

R1D200



Radar distance sensor

R1DBAF6KG/US/IO-Link



Product characteristics	
Communication interface	IO-Link
Housing	rectangular
Dimensions [mm]	80 x 80 x 45
Digital	
Electrical design	PNP/NPN; (parameterisable)
Output function	normally open / normally closed; (parameterisable)
Application	
Radio approval for	EU/RED; USA; Canada
Note on radio approval	The list of countries applying the European Radio Equipment Directive 2014/53/EU (RED) can be found under "Downloads".
Electrical data	
Operating voltage [V]	10...30 DC; (to SELV/PELV ; energy-limited circuits according to IEC/UL 61010-1 3rd ed. cl. 9.4)

R1D200



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Current consumption	[mA]	< 300; (mean value: 150 mA)
Power consumption	[W]	21; (maximum)
Protection class		III
Reverse polarity protection		yes
Max. power-on delay time	[ms]	1000
Operating frequency [GHz]		77...81
Maximum radiated average spectral density EIRP [dBm/MHz]		-17
Radiated peak power EIRP [dBm]		30

Inputs / outputs

Total number of inputs and outputs		3
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Inputs

Inputs	IN1	activation/deactivation of the radar
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Outputs

Total number of outputs		2
Output signal	OUT1	switching signal; IO-Link
	OUT2	switching signal; analogue signal
Short-circuit protection		yes
Type of short-circuit protection		pulsed
Overload protection		yes

Analogue

Analogue current output	[mA]	4...20, invertible; (scalable)
Max. load	[Ω]	500; (< 250 Ω: U _b 16...30 V DC; 250...500 Ω: U _b 18...30 V DC)
Analogue voltage output	[V]	0...10, invertible; (scalable)
Min. load	[Ω]	2000

Digital

Electrical design		PNP/NPN; (parameterisable)
Output function		normally open / normally closed; (parameterisable)
Max. voltage drop switching output DC	[V]	2.5
Permanent current rating of switching output DC	[mA]	200

Detection zone

Range	[m]	0.1...50; (referred to a 10 cm corner reflector)
Angle of aperture cylindrical	[°]	horizontal 40
		vertical 20

Measuring/setting range

Measuring range	[m]	0.1...50; (see diagram:)
Sampling rate	[Hz]	20...100

Accuracy / deviations

Hysteresis	[mm]	5; (parameterisable)
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R1D200



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Temperature coefficient analogue output [% of the span / 10 K]	± 0,1
Repeatability analogue output [% of the span]	< 0,1
Linearity error of analogue output [% of the span]	± 0,15
Precision analogue output [% of the span]	± 0,2 (in addition to the accuracy specifications in the further data section)

Software / programming

Parameter setting options	only via IO-Link
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Interfaces

Communication interface	IO-Link	
Transmission type	COM3 (230,4 kBaud)	
IO-Link revision	1.1	
SDCI standard	IEC 61131-9	
Profiles	Function class	Designation
	0x0030	BLOB transfer
	0x4000	Identification and Diagnosis
	0x8101	Locator
	0x8102	ProductURI
SIO mode	yes	
Required master port type	A	
Min. process cycle time [ms]	3.2	
IO-Link process data (cyclical)	function	bit length
	distance	32
	speed	32
	Power	8
	RCS	8
	sensor inclination	1
	device status	4
	binary switching information	4
IO-Link functions (acyclical)	application specific tag; operating hours counter; number of trigger events; internal temperature; ROI setting	
Supported DeviceIDs	Type of operation	DeviceID
	default	1518

Operating conditions

Ambient temperature [°C]	-40...80
Note on ambient temperature	without using the analogue output: -40...85 °C
Storage temperature [°C]	-40...85
Protection	IP 65; IP 66; IP 67; IP 69K; (with mounted connectors or protective caps)

Tests / approvals

EMC	DIN EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	DIN EN 61000-4-3 HF radiated	10 V/m
	DIN EN 61000-4-4 Burst	2 kV
	DIN EN 61000-4-6 HF conducted	10 V
	DIN EN 61000-6-2	immunity / industrial environments
	EN 55032 emission	Class A

R1D200



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Impact resistance	IEC 62262	IK06 (1J)
Vibration resistance	DIN EN 60068-2-6 Fc	10 g 10 frequency cycles, 1 octave/minute, in 3 axes
Shock resistance	DIN EN 60068-2-27 Ea	50 g 11 ms half-sine; 10 shocks each in every direction along the 3 coordinate axes
Continuous shock resistance	DIN EN 60068-2-29 Eb	40 g 6 ms half-sine; 4,000 shocks each in every direction along the 3 coordinate axes
Fast temperature change	DIN EN 60068-2-14 Na	TA = -40°C; TB = 85°C; t1 = 30 min; t2 = < 30 s; 300 cycles
Salt spray test	DIN EN 60068-2-11 Ka	8 test cycles
Electrical protection	DIN EN 61010-2-201	electric shock / electrical supply only via SELV/PELV circuits
MTTF [years]		53
UL approval	Ta	-40...65 °C
	File number UL	E205959

Mechanical data

Weight [g]	412.15
Housing	rectangular
Mounting	flush mountable
Dimensions [mm]	80 x 80 x 45
Materials	housing: PA; radome: PEI; Sealing: HNBR

Displays / operating elements

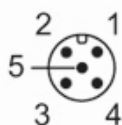
Display	switching status	2x LED, yellow
	operation	1x LED, green
	errors	1x LED, red

Remarks

Pack quantity	1 pcs.
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Electrical connection

Connector: 1 x M12; coding: A



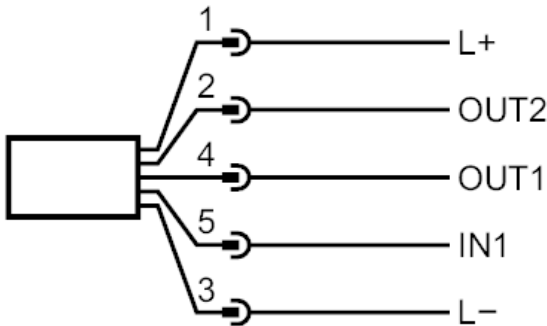
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Connection



- OUT1: switching output
IO-Link
- OUT2: switching output
analogue output
- IN1: activation/deactivation of the radar

Other data			
Operating mode	standard	Long range, high velocity	High switching frequency
max. distance	0.1...20 m	0.25...50 m	0.1...20 m
distance resolution	100 mm	320 mm	100 mm
distance accuracy	± 5 mm	± 15 mm	± 5 mm
max. velocity	± 6 m/s	± 15 m/s	± 15 m/s
velocity resolution	± 0.35 m/s	± 0.38 m/s	
speed accuracy	± 0.01 m/s	± 0.04 m/s	± 0.20 m/s
Switching frequency	20 Hz	20 Hz	100 Hz
distance	referred to a 10 cm corner reflector		
Resolution	for the detection of two objects of the same size		
accuracy	for a strong, point-shaped target		

R1D200

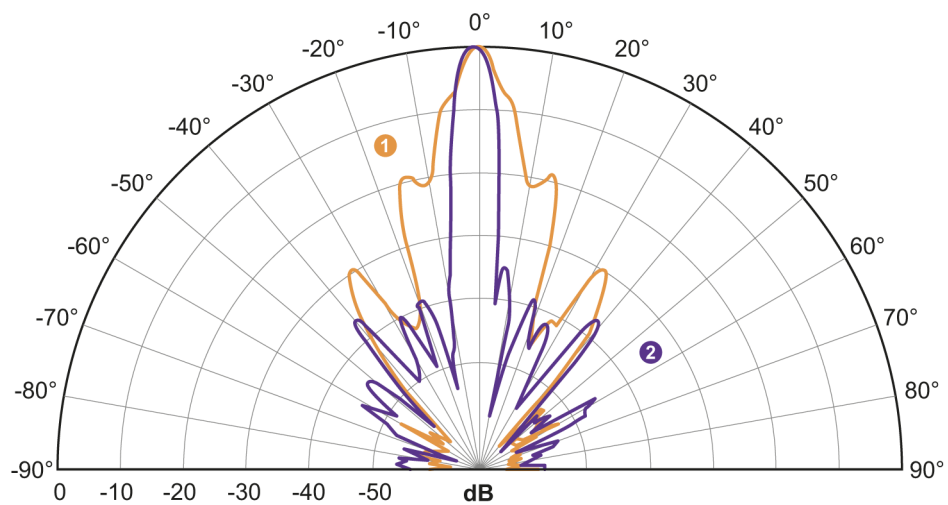
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Diagrams and graphs

Detection zone



1: azimuth

2: elevation

conditions

Reflector: 4.3" Trihedral Corner Reflector (SAJ043-S1)

RCS: 10 dBm²

distance: 5 m

operating frequency: 79 GHz