

Three Lakes Association Hydrolab for Dummies

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Know before you start:***Introduction***

The Quanta Hydrolab is a system used to monitor water quality. It is most commonly used to measure the Temperature, pH, Dissolved Oxygen (DO), Specific Conductance (SpC), and depth of a specific body of water. While the Quanta Hydrolab is predominantly used in larger bodies of water, it can be used to determine water quality in anything from lakes, rivers, and streams to process pipes, bays, estuaries, tanks, aquaria, and sewers. Data can be collected over a long or short period of time.

Unpacking

Our Hydrolab is stored in a large plastic camping cooler. It must always be returned to this cooler after use. When one opens the cooler one will find that the membrane end of the Transmitter is submerged in either deionized (distilled) or tap water. In order to keep the hydrolab functional the membrane end of the Transmitter must always be submerged, especially while being stored in between uses. The display, storage/calibration cups, 100 meter cable, and calibration fluids can also be found inside the cooler.

General Use

Before every use the hydrolab must be calibrated. If one fails to complete this task (which is described in detail in the next section) the data displayed will be extremely inaccurate and misleading. After one has calibrated the hydrolab he or she is ready to begin making measurements. In order to do this one will drop the Transmitter into the water and lower it to the desired depth. Another person should be holding the display. The display will tell that person all the different values for temperature, pH, depth etc. Once one has made all the desired measurements he or she is ready to pack up the hydrolab. Detailed instructions describing how to properly do this can be found in the "Storing the Hydrolab" section of this manual.

Be Careful

The Quanta Hydrolab is an expensive piece of equipment that was gifted to the Three Lakes Association a few years ago. Please make sure to handle it with care. The membranes at the end of the transmitter should not be touched. Also remember to never lower the hydrolab into the water without the protection cap. Failing to attach the cap can cause damage to the membranes which would result in inaccurate readings.

Calibration:**Hydrolab Quanta Calibration:**

1. Remove the storage cup and replace with the calibration cup. (1)
2. Rinse the calibration cup one or two times by filling the cup half-way with deionized water and shaking vigorously for several seconds. Try to remove as much fluid as possible from the cup after each rinse.
3. Use two or more calibration solutions that bracket anticipated conditions. Refer below for how to calibrate specific measurements.(2)

4. Carefully fill the calibration cup with the calibration solution until the probe is immersed. Shake vigorously for several seconds (except for DO).

5. Wait for the parameter reading to stabilize. Check to see if the reading is close to the calibration reading.

- If the reading is acceptable, record the calibration reading.
- If the reading is not acceptable, proceed to the calibration screen and enter the calibration solution concentration.
- In some circumstances, the unit will not accept the new calibration setting because of a problem with either the calibration solution or the unit. To see if the problem is the calibration solution, use a different calibration solution. If the problem is with the unit, try to find the source of the problem (faulty sensor, low battery, mistyped standard value, incorrect units, etc.).

6. Dispose of the calibration solution, followed by one or two rinses with deionized water.

Remove and store the calibration cup.

7. Fill the storage cup half-way with fresh tap water, and place it over the probe assembly.

Specific Conductance: The first solution should be deionized water, SpC \approx 0, and the second should be a calibration solution, such as SpC = 40 S/cm = 0.04 mS/cm. (3,4)

pH: The first solution should be lower than the typical measurement such as a pH = 7 buffer solution, and the second should be higher than the typical such as a pH = 10 buffer solution. (5,6,7,8)

Dissolved Oxygen: Fill the Calibration Cup with deionized or tap water (specific conductance less than 0.5 mS/cm) until the water is just level with the o-ring used to secure the membrane.(9) Carefully remove any water droplets from the membrane with the corner of a tissue. Turn the black calibration cup cover upside down (concave upward) and lay it over the top of the Calibration Cup. (10,11) Determine the barometric pressure for entry as the calibration standard. (12)

Using the Hydrolab:

Contents of the Hydrolab

- Three Covers: storage cup, Guard cover, and Calibration Cup
- 100 meter attached cable
- Display screen
- Transmitter Sensor End
- Dissolved Oxygen and pH Maintenance Kits
- 3 C Alkaline Batteries (life span of 20 hours with Propellor operating and no turbidity)

The hydrolab transmitter can measure temperature, pH, dissolved oxygen (DO), specific conductance (spC), depth, Oxidation Reduction Potential (ORP), Turbidity, Total dissolved solids (TDS), and Salinity.

Five Display Buttons (In order Top to Bottom)

- This Arrow Key is the enter/select key for the screen icons
- Esc/Propellor Key this key will bring the display back to the previous or main screen when pressed. This button can also turn on and off the propellor on the transmitter end. When the propellor is turned on an icon will appear on the screen.
- Toggle Key for up and left
- Toggle key for down and right
- On/Off display key which should be held till the transmitter screen turns on or off

Screens/ Screen Icon

The display has two screens. Screen one will show the spC, temperature, DO, pH, and depth. Selecting the SCREEN icon will show screen two. Screen two presents the battery voltage, salinity, DO (Percent Saturation), ORP, and turbidity.

Setup Icon

Selecting the SETUP icon will allow you to change the temperature, Salinity, TDS display, and depth Units.

Store Icon

By toggling over on the main screen and selecting STORE the hydrolab will capture the current readings in its memory. It will then allow you to toggle through the information that was selected for storing, if it is correct press the enter key, the top button. If the information is not correct and you do not wish to store it then press the Esc Key.

If the screen reads FAIL then the memory on the hydrolab is most likely full the Review Icon will allow you to clear the memory for more space.

Review Icon

The REVIEW icon on the hydrolab will show you the previous data stored. Toggling through Headings, Parameters, Digits, and Units selections will present the data screens of the most recent data stored. Use the arrow keys to see older information stored. By pressing the Esc Key the hydrolab display will show Clear/Clear All option. Pressing enter will erase the frames stored.

Using the Hydrolab

To use the hydrolab put the guard cap on the transmitter end to protect the sensors. Turn on the hydrolab, calibrate it, and rinse off the calibrating solutions. The hydrolab can then be lowered into a body of water at any desired depth (keep the hydrolab above the bottom) where you will be taking the measurements. The display will show the current readings. Turn on the propellor for a few seconds then off again, record the data then pull the hydrolab back up. Check to make sure that the propellor did not collect any weeds and the guard does not have sediment in it from contact with the bottom.

Storing the Hydrolab:

Fill the DS4 storage cup or MS cup with one inch of clean tap water and screw the cup on the multiprobe. Lay the cable in coils of at least 6 inches (15 cm) in diameter at the bottom of the plastic container. Place the multiprobe in Hydrolab's custom carrying case or in the center of the container on a circular piece of foam rubber for shock protection.

Your multiprobe cables are important components of your water quality monitoring system. They have been designed to be lightweight, portable, and durable. These cables serve two functions. First, raising, lowering, or deploying your multiprobe, and second, connecting your instrument with the surface computer and providing power and data transfers.

Protect all nonwaterproof cables (i.e. all cables except the waterproof underwater cable) from any water source during operation in the field. Keep all connectors dry at all times.