Aries 6504 BSI sCMOS Camera, 0.8 e^- Read Noise, 297 fps @ 4.2 MP

Model Aries 6504 · waveqvanta.com/products/aries-6504-scmos-camera

A fast, low-noise sCMOS camera for high-speed live imaging and long low-light exposures.



The Aries 6504 is a back-illuminated sCMOS camera based on the GSENSE6504BSI sensor, with 2048 × 2048 pixels of 6.5 µm and 95% peak QE. It reads the full 4.2 MP frame at up to 297 fps with 0.8 e^- RMS read noise, and with liquid cooling keeps dark current at or below 0.01 e^-/pixel/s at −20 °C. Typical uses span life-science microscopy, physical-science research and industrial inspection.

Key features

- Speed mode: 297 fps at full 4.2 MP resolution with 0.8 e^- RMS read noise
- Dynamic (HDR) mode: 170 fps at 4.2 MP with 16-bit output, 15 ke^- full well and 86 dB dynamic range
- 95% peak QE at 450 nm and 200–1100 nm spectral range with 6.5 µm pixels
- Dark current ≤ 0.01 e^-/pixel/s at −20 °C (liquid cooling); air cooling to −10 °C at 25 °C ambient
- USB 3.2 Gen 2×2 and dual CXP-12 interfaces deliver the same frame rates
- Four SMA trigger connectors with eight selectable output signals, plus timestamps

Specifications

Sensor Type	BSI sCMOS
Sensor	GSENSE6504BSI
Color / Mono	Mono
Peak QE	95% @ 450 nm
Spectral Range	200–1100 nm
Resolution	2048 × 2048
Pixel Size	6.5 µm × 6.5 µm
Effective Area	13.3 mm × 13.3 mm
Array Diagonal	18.8 mm
Full-Well Capacity	15 ke^- (Dynamic mode)
Readout Noise	0.8 e^- RMS (Dynamic and Speed modes)
Dynamic Range	86 dB (Dynamic mode)
Frame Rate	170 fps (Dynamic); 297 fps (Speed), at 4.2 MP
Shutter Type	Rolling, global reset
Exposure Time	6.6 µs – 10 s
Binning	2 × 2, 4 × 4
ROI	Supported
Cooling Method	Liquid, air
Cooling Temperature	Liquid: −20 °C @ 20 °C coolant; air: −10 °C @ 25 °C ambient
Dark Current	≤ 0.01 e^-/pixel/s @ −20 °C

DSNU / PRNU	0.3 e^- / 0.3%
Bit Depth	12 bit, 16 bit
Data Interface	USB 3.2 Gen 2×2, CXP-12 × 2
Trigger	Hardware, software; 4 × SMA; timestamp supported
Trigger Output	Readout End, Global Exposure, Exposure Start, Trigger Ready, First Row, Any Row, High, Low
Optical Interface	C-mount
Power Supply	DC 12 V
Power Consumption	60 W
Dimensions	80 mm × 80 mm × 108 mm (camera body only)
Weight	950 g
Operating Environment	Working 0–40 °C, 20–80% RH, 0–3000 m; storage −20 to 60 °C, 20–80% RH
Software / SDK Support	Acquisition and analysis software; C / C++ SDK; Windows 10 / 11, Ubuntu 22.04

Typical applications

- Super-resolution microscopy
- Light-sheet microscopy
- Calcium and voltage imaging
- High-content imaging
- Fluorescence imaging
- Astronomical research