DirectSense II User Calibration

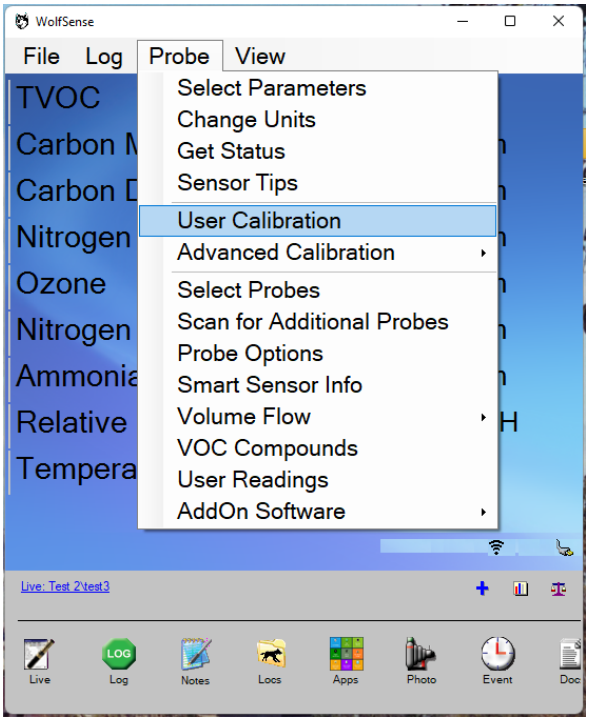
Performed with WolfSense LAP or DSII Configuration Tool

September 2022

With the appropriate calibration kit / equipment, a User Calibration can be performed on most gas sensors. Standard GrayWolf calibration kits include a regulator, calibration hood with tubing & reference gas to calibrate VOC's, CO2, CO and other gases. Interim User calibrations can help to maintain accuracy and reliability following a Factory calibration. The frequency of User calibrations recommended to maintain sensor accuracy will vary by sensor. Specific applications, protocols or S.O.P.s may require more frequent User (or Factory) calibrations.

Accessing the User Calibration Procedure

User calibration can be performed two ways using a Windows-based tablet, laptop or computer. For users with WolfSense LAP, access the procedure from the main menu, **Probe → User Calibration. Proceed to the Calibration Procedure on page 2.**

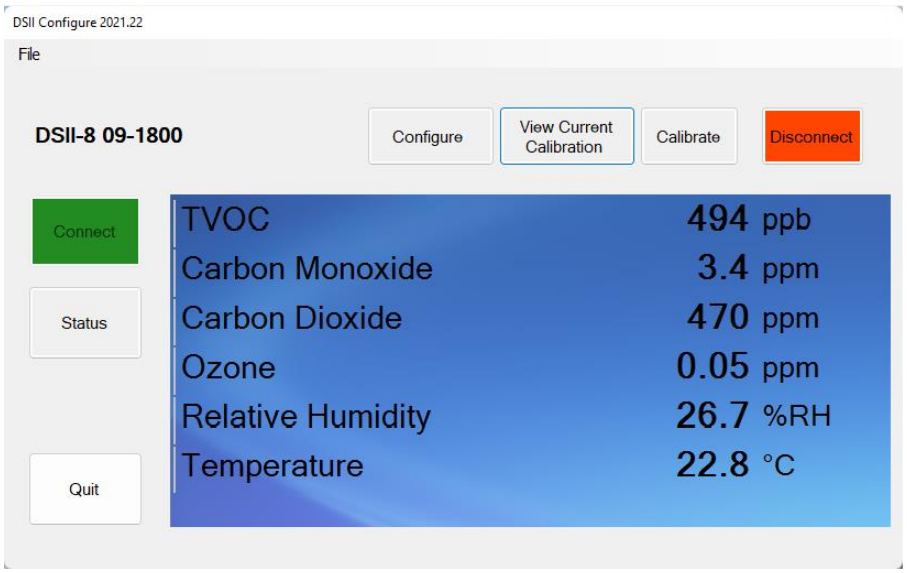


For users without WolfSense LAP, the web based DSII Configuration Tool can be used to configure settings and User calibrate the DirectSense II probe. This tool can be found at: https://graywolfsensing.com/downloads/dsii/dsii.exe

Once the link is opened, the free tool will be downloaded and run on your computer or tablet. If the file does not automatically run, locate your Downloads folder and open **dsii.exe.** (You may also create a desktop shortcut to this tool for easy access.)

Connect the DirectSense II probe to a USB port on your computer using the AD-DSIIUSB-1M probe cable (or wirelessly via Bluetooth). Click the **CONNECT** button.

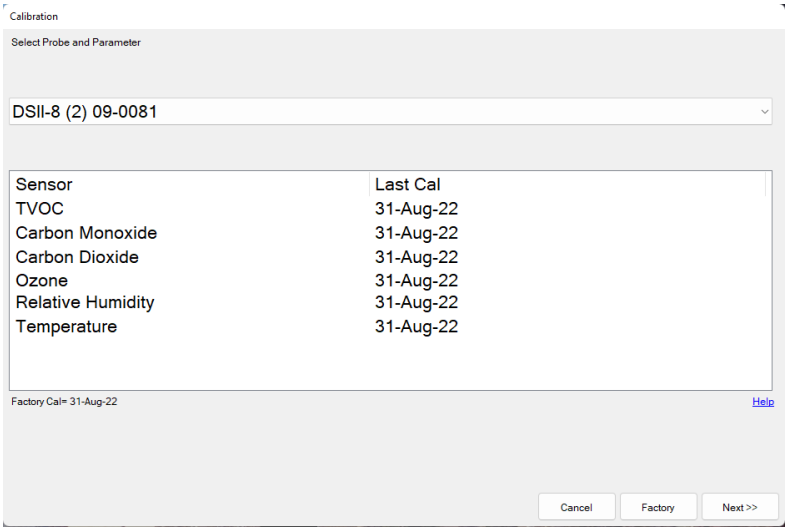
Once the parameters appear on screen, access User calibration by clicking **CALIBRATE**.

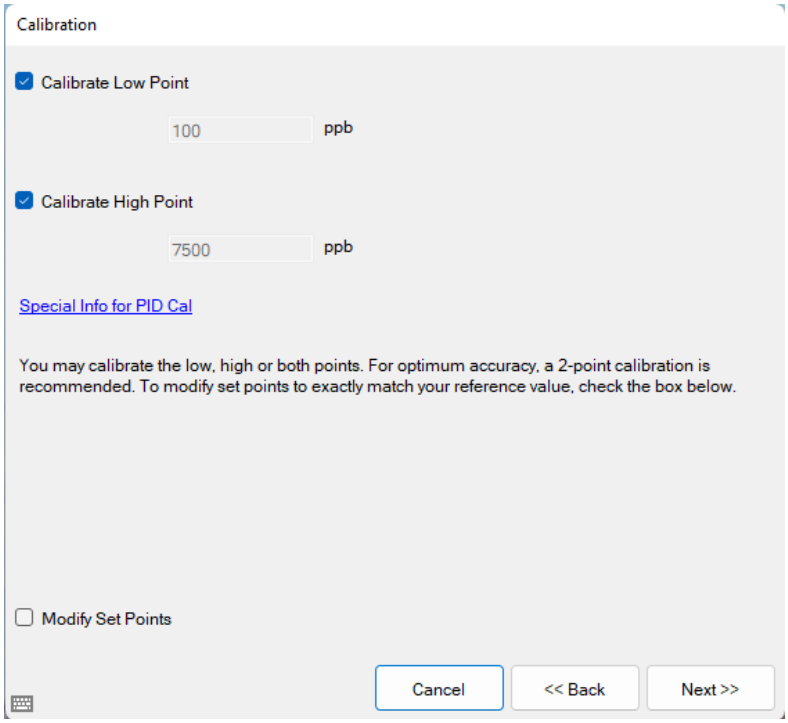


Calibration Procedure:

Prior to attempting calibration, the DirectSense II probe should be powered on for a minimum of 30 minutes to fully stabilize for optimum results.

1. Select the parameter you wish to calibrate from the list of available sensors.
2. Click **NEXT** to continue.
3. Choose to calibrate the high point, the low point or both points. For best accuracy, GrayWolf always recommends that you calibrate both points.
4. For the low and high calibration points, default calibration values are displayed. If the concentration of the reference gases you are using differs from these points, check the **Modify Set Points** checkbox. Refer to your Calibration Reference Gas labels for the proper values, then enter the new values into the Low and High Point fields and press **Next**.





Note: For TVOC calibration on the low-range PID sensor the recommended reference gases are **hydrocarbon-free zero air** (0.0 ppm gas) for the low point and **Isobutylene** between 5.0 ppm and 10.0 ppm for the high point. (GrayWolf typically supplies 7.5 ppm or 8.0 ppm gas.) For calibration on the high-range PID sensor, GrayWolf typically supplies a 3500 ppm Isobutylene gas for the high point. **See chart on the last page for more details.**

5. Open the sensor hatch on the DirectSense II probe to expose the individual sensors. This is done by using a 2.5mm Hex driver to unscrew the screw on the top-back of the probe. (This tool is provided in every kit with a DirectSense II probe.)

6. Screw the 0.3 LPM flow rate regulator snuggly onto the tank.

7. To start the flow of reference gas, turn the regulator dial counterclockwise. (On older regulators, push the dial in and turn a quarter turn.) To verify gas is flowing, put calibration hood to ear and listen for a slight hiss (although this is not recommended if using Cl2, HCl or other reactive reference gases).

8. Identify the sensor you have selected to calibrate and place the CA-HD4-A1 Calibration cap over the sensor. (Most sensors have a label identifying what they are. Call GrayWolf Tech Support at (203) 402-0477 for help identifying a sensor.)

9. Follow the prompts of the User calibration tool and then click **Start Calibration Procedure.**

10. While the reference gas is flowing over the sensor, follow the recommended stabilization time stated in the User calibration tool prompts.

11. Confirm that the readings have stabilized by the color of the displayed reading in the bottom left corner of the window. **Green** means the readings are stabilized, **Orange** means they are still stabilizing, and **Red** means they are not yet stable.

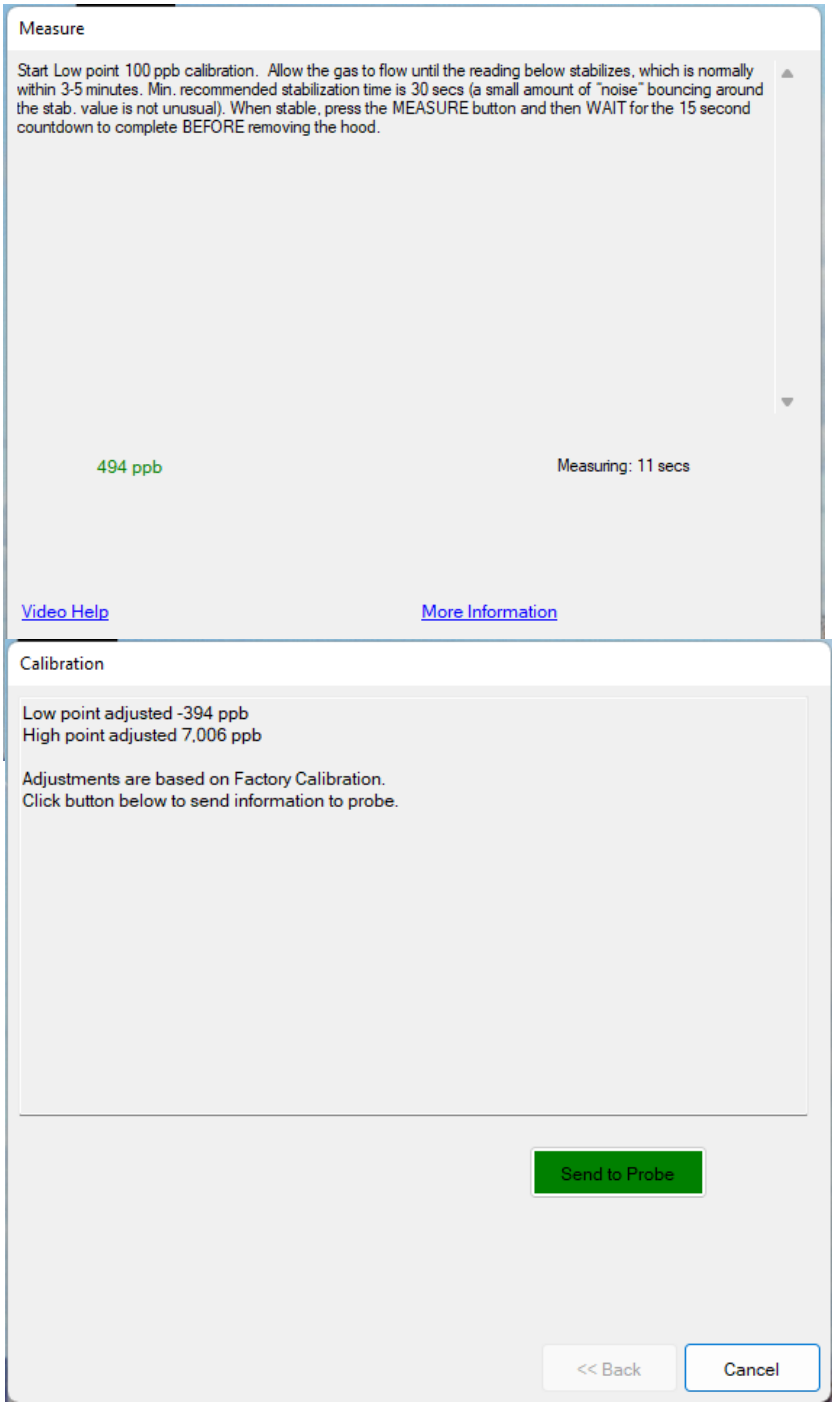
12. Once the readings are stable, press the **Measure** button. The calibration tool will take a 15-second average reading and will indicate “Complete” when the measurement is done. Press **Next** and follow the prompts to turn off the regulator (turn clockwise).

13. Repeat procedure steps 6-11 to perform a high point calibration.

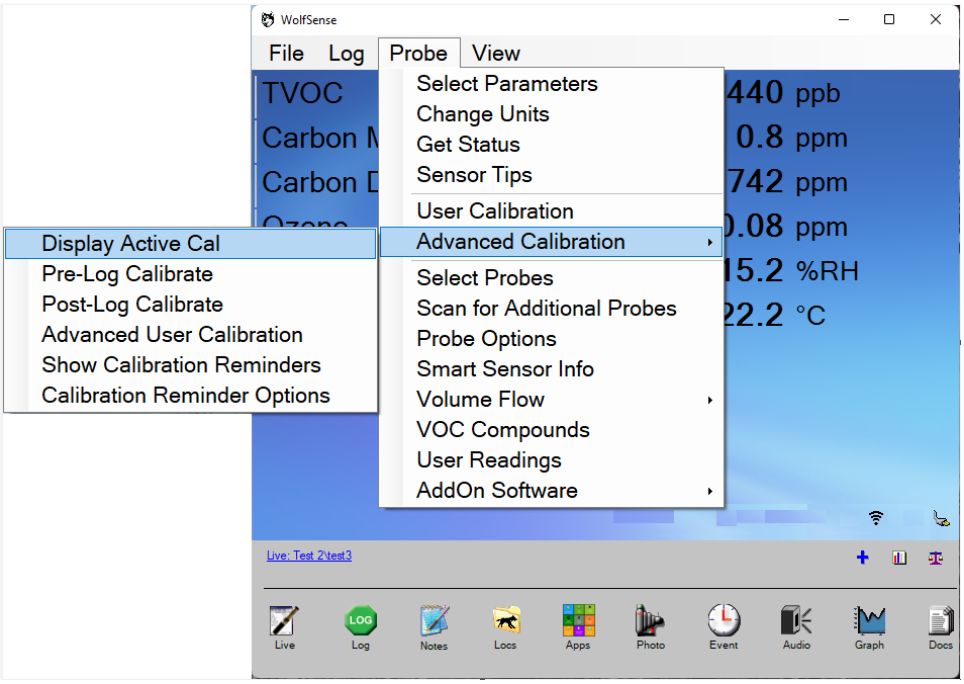
14. When the calibration procedure is complete, the tool will display a message indicating the offsets that will be applied on top of the current Factory calibration. To save these offsets, press **Send To Probe.**

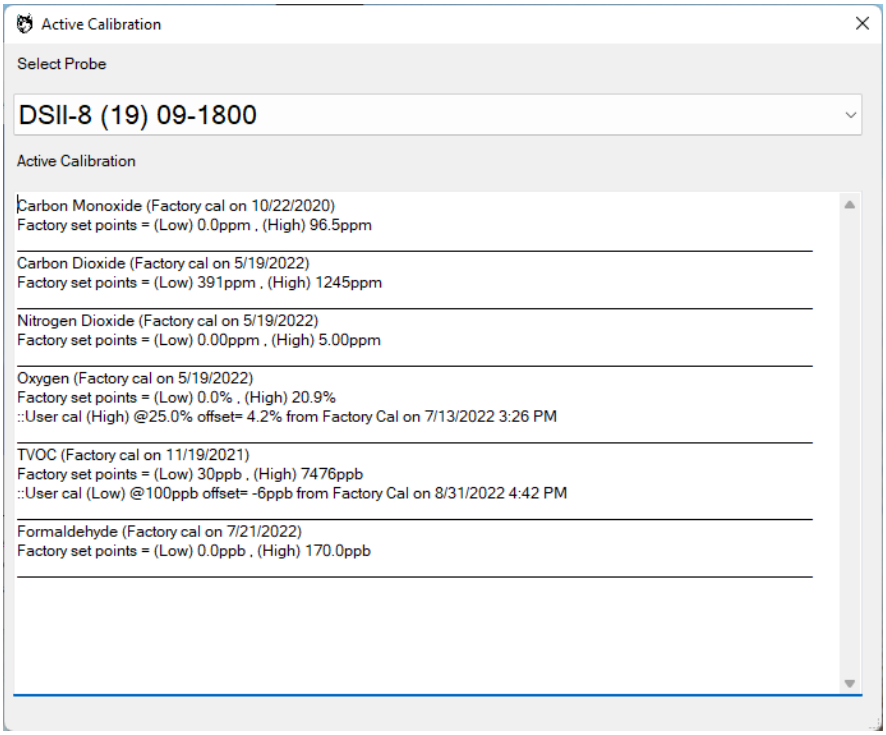
15. Allow 1-2 minutes for the calibration data to be saved to the smart sensors. Once complete, you may exit the User calibration tool or calibrate additional sensors.

Note: User Calibrations will be immediately reflected in the readings of the DirectSense II probe when connected via cable or Bluetooth classic. The probe must be rebooted for the changes to take effect on readings sent over BLE (to the WolfSense Mobile app), Wi-Fi or OEM mode.



After the calibration is complete, you can view the current settings in WolfSense LAP by selecting **Probe Menu / Advanced Calibration / Display Active Cal.** In the DSII Configuration Tool, select the **VIEW CURRENT CALIBRATION** button.





Restoring Factory Default Settings:

It may be necessary to restore the current Factory calibration if the User calibration does not appear to be reading as expected. To restore factory settings in WolfSense LAP, Select **Probe** menu, **User Calibration**, select the parameter to reset and press the **FACTORY** button. If you do not select a specific parameter all sensors will be reset to factory defaults. When using the DSII Configuration Tool, select the **CALIBRATE** button, then the parameter to rest and press the **FACTORY** button.

Typical Calibration Set Points and Gas Ranges

To properly calibrate your DirectSense II probe, Gray Wolf recommends that the following gas and concentrations be used:

Gas	Range	Typical Set Point
CO	Low	0.5 ppm
CO	High	95 ppm
CO_2	Low	375 ppm
CO_2	High	1250 ppm
VOC	Low	0 HC Air*
VOC	High PPB range	7500 ppb or 8000 ppb
VOC	High PPM range	3500 ppm or 5000 ppm

Note: Hydrocarbon-free Zero Air cylinders may contain a mixture of CO and CO2 (typically specified on the label) and may be used for the low-point calibration of those gases, but with reduced accuracy. For optimum accuracy, it is recommended that reference gases closer to the CO Low and CO2 Low calibration values referenced above be utilized to calibrate the CO & CO2 sensors.

For additional questions or troubleshooting regarding User Calibration, please email TechSupport@GrayWolfSensing.com.

For information regarding the purchase of calibration gas and equipment, please contact your sales representative or authorized GrayWolf Distributor, or email SalesTeam@GrayWolfSensing.com.