STORMWATER MONITORING PROJECT

# YSI ProPlus Calibration Procedure

### Calibration Information:

YSI supplies a threaded clear plastic calibration cylinder (sometimes called the transport cup) – it abbreviated as “cal cylinder” in this procedure. Upon completion of calibration, reinstall the sensor probe’s normal metal guard sleeve.

## Beginning Calibration::

1. Remove the metal guard sleeve from the YSI probes.
2. Locate the calibration cylinder for use in the below steps.

### pH Reference Information

- The calibration solution must be above the hole toward the top of the gray pH probe.
- pH 7 should read 0 millivolts +/-50
- pH 4 should read +177 mv (+165 to +180 range)
- pH 10 should read -177 mv (-165 to -180 range)
- The pH probe should last 18 months, replace if monthly checks show continually increasing calibration drifts, or probe response is exceedingly slow.
- To view past record of calibrations
    - File > View GLP
    - Record of calibrations
    - Scroll down until last pH.

## pH Calibration Procedure

Since the probe is normally placed in the 4 pH bath after field work, the pH calibration steps start with the 4 pH standard.

To begin, Press **Cal** button then select **ISE1 pH** then Enter.

#### pH 4 CALIBRATION STEPS

1. Fill cal cylinder with ½” of pH 4 buffer solution, install cal cylinder over probes to rinse, shake and swirl, then remove cal cylinder and dispose of liquid.
2. Fill cal cylinder halfway with pH 4 buffer solution and install over probes.
3. Enter original values (both pH and mVolt) on the Calibration Worksheet form.
4. Scroll up to Calibration Value and press ENTER.

5. Adjust to 4.0 (the exact value on bottle label), then scroll and select <<ENTER>> to accept the new value.
6. Press ENTER to accept the new calibration point; bottom of display should indicate “Ready for point 2t”).
7. Remove and then empty the cal cylinder.

#### pH 7 CALIBRATION STEPS

1. Fill cal cylinder with ½” of pH 7 buffer solution, install cal cylinder over probes to rinse, shake and swirl, then remove cal cylinder and dispose of liquid.
2. Fill cal cylinder halfway with pH 7 buffer solution and install over probes
3. Enter original values (both pH and mVolt) on the Calibration Worksheet form.
4. Scroll up to Calibration Value and press ENTER.
5. Adjust to 7.0 (the exact value on bottle label), then scroll and select <<ENTER>> to accept the new value.
6. Press ENTER to accept the new calibration point. The bottom of display should indicate “Ready for point 3”.
7. Remove and then empty the cal cylinder.

#### pH 10 CALIBRATION STEPS

1. Fill cal cylinder with ½” of pH 10 buffer solution, install cal cylinder over probes to rinse, shake and swirl, then remove cal cylinder and dispose of liquid.
2. Fill cal cylinder halfway with pH 10 buffer solution and install over probes
3. Enter original values (both pH and mVolt) on the Calibration Worksheet form.
4. Scroll up to Calibration Value and press ENTER.
5. Adjust to 10.0 (the exact value on bottle label) ), then scroll and select <<ENTER>> to accept the new value..
6. Press ENTER to accept the new calibration point. The bottom of display should indicate “Ready for next point”).
7. Remove and then empty cal cylinder.

Finish the pH calibration, by Pressing the **Cal** button.

Note: The display at the top should now show “Log one sample”.

If pH calibration is rejected at this final step (after pressing **Cal** button in the above), then select **Reset to Defaults pH.**

## Conductivity

1. If calibrating Conductivity, immediately following a pH calibration, rinse the probe with distilled if available, or tap water.
2. Fill cal cylinder 3/4 full of Conductivity Standard solution (the top vent hole on the black conductivity probe must be fully submerged in the standard solution)
3. Tap to dislodge air bubbles.
4. Press **Cal** button then Conductivity then Sp. Conductance
5. Next choose µS/cm (micro-Siemens- the top choice) and press Enter
6. Record Standard value, actual value indicated in Orig. Reading, and Temperature(°C) on the Calibration Worksheet form.
7. Arrow to Calibration Value (top of screen), press Enter and then enter value on the solution bottle label (1000) then press <<<Enter>>> to accept new calibration point.
8. Press Enter to Accept Calibration
9. Verify at top of the screen it reports “Log One Sample”
10. Empty cal cylinder

Finish the Conductivity calibration, by Pressing the **Cal** button.
The display at the top should now show “Log one sample”.

# Dissolved Oxygen

## DO Reference Information

This DO probe (polargraphic type) has a black body and operates covered with an electrolyte solution contained by a membrane within the yellow membrane cap.

1. If calibrating Dissolved Oxygen, immediately following a Conductivity calibration, thoroughly water rinse the probe.
2. Pour 1/4 inch of water into cal cylinder.
3. Thread cal cylinder onto the probe threads by no more than **half a turn**
   (this allows the cal cylinder to easily leak at the top so that the probe stays at atmosphere pressure).
4. Press **Cal** button.
5. Select DO then Enter.
6. Select **DO% (top one)** - not DO mg/l.
7. Immediately, Enter actual reading in Orig. Reading and Temperature(°C) on the Calibration Worksheet form.
8. Wait 10 minutes.
9. Press ENTER to accept calibration.
10. Record new calibration value (DO%) in Value After Cal on the Calibration Worksheet form.
11. Finish the Dissolved Oxygen calibration, by Pressing the Cal button.
    Note: The display at the top should now show “Log one sample”.
12. Remove cal cylinder, dump liquid.
13. Install normal probe shield (Metal sleeve)

If DO fails to calibrate:

1. Examine the cap closely:
   a. Is the film cut, broke or split, if so then replace the yellow DO cap filled with the electrolyte solution.
   b. Try again, but ensure the YSI has stabilized in at least 10-20°C (50-70°C) environment.
   c. Still an issue – Call Tim.

# Final Logging of YSI Calibration Data

Record all Calibration Worksheet information in the Google Docs “YSI Calibration” spreadsheet for the respective cities Log tab.

Check to make sure that the cal cylinder has been removed and the normal metal guard sleeve has been reinstalled.

# Battery Replacement - every two months

Since these instruments are shared among multiple volunteers, we feel it best to replace batteries sooner than later. It’s no fun to travel to your survey route on a raining cold day only to find the instruments are dead due to exhausted batteries.

We purchase batteries for the Anacortes instruments from Amazon and we buy by price. Lithium batteries that can be recharged are OK too.

Replace the 2 C-size batteries (either non-rechargeable or rechargeable) in the **YSI** instrument.
The battery cover is on the back side and held in by 4 screws/bolts that use a Philips-type screwdriver tip. **Do not over-tighten** or the brass inserted nut could twist out or strip. Just tighten to “snug.”

Replace the 3 AAA-size batteries (either non-rechargeable or rechargeable) in the **AMTAST** turbidity meter.

# Final Logging

Record all battery change out dates for each instrument in the Google Docs “YSI Calibration” spreadsheet for the respective cities Log tab.

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