

# Protecting the SeaSonde from Lightning and Other Electrical Surges

An ounce of prevention is worth a pound of cure

The occurrence of lightning striking SeaSonde antennas is extremely low. However, the statistics vary geographically and even a small risk exists at any coastal HF radar location. Some may ask, "what can be done to prevent the antenna from being struck by lightning?". Unfortunately there are no devices that can prevent a strike on the antennas without disrupting their normal performance. There might be some very sophisticated antenna protection system that may not negatively affect the antennas, but these expensive designs cost more than the price of entire SeaSonde unit and still can offer no guarantees.



All SeaSondes are equipped with some lightning protection built into the transmitter chassis and the receive antenna (shown below). The purpose of these devices is to minimize the effects of a lightning strike upon the more expensive parts of SeaSonde electronics if an antenna is hit.

**First Layer of SeaSonde Lightning Protection:  
Gas Discharge Tubes Inside TX chassis & RX antenna Board**

**Transmitter Chassis**  
Transmit Module (inside TX chassis) viewed from 2 angles  
Gas Discharge Tube (aka spark gap)  
Receive Antenna Board (inside RX antenna box) viewed from bottom

Inside the transmitter chassis is a gas discharge tube (aka spark gap) designed to arc over and shunt the energy to ground when a threshold voltage is reached. This provides some protection to the electronics in the event of a lightning strike on or near to the transmit antenna. A similar gas discharge tube is also built into the receive antenna board. If lightning hits the monopole and exceeds breakdown voltage then arcing to ground side of co-ax cable will occur, offering some protection to any equipment downstream.

**The SeaSonde Extended Lightning Protection Kit**, CODAR Product Code LT-E1, (shown below) is an optional secondary lightning protection package set in a small weatherproof housing (mountable either indoors or outdoors) intended to provide one additional layer of electronics protection. It uses the same gas discharge tube method on all transmit and receive cables connected to the electronics. It is not a guarantee against damage but is another technology that may help protect the electronics chassis (if either antenna or antenna cables take a direct hit).

Lightning can also hit buildings and power lines-- a hit to either can send strong surges of voltage through the building electrical system and damage electronics. Power coming to SeaSonde should be buffered via an

**Uninterruptable Power Supply (UPS) Power Conditioning Unit** (CODAR Product Code UPS1500). A UPS connecting the SeaSonde unit to its power source (e.g. wall plug) will provide a layer of protection to electronics against power surges that come from power line. They also allow for continued quality performance through power fluctuations (sometimes referred to as "brownouts"). UPS devices are small investments with big rewards.



CODAR Product Code UPS1500

Consult CODAR Support Team for additional details on protection technology and how these may be best utilized inside your SeaSonde network.

