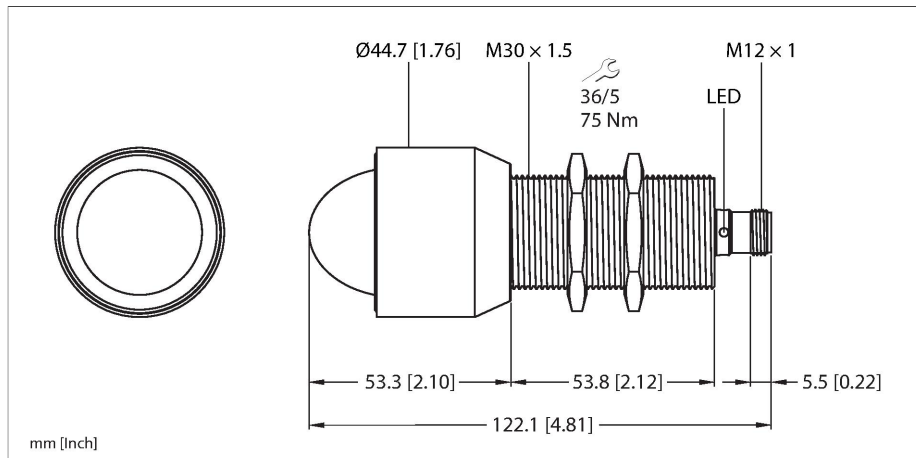


DR30N-M30E-IOL8X2-H1141

Radar Sensor – Distance/Object Detection



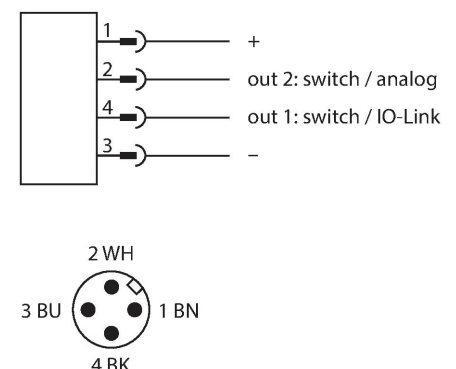
Technical data

Type	DR30N-M30E-IOL8X2-H1141
ID	100030152
Radar data	
Function	Radar scanner
Frequency range	122 - 123 GHz
Range	350...30000 mm
Resolution	1 mm
Minimum measuring range	500 mm
Minimum switching range	50 mm
Linearity error	$\leq \pm 0.1 \%$
Edge lengths of the nominal actuator	100 mm
Output power ERP	10 dBm
Output power EIRP	20 dBm
Cone angle	5 °
Repeatability	2 mm
Hysteresis	$\leq 50 \text{ mm}$
Electrical data	
Operating voltage U_B	18...33 VDC
Residual ripple	$< 10 \% U_{ss}$
DC rated operating current I_o	$\leq 250 \text{ mA}$
No-load current	$\leq 150 \text{ mA}$
Residual current	$\leq 0.1 \text{ mA}$
Short-circuit protection	yes/Cyclic
Reverse polarity protection	yes
Communication protocol	IO-Link
Output function	NO/NC programmable, PNP/NPN, analog output

Features

- Blind zone: 35 cm
- Range: 30 m
- Resolution: 1 mm
- Cone angle of the radar beam: Narrow $\pm 2.5^\circ$
- Approved acc. to ETSI 305550-2
- Approved acc. to FCC/CFR 47 Part 15.
- M12 x 1 male connector, 4-pin
- Operating voltage 18...33 VDC
- Operating voltage 10...33 VDC (in SIO mode)
- Switching output switchable between PNP/ NPN
- Analog output switchable between 4... 20 mA/0...10 V
- Automatic current/voltage detection
- IO-Link
- M30 cylindrical design, stainless steel

Wiring diagram



Functional principle

FMCW radar stands for frequency modulated continuous wave radar. FMCW is the English abbreviation for Frequency Modulated

Technical data

Output 2	Analog output
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 ₀	≤ 2 V
Switching frequency	≤ 10 Hz
Readiness delay	≤ 450 ms
Response time typical	< 10 ms
IO-Link	
IO-Link specification	V 1.1
IO-Link port type	Class A
Communication mode	COM 2 (38.4 kBaud)
Process data width	48 bit
Measured value information	32 bit
Switchpoint information	1 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	Threaded barrel, M30E
Dimensions	Ø 44.7 x 113.9 mm
Housing material	Stainless steel, 1.4401 (AISI 316) PTFE
Lens	plastic, PTFE
Max. tightening torque of housing nut	75 Nm
Electrical connection	Connector, M12 × 1
Ambient temperature	-25...+65 °C
Storage temperature	-40...+85 °C
Protection class	IP67 IP69K
	Not assessed by UL
Power-on indication	LED, Green
Switching state	2-color LED, Yellow
MTTF	187 years
Vibration resistance	20 g (10...2000 Hz), EN 60068-2-6
Shock test	EN 60068-2-27
Shock resistance	100 g (11 ms)
EMV	EN 61000-6-2:2019

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.

