

# BEND TIME IN HIGH-THROUGHPUT SCREENING

YOUR SPACESHIP

 Styx

Agile platform for droplet  
analysis and manipulation.

Specification sheet



**Droplet  
Genomics**

**YOUR GROUND CONTROL IN HIGH-THROUGHPUT BIOLOGY**

[DROPLETGENOMICS.COM](http://DROPLETGENOMICS.COM)

## PRESSURE PUMPS

**Type:** piezo-electric  
**Independent channels:** 4  
**Pressure range:** 0.5–25kPa  
**Pressure change response time:** <2.5s  
**Sample reservoir:** compatible with standard 1.5ml, 5ml and 15ml laboratory tubes

## FLUORESCENCE EXCITATION AND DETECTION

**Lasers:** Up to 4 separate wavelengths 488nm (base model), 405nm, 561nm, 633nm  
**Laser power:** 0–20mW  
**Detection channels:** 4 independent channels centred at 450nm, 520nm, 600nm and 670nm  
**Detection sensitivity:** 100 $\mu$ s – 100ms duration light pulses, with lower limit for photon flux at 1photon/ $\mu$ s at 25°C  
**Measurement throughput:** >1000 samples/s  
**Trigger latency:** <100 $\mu$ s with jitter <10 $\mu$ s

## HIGH-SPEED CAMERAS

**Number of independent cameras:** 2  
**Resolution:** 1440 x 1080  
**Exposure time:** 45 $\mu$ s – 2ms  
**Recording framerate:** 10 – 5000 frames/s (region size dependent)  
**Maximum recording buffer size:** 500 frames  
**Video playback rate:** 1 – 30 frames/s

## HIGH-VOLTAGE PULSE GENERATOR

**Pulse amplitude range:** 100 – 1000Vpp  
**Duty cycle:** up to 50%  
**Frequency tuning:** automatic  
**Pulse duration:** 100 $\mu$ s–100ms  
**Pulse synchronization delay:** 100 $\mu$ s–10ms with 10 $\mu$ s jitter

## ARTIFICIAL INTELLIGENCE SYSTEM

**GPU:** 512-core NVIDIA Volta, 32 TOPs  
**CPU:** 8-core NVIDIA Carmel Arm®v8.2 64-bit CPU 8MB L2 + 4MB L3  
**Memory:** 32 GB 256-bit LPDDR4x 136.5GB/s  
**Chip and droplet analysis rate:** <2.0s  
**Droplet size precision:**  $\pm$ 5 $\mu$ m (for nominal 100 $\mu$ m size)

## INTEGRATED MICROSCOPY

**Independent viewing areas:** 2  
**Optical magnification:** 0.7 $\mu$ m/px (viewing area 1), 1.5 $\mu$ m/px (viewing area 2)  
**Illumination source:** 0 – 0.25W LED 760nm monochromatic  
**Illumination type:** infrared  
**Microfluidic chip dimensions:** 25 x 75mm  
**Stage:** motorized 3 direction stage (XYZ)



## CONNECTIVITY

**Wired connectivity:** 1x Ethernet, 1x HDMI, 1x USB  
**Wireless connectivity:** 2.4GHz WiFi hotspot with DHCP server  
**Device control software:** integrated into the on-board computer

## WHY STYX?

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Up to 4 separate lasers enable a variety of fluorophores

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4 independent fluorescence detection channels for complex assays

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Dual high-speed microscopy setup for on-chip process analysis

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760nm illumination allows visualizing the process during fluorescence measurements

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Controllable high-voltage pulse generator for droplet manipulation applications

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No chip lock-in (compatible with elastomeric chips)

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Machine-vision and inline droplet analysis

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45 $\mu$ s camera exposure for sharp images at high speed

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