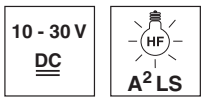
HT5.1 Diffuse reflection sensor with background suppression

en 01-2016/06 50132435

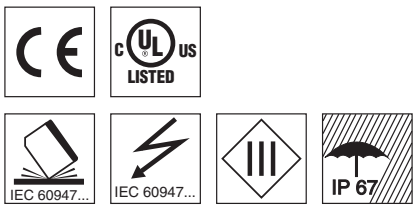




5 … 400 mm
200 mm with black-white error < 15%



- Diffuse reflection sensor with visible red light and adjustable background suppression
- Large scanning range and reliable switching nearly independent of object or background properties
- Exact scanning range adjustment
- For all standard applications in the area of object detection and positioning (e.g. containers in conveyor and storage systems)
- Small and compact construction with robust plastic housing, degree of protection IP 67 for industrial application
- ***NEW***: Housing with two integrated M3 metal threaded sleeves

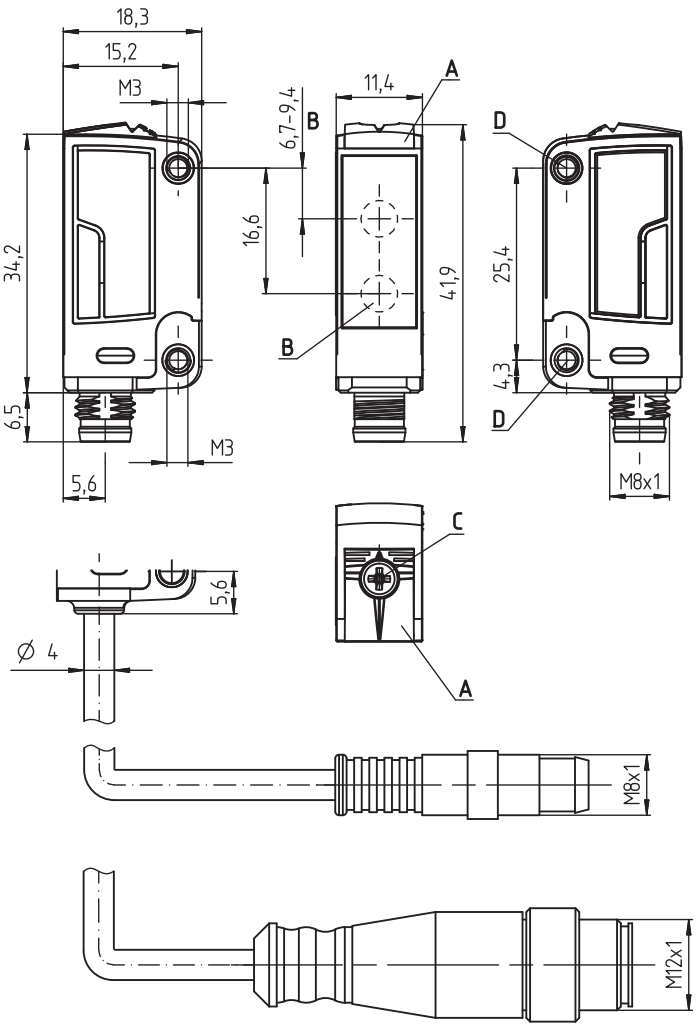


Accessories:

(available separately)

- Mounting systems (BT …)
- Cables with M8 connector (K-D …)

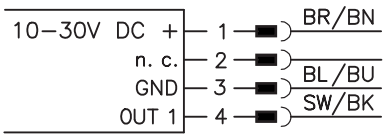
Dimensioned drawing



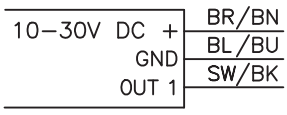
A Yellow indicator diode
B Optical axis
C Scanning range adjustment
D Threaded sleeve

Electrical connection

Connector, 4-pin



Cable, 3-wires



We reserve the right to make changes • DS_HT5_1_en_50132435.fm

Technical data

Optical data

Typ. scanning range limit [1]	5 … 400mm
Scanning range [2]	see tables
Adjustment range [1]	15 … 400mm
Black/white error < 15% up to	200mm
Light beam characteristic	focussed at 200mm
Light source [3]	LED (modulated light)
Wavelength	633nm (visible red light)

Timing

Switching frequency	1,000Hz
Response time	0.5?ms [4]
Response jitter	166µs
Readiness delay	≤ 300ms (acc. to. IEC 60947-5-2)

Electrical data

Operating voltage U_B [5]	10 … 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of U_B
Open-circuit current	≤ 20mA
Switching output	see part number code on page 3
Function	light/dark switching, see part number code on page 3
Signal voltage high/low	≥ (U_B-2V)/≤ 2V
Output current	max. 100mA
Scanning range	adjustable

Indicators

Yellow LED	object detected - reflection

Mechanical data

Housing	plastic (high-strength PC-ABS); 2x M3 brass threaded sleeves
Optics cover	plastic (PMMA)
Weight	with connector: 10g with 2m cable: 50g
Connection type	M8 connector, plastic or cable 2m (cross section 3 x 0.14mm²)

Environmental data

Ambient temp. (operation/storage)	-40°C … +60°C/-40°C … +70°C
Protective circuit [6]	2, 3
VDE safety class	III
Degree of protection	IP 67
Light source	exempt group (in acc. with EN 62471)
Standards applied	IEC 60947-5-2
Certifications	UL 508, CSA C22.2 no.14-13 [5] [7]

1) Typ. scan. range limit/adjustment range: max. achievable scanning range/adjustment 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 short decay times, an ohmic load of approx. 5kOhm is recommended
5) For UL applications: use is permitted exclusively in Class 2 circuits according to NEC
6) 2=polarity reversal protection, 3=short circuit protection for all transistor outputs
7) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

Tables

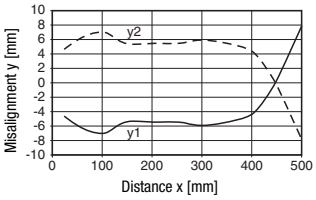
1	5	400
2	10	300
3	15	200

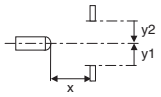
1	white 90%
2	gray 18%
3	black 6%

Scanning range [mm]

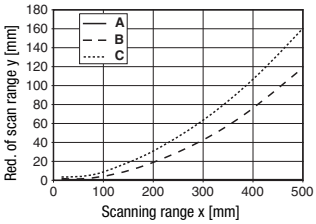
Diagrams

Typ. response behavior (white 90%)

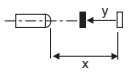




Typ. black/white behavior



A white 90%
B gray 18%
C black 6%



Notes

Observe intended use!

- This product is not a safety sensor and is not intended as personnel protection.
- The product may only be put into operation by competent persons.
- Only use the product in accordance with its intended use.

HT5.1 Diffuse reflection sensor with background suppression

Part number code

H	T	5		.	1	/	4	X	-	M	8						

Operating principle

HT	Diffuse reflection sensor with background suppression

Series

5	5 series

Light type

N/A	Red light
I	Infrared light

Equipment

1	Adjustable scanning range

Switching output/function /OUT1OUT2 (OUT1 = Pin 4, OUT2 = Pin 2)

4	PNP, light switching
P	PNP, dark switching
2	NPN, light switching
N	NPN, dark switching
X	Pin not assigned (n. c.- not connected)

Electrical connection

-M8	M8 connector, 4-pin
N/A	Cable, standard length 2m
-200-M8	200mm cable with M8 connector
-200-M12	200mm cable with M12 connector

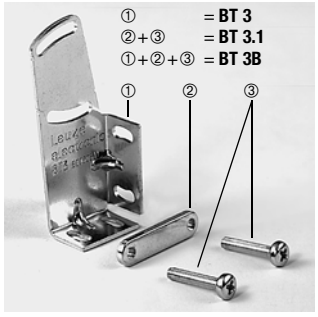
Order guide

The sensors listed here are preferred types; current information at *www.leuze.com*.

Sensors		Designation	Part no.
with 4-pin M8 connector			
	Pin 4 PNP, light switching, pin 2 not assigned (n. c.)	HT5.1/4X-M8	50129401
with cable, cable length 2m			
	Pin 4 PNP, dark switching, pin 2 not assigned (n. c.)	HT5.1/PX	50129402
	Pin 4 PNP, light switching, pin 2 not assigned (n. c.)	HT5.1/4X	50129400
	Pin 4 NPN, light switching, pin 2 not assigned (n. c.)	HT5.1/2X	50129399
Accessories mounting systems			
	Mounting bracket, galvanized steel	BT 3	50060511
	Mounting strap set, galvanized steel	BT 3.1 [1]	50105585
	Mounting bracket + mounting strap set, galvanized steel	BT 3B	50105546
	Mounting bracket, stainless steel V2A	BT 200M.5	50118542
	Mounting bracket, galvanized steel	BT 205M [1]	50124651
	Rod mount Ø 10mm, galvanized steel + aluminum	BTU 200M-D10	50117256
	Rod mount Ø 12mm, galvanized steel + aluminum	BTU 200M-D12	50117255
	Rod mount Ø 12mm, stainless steel V2A	BTU 200M.5-D12	50120426
	Rod mount Ø 14mm, galvanized steel + aluminum	BTU 200M-D14	50117254

1) Packaging unit: PU = 10 pcs.

Mounting systems

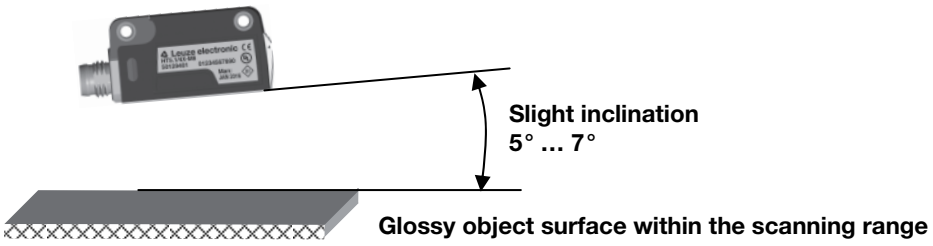






Application notes

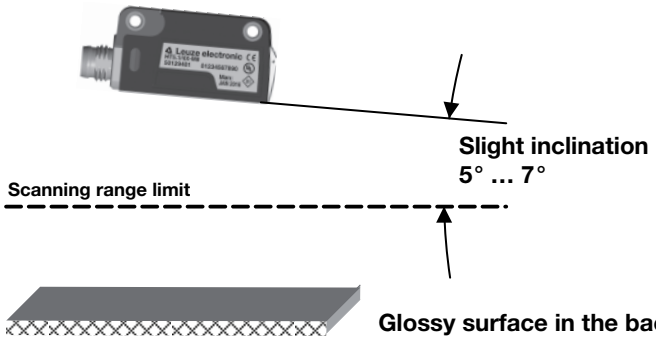
- **<u>Detection of glossy surfaces</u> within the scanning range**:
  When detecting glossy surfaces (e.g. metals), the light beam should not hit the object surface at a right angle. A slight inclination is enough to detect the object reliably. The following applies: the smaller the scanning range, the greater the angle of inclination (approx. 5° to 7°).



Glossy object surface within the scanning range

- **<u>Avoiding interference from glossy surfaces</u> in the background**:
  If a glossy surface is in the background (distance larger than scanning range limit), reflections may cause interfering signals. They may be avoided by mounting the device at a slight inclination (see figure below).

Attention!
It is imperative to note the task and the associated inclination of the sensor of approx. 5° … 7°.



Glossy surface in the background

- Objects should only be moved in laterally from the right or left. Moving in objects from the connector side or operating side is to be avoided.
- Outside of the scanning range, the sensor operates as an energetic diffuse reflection sensor. Light objects can still be reliably detected up to the scanning range limit.
- 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.