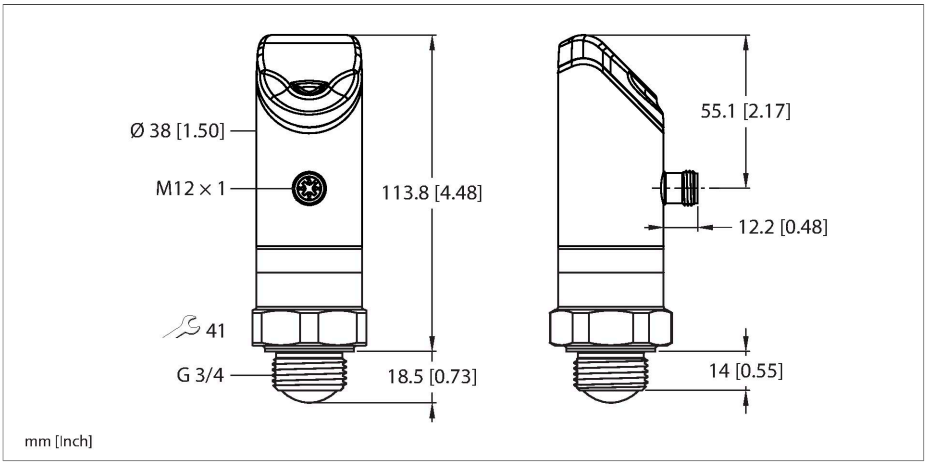
LRS510-10-51-LI2UPN8-H1141
Radar Sensor – Level Control



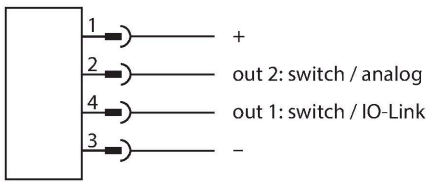
Technical data

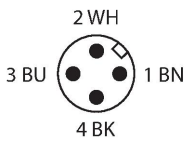
Type	LRS510-10-51-LI2UPN8-H1141
ID	100012729
Radar data	
Function	Radar scanner
Frequency range	122 - 123 GHz
Range	350…10000 mm
Resolution	1 mm
Minimum measuring range	500 mm
Minimum switching range	50 mm
Linearity error	≤ ± 0.1 %
Edge lengths of the nominal actuator	100 mm
Output power EIRP	10 dBm
Cone angle	10 °
Repeatability	2 mm
Hysteresis	≤ 50 mm
Electrical data	
Operating voltage U_B	17…33 VDC
Residual ripple	< 10 % U_{ss}
DC rated operating current I_e	≤ 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	NO/NC programmable, PNP/NPN, analog output
Output 2	Analog or switching output

Features

- Range: 10 m
- Blind zone: 35 cm
- Resolution: 1 mm
- Cone angle of the radar beam: ±5°
- Distance, level, volume or % output
- Approved according to ETSI 305550-2
- Approved according to FCC/CFR. 47 Part 15.
- Male connector, M12 × 1, 4-pin
- Operating voltage 18…33 VDC
- Switching output switchable between PNP/NPN
- Analog output switchable between 4… 20 mA/0…10 V
- Automatic current/voltage detection
- IO-Link
- 4-digit, 2-colored, 14-segment display
- Housing is rotatable by 180° after mounting the process connection
- Process connection G3/4"
- Pressure resistance -1…16 bar rel.

Wiring diagram



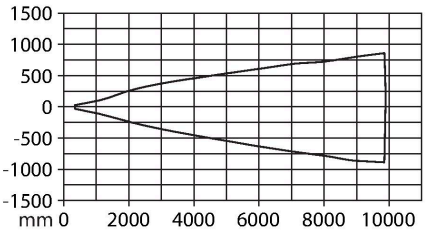


Technical data

Current output	4…20 mA
Voltage output	0…10 V
Load resistance current output	≤ 0.5 kΩ
Load resistance voltage output	≥ 2 kΩ
Voltage drop at I_e	≤ 2 V
Switching frequency	≤ 10 Hz
Response time typical	< 10 ms
IO-Link	
IO-Link specification	V 1.1
IO-Link port type	Class A
Communication mode	COM 3 (230.4 kBaud)
Process data width	80 bit
Measured value information	64 bit
Switchpoint information	4 bit
Frame type	2.2
Minimum cycle time	5 ms
Function pin 4	IO-Link
Function Pin 2	Analog
Maximum cable length	20 m
Profile support	Smart Sensor Profile
Mechanical data	
Design	With display (integrated probe), LRS
Dimensions	Ø 38 x 132.3 x 38 x 50.2 mm
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/polyarylamide 50 % GF UL 94 V-0 PEEK
Lens	plastic, PEEK
Max. tightening torque of housing nut	45 Nm
Electrical connection	Connector, M12 × 1
Process connection	G 3/4"
Ambient temperature	-25…+65 °C
Storage temperature	-40…+85 °C
Pressure resistance	16 bar
Protection class	IP67 IP69K
	Not assessed by UL
Switching state	2 × LEDs, Yellow
Vibration resistance	20 g (10…2000 Hz), EN 600068-2-6
Shock test	EN 60068-2-27
Shock resistance	50 g (11 ms)
EMV	EN 61000-6-2:2019 ETSI EN 301489-3 v.1.6.1

Functional principle

FMCW radar stands for frequency modulated continuous wave radar. FMCW is the English abbreviation for Frequency Modulated Continuous Wave. Non-modulated continuous wave radars have the disadvantage that they cannot measure distances due to lack of time reference. Such a time reference for distance measurement of stationary objects can be generated by means of frequency modulation. Using this method, a signal is emitted which continually changes the frequency. A periodic, linear frequency which varies upwards and downwards is used to limit the frequency range and to simplify the signal evaluation. The factor for the rate of change df/dt remains constant. If an echo signal is received, then this has a runtime delay as with the pulse radar, and thus a different frequency that is proportional to the distance.



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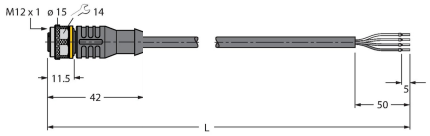
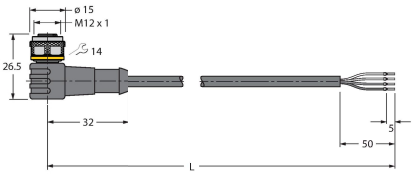
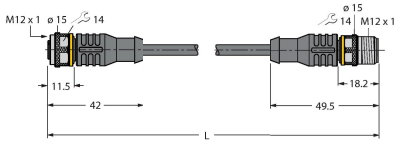
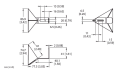
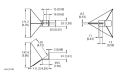
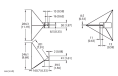
Technical data

Approvals	CE, ETSI, FCC, UL

Accessories

Dimension drawing	Type	ID	
	RKC4.4T-2/TEL	6625013	Connection cable, M12 female connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval
	WKC4.4T-2/TEL	6625025	Connection cable, M12 female connector, angled, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval
	RKC4.4T-2-RSC4.4T/TEL	6625208	Extension cable, M12 female connector, straight, 4-pin to M12 male connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval

Accessories

Dimension drawing	Type	ID	
	TBEN-S2-4IOL	6814024	Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A
	RR-6	100047726	Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 60 mm, RadarCrossSection: 10 m² (cf. automobile), reliable object detection up to 6.5 m
	RR-12	100047727	Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 120 mm, RadarCrossSection: 250 m² (cf. HGV), reliable object detection up to 15 m
	RR-20	100047728	Stainless steel radar reflector, optimized detection performance of an object, cathetus length: 200 mm, RadarCrossSection: 1115 m² (cf. ship), reliable object detection up to 25 m