全新 SOPHIA 超低噪声 CCD 相机

SOPHIA®超低噪声电子设备，具有高灵敏度（>95%QE）、速度和灵活性，具有高达 16 MHz 的多端口读出能力和高帧速率。ArcTec ™技术使得可以热电冷却而不需要冷却器或低温冷却器。

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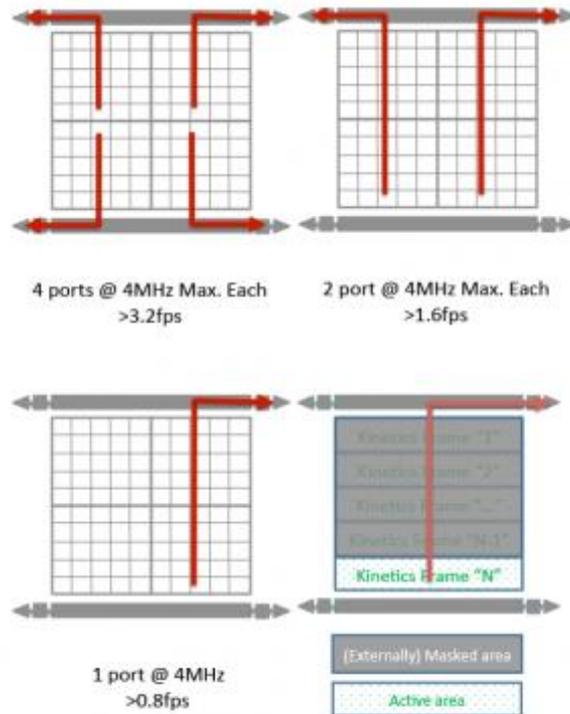>95%峰值量子效率
双电子读数
快速、多端口读出
ArcTec ™ 深度冷却

主要特点：
1.   超灵活性能
SOPHIA 提供多种读出模式，具有完整的触发支持和独立优化的时钟组合，甚至可以捕捉超快的事件。SOPHIA 还包含一个可现场更换的内部机械快门，以增强灵活性。

4 ports @ 4MHz Max. Each
>3.2fps

2 port @ 4MHz Max. Each
>1.6fps

1 port @ 4MHz
>0.8fps

Kinetics Frame "1"
Kinetics Frame "2"
Kinetics Frame "…"
Kinetics Frame "N-1"
Kinetics Frame "N"

(Externally) Masked area

Active area

2. ArcTec™ 冷却技术

利用全金属密封真空设计，ArcTec™ 冷却技术可防止脱气或长期退化。采用定制散热片设计，确保传感器和电子设备的有效散热。ArcTec™ 仅提供空气冷却、液体冷却（对于振动敏感环境）或两者的组合。
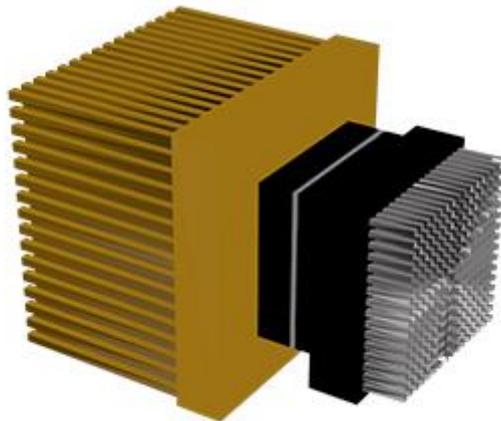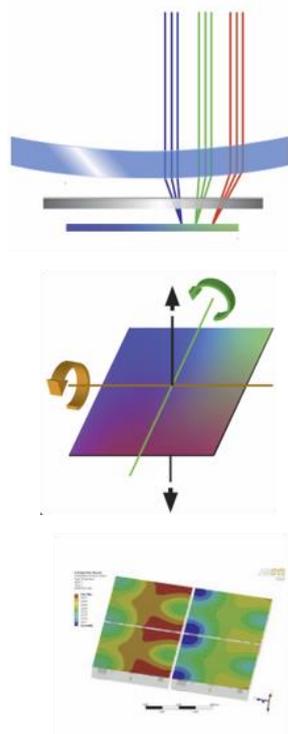

3. SOPHIA 4096B 功能

改进的光学设计

SOPHIA 4096B 具有改进的场平坦器，并减少了窗口到 CCD 的表面距离和窗口厚度。它提供改进的边缘锐度和更低的失真。

可重复 CCD 定位

可做到"零误差"机械装配的变化，SOPHIA 4096B 可以实现精确，可重复的 CCD 定位。可调的倾斜、俯仰和 z 轴平移降低了系统水平调整的要求。

多技术设计

重新设计的 CCD 冷却机构和真空室保证了非常大的 CCD 格式均匀散热，承受热循环。

4. 由 LightField 软件提供支持

强大和直观的软件与内置的数学引擎允许完全控制相机和光谱仪，实时图像分析和光谱数据。

LightField 软件将硬件控制和直接数据采集无缝集成到诸如 National Instruments 的 LabVIEW®和 MathWorks 的 MATLAB®等程序中。该软件还完全支持智能自动波长和强度校准。

产品参数：

B: Back-illuminated R: Deep-depletion

X: eXcelon™ technology UV: UV enhanced

MB: Midband AR coating A: Astro deep-depletion

AR: dual AR coating

SOPHIA 2048B – 132 参数

Feature	SOPHIA 2048B-132-VS-R	SOPHIA 2048B-132-VS-UV
CCD image sensor	e2v CCD42-40; back illuminated; deep depleted; grade 1; NIMO	e2v CCD42-40; back illuminated; UV enhanced; grade 1; NIMO
Dark current @ -90°C (with ambient air @ +20°C)	0.0001 e-/p/s (typical)	
Quantum efficiency	See QE curves on next page	
CCD format	2048 x 2048 imaging pixels: 13.5 x 13.5 µm pixels: 100% fill factor	
Imaging area	27.6 x 27.6 mm (optically centered)	
Deepest cooling temperature	< -90°C (typical) with liquid chiller; < -90°C (typical) with air	
Thermostating precision	±0.05°C	
Cooling method	Thermoelectric air or liquid cooling (liquid chiller required)	
Full well	Single pixel: 100 ke- (typical), 80 ke- (minimum);	
ADC speed/16 bits	8 MHz, 2 MHz, and 200 kHz	
System read noise per port @ 100 kHz @ 1 MHz @ 4 MHz	3.5 e- rms (typical) 7 e- rms (typical) 19 e- rms (typical)	
Vertical shift speed	24 µsec/row (programmable	
Nonlinearity	<2% @ 100 kHz	
Software-selectable gains	1, 2, 4 e-/ADU (low-noise input, typical)	
Data interface	USB 3.0 (5 m interface cable provided); Optional fiberoptic interface available for remote operation	
I/O signals	Two MCX connectors for programmable frame readout, shutter, trigger in	
Operating environment	+5°C to +30°C non-condensing	
Bake-out temperature	70°C (maximum)	
Certification	CE	
Camera head dimensions (L x W x H)	251.6 mm (9.91") x 129 mm (5.08") x 142.8 mm (5.62")	
Camera head weight	6.5 kg (14.3 lbs)	

Specifications are subject to change

SOPHIA 2048B – 152 参数

Feature	2048B-152-VS-X	2048B-152-VS-MB
CCD image sensor	Back-illuminated eXcelon CCD. Highest sensitivity in the visible region. High sensitivity in the NIR. Extremely low etaloning. 100x lower dark charge than deep-depleted sensors.	Back-illuminated CCD. Highest sensitivity in the visible region. Basic midband (MB) AR coating.
	Princeton Instruments' proprietary CCD; grade 1; AIMO	e2v CCD230-42; grade 1; AIMO
Dark current @ -90°C (with ambient air @ +20°C)	0.00025 e-/p/s (typical)	
CCD processing	Optional CCD processing for UV and NIR	
Quantum efficiency	See QE curves on next page	
CCD format	2048 x 2048 imaging pixels: 15 x 15 μm pixels: 100% fill factor	
Imaging area	30.7 x 30.7 mm (optically centered)	
Lens mount	F-mount with integral 45 mm shutter	
Deepest cooling temperature	< -90°C (typical) with liquid chiller; < -90°C (typical) with air	
Thermostating precision	±0.05°C	
Cooling method	Thermoelectric air or liquid cooling (liquid chiller required)	
Full well	Single pixel: 150 ke- (typical)	
ADC speed/16 bits	16 MHz, 4 MHz, and 400 kHz	
System read noise per port @ 100 kHz @ 1 MHz @ 4 MHz	3.6 e- rms (typical) 8.5 e- rms (typical) 22 e- rms (typical)	
Vertical shift speed	24 μsec/row (programmable	
Nonlinearity	<2% @ 100 kHz	
Software-selectable gains	1, 2, 4 e-/ADU (low-noise input, typical)	
Data interface	USB 3.0 (5 m interface cable provided); Optional fiberoptic interface available for remote operation	
I/O signals	Two MCX connectors for programmable frame readout, shutter, trigger in	
Operating environment	+5°C to +30°C non-condensing	
Certification	CE	
Camera head dimensions (L x W x H)	251.6 mm (9.91") x 129 mm (5.08") x 142.8 mm (5.62")	
Camera head weight	6.5 kg (14.3 lbs)	

Specifications are subject to change

SOPHIA 4096B-154

Feature	SOPHIA 4096B-154	SOPHIA 4096B-154A
CCD image sensor	e2v CCD scientific grade 1, AIMO.The large image area addresses demanding scientific imaging applications. Back-illuminated spectral response and low readout noise provide outstanding sensitivity. Available with midband coating (-MB version) or eXcelon process (-X version with proprietary eXcelon).	e2v CCD scientific grade 1, AIMO. The back-illuminated "astro" version offers higher full well capacity and lower readout noise than the CCD230-84 for demanding low-light applications. Astro midband (-MB version) and astro deep depletion with multiple AR coatings (-AR version) available.
CCD format	4096 x 4096 imaging pixels; 15.0 x 15.0 µm pixels; 100% fill factor	
Imaging area	61.4 x 61.4 mm	
Deepest cooling temperature (@ +20ºC)	< -90°C thermoelectric cooling with liquid chiller; < -60°C thermoelectric cooling with air	
Thermostating precision	±0.1°C	
Dark current (e⁻/pixel/sec)	0.0003 @ -60ºC	0.8 @ -60ºC
Cooling method	Thermoelectric air or liquid cooling (liquid chiller required)	
Full well	150 ke- (typical)	300 ke- (typical)
ADC speed/16 bits	3 MHz, 1 MHz, 500 kHz, 100 kHz; 4-port readout	3 MHz, 1 MHz, 500 kHz, 100 kHz; 4-port readout
ADC bits	18 bits @ 1 MHz and 100 kHz	18 bits @ 500 kHz and 100 kHz
System read noise per port	<22 e- rms @ 4 MHz/port; <8.5 e- rms @ 1 MHz/port; <4.0 e- rms @ 100 kHz/port	<8.0 e- rms @ 3 MHz/port; <4.0 e- rms @ 1 MHz/port; <2.0 e- rms @ 100 kHz/port
Readout modes	4-port, 2-port, or 1-port readout; Kinetics; External Sync	
Nonlinearity	<1% @ 100 kHz	
Software-selectable gains	1, 2, 4 e-/ADU	
Data interface	USB 3.0 (5 m interface cable provided); Optional fiberoptic interface available for remote operation	
I/O signals	Two MCX connectors for programmable frame readout, shutter, trigger in	
Software (optional)	LightField for Microsoft Windows 10 (64 bit); PICam SDK for Microsoft Windows and Linux; Automation for third-party software	
Internal shutter	90 mm mechanical shutter with internal control or TTL	
External shutter	90 mm mechanical shutter with TTL control	
Certification	CE	
Operating environment	+5°C to +30°C non-condensing	
Camera head weight	See page 12	

Specifications are subject to change

产品应用:
1. 荧光、磷光和光致发光光谱
2. 天文成像
3. 玻色-爱因斯坦凝聚