Aries 1517 Vacuum-Cooled BSI sCMOS Camera, 87 mm Diagonal, 15 µm Pixels

Model Aries 1517 · waveqvanta.com/products/aries-1517-scmos-camera

A large-format, vacuum-cooled sCMOS camera for wide-field astronomical imaging and long exposures.



The Aries 1517 is a large-format back-illuminated sCMOS camera with a vacuum-sealed, cooled sensor chamber, intended for astronomy and space observation. Its 4116 × 4100 array of 15 µm pixels spans an 87 mm diagonal, and it combines 1.2 e^- read noise with exposures of up to 3600 s. Compared with conventional large-format CCD cameras it is smaller, lighter and uses less power, which makes integration at the telescope simpler.

Key features

- Vacuum-sealed cooling chamber designed for more than 5 years of vacuum stability, reducing maintenance
- Cooling to −40 °C (air, 10 °C ambient) or −50 °C (liquid, 10 °C coolant); dark current 0.023 e^-/pixel/s at −40 °C
- Customizable cooling depth: at −70 °C, dark current can be as low as 0.008 e^-/pixel/s
- 87 mm diagonal with 15 µm pixels reduces multi-camera stitching and helps avoid under-sampling with long-focal-length optics
- 92% peak QE at 450 nm and 1.2 e^- read noise (High Dynamic mode); 16-bit output with up to 94.7 dB dynamic range
- Up to 81.4 ke^- full-well capacity (Standard Low Gain mode) for good linearity over a wide signal range
- CoF and CameraLink interfaces, GPS timing and timestamps; power draw below 100 W, about half that of a comparable large-format CCD camera

Specifications

Sensor Type	BSI sCMOS
Sensor	GSENSE1517BSI
Color / Mono	Mono
Peak QE	92% @ 450 nm
Resolution	4116 × 4100
Pixel Size	15 µm × 15 µm
Effective Area	61.74 mm × 61.5 mm
Array Diagonal	87 mm
Full-Well Capacity	67 ke^- (High Dynamic); 81.4 ke^- (Standard Low Gain); 16 ke^- (Standard High Gain)
Readout Noise	1.2 e^- (High Dynamic); 7.6 e^- (Standard Low Gain); 1.3 e^- (Standard High Gain)
Dynamic Range	94.7 dB (High Dynamic); 80.6 dB (Standard Low Gain); 81.9 dB (Standard High Gain)
Frame Rate	4 fps
Shutter Type	Rolling
Exposure Time	61.35 µs – 3600 s
Binning	1 × 1, 2 × 2, 4 × 4

ROI	Supported
Cooling Method	Air or liquid, vacuum-sealed sensor chamber
Cooling Temperature	Air: −40 °C @ 10 °C ambient; liquid: −50 °C @ 10 °C coolant
Dark Current	0.023 e^-/pixel/s @ −40 °C
DSNU / PRNU	0.3 e^- / 0.3%
Bit Depth	14 bit, 16 bit
Data Interface	CoF, CameraLink
Trigger	Hardware, software, frame grabber; SMA connector
Trigger Output	Readout End, Global Exposure, Exposure Start, Trigger Ready, High, Low, Any Row, First Row
Timestamp / GPS	Timestamp and GPS timing supported
Optical Interface	Custom, to user specification
Power Supply	DC 24 V
Power Consumption	Below 100 W
Dimensions	Ø 185 mm × 169.1 mm
Weight	9 kg
Operating Environment	Working −40 to 50 °C, 0–85% RH, 0–6000 m; storage −40 to 60 °C, 0–95% RH
Software / SDK Support	Sample acquisition software; C / C++ SDK; Windows 7 / 10, Ubuntu 18.04, custom

Typical applications

- Large-area sky surveys
- Deep-space low-light imaging
- Precision photometry and variable-star monitoring
- Astronomical spectroscopy
- Space debris detection
- Solar observation and soft X-ray imaging