

✚ Sonair



ADAR One

Sound, simple, safe:
3D obstacle detection for autonomous mobile robots

Technical Datasheet | Version 2.0

Details in this document are subject to change without notice.
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Danger

Before installation and commissioning, you must read and fully understand SDN108 ADAR One user manual. Always use the latest version available at sonair.com. Failure to follow the instructions and safety information may result in improper operation, device damage, serious injury or even death.

Features

Detection range	0 - 4 m
Field-of-view	180° by 180°
Detection capability (Safety function)	Torso ($\geq \varnothing 155$ mm) • 0-3 m at 0-75° • 0-2 m at 0-80° Legs ($\geq \varnothing 70$ mm) • 0-2.5 m at 0-60° • 0-1.5 m at 0-80° Cylinder with acoustically hard surface($\geq \varnothing 30$ mm) • 0-3 m at 0-60° • 0-1.5 m at 0-80°
Range precision	2-10 cm
Angular precision	0-45°: $\sim 3^\circ$ 45-70°: $\sim 6^\circ$ 70-90°: $> 10^\circ$
Frame rate	13-18 Hz
Response time	≥ 112 ms
Ultrasonic frequency	65-85 kHz
Multiple devices inside the detection range	Yes
Number of simultaneously monitored zones ¹⁾	3
Number of zone presets ¹⁾	128

¹⁾ 1x safe protective zone, 2x warning zones per preset

See SDN108 ADAR One user manual for detailed information

Interfaces

Safe output	1 OSSD Pair Protective Zone
Outputs	2 status outputs - Inner warning zone - Outer warning zone
Safe inputs	11 static control inputs Zone select
Data interface	1 Ethernet (CoAP over UDP/IP) 3D point cloud - Configuration
Display elements	2 dual color LEDs - OSSD status - System and warning zone status

Environmental

Operating temperature	0°C to +50°C
Storage temperature	-20°C to +60°C
Air humidity	10-95 % RH
Electromagnetic compatibility	IEC 61496-1, IEC 61000-6-1, IEC 61000-6-2, IEC 61000-6-3, IEC 61000-6-4
Enclosure ingress protection	IP 64
Vibration	IEC 61496-1, IEC 60721-3-5 class 5M1
Shock	IEC 61496-1, IEC 60721-3-5 class 5M2 IEC TR 60721-4-3 class 3M7
Max operating altitude	2300 m

Electrical

Supply voltage	24 V DC (18 V to 28 V DC) (PELV) ¹⁾
Supply current (maximum output load)	0.7 A
Supply current (no output load)	0.3 A
Power consumption	5 W

1. PELV can be realized with a SELV power supply by connecting 0V output to protective ground (PE).

Safety parameters

IEC 61508:2010	
Safety Integrity Level (SIL)	SIL 2
Element Type	Type B
Mode of Operation	High demand
Systematic Capability	SC 2
HFT	0
Diagnostic Coverage	95 %
Safe failure fraction (SFF)	95 %
ISO 13849:2023	
Performance Level (PL)	PL d
Category	2
PFH _d (mean probability of a dangerous failure per hour)	1.50×10^{-7} 1/h
MTTF _d (mean time to dangerous failure)	38 years
Mission Time	20 years
IEC 61496:2020	
Type of ESPE	Type 3
Demand rate	4/hour

Compliance

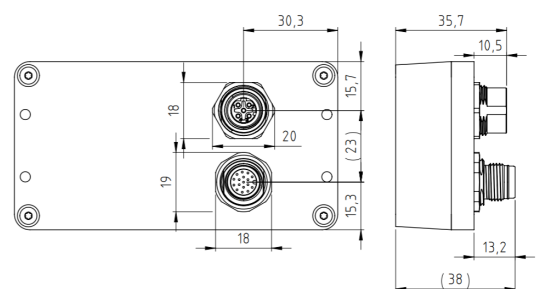
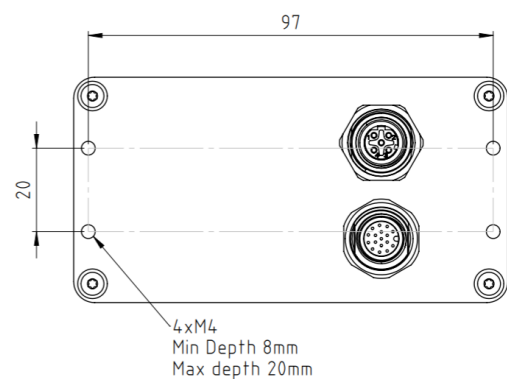
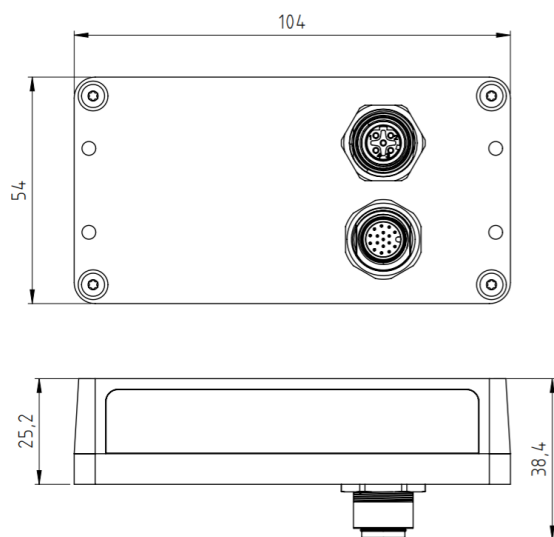
EC type-examination in accordance with Machinery Directive 2006/42/EC.

More: compliance.sonair.com

Mechanical dimensions

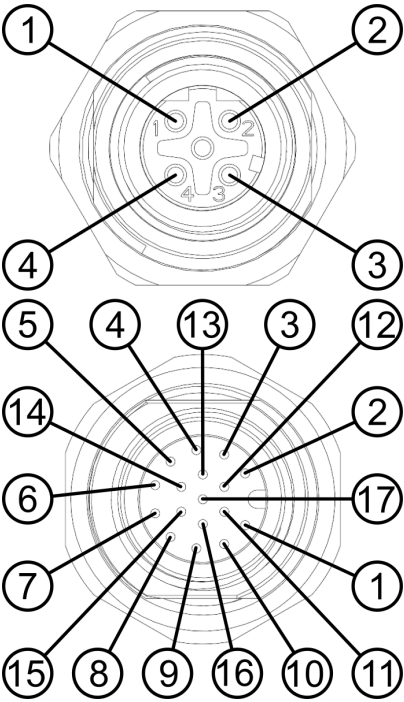
Size	Height 54 mm, width 104 mm, depth 25 mm, excluding connector and cables.
Weight	0.2 kg
Housing material	Aluminum and polymer

Sensor dimensions. Unit: mm



Pinout

Sensor connectors:



Ethernet 100Mb

- M12 D-coded 4-pin **female** connector

Pin	Designation	Function
1	TX+	Send data +
2	RX+	Receive data +
3	TX-	Send data -
4	RX-	Receive data -
Thread	SH	Shielding

I/O and power

- M12 A-coded 17-pin **male** connector

Pin	Designation	Function
1	PWR_IN	Supply voltage +24 V DC
2	PWR_RET	Supply voltage 0 V DC
3	OSSD0	OSSD0 output
4	OSSD1	OSSD1 output
5	ZONE_SELECT0	Safe input bit 0
6	ZONE_SELECT1	Safe input bit 1
7	ZONE_SELECT2	Safe input bit 2
8	ZONE_SELECT3	Safe input bit 3
9	ZONE_SELECT4	Safe input bit 4
10	ZONE_SELECT5	Safe input bit 5
11	ZONE_SELECT6	Safe input bit 6
12	ZONE_SELECT7	Safe input bit 7
13	ZONE_SELECT8	Safe input bit 8
14	ZONE_SELECT9	Safe input bit 9
15	INNER_WARNING	Inner warning zone output
16	OUTER_WARNING	Outer warning zone output
17	ZONE_SELECT10	Safe input bit 10
Thread	SHIELD	Shielding