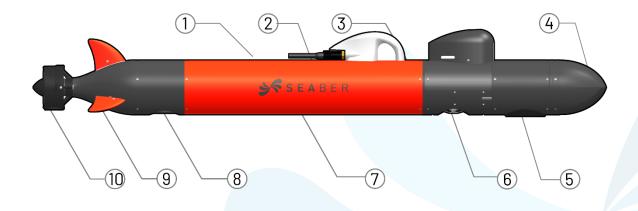


Datasheet MARVEL-LUMEN

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

MARVEL-LUMEN is equipped with a high quality underwater camera, for imaging acquisition that features geo-referenced digital capture of both still images and video. It comes with a DVL, to compensate current drift, improve positioning and keep altitude from the sea floor. It can be equipped with underwater acoustic positioning and communication module.



1	tart key and charging port 6 DVL (Doppler Velocity Logger)		
2	Mast (UHF radio communication, GNSS antenna and status LEDs)	d 7 Sealed dry body section which contains Lith lon battery and electronics	nium-
3	Acoustic positioning and communication module (in option)	n 8 Lighting	
4	Nose (wet part for buoyancy foam and payloads)	9 Fins	
5	Underwater camera	10 Propulsion Thruster	



Technical features

Length	110 cm		
Body Diameter	12 cm		
Weight in air	10 kg		
Depth rating	300 m		
Speed	2 to 6 knots		
Endurance	10 hours @ 3 knots / 6 hours @4 knots (with Li-lon battery)		
Navigation accuracy	<5m absolute positioning within USBL surface module range		
Energy	Rechargeable 600Wh/14.8V Li-lon		
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



Imaging payload					
Model		High quality underwater camera			
OPTICAL		LIGHTING			
Imaging type	Single camera, stills and video	Integrated Lighting	4x fixed dual-mode LED arrays		
Camera Sensor	Sony IMX304, 12.3 MP, 1.1 in. format, back-illuminated color CMOS with global shutter	Color Temperature	5,70K, 70 CRI minimum standard		
Camera Lens	12 mm f/2.8 rectilinear, low distortion (-0.5%)	Output Lumens	60,000 Lm in strobe mode; 6,000 Lm in torch mode		
Still Image Resolution	4,096 x 3,00 (12.3 MP)	Beam Angle	100°		
Still Image Rep Rate	4 Hz max, full-res standard	Strobe Pulse Duration	5 ms max standard		
Video Modes	720p HD @ 60 fps; 1,080p FHD @ 30 fps; 4K UHD @ 10 fps	Strop Rep Rate	2 Hz max standard; 4 Hz optional		
Angle of view	71° in air; 51° in water	Torch Dimming	0-100% in 1% increments		
Field of view	Approx. 96% of altitude in water				
Imaging Altitude	3-5 m recommended				

Acoustic positioning and communication module				
Model	Blueprint SeaTrac			
Acoustic Range	1km radius horizontal, 1km vertical (hemispherical)			
Range Resolution	±0.1m (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.			

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