



## Technical Note

---

4U™ Pump

## 4U 4-channel Microfluidic Pump: accurate and pulse-free flow rates for microfluidic applications

4U is a 4-channel precision, microfluidic, pressure pump for a variety of microfluidic applications, where accurate and stable flow rate delivery is required. The pressure pump component is based on controlled air injection. SmartFlo application executed on the iPad mini or LabVIEW based interface communicates with the 4 separate channels of the 4U pump allowing simultaneous control and independent programming of each pump’s flow profile.



*4U microfluidic pump: up to 4 pumps controlled independently via Apple iPad mini or LabVIEW*

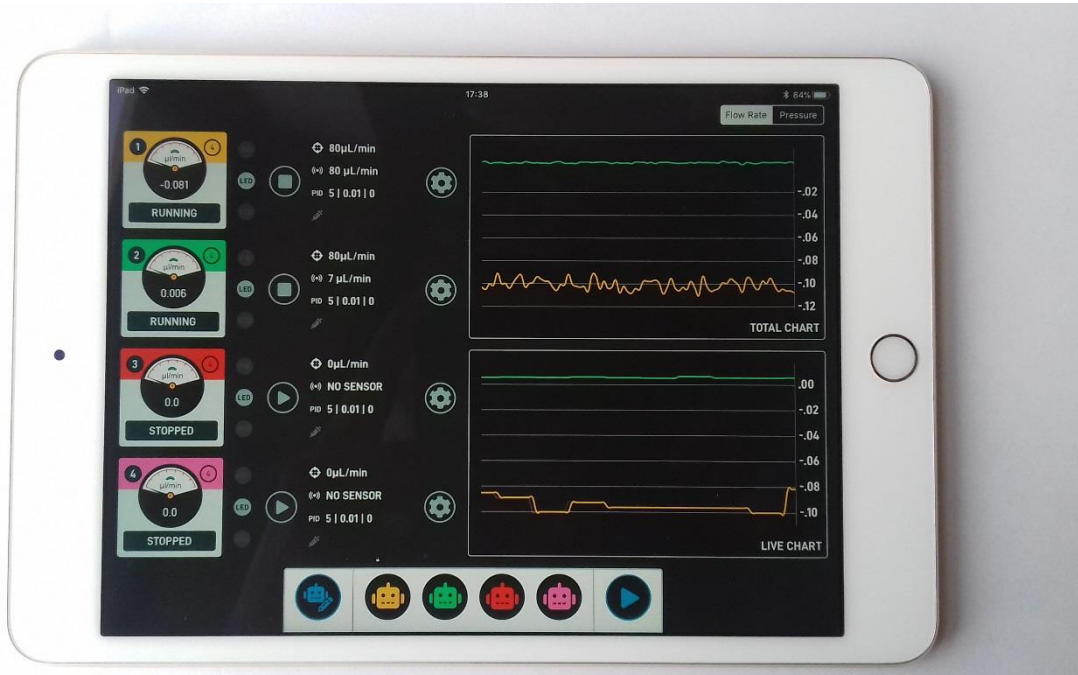
### Performance and Technical Specifications:

Technical specifications	
Software control	SmartFlow app running on iPad mini LabVIEW based PC software
Dimensions	230 mm (L) x 193 mm (W) x 85 mm (H)
Weight	~2.5 kg
Power requirements	110 / 220 V – 50 / 60 Hz – 60 W

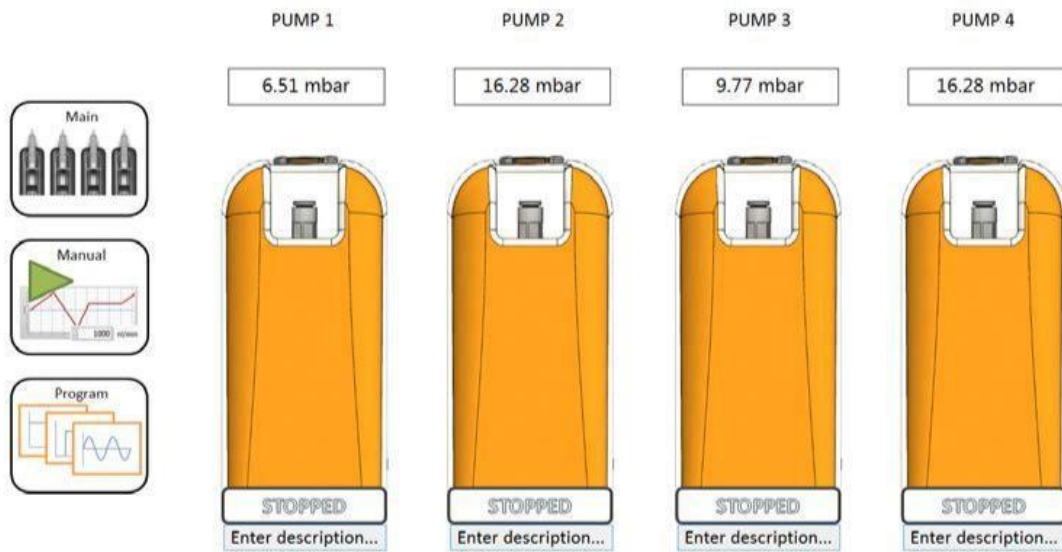
Performance specifications	
General specifications	Each channel of the 4U microfluidic pump incorporates: 2 modes of pumping: manual flow rate set or pre-programmed flow rate operation Pre-programmed mode includes: constant, ramp, step, sine functions
	Wi-Fi communication with iPad mini software
	USB communication with LabVIEW based PC control software
	Tactile power switch
Volumetric flow rates (per channel)	1 $\mu\text{L}/\text{min}$ –1 mL/min
Flow direction	Unidirectional (push)
Pulse-free flow rate for microfluidic applications*	1 $\mu\text{L}/\text{min}$ –80 $\mu\text{L}/\text{min} \pm 120 \text{ nL}/\text{min}$ with 80.0 $\mu\text{L}/\text{min}$ flow sensor (FS-80.0)
	10 $\mu\text{L}/\text{min}$ –1 mL/min $\pm 2 \mu\text{L}/\text{min}$ with 1.0 mL/min flow sensor (FS-1000)
Working pressure	Up to 145 psi or 10 bars

\*Measured with flow sensor and active PID feedback.

Flow sensor overview	
Operation	Plug and play connection to each channel of the 4U microfluidic pump
Features	Allows monitoring of each of the individual pump flow rates and active PID (proportional, integral, differential) feedback of pump flow rate
Dead volume	1–25 $\mu\text{L}$ depending on flow sensor
Measured flow rate ranges	See technical note on flow sensors
Max pressure	30 psi–2 bars maximum
Dimension	60 mm (L) x 51 mm (W) x 21 mm (H)
Weight	<0.1 kg
Power requirements	Via cable to 4U microfluidic pump



SmartFlo app running two channels of the 4U microfluidic pump on iPad mini



LabVIEW interface