE), color: red RAL 3000  
 plastic (PC)  
 by means of 2 brass sleeves integrated in the housing  
 with 2m cable: 50g  
 with 150mm cable and connector: 20g  
 2m cable, PVC, 4-wire, core cross section 4x0.14mm<sup>2</sup>,  
 150mm cable with M8/M12 connector, 4-pin,  
 150mm cable with M8/M12 connector, 3-pin

Connection type

### Environmental data

Ambient temp. (operation/storage)  
 Protective circuit <sup>5)</sup>  
 VDE safety class  
 Protection class  
 LED class  
 Standards applied  
 Certifications

-20°C ... +55°C / -30°C ... +75°C  
 1, 2, 3, 4  
 III  
 IP 67  
 1 (in accordance with EN 60825-1)  
 IEC 60947-5-2  
 cURus (Recognised Component Mark for Canada and USA)

- 1) Typ. scan. range limit: max. achievable scanning range for light objects (white 90%)
- 2) Scanning range: recommended scanning range for objects with different diffuse reflection
- 3) Average life expectancy 100,000h at an ambient temperature of 25°C
- 4) For UL applications: for use in class 2 circuits according to NEC only
- 5) 1=overload protection, 2=polarity reversal protection, 3=short circuit protection for all transistor outputs, 4=transient protection max. ± 50V

## Remarks

### ● Approved purpose

The diffuse reflection light scanners are optical electronic sensors for optical, contactless detection of objects. 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.

## Tables

### HRTR 2...-15F...

	mm					
1	1	4		14	18	
2	OFF	3	5	Scanning range [mm]	12	17
3		4	7		10	16

### HRTR 2...-30F...

	mm					
1	1	5		28	35	
2	OFF	3	6	Scanning range [mm]	24	33
3		4	7		20	32

### HRTR 2...-50F...

	mm					
1	1	4		46	60	
2	OFF	3	6	Scanning range [mm]	34	52
3		4	8		24	45

1	white 90%
2	grey 18%
3	black 6%

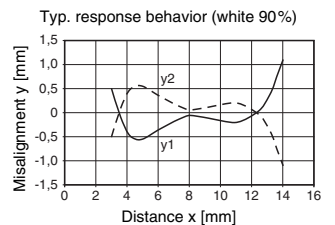
Scanning range [mm]  
 Typ. scanning range limit [mm]  
 Sensor OFF



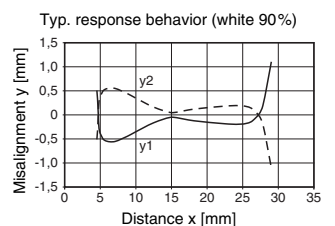
In the areas between "Sensor OFF" and the operating range, the sensor functions with only a low performance reserve. The sensor typically flashes in this case. Depending on the tolerance, it is, however, also possible that the sensor no longer detects objects.

## Diagrams

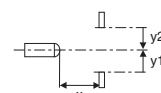
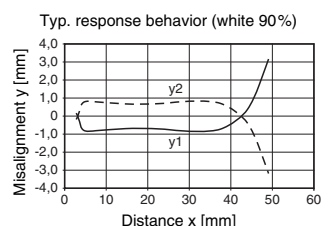
### HRTR 2...-15F...



### HRTR 2...-30F...



### HRTR 2...-50F...



## HRTR 2 Miniature diffuse reflection light scanner with background suppression

### Part number code

H	R	T	R	2	/	4	2	D	-	1	5	F	,	1	5	0	-	S	1	2
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#### Operating principle

<b>HRTR</b>	Miniature light scanners with background suppression, red light
<b>PRK</b>	Miniature retro-reflective photoelectric sensor with polarization filter
<b>LSSR</b>	Miniature throughbeam photoelectric sensor, red-light transmitter
<b>LSER</b>	Miniature throughbeam photoelectric sensor, red-light receiver

#### Series

<b>2</b>	2 Series
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#### Switching output

<b>/42</b>	Bipolar transistor output open collector, OUT 1 (pin 4): PNP, OUT 2 (pin 2): NPN
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#### Switching output function

<b>N/A</b>	OUT 1 and OUT 2 both light switching
<b>D</b>	OUT 1 and OUT 2 both dark switching

#### Scanning range (only with operating principle HRTR)

<b>-15F</b>	Scanning range limit set to 15mm
<b>-30F</b>	Scanning range limit set to 30mm
<b>-50F</b>	Scanning range limit set to 50mm

#### Electrical connection

<b>N/A</b>	Cable, PVC, standard length 2000mm, 4-wire
<b>,150-S8</b>	Cable, PVC, length 150mm with M8 connector, 4-pin, axial
<b>,150-S12</b>	Cable, PVC, length 150mm with M12 connector, 4-pin, axial
<b>,150-S8.3</b>	Cable, PVC, length 150mm with M8 connector, 3-pin, axial

## Order guide

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

### Order code

### Part no.

#### Scanning range permanently set to 15mm

HRTR 2/42-15F	50112109
HRTR 2/42-15F, 150-S8	50112110
HRTR 2/42-15F, 150-S12	50112111
HRTR 2/42D-15F	50112112
HRTR 2/42D-15F, 150-S8	50112113
HRTR 2/42D-15F, 150-S12	50112114

#### Scanning range permanently set to 30mm

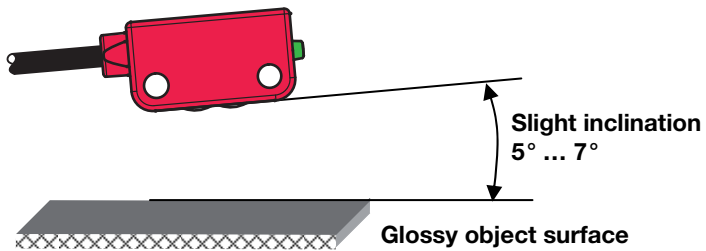
HRTR 2/42-30F	50112115
HRTR 2/42-30F, 150-S8	50112116
HRTR 2/42-30F, 150-S12	50112117
HRTR 2/42D-30F	50112118
HRTR 2/42D-30F, 150-S8	50112119
HRTR 2/42D-30F, 150-S12	50112120

#### Scanning range permanently set to 50mm

HRTR 2/42-50F	50112121
HRTR 2/42-50F, 150-S8	50112122
HRTR 2/2-50F, 150-S8.3	50120855
HRTR 2/42-50F, 150-S12	50112123
HRTR 2/42D-50F	50112124
HRTR 2/42D-50F, 150-S8	50112125
HRTR 2/42D-50F, 150-S12	50112126

**Application notes**

- When detecting glossy surfaces (e.g. metals), the light beam should not be incident on the object surface at a right angle. A slight inclination is sufficient for preventing undesired direct reflections. The following rule of thumb applies: the smaller the scanning range, the larger the angle of inclination (approx.  $5^\circ \dots 7^\circ$ ).



- Objects should only be moved in laterally from the right or left. Moving in objects from the cable side or LED side is to be avoided.
- The sensors are equipped with effective measures for the maximum avoidance of mutual interference should they be mounted opposite one another. Opposite mounting of multiple sensors of the same type should, however, absolutely be avoided.