



MCAM™

Kestrel

The **MCAM™ Kestrel**, built on Ramona's **Multi-Camera Array Microscope™** technology, is designed for high-throughput model organism research. It enables simultaneous observation of all wells in standard 24, 48, or 96-well plates, featuring **Behavior Mode** for high-speed behavioral analysis and **Screening Mode** for comprehensive fluorescence imaging.

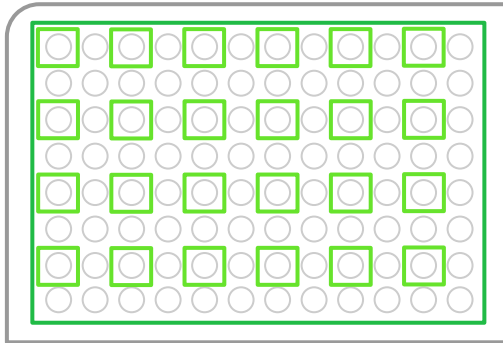
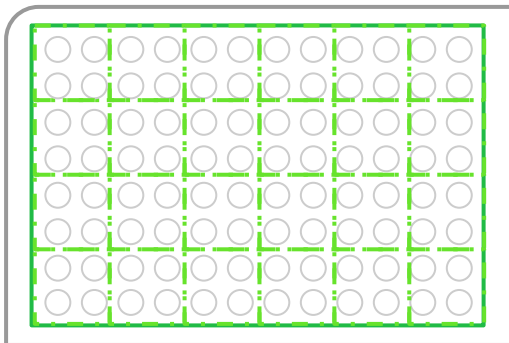
With 24X higher resolution than competitors, the Kestrel's customized software rapidly quantifies locomotion kinetics and gross morphology across entire well plates, unlocking completely new, high-throughput workflows for understanding organism behavior.



Our Arrayed Architecture Facilitates Full Well-Plate Imaging

System Field-of-View: Behavior Mode

System Field of View: Screening Mode



- = Well
- = Screening Camera FOV
- (dashed) = Behavioral Camera FOV
- = Plate Perimeter
- (thick green) = Aggregate FOV

A Uniform View

Perspective makes peering into many well plates problematic with a single lens. Our array of micro-cameras and wide-field illumination ensure uniform observation across all wells.

High-throughput

Inspired by the tools scientists use everyday, the **MCAM™ Kestrel** is ideal for assessments in standard SBS well plates.

Behavior Mode

Screening Mode

Optical Characteristics - Modality-Specific

System Field Of View	82mm x 118mm	74mm x 110mm
Live View Stitched View	Full Field Of View Live	Partial View Live 2x2 scan for Full Field of View
Resolution	9.5µm/ pixel	3.2µm/ pixel
Numerical Aperture	0.02	0.053
Working Distance	240mm	90mm
Depth of Field	3mm	0.50mm
Micro-Camera Array Size	6 x 4 = 24	6 x 4 = 24
Micro-Camera Array Spacing	18mm	18mm
Micro-Camera Field of View	29.2mm x 29.2mm	9.5mm x 9.5mm

Sensor Characteristics

Micro-Camera Array Spacing	18mm
Image Sensors	CMOS - RGB Color Monochrome
Array Pixel Count	314 Megapixel
Bit Depth	8
Digital Gain	7.75
Analog Gain	2
Minimum Exposure	140 microseconds
Maximum Exposure	9 seconds
Max. Frame Rate (full array)	22 fps (bin1), 160 fps (bin4)
Data Transfer Interface	PCIe 3.0 (x16) (x4)
Maximum Data Rate	45 Gb/sec 19 Gb/sec
Native File Format	.nc (HDF5), .tiff, .bmp, .mp4
Metadata	.json
Metadata Options	By Plate Barcode
Local Storage	4 TB (up to 30 TB internal upon request)
Network-Attached Storage	Available Upon Request
Microscope Orientation	Upright or Inverted
Vibration Dampening	Integrated
Dimensions (Typ.)	395mm x 500mm x 525m
Weight (Typ.)	30 kg
Stage Inserts	160mm x 110mm Universal Mount
Nominal Power Consumption	400W
Maximum Power Consumption	750W
Power	120V @ 60Hz 240V @ 55Hz
Thermal Monitoring	K-Type Thermo. +/- 1.5C Accuracy Reporting Integrated in Metadata
Active Thermal Control	Available Upon Request - Ramona + Tokai Hit Stage Top Module
Transmission	LED Structured Illumination Panel
Control	Individually Addressable
Spectra	VIS IR
Reflection	LED Diffuse Illumination Rails
Spectra	VIS IR UV
Ubuntu Linux	Version 22.04
Python	Version 3.10
Acquisition Modes	Snapshot, Z-Stack, Timelapse, Video
Observation Modes	Brightfield, Darkfield, Fluorescence
Focus	Global Linear Z-Positioning
API	Python-Based docs.ramonaoptics.com
Output Trigger	SMA Type @ 5V Signal
Image Capture Firmware	Custom Gigapixel Frame Grabber
Cross-Sensor Synchronization	<6 microseconds
2D Image Mosaicing	Live
Neural Network-Based 2D	Available
Control software	For MCAM Computer

Data

Mechanical, Power, & Thermal

Illumination

Operation

Software & Firmware