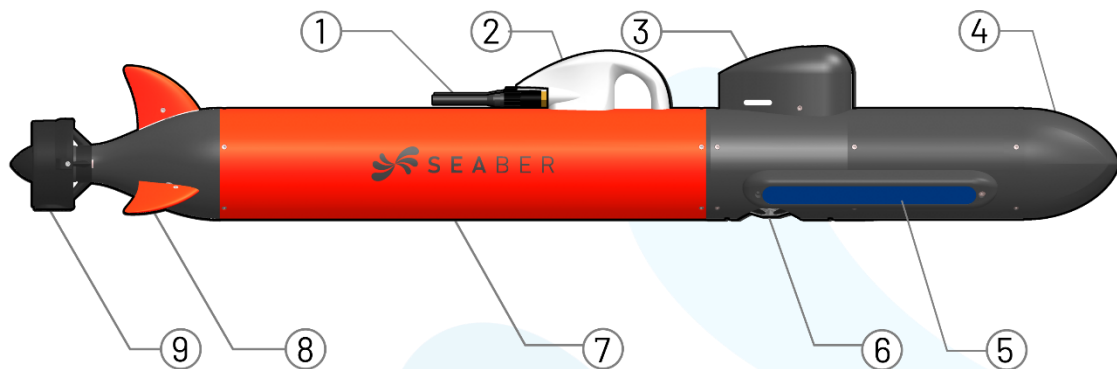


Datasheet

MARVEL-SCAN

This document provides further information on the **MARVEL-SCAN** key features.

MARVEL-SCAN is equipped with a dual frequency Side-Scan Sonar from *Marine Sonic*, producing seabed scan images. It comes with a DVL, to compensate current drift, improve positioning and keep altitude from the sea floor. It is equipped with underwater acoustic positioning and communication module.



1 Start key and charging port

2 Mast (UHF radio communication, GNSS antenna and status LEDs)

3 Acoustic positioning and communication module

4 Nose (wet part for buoyancy foam and payloads)

5 Side-scan sonar transducers 600, 900, 1200, 1800 kHz
Side-scan sonar bi-frequencies transducers
600kHz/1200kHz or 900kHz/1800kHz

6 DVL (Doppler Velocity Logger)

7 Sealed dry body section which contains Lithium-Ion battery and electronics

8 Fins

9 Propulsion Thruster

Technical features

Length	130 cm
Body Diameter	12 cm
Weight in air	11,5 kg
Depth rating	300 m
Speed	2 to 6 knots
Endurance	10 hours @ 3 knots / 6 hours @ 4 knots (with Li-Ion battery)
Navigation accuracy	<5m absolute positioning within USBL surface module range
Energy	Rechargeable 600Wh/14.8V Li-Ion
Battery Charger	100 to 240 VAC 50 to 60 Hz
Programming interface	SEAPLAN software by SEABER
Surface Communication	LoRa UHF point-to-point communication with SEACOMM device For MARVEL status messages and orders Autonomous buoy with USBL unit and dual antenna GNSS-RTK module
Underwater Communication	Real-time status of the MARVEL with acoustic modem Possibility to send orders to the MARVEL during the mission
Accessories	Rugged transport case Spare parts and tools in waterproof bag

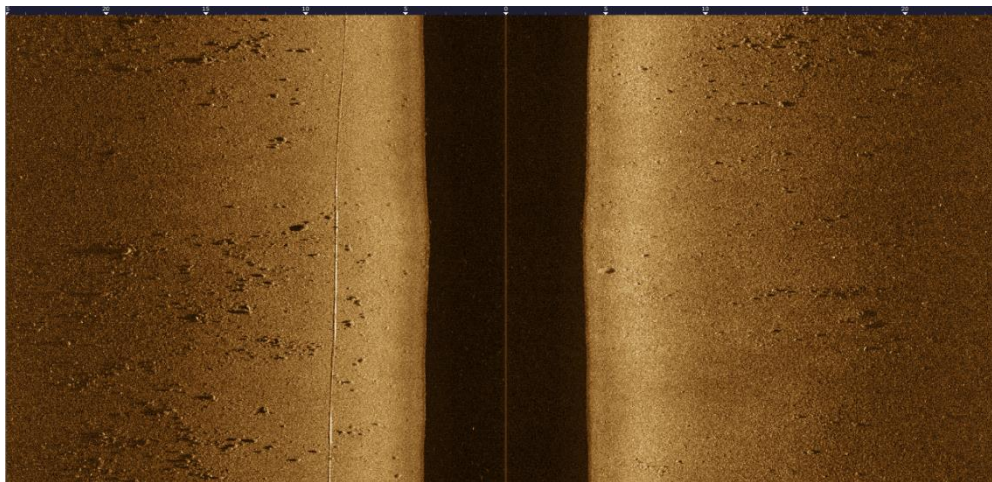
Sensors

DVL	
Model	Waterlinked A50
Frequency	1 MHz
Beam angle	22.5 degrees
Ping rate	4-26 Hz
Max altitude	50 meters
Max velocity	3.75 m/s
Velocity resolution	0.1 mm/s

Side Scan Sonar	
Model	Marine Sonic
Frequency	600, 900, 1200, 1800 kHz Dual Frequency 600kHz/1200kHz or 900kHz/1800kHz
Range	Up to 140m (600kHz), 45m (1200kHz) Up to 80m (900kHz), 25m (1800kHz)
Horizontal Beam Angle	0.4° (one-way), <0.3° (two-way)
Vertical Beam Angle	24° (two-way)
Output file format	SDS (Marine Sonic Format) XTF (eXtended Triton Format)

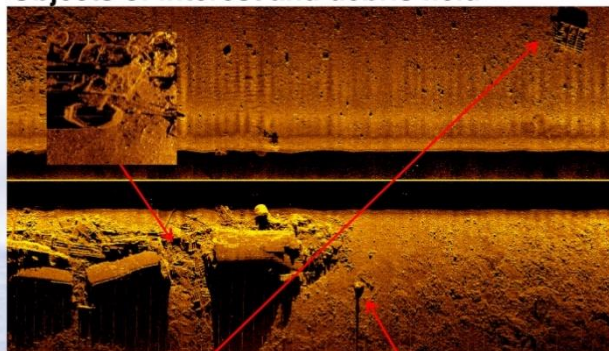
Acoustic positioning and communication module	
Model	Blueprint SeaTrac
Acoustic Range	1km radius horizontal, 1km vertical (hemispherical)
Range Resolution	$\pm 0.1\text{m}$ (dependant on provided VOS accuracy)
Velocity of Sound Range	1300ms ⁻¹ to 1700ms ⁻¹ (can auto-compute from water temp & depth)
Beacon Velocity	Active Doppler compensation, up to 15kts (28kph)
Communications	Broadband spread spectrum encoding, 24-32kHz, 100 baud. Multi-tiered Acoustic Protocol Stack.

MARVEL AUV is subject to dual use export license from SBDU authority in France.



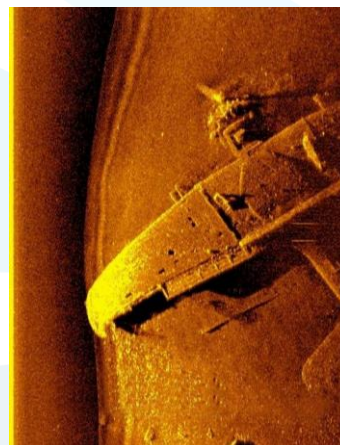
(35mm telecom cable survey)

Objects of interest and debris field



Approx 10m x 8m long
grating or hull section.
Approx 82m from vessel

Note considerable height above bottom



(SS Shirvan Debris Field - 600kHz)

(WW II era Curtiss SC "SC "Seahawk" float plane- 1800kHz)