Aries 6506 BSI sCMOS Camera, 22 mm Diagonal, 200 fps, 0.7 e⁻ Noise

Model Aries 6506 · waveqvanta.com/products/aries-6506-scmos-camera

A back-illuminated sCMOS camera sized for the field of standard microscopes, with fast full-frame readout.



The Aries 6506 uses the back-illuminated GSENSE6510BSI sensor read out at 2400 × 2400 pixels of 6.5 µm, giving a 22 mm diagonal suited to the field of view of standard microscope optics. Full-resolution output runs at up to 200 fps (5.8 MP), and several readout modes let users trade speed, full well and noise. Data are carried over a dual 10GigE link, so no frame grabber is needed.

Key features

- 95% peak QE with read noise down to 0.7 e⁻ (median) in Sensitivity Low Noise mode
- Speed mode: 200 fps at full 5.8 MP with selectable full well of 1.24 ke⁻, 4.5 ke⁻ or 20 ke⁻
- Dynamic HDR mode: 16-bit output at 111 fps with 13.7 ke⁻ full well and 77 dB dynamic range
- Full-frame throughput of about 1160 Mpixel/s, compared with about 420 Mpixel/s for a typical 18.8 mm-diagonal sCMOS camera
- Dual 10GigE data interface with standard cabling; no frame grabber required
- Air cooling to 0 °C or liquid cooling to −10 °C, on-board defect pixel correction and 1 µs timestamp accuracy

Specifications

Sensor Type	BSI sCMOS
Sensor	GSENSE6510BSI
Color / Mono	Mono
Peak QE	95%
Resolution	2400 × 2400
Pixel Size	6.5 µm × 6.5 µm
Effective Area	15.7 mm × 15.7 mm
Array Diagonal	22 mm
Readout Modes	Dynamic HDR; Speed (high / mid / low gain); Sensitivity (Standard / Low Noise)
Full-Well Capacity	13.7 ke⁻ (HDR); 1.24 / 4.5 / 20 ke⁻ (Speed); 1.55 / 0.69 ke⁻ (Sensitivity)
Readout Noise	Median: 1.8 e⁻ (HDR); 1.8 / 3.6 / 10.3 e⁻ (Speed); 1.3 / 0.7 e⁻ (Sensitivity)
Dynamic Range	77 dB (Dynamic HDR mode)
Frame Rate	111 fps (HDR); 200 fps (Speed); 117 / 6.9 fps (Sensitivity), full resolution
Shutter Type	Rolling, global reset
Exposure Time	4 µs – 10 s
Binning	2 × 2, 4 × 4
ROI	Supported
Cooling Method	Air, liquid
Cooling Temperature	Air: 0 °C @ 25 °C ambient; liquid: −10 °C @ 20 °C water
Dark Current	1.3 e⁻/pixel/s @ 0 °C; 0.6 e⁻/pixel/s @ −10 °C

Bit Depth	16 bit (HDR), 11 bit (Speed), 12 bit (Sensitivity)
Data Interface	2 × 10GigE
Trigger	Hardware, software; Hirose 6-pin; 1 µs timestamp accuracy
Trigger Output	Exposure start, global exposure, readout end, trigger ready, first/any row, line, high/low
Optical Interface	C-mount
Power Supply	12 V / 8.5 A
Power Consumption	≤ 55 W
Dimensions	95 mm × 100 mm × 100 mm (H × W × L)
Weight	1350 g
Operating Environment	Working 0–40 °C, 10–85% RH; storage 0–60 °C, 0–90% RH
Operating System	Windows, Linux
Software / SDK Support	Acquisition and analysis software, LabVIEW, MATLAB, Micro-Manager 2.0; C/C++/C#/Python SDK

Typical applications

- Super-resolution and single-molecule microscopy
- Light-sheet microscopy
- Calcium and live-cell imaging
- High-content and high-throughput imaging
- Confocal imaging
- Fluorescence slide scanning