Aries 16 LT BSI sCMOS Camera, 16 µm Pixels, 0.9 e^- Read Noise

Model Aries 16 LT · waveqvanta.com/products/aries-16-lt-scmos-camera

A large-pixel sCMOS camera for photon-starved imaging, from single molecules to cold atoms.



The Aries 16 LT is a back-illuminated sCMOS camera with 16 µm pixels on an 800 × 600 sensor, built for measurements where only a few photons reach each pixel. It reaches 0.9 e^- read noise in Low Noise mode and holds a typical 73 ke^- full well, so it can take the place of an EMCCD camera without excess-noise or gain-aging issues. Air or liquid cooling, USB 3.0 and CameraLink outputs and a C-mount make it easy to fit into existing optical setups.

Key features

- 16 µm × 16 µm BSI pixels with 90.7% peak QE at 550 nm; per-pixel sensitivity more than 5× that of a typical 6.5 µm pixel
- Two readout modes: Low Noise (0.9 e^-, 25 fps) and HDR (1.6 e^-, 60 fps)
- 73 ke^- typical full-well capacity and 93 dB dynamic range for strong and weak signals in the same frame
- Air cooling to 50 °C below ambient or liquid cooling to 60 °C below ambient; dark current 0.2 e^-/pixel/s
- Flexible binning (2 × 2, 4 × 4 or arbitrary), ROI readout and 1 µs timestamp accuracy
- USB 3.0 and CameraLink interfaces, SMA trigger I/O and SDKs for C, C++, C# and Python

Specifications

Sensor Type	BSI sCMOS
Color / Mono	Mono
Peak QE	90.7% @ 550 nm
Resolution	800 × 600
Pixel Size	16 µm × 16 µm
Effective Area	12.8 mm × 9.6 mm
Array Diagonal	16 mm
Full-Well Capacity	73 ke^- (typical)
Readout Noise	0.9 e^- (Low Noise mode); 1.6 e^- (HDR mode), typical
Dynamic Range	93 dB (typical)
Frame Rate	60 fps (HDR mode); 25 fps (Low Noise mode)
Shutter Type	Rolling, global reset
Exposure Time	26 µs – 60 s
Binning	2 × 2, 4 × 4, arbitrary binning
ROI	Supported
Cooling Method	Air, liquid
Cooling Temperature	Air: 50 °C below ambient; liquid: 60 °C below ambient
Dark Current	0.2 e^-/pixel/s
DSNU / PRNU	0.3 e^- / 0.3%

Bit Depth	12 bit, 16 bit
Data Interface	USB 3.0, CameraLink
Trigger	Hardware, software; SMA connectors
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low
Timestamp	1 µs accuracy
Optical Interface	C-mount
Power Supply	12 V / 8 A
Power Consumption	38 W
Dimensions	95 mm × 95 mm × 114 mm (H × W × L)
Weight	1500 g
Operating Environment	Working 0–40 °C, 0–85% 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

- Cold-atom and single-atom detection
- Quantum physics experiments
- Single-molecule localization and tracking (STORM)
- Single-molecule fluorescence, FRET, FCS and TIRF
- Bioluminescence and chemiluminescence imaging
- Electroluminescence imaging