



AGILE.      PRECISE.      DATA-DRIVEN.

# EXRAY™

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Technical Specifications



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# EXRAY™ ROV

EXRAY™ is a professional underwater inspection robot specifically developed for detailed inspections of complex submerged assets.

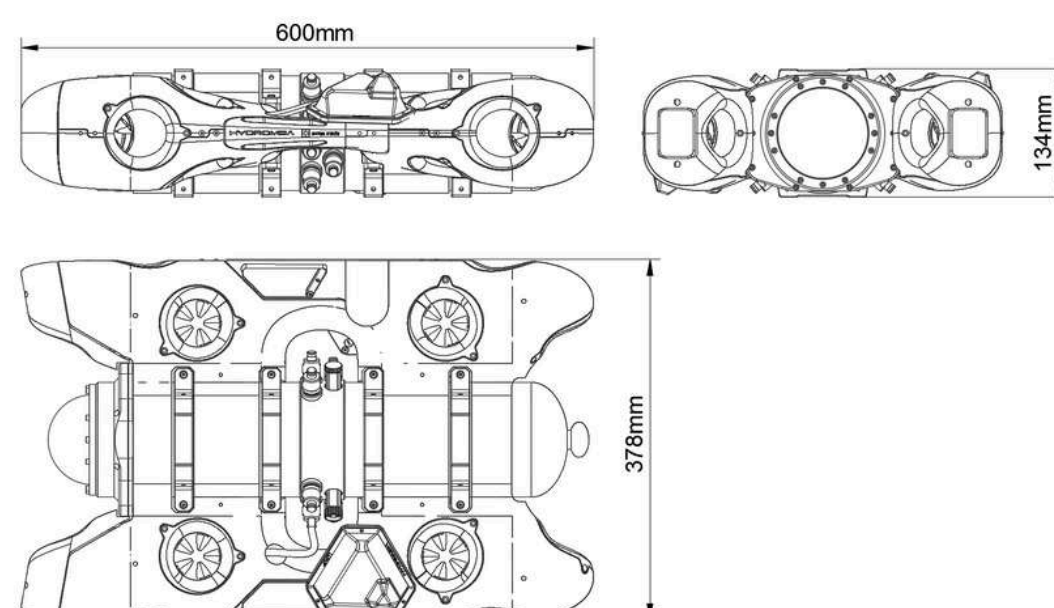
Slim, light, agile, smart, and highly modular with increasing roster of payload sensors, it is an excellent tool for tough underwater inspection missions.



## VEHICLE SPECIFICATIONS

<b>Dimensions (LxWxH)</b>	600 x 378 x 134 mm (23.62 x 14.88 x 5.28 in)
<b>Weight in Air</b>	9 kg (20 lbs)
<b>Weight in Fresh Water</b>	Neutrally buoyant, with adjustable buoyancy for other environments
<b>Depth Rating</b>	100 m (328 ft)
<b>Max Speed</b>	1m/s forward/backward *
<b>Thrusters</b>	Rim-driven hubless hydro-lubricated design. 4 vectored + 4 vertical. <b>Power Train Consumption:</b> Hovering: 50 W Average: 70 W Strong Currents: 200 W
<b>Dexterity</b>	6 DOF
<b>Lights</b>	Adjustable, up to a total of 4800 lumen
<b>Construction</b>	HDPE, anodized aluminum, POM
<b>Endurance</b>	Between 4 to 6 hours *
<b>Internal Memory</b>	16 GB (4 h recording), additional slot for a microSD card and 256 GB max
<b>Operating Temperature</b>	0°C to 40°C (32°F to 104°F)
<b>Aux Ports</b>	2x Serial RS232/RS485 and CANbus, 2x Ethernet 10/100, 1x Gigabit
<b>Automation</b>	Auto depth, auto pitch; station hold with optional DVL
<b>IMU Sensor</b>	9 axes, accelerometer, magnetometer, gyroscope
<b>Depth Sensor</b>	0 to 30 bar range, 0.2 mbar resolution
<b>Optional Payload</b>	Gripper, UT Sensor, DVL, Scanning Imaging Sonar, Multi-beam Sonar, SPEERA™ Vacuum Cleaner. (Page 6)

\*PRELIMINARY SPECIFICATIONS - MAY BE SUBJECT TO CHANGE WITHOUT NOTICE



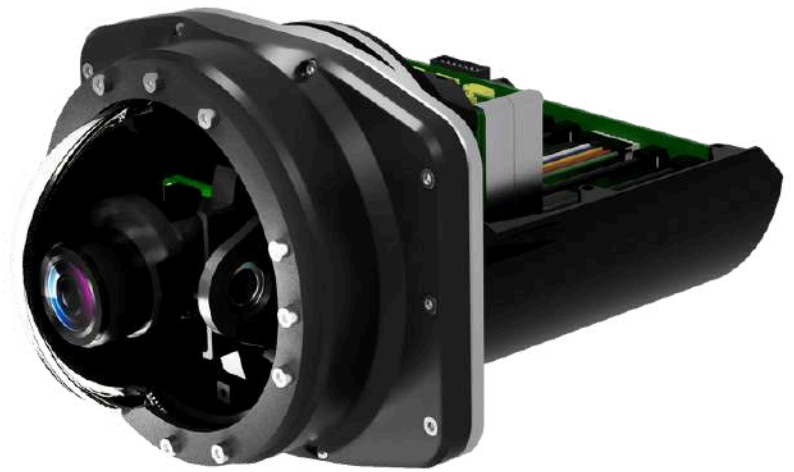
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# EXRAY™ ROV

## CAMERA SPECIFICATIONS

Video	FHD, 24 Hz, .mkv
Images	FHD, 4K, RAW, .jpeg
Tilt	±70°; horizontal
Horizontal Field of View	110°
Focal Length	2.7-13 mm (0.11-0.51 in)
Optical Zoom	2.5x - 3x (5 - 20 m (16 - 66 ft))
Focus	Adjustable focus - from the camera dome surface to infinity, even while zoomed in.



## TETHER SPECIFICATIONS

Type *	Twisted copper pair, ruggedized Optional: Single mode fiber up to 2,000 m (6,516 ft)
Length *	100 m (328 ft)
Diameter *	4 mm (0.16 in) low drag
Weight in Water	Neutrally buoyant
Minimum Breaking Strength	155 kgf (342 lbf)

\*ADJUSTABLE UPON REQUEST



## SWAPPABLE BATTERIES

Type	Lithium Ion stackable (Max ROV load - 3 batteries)
Nominal Voltage	14.4 V (maximum voltage 16.8 V)
Nominal Energy	97.92 Wh per battery
Weight in Air	415 g (0.9 lbs) per battery
Charge Time	40 minutes per battery
Option	Batteries can be charged directly inside the EXRAY™



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# EXRAY™ WIRELESS SYSTEM

The EXRAY™ ROV can be seamlessly upgraded with the EXRAY™ FLYOUT, transforming a tethered ROV into a zero-latency wireless inspection system powered by the advanced LUMA™ high-bandwidth communication technology.

When docked, the EXRAY™ FLYOUT and EXRAY™ ROV function as a single integrated unit. Once the pilot positions the system near the inspection target, the FLYOUT can be detached from the ROV, enabling remote control with real-time HD video streaming, as if still tethered.



## SYSTEM SPECIFICATIONS

**Dimensions for the Wireless System (LxWxH)** 629 x 378 x 321 mm (24.76 x 14.88 x 12.64 in)

**Weight in Air** 18 kg (40 lbs)

All other specifications for the EXRAY™ FLYOUT are identical to that of EXRAY™ ROV.

## INCLUDED PAYLOAD

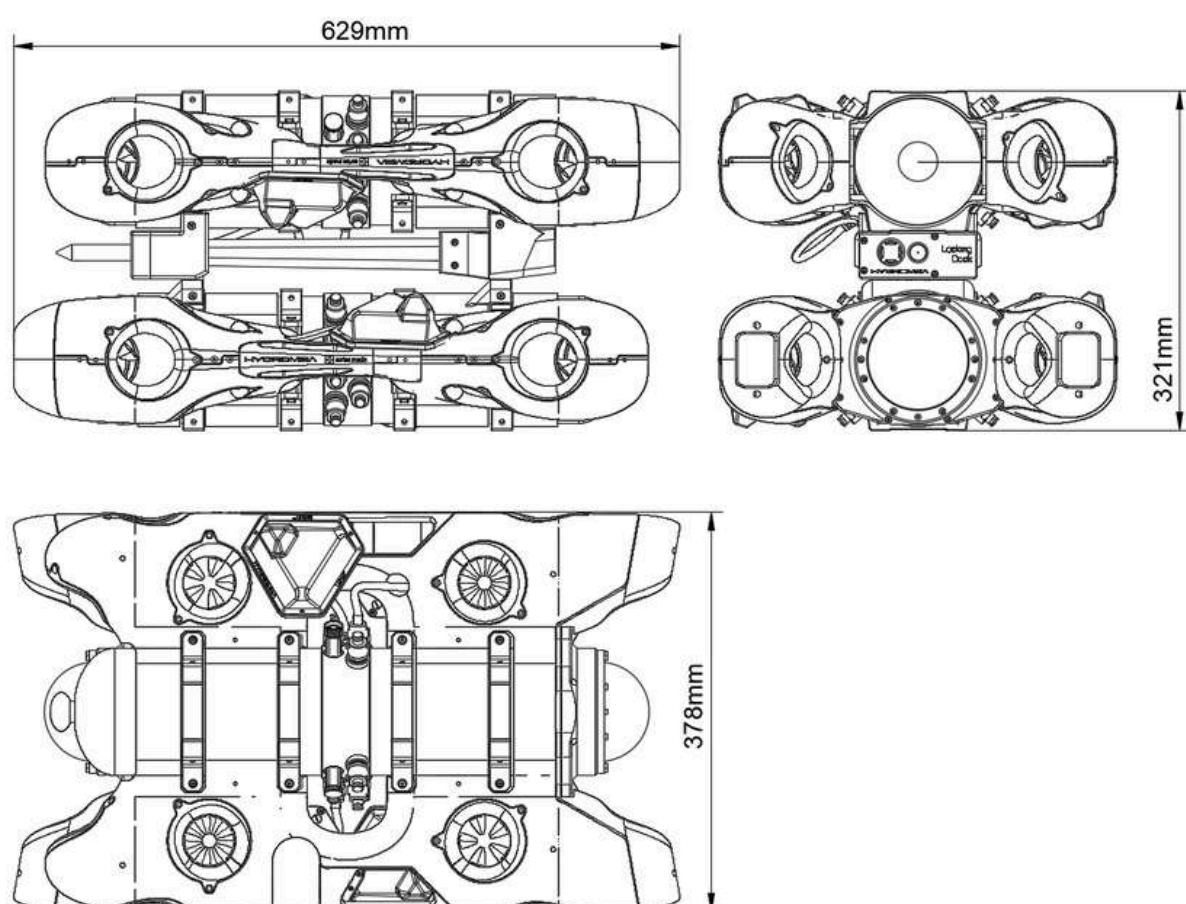
### DOCKING RAILS

**Nominal Voltage** 11V - 16.8V

**Nominal Power** 8 W

**Sensors** Positioning / locking

**Weight in Water** Neutrally buoyant



## OPTIONAL PAYLOAD

Each robot is equipped with multiple versatile payload ports: 2x Serial RS232/RS485 and CANbus, 2x Ethernet 10/100, all with power.

Additionally, there's a 1x Gigabit port for high-speed data offloading.

These universal ports allow integration with the majority of industry-standard sensors. When a payload is connected, the NAVIA™ intelligent management interface automatically recognizes it, making the payload's functions readily accessible through the NAVIA™ user interface. New payloads are continuously added to the EXRAY™ inventory and seamlessly integrated into the NAVIA™ interface.

We also offer custom integration for any specific payload you need. Please contact us for more details.



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# EXRAY™ PILOT & INSPECTOR STATIONS

The EXRAY™ PILOT STATION operates on NAVIA™, an intuitive control management platform designed for pilots. It provides comprehensive control over both the EXRAY™ ROV and EXRAY™ FLYOUT, as well as all system features.

The EXRAY™ INSPECTOR STATION serves as an optional extension of the PILOT STATION, ideal for scenarios where an inspection mission is overseen by an additional person, such as a class surveyor. This station enables real-time monitoring of the mission, along with the ability to add labels and comments to points of interest using NAVIA™'s proprietary workbook for data management and analytics.



PILOT STATION

INSPECTOR STATION

## PILOT & INSPECTOR STATIONS

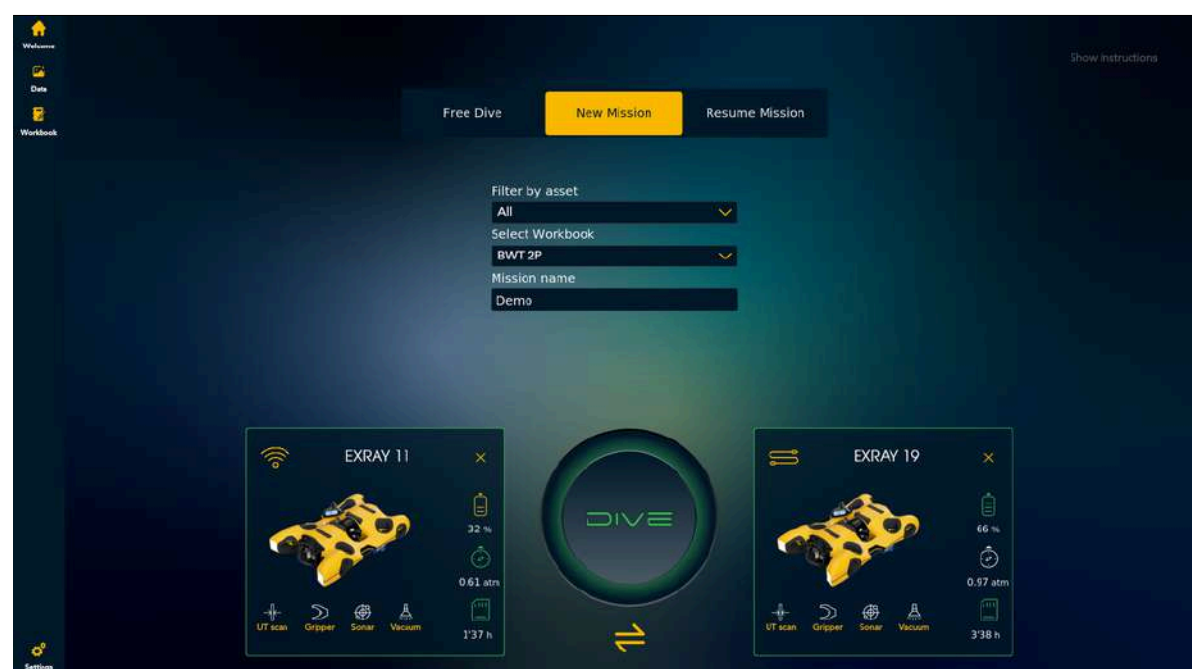
<b>Dimensions (LxWxH)</b>	420 x 320 x 180 mm (16 x 13 x 7 in)
<b>Weight PILOT</b>	8 kg (18 lbs)
<b>Weight INSPECTOR</b>	7 kg (15 lbs)
<b>Ingress Protection</b>	IP68 (closed), IP44 (open)
<b>Screen</b>	15.6 inch LCD touch screen 1080p/FHD
<b>Keyboard, Touchpad</b>	USB
<b>Operating Temperature</b>	0°C to 40°C (32°F to 104°F)
<b>NAVIA™ Mission Platform</b>	Fully integrated, intuitive professional interface and data management tool
<b>Power PILOT</b>	30 W
<b>Power INSPECTOR</b>	20 W
<b>Plug</b>	US, UK, EU
<b>External Memory</b>	microSD Card / USB Stick
<b>Remote Controller PILOT</b>	USB 2.0

## NAVIA™ MISSION PLATFORM

NAVIA™ combines advanced technology and an intuitive interface to support pilots in dive missions by streaming live video, sonar, and sensor data, capturing measurements, and recording media on a single platform.

NAVIA™ enhances INSPECTOR STATION with a second screen for in-dive POI data capture and real-time annotations. Additionally, it supports EXRAY™ software upgrades, configuration, diagnostics, and issue communication.

To go one step further in data reporting and analysis, NAVIA™+ data management tool is available as an add-on license and it further streamlines workbook creation for various inspection types, integrating them with mission management. Data is intuitively labeled and can be auto-generated into detailed reports with one click. It also consolidates data from multiple EXRAY™ ROVs across missions for centralized analysis.



NAVIA™ MISSION PLATFORM



# EXRAY™

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## Optional Payloads

PLEASE INQUIRE, IF YOU NEED  
SPECIFIC PAYLOADS NOT LISTED.



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# GRIPPER

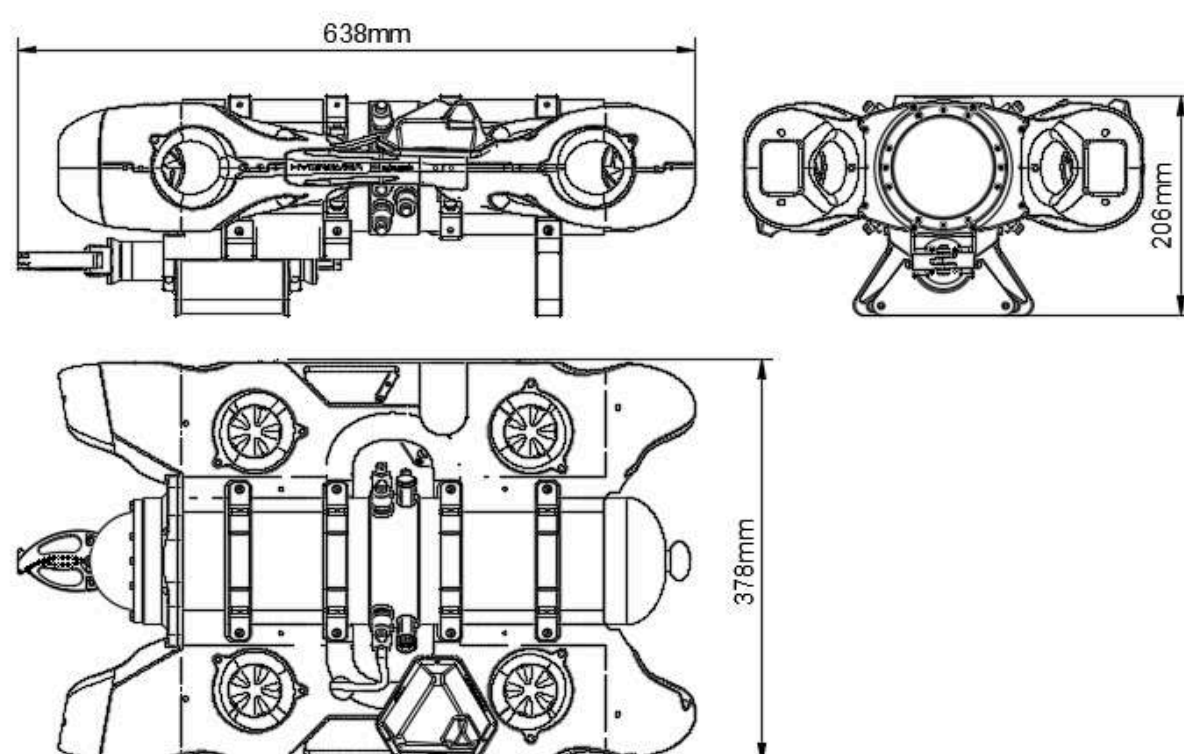
The Gripper supplied by BlueRobotics equips the **EXRAY™** with the capability to interact with the underwater environment, enabling tasks such as retrieving objects, attaching recovery lines, or freeing a snagged tether.

The Gripper is a fully integrated solution with **NAVIA™** without the need of an external system.



## SYSTEM SPECIFICATIONS

<b>Dimensions (L x W)</b>	309.2 x 36 mm (12.17 x 1.42 in)
<b>Weight in Air</b>	524 g (18.5 oz)
<b>Weight in Water</b>	Neutrally buoyant
<b>Pressure Rating</b>	300 m (984 ft)
<b>Supply Voltage</b>	9 - 18 Volts
<b>Grip Force</b>	<b>At Tip:</b> 97N (22lbf)  <b>In Middle:</b> 124N (28lbf)
<b>Jaw Opening</b>	62 mm (2.14 in)
<b>Push-rod Axial Load Rating</b>	3 kg (6.6 lb)



The Gripper as an optional payload allows **EXRAY™** to seamlessly interact with the subsea environment.



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# UT SENSOR

EXRAY™ utilizes two types of ultrasonic probes supplied by Cygnus Instruments: twin crystal (T5B) and single crystal (S2C).\*


Twin crystal probes are suited for measuring heavily corroded metals. Single crystal probes are ideal for reading through and ignoring coatings, operating in Multiple-Echo mode. They function in Echo-Echo mode, allowing them to read through and ignore up to 1 mm (0.040 inch) of surface coating, and in Single-Echo mode when there are no surface coatings. The frequency of the probes range from 2 MHz to 5 MHz and the overall weight of the UT Sensor is 1001 g (35.31 oz).

The UT Sensor is fully integrated with NAVIA™ without the need of an external system.



## SYSTEM SPECIFICATIONS


Probe T5B for M1-OEM

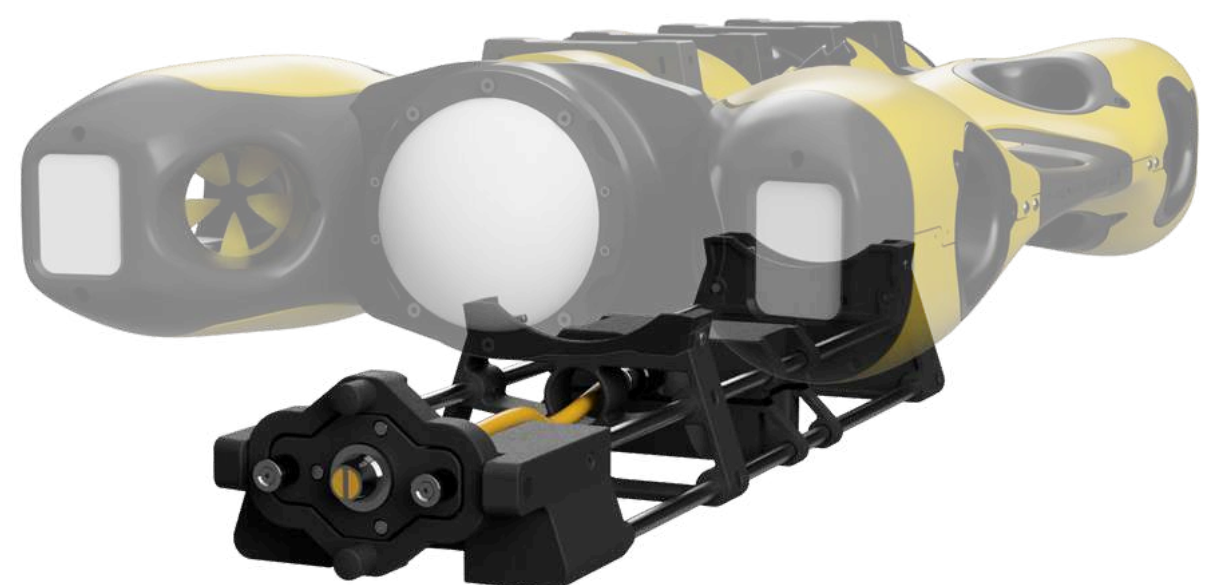
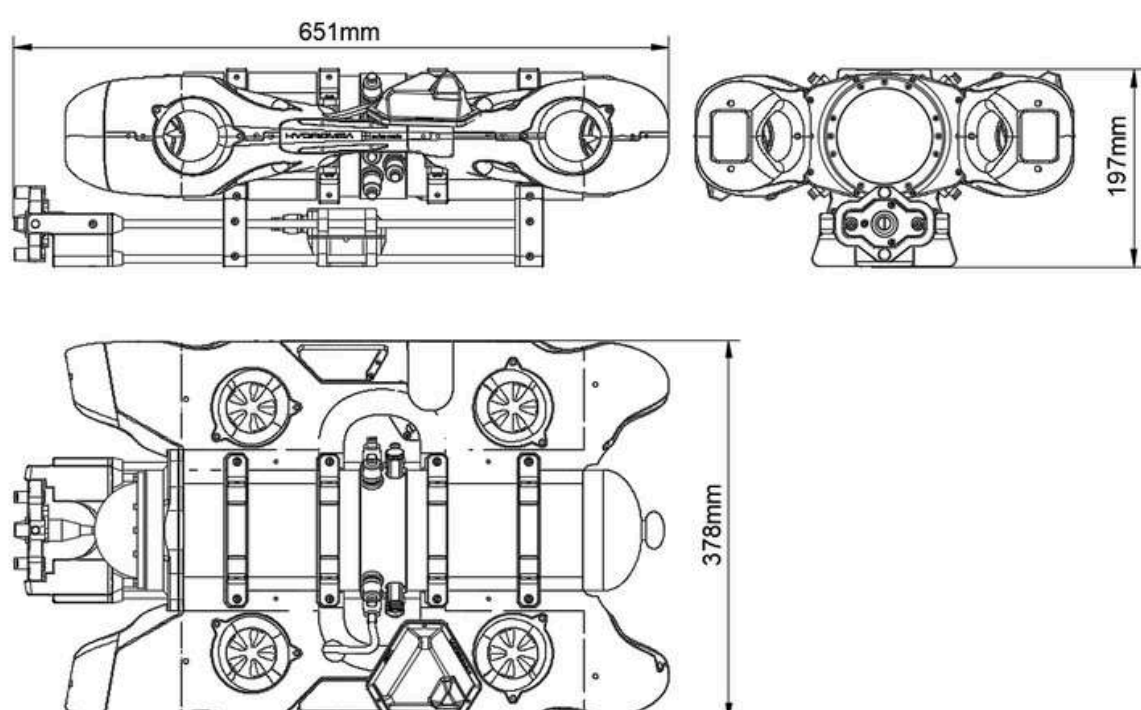
Frequency	5 MHz	
Tip Size	12.7 mm (0.5 in)	
Maximum Depth Rating	50 m (165 ft)	
Range in Steel (Single - Echo)	1.5 - 200 mm (0.059 - 7.90 in)	
Range in Steel (Echo Echo)	4 - 50 mm (0.16 - 2in)	
Temperature Range	-10°C to +70°C (14°F to 158°F)	

\*WE ARE ABLE TO PROVIDE OTHER PROBES UPON REQUEST.

## SYSTEM SPECIFICATIONS

Probe S2C for M1-OEM

Frequency	2.25 MHz	
Tip Size	13 mm (0.5 in)	
Maximum Depth Rating	300 m (984 ft)	
Range in Steel (Triple - Echo)	3 - 250 mm (0.120 - 10 in)	
Temperature Range	-20°C to +60°C (-4°F to +140°F)	



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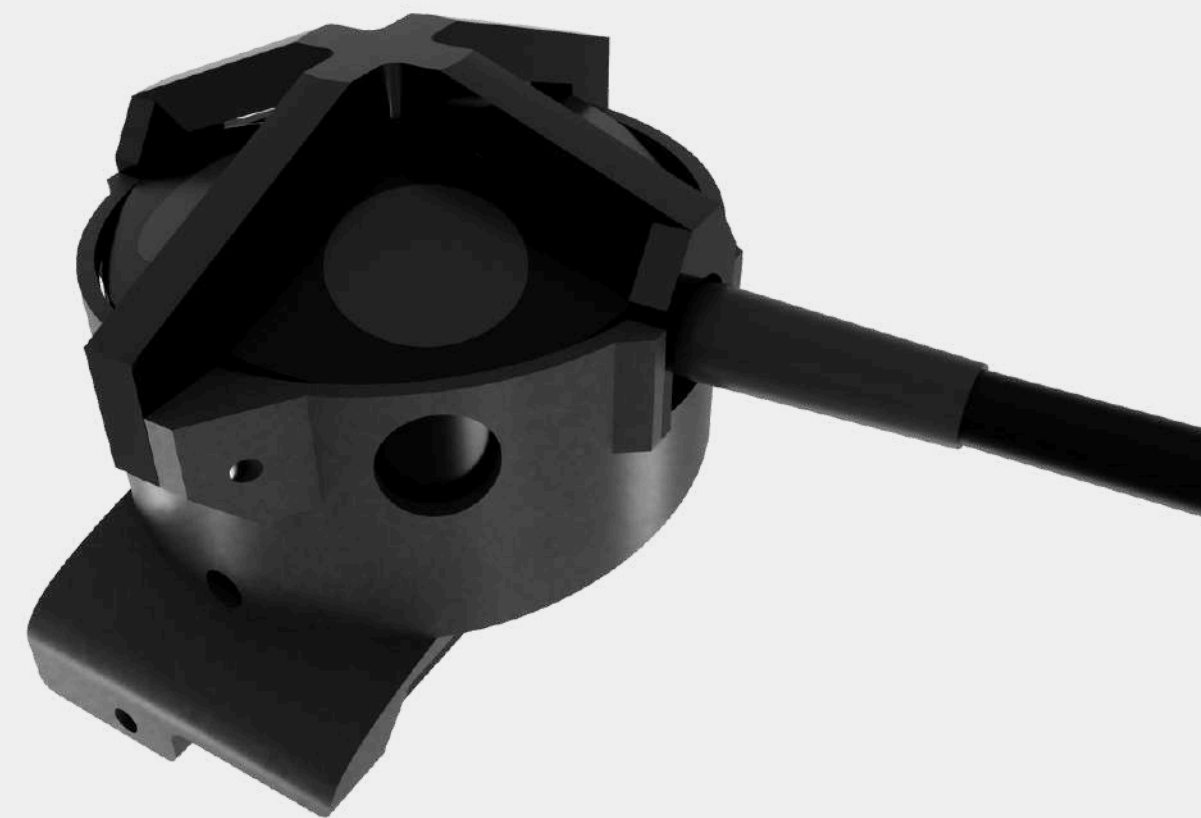
# DVL

The DVL is the cornerstone that allows **EXRAY™** to achieve full autonomy.

Provided by Water Linked, the DVL calculates velocity relative to the seafloor by emitting acoustic waves from its four angled transducers and measuring the frequency shift (Doppler effect) of the returning echoes.

By eliminating the need for topside communication, the DVL serves as a navigation sensor for **EXRAY™**, ensuring seamless stability and control during its operations.

The DVL is fully integrated with **NAVIA™** without the need of an external system.



## SYSTEM SPECIFICATIONS

Dimensions (Ø x H)	Ø 66 x 25 mm (Ø 2.56 x 1.38 in)
Weight in Air	170 g (6 oz)
Depth Rating	300 m (984 ft)
Power Consumption	4 W (Average)

## ACOUSTIC SPECIFICATIONS

Transducer Frequency	1 MHz
Ping Rate	4 - 15 Hz (adaptive to altitude)
Minimum Altitude	50 mm (1.97 in)
Maximum Altitude	50 m (165 ft)
Maximum Velocity	3.75 m/s
Long Term Accuracy	<b>Standard Version:</b> ±1.01 %  <b>Performance Version:</b> ±0.1 %



# SCANNING IMAGING SONAR

The Scanning Imaging Sonar is a mechanical scanning sonar designed for underwater navigation and imaging supplied by BlueRobotics.

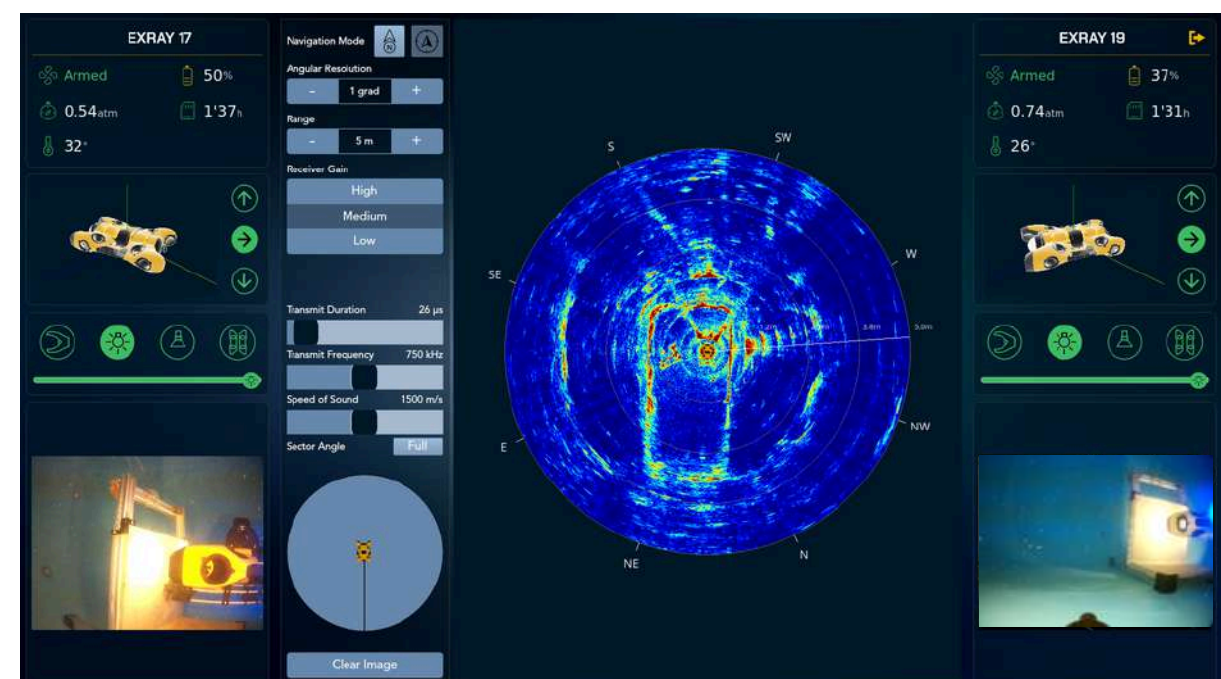
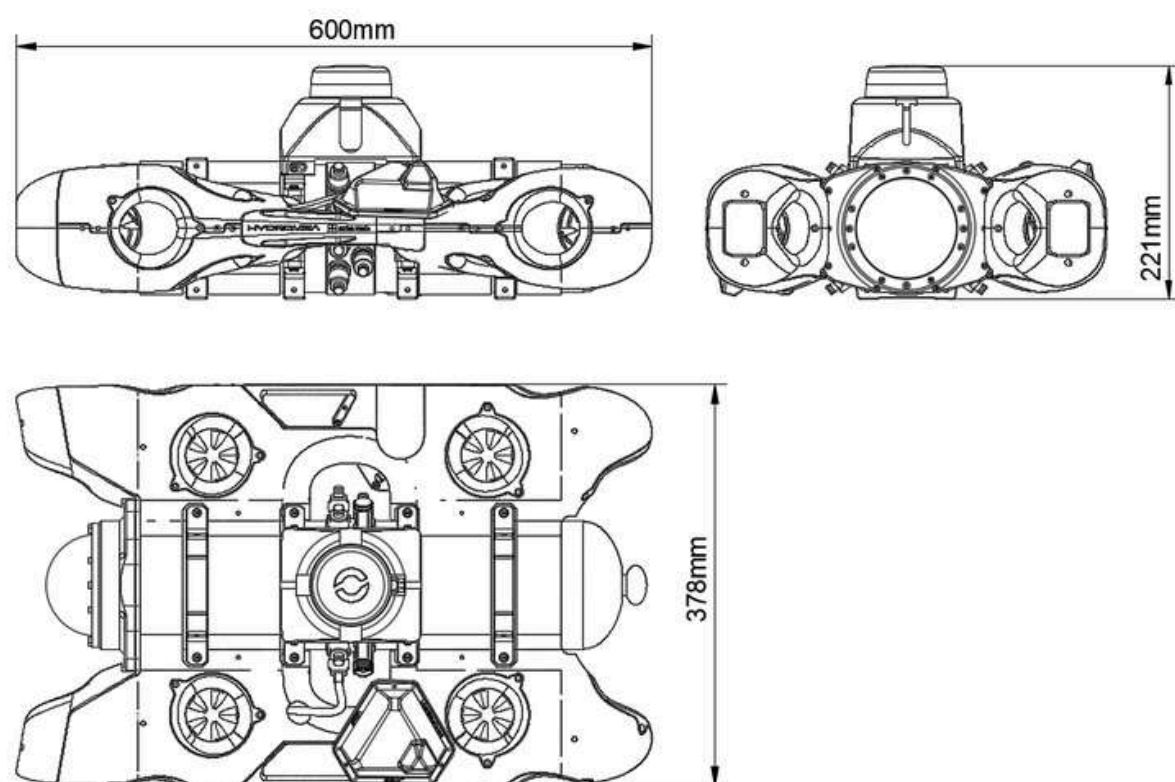
It aids in **EXRAY™** navigation by providing a top-down view of surroundings, using an acoustic transducer mounted on a rotating motor to produce detailed circular images of the underwater environment. This is a fully integrated solution with **NAVIA™**, allowing rotation and position compensation.



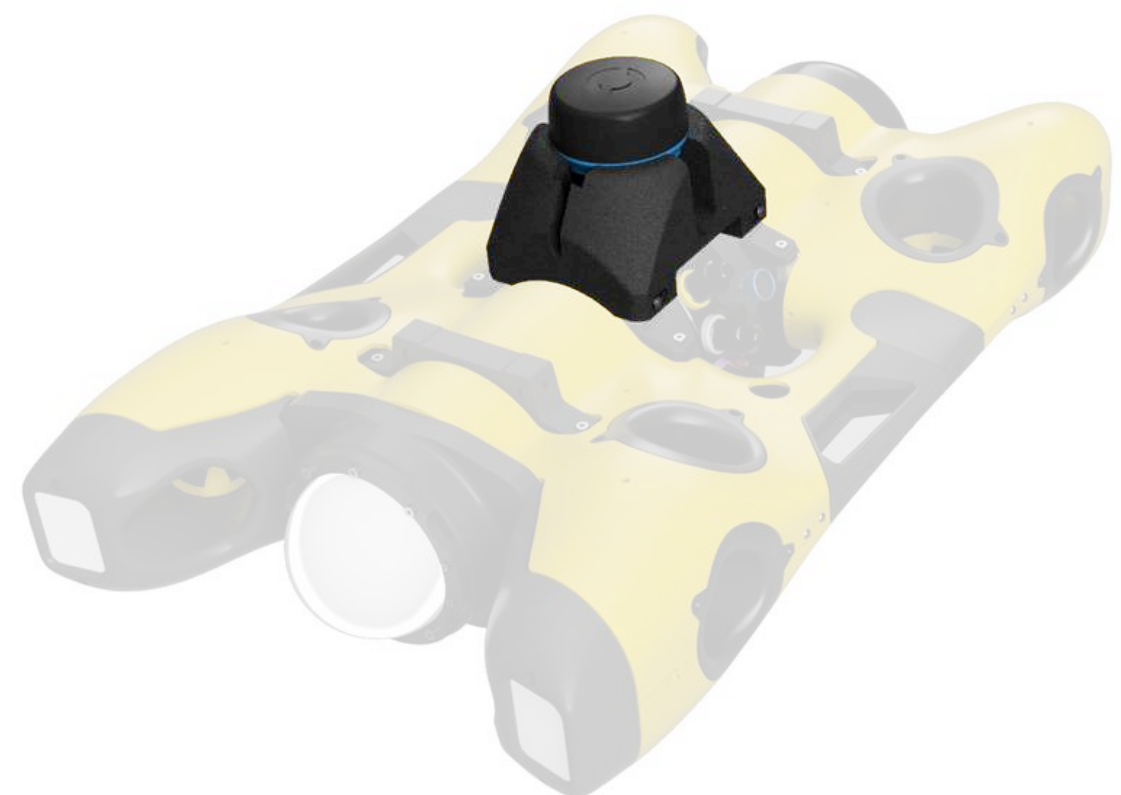
## SYSTEM SPECIFICATIONS

<b>Weight</b>	770 g (27.16 oz)
<b>Minimum Range</b>	0.75 m (2.5 ft)
<b>Maximum Range</b>	50 m (165 ft)
<b>Scanned Sector</b>	Variable up to 360°
<b>Scan Speed at 2m</b>	9 sec / 360° *
<b>Scan Speed at 50m</b>	35 sec / 360° *
<b>Pressure Rating</b>	300 m (984 ft)
<b>Temperature Rating</b>	0°C to 30°C (32°F to 86°F)

\*PRELIMINARY SPECIFICATIONS - MAY BE SUBJECT TO CHANGE WITHOUT NOTICE



No external software is needed as the data management system is fully integrated in **NAVIA™**.



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# MULTIBEAM SONAR

The Multibeam Sonar from Blueprint Subsea provides a comprehensive view of surrounding structures, objects, and the seafloor, making it an excellent navigational aid for **EXRAY™**. With rapid image updates, it enhances the ability to identify specific objects, making it ideal for underwater inspections and delivering precise dimensional data on structures and other targets.

The Multibeam Sonar is fully integrated with **NAVIA™** without the need of an external system.



## SYSTEM SPECIFICATIONS

<b>Dimensions (LxWxH)</b>	125 x 122 x 62 mm (4.92 x 4.80 x 2.44 in)
<b>Weight in Air</b>	980 g (34.57 oz)
<b>Weight in Water</b>	Neutrally buoyant
<b>Depth Rating</b>	500 m (1640.42 ft)
<b>Operating Temperature Range</b>	-5°C to 35°C (23°F to 95°F)
<b>Storage Temperature Rating</b>	-20°C to 50°C (-4°F to 122°F)

## PERFORMANCE SPECIFICATIONS

	M1200d	M3000d
<b>Operating Frequency</b>	1.2 MHz / 2.1 MHz	1.2 MHz / 3.0 MHz
<b>Maximum Range</b>	40 m / 10 m (131.23 ft / 32.81 ft)	30 m / 5 m (98.43 ft / 16.40 ft)
<b>Minimum Range</b>	2.5 mm / 2.5 mm (0.098 in / 0.098 in)	2.5 mm / 2 mm (0.098 in / 0.079 in)
<b>Update Rate</b>	40Hz	40Hz
<b>Horizontal Aperture</b>	130° / 60°	130° / 40°
<b>Vertical Aperture</b>	20° / 12°	20° / 20°
<b>Number of Beams</b>	512	512
<b>Angular Resolution</b>	0.6° / 0.4°	0.6° / 0.4°
<b>Beam Separation</b>	0.25° / 0.16°	0.25° / 0.1°



# SPEERA™ VACUUM CLEANER

SPEERA™ VACUUM CLEANER turns EXRAY™ ROV into a mighty underwater Hoover that will clean up sediment on the bottom of tanks.

This is an optional streamlined payload that has been uniquely designed for EXRAY™ ROV to reach any remote area thanks to the various nozzle shapes and ROV exceptional maneuverability.

With different mesh and nozzle sizes, it will effectively remove sediments, small rocks and debris. SPEERA™ VACUUM CLEANER can be fully customized on request.



## SYSTEM SPECIFICATIONS

Dimensions (LxWxH)	420 x 320 x 180 mm (16 x 13 x 7 in)
Weight in Air	800 g (1.76 lbs)
Rated Voltage	11 V - 16.8 V
Rated Power	50 W
Maximum Capacity	60 cl (20.29 oz)



The SPEERA™ filter can be easily removed to clean or replace for another mesh size.

## FILTER OPTIONS\*

### SMALL

Mesh / Inch	200 (75µm)
Recommended Nozzle	Wide
Min. sediments Size	~0.2 mm (0.008 in)

### MEDIUM

Mesh / Inch	100 (150µm)
Recommended Nozzle	Wide
Min. sediments Size	~0.5 mm (0.02 in)

### LARGE

Mesh / Inch	20 (841 µm)
Recommended Nozzle	Large
Min. sediments Size	~2 mm (0.078 in)

\*SPECIAL MESH SIZE CAN BE CREATED UPON REQUEST

## NOZZLES

### WIDE AND THIN

**Use Case** Used for collecting small sediment over a large zone

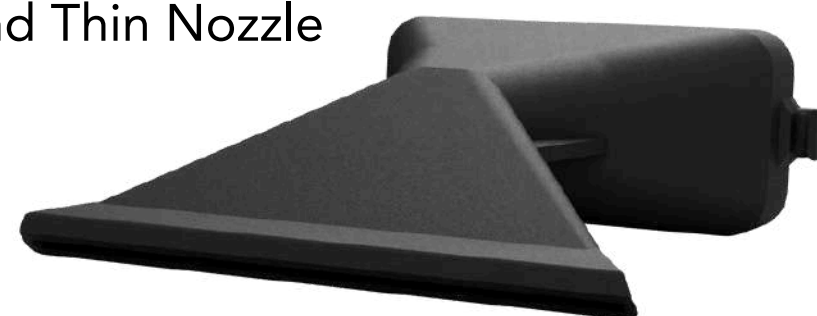
**Nozzle Entry Dimensions (L x w)** 24 x 35.5 mm  
(0.94 x 1.40 in)

### LARGE AND ROUND

**Use Case** Used for collecting bigger sediment and objects, and allowing easier access to corners.

**Nozzle Entry Dimensions (L x w)** 3 x 150 mm  
(0.12 x 5.9 in)

Wide and Thin Nozzle



Large and Round Nozzle



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