



Grabber Manual.

Blueprint Lab Grabber for Boxfish ROV



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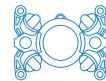
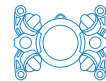


Table of Contents

1	About this document.....	3
1.1	Specifications.....	3
2	Grabber components.....	4
2.1	Grabber accessory and mounting lugs	4
2.2	Grabber mount on ROV	4
2.3	Grabber cable.....	4
2.4	Other items required.....	5
3	How to mount the grabber onto the ROV	6
4	How to use grabber during a dive	8
5	After a dive.....	9
6	How to use the ROV without a grabber.....	10
6.1	How to remove grabber cable	10
6.2	How to reattach the grabber cable.....	11



1 About this document

This document contains instructions for mounting the Reach Robotics (formerly Blueprint Labs) high-strength grabber to your Boxfish ROV, and how to control the grabber while the ROV is underwater.

Note:

If you wish to dive with the ROV without the grabber, you **must** unplug the grabber cable from the ROV. Instructions for removing the cable are also included in this document.



Boxfish ROV with Reach Robotics high-strength grabber

1.1 Specifications

The grabber is depth-rated to 300m.



2 Grabber components

Grabber, cable and mounting components are shown below.

2.1 Grabber accessory and mounting lugs

The grabber does not fit on the ROV when it is mounted, so it will be stored in your Accessory Box, in a protective foam case as pictured.



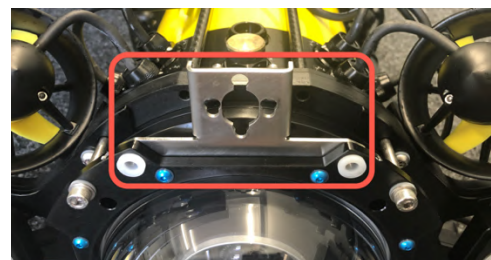
Contents of the case are:

- Grabber with mounting lugs and connector (with male pins inside)
- 2x thumbscrews to attach the grabber to its mount on the ROV.



2.2 Grabber mount on ROV

The mount is located underneath the front dome. The below photo is taken from an upside-down ROV.



2.3 Grabber cable

IMPORTANT!

The red cap covering the grabber cable is **NOT watertight**. If you wish to dive without the grabber attached, you will need to remove the entire cable from the ROV and insert a port plug in the GRAB port.

One end of the grabber cable will already be plugged into the penetrator port marked **GRAB** on the ROV body. The end that attaches to the grabber will be covered by a red cap. Note: this cap is not watertight. To dive without the grabber you will need to remove the whole cable from the ROV.



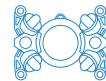


2.4 Other items required

Please obtain some **silicone aerosol spray**. We recommend spraying a light coat onto the connector between the grabber and the cable before and after a dive.

Remember to use the supplied **silicone grease** for lubricating o-rings when removing/inserting penetrator plugs into the 'GRAB' cable port on the ROV.

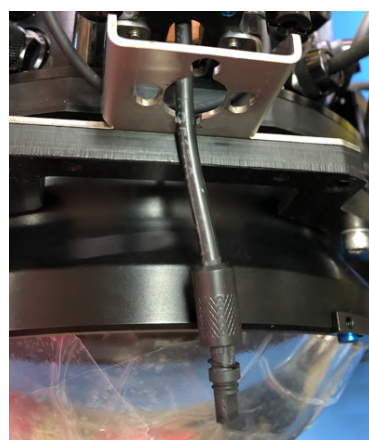
This port must remain watertight and the silicone grease helps prolong the life of the o-rings in the plugs.



3 How to mount the grabber onto the ROV

Note: You will find it easier to turn the ROV upside down or onto its side for better access to the mounting point.

1. Remove the red cap from the end of the cable and lightly spray with silicone spray.
2. Lightly spray the pins on the grabber connector with silicone spray.
3. Thread the grabber cable through the mount so there is about 10cm of cable.
4. Orient the grabber accessory so that the mounting bar is at the bottom.
5. Align the cable (there is a flat part on it) to the connector and connect the cable. **Take care when attaching the cable so as not to damage the pins inside the connector.**

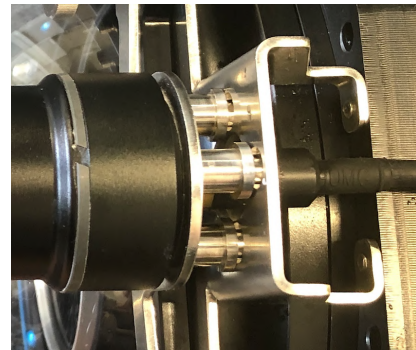




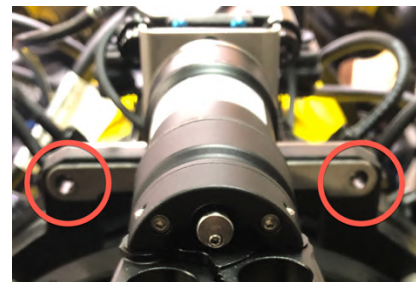
6. Screw in the black collar to the grabber connector to hold the grabber cable in place.



7. Thread the excess cable back through the hole in the mounting point. Insert the mounting lugs through and down into the metal mounting plate so they are held in place.



8. At this point, the holes on the sides of the mounting point on the ROV should be aligned with the holes on the grabber attachment.



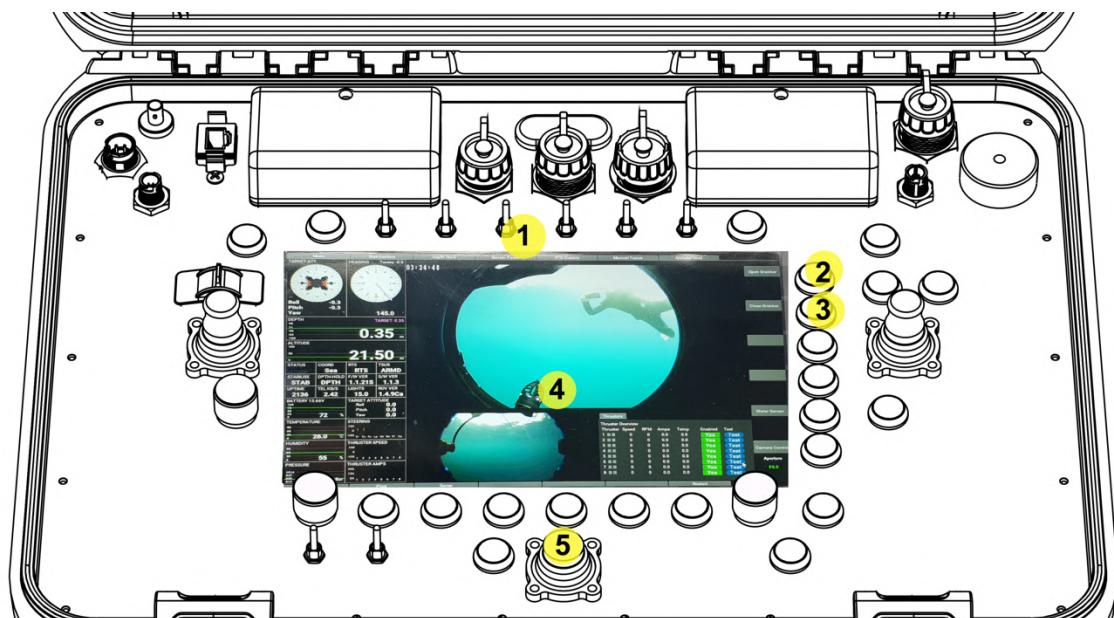
9. Fasten the grabber to the mount with the thumbscrews.





4 How to use grabber during a dive

To use the grabber, power on the ROV and Control Station. You will use the five areas on the Control Station shown below.



1. **Sensor Power switch.** Turn the Sensor Power switch (1) to the ON position to send power to the grabber. Note: when the ROV is out of the water, minimise the time that the sensor switch is turned on, and turn it off after use to avoid possible overheating of other equipment/sensors.
2. **Grabber open control button.** Press and hold the button to open the grabber arms. While holding the button, the arms will move slowly apart until the grabber is fully open. Release the button when you'd like the arms to stop opening, or when the arms are fully open.
3. **Grabber close control button.** Press down and hold the button to start to close the grabber arms. The arms will move slowly together until the grabber is fully closed. Release the button to stop moving the arms towards the closed position.
4. **Grabber view.** The grabber will be in view at point (4) on the screen showing the wide-angle camera feed. Use this for guidance when positioning the grabber and using the open/close controls.
5. **Pitch/roll joystick*:** Because the grabber does not sit flush with the bottom of the ROV, you may need to pitch the ROV forward to pick up objects from the bottom. Use the roll settings too if the object is at an angle.

* Note that this joystick is located in a different position (under the left joystick) in newer ROVs.



5 After a dive

IMPORTANT!

While the grabber is still connected, thoroughly rinse all components. Direct water behind the mechanism to reach all the nooks and crannies. After use in salt water, we recommend washing with warm soapy water to remove all the salt crystals.

After disconnecting and drying the grabber, lightly use silicone spray on the female end of the grabber cable AND the male pins on the grabber connector. This will prevent water from sitting in the connections and possibly damaging the connection points.

Replace the red cap onto the end of the grabber cable.



6 How to use the ROV without a grabber

IMPORTANT!

If you wish to use the ROV without the grabber, you must remove its cable as the end that connects to the grabber is not watertight.

6.1 How to remove grabber cable

6.1.1 Items needed

- Port plug (there will be a spare in your accessory box)

6.1.2 Before you start

- Ensure ROV is powered off

6.1.3 Procedure

1. Remove vacuum from ROV. Unscrew the collar from the vacuum port at the rear of the ROV and then pull out the valve to release the vacuum.





2. Locate the port labelled 'GRAB'. Unscrew the black knurled collar with your fingers and pull out the plug. It is held in place with two o-rings so you will need enough strength to pull past these.
3. Remove the cable from the ROV and store it safely in your accessories box. Note: You may need to cut cable ties if present.



4. Put a port plug in the grabber port and screw in the collar. Before you do this, apply a thin coating of silicone grease to the two o-rings on the plug.



5. Check that the ROV can hold a vacuum with this new port plug. Apply a vacuum to the ROV (875mBar) and monitor the pressure on the Control Station to ensure it is maintained for 10 minutes (for instructions, see the Boxfish ROV Owner's Manual).
6. Store the grabber, cable and thumbscrews carefully in your accessory box.

6.2 How to reattach the grabber cable

To use the ROV with the grabber again, you must reattach the grabber cable.

6.2.1 Before you start

1. Ensure ROV is powered off
2. Release the vacuum from inside the ROV
3. Unscrew and pull out the port plug from the 'GRAB' port
4. Apply a thin coating of silicone grease to the O-rings on the grabber cable.



6.2.2 Procedure

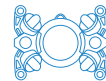
1. Line up the grabber cable plug with the port. The grabber cable plug contains an 8-way pin. **To ensure it is oriented correctly, the pin has a groove on the outside that must slot over a ridge in the port.**



2. Insert the grabber cable penetrator into the 'GRAB' port and secure the collar so it is fingertight. **Take care when inserting the plug. Don't push with excessive force or the connector may be damaged and require the ROV to be returned to our factory.** It can be useful to use a light to find the location of the ridge so you can line the plug up before inserting it.



3. Route the cable back through the grabber mounting plate, and then through the grabber mount. The exact path for the cable is not important, as long as the cable is not in the way of thrusters or sensors.
4. Use cable ties to secure the cable if necessary.
5. Check that the ROV can hold a vacuum.





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