

uProcess[™] System Quick Start Guide

This guide will show you how to assemble your **uProcess™** products and verify that they are functioning. For more complete instructions, please refer to the **uProcess System User Guide**, which can be accessed from the **uProcess software** (Help>About uProcess) or on our website at www.labsmith.com/support/microfluidics/.



Install Software

uProcess software runs on Microsoft Windows[®] XP, NT, 7, 8, or 10.

1. Install the uProcess software and EIB200 driver using the included USB drive, or from our website at <u>www.labsmith.com</u>.

Connect the uProcess System

Every system requires at least one **EIB**.

A **uPB** breadboard is used to mount multiple uProcess components.

2. Plug a EIB into a connector on the uPB breadboard, or

Use the grey communication cable to connect the **EIB** to the female connector on the top left corner of the breadboard, **or**

If not using a breadboard, use the grey communication cable to connect the EIB directly to a uDevice.

NOTE: Do not connect power to the **EIB** at this time. Connecting or disconnecting uDevices while the **EIB** is powered (hot swapping) can damage the uDevices.

Connect uDevice™ Hardware

A uDevice is a uProcess device that connects to the **EIB** (directly or via a breadboard) and is controlled through the software. uDevices include the **4VM** valve manifold (for controlling **AV-series** automated valves), **4AM** analog manifold (for controlling **uPS** pressure sensors and **uTS** temperature sensors), the **4PM** power module (for controlling **uTE** modules) and the **SPS01** syringe pump.

AV Valves and 4VM

A **4VM** valve manifold is required to actuate an **AV-series** automated valve. Each manifold can support up to 4 valves.

- 3. Plug a **4VM** manifold into a breadboard connector.
- 4. Secure each **AV-series** valve to the desired location on the breadboard using two 2-28-¹/₄" mounting screws.
- 5. Connect a flat flex cable from each **AV-series** valve to a port on the **4VM**. Labels on the valve and manifold indicate the correct orientation of the cable (ridges on the label indicate the metal strips on flat flex cable).

uTS01 Temperature Sensors, uPS01 Pressure Sensors, and 4AM

A **4AM** analog manifold is required to monitor a **uPS** series pressure sensor or **uTS** temperature sensor. Each manifold can support up to 4 sensors.

- 6. Plug a **4AM** into a breadboard connector.
- 7. For Pressure Sensing:
 - Thread a **uPS01** to a mating component (typically a breadboard reservoir or an interconnect, as shown below).



• Connect a flat flex cable from the **uPS01** to a port on the **4AM**. Refer to the **4AM** label and the **uPS01** figure below for the correct cable orientation (ridges on the label indicate the metal strips on flat flex cable).



- 8. For Temperature Sensing:
 - Connect a flat flex cable from the **uTS01** to a port on the **4AM**. Labels on the **uTS01** and **4AM** indicate the correct orientation of the cable (ridges on the label represent the metal strips on flat flex cable).
 - Optional: Secure the **uTS01** sensor body to the breadboard using a 2-28-¼" screw.
- **NOTE: uTS01-STD** sensors are typically used to measure surface temperature and are attached to the measurement surface via thermal tape or epoxy. **uTS01-INS** sensors are typically immersed in liquid (such as inside a reservoir).

SPS01 Syringe Pumps

- 9. Plug a **SPS01** syringe pump into a breadboard connector.
- 10. Optional: secure the SPS01 to the breadboard using two M2 screws.

uTE Thermal Module and 4PM

- 11. Plug a **4PM** power manifold into a breadboard connector.
- 12. Connect a flat flex cable from the **uTE** to a port on the 4PM. Refer to the **4PM** and **uTE** labels for the correct cable orientation (ridges on the label indicate the metal strips on flat flex cable).
- 13. Secure each **uTE** module to the desired location on the breadboard (2-28-¼" mounting screws are use for **uTE02**, M2-6 screws for the **uTE01**).

uEP01 Electrophoresis Power Supply

14. Please see the **uEP01** Quick Start Guide for specific instructions and safety information on operating the **uEP01** electrophoresis power supplies.

uProcess software

- 15. Connect the power supply from the **EIB** to an outlet.
- 16. Connect the micro USB cable from the **EIB** to a USB port on the computer.
- 17. Launch the uProcess software.
- 18. The uDevices pane will be in the top left corner of the software. Right-click on Interfaces and choose New Interface.

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19. Select the COM port to which the EIB is connected, and click OK.

NOTE: If the COM port is unknown, click on '*Open Windows device manager...*' and view the *Ports* list. The correct COM port is listed as 'Silicon Labs CP210x USB to UART Bridge.'

The uDevices pane should now show all connected uDevices. The top right right pane is the uProcess dashboard, which contains control panels for all connected uDevices.

NOTE: The uDevices listing order is based on the device address, not the position on a breadboard.

- 20. Click on each uDevice name under the *Interfaces* listing to determine which hardware belongs with each address. The indicator light on the device will flash red/green when that device is selected.
- 21. As each uDevice is selected this also brings up the individual control panel for that device. Click the *Interfaces* heading in the uDevice window to return to the uProcess dashboard.
- **NOTE**: Click *Rescan for Devices* () to refresh the Interfaces and uDevices listings after cycling power or adding/removing devices.

AV-series Valve Operation

The **4VM** channels are factory set to a AV201 valve type. The user must set each 4VM channel to the correct valve type before operation.

- 22. Select the **4VM** from the from the uDevice list to access the **4VM** control panel.
- 23. Click the 4VM button for each channel with a connected valve and select the Valve type, subtype and Name are optional.

Once the type has been set, valves valves can be actuated via controls on the uProcess dashboard or the individual **4VM** control panel.

24. Select the desired valve position from the dropdown menu and click the Apply Settings Now button ().

The valve LED will glow green when it is moving towards position "A" or red when it is moving to position "B".

NOTE: Continuously update uDevices as the settings change by selecting the Update Continuously button (Sa).

4VM02.V1	Action:	Select motion	~	Indeterminate
4VM02.V2	Action:	Select motion	~	Indeterminate
Missing	Action:		~	
Missing	Action:		\sim	

SPS01 Syringe Pump Operation

Syringe pumps can operated from the uProcess dashboard or by selecting a pump in the uDevices window to access an individual **SPS01** control panel.

25. Set the volume and flow rate for the **SPS01** by typing in the desired values or moving the slider bar.

The **SPS01** LED will glow red for fill and green for dispense.

	Target vo	olume		Flow rate	
0 🔛		ul 10.2	227 ul	ul/min	0.000 ul/min
			0.0	0.073	2800

uPS Pressure and uTS Temperature Monitoring and Regulation

uPS pressure sensors and **uTS** temperature sensors can be monitored via controls on the uProcess[™] dashboard or the individual 4AM control panel. See the **uProcess User Manual** for information on pressure regulation.

		Nr a	Reg
P21285:	-2.038	kPa	Reg
T00132:	29.378	С	Reg

uTE01 and uTE02 Thermal Control Operation

uTE01 and **uTE02** modules can be operated from the uProcess dashboard or by selecting a module in the uDevices window to access an individual **uTE** control panel.

The **uTE** LED will glow red if the applied voltage is positive and green if the applied voltage is negative.

- **NOTE:** If using a **uTE01** module the 4PM channels must be set to the correct module type before operation (see user's manual). **uTE02** modules are smart sensors with onboard memory of the module type.
- **NOTE**: Monitor the hot-side of the Peltier and use a heat sink to minimize the chance of damaging a **uTE** module. Refer to the uProcess Thermal Spec Sheet for information on the **uTE module temperature and power limits.**

4PM01									
2 🕄	Load1	Off	~	-4	1	4	0.000	A	×
	Load2	Off	~	-4	8 * * * * * * * * * * * * * * * * * * *	4	0.000	A	~
	Load3(?)	Off	~	-4	1	4	0.000	A	~
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Automated Control

Creating automated scripts with the uProcess software:

- 26. From the **uProcess dashboard**, set the target conditions for each **uDevice** and click the *Save as New Sequence Step* button (
- 27. Select **Run** (**)**) to start the sequence.

Support

Refer to the **User Manual** for more detailed information about uProcess and creating automated scripts (go to **uProcess software** at Help>About uProcess, or at www.labsmith.com). If you cannot find the information you need, call technical support at (925) 292-5161 or email <u>support@labsmith.com</u>.

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Sequencer 0 × 2010 - Q Sequencing Script	4VM02 4VM02 4VM02 40402.V1 Action: Select motion Indeterminate 40402.V2 Action: Select motion Indeterminate 40402.V2 Action: Indeterminate Missing Action: Indeterminate	
	4PM01 Lead1 Off v 4 4 4 Lead2 Off v 4 4 Lead20 Off v 4 4 Lead30 Off v 4 0.000 A v Lead30 Off v 4 0.000 A v Lead30 Off v 4 0.000 A v Lead30 Off v 4 0.000 A v	
	SPS01 Target volume u 10.227 ut How rate u/min 0.000 ut/m 0.073 2800 0.073 2800	iin D

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