



OCEAN SONICS

Tow Fish User Guide



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Introduction

The **Tow Fish** allows users the ability to deploy an icListen Smart hydrophone behind a vessel with an autonomous or cabled deployment.

The Tow Fish is a towed underwater depressor designed by Dartmouth Ocean Technologies. The Tow Fish allows users tow a hydrophone at a constant depth behind a vessel while shielding the hydrophone sensing element, reducing flow noise. Ocean Sonics has a custom designed mount to use with an icListen hydrophone.

Users can use a Tow Fish to conduct underwater research and marine mammal monitoring. The Tow Fish minimizes drag and maintains even depth improving the accuracy of your data collection. The Tow Fish is the perfect tool for deploying towed arrays, maintaining compliance while performing seismic surveying or marine construction.

Tow Fish Quick Start



OSL Tip This setup gives details for the deployment of the Tow Fish equipment, see [icListen Guide](#) for setup of icListen hydrophone.

Setup Hydrophone

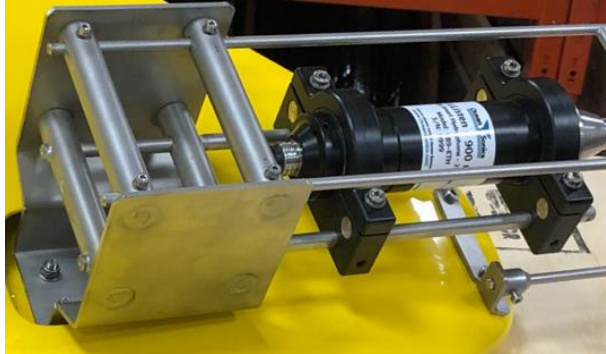
1. Configure the icListen hydrophone for the deployment.

Assemble Configuration

2. Mount the icListen Smart Hydrophone on the Tow Fish.
 - a. Position the icListen with the element pointing towards the tip of the Tow Fish (see below).



- b. Two bands on the hydrophone will line up with clamp positions on mount.



- c. Secure the hydrophone with the 2 top bands of the clamps and tighten the hex screws in place with a Hex (Allen) key.
3. For an autonomous deployment, without a cable, use the icListen shorting plug to protect the pins on the hydrophone.
 4. For a cabled deployment
 - a. If you are deploying from the cable, Attach cable grips to cable. (see [Appendix A](#)).
 - b. Pass the female end (no pins) of the cable through the hole on the top of the tow fish.
 - c. Plug the cable into the hydrophone.
 5. Attach the fin to the top of the Tow Fish using the screws provided.

- a. Use a Hex (Allen) Key to tighten the screws.



6. Connect the rope/cable grips to the oval quick link.
 - a. It is useful to use a rope with an eye hook



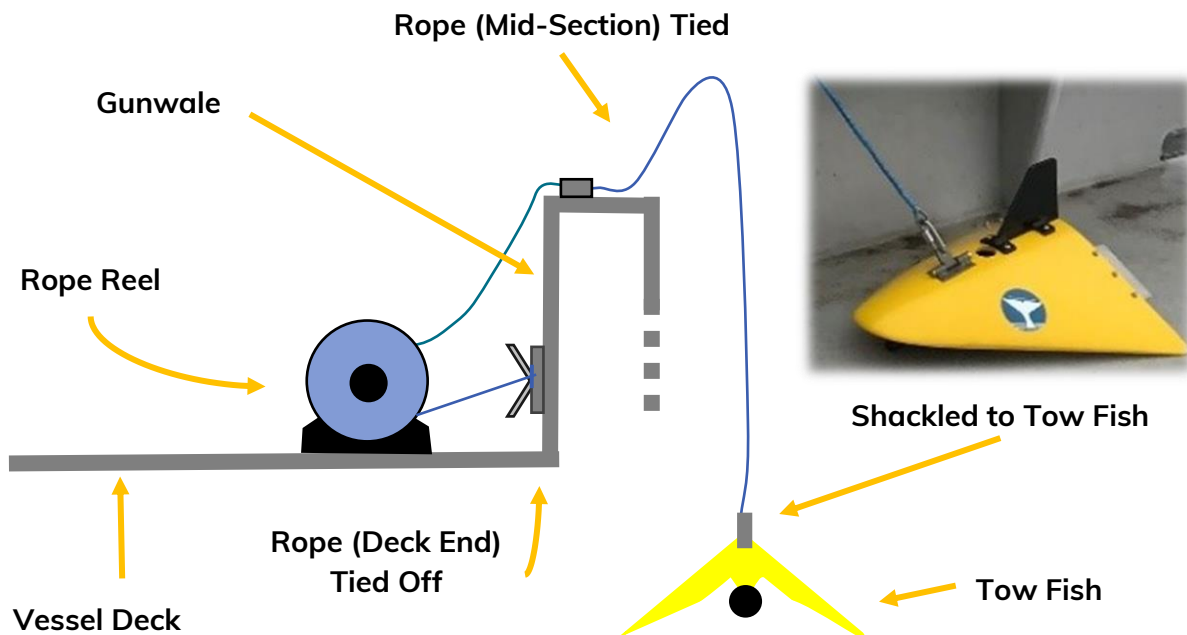
- b. If you are using cable grips, loop the cable grips through the oval quick link, a rope can be used as a secondary line.
7. Ensure the rope and/or cable grips are being used as the tension member and no strain is being placed on the connectors of the cable.
8. If a cable and rope are being used, it is beneficial to tape or cable tie them together every few meters.



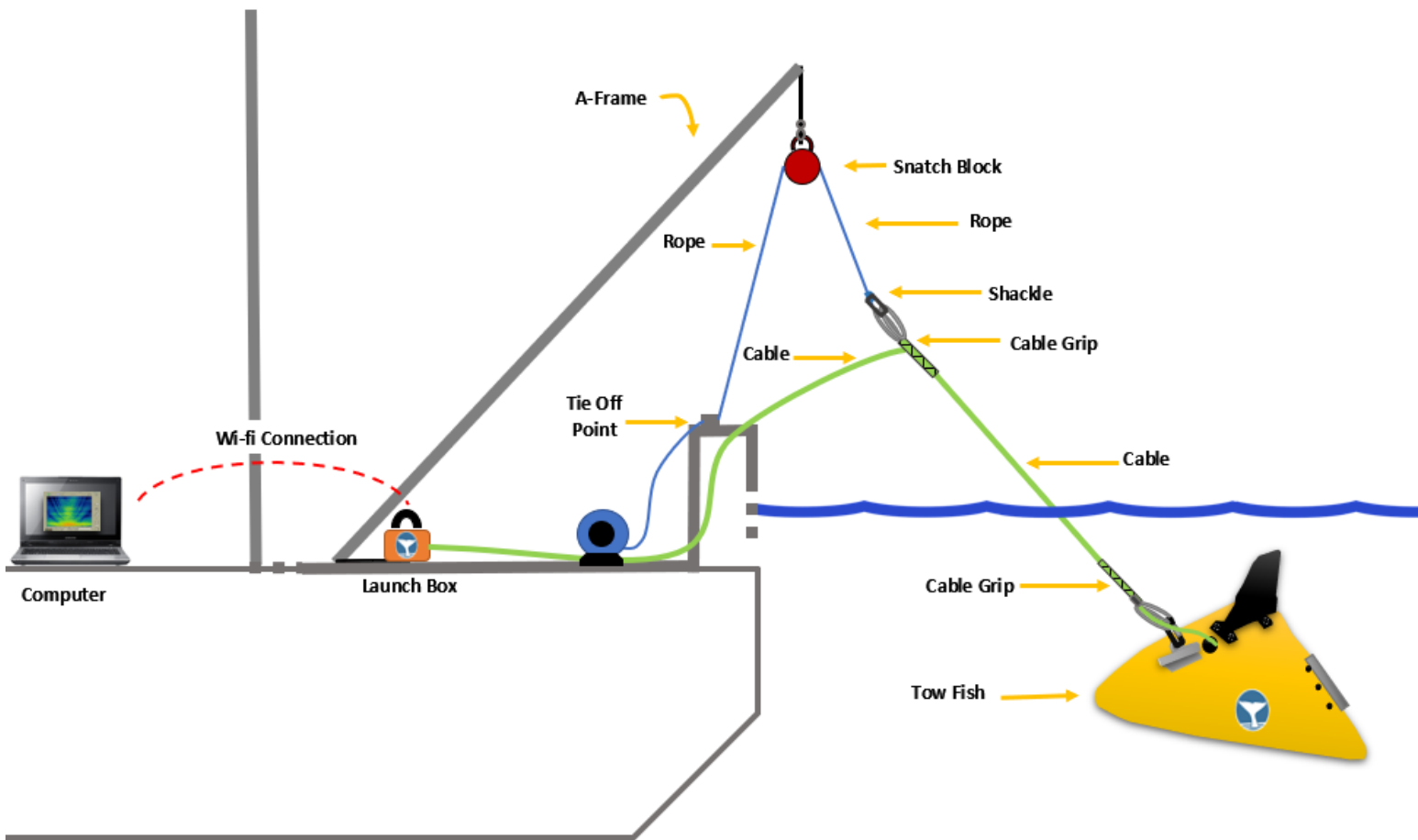
Deployment

1. Secure the deck end of the deployment rope to the vessel.
2. Ensure the rope is secured to the Tow Fish shackle.
3. Stop the vessel.
4. Place the Tow Fish in the water maintaining control over the towline.
5. To adjust the Tow Fish depth, have the vessel slowly transiting and pay out the rope to a desired length (anticipate 5:1, rope length to depth ratio).
Please see [Appendix B](#) - Recommendation #3 for further details.
6. Once the desired rope length is paid out the rope can be tied off to a midsection point on the vessel.
7. Increase the vessel to the desired towing speed.
For best results, the Tow Fish should be operated at speeds between 1 to 5 knots.
8. Once the deployment is complete, take care to gently place the Tow Fish on deck, and rinse the unit along with the deployment rope.
9. Stop the recording on the hydrophone and power down to maintain battery life.

Autonomous Deployment



Cabled Deployment



Appendix A

Double Eye Cable Grip Installation

Depending on the type of cable grip/ cable sock being used the instructions may vary. Please follow the guidelines of your cable grip you have purchased or rented.

<https://www.powerandcables.com/wp-content/uploads/2017/04/Slingco-Cable-Socks-Brochure.pdf>

Female Connector End – connector without pins

Prior to use the condition of the cable sock should always be checked for damage – ensure the correct size of sock is used for the intended cable diameter and approximate breaking strain.

1. Ensure the correct size of cable grip is selected based on the outside sheath diameter of the cable
2. Widen the lattice at end of cable grip – this can be done by pressing the end of the cable grip against a hard surface to open the end of the lattice structure
3. On the female end of the cable where the cable connects to the icListen hydrophone install the first cable grip
4. Place the cable grip over the end of the cable with the two loops closest to the connector
5. Push cable grip over the cable
6. Measure approximately 0.5 meters from the end of the connector to where the cable grip will be placed on the cable
7. Line up the cable grip to the point where you would like it to be place on the cable
8. Ensure the loops of the grip are closer to the female connector of the cable



9. Once to 6 b. in the Quick Start, where you insert the loops into the shackle on the tow fish, you can adjust where the cable grip is on the cable and how much cable you will want between this point and the hydrophone with the loop in the cable
10. When the cable grip is in place and gripping the cable, cable ties should be fitted to the end of the cable grip. Recommend between 1 1/4" (30mm) and 2 1/4" (55mm) from end of the lattice.
 - a. Find an X (cross) on the cable where you will begin an under-over pattern, under the first X cross and over the next cross continuing until returning to the first X to connect the cable tie.

- b. Move further down the cable grip and perform the same under over pattern ensuring the opposite X crossings are being secured
11. Tape should then be wound around the end of the grip furthest away from the eye ends. This will prevent any snagging while being pulled.

Male Connector End – connector with pins

12. Measure out the desired cable length between the placement of the first cable grip to where the second cable grip will be placed, how far the tow fish will be pulled from the vessel.
13. This length should ideally be less than the depth of the water to ensure the tow fish will not be dragged along or hit the bottom damaging the equipment.
14. Place the cable grip over the end of the cable with the two loops closest to the connector
15. Push cable grip over the cable to the measured distance.
16. Secure the cable grip with the two cable ties, as was done for the previous cable grip.
17. The cable grip can be attached to a shackle and secured to the vessel.
 - a. See the Cabled Deployment for suggested configuration
 - b. If no A-frame is available, it is possible to just attach the shackle to a rope and tie it off on the deck of the vessel.
18. Once amount of cable is fed into the water the cable grip or attached shackle can be secured/ tied off to the vessel.
19. The remaining cable with the male connector end will be secured on the deck of the vessel without strain from the tow fish.
20. The cable on deck will be plugged into a Launch Box or test cable to a computer to record and stream data in real-time.

Appendix B

Deployment Recommendations

1. The Tow Fish is negatively buoyant and will sink when not being towed.

Rope length should be chosen based on water depth of the deployment area. If the rope is longer than the depth of the water special care should be taken to ensure the Tow Fish is retrieved before the boat slows to a stop, so the Tow Fish does not hit bottom and cause damage to the equipment.

2. Increasing speed will increase the overall engine noise, flow noise and strum recorded on the hydrophone.

The best data will be collected on the hydrophones while being operated at speeds between 1 to 5 knots. Reducing speed will minimize flow noise, engine noise and maximize the signal to noise ratio of your target sounds. Engine noise may be found up to 10 kHz below speeds of 6 knots.

3. A Tow Fish Depth Calculator can be made in Microsoft Excel for quick depth calculations.

By knowing amount of rope in the water, and the angle of the rope into the water, the depth of the Tow Fish can be calculated.

4. The towline strain will increase as speed increases to a maximum strain of 40kgf at 8 knots.

5. 3/16" Amsteel was used during testing of the Tow Fish.

Amsteel rope (or equivalent) with a smaller outer diameter will diminish sound from rope strum and increase the Tow Fish stability.