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Ping Installation Guide for the *BlueROV2*

Introduction %

The *Ping* (<https://www.bluerobotics.com/store/sensors-sonars-cameras/sonar/ping-r1/>) sonar is a multipurpose single-beam echosounder with a 30m sonar range and 300m depth rating. When mounted on a *BlueROV2* and, connected to a *BLUART* (<https://www.bluerobotics.com/store/comm-control-power/tether-interface/bluart-r1-rp/>) USB to Serial and RS485 Adapter and the *Ping-Viewer* software application, a *Ping* can be used as an altimeter to see how high the *BlueROV2* is above the seafloor.

NEW



Beta

Ping Sonar Altimeter and Echosounder

\$279.00

(<https://www.bluerobotics.com/store/sensors-sonars-cameras/sonar/ping-sonar-r2-rp/>)

Add to Cart (</learn/ping-installation-guide-for-the-bluerov2/?add-to-cart=13223>)

Parts and Tools %

You Will Need %

NEW



6" Straight Micro-USB to USB-A Cable

\$8.00

(<https://www.bluerobotics.com/store/comm-control-power/tether-interface/misc-cab-usb-micro->

NEW



BLUART USB to Serial and RS485 Adapter

\$29.00

(<https://www.bluerobotics.com/store/comm-control-power/tether->

NEW

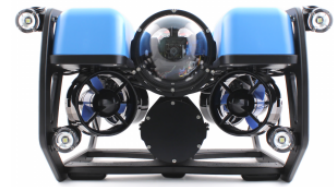


Beta

Ping Sonar Altimeter and Echosounder

\$279.00

([https://www.bluerobotics.com/store/sensors-](https://www.bluerobotics.com/store/sensors-sonars-cameras/sonar/ping-)



BlueROV2

\$2,784.00 – \$4,563.00

(<https://www.bluerobotics.com/store/rov/bl>

Add to Cart (<https://www.bluerobotics.com/store/rov>)

straight-6in-r1/)

interface/bluart-r1-rp/)

sonar-r2-rp/)

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Hex Key Set

\$6.00

(<https://www.bluerobotics.com/store/cables-connectors/tools/tool-hex-set-r1/>)

Penetrator Wrench

\$12.00

(<https://www.bluerobotics.com/store/cables-connectors/tools/tool-penetrator-wrench-r1/>)

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You will also need:

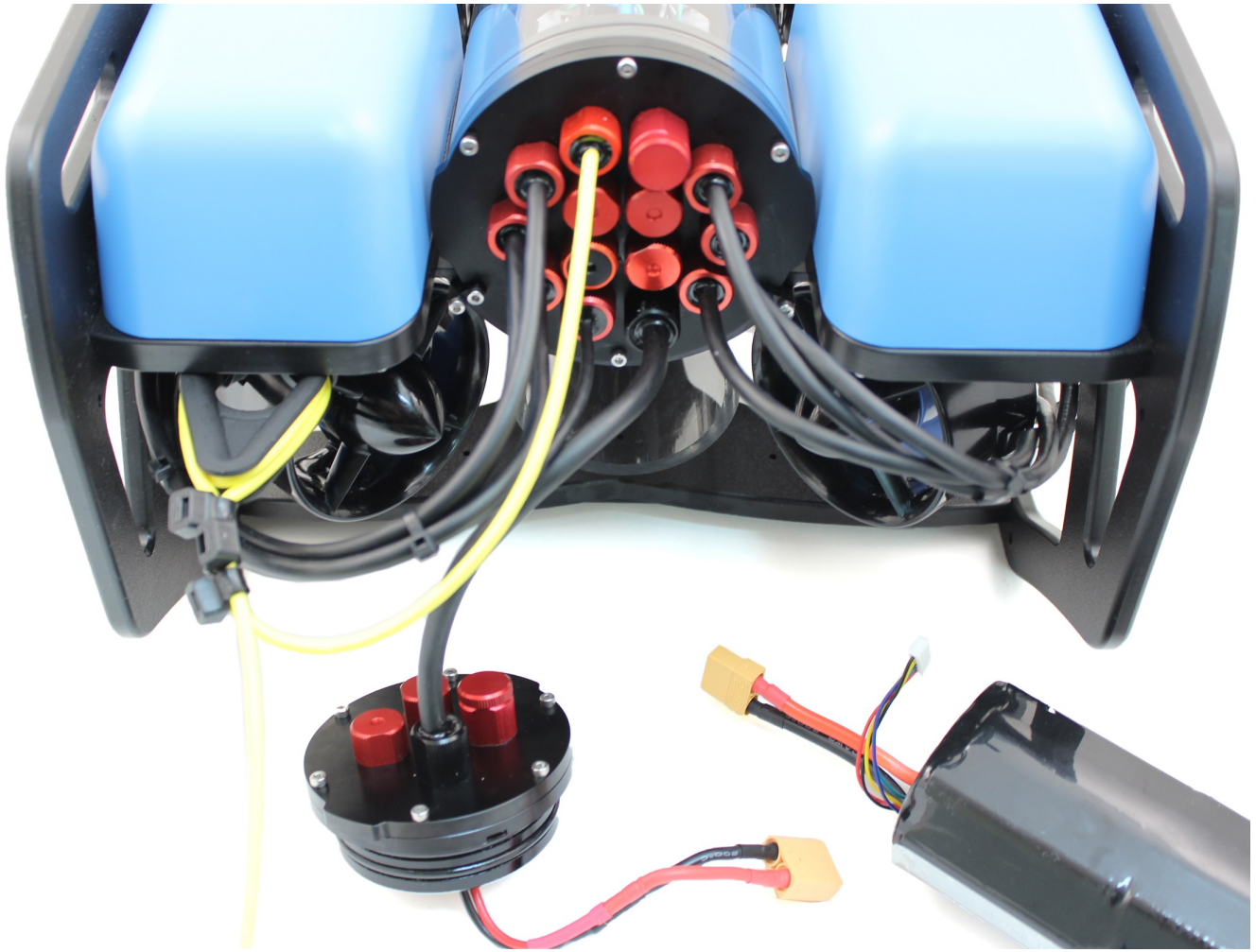
- 1 x #1 Phillips head screwdriver (*BlueROV2* kit)
- 1 x Sharpie or other type of marking pen (not included)
- 1 x 5.50mm (or 7/32") drill bit (not included)
- 1 x Battery Powered Hand Drill (not included)
- 1 x Bottle of Threadlocker (not included)

Removing a Blank Penetrator

To remove a blank penetrator from your *BlueROV2*, you will need the following tools:

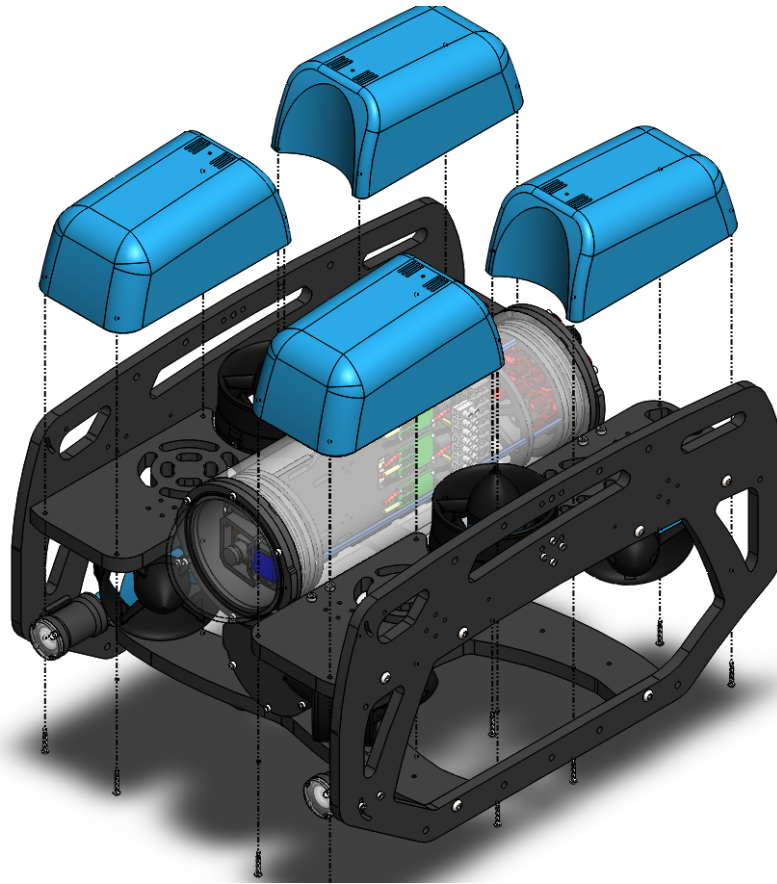
- 1 x 2.5 mm hex driver
- 1 x #1 Phillips head screwdriver
- 1 x Penetrator wrench

1. To ensure your ROV is completely powered off, please remove the battery completely from the 3" enclosure and place to the side.



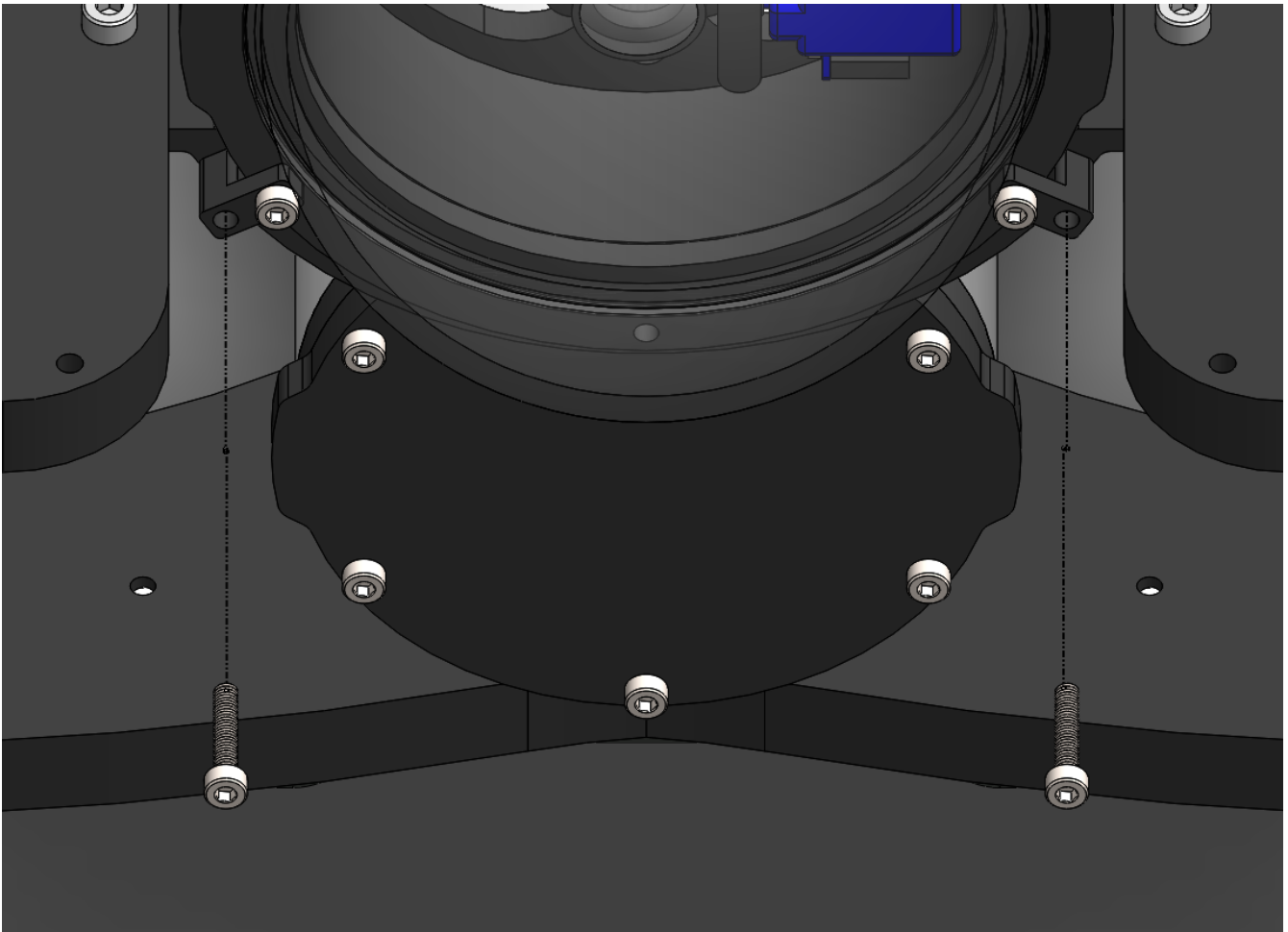
(/wp-content/uploads/2019/01/ping-remove-battery.jpg?x68454)

2. Remove the fairings and buoyancy blocks by removing the self-tapping screws that hold the fairings to the frame.



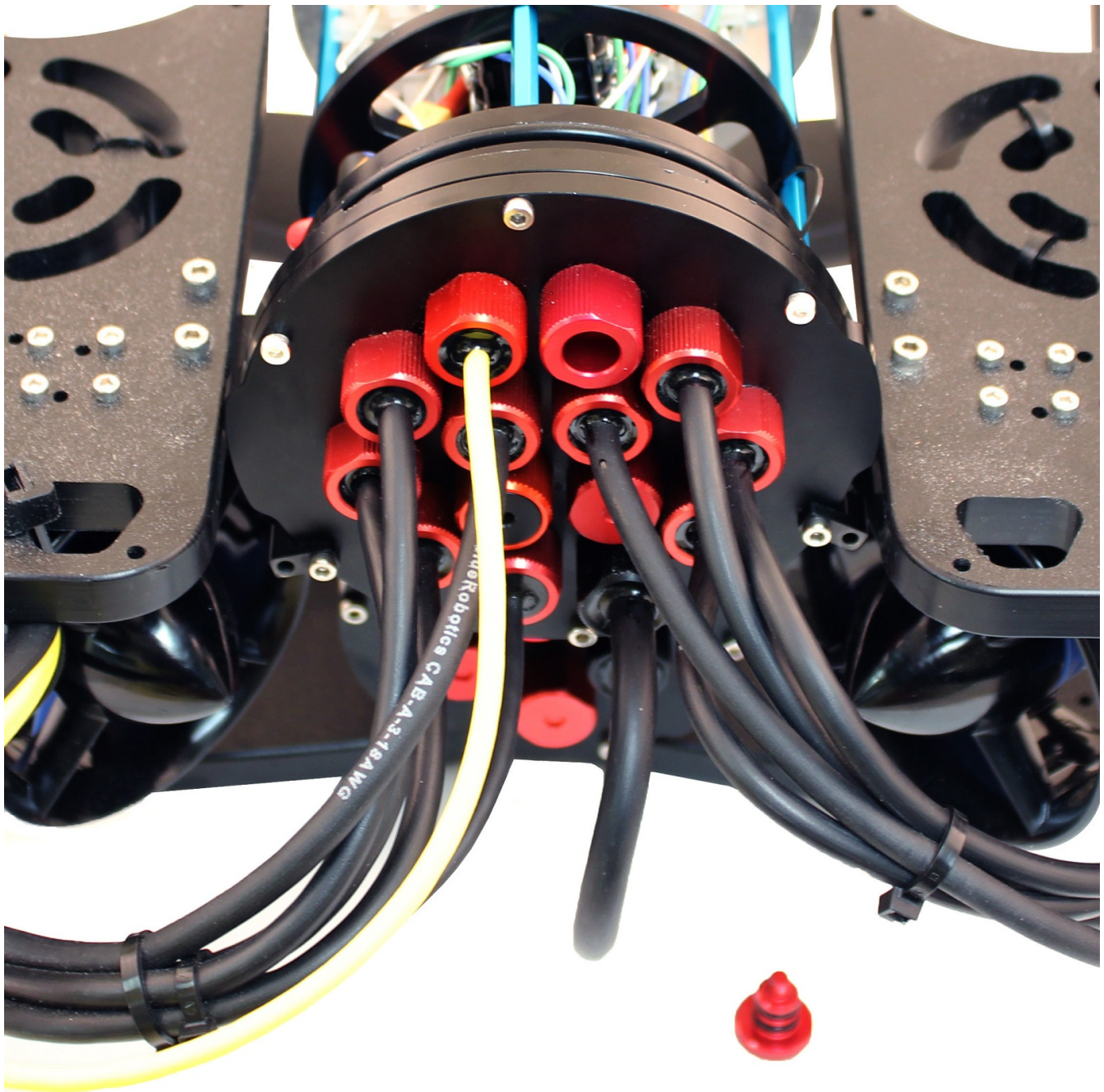
(/wp-content/uploads/2019/01/ping-remove-fairings.png?x68454)

3. Remove the 4" electronics enclosure from the ROV by removing the M3x16 screws that mount the enclosure to the ROV cradle.



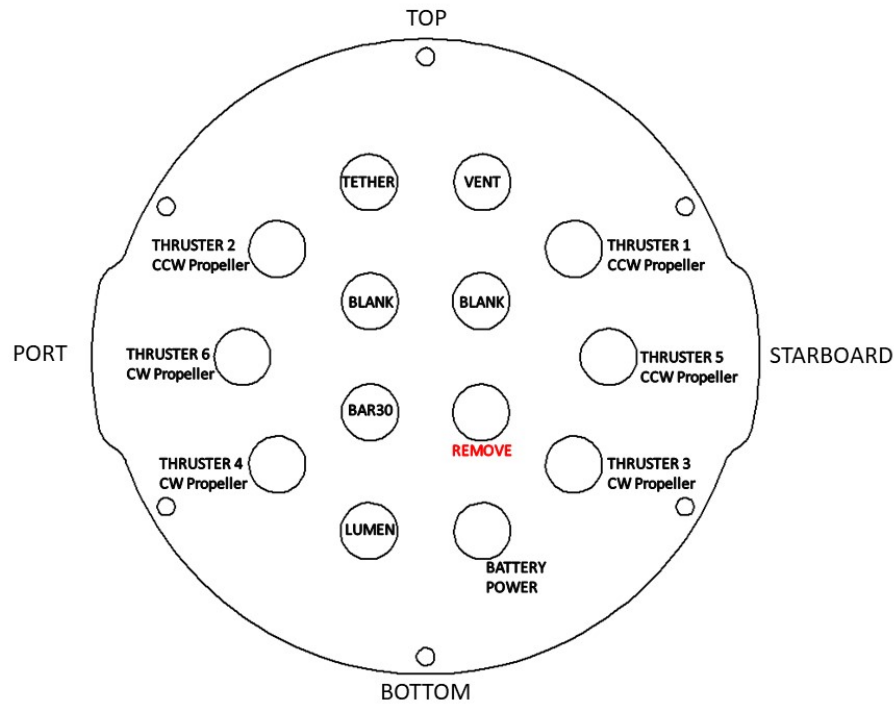
(/wp-content/uploads/2019/01/ping-clip-installation.png?x68454)

4. Remove the Vent Plug from the Vent Penetrator Bolt on the electronics enclosure. Remove the 4" tube and forward dome assembly from the rear end cap.



(/wp-content/uploads/2019/01/ping-tutorial-remove-vent.jpg?x68454)

5. Remove the blank penetrator as pictured from the 4" End Cap with the penetrator wrench that came with the BlueROV2 kit.



(/wp-content/uploads/2019/01/ping-end-cap-remove.jpg?x68454)

Install Ping Penetrator %

To install *Ping* into the end cap, you will need the following parts and tools:

- 1 x *Ping* Echosounder
- 1 x Penetrator Nut (Red)
- 1 x Penetrator O-ring
- 1 x Silicone Grease – 10g Tube
- 1 x Isopropyl Alcohol Wipe
- 1 x Penetrator wrench

1. Wipe the exterior surface of the electronics enclosure endcap clean with isopropyl alcohol or isopropyl alcohol wipes, and make sure it is free of any particles in the areas where the penetrator O-ring will sit.

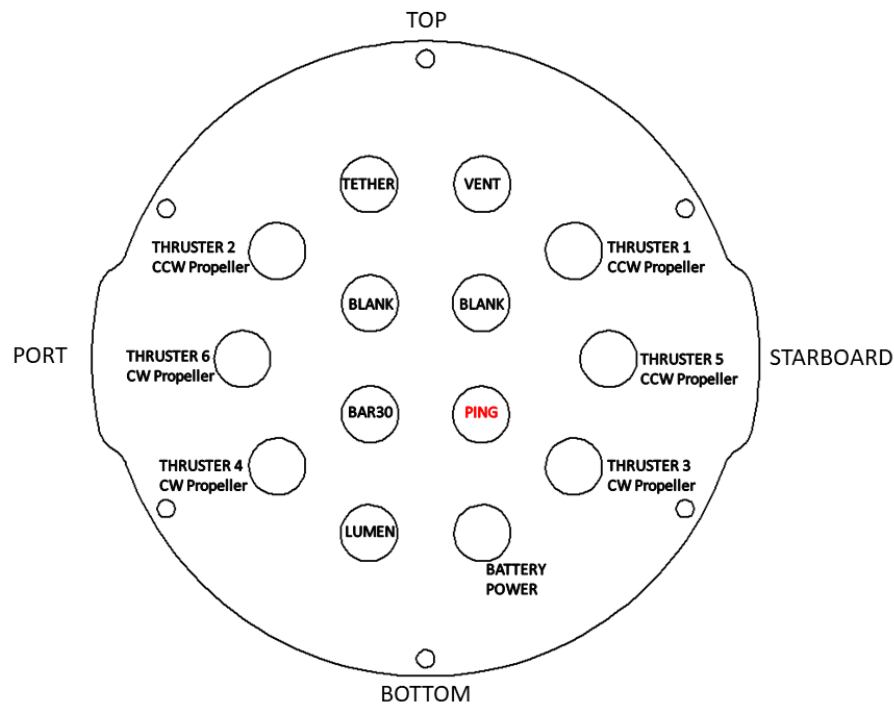
2. Remove the O-ring from the bag and apply silicone grease to it.



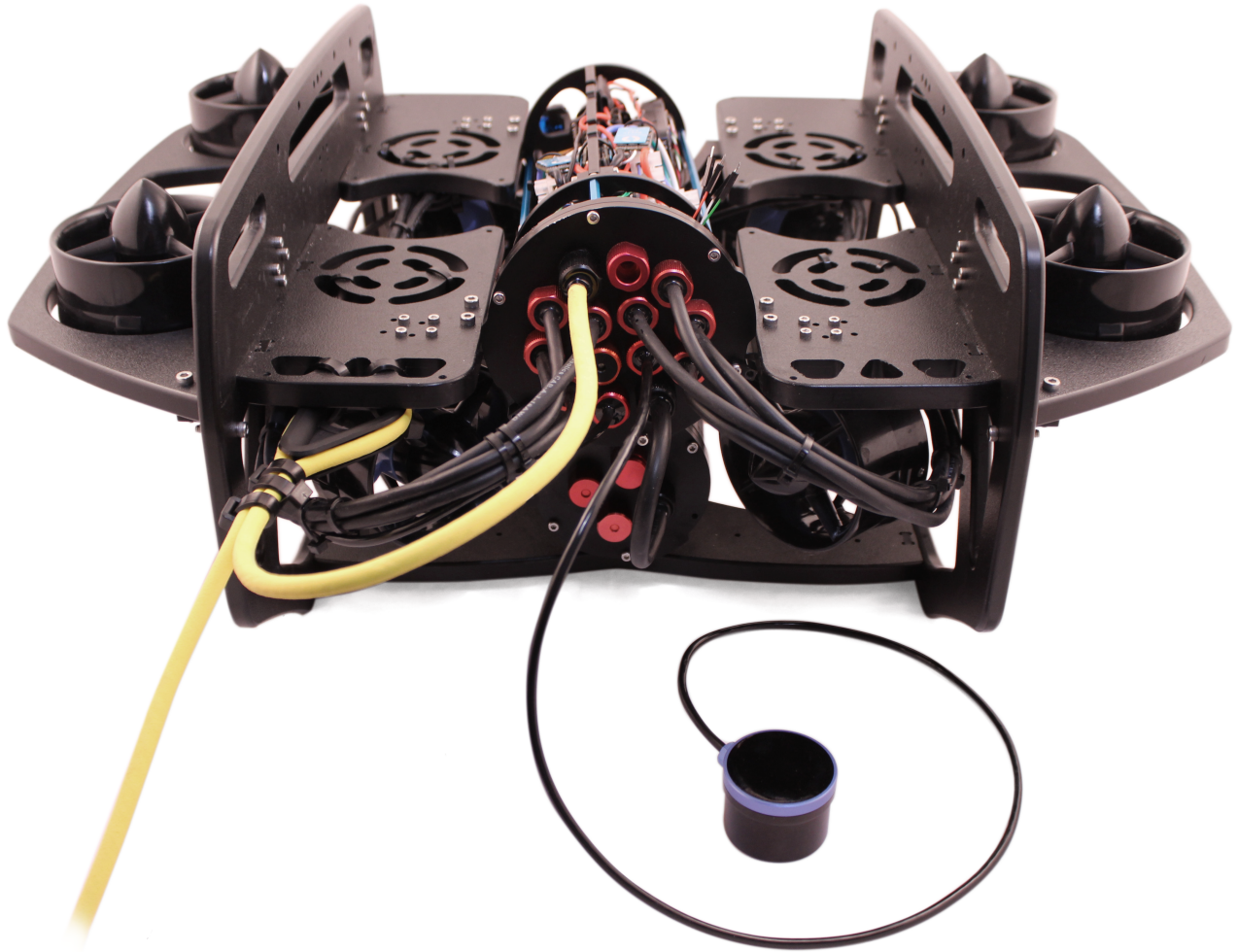
(/wp-content/uploads/2019/01/ping-grease-o-ring.png?x68454)

3. Install the O-ring onto the *Ping* cable penetrator.

4. Install the Ping cable penetrator on to the end cap in the hole you previously removed the blank penetrator from. Tighten to finger tight, then use the provided wrench to tighten it an additional $\sim 1/16$ of a turn. If you can't loosen it with your fingers, it is tight enough.



(/wp-content/uploads/2019/01/ping-end-cap.png?x68454)



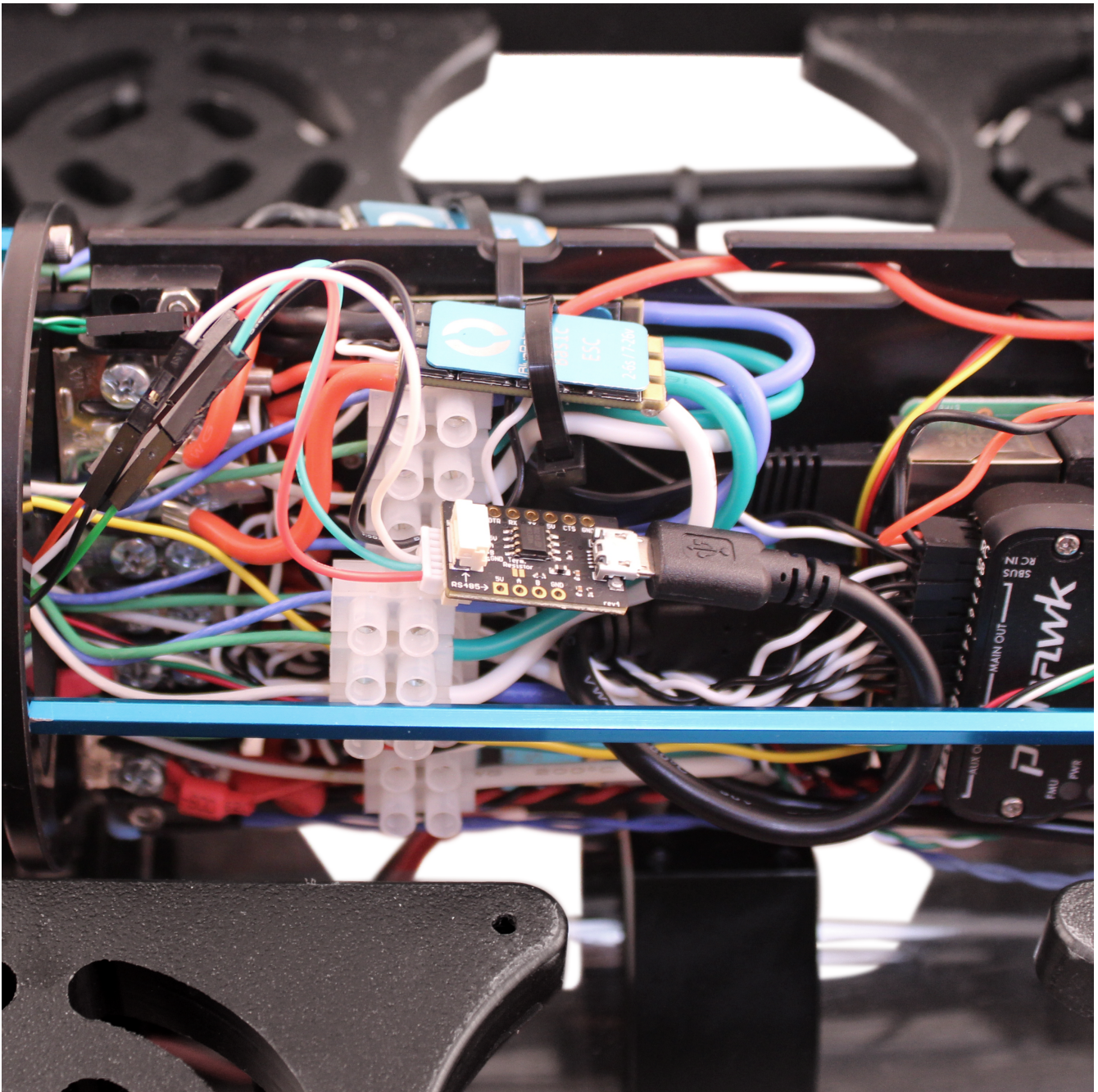
(/wp-content/uploads/2019/01/IMG_3721.png?x68454)

Wiring Connections ↻

To install the Ping wires into your *BlueROV2*, you will need the following components:

- 1 x *BLUART* USB to Serial and RS485 Adapter
- 1 x Header pin to JST-GH Cable Adapter
- 1 x 6" Straight Micro USB to USB-A Cable

1. Plug the Header pin to JST-GH Cable Adapter into the male header pins coming from the Ping so that the same color wires match up when plugged in (red-red, black-black, white-white, green-green).
2. Plug the 6-position JST-GH plug into the serial JST-GH receptacle on the *BLUART* serial adapter.
3. Plug the *BLUART* into one of the open USB ports on the Raspberry Pi using the 6" Straight Micro USB to USB-A Cable.



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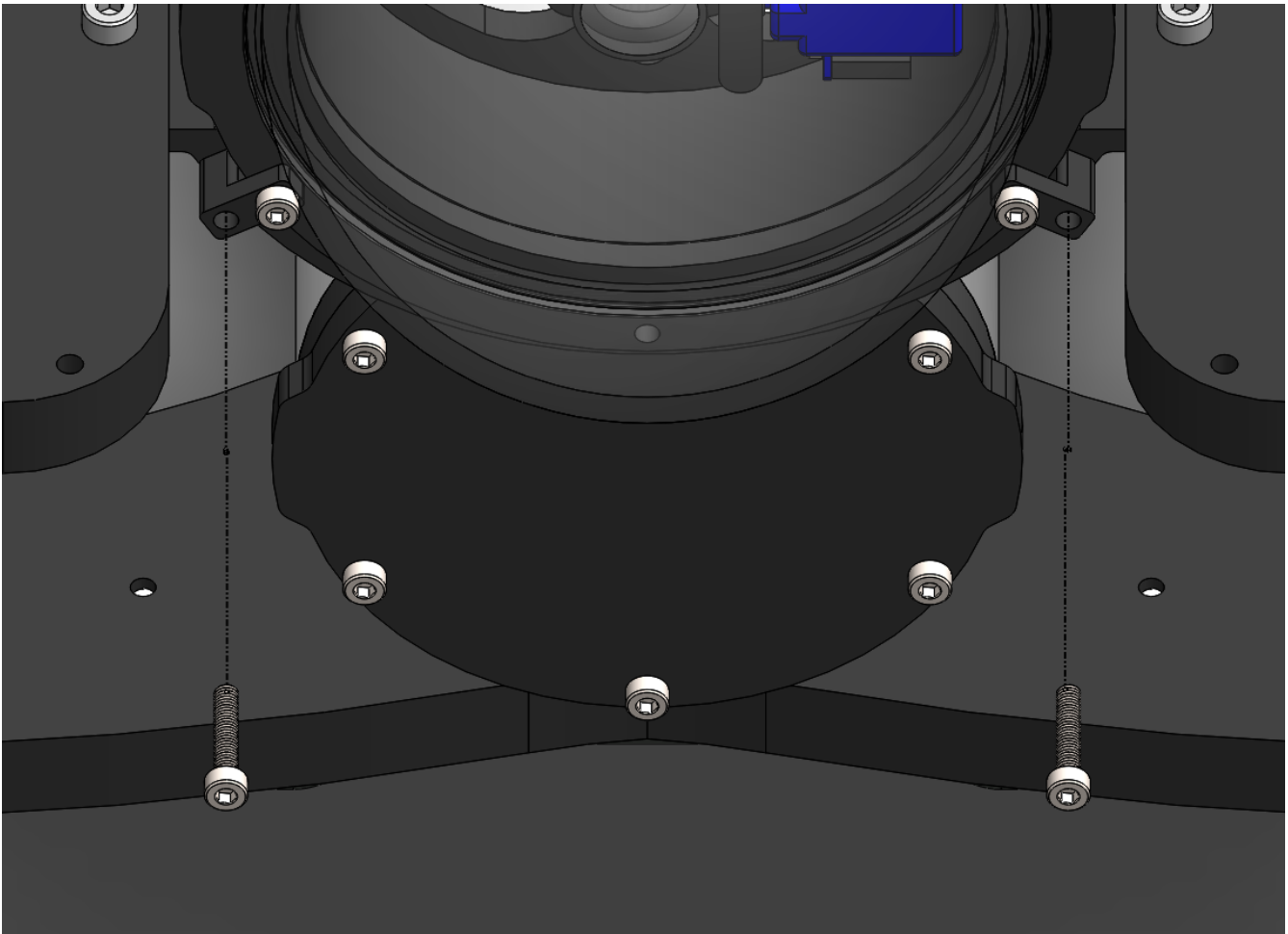
Reassemble *BlueROV2* Electronics Enclosure ↻

To reassemble your *BlueROV2* Electronics Enclosure, you will need the following parts and tools:

- 4 x M3x16 screws that were placed off to the side during disassembly
- 1 x Silicone Grease - 10g Tube
- 1 x 2.5 mm hex driver

Reinstall 4" Watertight Enclosure onto ROV with the following steps:

1. Apply silicone grease to the two radial O-rings on the O-Ring Flange (4" Series) that is attached to the Electronics Tray then install the Watertight Enclosure (4" Series) with installed Dome End Cap to the O-Ring Flange (4" Series).
2. Mount the Electronics Enclosure to the frame using the M3x16 screws so that the dome is on the same side as the front center panels (the center panels without the 3 large holes). Install the M3x16 screws through the clips and into the Enclosure Cradle (4" Series). It is easier to install these screws if the clips are not fully tightened until all screws are through the clips and threading into the Enclosure Cradle (4" Series). This allows to clips to rotate so you can find the threaded hole in the Enclosure Cradle (4" Series) easily.



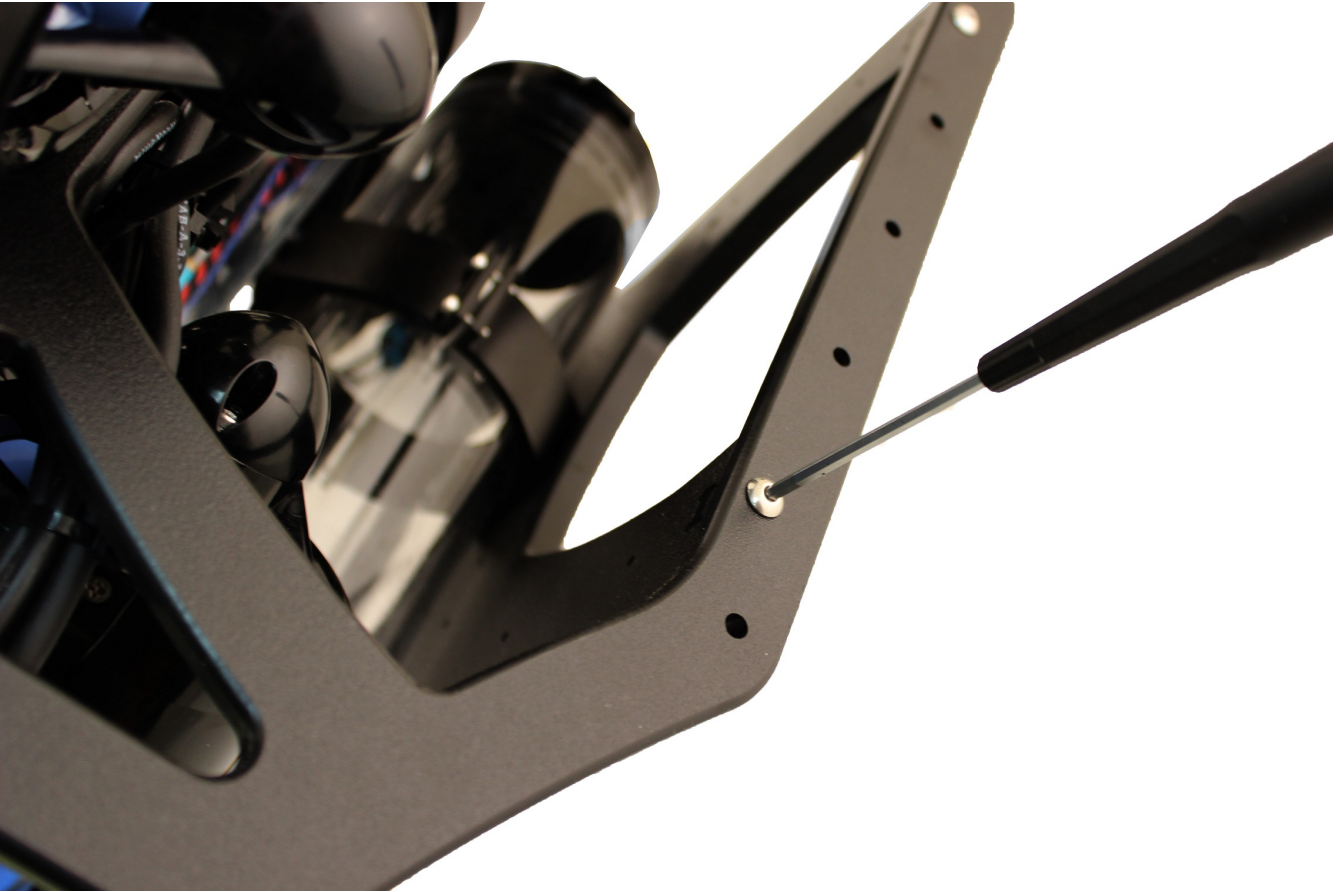
(/wp-content/uploads/2019/01/ping-clip-installation.png?x68454)

Mounting the Ping to the *BlueROV2* Frame

To mount the Ping to the *BlueROV2* frame, you will need the following parts and tools:

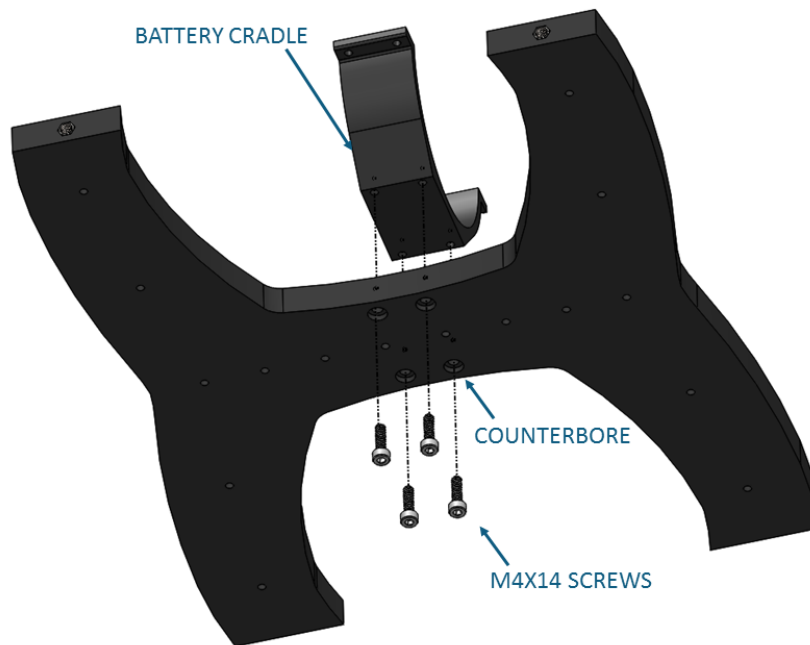
- 1 x *Ping* Mounting Bracket
- 4 x M3x5 button head cap screws
- 2 x M5x16 button head cap screws
- 1 x Marking pen
- 1 x 5.50mm (or 7/32") drill bit (not included)
- 1 x Battery Powered Hand Drill (not included)
- 1 x 3 mm hex driver
- 1 x Bottle of Threadlocker

1. Remove the rear end cap from the 3" battery enclosure.
2. Remove the bottom frame panel from the *BlueROV2* by removing the four M5x16 Screws.



(/wp-content/uploads/2019/01/ping-tutorial-remove-frame-bottom.jpg?x68454)

3. Remove the 3" battery enclosure by removing the M4x14 Screws from the bottom of the frame.



(/wp-content/uploads/2019/01/ping-remove-battery-enclosure.png?x68454)

4. Place the *Ping* mounting bracket on top of the bottom frame plate in a location so that it will not come in contact with the 3" tube or any other component of the ROV when installed. There is enough clearance so that it will not contact the underside of a thruster. Make sure there is enough clearance so that the transducer head is unobstructed. The final placement is up to the user, there is no template for where the mounting plate *must* be installed.



(/wp-content/uploads/2019/01/IMG_3723.png?x68454)

5. Mark the placement location with a permanent pen or marker through the two M5 holes.



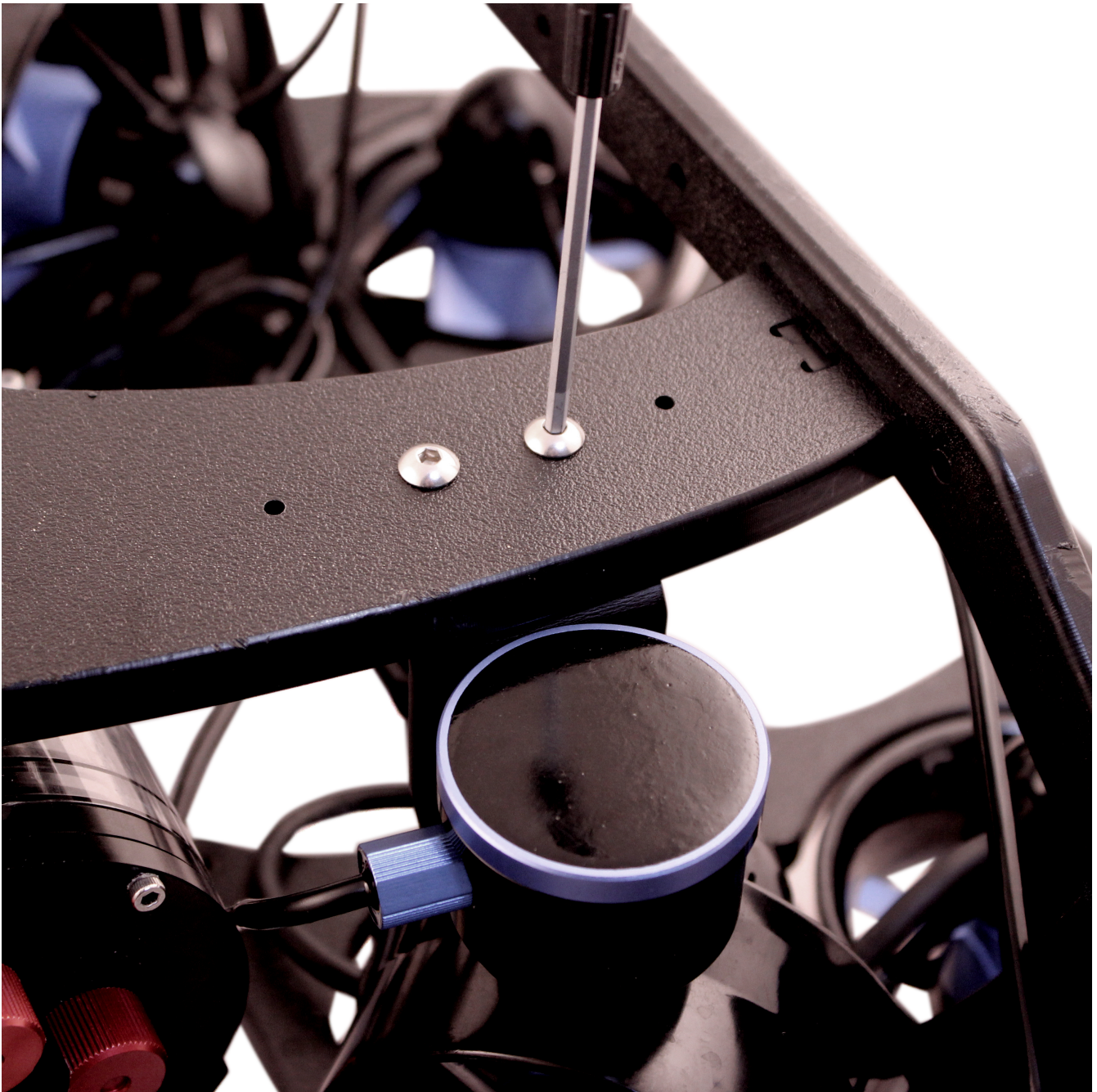
(/wp-content/uploads/2019/01/IMG_3724.png?x68454)

6. With a battery powered hand drill and 5.50mm drill bit, drill straight holes in the position markings.
7. Re-attach the 3" battery enclosure to the frame with the M4x14 Screws.
8. Re-attach the bottom frame panel to the *BlueROV2* with the four M5x16 Screws.
9. Using the 4 x M3x5 button head cap screws, secure the *Ping* to the mounting bracket.



(/wp-content/uploads/2019/01/IMG_3725.png?x68454)

10. Coming from the aft end of the *BlueROV2*, weave the *Ping* assembly into its mounting location, apply a drop of threadlocker to the included M5x16 Screws and secure to the frame.

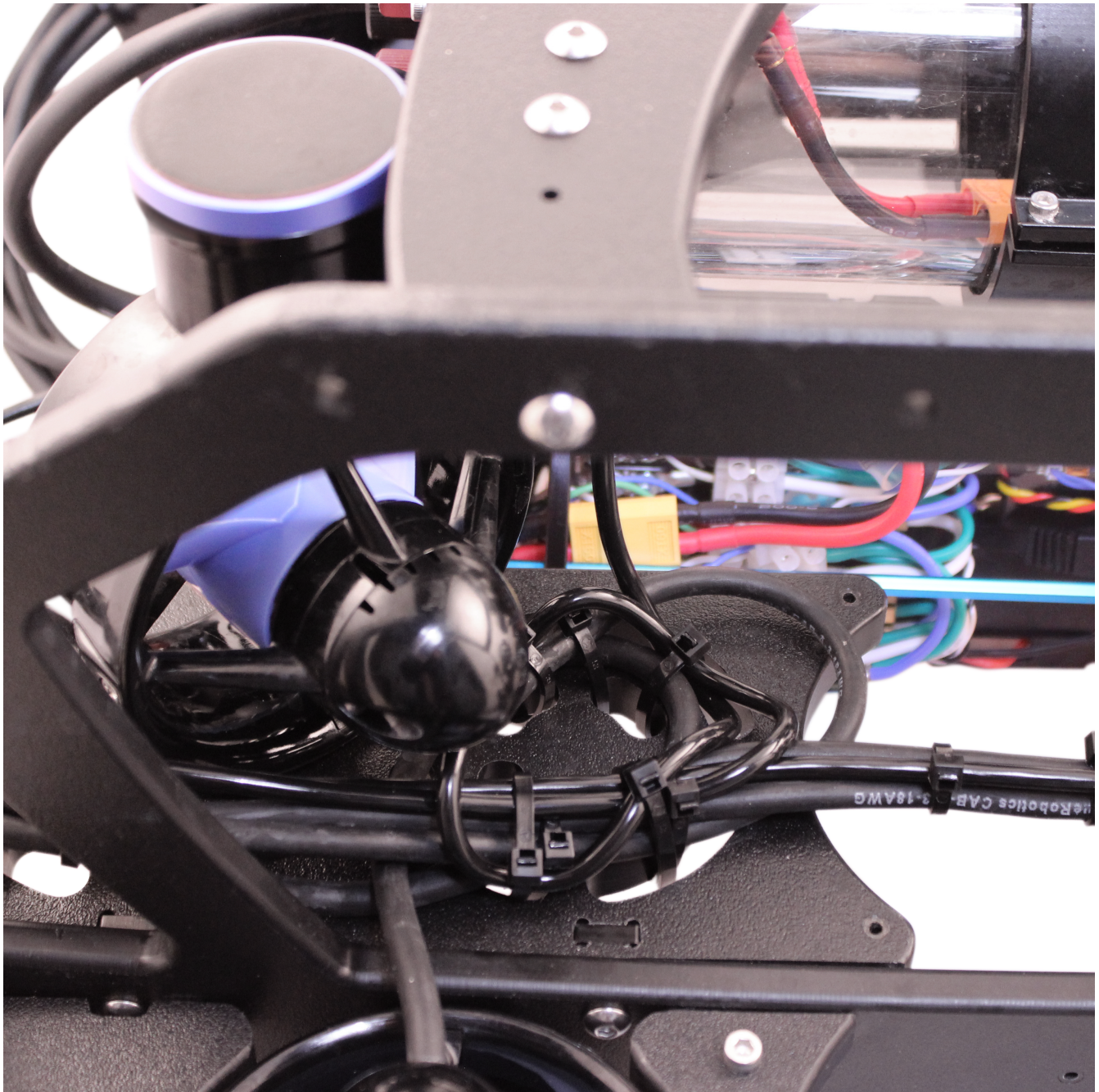


(/wp-content/uploads/2019/01/IMG_3726.png?x68454)

Cable Management 📌

To clean up the external *Ping* cable, you will need at least one zip tie and your scissors/wire cutters.

The primary goal of cable management is to prevent the wires from getting cut by the propellers. Make sure to check that no wires can reach the propellers after you have finished routing the *Ping* cable.



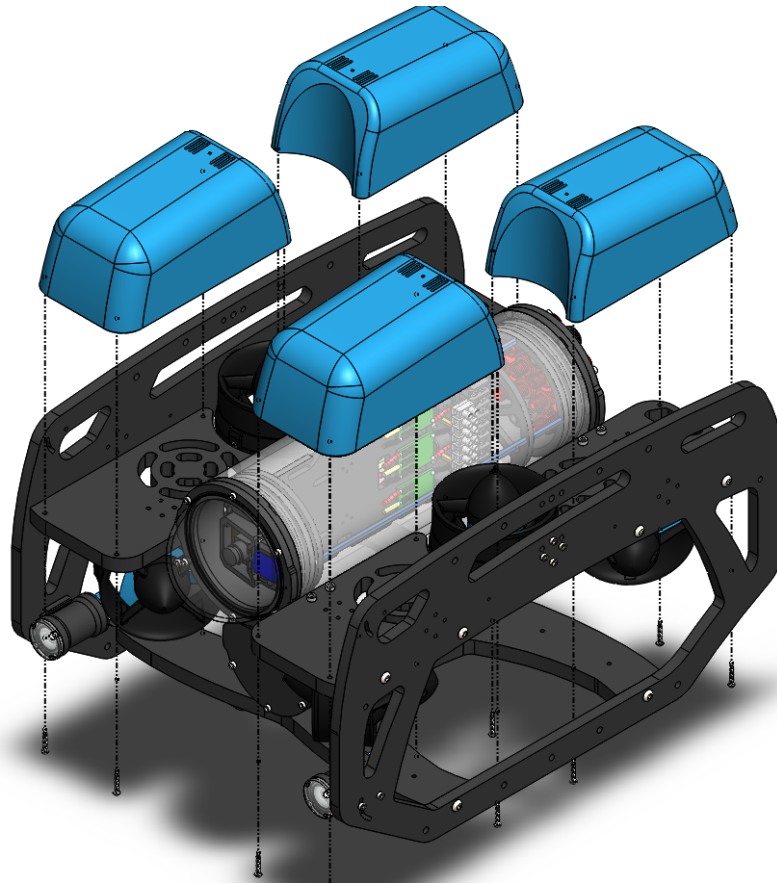
(/wp-content/uploads/2019/01/IMG_3727.png?x68454)

Reinstall Buoyancy Blocks and Fairings 📌

To install the new buoyancy blocks and fairings, you will need the following parts and tools:

- 16 x Fairing screws that were placed off to the side during disassembly
- 4 x Fairings with buoyancy installed that were placed off to the side during disassembly
- 1 x #1 Phillips head screwdriver

1. Reinstall Original Fairing Blocks onto ROV by installing the screws through the center panels and into the fairings.



(/wp-content/uploads/2019/01/ping-remove-fairings.png?x68454)

Adjusting Ballast on the Frame %

To adjust the amount or position of ballast on the frame you need the following parts and tools:

- 7 x 200g Ballast weights (from original BlueROV2 Kit)
- 7 x 8-16 Thread, 5/8" Long, Thread-Forming Screws
- 1 x #2 Phillips head screwdriver

To get the longest battery life and the best driving experience, it is important to have the ROV close to balanced from front to back in water and close to neutrally buoyant. *Ping* is 48g negatively buoyant in water, so depending on placement, the ROV will need to be re-trimmed based on your operating conditions. Trimming the ballast may involve a bit of trial and error.

Software Update %



Ping requires ArduSub Companion image version 0.0.16 (<https://raw.githubusercontent.com/bluerobotics/companion/master/release-notes.txt>) or higher. If your Companion image is out of date, please follow the BlueROV2 Software Update (<http://docs.bluerobotics.com/brov2/software-setup/#update-software>) procedures.

ArduSub Companion Computer Setup

Reboot
Shutdown

Companion Version: 0.0.16

 Enable Advanced Options

Pixhawk Firmware Update

ArduSub Version:
3.5.3

Download and Update (Requires Internet Connection):

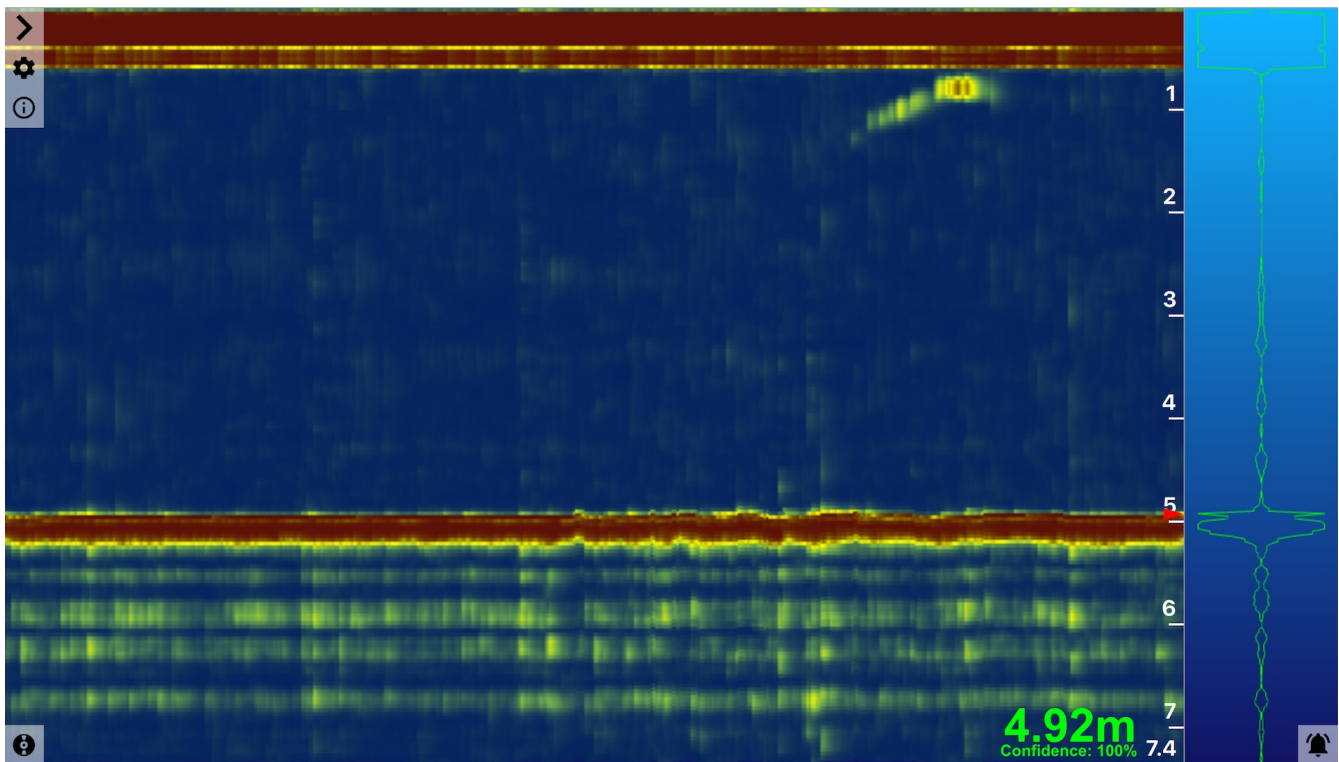
Development
Beta
Stable

Upload Firmware File:

(/wp-content/uploads/2019/01/Companion-0.0.16.png?x68454)

Use With Ping-Viewer Software ↗

Follow the Ping-Viewer Quick Start (<https://github.com/bluerobotics/ping-viewer/wiki#quick-start>) for installing the latest version of Ping-Viewer and learning about its features.



(/wp-content/uploads/2019/01/ping-viewer-1.jpg?x68454)

Main Ping-Viewer Interface Window


Troubleshooting ↗


Ping-Viewer does not connect to the onboard Ping ↗

1. Recheck the Ping wiring harness going to the BLUART. The wire colors should match
2. Check which version of ArduSub Companion is installed on your BlueROV2. The version number should either be displayed in the main Header Bar (<https://www.ardusub.com/operators-manual/companion-web.html#companion-header>) or the Companion Software Status (<https://www.ardusub.com/operators-manual/companion-web.html#system>) section. Ping will need version 0.0.16 or higher to run on a BlueROV2.
3. Try a different Micro-USB cable. Sometimes USB cables are faulty. Contact support@bluerobotics.com (<http://support@bluerobotics.com>) if you discover you have a faulty Micro-USB cable purchased from the Blue Robotics store.

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Tags

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Posted 29 Jan 2019
 Last updated on 6 Feb 2019

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