

Introduction

Turner Designs' C3 Submersible Fluorometer can be used to quantify biological, chemical, or physical materials in aquatic systems using fluorescence detection. The C-ray Towed Deployment Body houses the C3 enabling it to be towed for shallow water (0-50 meters) research. Researchers can collect horizontal profiling data and combine those data with GPS data in order to map the fluorophore(s) of interest for an area of water.

When combined with mapping software, the C3 and C-ray can collect real-time water quality data at various depths and display the location-based data graphically.

C-ray Package P/N 2300-750 Includes

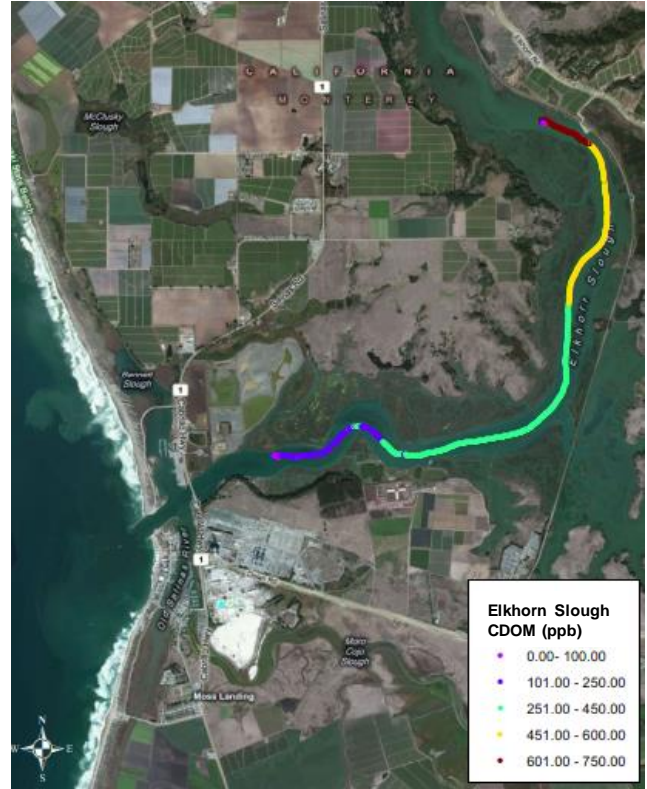
- ◆ C-ray Towed Deployment Body (1)
- ◆ Fluorometer Retaining Pins (2)
- ◆ Locking Pins (3)
- ◆ Shackle (1)
- ◆ Shackle Retaining Pin (1)
- ◆ Shackle Locking Nut (1)

Required Parts & Accessories not included in C-ray Package

- ◆ C3 Submersible Fluorometer P/N 2300-000
- ◆ C-ray Shade Cap P/N 2300-502
- ◆ Turner Designs Extender Cable (10m, 25m or 50m)
- ◆ Continuous Data Cable P/N 2200-160
- ◆ +12 VDC portable power supply
- ◆ Field PC - GPS may be integrated or input from another source.
- ◆ Mapping Software such as <http://www.windmill.co.uk/> or similar

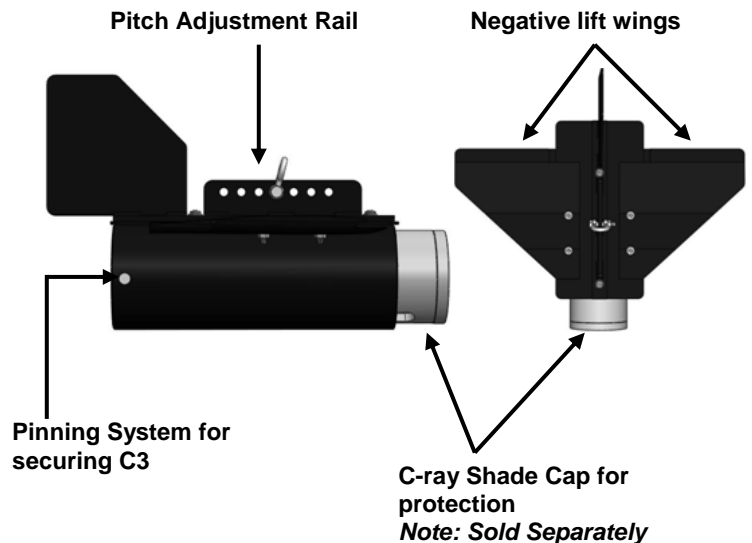
Benefits

- Depth can be adjusted during sampling to achieve multiple depths
- Negative lift wings combined with the heavy housing ensures the C-ray remains at depth
- Sturdy housing offers superior protection for the C3 by preventing damage when deploying, recovering, or sampling
- C-ray Shade Cap helps block possible sources of light that may interfere with the C3 measurements
- Pitch adjustment allows users to vary speeds based on depth, water type, cable used to tow the C-ray, etc.



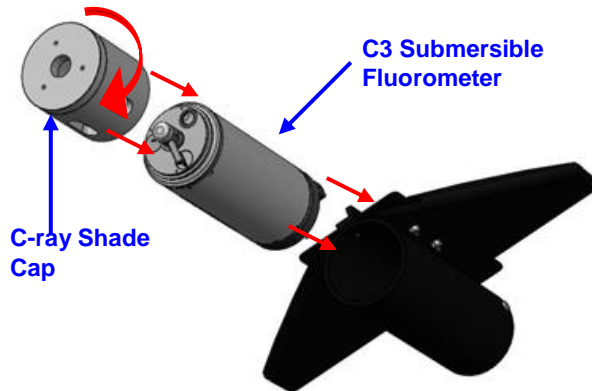
Example of graphically displayed C3 data captured while towed on a C-ray.

Features

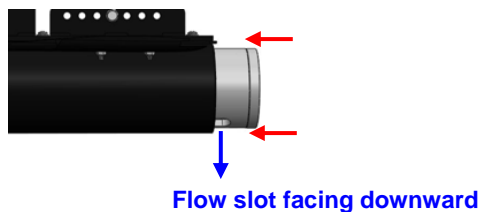


Installation

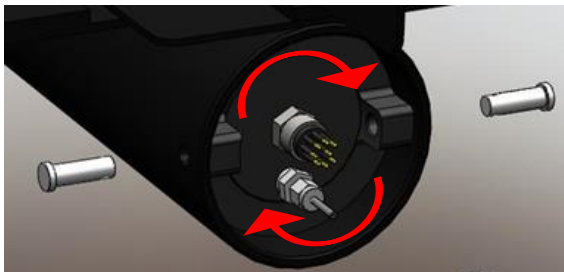
- 1) Using clockwise turns, thread the C-ray Shade Cap onto the C3 until it is fully tightened.



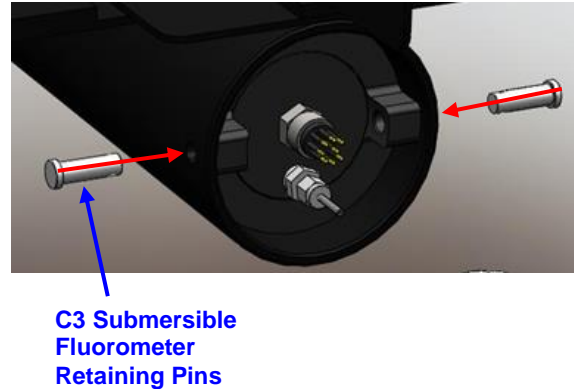
- 2) Insert the C3 into the C-ray so that the C-ray Shade Cap's flow slots are facing as downward as possible.



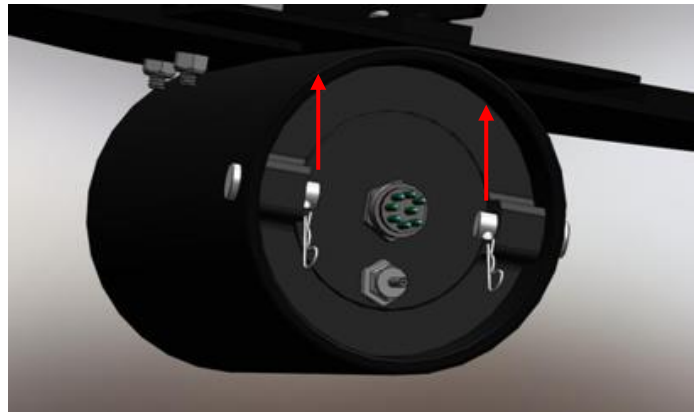
- 3) Rotate the C3 slightly to align the eyelifts with the predrilled holes in the C-ray's housing so that the C3 can be secured using the pinning system. **Note: Slight rotation is necessary to keep the flow slots facing downward.**



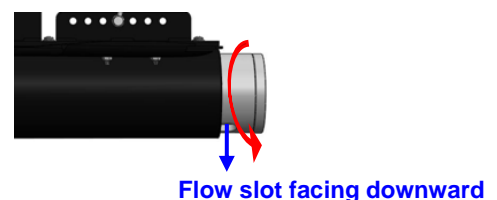
- 4) Insert the Retaining Pins through the predrilled holes in the C-ray's housing and through the eyelifts on the C3's housing thereby retaining the C3's position.



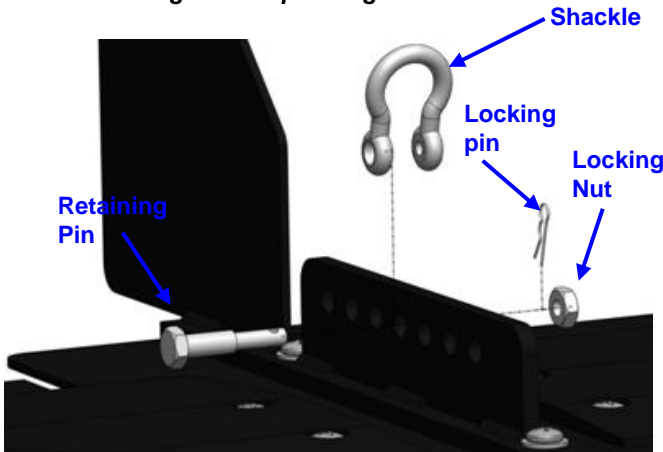
- 5) Install the Locking Pins to ensure the Retaining Pins are secured in their position by inserting the Locking Pins' straight edge through the Retaining Pins' predrilled hole making sure the Retaining Pin locks onto the center of the Locking Pin.



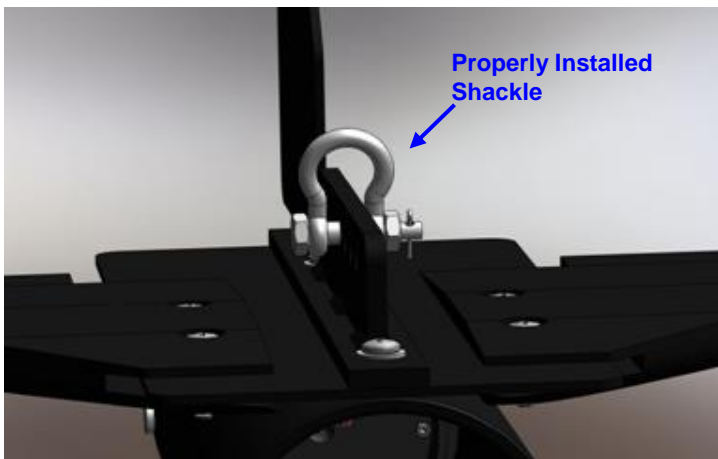
- 6) Now that the C3 is secured to the C-ray's housing, check the C-ray Shade Cap's flow slots to make sure they are facing downward. If they are not facing downward, turn the C-ray's Shade Cap slightly, counterclockwise, to adjust the flow slots to face in the downward position.



- 7) The shackle that attaches to the Pitch Adjustment Rail consists of 4 pieces. Align the Shackle with one of the positions on the Pitch Adjustment Rail.
Note: The position closest to the C-ray's rear fin points the nose downward and can be used for higher speeds or lower depths. The position closest to the front end of the C-ray points the nose upward and can be used during vertical profiling.



- 8) Insert the Retaining Pin through the shackle and thread the Locking Nut onto the end of the Retaining Pin.
- 9) Insert the straight edge of the Locking Pin into the Retaining Pin's predrilled hole to keep the Locking Nut from unscrewing. Make sure the Retaining Pin locks onto the center part of the Locking Pin. A properly installed Shackle will resemble the shackle in the figure below.



- 10) Attach a wire cable to the shackle and deploy the C-ray for towed horizontal profiling.

Notes

- Do not remove any of the screws located on the C-ray. These screws are tightened in a specific manner so they will remain fastened. Removing and re-installing the screws may cause a C-ray malfunction during sampling, result in damage to the C-ray, or result in loss of instrumentation.
- Do not use any parts other than the ones shipped with the C-ray. The shackle and pinning system are designed specifically for the C-ray, using any other parts for the pinning system or shackle may result in damage or loss of instrumentation.
- Make sure to rinse the C-ray with freshwater after each deployment to remove trapped seawater or natural water which may contain organisms and/or minerals that may cause build up on the C-ray's parts.
- If the C-ray has been damaged in any way, stop use and contact Turner Designs for further instructions.

C-ray Specifications

Material (Housing)	Powder Coated Low Carbon Steel
Material (Wings)	High Strength Plastic
Material (C-ray Shade Cap)	Delrin Plastic
Inside Diameter	10.4 cm (4.1 in.)
Length	37.8 cm (14.9 in.)
Width	49.8 cm (19.6 in.)
Weight	7.44 kg (16.4 lbs.)

C3 Submersible Fluorometer Specifications

Material	Delrin Plastic
Diameter	10 cm (3.9 in.)
Length	23 cm (9.1 in.)
Weight in Air	1.64 kg (3.6 lbs.)