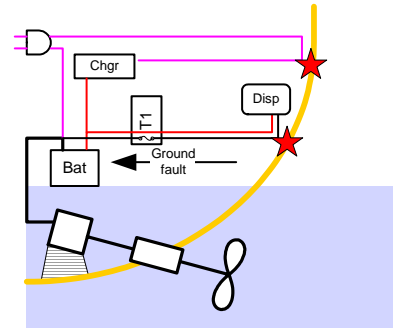


## Precautions to take when installing on a boat with an isolated power system

Many modern boats have electrical systems which are designed to be isolated from the hull. This is done to protect the hull from being damaged by electrolysis.

With this type of system, all electrical components and wiring must be designed and installed in such a way that no connection between the electrical system and the hull is made, accidentally or otherwise. Needless to say, in the presence of salt water, this is a chronic challenge requiring constant maintenance and monitoring.

The salient point with isolated supplies is that the hull is not connected to the supply negative, so it's free to float. Any circuit touching it forces it to take on that potential. If another circuit element also touches the hull, ground fault current flows and takes out the weakest link in the 'sneak' path.



These ground faults are very hard to detect, because the damage usually occurs nowhere near where the contact was made and not even in the same piece of gear. And the damaging contact could be momentary, such as when starting the engine.

### How to tell if the boat has an isolated supply

Disconnect the power cable from the Ockam CPU – especially the ground lead. Measure the AC and DC voltage and resistance (if the voltages are zero) between the battery negative and the hull (not the engine). If there is voltage or non-zero resistance, the battery is floating.

### Check that the Ockam system is isolated from the hull

- With the power leads disconnected from the CPU, but the rest of the system connected, measure the resistance between the Ockam bus shield (connector shell) and the hull. There should be at least 10,000 ohms. If not, go over the bus and isolate all BNC connectors from the hull. Also check for chafing where the cable passes thru bulkheads.
- Sensors attached to interfaces must also isolate their signal and power leads from the case to avoid ground faults. If you get ground indication, disconnect interfaces one at a time to check for this sneak path.
- For the T1, additional ground contacts can also be made thru the NMEA, GPS and RS232 ports. If you get ground indication, remove these connections one at a time to determine where the problem lies.

### Installation tips

- Cover all BNC connectors to prevent contact with the hull.
- When running cable thru bulkheads, sleeve the hole to prevent the bulkhead from chafing thru to the Ockam bus shield (or to a 12 volt supply wire).

- Before connecting NMEA output to another device, be sure that the device input is opto-isolated.
- Check that laptop inverters provide isolated power to prevent AC from getting into the RS232 port. With the laptop running on its charger (and inverter), and disconnected from the Ockam system, measure the AC voltage between the laptop metal and battery negative. If necessary, a ground strap connected to battery negative should be fitted.