



User Manual

Flow Series II

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About Surfbee.io Flow Series

Introducing the new Surfbee ASVs:
Our Autonomous Surface Vessels are designed
to revolutionise water measurements.

Dive into a new realm of possibilities with this
advanced technology that combines precision
engineering with unparalleled performance.

This user manual is designed for the following
vessels:



Flow Seeker



Flow Scout



Flow Finder

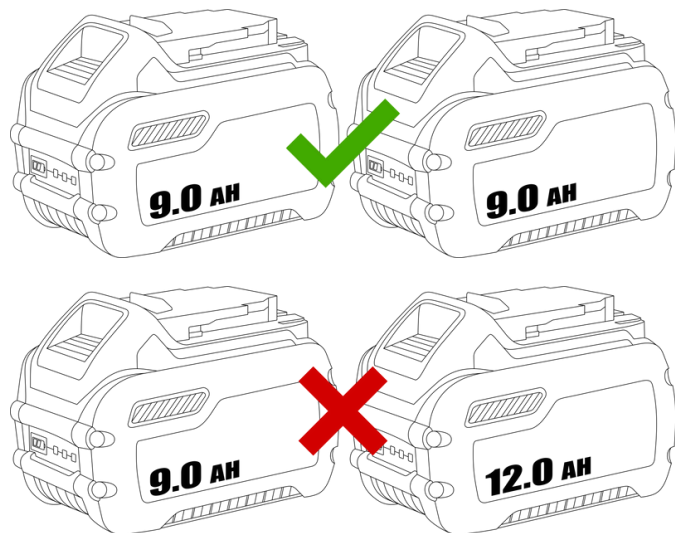
Please read before operation

Batteries DeWalt 18V

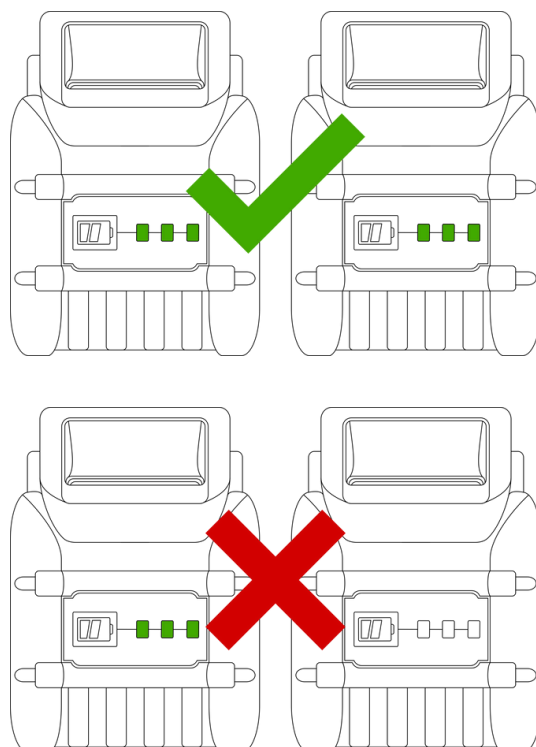
We recommend the use of 2 batteries 9.0 Ah or 12.0 Ah.

Ensure that batteries have the same capacity and charge state, mixing different battery capacities and battery charge state can damage them.

(e.g. do not use a DeWalt 9 Ah battery with a DeWalt 12 Ah)

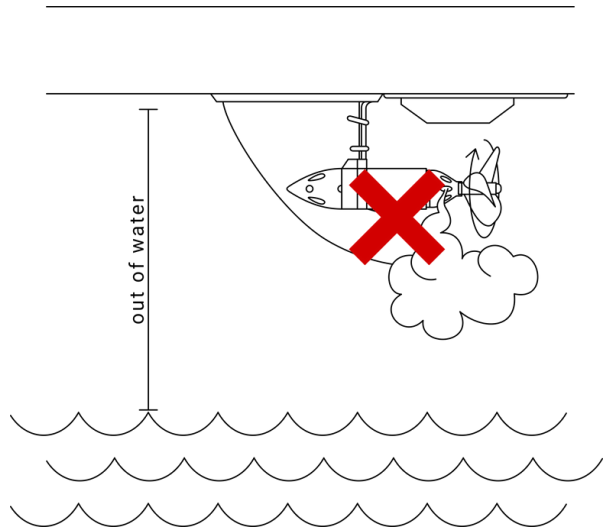


Avoid using a fully charged battery with a discharged battery to prevent damage.

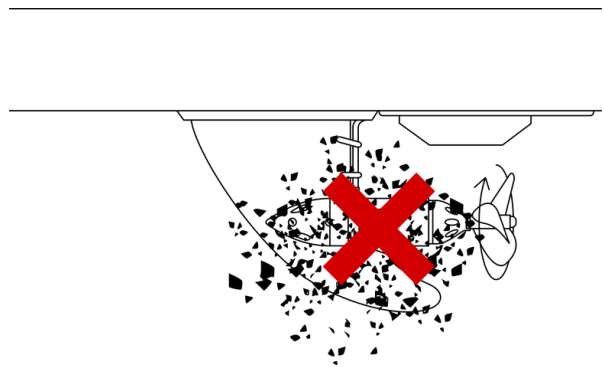


Thrusters

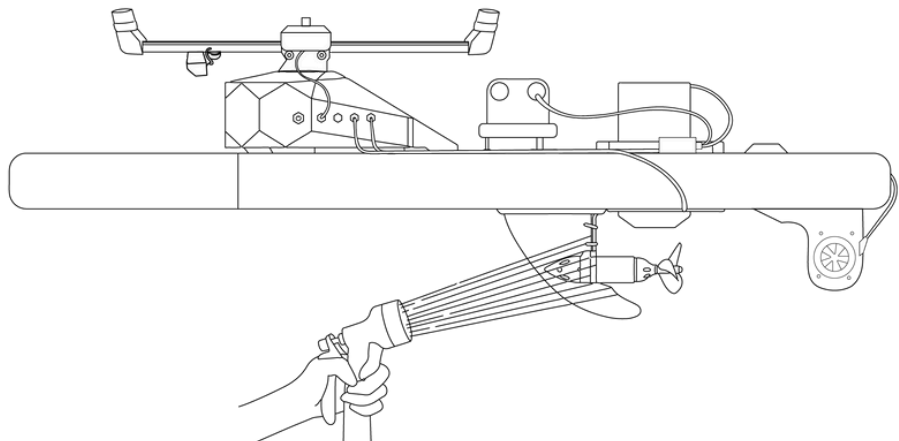
Avoid running thrusters for extended periods without being immersed in water. Overheating may damage the motor if operated out of water.



Check for debris around the motor; any obstructions may strain the motor and accelerate wear.

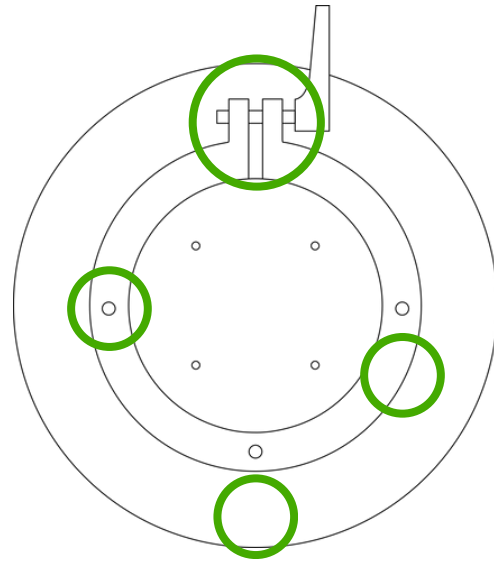


After operating in salt or turbid water, flush the thrusters with fresh water for 2 minutes to prevent corrosion.

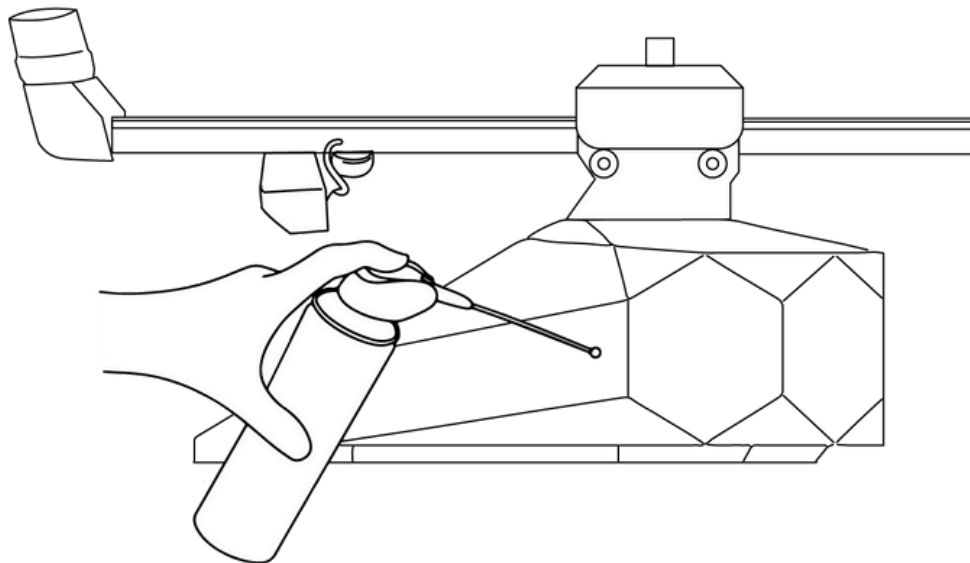


Maintenance

Before operating the vessel, ensure all bolts and mounting hardware are securely tightened.



Check for debris around the motor; any obstructions may strain the motor and accelerate wear.

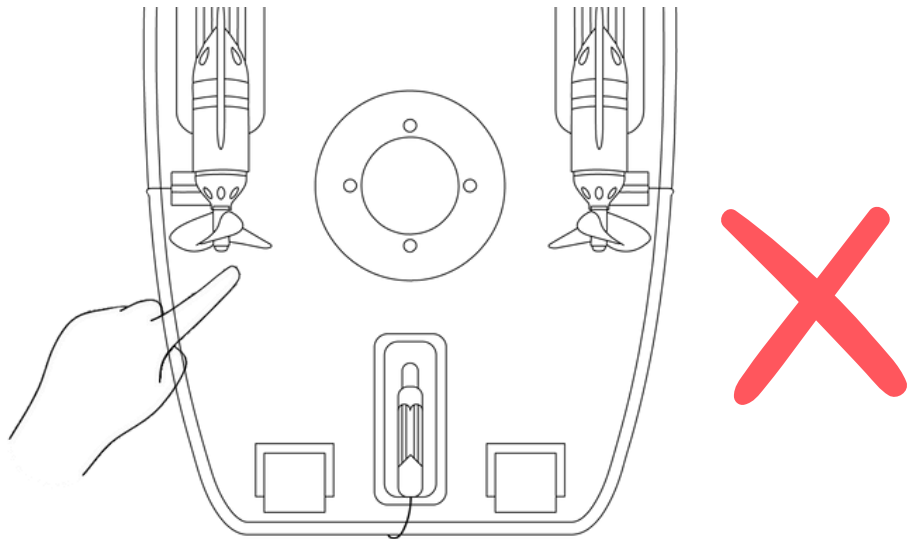


SAFETY RECOMMENDATIONS

Avoid Contact with Thrusters:

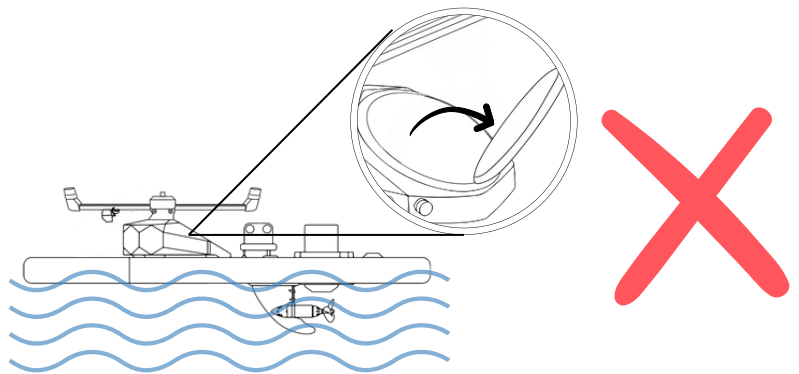
Keep all body parts clear of the thrusters at all times, especially during operation or testing, or any situations that your vessel is armed. Thrusters can cause serious injury if any body part comes into contact with them.

Always ensure that the vessel is disarmed before handling any components near the thrusters, even for inspection or maintenance.



Water and Electrical Safety:

Do not open the hatch of the vessel in wet conditions, such as when it is raining, or if the vessel is on the water. This can lead to water entering the electronics compartment, causing damage and further electronic risks. Make sure the vessel is disarmed and turned off before opening the hatch.

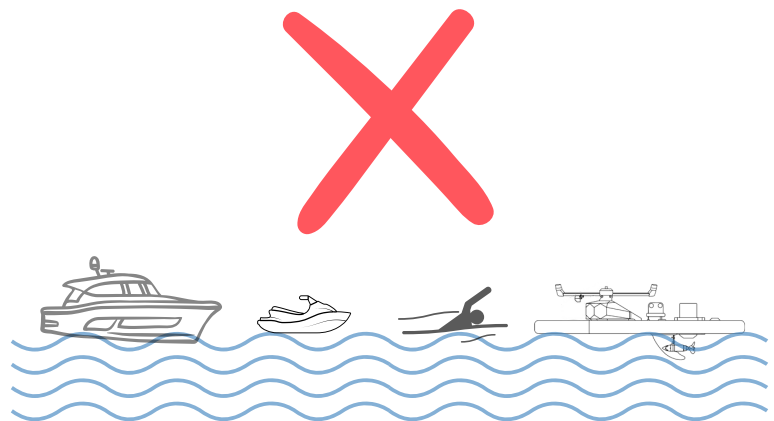


Do not operate Around People and Other Vessels:

Never operate the vessel near swimmers, divers, or areas where people may be in the water. Always maintain a safe distance from shorelines, docks, or crowded areas.

Avoid operating near other vessels. Follow local regulations regarding the distance your vessel must keep from other watercraft to prevent collisions or interference.

Always monitor the vessel's path during autonomous operation to ensure it avoids people, wildlife, and other obstacles.



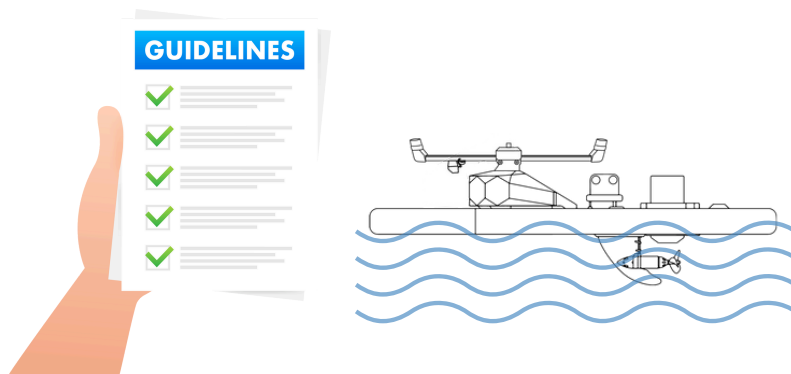
SAFETY RECOMMENDATION

Follow Marine Authority

Guidelines:

Always comply with local maritime authority regulations and navigational laws in your country. This includes understanding speed limits, restricted areas, and no-go zones.

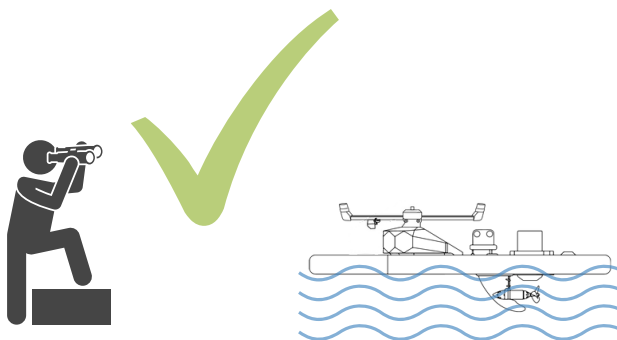
While operating your vessel make sure you comply with international regulations for preventing collisions (COLREGs) and the Water Authorities in your country, including but not restricted to licenses to operate ASVs.



Remote Operation Safety:

If operating the vessel remotely, always maintain clear visual contact or use the camera to monitor its location and activity.

Be prepared to manually intervene and take control if autonomous navigation fails or if the vessel behaves unpredictably.



Follow the instructions in this Manual

Make sure the operators are trained and follow all the operations procedures in this manual



Risk of Liability:

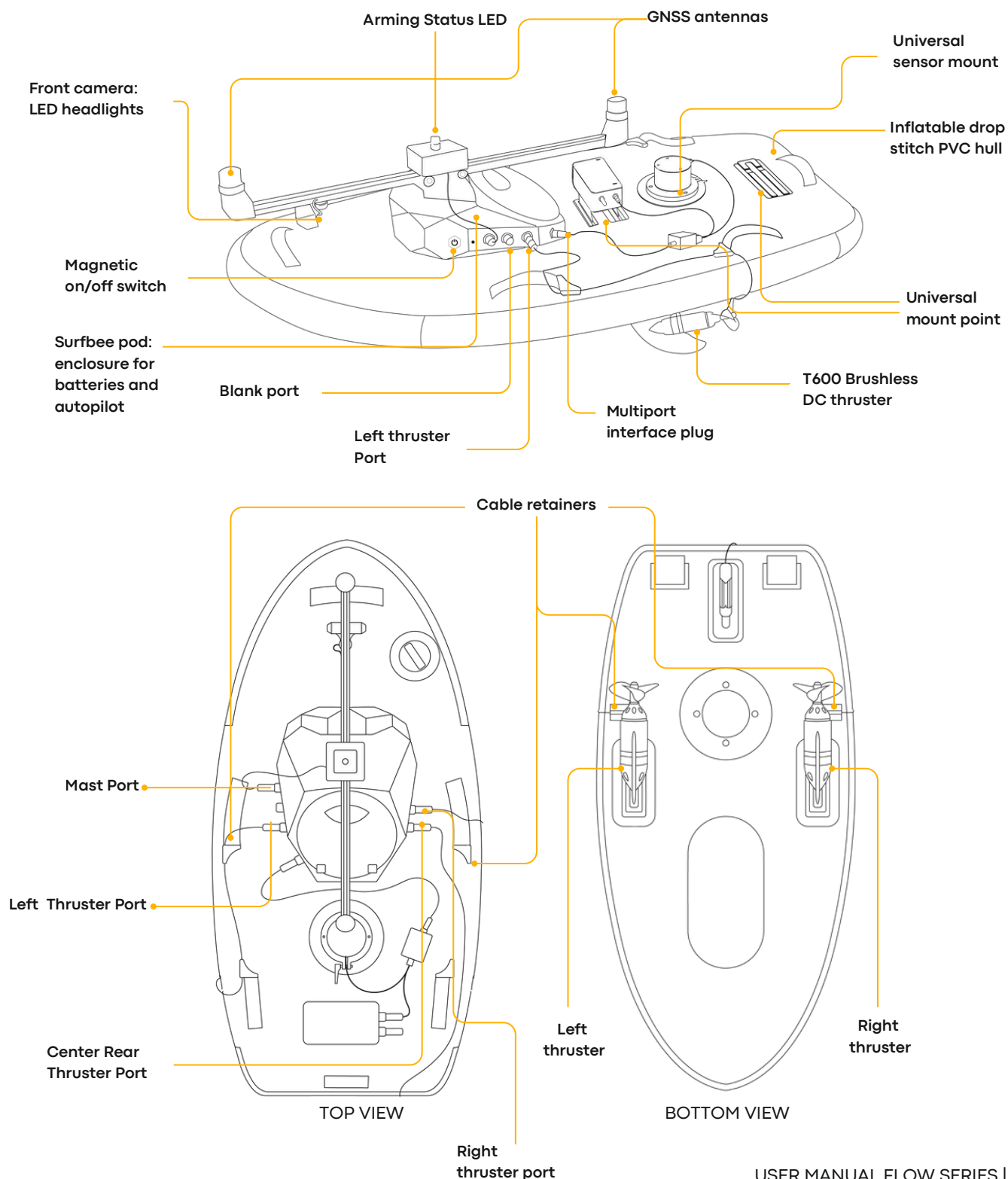
Always operate the vessel in compliance with the safety guidelines provided. Failure to follow these guidelines can result in damage, injury, void of warranty or legal consequences.

The manufacturer cannot be held liable for accidents, injuries, or damages caused by improper operation or non-compliance with these safety recommendations.

By adhering to these safety recommendations, you help ensure the safe and responsible operation of your vessel, minimizing risks to both people and property. Always prioritize safety in every step of the process, from setup to post-operation care.

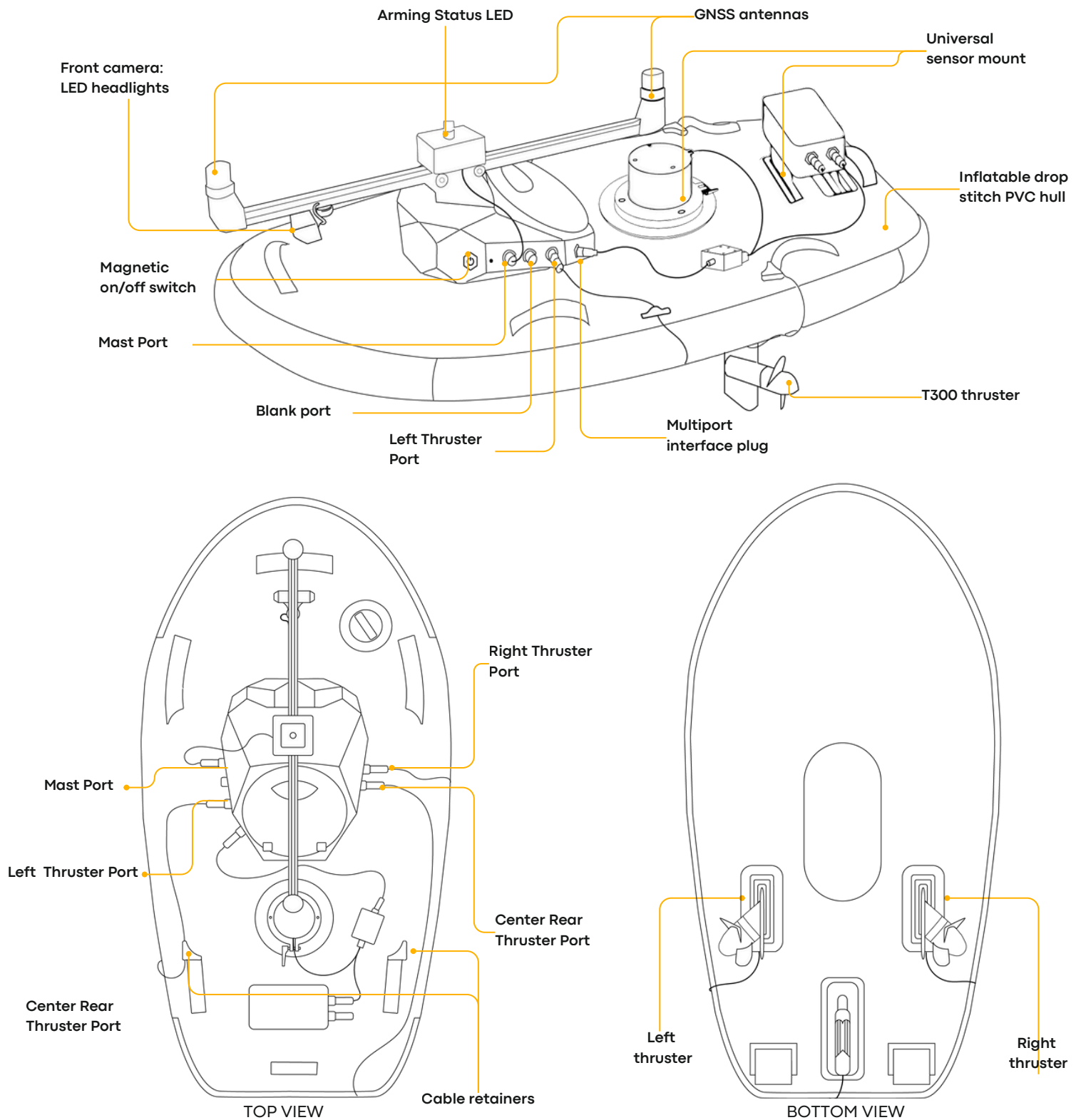
Equipment Overview

Flow Seeker



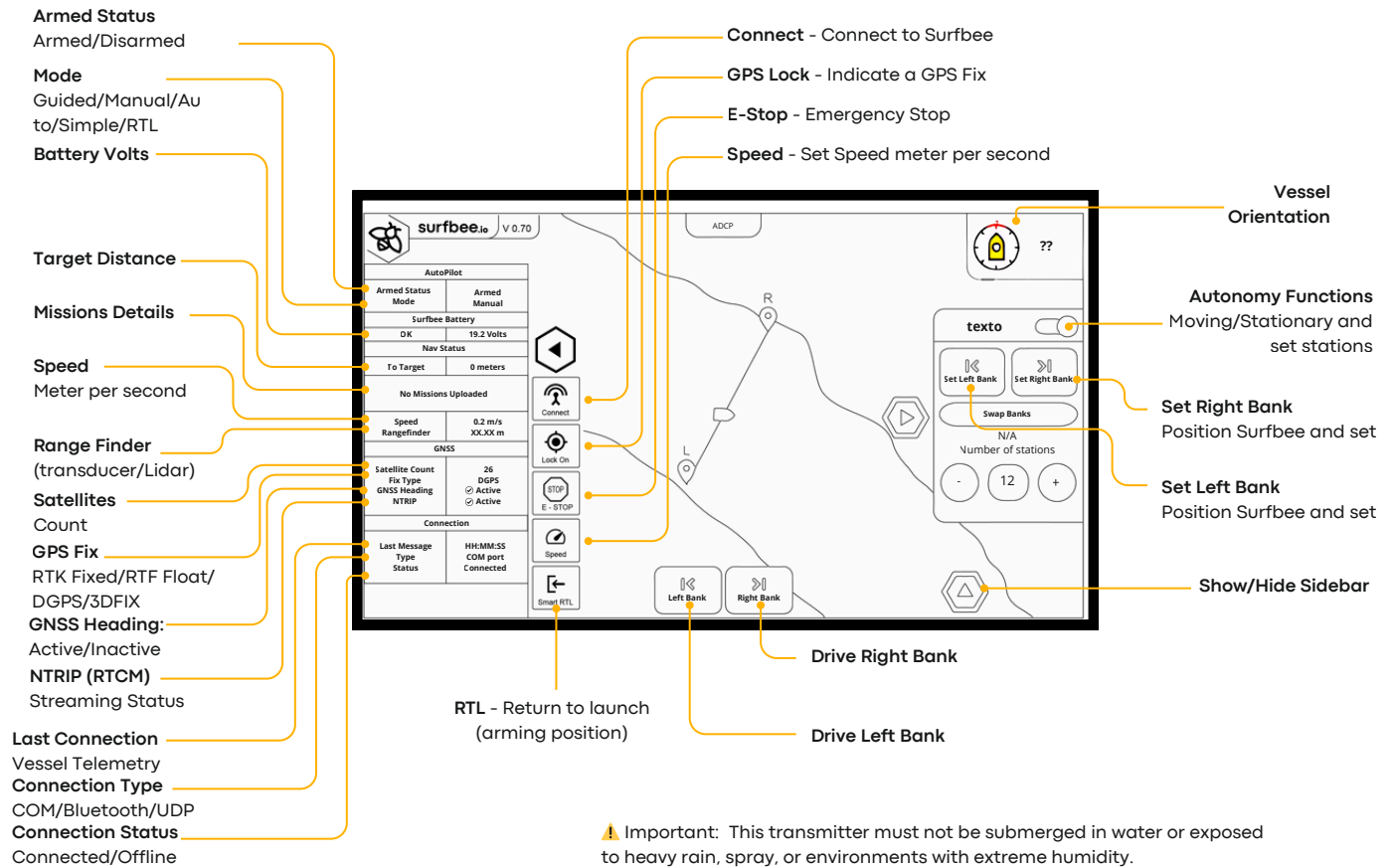
Equipment Overview

Flow Scout/Finder

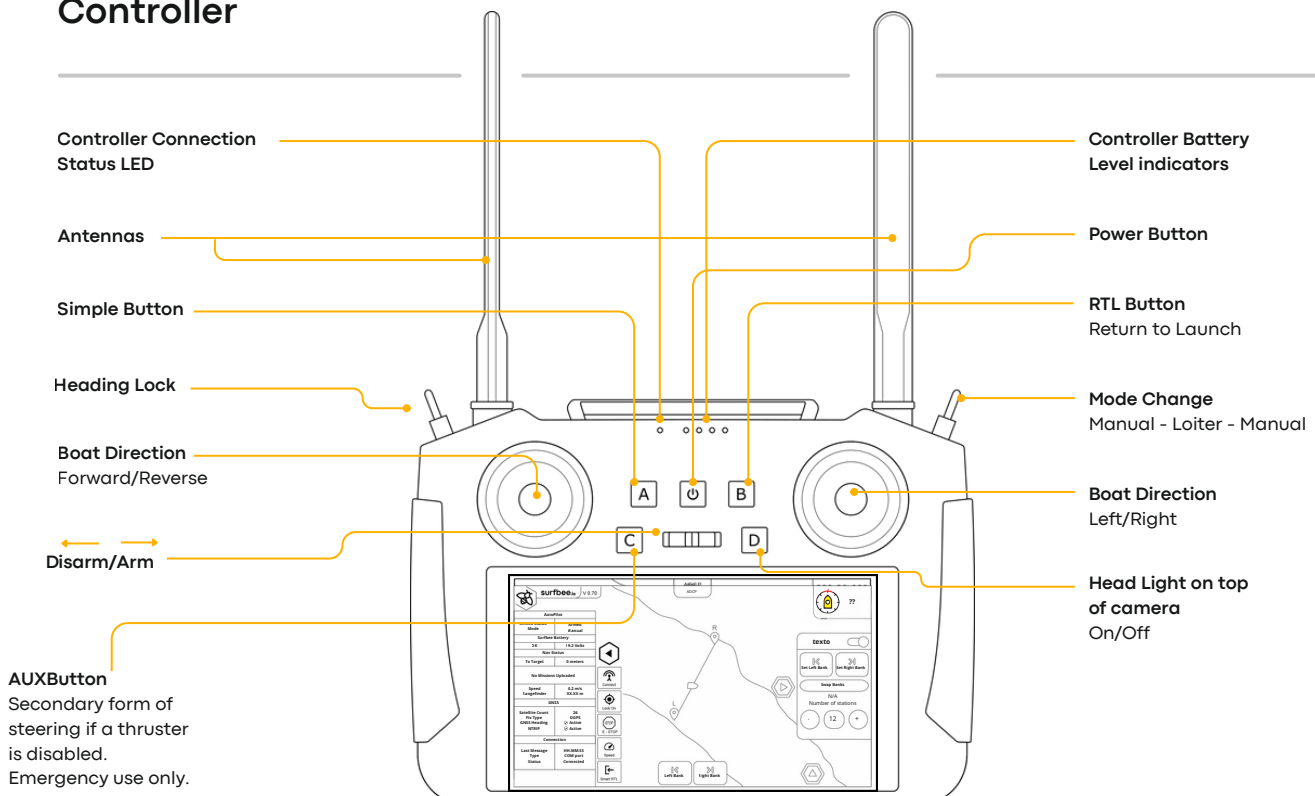


Surfbee App

For more information check the Surfbee App Manual



Controller

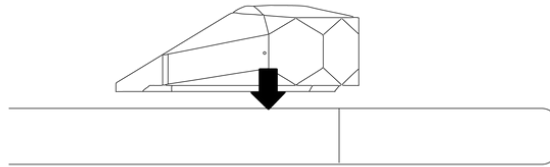


Assembling your Surfbee Flow Series

1 Inflate your vessel's hull

- 1.1 Before fully inflating your vessel, partially inflate it to provide just enough rigidity to insert the yellow plastic pod into the designated compartment.

Ensure the pod is positioned as illustrated in the provided image.

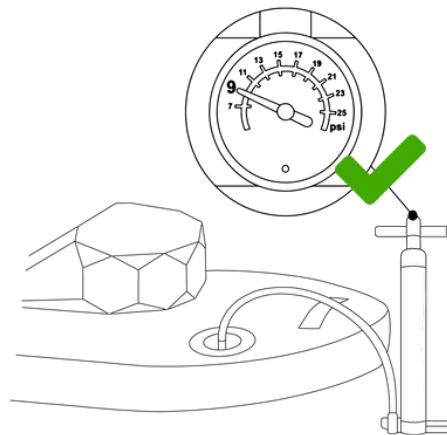


- 1.2 Once the pod is securely in place, continue inflating the vessel to the correct air pressure (7-9psi).

This process ensures that the pod is firmly secured by the pressure of the inflated vessel, maintaining stability and buoyancy during operation.

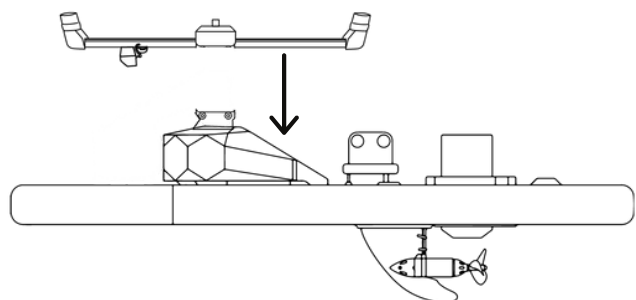
Note:

If you experience difficulty fitting the pod into the hull, try placing the hull on the floor and partially inflating it to give it some shape. Insert the pod as much as possible while the hull is still slightly inflated. Then, inflate the vessel to around 7 psi. With the vessel stabilized at this pressure, you can apply additional force to securely seat the pod into position.



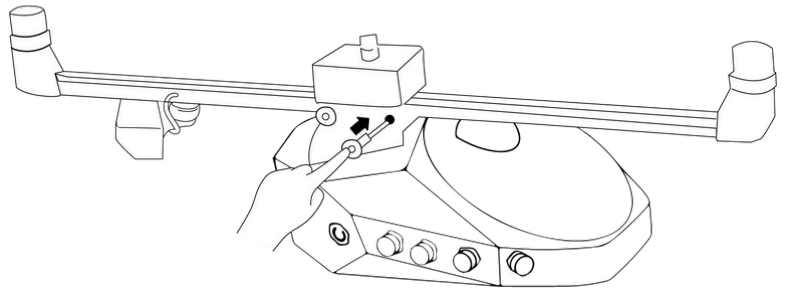
2 Attach the mast to your vessel

- 2.1 Place the mast on top of the yellow pod and align the holes on the base of the mast with the corresponding holes on the yellow pod.

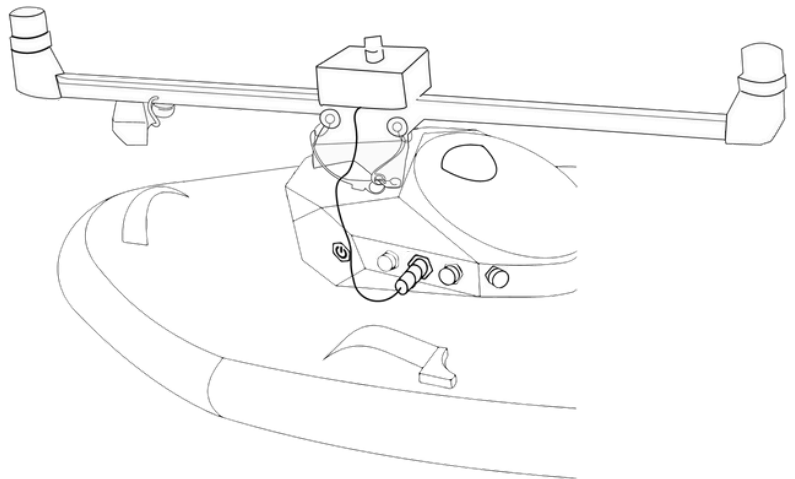


ASSEMBLY

- 2.2** Press the center button on each quick release pin to unlock them, allowing the pins to be inserted.
- 2.3** While keeping the holes aligned, insert each pin through the holes on both the mast and the yellow pod. Ensure the pins go all the way through and lock in place.

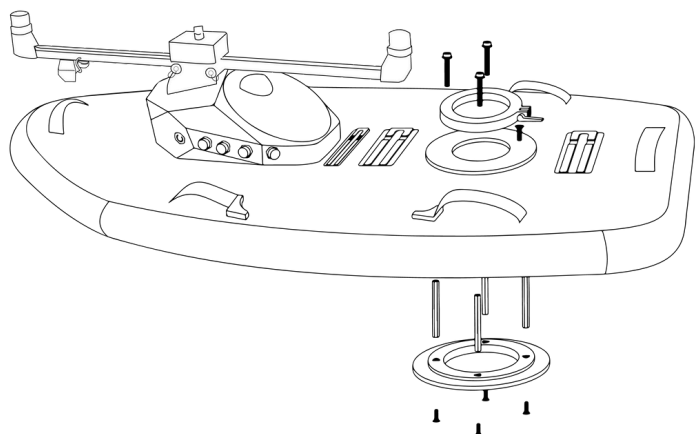


- 2.4** Gently tug on the mast to confirm it is properly secured to the vessel. Ensure both quick release pins are fully inserted and locked.
- 2.5** Connect the Mast to the connector, as the image shows .

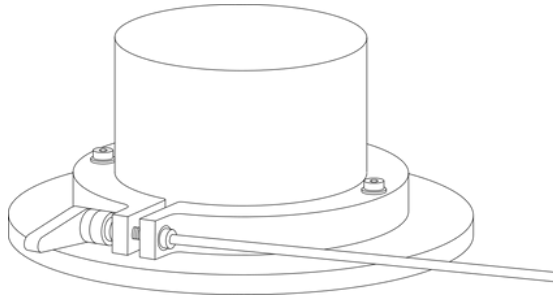


3 Attach the mounts to the vessel

- 3.1** Attach the mount to your vessel by connecting the bolts as the image shows.

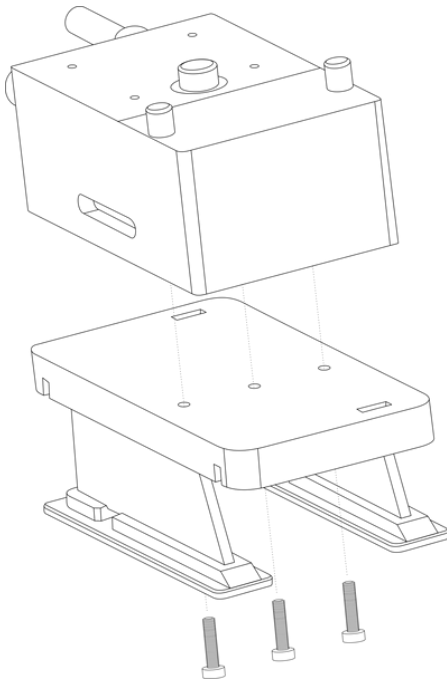


- 3.2** If your sensor requires an adapter, connect the adapter to the mount first. Then, insert your sensor into the mount and tighten the bolts to secure your sensor to the vessel using the provided key.

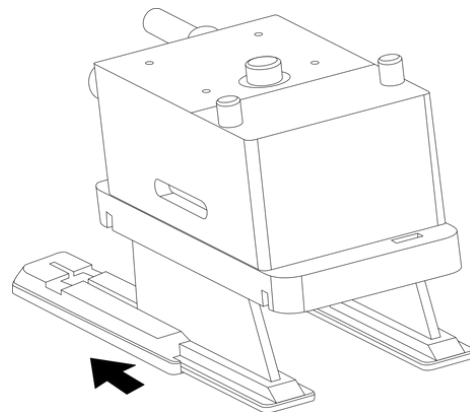


4 Attaching the PCM mount

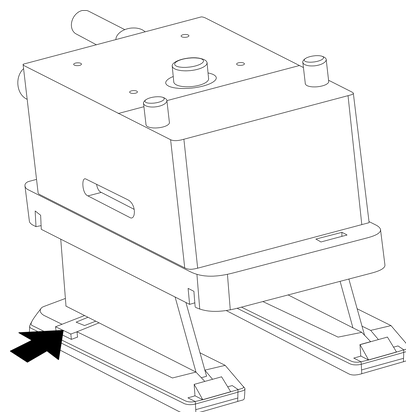
- 4.1** Connect the PCM to its mounting equipment, using the provided bolts as the image shows:



- 4.2** Then, slide the PCM Mount into one of the two universal mount points located on the top of your vessel.



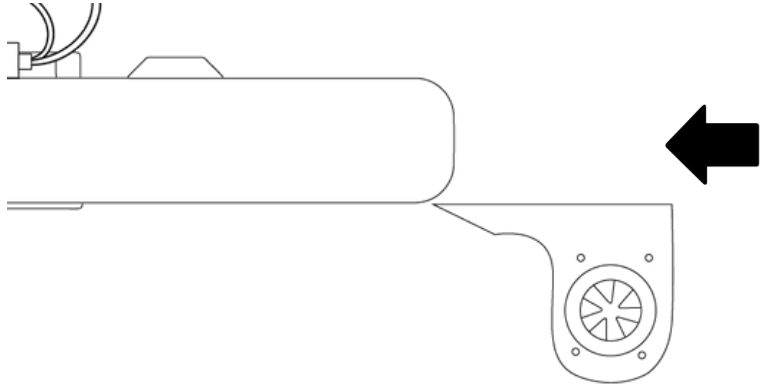
- 4.2** After that, insert the safety lock to secure your PCM.



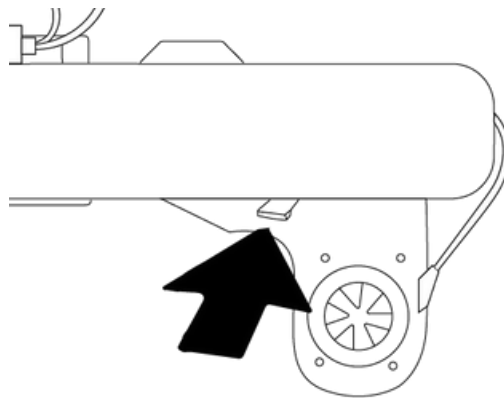
5 Connect Your Thrusters

Center Rear Thruster

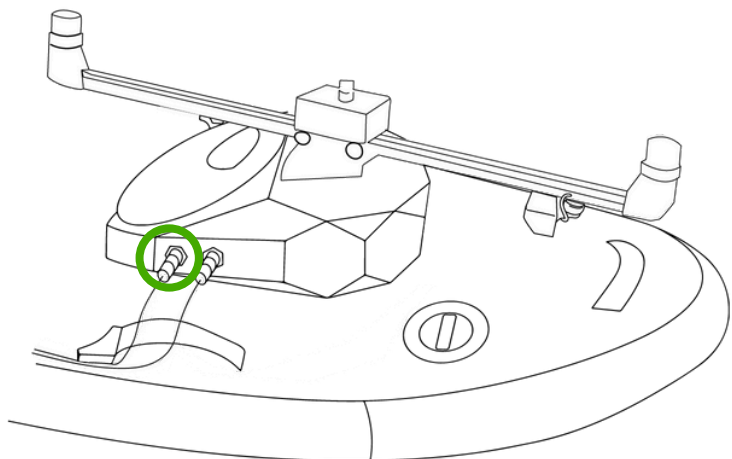
- 5.1 Slide the Center Rear Thruster into the mount located in the bottom of your vessel as the image shows



- 5.2 Then, slide the grey lock to secure it to the pod.

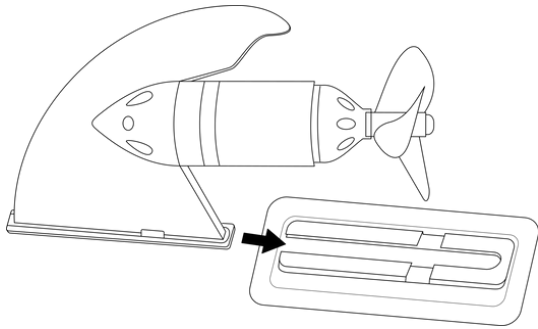


- 5.3 Once the Center Rear Thruster is fully attached and secured, connect the cable into the back port located on the right side of your vessel.

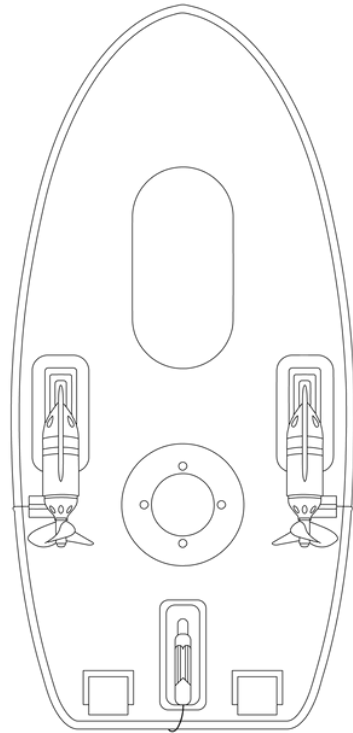
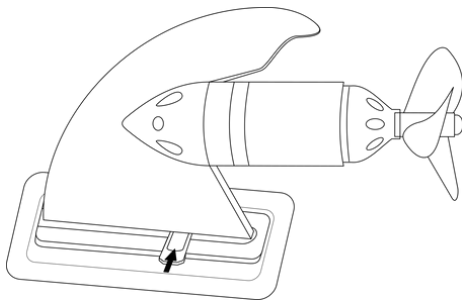


Left Thruster

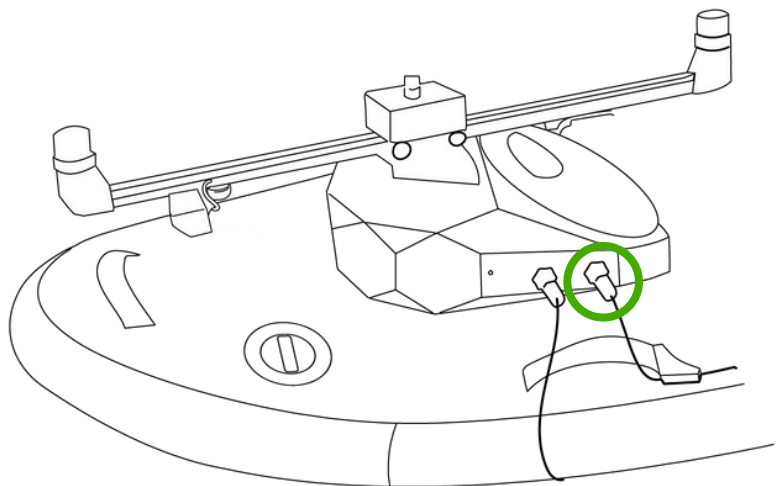
- 5.4 Slide to insert the left thruster in the skeg base located in the bottom of your vessel



- 5.5 Slide to insert the left thruster in the skeg base

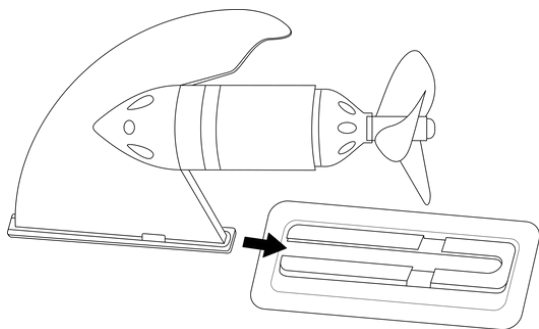


- 5.6 Once the left thruster is fully attached and secured, connect the cable into the back port located on the left side of your vessel, as the image shows.

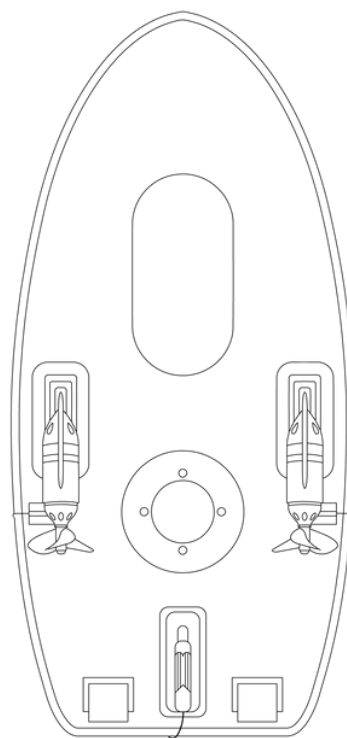
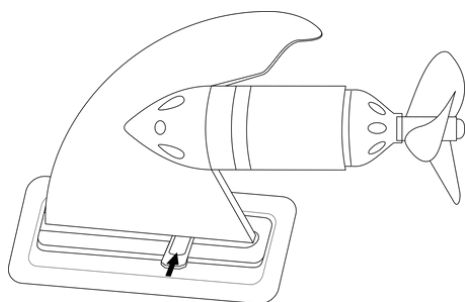


Right Thruster

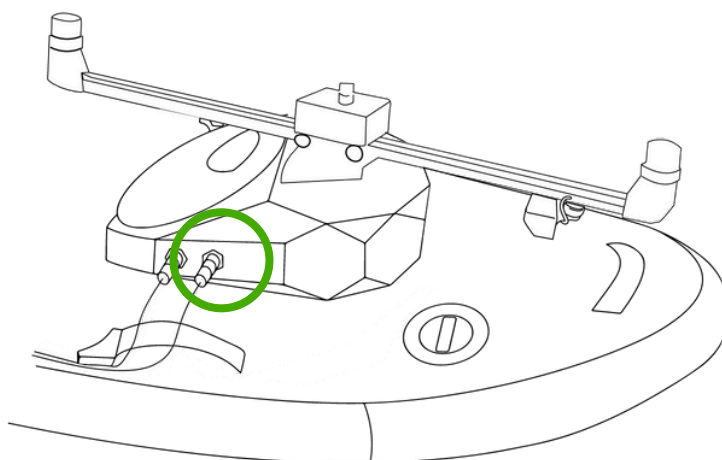
- 5.7 Slide to insert the right thruster in the skeg base located in the bottom of your vessel.



- 5.8 Slide to insert the Right thruster in the skeg base

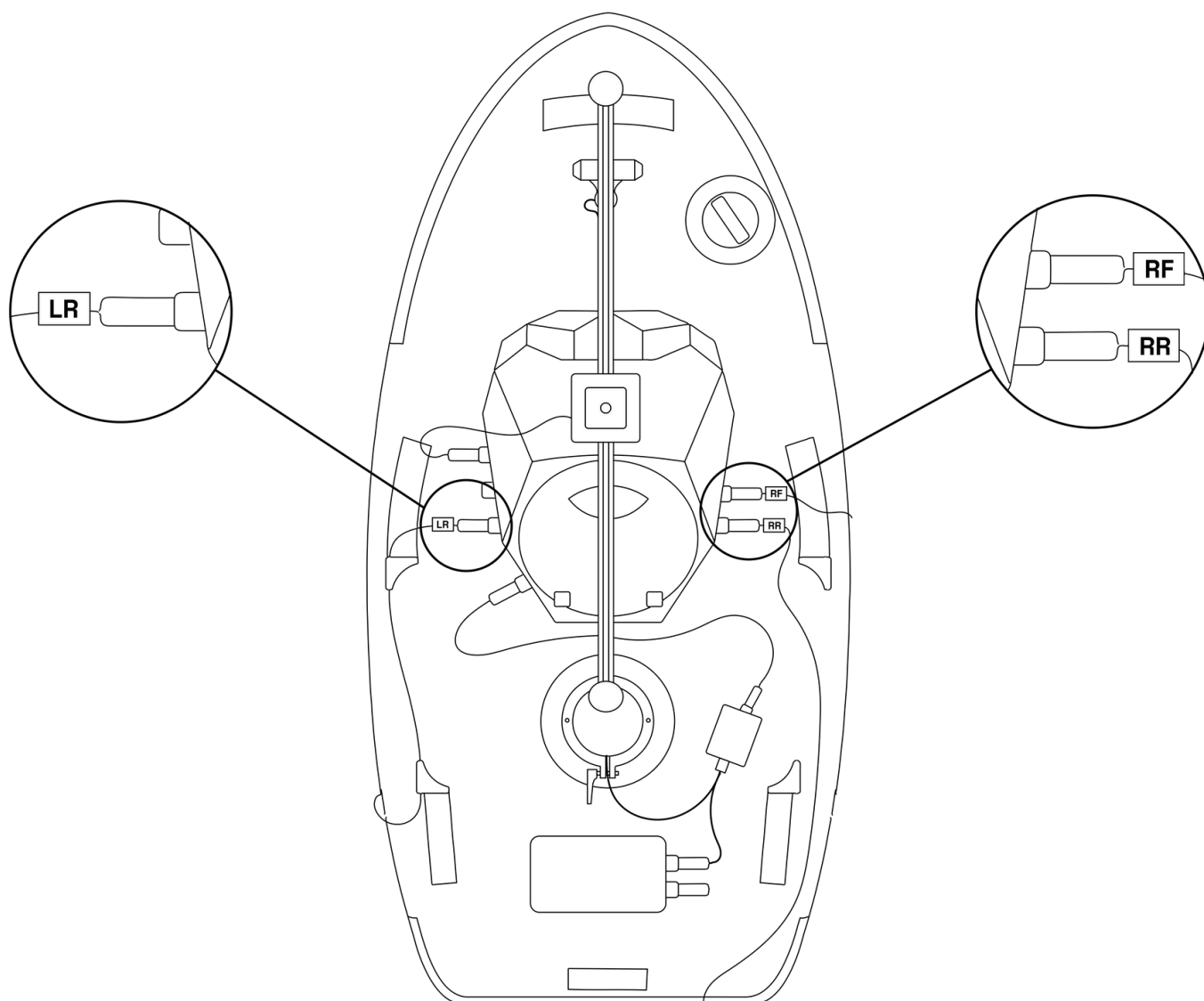


- 5.9 Connect the thruster cable (right thruster) into the right side of the plastic pod.



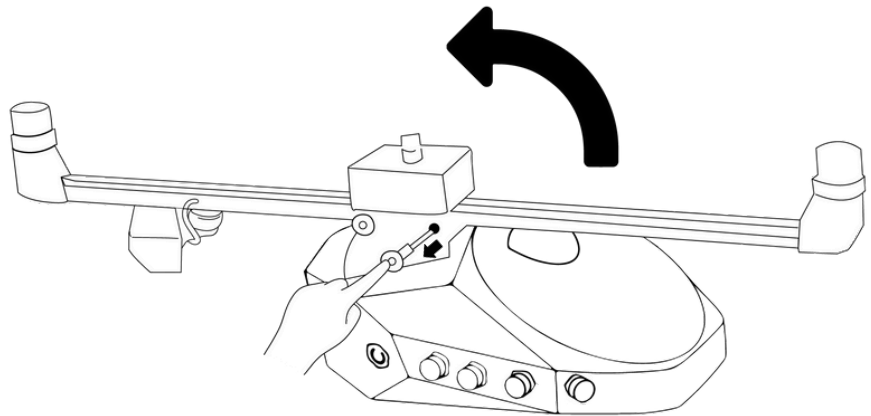
Check Motor Position

After connecting the motors according to the port instructions, verify that the 3D-printed labels on each motor match the stickers inside the pod, as shown in the image below. This ensures each motor is installed in the correct position for proper operation.

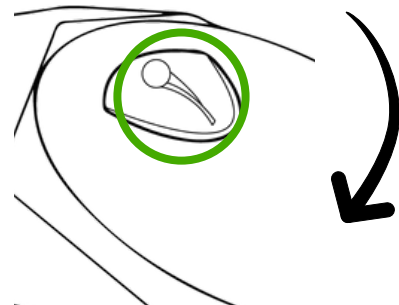


6 Open the Hatch and Replace the Batteries

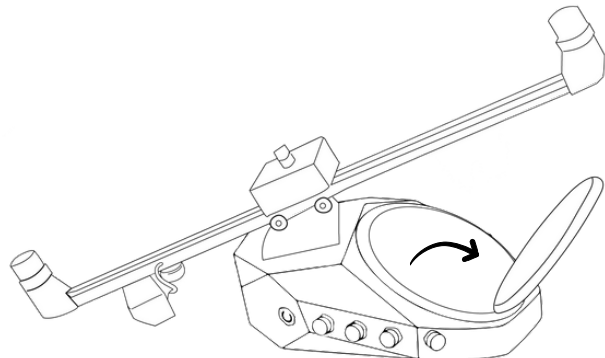
- 6.1 Locate the Quick-Release Pin: Identify the quick-release pin positioned on the right side of the mast.
- 6.2 Remove the Pin: Press the center button of the pin, then carefully pull it out to release the mast.
- 6.3 Swing the Mast: Once the pin is removed, swing the mast forward to provide access to the hatch.



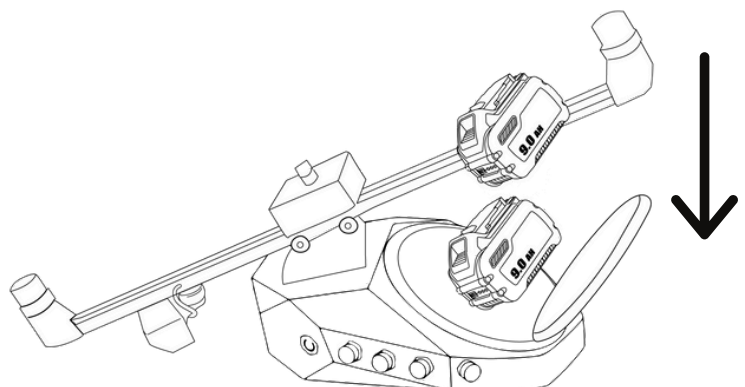
- 6.3 Unlock the Hatch: Move the lock in the direction indicated in the image to unlock the hatch.



- 6.4 Open the Hatch: With the mast swung forward and the hatch unlocked, proceed to open the hatch as shown in the image.

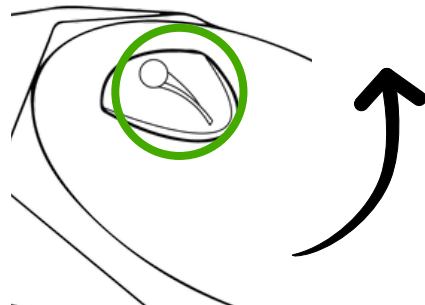
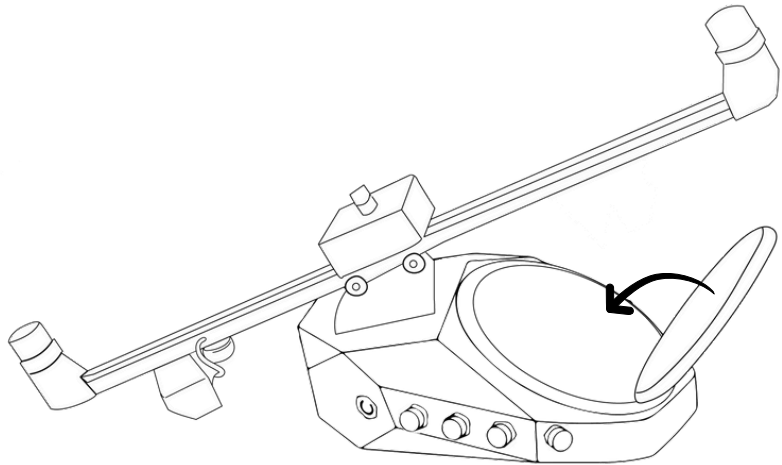


- 6.5 Insert the Batteries: Place the batteries into the designated compartment.



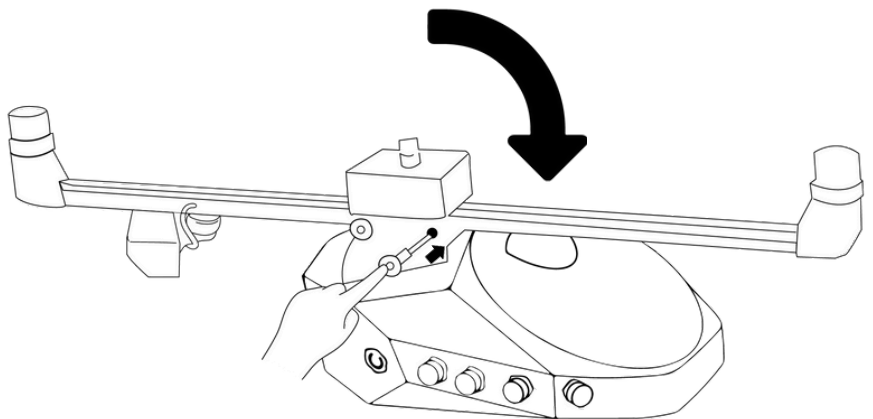
7 Close the Hatch

- 7.1** Close the Hatch: After the batteries are inserted, lower the hatch and lock it by moving the lock back in the reverse direction, as shown in the image. This is an important step to maintain the waterproofness of your electronics



- 7.2** Return the Mast: Swing the mast back to its original position

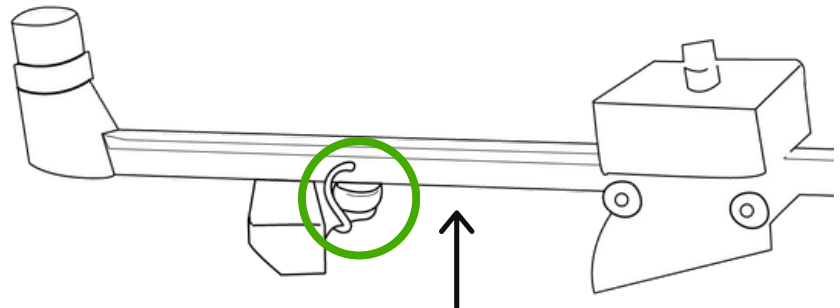
- 7.3** Reinsert the Quick-Release Pin: Align the mast and insert the quick-release pin back into its place by pressing the center button and pushing it through the slot to lock the mast securely.



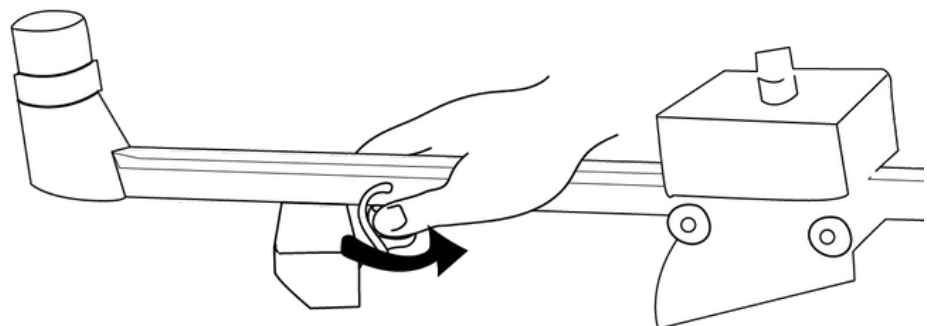
8 Adjust the Camera Angle

- 8.1 Lift the Knob: Gently lift or pull up the knob. This will unlock the camera, allowing you to adjust its position.

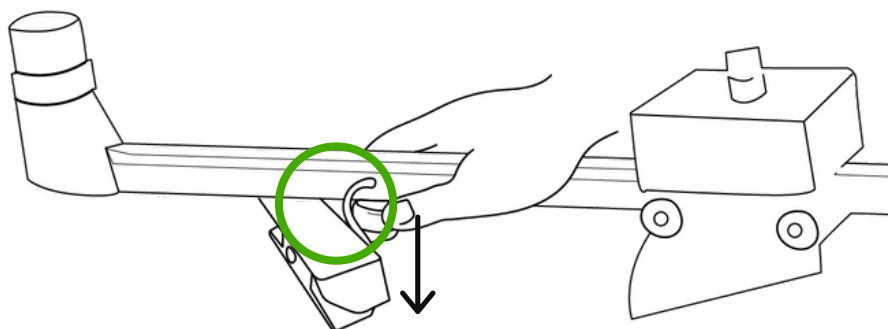
- 8.2 Locate the Adjustment Knob: The part marked in the green circle is a locking knob for the camera angle adjustment. This is what you refer to as the "round thingy".



- 8.2 Twist to Adjust the Angle: Once the lever is lifted, rotate the camera in the desired direction to set the angle you need.

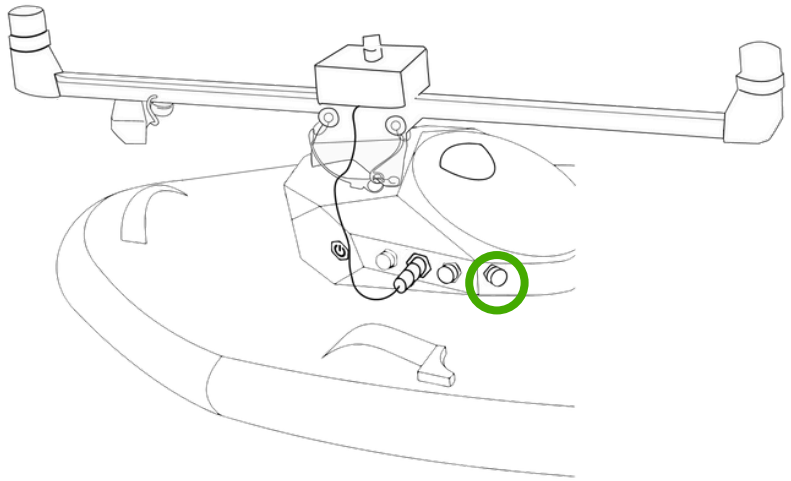


- 8.2 Lock the Position: After adjusting the camera to the desired angle, push the lever back down to lock it in place. This will secure the camera and prevent further movement.

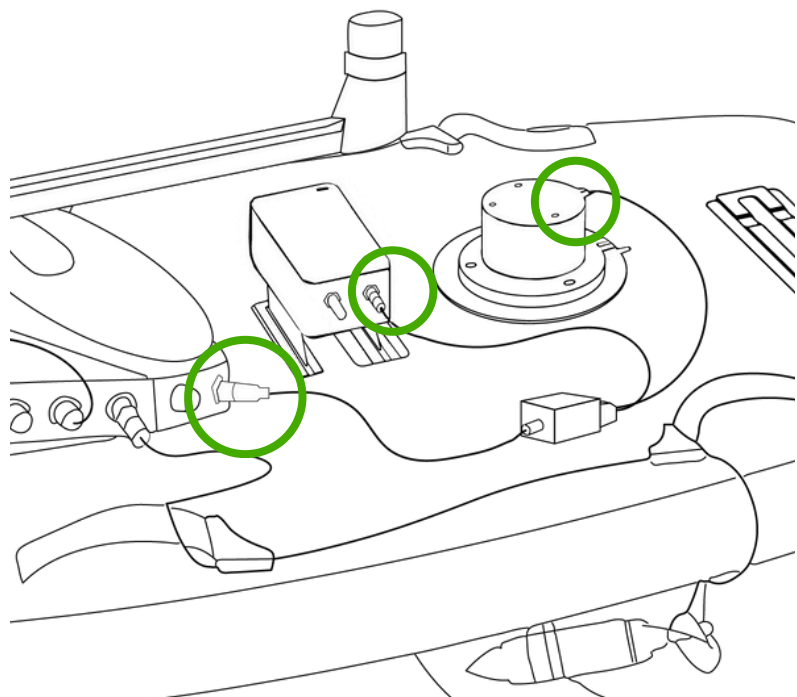


9 Connect the Multiport Cable to your sensor

- 9.1 Locate the multiport in your vessel as marked in green in the image.



- 9.2 Then, connect the other side to your sensor.



Controller Functions

Arming switch

1. Power On and Wait:

After powering on the Surfbee and your transmitter, wait for 90 seconds before arming.

This allows the autopilot GPS to acquire accurate location data necessary for operation.

2. Arm the Vessel:

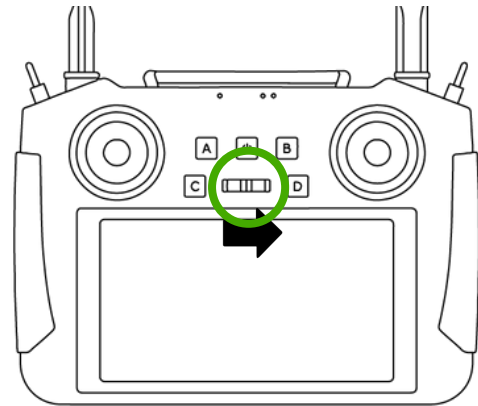
Slide the arming switch to the right to arm the vessel.

Caution: Be mindful of the thrusters activating. Ensure you follow all safety instructions to prevent accidents.

3. Verify Arming:

Confirm that the vessel is armed by checking the indicator lights or control interface as specified in the user manual.

Note: The vessel must be armed to operate.



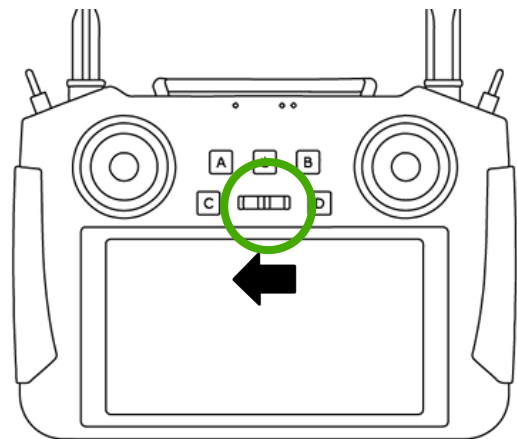
Disarming switch

Slide the disarming switch to the left to disarm the vessel.

Ensure the thrusters have stopped before handling the vessel.

Use the disarm mode when moving the Surfbee between your vehicle and the water.

Always keep the vessel disarmed during any handling to prevent accidental activation.



Warning:

Do Not Disarm During Operation:

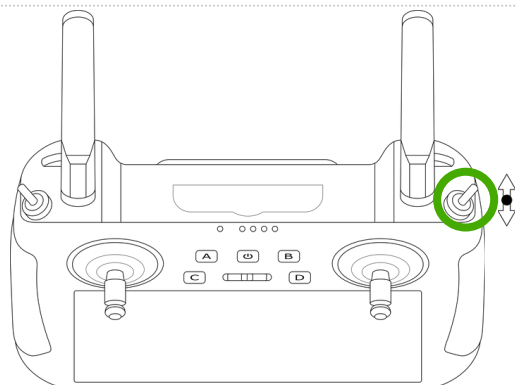
Avoid disarming the vessel while it's in operation on the water. Disarming mid-operation may result in loss of control and difficulty retrieving the vessel.

Loiter

The dial on your controller, as marked in green in the diagram, allows you to switch between Loiter Mode and Manual Mode. Here's how it works:

- Center Position - Loiter Mode

When the dial is in the center position, Loiter Mode is activated. In this mode, the Surfbee will autonomously hold its current position. This is ideal for maintaining a steady location without active manual input.

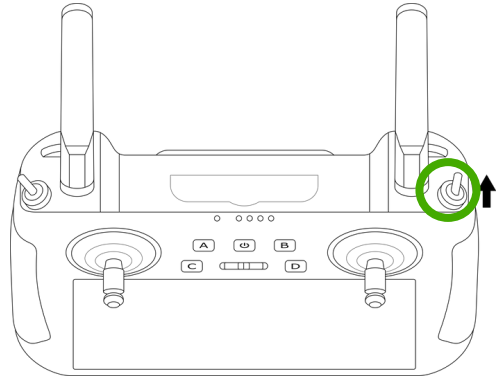


Important Notes: Be Cautious When Activating Loiter Mode: Activating Loiter Mode on land may cause the thrusters to engage, potentially leading to unexpected movement. Ensure the Surfbee is safely in the water before activating this mode.
Quickly Switching Back to Manual: If you need immediate control, be prepared to shift the dial forward or backward to quickly return to Manual Mode.

Controller Functions

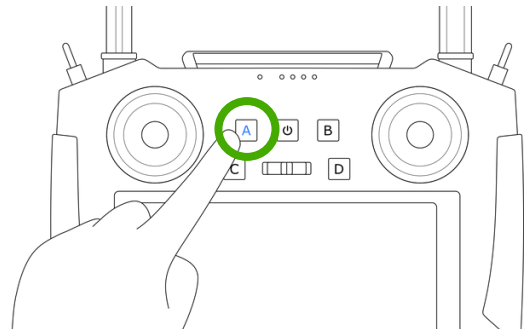
Manual Mode

Allows the operator to control the Surfbee using joysticks. Move the Dial Forward or Backward to activate the Manual Mode. Moving the dial forward or backward switches the Surfbee into Manual Mode, allowing you full manual control over its movement.



Simple Button

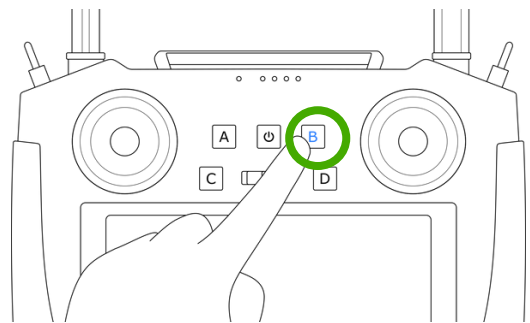
Activates Enhanced Manual mode, simplifying control for inexperienced operators. In this mode, the autopilot maintains the vessel's heading at the last joystick-commanded direction, making it easier to perform manual ADCP measurements accurately.



RTL (return to launch)

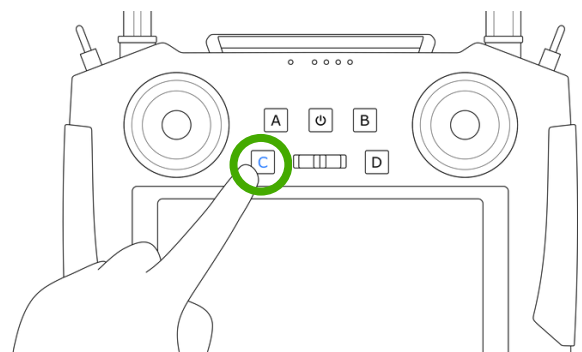
The Return to Launch (RTL) function commands the Surfbee to return to its armed position in a direct line. RTL activates automatically when the battery reaches its lowest safe level or if radio transmission is lost for 5 seconds, providing a safe fallback to avoid losing the vessel.

Note: Ensure the path back to the armed position is clear of obstacles before activating RTL, as the Surfbee will follow a straight-line route.



AUX Button

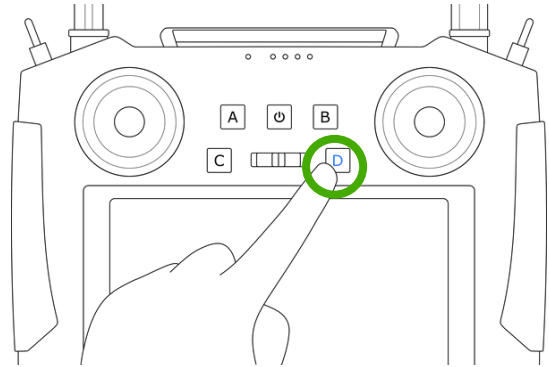
Secondary form of steering if a thruster is disabled, activating the APU (Auxiliary Propulsion Unit). Use for emergencies only and limit to 5 minutes of continuous use to prevent overheating.



Controller Functions

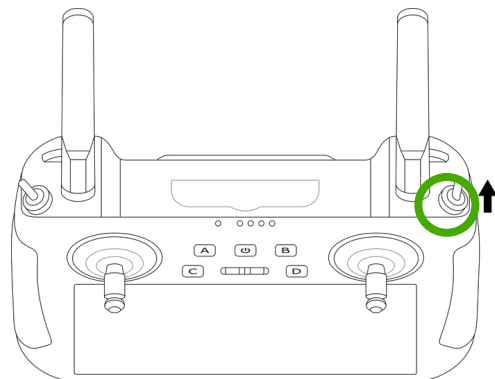
Light Button

Activates the forward-facing LED on the mast camera to provide illumination.



Manual Mode

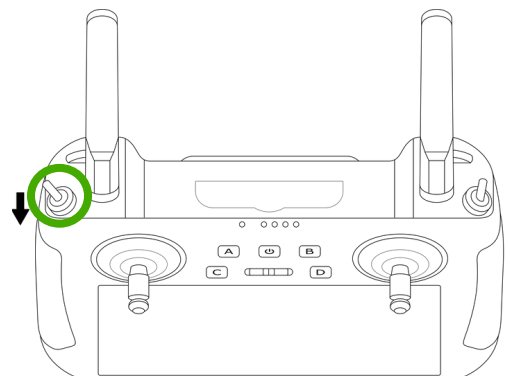
Allows the operator to control the Surfbee using joysticks. Move the Dial Forward or Backward to activate the Manual Mode. Moving the dial forward or backward switches the Surfbee into Manual Mode, allowing you full manual control over its movement.



Heading Lock (Only for Scout and Finder)

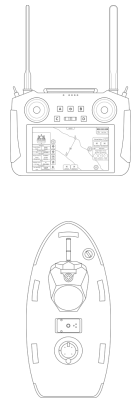
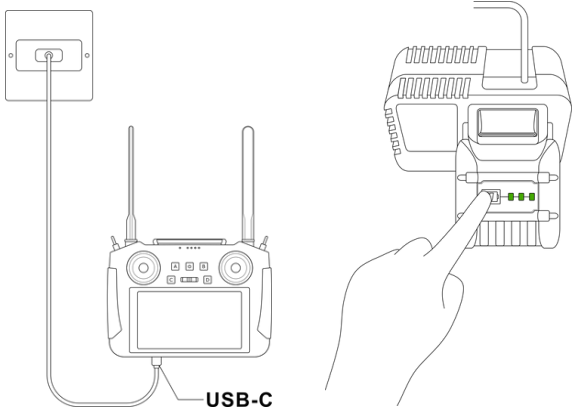
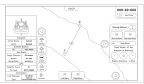
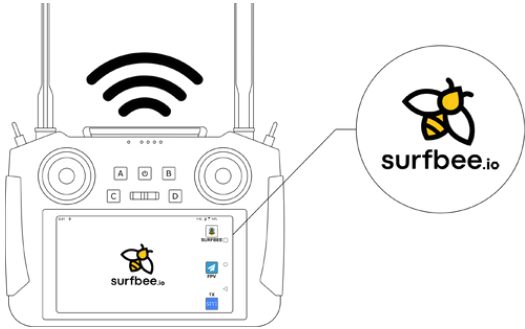
Allows the operator to lock the heading for the Flow Scout and Flow Finder by moving the left dial backward, holding the vessel's direction steady.

Important: This feature is best used under specific conditions. Please refer to additional documentation for detailed guidelines and tips on optimal gauging practices to ensure accurate results.



Launch checklist

1 Preparation

WHAT	WHERE	
<p>1.1 Ensure Surfbee DeWalt batteries and controller are fully charged</p> <p>Note: Transmitter can not be powered while using, so be prepared</p> <p>A LED light near the charging port in the bottom of the transmitter will provide the information: red (charging) or green (fully charged)</p>		 <p>USB-C</p>
<p>1.2 Ensure Surfbee App is updated to the latest version and has connectivity for realtime maps.</p> <p>For more information, check our Surfbee App Manual.</p>		<p>Request the latest version of the Surfbee App to our team via email to: support@surfbee.com.au</p> 

Safety Precautions

Handling the Vessel:

Always disarm the Surfbee before lifting, carrying, or performing maintenance.

Check that all team members are aware when the vessel is being armed or disarmed.

During Operation:

Be cautious of the thrusters when arming the vessel.


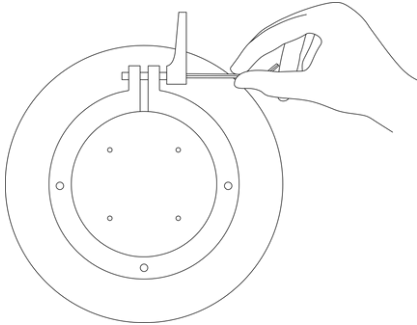
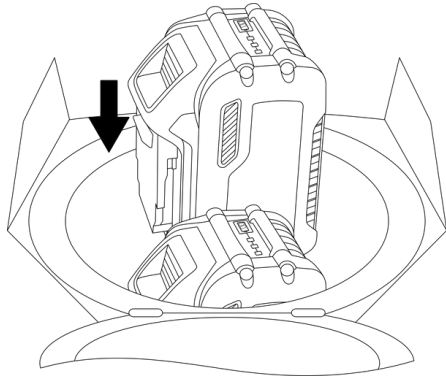
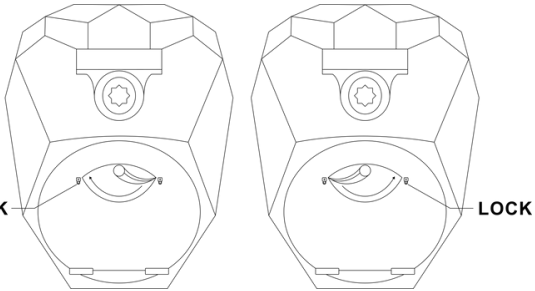

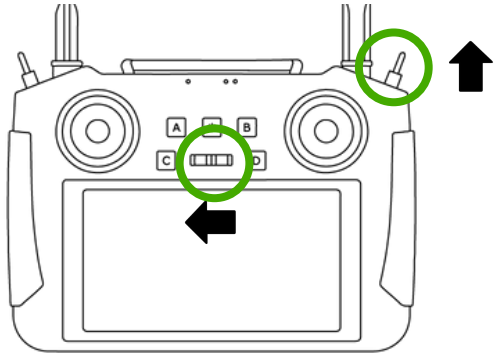
Keep a safe distance from the thrusters to prevent injury.

Environmental Awareness:


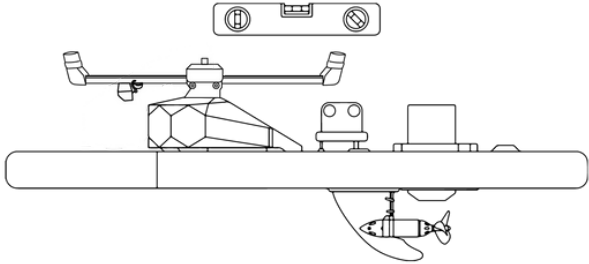
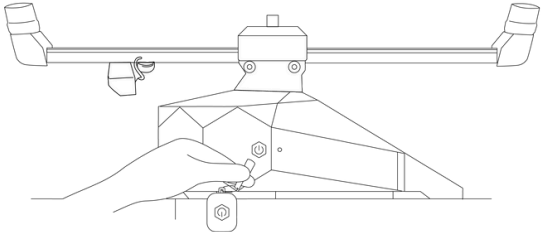
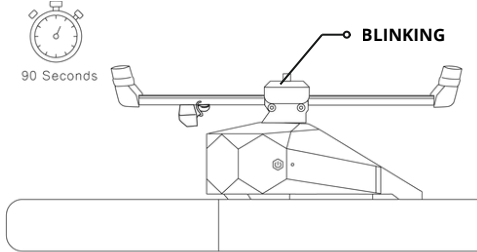
Ensure the operating area is clear of obstacles, people, and wildlife before arming.

Monitor weather conditions to maintain safe operation.


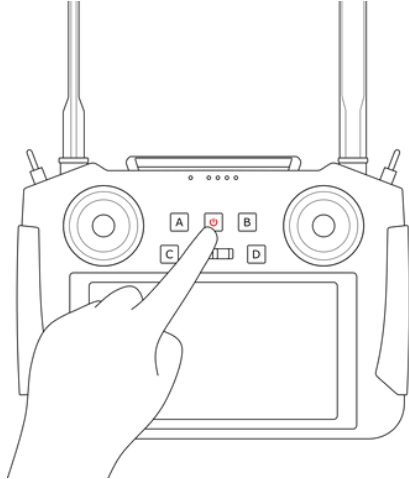
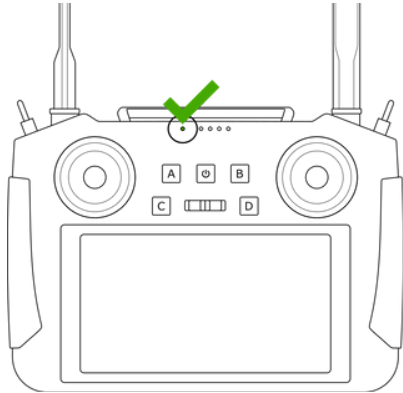
2 On-site setup

WHAT	WHERE	
<p>2.1 Insert the sensor into the locking collar and check that the height is suitable for the application, then tighten the locking collar with a 4mm allen key.</p>		
<p>2.2 Install fully charged batteries.</p> <p>Insert the fully charged DeWalt batteries into the Surfbee. Please ensure Hatch is closed before operation.</p>		
<p>2.3 Switch to Disarm mode.</p> <p>Set the Surfbee to Disarm mode on the controller (by sliding the switch to the left) and Manual (top-right dial).</p>		


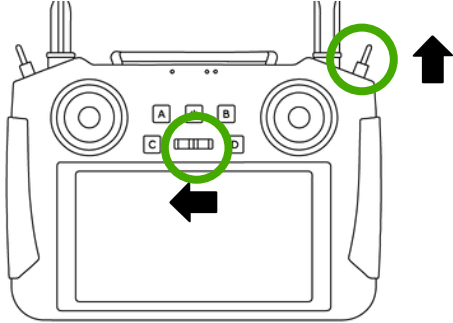
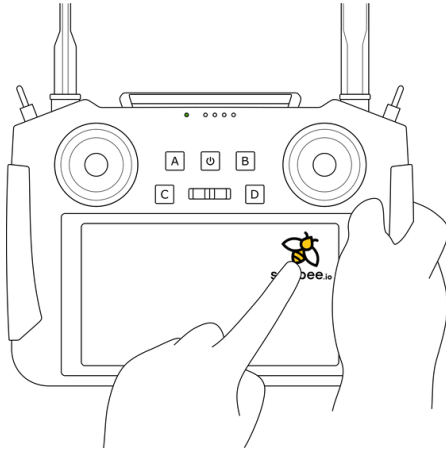

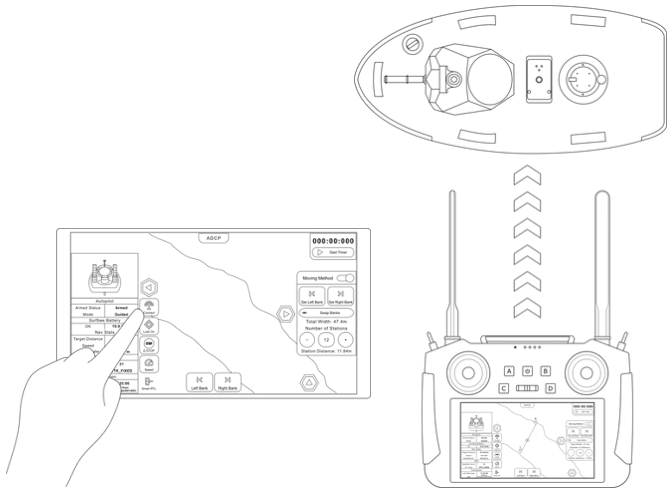
2 On-site setup

WHAT	WHERE	
<p>2.4 Place the vessel onto level ground with a clear view of the sky.</p> <p>Important: In order to arm the vessel, it needs to be in a flat surface and away from any magnetic interferences, which includes concrete areas, bridges, cars and the magnetic key.</p>		
<p>2.5 Power on the vessel using the locating magnet over the power location.</p> <p>Use the locating magnet to power on the Surfbee by placing it over the designated power location.</p>		
<p>2.6 Wait for 90 seconds (mast LED should be blinking) before moving to the next steps e placing the vessel into the water.</p> <p>Allow at least 90 seconds for the Surfbee to acquire a GPS lock.</p> <p>Note: Blinking light is a sign that the vessel is on, but disarmed</p>		


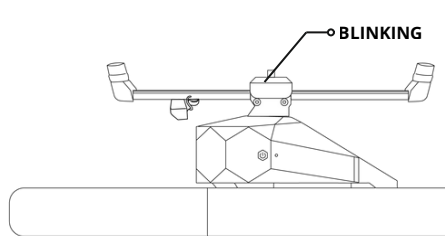
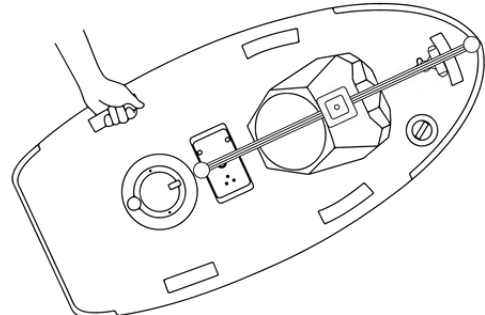

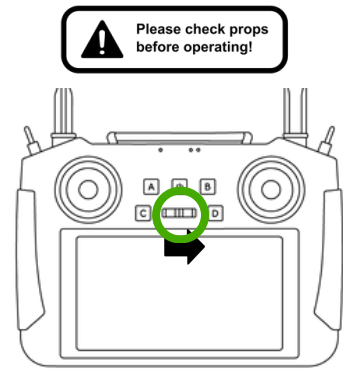
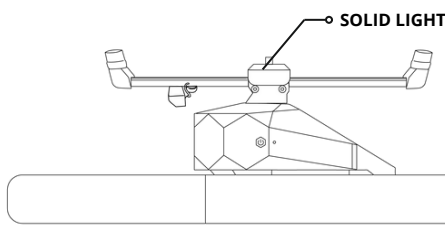
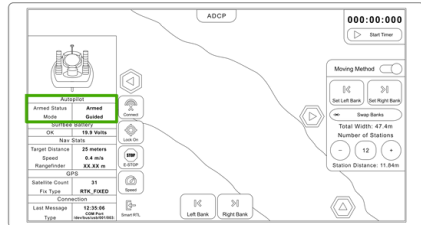
3 Controller setup

WHAT	WHERE	
<p>3.1 Press the power button on the controller once for 1 second and then again for 2 seconds until all power lights are illuminated.</p> <p>Power on the controller by pressing the button as instructed in the image.</p>		
<p>3.2 Once the controller has booted up the Connection Status LED will turn green once connected to the Surfbee.</p> <p>Wait for the green indicator on the controller to confirm successful connection to the Surfbee.</p>		




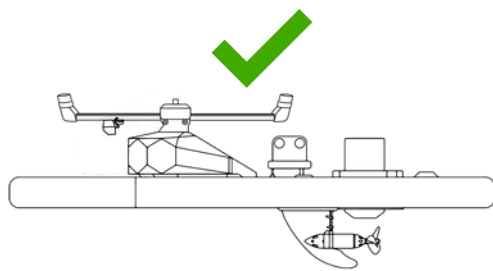
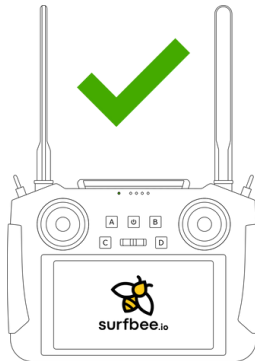
4 Surfbee App setup

WHAT	WHERE	
<p>4.1 Ensure the Surfbee mode is in Manual mode and is Disarmed.</p> <p>Verify that the Surfbee is in manual mode and disarmed on the controller.</p>		
<p>4.2 Launch the Surfbee app.</p> <p>Open the Surfbee app from the startup screen (top right corner) on the controller.</p>		
<p>4.3 Select the Connect button on the App to get Surfbee telemetry data.</p> <p>Use the app to connect to the Surfbee and access telemetry data.</p> <p>Note: In the left side of the screen of the Surfbee App you can check if the vessel is connected to your transmitter</p>		



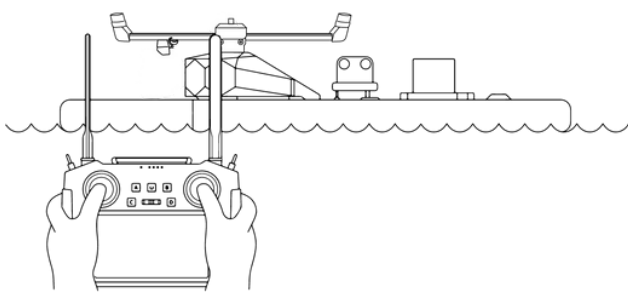
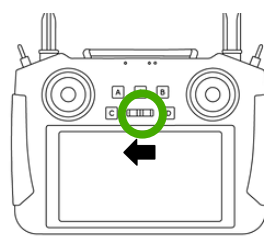
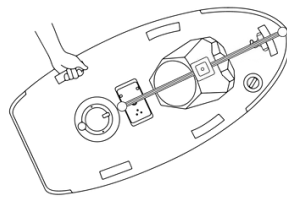
5 Launching

WHAT	WHERE	
<p>5.1 LED mast light on Surfbee flashing.</p> <p>Confirm that the LED mast light is flashing, indicating that the Surfbee is in a disarmed state.</p>		
<p>5.2 Portage to Launch.</p> <p>Move Surfbee to water using hand hold straps.</p>		
<p>4.3 Arming</p> <p>Switch the A/D switch on the controller to the Armed position (move switch to most forward position) on the controller.</p> <p>Important: Ensure props are clear of any obstructions, e.g. weeds, debris.</p>		
<p>4.3 Confirmed armed</p> <p>LED mast light will be solid on Surfbee, and Armed Status on App.</p> <p>Reminder: Location of Return to Launch is set when Armed.</p>		 


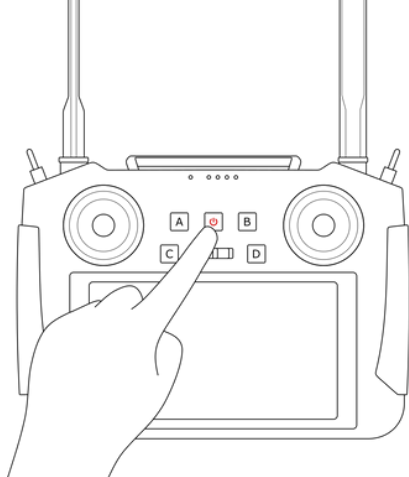

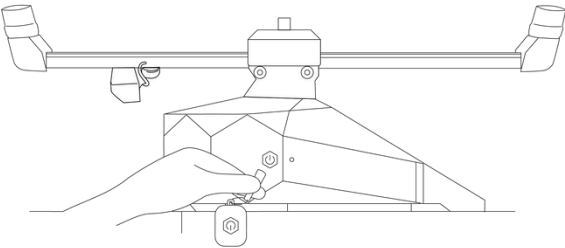
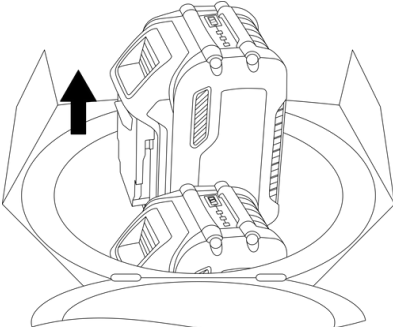
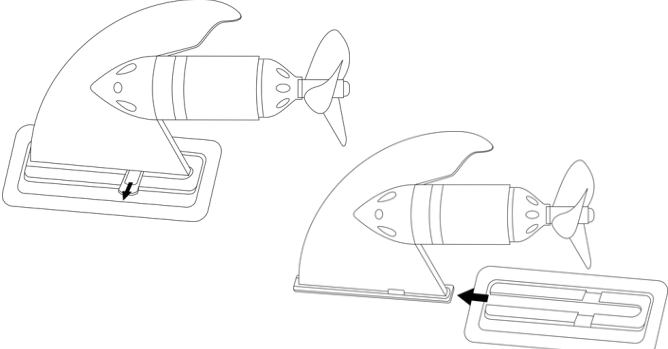
5 Mission Ready

WHAT	WHERE	
<p>5.1 Now the vessel is ready for use.</p> <p>*Please refer to app manuals for ADCP Gauging, Bathymetry or Environmental Survey operations.</p> <p>With the Surfbee armed and all systems functioning, it is now ready to start the gauging/survey mission.</p>	  	 


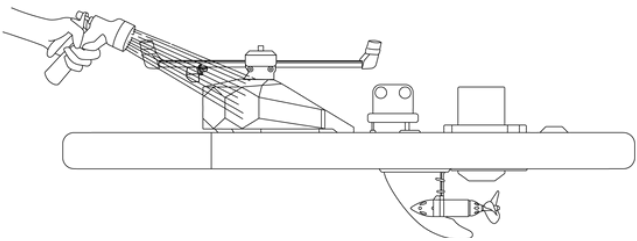


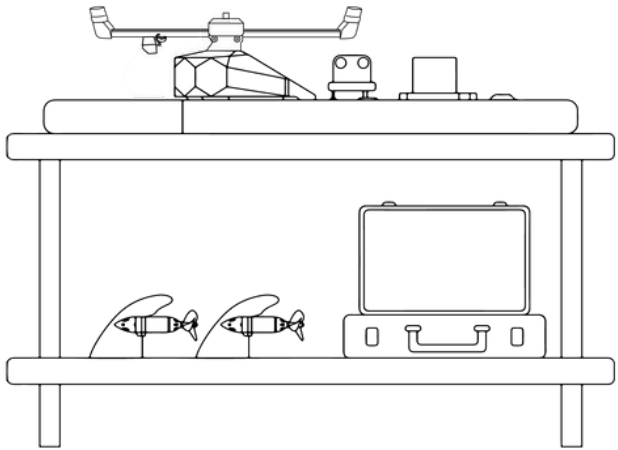
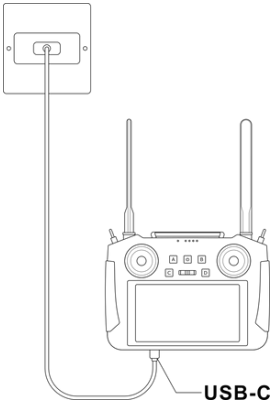
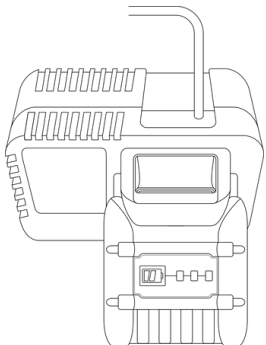
6 Shutdown procedure

WHAT	WHERE	
<p>6.1 Return the vessel to a safe location.</p> <p>Navigate the Surfbee back to a safe and accessible location on the water.</p>	 	
<p>6.2 Toggle the A/D switch to Disarm position.</p> <p>Switch the A/D switch on the controller to the Disarm position.</p> <p>Important: After disarming you won't be able to control your vessel, so be ready to collect it.</p>		 

6 Shutdown procedure

WHAT	WHERE	
<p>6.3 Power off the Controller.</p> <p>Press and hold the power button on the controller to power it off.</p>		
<p>6.4 Power off the vessel using the locating magnet over the power location.</p>		
<p>6.5 Disconnect and remove DeWalt batteries.</p> <p>Remove the DeWalt batteries from the Surfbee.</p>		
<p>6.6 Remove Thruster fins and sensor.</p> <p>Carefully detach the thruster fins and transducer from the Surfbee.</p>		

6 Shutdown procedure

WHAT	WHERE	
<p>6.7 Clean and dry the Surfbee.</p> <p>Flush (run in fresh water for 2 min) after use if operating in salt or highly turbid water.</p>		
<p>6.8 Store the Surfbee and Controller in a safe place.</p> <p>Place the clean and dry Surfbee and Controller in a secure storage location.</p>	 	
<p>6.9 Charge Controller battery.</p> <p>Charge the controller batteries to ensure they are ready for the next use.</p>		 <p>USB-C</p>
<p>6.10 Charge Surfbee DeWalt batteries.</p> <p>Charge the Surfbee batteries to ensure they are ready for the next use.</p>		

Warranty information

This product is covered under a 12-month limited manufacturer's warranty for all parts and labor concerning defects in materials and workmanship. Surfbee will repair and/or replace, at its sole option, any malfunctioning products due to errors in the manufacturing process.

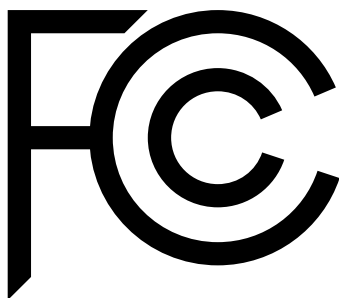
- a. **Manufacturer's Warranty:** Thruster, Hull, and Electronic Hardware.
- b. **Duration:** The warranty coverage for the Thruster, Hull, and Electronic Hardware is valid for a period of 6 months from the date of purchase. If your local legislation requires a longer period, this warranty may be extended to a maximum period of 24 months.
- c. **Coverage:** This warranty covers defects in materials and workmanship under normal use and service. If a product is found to be defective in material or workmanship during the warranty period, it will be repaired or replaced at the manufacturer's discretion.
- d. **Exclusions:**
 - Design Shortcomings: The warranty does not cover issues that are intrinsic to the product design.
 - Misuse by Customer: The warranty does not cover damages resulting from improper use or installation, use beyond intended functions, impact damages, overloading, or misuse inconsistent with product specifications.
 - Environmental Factors: Damage caused by exposure to extreme temperatures, corrosive environments, swift water environments, water ingress, or UV damage.
 - Unauthorized Modifications: Any alterations, repairs, or modifications not authorized by the manufacturer will void the warranty.
 - Incidental Damage: The warranty does not cover any form of indirect or incidental damages including but not limited to lost profits, business interruptions, loss of goodwill, or loss of business and/or customer relationships.
 - Cosmetic and Wear and Tear: Cosmetic damages or damages resulting from normal wear and tear are not covered.
- e. Batteries are excluded from warranty.
- f. Claims for Labor costs and/or other charges resulting from the use of Surfbee goods and/or products are not covered by this limited warranty.
Surfbee disclaims all express warranties other than those contained above and all implied warranties, including but not limited to warranties of merchantability and/or fitness for a particular purpose.

If your system is not functioning properly, please first consult our manual to identify the source of the problem. For immediate assistance, contact your local supplier for first-level support. If the issue requires further expertise, your supplier will coordinate with Surfbee to provide second-level support directly.

We reserve the right to refuse receipt of shipments without Serial Numbers. We require that the systems be shipped back in the original shipping and packing material and all delivery cost to Surfbee is covered by the customer (including all taxes and duties). If the system is returned without appropriate packaging the customer will be required to cover the cost of a new packaging crate and material.

NOTE – The transmitter and charger are carefully selected third party supplier branded components which do not come under the Surfbee warranty but instead are covered by the suppliers own warranty, the details of which can be obtained by contacting Surfbee.

Compliance Certifications



**For inquiries,
contact us.**



surfbee.io



sales@surfbee.io