Preparing to Deploy pH Sensor

1. Unscrew the sensor guard.
2. Unscrew the soaker bottle cap, and remove the soaker bottle. An O-ring on the pH electrode retains the cap.
3. Reinstall the sensor guard for deployment.
4. Sea-Bird ships the pH sensor with 2 spare *solid* caps to prevent spillage when the soaker bottle is not installed. Place one of these caps on the soaker bottle and store.

CAUTION
When removing or installing the soaker bottle, do not force the pH electrode sideways.
The electrode's outer shell is plastic, but the **inner stem is glass and can break if the electrode is handled roughly.**

Note: All photos are of an SBE 18; details for other sensors are similar.

Unscrew sensor guard

Unscrew cap and remove bottle; cap remains on electrode

Solid cap for storage solution while sensor deployed

Storing pH Sensor after Recovery

Optimal performance is obtained when the sensor stays hydrated during storage:

1. Unscrew the sensor guard.
2. Remove the *solid* cap from the soaker bottle.
3. Slide the cap that was retained on the electrode down to the O-ring that is retaining it. Thread the soaker bottle onto the cap.
4. Verify that there is enough fluid in the bottle to cover the end of the probe up to the first O-ring (as shown in the photo).
5. Reinstall the sensor guard.
6. Store the sensor in an upright position (soaker bottle end down).

Verify solution covers end of probe at least up to this level
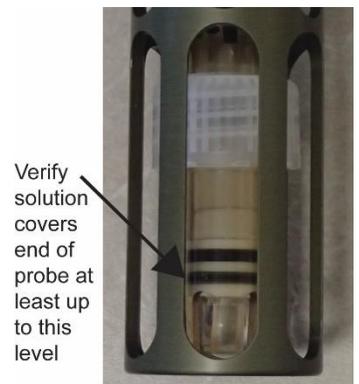
The *soaker* fluid is 4 Molar Potassium Chloride Saturated with Silver Chloride. Additional solution, if required, may be made using commercially available buffer capsules, KCl crystals, and distilled water. Replace the soaker solution as needed to keep the sensor submerged at least up to the first O-ring.

The sensor will tolerate the periodic absence of the soaker bottle and can be returned to initial performance by soaking for a few hours. However, **exposure of the bare sensor to temperature extremes (e.g., strong direct sunlight on a hot day) can cause a loss of internal electrolyte**. Subsequent cooling will draw air into the sensor, which will lead to pressure-related problems.

Note: The sensor contains a non-organic electrolyte and antibacterial inhibitors designed to optimize its use in marine environments.

Calibrating the pH Sensor

Note: A recommended source of buffer solutions is https://us.vwr.com/store/catalog/product.jsp?catalog_number=97021-450.

Sea-Bird recommends that you recalibrate your pH sensor at the start of every cruise, and then at least once per month, depending on use and storage.

Sea-Bird pH sensors are calibrated with commercial buffer solutions (± 0.02 pH). Make periodic corrections by comparison to buffers near the anticipated in situ pH, typically in the 7 - 8 pH range. Best calibration of the sensor is obtained by soaking the sensor in a KCl solution (described above in *Storing pH Sensor after Recovery*) for 30 minutes prior to standardization with buffers.

To calibrate:
1. For easier access during calibration, remove the pH sensor from the mount kit holding it to the CTD, but leave the pH sensor cable connected to the CTD end cap.
2. Run Seasave V7, set it up to display the pH voltage (the voltage channel for the pH data is listed on the instrument configuration page in your CTD manual), and start real-time data acquisition.
3. Connect a small-gauge wire to one of the screws at the connector end of the sensor housing and put the other end into the buffer solution bottle.
4. Put the pH probe in the buffer solution and wait 1 minute for complete stabilization. Note the resulting voltage on the computer display.
5. Repeat this process for at least two other values of pH, preferably *bracketing* the range of interest. **Rinse the pH electrode in deionized water between measurements in the different pH buffer solutions.**

Note: In our Seasoft V2 suite of programs, edit the CTD configuration (.con or .xmlcon) file using the Configure Inputs menu in Seasave V7 (real-time data acquisition software) or the Configure menu in SBE Data Processing (data processing software). Select pH as a voltage sensor when editing the configuration file; the software prompts for slope and offset.