



ImageXpress Environmental Control

Gas Mixer

Hardware

Set Up Guide

ImageXpress Environmental Control Gas Mixer Set Up Guide

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ImageXpress Environmental Control Gas Mixer



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The purpose of the gas mixer is to deliver 5% CO₂ into the sample chamber of an ImageXpress® instrument in order to ensure cell viability during imaging. The optional N₂ is used for hypoxia. The gas mixer controls the amount of CO₂ and O₂ gas, using pure CO₂ and N₂ (hypoxia). This gas mixer combines the input gases through the mixer to a specified percentage and feeds that mixed gas to the connected ImageXpress at a specified flow rate. A filter on the O₂ input prevents dust from entering the instrument.

Varying percentages and flow rates of CO₂ are tested by Molecular Devices, with a fixed O₂ concentration of 20% (Air) in order to determine percent CO₂ and flow rate necessary to produce 5% CO₂ in the ImageXpress Sample Chamber. When using this gas mixer with a Robo EC plate holder, due to gas leakage out of the chamber, setting the gas mixer to the Standard EC 5% CO₂ mixture does not necessarily yield a 5% CO₂ mixture in the sample chamber. The compensation values are included in a table pasted to the top of the gas mixer.

Obtaining Support

Molecular Devices is a leading worldwide manufacturer and distributor of analytical instrumentation, software, and reagents. We are committed to the quality of our products and to fully supporting our customers with the highest level of technical service.

Our Support website—www.moleculardevices.com/service-support—describes the support options offered by Molecular Devices, including service plans and professional services. It also has a link to the Molecular Devices Knowledge Base, which contains documentation, technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance, you can submit a request to Molecular Devices Technical Support.

Please have your instrument serial number or Work Order number and your software version number available when you call.



Package Contents

The ImageXpress Environmental Control Gas Mixer Kit includes the following:

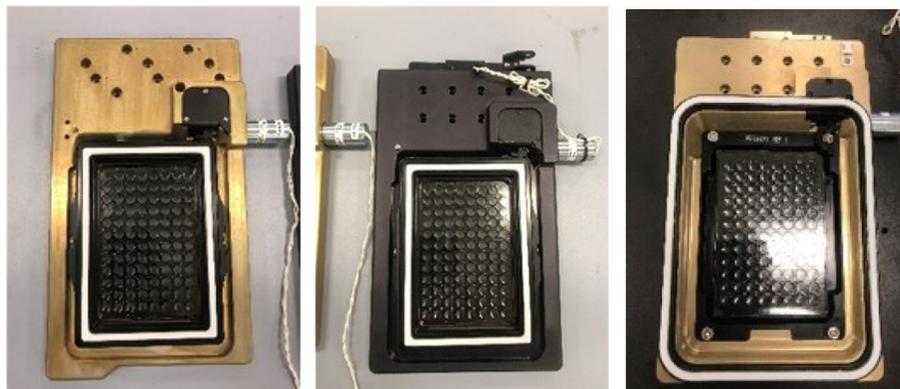
Item	Quantity	Description
	1	LCI FC-9 Gas Mixer
	2	AC Power Cable
	2	Gas Pressure Regulators
	2	Gas Control Speed Valves
	2	4 mm Tubing
	2	6 mm Tubing

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Item	Quantity	Description
 A white, cylindrical air pump protection filter with a white plastic housing and a clear plastic bag. A label on the bag reads "Filter for air/pump protection".	1	Air Pump Protection Filter
 Two cylindrical spare fuses, one standing upright and one lying horizontally, both with gold-colored ends and a dark body.	2	Spare Fuses

For a complete list of the contents of the package, see the enclosed packing list.

Use the following procedures to set up your gas mixer with your ImageXpress instrument. This gas mixer can be used with instruments using a standard plate holder and optional environmental control kit, or a robot-friendly environmental control plateholder (Robo EC) and optional environmental control kit.



Standard Plate Holders With Microplates and Live-Cell Sealing Rings

Robo EC Plate Holder With Microplate

CO₂ percentage settings vary depending on which plate holder your instrument uses. For example, to maintain 5% CO₂ in the sample chamber using a Robo EC plate holder, you need to set the CO₂ % higher on the gas mixer to compensate for sample chamber leakage.

Table 3-1: Pressure Setting Needed to Maintain a 5% CO₂ Concentration in the Sample Chamber for the Required Flow Rate

Standard Plate Holder with Live-Cell Seal				Robo EC Plate Holder			
Flow Rate ml/min	% CO ₂	%O ₂	Pressure (psi)	Flow Rate ml/min	% CO ₂	%O ₂	Pressure (psi)
50	5.0	20.0	4	50	7.2	19.5	4
100	5.0	20.0	8.5	100	5.9	19.8	8.5
150	5.0	20.0	12.5	150	5.6	19.8	12.5
200	5.0	20.0	15	200	5.4	19.9	15

The gas mixer set up involves the following procedures:

1. Connecting the Gas Mixer on page 10
2. Setting the Gas Mixture on page 14
3. Shutting Off the Gas Mixer on page 16
4. Storing the Gas Mixer on page 16

For help setting up for hypoxia studies, refer to the Molecular Devices Knowledge Base at support.moleculardevices.com.

Connecting the Gas Mixer

You can connect the gas mixer to either your house CO₂ gas line in your lab, or an external tank of 100% CO₂ gas.

In your lab, locate your whole ImageXpress system close to your CO₂ gas source. Set up the gas mixer unit close to your ImageXpress instrument.

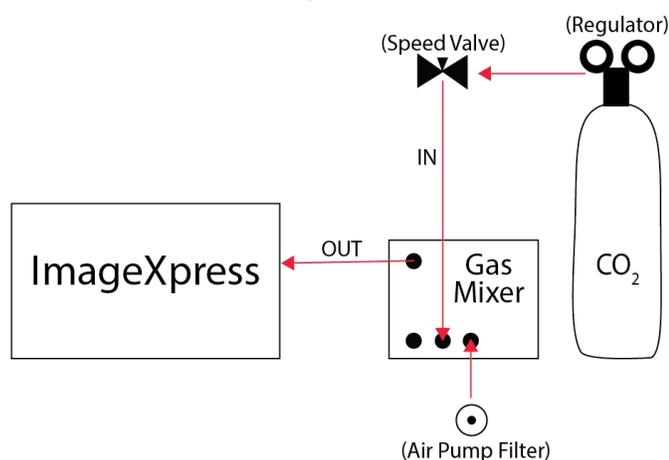
Follow the procedure that matches your lab gas source setup:

- (Typical) [Regulator Pre-Installed](#)
- [No Regulator Pre-Installed on page 12](#)

Regulator Pre-Installed

It is likely that the gas source in your lab already has a standard regulator installed and you do not need the preset Gas Pressure Regulators provided in this kit.

Overview connection diagram:



To connect gas source, gas mixer, and instrument:

1. On the regulator nozzle, connect the threaded end of one of the provided Gas Control Speed Valves. Remove or replace from the regulator nozzle any incompatible adapter as appropriate.



CAUTION! Do not over-tighten the Gas Control Speed Valve because you can crack the threads.

2. On the connected Gas Control Speed Valve, tighten the brass screw on the other end until it is closed then open it only one full turn.
3. Insert some of the provided 4 mm tubing into the blue port of the connected Gas Control Speed Valve and connect the other end to the **CO₂** inlet port on the back of the gas mixer.



4. On the back of the gas mixer, connect a 1 inch piece of the provided 4 mm tubing to the **GAS OUT** port.
5. On the back of the ImageXpress Systems Power and Options Controller, disconnect the 6 mm tubing connected to the **MIXED CO₂ OUT** port ; remove the connector from the tubing;



then connect the tubing over the 4 mm tubing connected to the **GAS OUT** port on the back of the gas mixer.



6. Connect the provided Air Pump Protection Filter to the **Filter** inlet port on the back of the gas mixer.



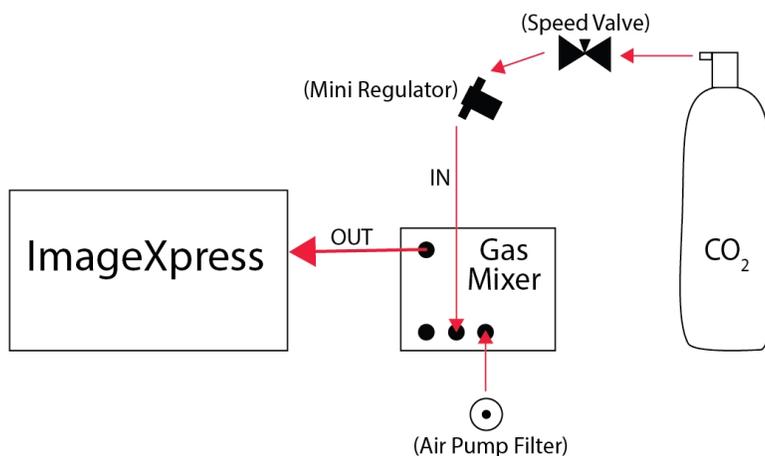
The **Filter** inlet port pumps in ambient air for O₂ use in your gas mix.

7. Open CO₂ flow at your source.
If it is a tank, turn the knob on top of CO₂ tank several times to allow the CO₂ flow.
If you have a 2 stage regulator, set from the regulator CO₂ outward flow to 8-12 PSI.
The Gas Control Speed Valve further controls the rate of gas into the gas mixer.
8. Connect the AC power cable to the back of the gas mixer and plug it in to a power socket.
9. Continue to set the gas mixture. See [Setting the Gas Mixture on page 14](#).

No Regulator Pre-Installed

Only follow one of the hardware connection procedures. If you just used the procedure for [Regulator Pre-Installed on page 10](#), continue to [Setting the Gas Mixture on page 14](#).

The following procedure uses the provided adjustment-free, preset Gas Pressure Regulator. Overview connection diagram:



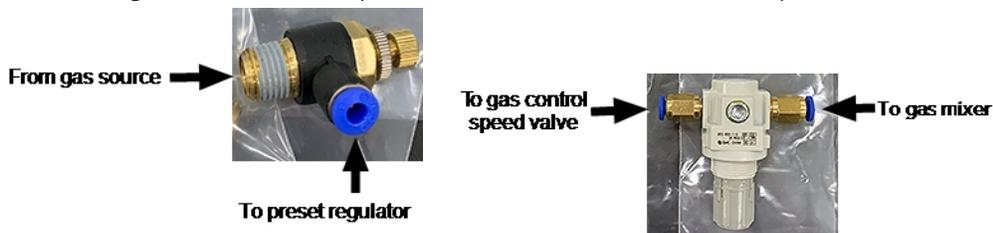
To connect gas source, gas mixer, and instrument:

1. On the outlet of your CO₂ gas source, house or tank, connect the threaded end of one of the provided Gas Control Speed Valves.



CAUTION! Do not over-tighten the Gas Control Speed Valve because you can crack the threads.

2. On the connected Gas Control Speed Valve, tighten the brass screw on the other end until it is closed then open it only one full turn.
3. With some of the provided 4 mm tubing, connect to the IN port of one of the provided Gas Pressure Regulators to the blue port of the connected Gas Control Speed Valve.



4. With another piece of the provided 4 mm tubing, connect the OUT port of the connected Gas Pressure Regulator to the CO₂ inlet port on the back of the gas mixer.



5. On the back of the gas mixer, connect a 1 inch piece of the provided 4 mm tubing to the **GAS OUT** port.
6. On the back of the ImageXpress Systems Power and Options Controller, disconnect the 6 mm tubing connected to the **MIXED CO₂ OUT** port; remove the luer lock connector from the tubing,



then connect the tubing over the 4 mm tubing connected to the **GAS OUT** port on the back of the gas mixer.



7. Connect the provided Air Pump Protection Filter to the **Filter** inlet port on the back of the gas mixer.



The **Filter** inlet port pumps in ambient air for O₂ use in your gas mix.

8. Open CO₂ flow at your source.
If it is a tank, turn the knob on top of CO₂ tank several times to allow the CO₂ flow.
The Gas Control Speed Valve controls the rate of gas into the gas mixer.
9. Connect the AC power cable to the back of the gas mixer and plug it in to a power socket.
10. Continue to set the gas mixture. See [Setting the Gas Mixture on page 14](#).

Setting the Gas Mixture

The software for your gas mixer comes pre-installed and uses a touch screen interface.



To set the gas mixture:

1. On the front of the gas mixer, press the power switch on.



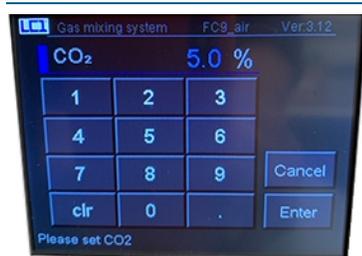
2. Touch and hold **Set** on the **CO₂** screen button.



3. In the **Set CO₂** screen, touch the percentage value you need, which depends on the plate holder installed in your ImageXpress instrument. Unless you have a Robo EC plate holder, enter 5.0% then touch and hold **Enter** to return to the main screen.



Note: The Robo EC plate holder CO₂ requirements vary depending on flow rate. Refer to [Table 3-1](#) for the appropriate value to enter.



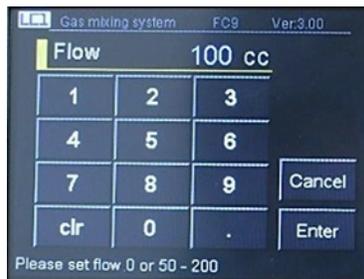
4. Touch and hold **Set** on the **O₂** screen button.
5. In the **Set O₂** screen, enter 20% then touch and hold **Enter** to return to the main screen.



Note: The Robo EC plate holder O₂ requirements vary depending on CO₂ rate. Refer to [Table 3-1](#) for the appropriate value to enter.

6. Touch and hold **Set** on the **Flow** screen button.

7. In the **Set Flow** screen, enter the flow rate you need for your sample then touch and hold **Enter** to return to the main screen. For flow rate values, refer to [Table 3-1](#).



8. Watch the values you set on the main screen gradually increase to 5% CO₂ and 20% O₂ and then stabilize to +/-0.1%.



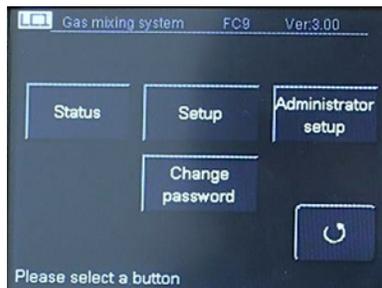
It takes approximately one hour for the Gas Mixer to reach 5.0% CO₂.
A chirping alarm sounds until the levels stabilize to match your settings.

Checking the Gas Mix Status

After entering your gas mixture settings, you can check the mix status.

To check the gas mix status:

1. On the main screen, touch and hold the **Menu** button.
2. On the Menu screen, touch and hold the **Status** button.



3. View your settings.

	P.V	S.V	Offset	Pro'	Inf	Dif	Out
CO ₂	5.0	5.0	0.0	100	200	3	0%
O ₂	5.0	5.0	0.0	120	200	2	62%
N ₂	--	--	--	225	55	2	57%
Flow	100	100					

Version 3.00

4. When you are finished viewing your settings, touch and hold the  **Return** button.

Shutting Off the Gas Mixer

When you are finished using the gas mixer, shut it off.

To shut off the gas mixer:

1. Shut off the CO₂ flow at your source.
2. On the front of the gas mixer, press the power switch off.



Storing the Gas Mixer

If you use the gas mixer infrequently, when you are finished using it, you can disconnect it and store it until you need it again. We recommend using the original kit box for the spare parts, the power cable, and the gas mixer storage.

To store the gas mixer:

1. After [Shutting Off the Gas Mixer](#), unplug the AC power cable from the power socket and disconnect it from the back of the gas mixer.
2. To disconnect the **GAS OUT** tubing, press in the blue ring and pull out the tubing.



3. Leave the tubing attached to your ImageXpress instrument connected.
4. To disconnect the **CO₂** tubing, press in the blue ring and pull the tubing out from both the gas mixer and the Gas Control Speed Valve.



5. Remove the Gas Control Speed Valve from your CO₂ gas source.
6. Box the gas mixer and power cable together with the provided spare parts.
7. Store the box in the same environmental conditions as the ImageXpress instrument.

Contact Us

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