

**HRTL 96B**

**Laser light scanner with background suppression**

en 01-2011/10 50113486



**100 ... 30000 mm**



- The laser light scanner, based on the principle of light propagation time measurement, makes a large detection range and universal application possible
- Visible red light
- Optimized for use with reflective tape
- Differentiates reflective tape from other objects (e.g. collision protection, area monitoring, synchronization)
- Automatic reserve and hysteresis ensure reliable switching behavior
- Extremely simple operation, teachable switching points
- Adaptation to applications by means of configuration (window function, among others)
- Test input for checking the switching function and deactivating the laser
- Time lock prevents unintentional changing of the switching points

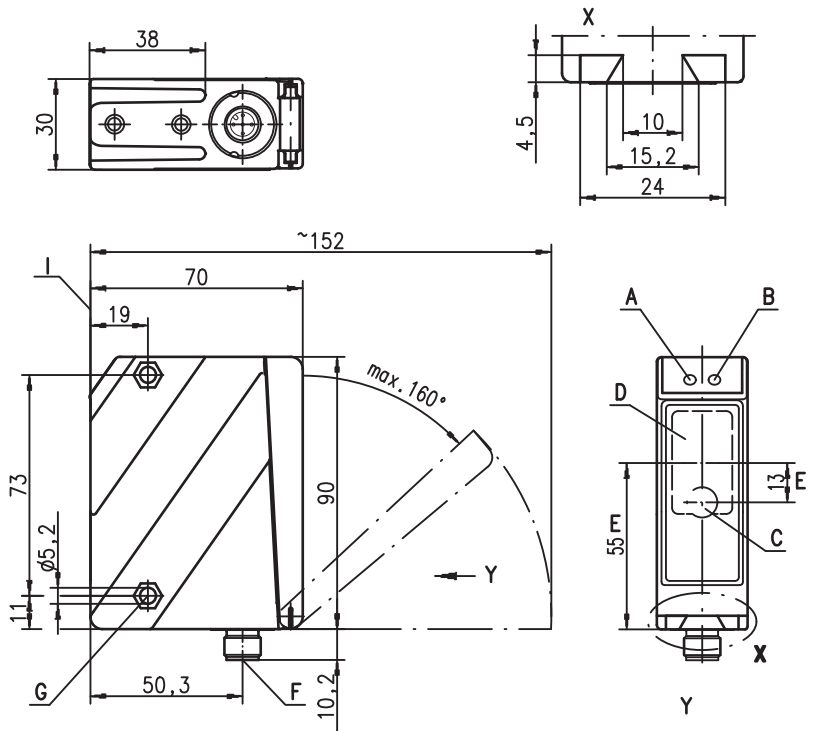


**Accessories:**

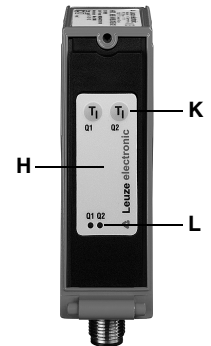
(available separately)

- Mounting systems (BT 96, BT 96.1, UMS 96, BT 450.1-96)
- M12 connectors (KD ...)
- Ready-made cables (K-D ...)
- Tape 4 100x100
- Ref 7-A-100x100

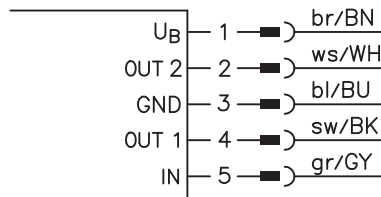
**Dimensioned drawing**



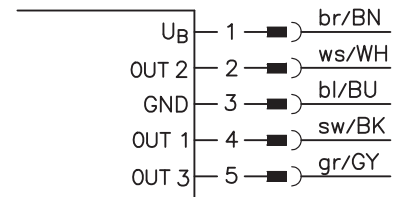
- A** Green indicator diode
- B** Yellow indicator diode
- C** Transmitter
- D** Receiver
- E** Optical axis
- F** Device plug M12x1
- G** Countersinking for SK nut M5, 4.2 deep
- H** Key pad
- I** Reference edge for the measurement (cover glass)
- K** OUT1 scanning range adjustment
- L** Indicator diodes yellow for OUT1 switching output



**Electrical connection**



Pin 5= Deactivation



Pin 5= Switching output  
Pin 5= Analog output  
Pin 5= NC

We reserve the right to make changes • DS\_HRTL96B\_en.fm

## Specifications

### Optical data

Typ. scanning range limit (tape 4) <sup>1)</sup>	100 ... 30000mm
Scanning range <sup>2)</sup>	150 ... 25000mm
Adjustment range / teach-in range	150 ... 25000mm
Light source	laser (red light), pulsed
Light spot diameter	1m: 6mm / 3m: 5mm / 5m: 4mm / 7m: 4mm
Wavelength	658 nm
Max. output power	< 248 mW
Pulse duration	6.5 ns
Standard	laser class 2 in accordance with DIN EN 60825-1:2007

### Timing

Switching frequency	100Hz
Response time	5ms
Delay before start-up	≤ 200ms

### Electrical data

Operating voltage $U_B$	18 ... 30VDC (incl. residual ripple)
Residual ripple	≤ 15% of $U_B$
Open-circuit current	≤ 120 mA
Switching output	.../6... 1 push-pull switching output <sup>3)</sup> PNP light switching, NPN dark switching
	.../66... 2 push-pull switching outputs
Signal voltage high/low	≥ ( $U_B - 2V$ ) / ≤ 2V
Output current	max. 100mA

### Indicators

<b>Sensor front</b>	
Green LED	ready
Yellow LED	reflection (Q1 = OUT1)
<b>Sensor back</b>	see table

### Mechanical data

Housing	<b>Metal housing</b> diecast zinc
Optics cover	glass
Weight	380g
Connection type	M12 connector, 5-pin

### Environmental data

Ambient temperature (operation <sup>4)</sup> /storage)	-40°C ... +50°C / -35°C ... +70°C
Protective circuit <sup>5)</sup>	1, 2, 3, 4
VDE safety class <sup>6)</sup>	II, all-insulated
Protection class	IP 67, IP 69K <sup>7)</sup>
Standards applied	IEC 60947-5-2

### Options

#### Deactivation input (active)

Transmitter not active/active	≥ 8V / ≤ 2V
Activation/disable delay	≥ 20ms
Input resistance	10KΩ ± 10%

- 1) Typ. scanning range limit: max. attainable range without performance reserve
- 2) Scanning range: recommended range with performance reserve
- 3) The push-pull switching outputs must not be connected in parallel
- 4) Down to -30°C: Without restriction. Below -30°C: Sensor for voltage supply remains in place, the sensor becomes fully functional again approx. 3min. following reactivation of the voltage supply, if necessary, repeat the activation procedure
- 5) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs, 4=interference blanking
- 6) Rating voltage 250VAC
- 7) IP 69K test in accordance with DIN 40050 part 9 simulated, high pressure cleaning conditions without the use of additives, acids and bases are not part of the test

#### ● 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.

## Tables

Switching points	no reflection	object detected
Yellow LED Q 1	off	on
Yellow LED Q 2	-	-

## Remarks

- Setting the switching points:  
Point the sensor towards the object.  
Q1: Hold teach button 1 down for approx. 2s, release when the LED starts flashing, teach in of switching point complete.  
The object has been detected when Q1 indicator lights up.
- Reserve: For the reliable detection of objects with low reflectance, a reserve is automatically added during the teach-in event. This is constant over the entire teach-in range.  
Object is detected:  
distance to sensor ≤ teach-in point + reserve
- Hysteresis: To ensure continuous object detection in the switching point, the sensor has a switch-off hysteresis.  
Object is no longer detected if:  
distance to sensor > teach-in point + reserve + hysteresis.
- Factory setting:  
reserve: approx. 50mm  
hysteresis: approx. 50mm
- Object detection:  
resolution < 5mm, standard deviation ±10mm at ±3 Sigma
- With the set scanning range, a tolerance of the upper scanning range limit is possible depending on the reflection properties of the material surface.
- Window function: Object is detected at distance switching point ± window width

## HRTL 96B

## Laser light scanner with background suppression

### Part number code

H	R	T	L	9	6	B	/	6	6	.	9	.	0	3	S	-	S	1	2
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#### Operating principle

**HRT** Diffuse reflection light scanners with background suppression

#### Operating principle

**L** Laser (red light)

#### Construction/version

**96B** 96B Series

#### Switching output/function (OUT 1: Pin 4, OUT 2: Pin 2)

**/6** 1 x push-pull transistor output, OUT 1: light switching

**/66** 2 x push-pull transistor output, OUT 1: light switching, OUT 2: light switching

#### Switching input

**.9** Deactivation input (Pin 5)

#### Equipment

**.03** Individual customer or sensor configuration

#### Light-spot geometry

**S** Small light spot

#### Electrical connection

**-S12** M12 connector, 5-pin (plug)

### Order guide

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

Order code	Part No.	Features
HRTL 96BM/66.04S-S12 <sup>1)</sup>	50115690	2 x push-pull switching output
HRTL 96BM/66.9.03S-S12 <sup>2)</sup>	50112862	2 x push-pull switching output, 1 x deactivation input

- 1) The sensor is optimized for detecting reflective tape - other objects / surfaces are suppressed. Especially suited, e.g., for:
- Collision protection: telpher line, crane systems, ...
  - Area monitoring: side-tracking skate
  - Synchronization: conveyor systems, crane systems

- 2) The sensor is optimized for a large range on reflective tape. Objects in the short range (<6m) are detected depending on their surface.

Scanning area: larger scanning ranges on request

