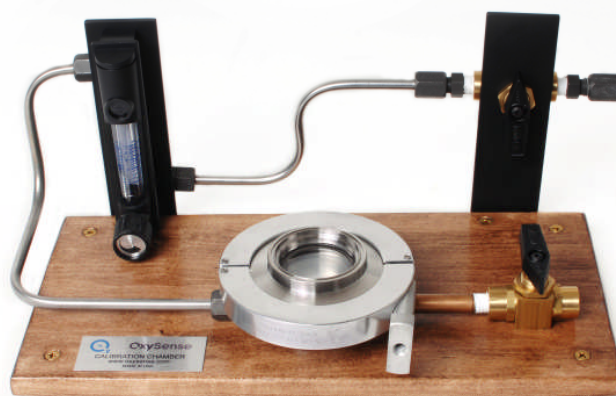
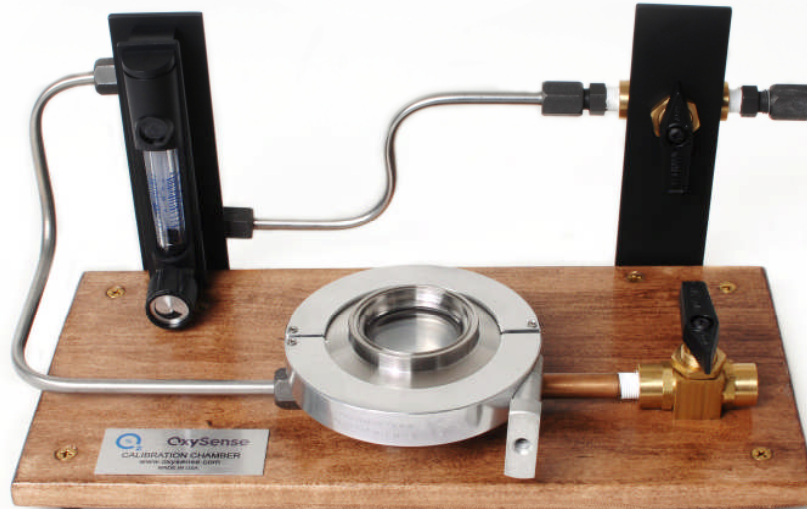


THE OXYSENSE CALIBRATION CHAMBER



The OxySense Calibration Chamber is an accessory to the OxySense equipment line that enables an easy method for recalibrating the OxySense Software for a narrow range of



oxygen measurement. Currently, each lot of O₂xyDots[®] comes with factory calibration numbers for a working range of 0-21 percent oxygen (saturation level), 21 percent being the oxygen in ambient air. Each lot of O₂xyDots[®] has their own set of calibration numbers. By developing new calibration numbers for a specific lot of O₂xyDots[®] for your OxySense software using the new calibration chamber within a narrower range of oxygen (e.g 0-5%), ***users will achieve more precise discrimination and better linearity of their readings within that range.***

In addition, the user can also use the Calibration Chamber to recalibrate their system if the O₂xyDots[®] have remained unused for an extended period of time (in excess of 6 months) or if the unused O₂xyDots[®] have been exposed to excessive florescent light for an extended period of time.

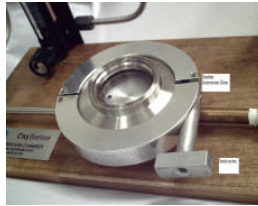
By using the Calibration Chamber in conjunction with the OxySense calibration software (included as part of the standard OxySense software package), the recalibration process becomes both simple and quick.

I. EQUIPMENT REQUIRED

- OxySense Calibration Chamber
- OxySense 5000 series or 300 series instrument
- O₂xyDots[®]
- Double sided transparent tape
- High calibration gas (high oxygen level to which the dots are to be calibrated)
- Low calibration gas (0% oxygen, i.e. pure nitrogen)
- ¼” Tygon or PVC tubing. Use the appropriate length to reach gas supply

II. PREPARING THE CALIBRATION CHAMBER

Step 1 - Unscrew and remove the Calibration Chamber clamp



Step 2 - Remove the sight glass top

Step 3 - Attach an O₂xyDot[®] to the underside of the glass with double sided tape, making sure the flat side of the O₂xyDot[®] is against the glass (as you would when setting up a test sample)



Step 4 – Replace the sight glass top on the Chamber base and replace and hand tighten the clamp

Step 5 – Turn on your OxySense instrument and click on the Calibration Tab

Step 6 - Click on the Get Signal button, found in the lower left hand corner of the Calibration Screen

If your objective is to recalculate the factory calibrations for the standard working range i.e. 0-21% O₂, all you will need is a pure nitrogen source.

If your objective is to recalibrate for a narrower working range, you will need a bottle of pure nitrogen and a bottle of certified gas for the upper end of the desired range e.g. for a 0-5% working range, you will need pure nitrogen and a certified 5% O₂ gas source.

You are now ready to develop your new calibration numbers.

We recommend you begin your process by calibrating at the high end of the range first.

III. SETTING THE UPPER CALIBRATION LIMIT

A. CALIBRATING FOR A 21% UPPER LIMIT

If you are recalibrating for the factory set range of 0-21% O₂, you do not need to flush the chamber before your initial test, as it should contain the ambient level of O₂ (since that was the level of the environment when you sealed the Chamber).

If you are recalibrating for a range where the **Upper calibration limit is lower than 21%** (ambient) **please skip to section B below now**, otherwise proceed with Step 1.

Step 1 – From the Calibration Screen, confirm that the box next to Low has a 0 in it and the box next to High has 21 in it. These set the range you want to calibrate over. If the numbers in the boxes are different, please enter 0 next to Low and 21 next to High.

Step 2 – Position the reader pen on top of the sight glass directly over the O₂xyDot[®] (for best results use a clamp to hold the pen over the dot). You can check your alignment by referring to the bar on the left side of the calibration screen. You should see a red and green bar, and the green end should line up at approximately the 0 hash mark. If this is not the case, you can use the gain button to adjust it up or down, as required (this need not be exact, only reasonably close).

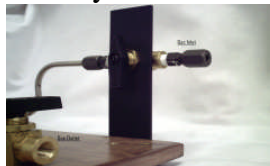
Step 3 – With the Pen alignment set, click the Get High button. A number should appear in the box with the 21 and the Get High button. **SKIP To Section II- Setting the Lower Calibration Limit.**

B. CALIBRATING FOR AN UPPER LIMIT OF LESS THAN 21%

If you want to set the upper calibration level at **less than 21%**, use the Calibration screen and:

Step 1 - Confirm that the box next to Low has a 0 in it and enter a number in the box next to High equal to the O₂ percentage of your Certified Gas (such a 5 for 5% O₂ gas). These establish the range you want to calibrate over.

Step 2 – With both the inflow and out flow valves on the Calibration Chamber open (the handles should be position so the handles are pointing the same way as the tubing going into or out of the valve), attach your Certified Gas source to the inlet valve.



Step 3- Turn on the Calibrated Gas source to allow for a steady flow.



Adjust the flow rate using the flow meter adjustment knob so that the flow marker is at 1.0.

Allow it to flush the chamber for between 1 and 5 minutes. You may verify the progress of the flush by taking periodic O₂ readings. This is accomplished by positioning the Pen over the dot (as described above) and clicking the Capture button found at the bottom of the calibration screen. A number will appear in the Last Oxygen Reading box, found in the upper left corner of the Calibration Screen. **DO NOT BE CONCERNED ABOUT THE ACCURACY OF THIS NUMBER. THE PURPOSE OF TAKING THESE READING IS TO DETERMINE WHEN THE NUMBER STABILIZES** (allowing for small variations only). **THIS MEANS THE FLUSHING PROCESS IS COMPLETE. AGAIN DO NOT WORRY ABOUT THE NUMBER ITSELF.**

Step 4 – Once the Chamber has been fully flushed (as indicated by a stable Capture reading), close the Inflow valve first, then close the outflow valve and turn off your Certified Gas source.

Step 5 – Position the reader pen on top of the sight glass directly over the O₂xyDot[®] (you can check you alignment by referring to the bar on the left side of the calibration screen. You should see a red and green bar, and the green end should line up at approximately the O hash mark. If this is not the case, you can use the gain button to adjust it up or down, as required. This need not be exact, only reasonably close).

Step 6 – With the Pen alignment set, now click the Get High button. A number should appear in the box with the new Upper Calibration Limit and the Get High button.

III. SETTING THE LOWER CALIBRATION LIMIT

You are now ready to take your Low reading.

Step 1 – With both the inflow and out flow valves on the Calibration Chamber open (the handles should be position so the handles are pointing the same way as the tubing going into or out of the valve), attach you pure Nitrogen gas source to the inflow valve.

Step 2- Turn on the Nitrogen source to allow for a steady flow, and allow it to flush the chamber for between 1 and 5 minutes. You may verify the progress of the flush by taking periodic O₂ readings. This is accomplished by positioning the Pen over the dot (as described above) and clicking the Capture button found at the bottom of the calibration screen. A number will appear in the Last Oxygen Reading box, found in the upper left corner of the Calibration Screen. **DO NOT BE CONCERNED ABOUT THE ACCURACY OF THIS NUMBER. THE PURPOSE OF TAKING THESE READING IS TO DETERMINE WHEN THE NUMBER STABILIZES** (allowing for small variations only). **THIS MEANS THE FLUSHING PROCESS IS COMPLETE. AGAIN DO NOT WORRY ABOUT THE NUMBER ITSELF.**

Step 3 – Once the Chamber has been fully flushed (as indicated by stable Capture readings), close the inflow valve first, then close the outflow valve and turn off your nitrogen source.

Step 4– Position the Pen above the OxyDot mounted in the Calibration Chamber (insuring your alignment by referring to the Signal Bar Graph) and click the Get Low Button. A number should appear in the box between the 0 and the Get Low Button. This is your low end calibration number.

Step 5 – When you have taken both the high end reading and low end reading (there should be numbers in both boxes), click the Calculate New dA/dB button; you should see the new dA/dB numbers appear in the Calculated dA/dB section (on the right side of the screen) under the New column. We **strongly recommend** that you write down these new numbers, as they are the numbers you will need to use for all the O₂xyDots[®] in the lot of O₂xyDots[®] that the test O₂xyDot[®] was taken from. We also **strongly recommend** that you update the label on the plastic sheet or the plastic packets (in the case of glass backed O₂xyDots[®]) with the remaining O₂xyDots[®] with the new calibration numbers.

Step 6 – The final step in the process is to save the new calibration numbers in the system. This assumes that you will be using the same lot of O₂xyDots[®] for your next tests. In order to save the new calibrations in the system simply click on the Save Calculated dA/dB button.

You are now ready to begin your tests using the new calibration numbers.

If you have any additional questions please contact your OxySense distributor or OxySense Technical Support.

You can reach technical customer support by phone at +1.702.361.7921 extension 3138, or by email at technicalsupport@oxysense.com. You may also visit our website at <http://www.oxysense.com>.

When contacting technical support, we ask that you have the O₂xyDot[®] batch number with which you are working available.