
5. SEMBAPRO™ SOFTWARE

5.1. Starting the Program

The Octave System is controlled by the SembaPro software, an Apple Macintosh-based application. This software is preloaded on the computer supplied with the system and is available on the desktop. To begin, power up the Octave System as described in Section 4. Start up the computer by pressing the power button on the rear of the case. After the computer's main window appears, double click on the program icon to start the SembaPro application.

5.1.1 Installation

If the program is being installed or an upgrade to the software is required, the program may be supplied by Semba as a compressed SembaPro.zip folder, which may also contain the .app file extension, with the "zipper" indicated in the folder icon on the desktop.

If a prior version of the software is already present on the computer, first move the old version to another folder and rename it (to keep as a backup). To do this, double click on the Macintosh HD icon on the desktop, which will open the root directory on the hard drive. Double click on the Applications folder to open it, and drag the "old" SembaPro program icon from the desktop to this folder. To rename it, right click on the program icon, select "Get Info", then click on "Name and extension" to expand the menu. Type in the new extension (e.g. .old) in place of .app and press return. Answer "yes" in the dialog box and close the Get Info window. Close the Macintosh HD window.

Copy the .zip folder of the new program to the desktop by dragging it from its supplied location to the desktop. Double click on the folder. The new SembaPro program icon should appear on the desktop. To run the program, double click on this icon.

5.2. Using the Program

5.2.1 Opening Screen: the Current Valve State Window

When the SembaPro program is first opened, the Current Valve State window appears (see Figure. 6). If the window does not appear, open it from the Window menu. The Current Valve State window shows the status of all nine valves for all eight columns, and allows control of individual valves. Before opening or closing any valves, first be sure that the pneumatic pressure on the system is activated as described in Section 4 and that all the valves are closed by clicking on the "Close all valves" button. No valve LED's on the front panel should be lit after clicking this button.

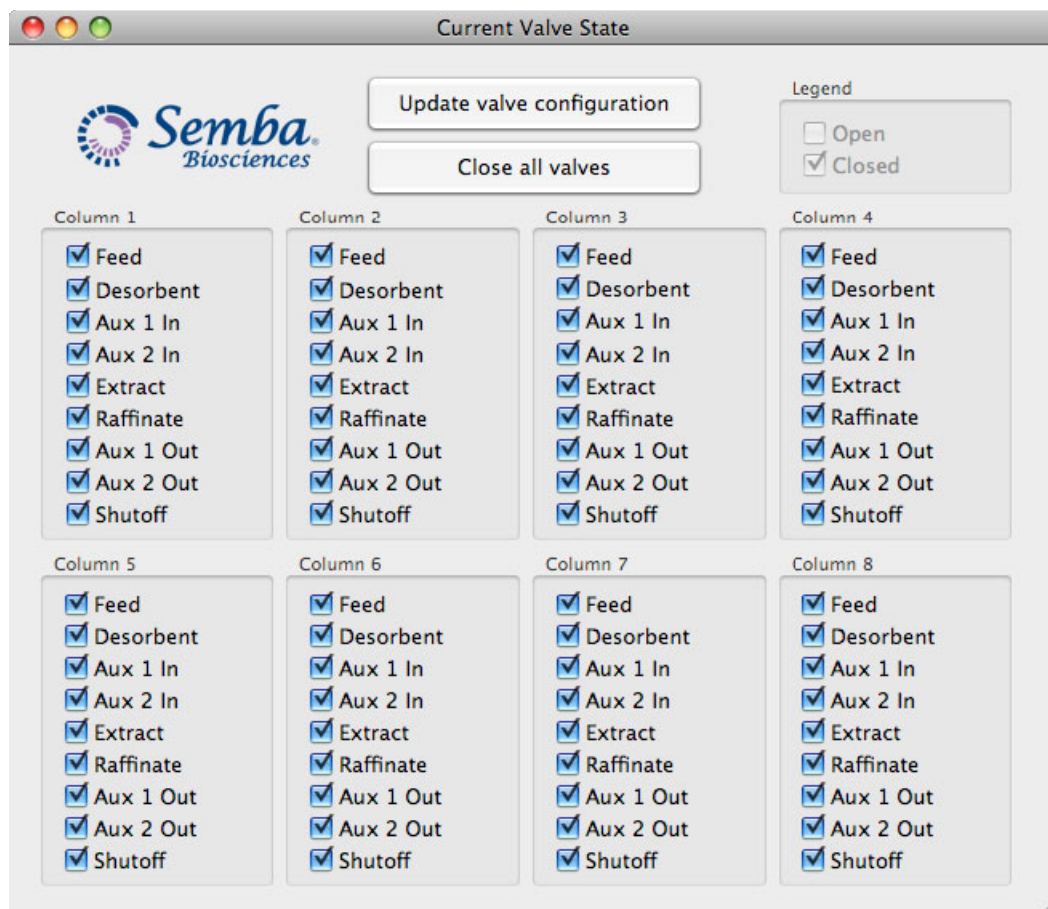


Figure 6. SembaPro™ Current Valve State window

5.2.2 Valve Names and Operation

The first eight valve names listed for each column in the SembaPro application correspond to the inlet and outlet streams. Feed, Desorbent, Aux 1 In and Aux 2 In are the inlet streams connected to inlets A-D, respectively, and Extract, Raffinate, Aux 1 Out, and Aux 2 Out are the outlet streams connected to outlets E-H, respectively (see table below).

<u>Stream</u>	<u>Inlet/Outlet Connection</u>
Feed	A
Desorbent	B
Aux 1 In	C
Aux 2 In	D
Extract	E
Raffinate	F
Aux 1 Out	G
Aux 2 Out	H

The “Shutoff” valve (I) indicates the valve that allows flow from one column in the series to the next.

In the SembaPro application, the closed position is indicated by a checkmark in the box next to the valve name. To open a valve, click once on a checked box, which clears the box. The valve does not actually open until the “Update valve configuration” button at the top of the window is pressed (by clicking once). When this button is pressed a “pfft” sound should be heard from the valve block as the solenoid exhausts gas pressure, and the front panel LED corresponding to the

appropriate valve should light up. To close a valve, click on an open box to make a checkmark, and then click on the “Update valve configuration” button. There will be a brief “click” sound and the LED should turn off as the valve closes.

If no sound is heard or the LED does not light up when the “Update valve configuration” button is pressed, make sure that the power up procedure described in Section 4 has been followed. If the LED lights up and no sound is heard, it is likely that the gas pressure is off or the nitrogen tank is empty. If there is both power to the unit and gas pressure and no response is observed when opening/closing valves, the SembaPro application may need to be restarted. This may occur if the computer goes into sleep (standby) mode while the application is running. To prevent the computer from going to sleep, click on the Apple menu on the far upper left of the main screen, and select System Preferences. In the System Preferences window click on Energy Saver (under “Hardware”). In the resulting window move both pointers to “Never” and uncheck the box next to “Put the hard disk(s) to sleep when possible.” Close the window by clicking on the red button on the top left corner. The computer will now remain awake until shut down or put to sleep manually.

When the Current Valve State window is active, multiple valves can be opened and closed at the same time by checking/unchecking the desired boxes and then pressing the “Update valve configuration” button.

The Current Valve State window is very useful for performing single or multicolumn operations that do not require a full program script. See Section 7.3 for additional information.

5.2.3 Pump Control Window

Pumps are normally controlled from the Script window (see next section). When the Script window is not open, pump flow rates and power can be controlled from the Pump Control window, which is accessed from the Window menu (see Figure 7). Each pump is individually controlled in the Manual Control option; simply double click on the white box next to the appropriate pump, enter the desired flow rate next to the appropriate pump and press enter or return on the keyboard. To switch a pump on or off (if using outside a script), click on the box next to the flow rate. A check mark indicates that the pump is on; a cleared box indicates that it is off. The pump speed may also be set by dragging to the pump scroll bar button with the mouse.

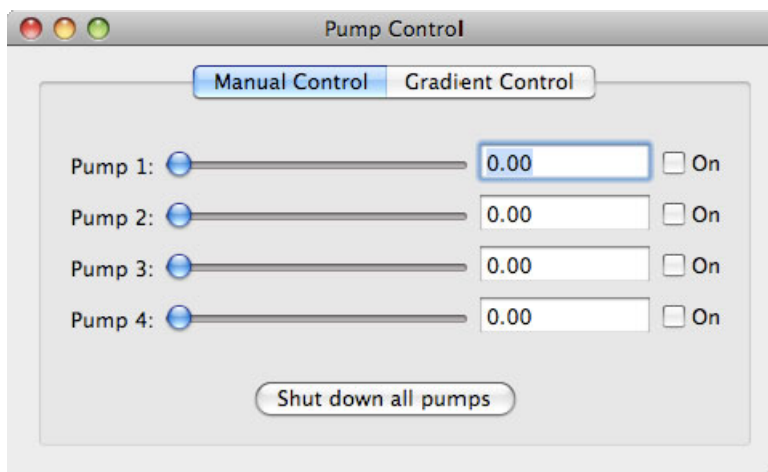


Figure 7. SembaPro™ Pump Control window

5.3. Using Scripts



5.3.1 Script Window

Scripts are simple files that control the valves and pumps in a set program. To open an existing script, select Open under the File menu. Navigate to the desired script file and select to open it. The Script window appears (see Figure 8).

In the Script window a “Step” column for entering program steps is displayed on the left side of the screen, as well as boxes for entering the duration of a step (switch time) in seconds, boxes for entering flow rates for the four pumps, and the valve status for all eight columns.

Valve states for each column are displayed vertically under the column number 1-8 headings. By clicking on the appropriate box under the column heading, the valve positions can be switched open (empty box) or closed (checked box).

The buttons along the bottom of the window are used when programming and running the script.

Button	Function
+	Add a step
-	Delete selected step
	Loop – cycle repeats from step 1 when highlighted
	Pumps – pumps switch on with Start script command when highlighted

The “+” and “-” buttons add or remove a step at the selected position and are used only in programming. The “loop” button, when highlighted, indicates that the script will repeat from step 1 after the last step is finished. To the right of the loop button is the “pump state” button. The pump state button, when highlighted, will start all pumps at the programmed flow rates when the “Start script” button next to it is clicked. The “Start script” button begins the script; when pressed the first step begins counting down according to its programmed time and the button name changes to read “Stop script.” A script can be stopped (interrupted) at any point by pressing the “Stop script” button during the run. All pumps will stop and all valves will remain at the state they were in when the Stop script button was clicked. When Stop script is pressed again, the pumps restart and countdown for that step resumes from the point where it stopped.

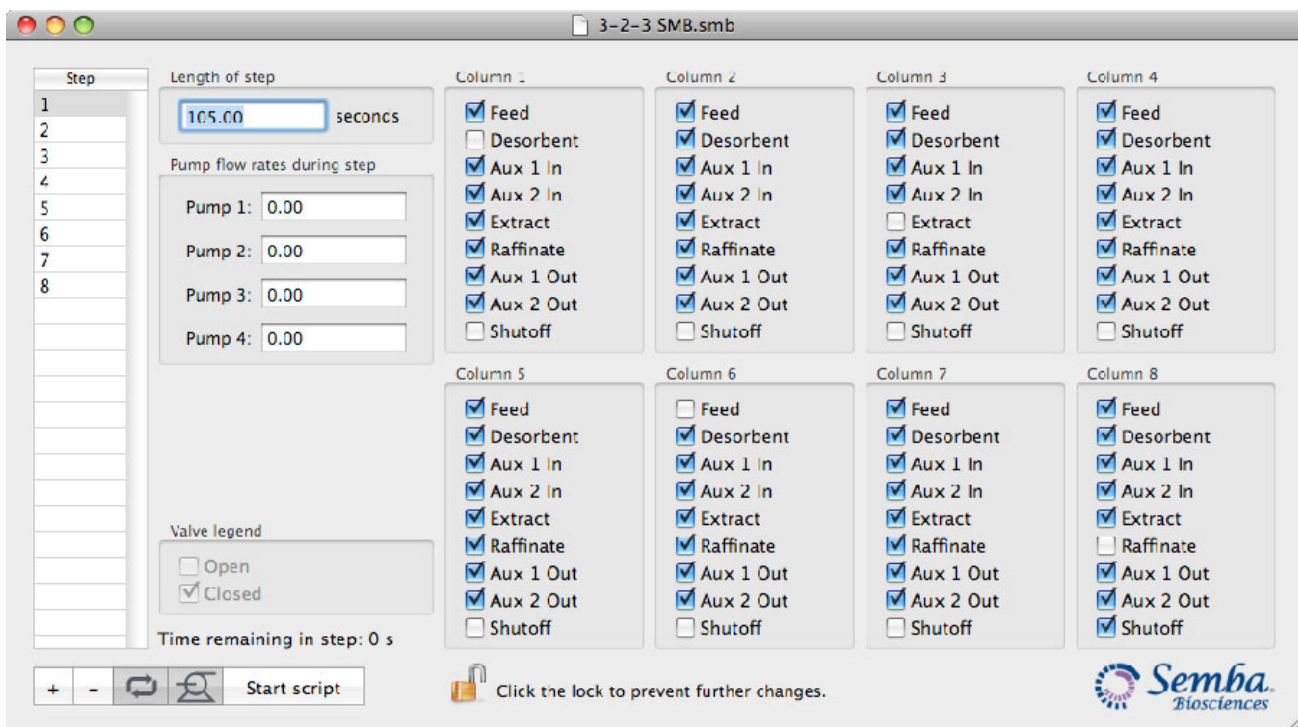


Figure 8. SembaPro™ Script window

5.3.2 Creating a Script

A new script can be written by selecting “New” from the File menu, or an existing script can be modified (after unlocking it, see below) by selecting “Open” and scrolling to an existing file to open it. Scripts can be created easily by using the open Script window to add or delete steps, program the switch time, valve states, and pump flow rates.

After a script is created it can be “locked” to prevent accidental changes by clicking on the lock icon at the bottom of the window. If the lock icon at the bottom of the window is in the closed position, the script cannot be modified. The lock can be opened by clicking on it and entering the computer’s password in the dialog box. The default password is “sembabio”.

To add a step, position the mouse pointer over the Step column in the row corresponding to where the step will be added, click to select the step, and then click the “+” button. A new step is created above the selected step. Selected steps may also be copied and pasted using standard commands. The Script window will show the valve configuration, pump flow rates, and length of each step or ‘switch time’ for the step that is highlighted in the Script window. Defaults for a new step are valves all “off”/closed/boxes checked, pump flow rates all 0, switch time 10 seconds, and “loop” on. To modify the switch time, or pump flow rates double click on the corresponding box and type in the desired number in the Script window.

To open the desired valves in a step, click on the appropriate valve boxes in the Script window (clear the boxes) in that step.

To add a step at the end of the script, position the mouse pointer after the last step in the sequence and click “+”. Configure the valves, pump flow rates, and switch times for each step by checking/unchecking the appropriate boxes under the corresponding valve names in the Script window and entering the desired flow rates in ml/min and switch time in seconds.

To remove a step, select it by clicking on the Step cell in the appropriate step, and then click on the “-” button.

To move a step, drag the step to the desired position in the script.

It is often convenient to modify multiple steps in a script at the same time, for example to set the switch time and pump flow rates for all steps. Multiple steps in a range can be selected clicking on the first step to be modified, then while holding down the shift key, clicking on the last step to be modified. Figure 9 shows a Script window with multiple steps selected. Non-consecutive steps can be selected by holding down the command key while clicking on the desired steps. Pump flow rates, switch time, and valve state changes entered while multiple steps are selected will be applied to equally to all selected steps.

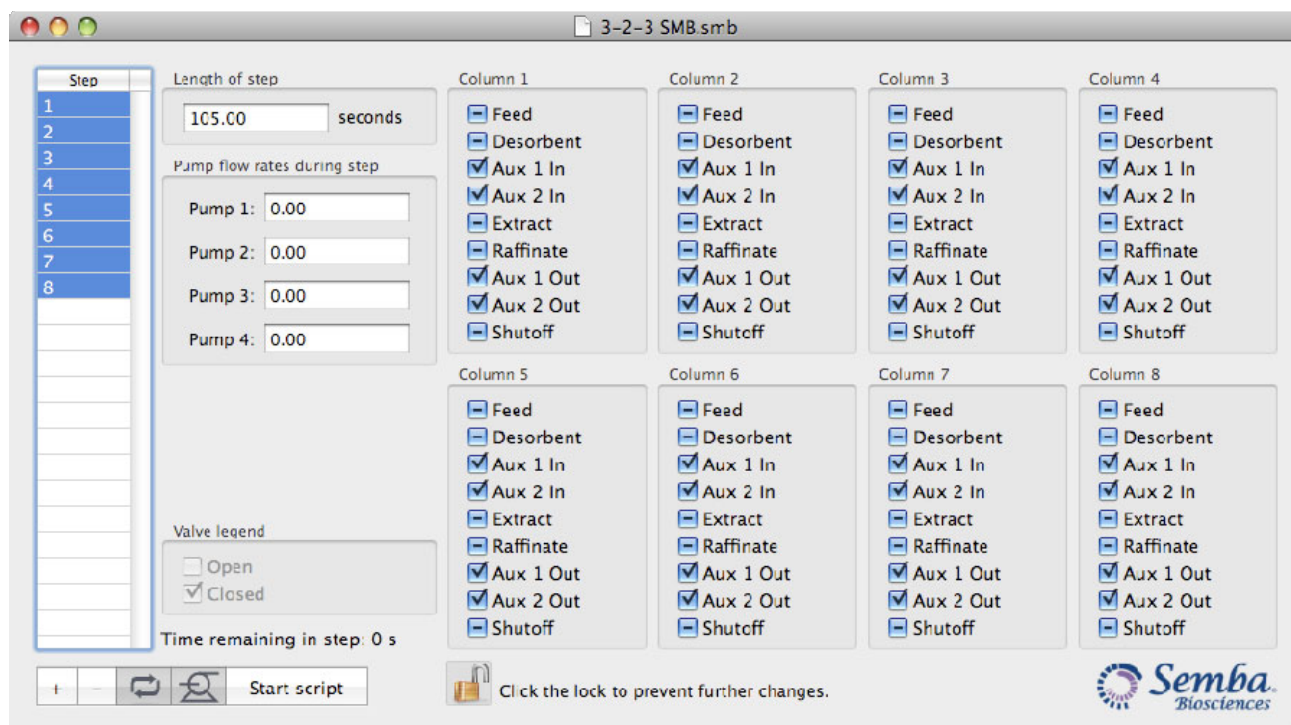


Figure 9. Script window with multiple steps selected

NOTE: When writing a script or working in the Script window, be careful to select steps only by clicking on the Step number in the Script window; clicking on any of the valve cells will change its status (open or closed).

When the script is finished, click the lock icon to prevent accidental changes, select "Save as" under the File menu, type in a filename, note its location (Where), and click Save.

5.3.3 Running a Script

To run a script, open the appropriate file as described above. When the system is ready (system powered up, columns connected, solvent and sample reservoirs prepared, detectors and fraction collectors connected and warmed up), click on the "Start script" button and the run begins – the valves will open/close and pumps will start as programmed in the script.

During the run, it is likely the script will need to be interrupted briefly to change solvents or perform other operations. At the desired time, click on "Stop script," perform the operation, and restart the script. The script will restart at the time where it was originally stopped.

Note that during the run, the valve configuration of the active step in a script is shown in the Script window and also on the top panel LED display on the Control Module.

After the run is finished, flush the system with appropriate desorbent followed by storage solution. The script can be continued for these operations, or the script can be stopped and the operations can be performed manually by opening and closing the appropriate valves in the Current Valve State window and running the pumps from the Pump Control window. Shut down the system as described in Section 4.