

1st October 18

UV254 Go! Measurement and Calibration of COD Via a Spectrophotometer



Tools Needed

- Photonic Measurements UV254 Go!
- Quartz Cuvettes
- Distilled water
- Spectrophotometer or Photometer
- COD Reagents
- COD Reagent procedure requirements such as a Block heater.

Benefits to the UV254 Go! for COD

- Benefits include
- No reagents needed to perform measurement
- Time, no waiting around for lengthy reagent procedures that can take up to 2hours
- Cost, do not have to pay for reagents and disposal of chemicals
- Waste, no nasty reagents to safely dispose

Why is Calibration Needed?

The UV254 Go measures the change in absorption in the UV part of the light spectra at a wavelength of 254nm. The change in absorption at this wavelength trends with the amount of COD in the sample. The UV254 is also sensitive to other chemicals in the sample such as organic material, that means the trend in UV254 signal is dependent on multiple components within the sample being measured.

Importantly though, as the chemical make-up of the water changes so does the percentage of species that make up the complete UV254 response.

Thus, it is important to calibrate the UV254 device on a regular basis to account for changes in the chemical make-up of the water.

When to Calibrate

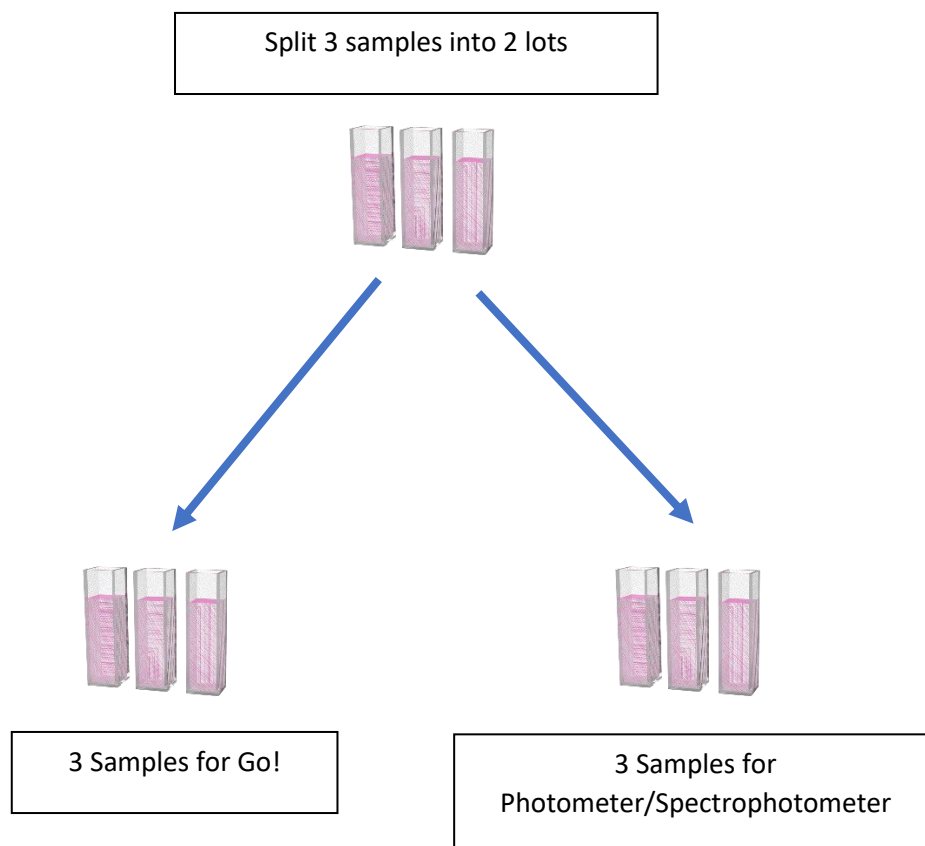
The UV254 Go can save calibrations at four different sampling locations. This reduces the need to re-calibrate the system for different locations in which the water may have different chemical make-ups.

1. Routinely calibrated the system weekly/monthly. Depending on local laboratory procedures and changes in water chemistry
2. Location of the samples has not been previously calibrated
3. Seasonal changes. Is there more organic material in the water due to higher temperatures or flood
4. Unexpected spikes in the data being measured

How to calibrate

To calibrate COD on the Photonic Measurements Go! we recommend using Palintest COD reagents and Photometer 7100. Other manufactures provide solutions, but the Palintest test are low cost and reliable.

Take at least 3 samples of the water and divide them in two. One of each for the Go! and one each for the COD reagent. 3 samples are needed in order to get enough statistical information to perform a calibration. Make sure that the samples are labelled so that measurements from each of the three samples can be correlated.



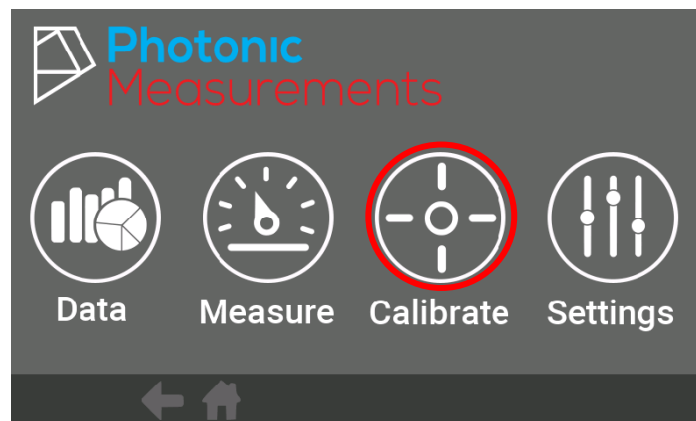
Measure COD on Photometer

Perform the measurement of COD using the procedure from the COD reagent manufacture. Write down the results for each sample...

Sample Name	Value mg/L
Sample 1	Enter Photometer measurement here
Sample 2	Enter Photometer measurement here
Sample 3	Enter Photometer measurement here

Measure COD on Go!

Start the Go!



Select the Calibration Screen



Select a location to store the calibration on

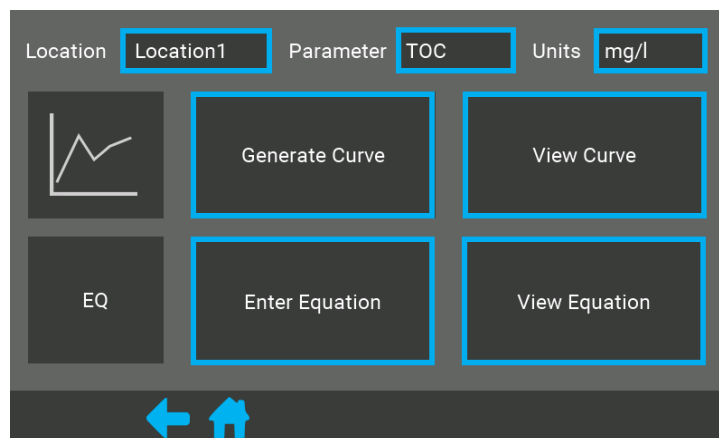
For each location up to 4 calibration can be saved. This allows for a total of 16 calibrations to be saved on each Go!

Another way to look at this, is that the locations can be used to save four different parameters per testing site. As the calibration for example for COD maybe different from one measurement site to the next.



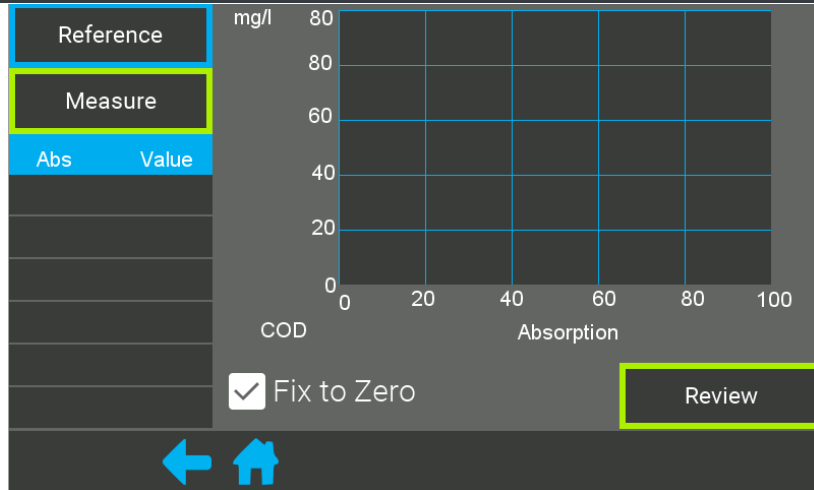
Select a parameter

Don't worry at this stage if the parameter/name is not there for the parameter you want to calibrate this can be edited by selecting a parameter on the screen below

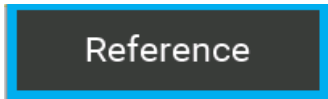


If you need to edit the location, parameter or units name, you can do so by clicking on the blue box for each component.

To carry out the calibration click on **Generate Curve**.

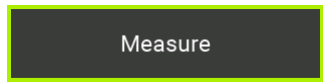


Prepare a reference sample of distilled water into a cuvette.

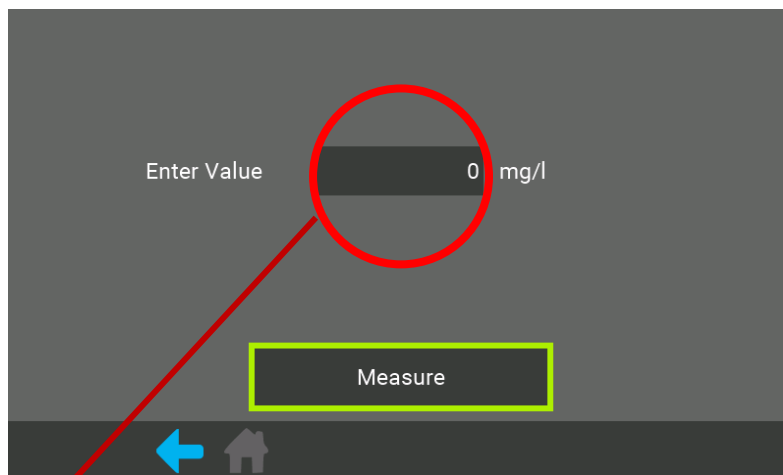


Click on the reference button

Keeping the distilled water reference sample in the Go! and

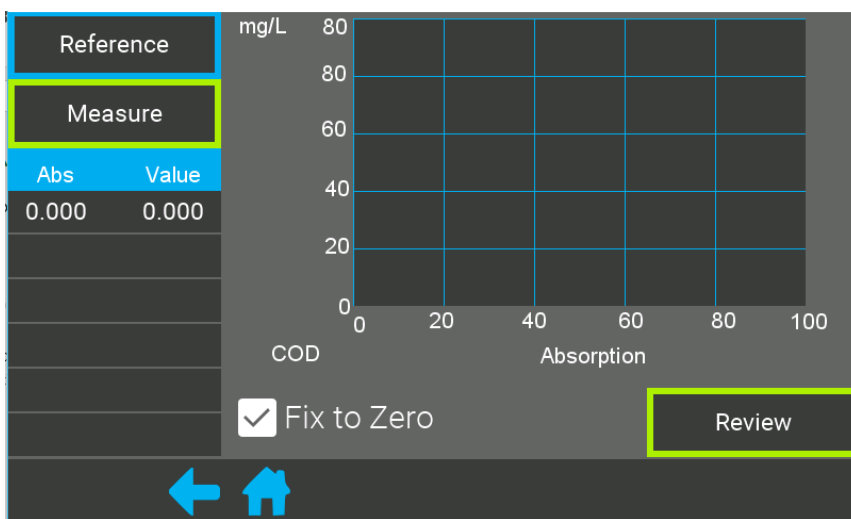


Click on Measure



Enter the value in mg/L for the sample. For the reference sample this will be zero (0).

Once the calibration value has been entered press measure again

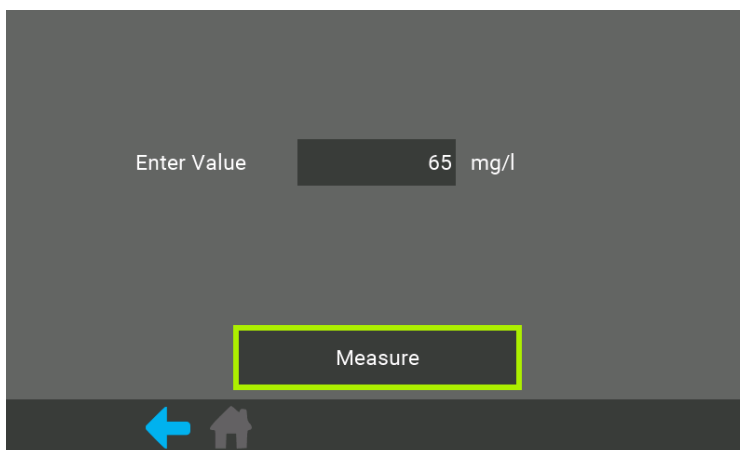


Next, lets measure sample 1.

Filling cell/cuvette with sample, best practice

The best practice is to reuse the same cuvette/cell as was used in the reference. Thus, empty the reference cell of the distilled water. Place a small amount of sample 1 into the cell, 1/10 off cell height and then move sample around in cell, then empty. Lastly place sample 1 into the cell 3/4 height and place into the Go!

Click measure and then enter the value for sample 1. For example, if sample 1 was 65mg/L from the photometer enter it in the box shown below.

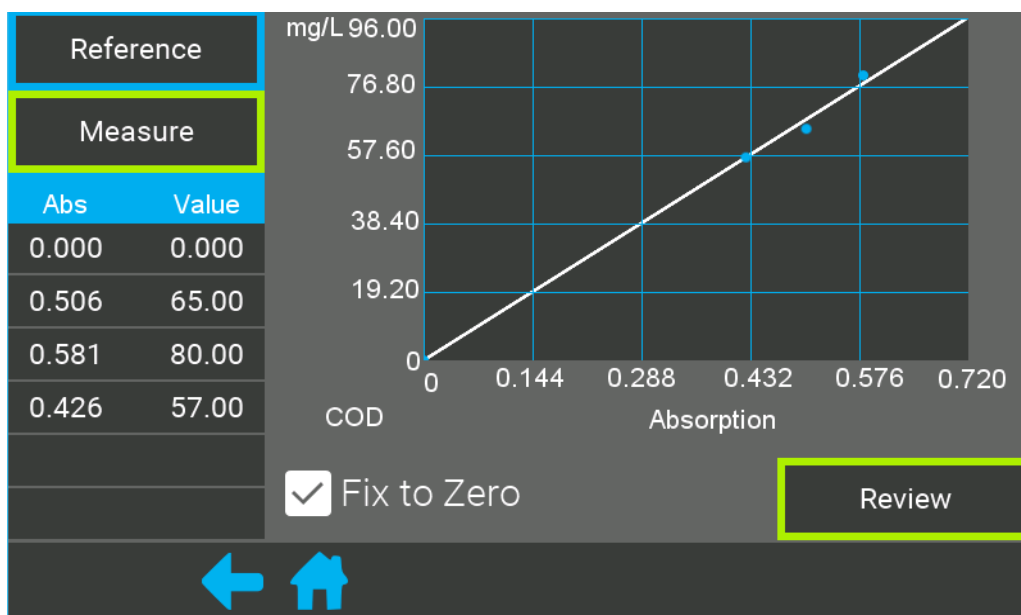


Next click measure



Repeat the measurement for sample 2 and 3.

As such, three points will appear on the graph along with the point at 0.0mg/L from the reference.



Review

Once all calibration points have been measured click on Review



Parameter **COD**

Equation of form: Value = A + (B x Absorption) + (C x (Absorption)²)

A = 0.000000 B = 133.7384 C = 0.000000

Editable Max Value = 80.00000 mg/l

Cancel Complete

Before clicking on Complete, change the Max Value of the measurement. For example, if you all three calibration points fall below what you expect the max range to be, then enter the max range of your water. That could be 400mg/L for example.

Complete

Lastly, click complete

The calibration will now be stored in the system.

The calibration can be verified by measuring one of the calibration samples again through the measurement screen. Please see the measurement quick start procedure.