# E-band Ultra Short-range Marine Radar SDM360-76

Best design for autonomous vessels

Wide vertical field of view (15 degrees )

# Distance range: 0-0.16 or 0-0.32 nmi

## FIRST IN THE INDUSTRY E-BAND MARINE RADAR WITH ZERO BLIND SPOT

The radar is intended to work as the obstacle sensor for installation on any vessel which operates in poor visibility conditions. This especially includes **any vessels with an automated collision-free navigation system** or unmanned ships and autonomous boats, private yachts, as well as gas carrier ships and others with dangerous goods, icebreakers and ice-class commercial ships, tugs, rescue vessels.

A zero blind zone allows SDM360-76 radar to measure the distance between the vessel and possible obstacles (other vessels around, port facilities, coastline) within the typical range from 0 to 300 m (0 to 0.162 nmi) with the accuracy of ±7.5 cm. The range can be set programmatically, for example, set to max 0-600 m (0-0.324 nmi) or to min 0-100 m (0-0.054 nmi) depending on the current environments around and the size of the vessel. A wide vertical viewing angle of 15 degrees allows the radar to keep targets within the radar's field of view in sea roll conditions.



## **Applications**

- Ultra short-range 360° radar for a vessel situational awareness
- Hazard detection sensor with visual and audible alarm
- Mooring observation radar assistance
- Port area waters all-weather monitoring

#### Features

- 0 to 300 m (0 0.162 nmi) guarenteed range with no radar blind spot
- High-resolution situational awareness with 0.15 m accuracy
- Wide vertical field of view (15 degrees )
- Detailed output radar images to the dashboard
- Data transfer to 3rd party app which support the open data format
- Navigate safely through narrow waterways, at night and fog
- Identify and locate small boats, buoys and coastline
- Dome design with 30 RPM antenna rotation

## **INSTALLATION ON A VESSEL FOR PANORAMIC RADAR PICTURE**



Two radar units are usually enough for all-round short-range radar picture

To eliminate dead zones on large ships, it is necessary to use two or more radar units installed on opposite sides of the ship, including radar units in the bow and stern.

Small vessels such as autonomous speedboats, tugs, yachts or fishing seiners could carry single radar unit



The radar software uses data about the contour of the ship and the geometric position of the radar onboard to calculate the distance from the ship to the obstacles.



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The SDM360-76 E-band (76 GHz) radar has an inherently higher resolution than the S, X or even K-band more typically used for marine radar. The radar provides detailed output radar images both to the dashboard and can transfer data to third party applications which support the open data format.

When using several radar units on the vessel, the steering officer is provided with a summary radar picture. In addition, warning information about a dangerous approach is displayed indicating the course to the nearest obstacle (marked with a red dot on the screen), and an audible alarm for critically close obstacle awareness can also be activated.

The SDM360-76 has a dome design with 40 cm in diameter and provides high levels of situational awareness in densely populated and narrow waters. It allows all-around (360°) visibility.



## INSTALLATION ALONG PORT BERTHS FOR ALL-WEATHER AREA MONITORING





Radars can be installed on port berths to monitor the water area for emergency events

SDM360-76 radar has very low radiation emission (up to 100 mW) for safe operation on board of the vessels and in the territory of commercial port.

This 76 GHz radar operates in the millimeter wave spectrum, has no weather restrictions, unlike video surveillance systems or laser rangefinders to provide 24x7 monitoring of port area waters. Easy penetration of the fog, dust, smog, smoke, water vapour is provided. In addition, the operation of the radar is not affected by direct sunlight or ship searchlights.

The advantage of the technological solution of the SDM360-76 radar is scanning the near-field zone "to its own side" with a high resolution and regardless of weather conditions. It has a crucial advantage over traditional S- or X-band maritime radars, which have a significant blind spot.

The radiation with a power of 100 mW is several times lower than the radiation from a conventional mobile phone (compare to 300 mW for the latest iPhone models). Radiation density at a distance of several meters falls below a minimum to be measured. The glass of the cabin windows and the metal of the ship's hull attenuates the radiation of the radar at a frequency of 76 GHz to almost zero.



### SDM360-76 DRAWING





## SDM360-76 SPECIFICATIONS

Guaranteed distance measurement range Max instrumental distance measurement range Distance measurement error, max Radar frequency Modulation Output power at swept frequency modulation Antenna type Antenna RPM Protective radome included Beam width in the horizontal plane Beam width in the vertical plane Output Interface \* Consumed electrical power Environment protection class Environment operating temperature ,°C

0 – 300 m (0 – 0.162 nmi) 0 – 600 m (0 – 0.324 nmi) ± 0.075 m 76.5 ± 0.5 GHz FMCW 100 mW Built-in 30 Yes 2 degrees 15 degrees 1000Base-Tx UTP Ethernet 100 W, 18-36 V DC IP65 / IP67 -40 to +55 °C



\* When operates at cold weather, the radar utomatically activates heater inside the radar case to keep radar components running reliably.

Thus, the consumed power changes to 25 W more.

Contact ELVA-1 for more details about SDM360-76 E-band ultra short-range marine radar



