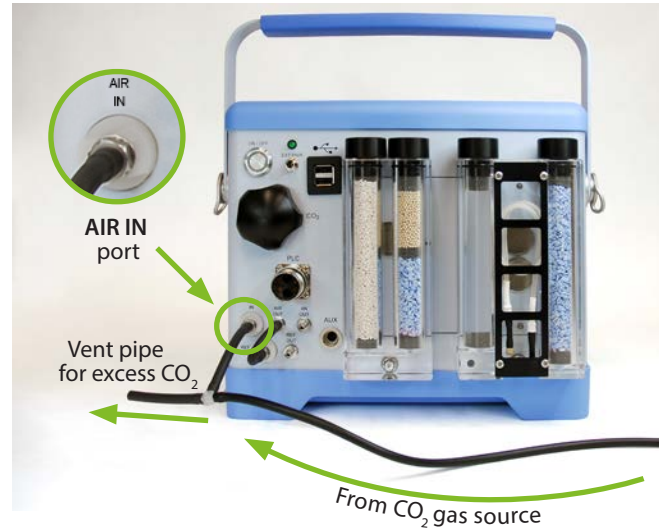


Using An External CO₂ Source with CIRAS-4

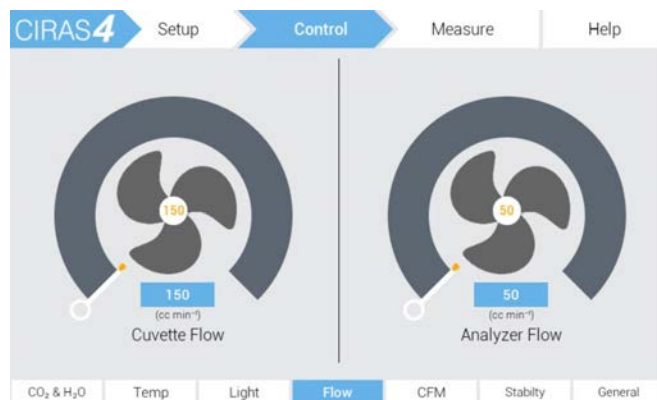
Some experiments may require the need to connect the directly to a larger external CO₂ gas tank mixture that can provide the CIRAS-4 with a specific CO₂ concentration (for example, 400 ppm with balance of air/nitrogen) as opposed to using the small CO₂ cartridges. The CIRAS-4 offers a simple solution that does not require the need to purchase additional hardware.

Important: To maintain the best accuracy, it is highly recommended to use CO₂ gas tank mixtures traceable to NIST (or similar standards) with accuracy of $\leq 1\%$.



- Using a known, accurate CO₂ mixture as described above, and a low-pressure regulator, connect to the CIRAS-4 **Air In** gas port on the CIRAS-4 console as shown above with a T-piece and vent pipe to avoid overpressure.
- Set the flow rate on the CO₂ gas mixture tank regulator to a rate of approximately 100 cc min⁻¹ greater than the **Cuvette Flow** rate set on the CIRAS-4 by selecting **Control** from the main menu followed by **Flow** from the context menu. Once in the **Flow** dialog box, set your **Cuvette Flow**.

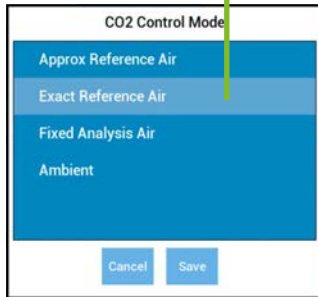
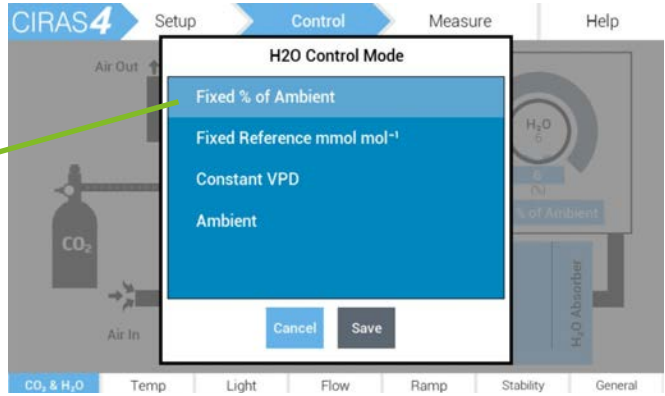
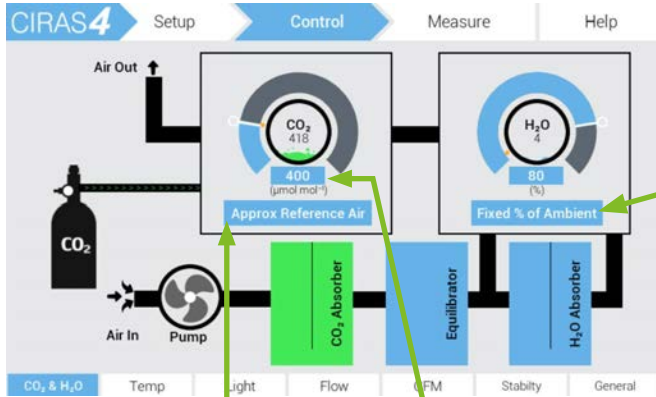
- Check the vent pipe to ensure that you have excess flow out of it (a flow meter is handy to have here). Also make sure that the link pipe is in place connecting the REF IN and AIR OUT.



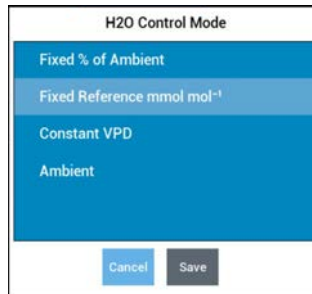
- Make sure that the CO₂ cartridge holder is empty and is threaded in place.
- Remove the Soda Lime desiccant from the CO₂/H₂O control absorber column located next to the H₂O equilibrator on the back of the CIRAS-4 console and put the assembly back in place.

- Select CO₂ and H₂O from the submenu via Control and select "Exact Reference Air" via the CO₂ Control Mode dialog box and set the CO₂ Value to "0" (μmol mol⁻¹) as shown below.

- If H₂O Reference control is desired, select "Fixed % of Ambient" in the H₂O Control Mode dialog box and leave the Drierite desiccant in place in the other control absorber column next to the H₂O equilibrator. This will allow control of H₂O from 0-100% of ambient.



- If H₂O Reference control is not required, the user can either remove the Drierite desiccant in the control absorber column, put the empty assembly back in place, and set the H₂O Control Mode to "Ambient" or simply set the H₂O Control Mode to "Fixed Reference mmol mol⁻¹" and the H₂O Value to "100" (%).



If you would like to learn more about this application or speak with one of our experienced technical staff, please feel free to get in direct contact with us via any of the contact information listed below:

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