

ODIN *Specification*

IMAGING SENSOR

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| Description | High-performance camera with integrated analysis and feature extraction. |
| Frame Rate | 210 fps @ 1280×1024 px; up to 10000 fps @ 400×32 px |
| Type | Monochrome; 10bit color depth; 1/2" active area |
| Sensitivity | Wavelength range 300-1000nm; 58% QE @ 550nm peak ; 62% QE @ 630nm; global shutter |
| Pixel size | 4.8µm |
| Latency | Image capturing to analysis result <200µs; control precision <10 ns |
| Outputs | 6 flash outputs for light control; 2 trigger for sorting / device control (3.3V TTL) |
| Interfacing | C-mount; Ethernet; DVI-D; USB |
| Fluorescence compatibility | Yes, up to 4 channels (additional hardware required), e.g. 405nm, 488nm, 532nm, 561nm, 638nm |

ILLUMINATION UNIT

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| Description | Illumination unit for ultra-sharp images. |
| Colors | Colors: blue, green, red, others on request |
| Flash Length | 0.1µs – 5µs |

SIGNAL HUB

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| Description | Electrical decoupling of output signals with 8 SMB standard connectors (5V TTL) for lab compatibility. |
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SOFTWARE

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| Description | User-friendly and feature-rich graphical user-interface for observation, analysis, and control. |
| Readout Regions | 2 freely selectable, simultaneous readout regions, e.g. for two stage processes, immediate quality control or parallelization |
| Analysis | Real-time analysis of detection parameters |
| Plotting Engine | Comprehensive plotting features for easy visualization of data in scatter or line plots; direct access to image data, cross channel and intra channel visualization and gating; gate combining; arbitrary polygon gating |
| Storage Format | RAW; AVI uncompressed; MJPEG; MP4; XLS; XLSX; CSV (infinite recording) |
| Triggers | Freely programmable and independent triggers; latency down to 200µs (frame rate dependent) |

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|--------------------|---|
| Gating | Freely configurable gating; graphical marking in scatter plot; arbitrary points polygon selection |
| Multi-color Mode | Up to 4 simultaneous imaging settings by time multiplexing (e.g. bright field and three different fluorescent colors) |
| Smart Imaging Mode | Yes (all images; only particles; one per particle; partial imaged particle removal) |
| Remote Control | HTTP; ZMQ |

EXPERIMENTAL FEATURES

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| Sorting Method | Active Dielectrophoretic |
| Sorting Efficiency | Up to 99 % demonstrated |
| Sorting Selectivity | Up to 99 % demonstrated |
| Sorting Purity | Up to 99 % demonstrated |
| Droplet Sizes | 10 μ m to 1 mm diameter |
| Detection Methods | Bright field image Phase contrast image Fluorescence 408 nm image Fluorescence 488 nm image Fluorescence 532 nm image Fluorescence 561 nm image Fluorescence 638 nm image |
| Detection Parameters | Brightness/intensity; brightness contrast; circumference; area; surface roughness; colocalization; fluorescence colocalization; particle count; area contrast; fill factor; elongation; circularity; size; velocity; position; granularity; removal of small dirt particles; area of no contrast; contrast within particles; particles touching walls; particles touching image boundaries; particle position; particle velocity; |
| Modular Integration Options | Adaptable sorting techniques Adaptable microfluidic chips (no vendor lock in) Adaptable microscope techniques Adaptable lasers Adaptable fluorescence filter sets Adaptable detection technologies Inline droplet generation or reinjection Incubation, temperature control Sterilization |
| Quality Control | In-line, multispectral image per particle pre & post sorting; all droplets recorded |
| Sample Viability | Further downstream usage of the sample; maximized cell viability |
| Assay-based Sorting | Yes |