## HT10 — Laser light scanner with background suppression

en 01-2015/09 50130293

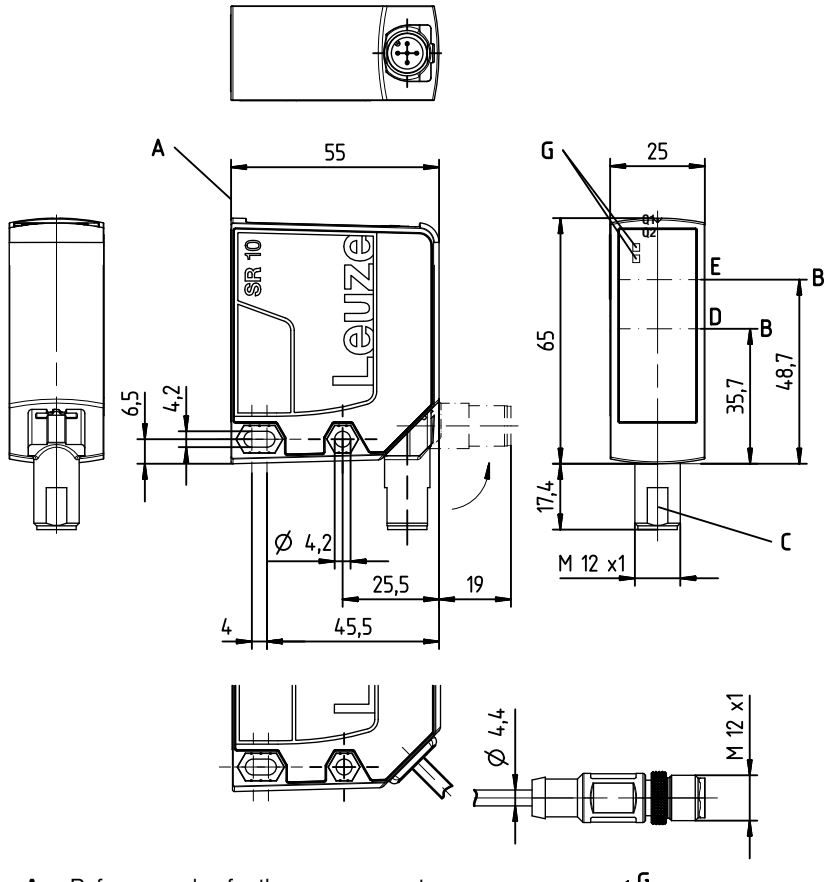
**50 … 25000 mm**

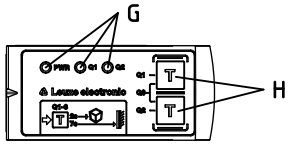
18 - 30 V DC

IO-Link

- The laser light scanner, based on the principle of light propagation time measurement, makes a large detection range and universal application possible
- Optimized for use with reflective tape
- Preset hysteresis and reserve ensure reliable switching behavior
- Extremely simple operation, teachable switching points
- Input for deactivation of the laser
- Minimum teach duration prevents unintentional changing of the switching points

## Dimensioned drawing

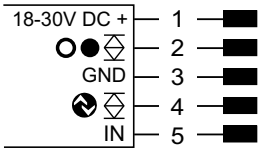


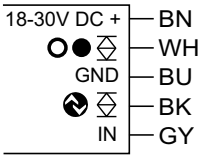

**A** Reference edge for the measurement
**B** Optical axis
**C** Turning M12 connector, 90°
**D** Receiver
**E** Transmitter
**G** Indicator diodes green/red (control panel)
2 x yellow (control panel and lens cover)
**H** Key pad

## Electrical connection

HT10L1-25M.3/L69-M12
HT10L1-25M.3/L69,200-M12




HT10L1-25M.3/L69




CDRH

IP 67

IEC 60947...

IEC 60947...

## Accessories:

**(available separately)**

- HighGain reflective tape REF 7-A-100x100 (part no. 50111527)
- Mounting systems
- Cable with M12 connector (K-D …)
- IO-Link master set SET MD12-US2-IL1.1 + accessories - diagnostics set (part no. 50121098)

# Specifications

## Optical data

| | | |
|---|---|---|
| Typ. scanning range limit [1) 2)] | | 50 … 25000mm (HighGain reflective tape) |
| Scanning range [3)] | | 50 … 25000mm (HighGain reflective tape) |
| Adjustment range (teach-in range) | | 50 … 25000mm (HighGain reflective tape) |
| Light source | | laser |
| Laser class | | 1 (acc. to IEC 60825-1:2007) |
| Wavelength | | 658nm (visible red light) |
| Impulse duration | | 6ns |
| Max. output power (peak) | | 391mW |
| Light spot | | approx. 25x25mm² at 25m |

## Error limits

| | | |
|---|---|---|
| Accuracy [4)] | | ± 50mm |
| Reproducibility [5)] | | 16mm |
| Temperature drift | | ± 2mm/K |

## Timing

| | | |
|---|---|---|
| Switching frequency | | 40Hz |
| Response time | | < 50ms |
| Delay before start-up | | ≤ 300ms |

## Electrical data

| | | |
|---|---|---|
| Operating voltage $U_B$ | | 18 … 30VDC (incl. residual ripple) |
| Residual ripple | | ≤ 15% of $U_B$ |
| Open-circuit current | | ≤ 150mA |
| Switching output | …/…6… | push-pull switching output [6)], PNP light switching, NPN dark switching |
| Signal voltage high/low | | ≥ ($U_B$-2 V)/≤ 2V |
| IO-Link | | COM2 (38.4kBaud), vers. 1.1, min. cycle time 2.3ms, SIO is supported |

## Indicators

| | | |
|---|---|---|
| Green/red LED | green continuous light | ready |
| | red | no signal |
| | orange | warning, weak signal |
| | off | no voltage |
| Yellow LEDs Q1/Q2 | on | object detected |
| | off | object not detected |

## Mechanical data

| | |
|---|---|
| Housing | plastic |
| Optics cover | glass |
| Weight | 70g (M 12 connector)<br>133g (2m cable)<br>90g (cable with M 12 connector) |
| Connection type | turning M 12 connector, 90°<br>2m cable, core cross section 5 x 0.14mm² (5 x 26 AWG)<br>0.2m cable with M12 connector |

## Environmental data

| | |
|---|---|
| Ambient temp. (operation/storage) | -40°C … +50°C/-40°C … +70°C |
| Protective circuit [7)] | 1, 2, 3 |
| VDE safety class | III |
| Degree of protection | IP 67 |
| Standards applied | IEC 60947-5-2 |

## Options

**Deactivation input**

| | |
|---|---|
| Transmitter inactive/active | ≥ 8V/≤ 2V[8)] |
| Activation/disable delay | ≥ 20ms |
| Input resistance | approx. 10kΩ |

1) Typ. scanning range limit: guaranteed scanning range against 90% at maximum setting
2) Sensor is optimized for reflective tape
3) Scanning range: recommended range with function reserve
4) Measurement on HighGain tape REF 7-A-100x100 (part no. 50111527), identical environmental conditions, "Speed" operating mode, after 20min warmup time.
5) Same object, identical environmental conditions, "Speed" operating mode, measuring value noise 1 sigma, after 20 min. warmup time, measurement object ≥ 50x50mm²
6) The push-pull switching outputs must not be connected in parallel
7) 1=transient protection, 2=polarity reversal protection, 3=short circuit protection for all outputs
8) Upon deactivation of the laser, the outputs become inactive

# Tables

| Switching points[1)] | no reflection | object detected |
|---|---|---|
| Yellow LED Q 1 | off | on |
| Yellow LED Q 2 | off | on |

1) applies for object teach

# Remarks

**Adjusting the switching points**

- **Object teach:**
  Align sensor with object.
  Q1: Press teach button 1 for approx. 2s,
  Q2: Press teach button 2 for approx. 2s.
  Switching point is taught.
  Object is detected if the respective Q1/Q2 indicator illuminates.
- **Teach against background:**
  Point sensor at background.
  Q1: Press teach button 1 for approx. 7s,
  Q2: Press teach button 2 for approx. 7s.
  Switching point is taught.
  Reflective tape between sensor and background is detected. After teaching, indicators Q1/Q2 are off. If object/reflective tape is detected, the corresponding indicator illuminates.
- **Hysteresis:**
  To ensure continuous object detection in the switching point, the sensor has a switch hysteresis.
  Object is no longer detected if: distance to sensor > teach point + hysteresis + reserve.
- **Factory setting:**
  Hysteresis: approx. 150mm,
  Reserve: approx. 150mm.
  Both values can be changed on request.

**Operate in accordance with 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 the intended use.

## Laser safety notices

**ATTENTION, LASER RADIATION – LASER CLASS 1**

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product in **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24th, 2007.

- Adhere to the applicable legal and local regulations regarding protection from laser beams.
- The device must not be tampered with and must not be changed in any way.
  There are no user-serviceable parts inside the device.
  Repairs must only be performed by Leuze electronic GmbH + Co. KG.

## IO-Link process data format

(IO-Link 1.1, M-sequence TYPE_2_1)

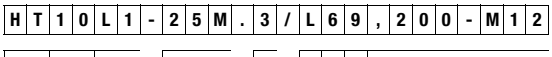
**Output data device (8 bit)**

| Data bit | | | | | | | | Assignment | Meaning |
|---|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | |
| | | | | | | | | Switching output Q1 | 0 = inactive, 1 = active |
| | | | | | | | | Switching output Q2 | 0 = inactive, 1 = active |
| | | | | | | | | Switching output Q3 | 0 = inactive, 1 = active (if Q3 not present = 0) |
| | | | | | | | | Measurement | 0 = initialization/teach/deactivation, 1 = running measurement |
| | | | | | | | | Signal | 0 = no signal or signal too weak, 1 = signal ok |
| | | | | | | | | Warning | 0 = no warning, 1 = warning, e.g., weak signal |
| | | | | | | | | 0 | not assigned (initial state = 0) |
| | | | | | | | | 0 | not assigned (initial state = 0) |

**Input data device**

None

## Part number code




**Operating principle**

| | |
|---|---|
| **HT** | Laser light scanner with background suppression |

**Series**

| | |
|---|---|
| **10** | Series 10 |

**Laser class**

| | |
|---|---|
| **L1** | Laser class 1 (acc. to IEC 60825-1:2007) |

**Measurement range**

| | |
|---|---|
| **25M** | Extended detection range 50 … 25000 mm, measurement on HighGain tape REF 7-A-100x100 |

**Equipment**

| | |
|---|---|
| **3** | Membrane keyboard for teach-in |

**Assignment pin 4**

| | |
|---|---|
| **L** | IO-Link (with dual channel, also push/pull switching output) |

**Assignment pin 2**

| | |
|---|---|
| **6** | Push/pull switching output |

**Assignment pin 5**

| | |
|---|---|
| **9** | Deactivation input (factory setting) or teach input (> 8 VDC, configurable) |
| **6** | Push/pull switching output |
| **X** | Do not connect |

**Electrical connection**

| | |
|---|---|
| **-M12** | M12 connector, 5-pin |
| **N/A** | Cable, length 2000 mm with wire-end sleeves, 5-wire |
| **,200-M12** | Cable, length 200 mm with M12 connector, 5-pin |

## Order guide

| | Designation | Part no. |
|---|---|---|
| **Connection: M12 connector, 5-pin** | | |
| IO-Link 1.1/switching output, 1 push/pull switching output, deactivation input | HT10L1-25M.3/L69-M12 | 50129541 |
| **Connection: cable, length 2000 mm with wire-end sleeves, 5-wire** | | |
| IO-Link 1.1/switching output, 1 push/pull switching output, deactivation input | HT10L1-25M.3/L69 | 50129547 |
| **Connection: cable, length 200 mm with M12 connector, 5-pin** | | |
| IO-Link 1.1/switching output, 1 push/pull switching output, deactivation input | HT10L1-25M.3/L69,200-M12 | 50129552 |
| **Accessories** | | |
| HighGain reflective tape, 100 mm x 100 mm, self-adhesive | REF 7-A-100x100 | 50111527 |
| Mounting system for mounting on rods Ø 10 mm | BTU 460M-D10 | 50128379 |
| Mounting system for mounting on rods Ø 12 mm | BTU 460M-D12 | 50128380 |
| Connection cable with M12 connector, angled, 5-pin, length 2 m, PVC sheathing (many other connection cables are available) | K-D M12W-5P-2m-PVC | 50104556 |
| IO-Link master set | SET MD12-US2-IL1.1 + accessories - diagnostics set | 50121098 |