Your Global Automation Partner

TURCK

DR...-...

Radar Distance Sensors

Instructions for Use

Contents

1 About These Instructions

These instructions for use describe the structure, functions and the use of the product and will help you to operate the product as intended. Read these instructions carefully before using the product. This is to avoid possible damage to persons, property or the device. Retain the instructions for future use during the service life of the product. If the product is passed on, pass on these instructions as well.

1.1 Target groups

These instructions are aimed at qualified personal and must be carefully read by anyone mounting, commissioning, operating, maintaining, dismantling or disposing of the device.

1.2 Explanation of symbols used

The following symbols are used in these instructions:

	**DANGER** DANGER indicates a dangerous situation with high risk of death or severe injury if not avoided.
	**WARNING** WARNING indicates a dangerous situation with medium risk of death or severe injury if not avoided.
	**CAUTION** CAUTION indicates a dangerous situation of medium risk which may result in minor or moderate injury if not avoided.
	**NOTICE** NOTICE indicates a situation which may lead to property damage if not avoided.
	**NOTE** NOTE indicates tips, recommendations and useful information on specific actions and facts. The notes simplify your work and help you to avoid additional work.
▶	**CALL TO ACTION** This symbol denotes actions that the user must carry out.
⇨	**RESULTS OF ACTION** This symbol denotes relevant results of actions.

1.3 Other documents

Besides this document the following material can be found on the Internet at **www.turck.com**:

- Data sheet
- Commissioning manual IO-Link devices
- IO-Link parameters manual
- EU Declaration of Conformity (current version)
- Approvals

1.4 Feedback about these instructions

We make every effort to ensure that these instructions are as informative and as clear as possible. If you have any suggestions for improving the design or if some information is missing in the document, please send your suggestions to **techdoc@turck.com**.

2 Notes on the Product

2.1 Product identification

These instructions apply to the following radar distance sensors:

DR 15 S – M30 E – IOL 8 X2 – H1 1 4 1

DR 15 S **Series** – M30 E **Design** – IOL 8 X2 **Electrical version** –

Aperture angle, radar wave
S 7°

Sensing range
… Max. range in m

Functional principle
DR Radar, Distance

Housing length
E Long

Housing
M… Threaded barrel, stainless steel
Ø in [mm]

Indication
X2 Multicolor LED

Voltage range
8 17…33 VDC

Output function
2UPN Switching outputs
IOL IO-Link

H1 1 4 1 **Electrical connection: Connector**

Assignment
1 Standard assignment

Number of contacts
4 4 contacts

Connector type
1 Straight

Connector type
H1 M12 × 1 connector

2.2 Scope of delivery

- Radar distance sensor
- Two M30 threaded nuts for mounting
- Quick Start Guide

2.3 Turck service

Turck supports you with your projects, from initial analysis to the commissioning of your application. The Turck product database under www.turck.com contains software tools for programming, configuration or commissioning, data sheets and CAD files in numerous export formats.

The contact details of Turck subsidiaries worldwide can be found on p. [▷ 31].

3 For Your Safety

The product is designed according to state-of-the-art technology. However, residual risks still exist. Observe the following warnings and safety notices to prevent damage to persons and property. Turck accepts no liability for damage caused by failure to observe these warning and safety notices.

3.1 Intended use

The radar distance sensors of the DR… series detect without contact the presence of solid or liquid objects and measure the distance to those objects. If multiple objects are in the detection range, the object closest to the sensor is detected. Detection range and object detection can be adjusted via filter settings and sensor configurations.

The devices may only be used as described in these instructions. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

3.2 Obvious misuse

- The devices are not safety components and must not be used for personal or property protection.

3.3 General safety instructions

- The device may only be assembled, installed, operated, parameterized and maintained by professionally-trained personnel.
- The device may only be used in accordance with applicable national and international regulations, standards and laws.
- The maximum transmission output of the sensor is within the approved limit values specified in ETSI EN 305550-2 .
- Only operate the device within the limits stated in the technical specifications.

4 Product Description

The radar distance sensors of the DR… series are contained in a metal housing. The devices are provided with a metal M12 plug connector for connecting the sensor cable. The device functions can be set via a teach function or via IO-Link.

Devices with the following output functions are available:

- DR…-IOL8X2…: 1 switching output (PNP/NPN/Auto) as well as 1 switching output (PNP/NPN/Auto) or 1 analog output (I/U/Auto)
- DR…-2UPN8…: 2 switching outputs (PNP/NPN/Auto)

4.1 Device overview

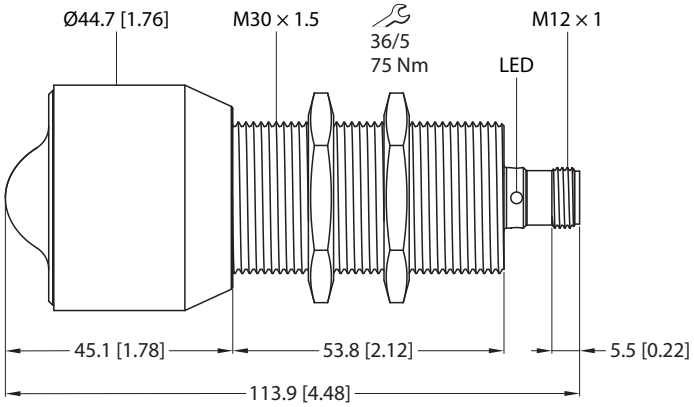


Fig. 1: Dimensions

4.1.1 Indication elements

The radar distance sensors are provided with a green and a yellow LED that are visible via four indicator points. Only one LED can be active. If an LED is active, all four indicator points are lit.

4.2 Properties and features

- Range: 15 m
- Blind zone: 35 cm
- Resolution: 1 mm
- Opening angle of the radar cone: ±7.5°
- Approved in accordance with ETSI 305550-2
- Male connector, M12 × 1, 4-pin
- Operating voltage 18…33 VDC
- Switchable PNP/NPN switching output
- Switchable 4…20 mA/0…10 V analog output
- Automatic current and voltage detection
- IO-Link
- Cylindrical design M30

4.3 Operating principle

The FMCW radar (frequency modulated continuous wave) measures the distance to stationary objects.

The sensor outputs a radar signal that changes in frequency. A periodic, linear frequency which varies upwards and downwards is used to limit the frequency range and to simplify the signal evaluation. The rate of change df/dt of frequency remains constant. Objects in the detection range reflect the transmitted signal. The change in the signal delay and frequency of the reflected signal are used to determine the distance to the object.

The frequency modulated continuous wave radar therefore has a clear advantage over the unmodulated continuous wave radar, which cannot detect distances.

4.4 Functions and operating modes

The device measures the distance between the detected object and the end of the sensor housing. A single switch point or window function can be set for the switching outputs. The measuring range of the analog output can be defined as required within the measuring range limits. The device provides analog or switching signals at the outputs depending on type. The measured value is also sent via the IO-Link process data to the higher control level. The distance value can be transferred in m via the process data. The device parameters can be set via IO-Link and via the teach-in function.

4.4.1 Setting options

The devices feature the following three setting options:

- Setting via IO-Link
- Setting via teach-in function
- Setting via FDT/DTM

4.4.2 Output functions – switching output

The following sensor functions are available for the switching outputs:

- Single point mode
- Window mode
- Two point mode

Digital output – single point mode

In **Single point** mode one switch point can be set for the digital output either via IO-Link (indices 0x3C and 0x3E) or with an available target. The hysteresis can be set.

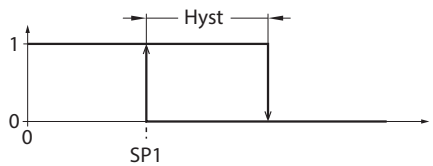


Fig. 2: Single point mode

Digital output– window mode

In **Window** mode the start and end point of the switching window can be set for the digital output either via IO-Link (indices 0x3C and 0x3E) or with an available target. The switch window must be within the detection range. The hysteresis can be set.

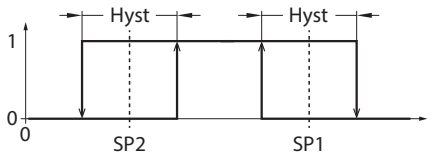


Fig. 3: Window mode

Digital output– two point mode

In **Two point** mode one switch-on point and switch-off point can be set for the digital output either via IO-Link (indices 0x3C and 0x3E) or with an available target. The mode can also be used for a freely adjustable hysteresis.

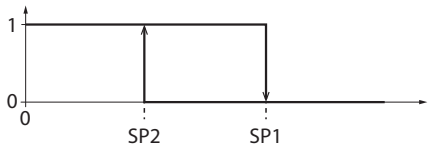


Fig. 4: Two point mode

4.4.3 Output functions – analog output

The analog output of the DR…IOL8X2 sensors can be set as either a current or voltage output. The measuring range is freely definable.

The minimum distance between the start and end point is 500 mm.

Current output

In the defined measuring range, the device supplies an analog current signal between ASP (analog start point) and AEP (analog end point). The following output configurations can be set:

- 4…20 mA (factory setting)
- 0…20 mA
- 20…4 mA
- 20…0 mA

Voltage output

In the defined measuring range, the device supplies an analog voltage signal between ASP (analog start point) and AEP (analog end point). The following output configurations can be set:

- 0…10 V (factory setting)
- 0…5 V
- 1…6 V
- 0.5…4.5 V
- 10…0 V
- 5…0 V
- 6…1 V

Output behavior of the analog outputs

The following figures illustrate the behavior of the analog outputs:

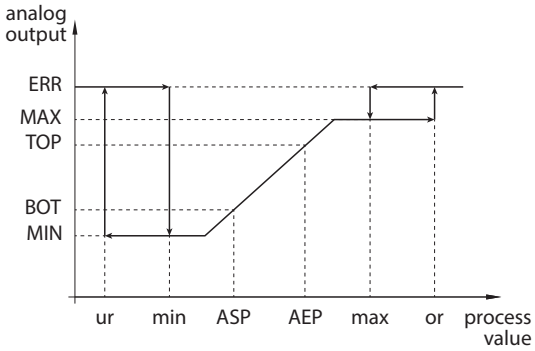


Fig. 5: Rising output characteristic

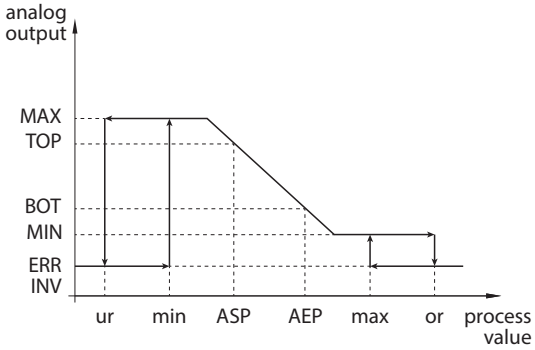


Fig. 6: Falling output characteristic, MIN ≠ 0

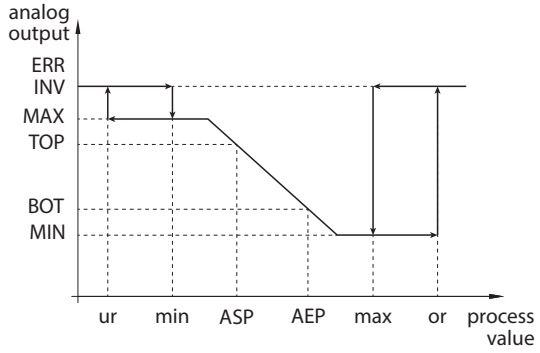


Fig. 7: Falling output characteristic, MIN = 0

Output configuration		BOT	TOP	ERR INV	MIN	MAX	ERR
4…20 mA	20…4 mA	4 mA	20 mA	3.5 mA	3.8 mA	20.5 mA	21.1 mA
0…20 mA	20…0 mA	0 mA	20 mA	21.1 mA	0 mA	20.5 mA	21.1 mA
0…10 V	10…0 V	0 V	10 V	11 V	0 V	10.5 V	11 V
0…5 V	5…0 V	0 V	5 V	6 V	0 V	5.5 V	6 V
1…6 V	6…1 V	1 V	6 V	0 V	0.5 V	6.5 V	7 V
0.5…4.5 V	4.5…0.5 V	0.5 V	4.5 V	5.5 V	0 V	5 V	5.5 V

4.4.4 IO-Link mode

The devices must be connected to an IO-Link master for operation in IO-Link mode. If the port is configured in IOL mode, bidirectional IO-Link communication is provided between the IO-Link master and the device. For this the device is integrated in the controller level via an IO-Link master. The communication parameters are exchanged first of all; the cyclic data exchange of the process data (process data objects) then starts.

4.4.5 SIO mode (standard I/O mode)

In standard I/O mode no IO-Link communication takes place between the device and the master. The device only transfers the switching state of its binary outputs and can also be run via a fieldbus device or controller with digital PNP or NPN inputs. An IO-Link master is not required for operation.

The device parameters can be set via IO-Link and then operated at the digital inputs with the appropriate settings in SIO mode. Not all functions and properties of the device can be used in SIO mode.

4.4.6 Auto sensing function

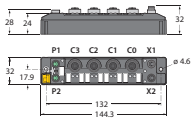
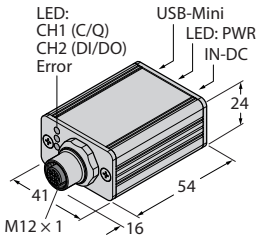
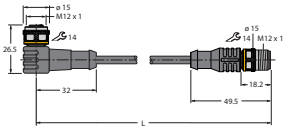
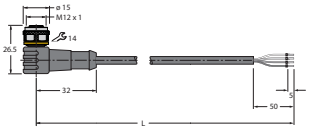
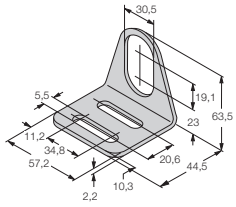
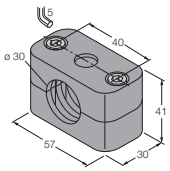
When connected to an I/O module, the auto sensing function enables the device to support the set switching output behavior (PNP/NPN) or analog output characteristics. The auto sensing functions are activated by default.

4.4.7 Signal gain

A signal gain can be set in order to detect a poorly reflecting target. The signal gain can be set to the following levels.

- Low gain
- Standard gain
- High gain

4.5 Technical accessories

Figure	Type	Description
	TBEN-S2-4IOL	Compact multiprotocol I/O module for Ethernet, 4 IO-Link master channels, 4 universal digital PNP channels, 0.5 A, channel diagnostics
	USB-2-IOL-0002	IO-Link adapter V1.1 with integrated USB interface
	WKC4.4T-2-RSC4.4T/TXL	Connection cable, M12 female connector, angled to M12 connector, straight, 4-pin, cable length: 2 m, sheathing material: PUR, black; cuLus approval
	WKC4.4T-2/TXL	Connection cable, M12 female connector, angled, 4-pin, cable length: 2 m, sheathing material: PUR, black; cuLus approval
	MW-30	Mounting bracket, stainless steel, for M30
	BSS-30	Mounting clamp for smooth and threaded barrel devices; material: polypropylene

In addition to the above connection cables, Turck also offers other cable types for specific applications with the correct terminals for the device. More information on this is available from the Turck product database at www.turck.de/products in the Connectivity area.

5 Installing

The lens curvature does not have to be taken into account for the installation. The sensor detects the object nearest to the sensor and outputs the distance. Object reflections can be filtered out using the sensor parameters.

The sensors can be installed in any alignment according to application requirements. The radar wave is propagated perpendicular to the surface of the radar lens. Refer to the following table for the opening angle:

Type	Opening angle
DR…S-…	± 7.5°

The maximum tightening torque for fastening the sensor is 75 Nm.

- Install the sensor at the intended mounting location. Observe blind zone s_{min}, in which no object detection is possible (see technical data, [▶ 29]).
- Install the sensor in such a way that no foreign objects are located in the detection range.

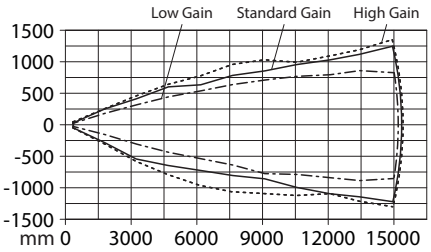


Fig. 8: DR…S-… range diagram

- Align the sensor at right angles to the desired target. If the radar wave hits the target at right angles, it will be reflected with the maximum possible signal strength.

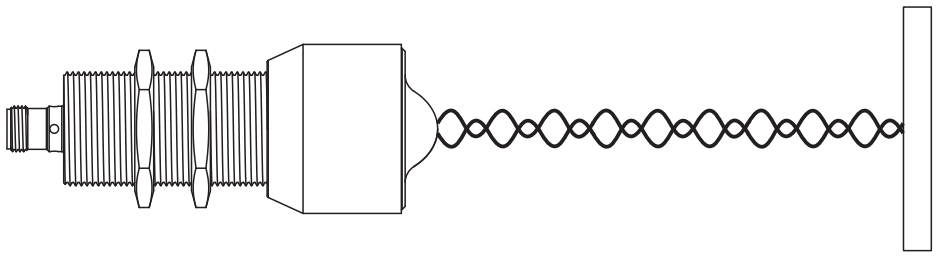


Fig. 9: Planar target – path of radar waves (schematic)

- The inclination angle of planar targets must be smaller than the opening angle of the sensor. If the target is inclined too much, the reflected radar signal will no longer be detected by the sensor.

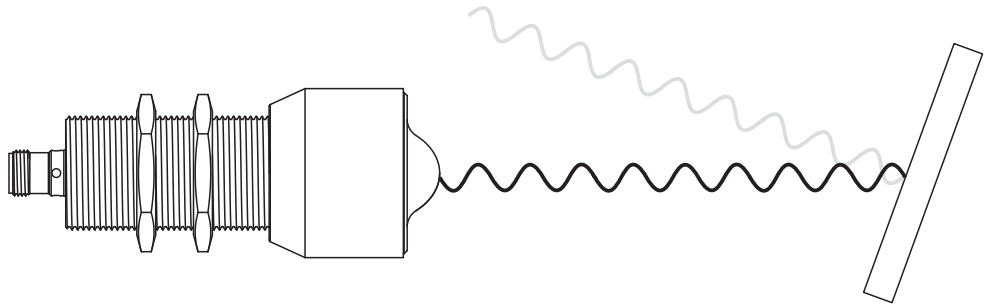


Fig. 10: Inclined planar target – path of radar waves (schematic)

- Align the sensor centrally on targets with a bent surface (e.g. cylindrical targets). As the main component of the radar signal is scattered in different directions after hitting the target, the strength of the detected signal is smaller than with planar targets.

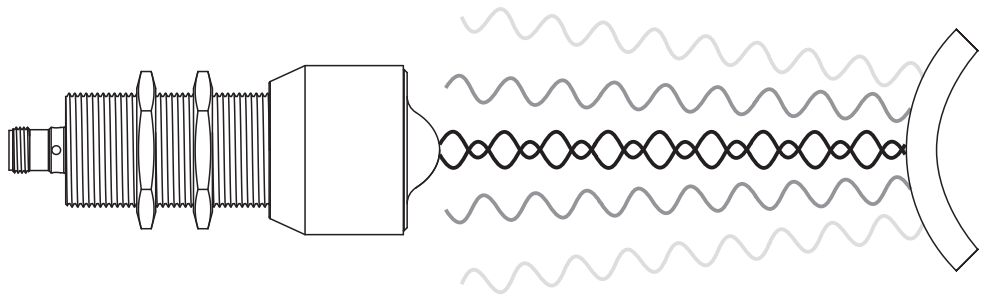


Fig. 11: Target with bent surface – path of radar waves (schematic)

6 Connection

NOTE
The device must be provided with an SELV/PELV power supply compliant with a limited energy circuit in accordance with UL61010-1 3rd Edition (IEC/EN 61010-1).

- ▶ Connect the female connector of the connection cable to the male connector of the sensor.
- ▶ Connect the open end of the connection cable to the power supply and/or processing units.

6.1 Wiring diagrams

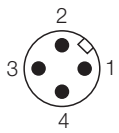


Fig. 12: DR…IOL8X2 pin layout

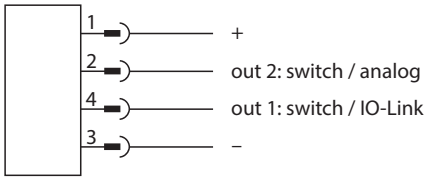


Fig. 13: DR…IOL8X2 wiring diagram

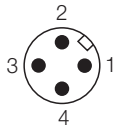


Fig. 14: DR…2UPN… pin layout

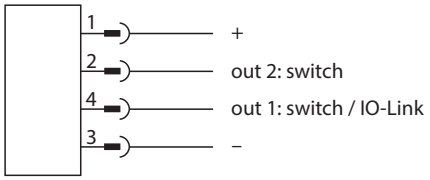


Fig. 15: DR…2UPN… wiring diagram

7 Commissioning

After connecting and switching on the power supply, the device is automatically ready for operation.

The analog and switching outputs have a 300 ms readiness delay.

7.1 Activating IO-Link mode

NOTE
The voltage range in IO-Link mode is 18…30 VDC.

- ▶ Set a cycle time of min. 2.3 ms on the IO-Link master.
- ⇨ The device is operational. After a readiness delay of 450 ms, the process data can be sent to the IO-Link master.

7.2 Activating SIO mode

- ▶ Connect the device to a standard I/O port or an analog port.
- ⇨ The device is operational after a readiness delay of 500 ms.

The readiness delay in SIO mode is required to operate preactivated sensors so that the sensor can exclude being connected to an IO-Link master. The readiness delay does not have an effect on any potential IO-Link communication.

8 Operation

8.1 LEDs

LED	Meaning
Yellow	NO contact: object within the teach-in range, switching output 1 on NC contact: no object in teach-in range, switching output 1 on
Green	NO contact: object within the detection range, switching output 1 off NC contact: object within the teach-in range, switching output 1 off
Off (only NO contact)	No object within the detection range, switching output 1 off
Green flashing	IO-Link mode active

9 Setting and Parameterization

Teach in the devices as follows:

- Manual bridging (shorting): Short circuit pin 1 with pin 4.

Once the teach-in process has been successfully completed, the devices automatically switch to normal operation.

The LED is lit green for 2 s if the teach-in operation is successful. If a teach-in operation was not successful, the LED flashes yellow for 2 s at a frequency of 5 Hz.

9.1 Setting by manual bridging (shorting)

9.1.1 Selecting the output

- ▶ Switching output 1: Short circuit Pin 1 and Pin 4 for 2…8 s.
- ▶ Output 2: Short circuit Pin 1 and Pin 4 for 8…14 s.
- ⇨ The output was successfully selected if the LED flashes green for 2 s.

9.1.2 Setting a single switch point

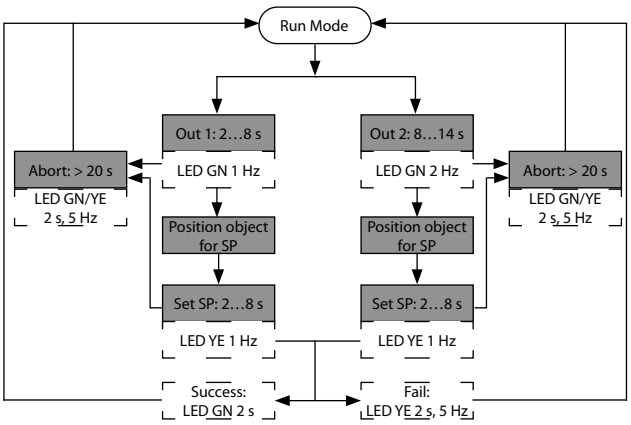


Fig. 16: Flow chart

If a single switch point is set, the device behaves as in Window mode. Besides the set switch point, a virtual switch point is present at the beginning of the detection range.

- ▶ Select the output.
- ▶ Position the object for the switch point in the detection range.
- ▶ Press Pin 1 and Pin 4 to U_B within 30 s for 2…8 s.
- ⇨ The switching point was successfully set if the LED flashes green for 2 s.

9.1.3 Setting the switching window

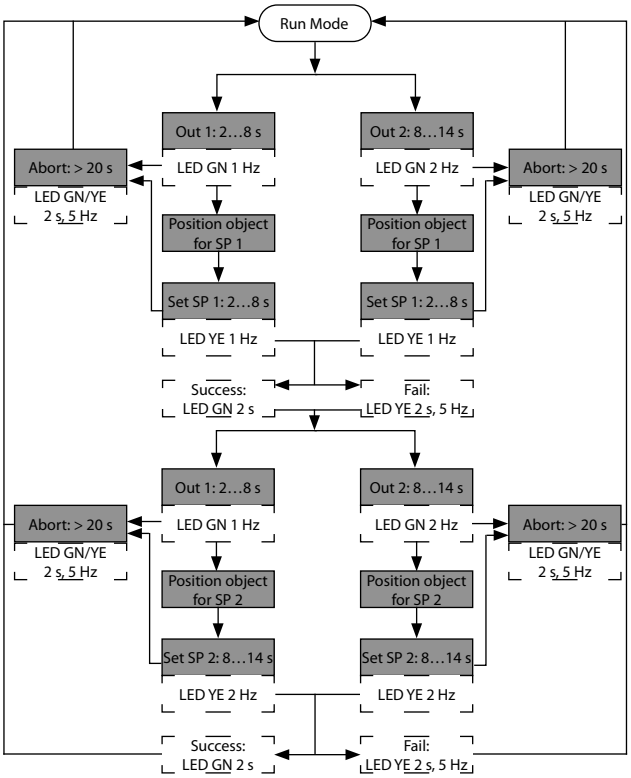


Fig. 17: Flow chart

The device is in Window mode if a switch window was selected. SP1 and SP2 are defined by the user. The sensor operates as a retroreflective sensor around SP1 if the hystereses of SP1 and SP2 overlap.

- ▶ Select the output.
- ▶ Position the object for switch point 1 in the detection range.
- ▶ Short circuit Pin 1 and Pin 4 within 30 s for 2…8 s.
- ⇨ Switching point 1 was successfully set if the LED flashes green for 2 s.
- ▶ Reselect the output.
- ▶ Position the object for switch point 2 in the detection range.
- ▶ Short circuit Pin 1 and Pin 4 within 30 s for 8…14 s.
- ⇨ Switch 2 point was successfully set if the LED flashes green for 2 s.

9.1.4 Setting the output function

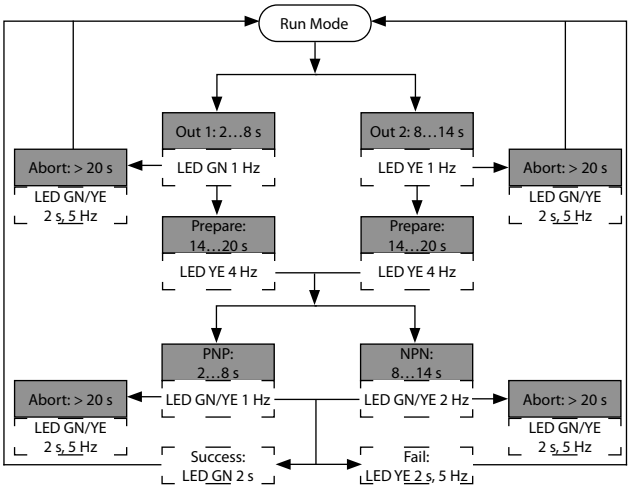


Fig. 18: Flow chart

- ▶ Select the output.
- ▶ Short circuit Pin 1 and Pin 4 within 30 s for 14…20 s.
- ▶ PNP output: Short circuit Pin 1 and Pin 4 for 2…8 s.
- ▶ NPN output: Short circuit Pin 1 and Pin 4 for 8…14 s.
- ⇨ The output function was successfully set if the LED flashes green for 2 s.

9.1.5 Resetting to factory settings

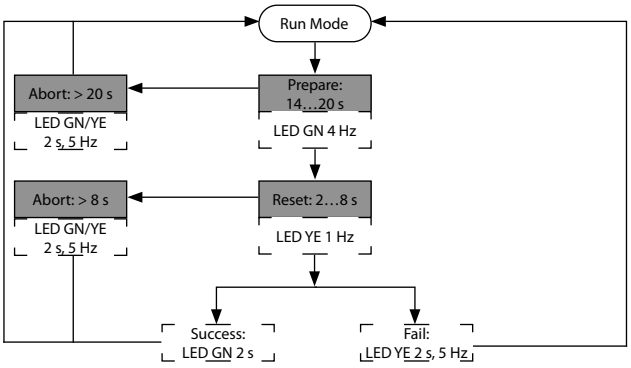


Fig. 19: Flow chart

- ▶ Start reset: Short circuit Pin 1 and Pin 4 for 14…20 s.
- ▶ Press Reset: Short circuit Pin 1 and Pin 4 within 30 s for 2…8 s.
- ⇨ The device was successfully reset if the LED flashes green for 2 s.

9.2 Setting via IO-Link

The device can be parameterized within the technical specifications (see data sheet) via the IO-Link communication interface – both offline, e.g. with the configuration tool as well as also online via the controller. An overview of the different functions and properties that can be set and used for IO-Link or SIO mode can be found in the chapter “Setting” and in the IO-Link parameter manual of the device. Detailed instructions on the parameterization of devices via the IO-Link interface are provided in the IO-Link commissioning manual.

All the parameters can be changed in IO-Link mode via the controller during commissioning as well as during operation. In SIO mode the device operates according to the last setting made in IO-Link mode.

9.3 Setting and visualizing with the Turck Radar Monitor

The device can be parameterized and tested via a Turck IO-Link master (e.g. TBEN-S2-4IOL). The integrated web server of the IO-Link master offers access to all the parameters of the sensor IODD. An overview of the IO-Link parameters as well as descriptions are provided in the IO-Link parameter manual. The Turck Radar Monitor is also available for visualizing process data.

Access to the sensor parameters and the Turck Radar Monitor requires the connection of a Turck IO-Link master. The following table shows the firmware status of the IO-Link masters required for using the Turck Radar Monitor:

IO-Link master	Firmware status
FEN20-4IOL	V1.2.0.0
TBEN-L4/5-8IOL	V3.3.2.0
TBEN-LL-8IOL	V1.1.1.0
TBEN-S2-4IOL	V3.4.1.0

Refer to the instructions for use of the relevant device for information on the Turck IO-Link masters.

- ▶ Connect the IO-Link master to the power supply.
- ▶ Connect the IO-Link master to a PC via the Ethernet interface.
- ▶ Connect the radar sensor to an IO-Link port of the IO-Link master.

9.3.1 Reading in IODD in the web server

- ▶ Set the input port of the IO-Link master as an IO-Link port.
- ▶ Open the **IODD Configurator** tab in the web server.

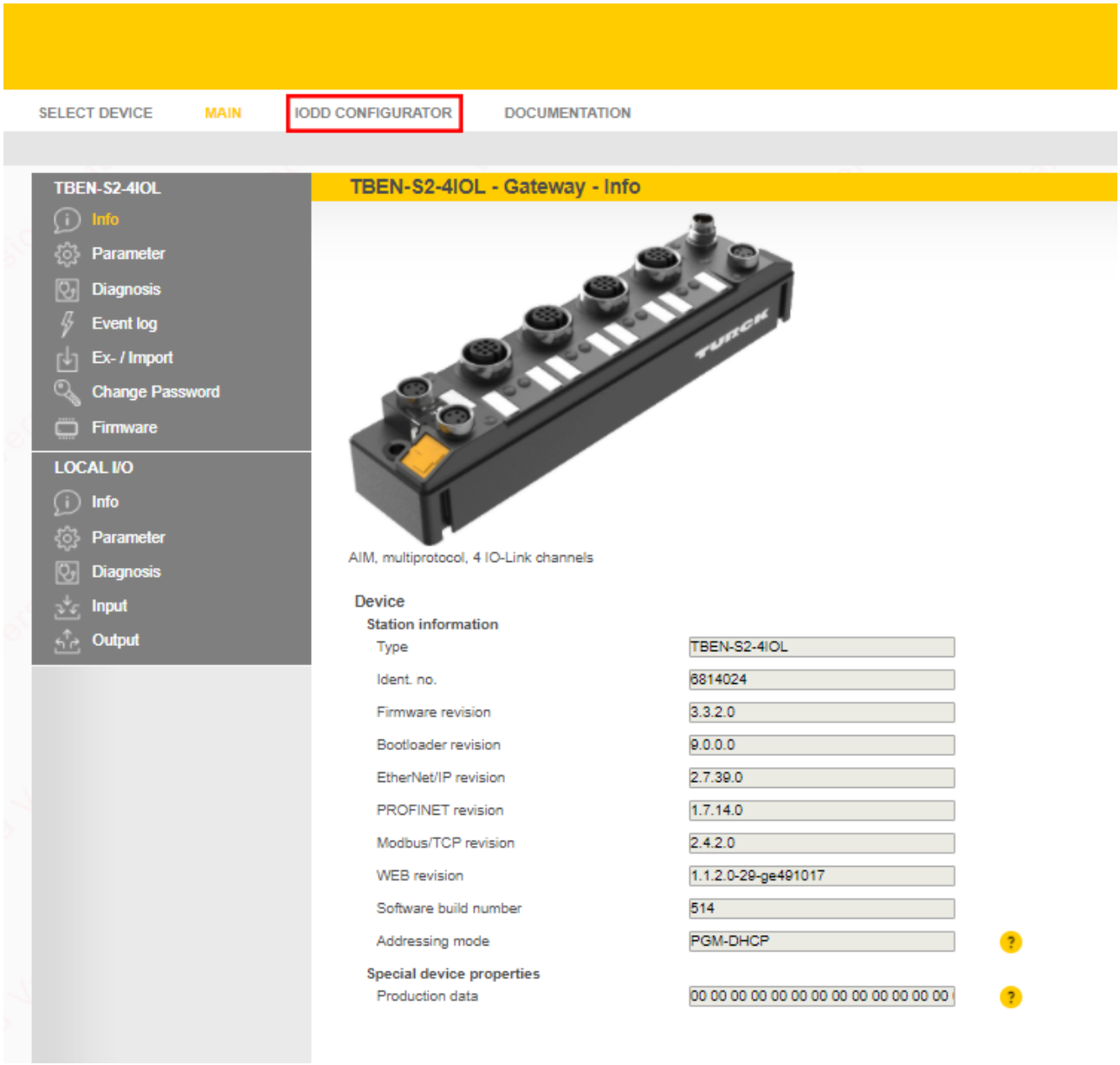


Fig. 20: Web server – IODD Configurator

▶ Load the specific device IODD in the web server via **Load IODD**.

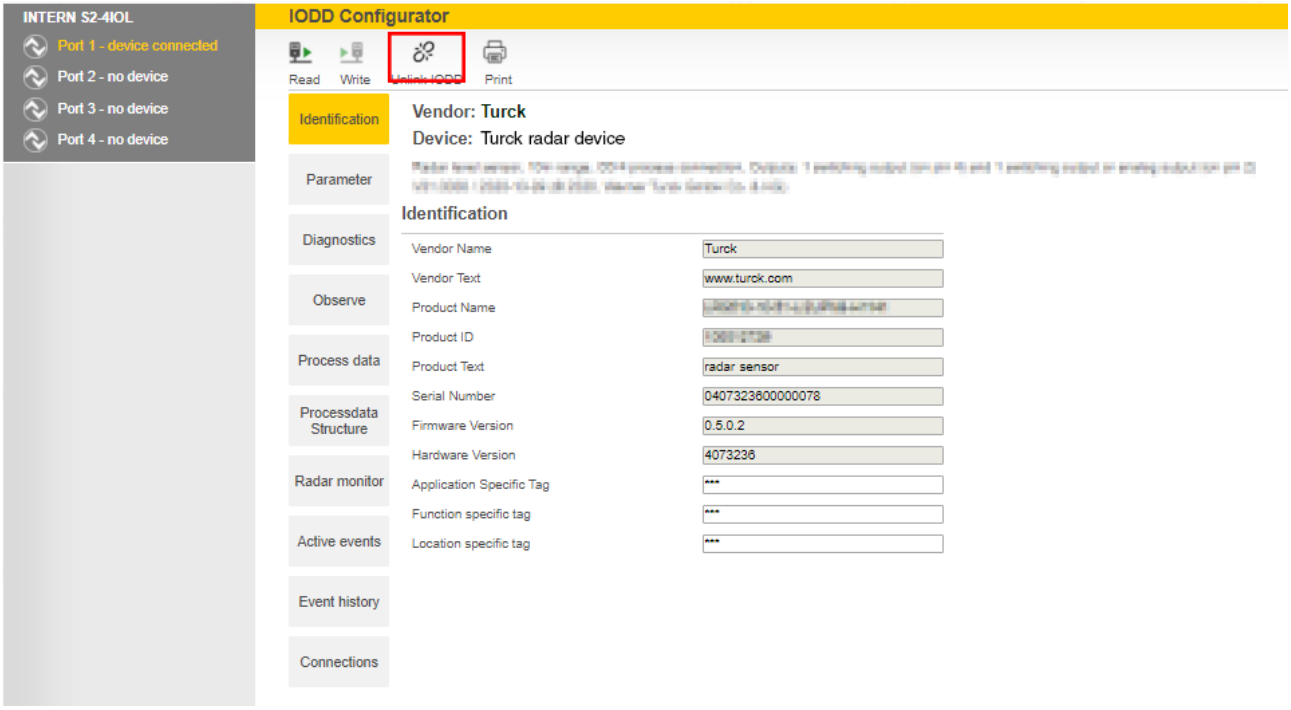


Fig. 21: Loading IODD

9.3.2 Turck Radar Monitor – overview

The Turck Radar Monitor makes it possible to visualize the process data and filter signals. The display consists of:

- FFT diagram and envelope curve
- Object detection

▶ To launch the Turck Radar Monitor, choose **Radar monitor**.

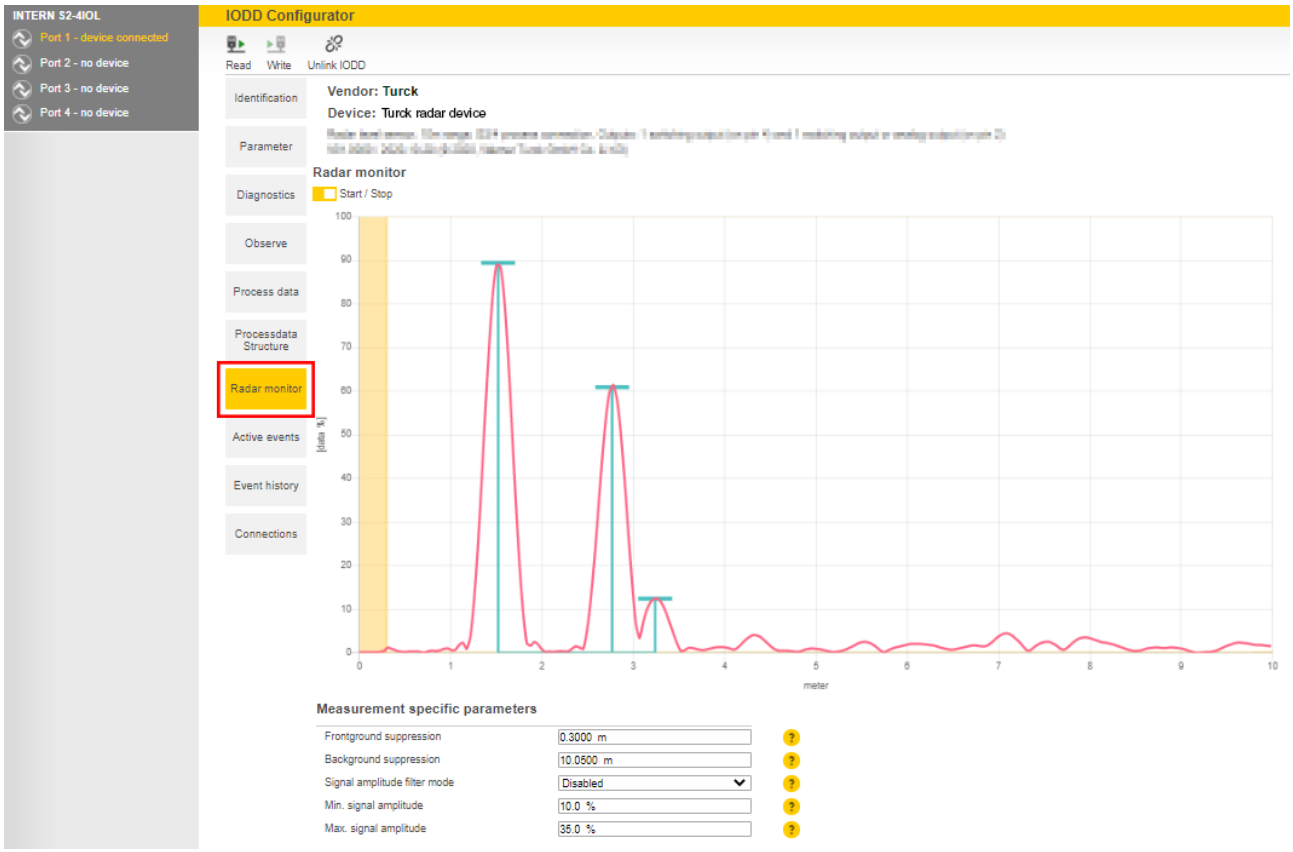


Fig. 22: Turck Radar Monitor – overview

Each displayed peak represents an object detected by the sensor in the detection range. The following points must be observed:

- Peaks with a blue bar (max. 10 value pairs consisting of distance value and intensity value) are forwarded for signal processing.
- The first peak is output as a process value.
- Peaks below a device specific signal intensity limit are no longer detected.
- Background noise can produce small ghost objects (see distance range from approx. 5 m in the figure above).

9.3.3 Turck Radar Monitor – filtering signals

The Turck Radar Monitor offers four filter options for suppressing interference signals:

- Foreground suppression (≥ 0.3 m)
- Background suppression (≤ max. range + 0.05 m)
- Min. signal intensity filter
- Max. signal intensity filter (≥ 10 %)

The minimum distance between foreground and background suppression is 0.1 m. Example: If the foreground suppression is set to 1 m, the background suppression must be ≤ 0.9 m or ≥ 1.1 m.

Minimum and maximum signal intensity filters can be activated individually or together. The step width is 1 %. The minimum distance between the minimum and maximum signal intensity filter is 10 %.

Only peaks within the signal limits are passed on for further processing.

▶ Adjust the filter in the **Measurement specific parameters** area.

⇨ The signal limits are indicated in the Turck Radar Monitor in a white area. Peaks without blue bars are not passed on for data processing.

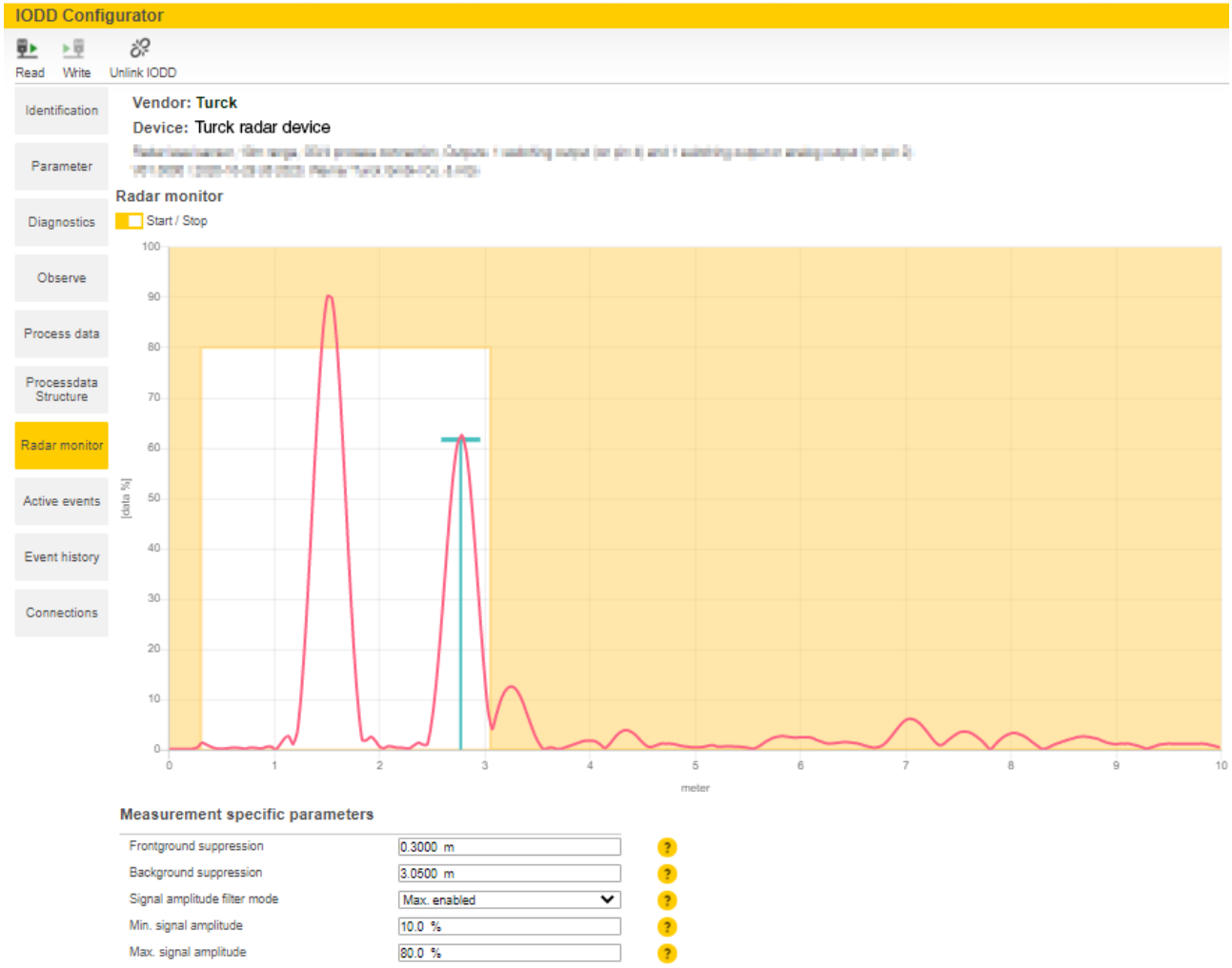


Fig. 23: Example – filtering signals

Hans Turck GmbH & Co. KG | T +49 208 4952-0 | F +49 208 4952-264 | more@turck.com | www.turck.com

10 Troubleshooting

If the device does not function as expected, first check whether ambient interference is present. If there is no ambient interference present, check the connections of the device for faults.

If there are no faults, there is a device malfunction. In this case, decommission the device and replace it with a new device of the same type.

11 Maintenance

The device is maintenance-free. Clean with a damp cloth if required.

12 Repair

The device must not be repaired by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

12.1 Returning devices

Returns to Turck can only be accepted if the device has been equipped with a Decontamination declaration enclosed. The decontamination declaration can be downloaded from
https://www.turck.de/en/retoure-service-6079.php
and must be completely filled in, and affixed securely and weather-proof to the outside of the packaging.

13 Disposal

The devices must be disposed of correctly and must not be included in general household garbage.

14 Technical Data

Type	DR15S-M30E-IOL8X2-H1141	DR15S-M30E-2UPN8X2-H1141
ID	100030148	100030149
Radar data		
Frequency range	122…123 GHz	
Range	350…15000 mm	
Resolution	1 mm	
Minimum value – measuring range	500 mm	
Minimum value – switching range	50 mm	
Linearity tolerance	≤ ± 0.1 %	
Edge length of the norm target	100 mm	
EIRP radiant power	10 dBm	
EIRP radiant power	20 dBm	
Opening angle	15°	
Repetition accuracy	2 mm	
Hysteresis	≤ 50 mm	
Electrical data		
Operating voltage	17…33 VDC	
Ripple	< 10 % U_{ss}	
DC rated operational current	≤ 250 mA	
No-load current	≤ 100 mA	
Residual current	≤ 0.1 mA	
Short-circuit protection	Yes/cyclic	
Reverse polarity protection	Yes	
Communication protocol	IO-Link	
Output function	NC/NO programmable, PNP/NPN, analog output	NC/NO programmable, PNP/NPN
Output 2	Analog output	Switching output
Current output	4…20 mA	–
Voltage output	0…10 V	–
Load resistance current output	≤ 0.5 kΩ	–
Load resistance voltage output	≥ 8 kΩ	–
Voltage drop at I_e	≤ 2 V	
Switching frequency	≤ 10 Hz	
Readiness delay	≤ 450 ms	
Response time, typically	< 10 ms	
IO-Link		
IO-Link specification	V1.1	
IO-Link port type	Class A	
Communication mode	COM 2 (38.4 kBaud)	
Process data width	32-bit	

Type	DR15S-M30E-IOL8X2-H1141	DR15S-M30E-2UPN8X2-H1141
Measured value information	28-bit	
Switching point information	2-bit	
Frame type	2.2	
Minimum cycle time	3 ms	
Function Pin 4	IO-Link	
Function Pin 2	Analog	DI
Maximum cable length	20 m	
Profile support	Smart Sensor Profile	
Mechanical data		
Design	Threaded barrel, M30E	
Dimensions	Ø 44.7 × 104.3 mm	
Housing material	Stainless steel, 1.4401 (AISI 316) PTFE	
Max. tightening torque of housing nuts	75 Nm	
Electrical connection	Male connector, M12 × 1	
Ambient temperature	-25…+65 °C	
Storage temperature	-40…+85 °C	
Protection type	IP67, IP69K (UL: Type 1)	
Operating voltage indication	LED, green	
Switching state indication	2-color LED, yellow	
Vibration resistance	20 g (10…2000 Hz), EN 60068-2-6	
Shock testing	EN 60068-2-27	
Shock resistance	100 g (11 ms)	
EMC	EN 61000-6-2:2019 ETSI EN 301489-3 v.1.6.1	
Approvals	CE, UKCA, ETSI, FCC, UL	

15 Turck Subsidiaries - Contact Information

Germany	Hans Turck GmbH & Co. KG Witzlebenstraße 7, 45472 Mülheim an der Ruhr **www.turck.de**
Australia	Turck Australia Pty Ltd Building 4, 19-25 Duerdin Street, Notting Hill, 3168 Victoria **www.turck.com.au**
Belgium	TURCK MULTIPROX Lion d'Orweg 12, B-9300 Aalst **www.multiprox.be**
Brazil	Turck do Brasil Automação Ltda. Rua Anjo Custódio Nr. 42, Jardim Anália Franco, CEP 03358-040 São Paulo **www.turck.com.br**
China	Turck (Tianjin) Sensor Co. Ltd. 18,4th Xinghuazhi Road, Xiqing Economic Development Area, 300381 Tianjin **www.turck.com.cn**
France	TURCK BANNER S.A.S. 11 rue de Courtalin Bat C, Magny Le Hongre, F-77703 MARNE LA VALLEE Cedex 4 **www.turckbanner.fr**
Great Britain	TURCK BANNER LIMITED Blenheim House, Hurricane Way, GB-SS11 8YT Wickford, Essex **www.turckbanner.co.uk**
India	TURCK India Automation Pvt. Ltd. 401-403 Aurum Avenue, Survey. No 109 /4, Near Cummins Complex, Baner-Balewadi Link Rd., 411045 Pune - Maharashtra **www.turck.co.in**
Italy	TURCK BANNER S.R.L. Via San Domenico 5, IT-20008 Bareggio (MI) **www.turckbanner.it**
Japan	TURCK Japan Corporation Syuuhou Bldg. 6F, 2-13-12, Kanda-Sudacho, Chiyoda-ku, 101-0041 Tokyo **www.turck.jp**
Canada	Turck Canada Inc. 140 Duffield Drive, CDN-Markham, Ontario L6G 1B5 **www.turck.ca**
Korea	Turck Korea Co, Ltd. B-509 Gwangmyeong Technopark, 60 Haan-ro, Gwangmyeong-si, 14322 Gyeonggi-Do **www.turck.kr**
Malaysia	Turck Banner Malaysia Sdn Bhd Unit A-23A-08, Tower A, Pinnacle Petaling Jaya, Jalan Utara C, 46200 Petaling Jaya Selangor **www.turckbanner.my**

Mexico	Turck Comercial, S. de RL de CV Blvd. Campestre No. 100, Parque Industrial SERVER, C.P. 25350 Arteaga, Coahuila **www.turck.com.mx**
Netherlands	Turck B. V. Ruiterlaan 7, NL-8019 BN Zwolle **www.turck.nl**
Austria	Turck GmbH Graumanngasse 7/A5-1, A-1150 Wien **www.turck.at**
Poland	TURCK sp.z.o.o. Wroclawska 115, PL-45-836 Opole **www.turck.pl**
Romania	Turck Automation Romania SRL Str. Siriului nr. 6-8, Sector 1, RO-014354 Bucuresti **www.turck.ro**
Russian Federation	TURCK RUS OOO 2-nd Pryadilnaya Street, 1, 105037 Moscow **www.turck.ru**
Sweden	Turck Sweden Office Fabriksstråket 9, 433 76 Jonsered **www.turck.se**
Singapore	TURCK BANNER Singapore Pte. Ltd. 25 International Business Park, #04-75/77 (West Wing) German Centre, 609916 Singapore **www.turckbanner.sg**
South Africa	Turck Banner (Pty) Ltd Boeing Road East, Bedfordview, ZA-2007 Johannesburg **www.turckbanner.co.za**
Czech Republic	TURCK s.r.o. Na Brne 2065, CZ-500 06 Hradec Králové **www.turck.cz**
Turkey	Turck Otomasyon Ticaret Limited Sirketi Inönü mah. Kayisdagi c., Yesil Konak Evleri No: 178, A Blok D:4, 34755 Kadiköy/ Istanbul **www.turck.com.tr**
Hungary	TURCK Hungary kft. Árpád fejedelem útja 26-28., Óbuda Gate, 2. em., H-1023 Budapest **www.turck.hu**
USA	Turck Inc. 3000 Campus Drive, USA-MN 55441 Minneapolis **www.turck.us**

16 Appendix: Conformity and Approvals

16.1 EU Declaration of Conformity

Hans Turck GmbH & Co. KG hereby declares that the radar distance sensors of the DR… series comply with Directive 2014/53/EU and the Radio Equipment Regulations 2017. The complete text of the EU declaration of conformity can be obtained from the following Internet address: **www.turck.com**

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