

VideoRay \$ 50.00 Submersible Camera

VideoRay R&D Engineers set out to develop a low cost submersible video camera constructed of common materials and easy to construct – specifically for the MATE competition. The result is a black and white camera the costs ~ \$50.00 and is good to depths to + 100 ft.

Materials Needed:

Camera - \$49.99 X-10 Anaconda color camera (SC18A) – http://www.x10.com/cameras/sc18a_s.html. The unit comes with a power supply and 60 foot combination power/video cord. (Frequently X-10 has special offers, such as 3 cameras for \$99. Check the web site!)



Potting Epoxy- EnviroTex Light, comes in a box and can find it craft stores. Here is a link to a store that sells it <http://www.alpineimport.com/Itemdesc.asp?CartId={5AFDB86E-8131-46C6-96EF-B91DB810958F}&ic=02008&Tp=> One 8 oz kit should make around 4 cameras; \$6.29.



Silicon Aquarium Sealant – This particular sealant is made by DAP. Shouldn't be too hard to come by – try Home Depot or a hardware store.



Quick Drying Epoxy. It dries in a few minutes. There are two parts to the epoxy that you need to mix together when dispensed. You just use a little so it should last a while. You can order these on line at www.mcmaster.com, Part # 7541A76. \$3.18



Plastic Container 2 oz – McMaster Carr – Part # 4188T411, can order on line at www.mcmaster.com. They come on a package of 10 for \$6.48

Procedure

1. Get the camera ready. You need to hook the camera up to a video source to focus it. You focus it by turning the lens. You want items around 6 inches from the lens to be in focus.
2. When finished focusing the camera you will next be placing the camera lens against the bottom of the plastic container.
3. The plastic container has markings on the bottom so you need make sure that when you place the camera lens that there are no markings in front of it.

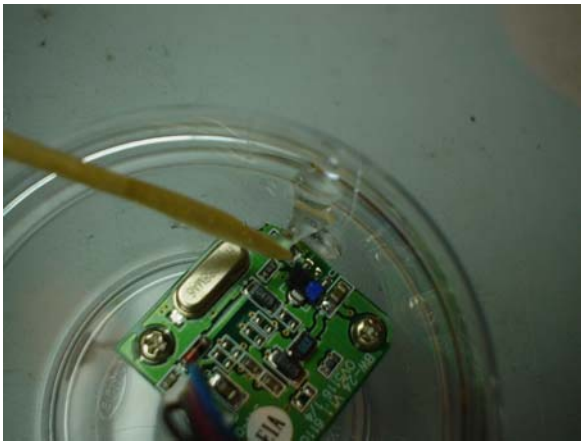


4. Put some silicon on the tip of a toothpick.

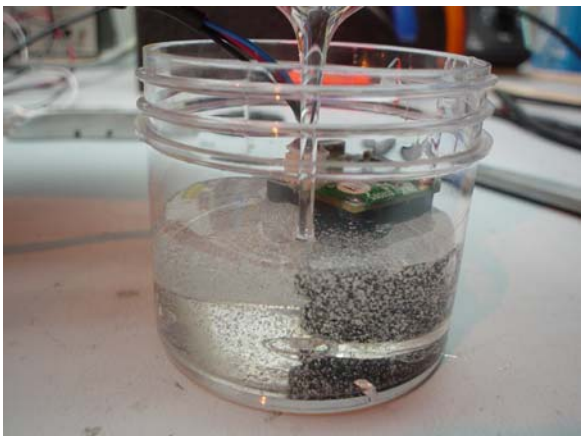


5. Spread the silicon on the flat ring around the lens.
6. Place the camera inside the plastic container, making sure that the lens is not obstructed by any markings on the bottom of the container.

7. Next, spread the 5 minute epoxy on the camera side that is against the container.
This is to hold the camera in place.
8. Hold it in position with a toothpick until dry, about 5 minutes.



9. Let the silicon dry for an hour.
10. After letting the silicon dry for an hour, the camera is now ready to be potted with the EnviroLite epoxy.
11. Mix the epoxy in a ratio 1 to 1 in a plastic cup. **IMPORTANT – DO NOT APPLY ANY HEAT AS INSTRUCTIONS SAY ON BOX.** This will accelerate the curing process, but also force epoxy into the camera, which will damage it. The fine bubbles are OK; they will not cause any problems.
12. Pour the epoxy until it fills the container.



13. When potting the camera the black part of the wire must be submerged in the epoxy to insure proper sealing and durability.



14. Let Dry overnight. The camera should then be ready to use. For mounting, you can drill holes in the epoxy if you like, so long as you are careful not to hit the parts. We have tested a unit built at VideoRay to 150 PSI, or about 300 feet deep in fresh water.