



Where Light Meets Life™

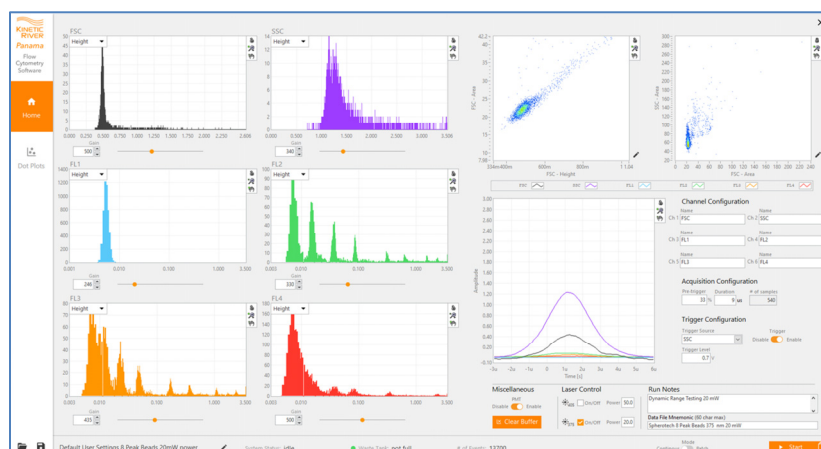
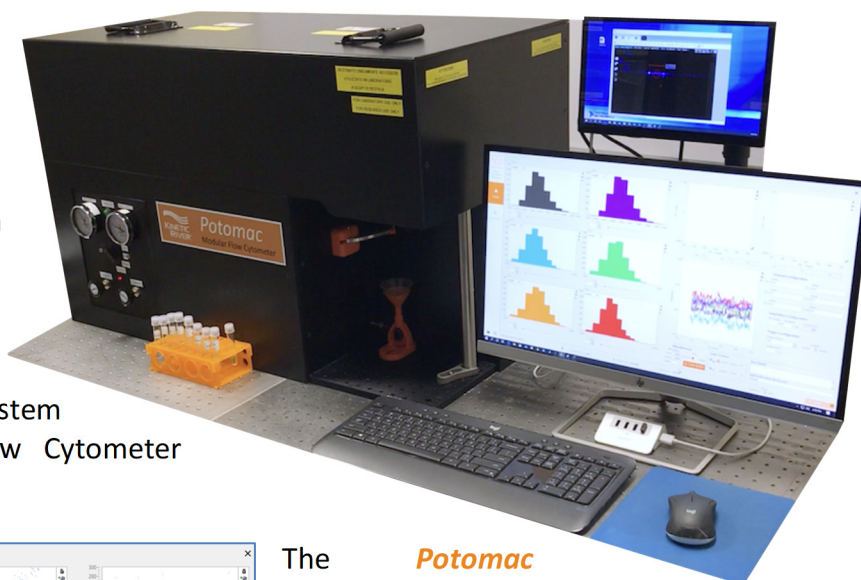
Potomac

Customizable Modular Flow Cytometer

Tech Notes

For many applications in cutting edge of research, “one-size” most definitely does not “fit all.” Whether you require exotic light sources, extreme flow rates, custom flow cells, or novel optical setups, the need for flexibility and customization often cannot be met with fixed-layout systems.

We designed and developed a **flexible** and completely **customizable** solution to address this need. With a **modular** system architecture, the **Potomac** Modular Flow Cytometer adapts to your requirements.



The Panama software for instrument control and data visualization

The **Potomac** architecture can support **up to 8 lasers** (including externally mounted ones), and **up to 20 channels of detection** using either compact PMTs or silicon photomultipliers (SiPMs). Excitation lasers are provided as collinear or spatially separated, and either free-space or fiber-coupled. All filters and beamsplitters are kinematically mounted and swappable **without the need for realignment**. The entire optomechanical structure is based on cage cube assemblies allowing for **simple modifications and**

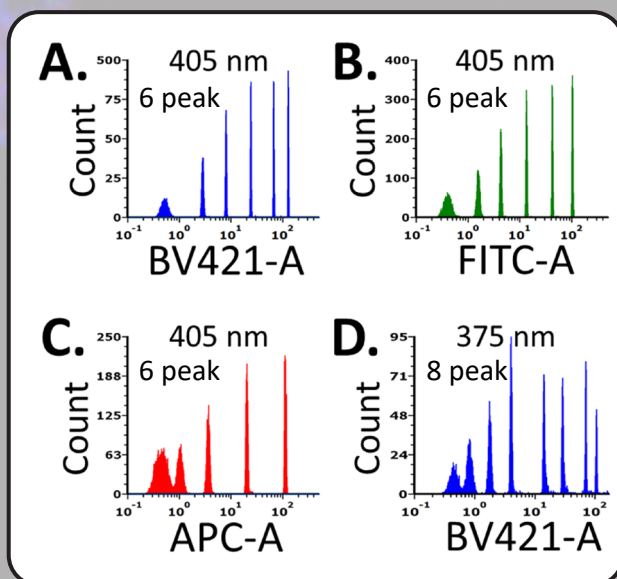
upgrades. The **Potomac** features Kinetic River’s *Shasta* fluidic control system for ultrastable sheath flow and **superior core stream control**. The *Cavour* always-on flowcell monitor allows you to optimize laser alignment and core stream dimensions in real-time **without removing the cover**. The entire system is operated using our intuitive, easy-to-use *Panama* flow cytometry software for instrument control and data visualization, providing researchers with the flexibility their cutting-edge research requires.

Most importantly, the **Potomac** can be easily customized for unique requirements. The system can be also easily **upgraded** over time, allowing you to start with a basic system and adding capabilities as you grow.

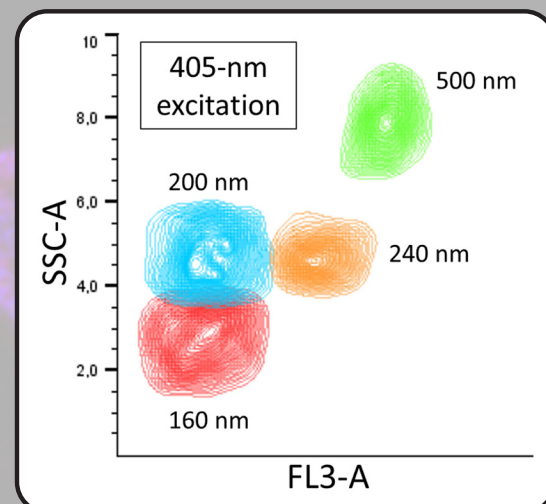
The **Potomac** – if you have specialized flow cytometry needs, you won’t find anything else like it.

The Potomac, or use thereof, may be covered in whole or in part by patents in the U.S. and other jurisdictions. A current list of applicable patents can be found at <https://www.kineticriver.com/kinetic-river-corp-patents>.

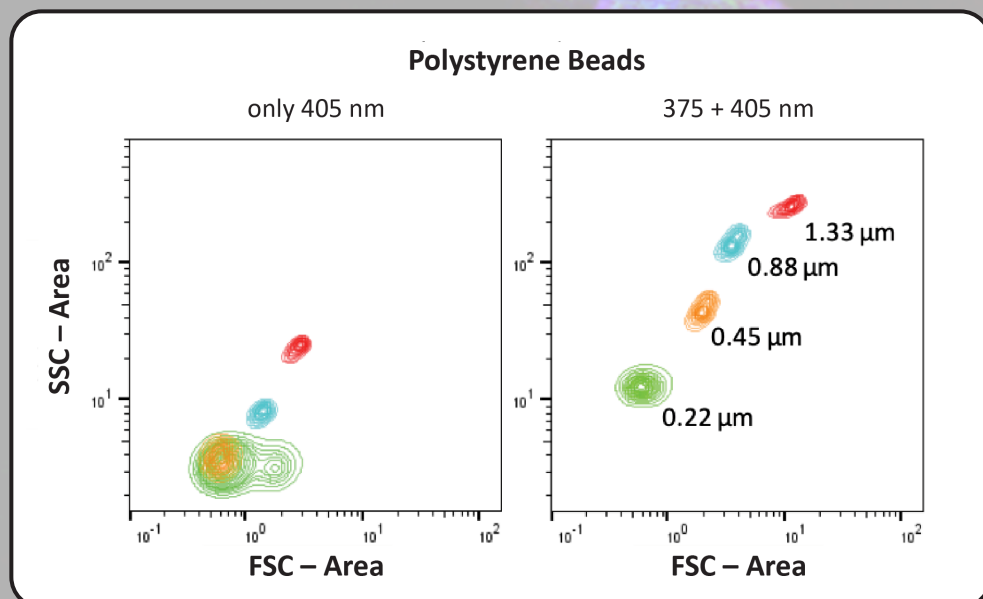




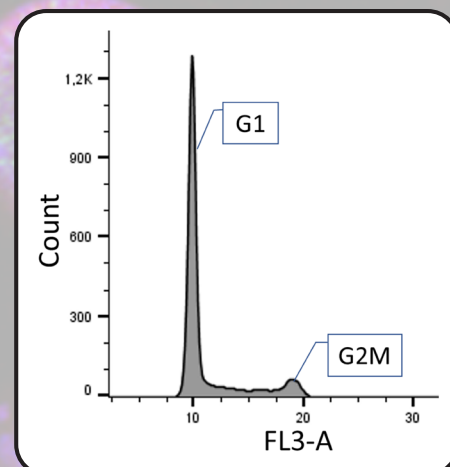
Potomac dynamic range was measured using Sphero-tech Rainbow Calibration Beads. Panels A–C show 6-peak beads excited at 405 nm. Panel D shows 8-peak beads excited at 375 nm.



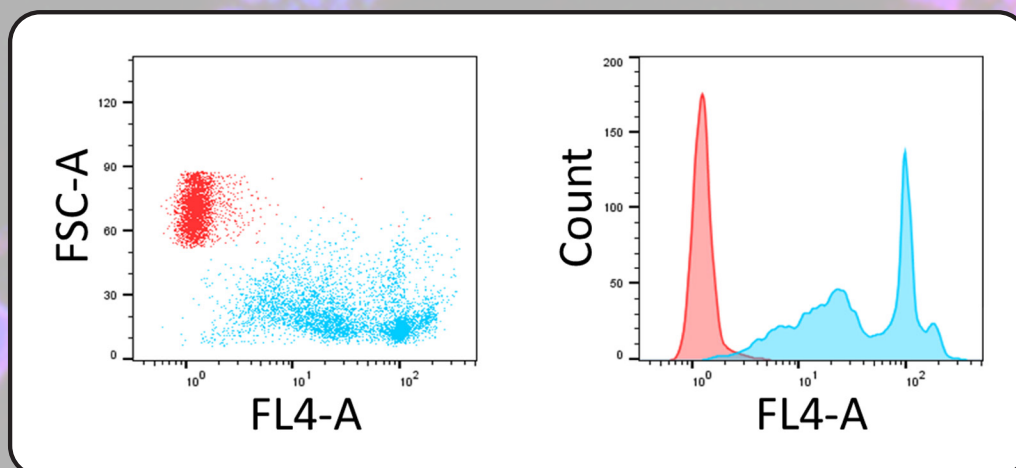
The Potomac demonstrates excellent nanoparticle size discrimination using BioCytex Megamix-Plus SSC beads, despite the low excitation efficiency at 405 nm.



Polystyrene nanoparticles run on the Potomac can be more easily resolved using the 375- and 405-nm lasers in combination than either laser by itself.



A cell cycle assay on the Potomac shows a tight G1 peak (<4% CV) with an easily observed G2 peak.



A cell viability assay run on the Potomac using DAPI-stained SH-SY5Y cells (375-nm excitation) shows that live (red) and dead (blue) cell populations can be easily distinguished.



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Customizable Modular Flow Cytometer Specifications

Excitation Optics

Standard laser options (up to 8):

- 375 nm (70 mW)
- 405 nm (500 mW)
- 488 nm (300 mW)
- 532 nm (400 mW)
- 561 nm (200 mW)
- 591/594 nm (100 mW)
- 638/640 nm (500 mW)
- 785 nm (350 mW)

Custom laser options (powers vary from 30 – 500 mW):

- 266, 350, 395, 420, 445, 460, 473, 505, 515, 633, 660, 685, 705, 730, 750, 830, 850 nm

Emission Optics

Scattering channels:

- FSC: customizable
- SSC: 90°, 1.25 NA

Fluorescence channels:

- up to 18 channels
- customizable bandpass selections

Detectors:

- PMTs or silicon photomultipliers (SiPMs)

Fluidics

Dual hydrostatic pressure injection option:

- 8-L sheath capacity, pressure up to 30 psig
 - Sample injection speed:
 - option A: variable 0.2 – 20 $\mu\text{L}/\text{min}^*$
 - option B: variable 2 – 200 $\mu\text{L}/\text{min}^*$
- * higher and lower custom rates available

Signal Processing

Data formatting:

- CSV files
- optional: raw waveforms

Performance

Sensitivity (405-nm excitation, 466/40-nm channel):

- BV421 ≤ 100 MESF (est.)
- 8/8 Spherotech Rainbow bead peaks

Nanoparticle detection (375+405-nm excitation, FSC/SSC):

- 160-nm Megamix-Plus

Resolution (375-nm excitation):

- FL CV 4% (G1 peak)
- FSC CV 2% (ThermoFisher W500CA beads)

Throughput:

- 10,000 events/s (typ.)

Installation Requirements

Dimensions:

- 36" x 20" x 23" (W x D x H)
(monitors, sheath and waste tanks separate)

Weight:

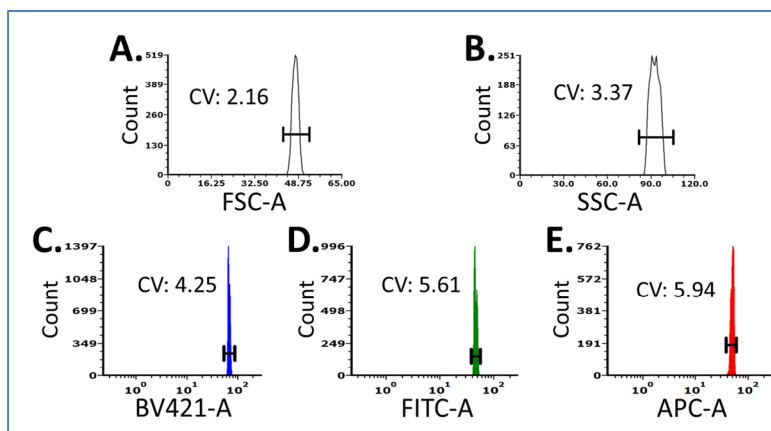
- 200 lbs. (2-laser, 7-detector system; monitors, sheath and waste tanks separate)

Environmental:

- 15°–30°C, 60% RH

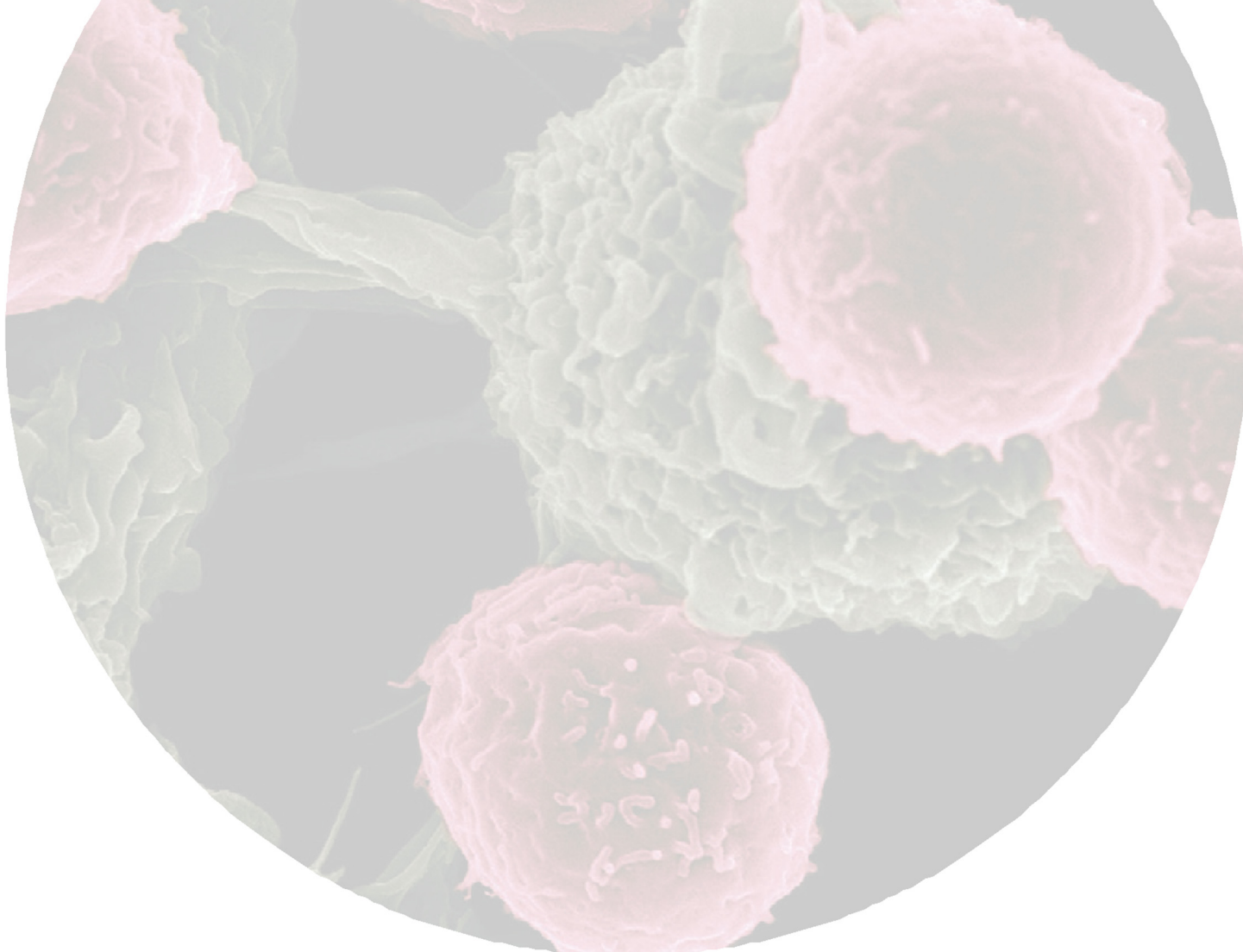
Power:

- North America: 120 VAC, 50/60 Hz, 8A
- Japan: 100 VAC, 50/60 Hz, 8A
- Rest of world: 230 VAC, 50/60 Hz, 5A



A) FSC and B) SSC CVs were generated using ThermoFisher W500CA beads. Fluorescence CVs were assessed with Spherotech Ultra Rainbow Fluorescent Particles in the C) BV421, D) FITC, and E) APC channels (excitation at 405 nm).





Kinetic River Corp.

**897 Independence Avenue, Suite 4A
Mountain View, CA 94043-2357 USA**

+1 (650) 439-7413

info@KineticRiver.com

<https://www.kineticriver.com>

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The TRFC technology, or use thereof, may be covered in whole or in part by patents in the U.S. and other jurisdictions. A current list of applicable patents can be found on our website at <https://www.kineticriver.com/kinetic-river-corp-patents/>.

