Aries 6504 Pro

The Aries 6504 Pro is built on a next-generation back-illuminated sCMOS platform. In high-sensitivity readout mode, it achieves 0.43 e- (RMS) readout noise for single-photon-level signal discrimination, complemented by 297 fps at 4.2 MP and ≤ 0.01 e-/p/s@-20°C, enabling precise measurement in demanding scientific and high-end industrial applications.

Key Features	Benefits
High-Sensitivity Mode	0.43 e- (RMS) readout noise at 99 fps @ 4.2 MP, enabling single-photon-level resolution.[1]
High-Speed Mode	297 fps@4.2 MP with 0.8 e- (RMS) readout noise, optimized for high-speed low-light imaging.
HDR Mode	170 fps@4.2 MP with 16-bit depth; high-speed acquisition and wide dynamic range.
≤ 0.01 e-/p/s@-20°C Dark Current	5X gen-over-gen improvement, enabling high-precision quantitative long-exposure imaging.
USB 3.2 & CoaXPress Interfaces	Flexible connectivity at the same frame rate; adaptable to diverse applications.
Air & Liquid Cooling	Reduces dark current and signal fluctuation, supporting long-term system stability.

Typical Applications

- Super-resolution imaging
- Light sheet imaging
- SIM imaging
- Calcium / voltage imaging
- Bioluminescence
- High-content imaging
- Quantum physics
- Astronomical research

Noted Examples

[1] In high-sensitivity mode, The Aries 6504 Pro shows clearly separated histogram peaks at ultra-low illumination of 2 e-/pixel, delivering a significant SNR improvement over the previous-generation back-illuminated sCMOS camera.

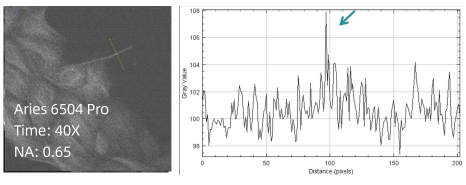


Fig. 1-1 Aries 6504 Pro Ultra-low-light image (2 e-/pixel)

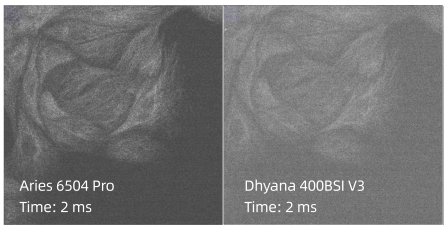
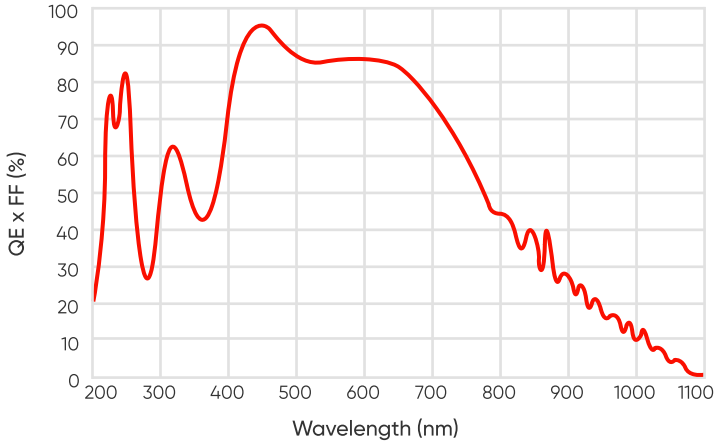
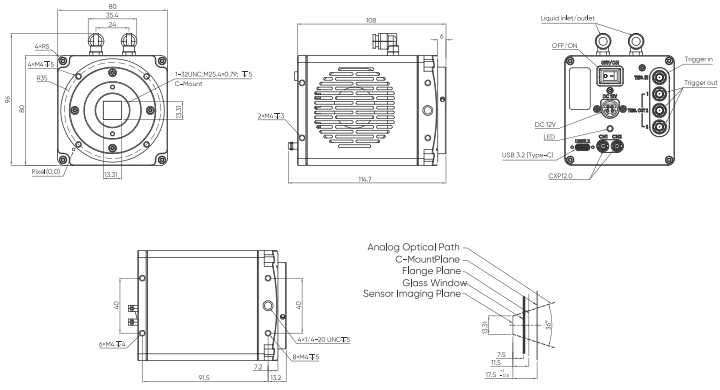


Fig. 1-2 Ultra-low-light comparison (2 e-/pixel)

Quantum Efficiency



Dimensions (Unit: mm)



Specifications

Product Name	Aries 6504 Pro
Model	A6504 Pro
Sensor Type	BSI sCMOS
Sensor Model	GSENSE6504BSI
Chrome	Mono
Spectral Range	200 nm - 1100 nm
Peak QE	95%@450 nm
Resolution	2048 (H) x 2048 (V)
Pixel Size	6.5 μm x 6.5 μm
Effective Area	13.3 mm x 13.3 mm
Frame Rate	99 fps@Sensitive mode 170 fps@Dynamic mode 297 fps@Speed mode
Full-Well capacity	15 Ke-@Dynamic mode
Dynamic Range	91 dB@Sensitive mode
Readout Noise	RMS: 0.43 e-@Sensitive mode
Dark Current	≤ 0.01e-/p/s@-20°C
DSNU	0.1 e-@Dynamic mode
PRNU	0.3%
Cooling Method	Liquid, Air
Cooling Temp.	Liquid: -20°C@Liquid Temperature 20°C; Air: -10°C@Ambient Temperature 25°C
Binning	2 x 2, 4 x 4
ROI	Support
Trigger Mode	Hardware, Software
Trigger Output	Readout End, Global Exposure, Exposure Start, Trigger Ready, First Row, Any Row, High, Low
Trigger Interface	SMA*4
Timestamp	Support
Data Interface	USB 3.2 Gen 2x2, CXP 12 x 2
Optical Interface	C Mount
Bit Depth	12 bit, 16 bit
Power Supply	DC 12 V
Power Cons.	60 W
Dimensions*	80 mm (H) x 80 mm (W) x 108 mm (L)
Weight	950 g
Software	Sample Pro, Mosaic V3
SDK	C / C++
Operating System	Windows 10 / 11, Ubuntu 22.04
Operating Environment	Working: Temp. 0°C~40°C, Hum. 20%~80%, Altitude 0 m~3000 m; Storage: Temp. -20°C~60°C, Hum. 20%~80%;

* The dimensions shown refer to the bare camera body only, Please see the mechanical drawing for details.

*Specifications in this manuat are subject to changes without prior notice.