



Camera Technology
Focused on Scientific Imaging
and Challenging Inspection

Scientific Cameras Catalog



ISO9001 CE RoHS

www.tucsen.com

About Us



Tucsen designs and manufactures camera technology focused on Scientific Imaging and Challenging Inspection. Our focus is to create reliable camera devices which allow our customers to answer challenging questions. Engineering talent and relationships with our sensor providers allow us to drive product performance and our business model allows us to also drive a price advantage. With operations in Europe, North America and Asia, we help customers in numerous markets across the world to discover the answers to quality, research and medical questions.

2006

Founded

200+

Employees

30+

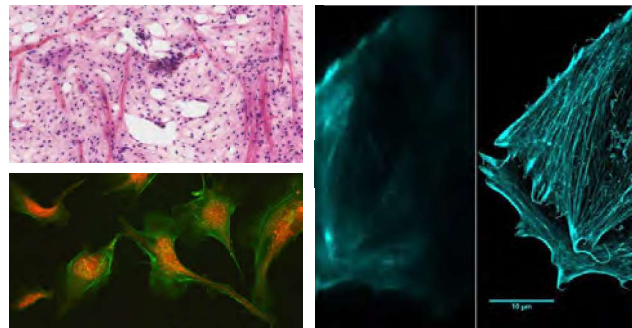
Countries & Regions

2

R&D Centers

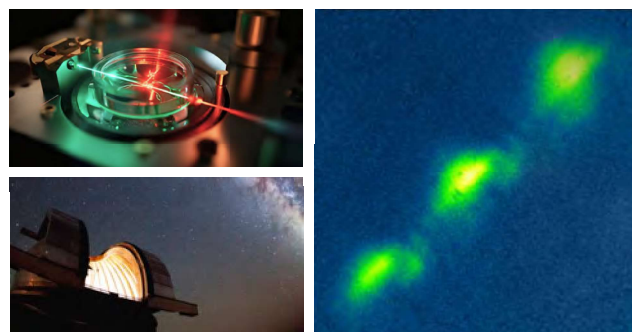
20,000m²

Advanced Manufacturing Base



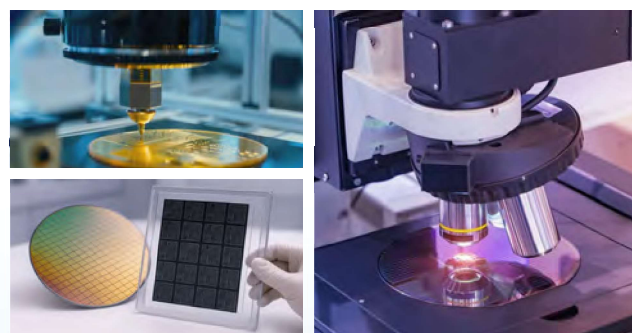
Life Sciences

Offering a wide range of high-performance sCMOS and CMOS cameras for life sciences, supporting advanced microscopy and high-throughput imaging.



Physical Sciences

Specialized cameras for physical science research, featuring single-photon sensitivity, X-ray/EUV detection, and ultra-large-format imaging.



Semiconductor Inspection

High speed TDI line scan cameras and large area scan cameras for fast, precise semiconductor defect detection.

Catalog

High-Throughput Cameras

TDI Scan Series

Gemini 8KTDI	01
Gemini 16KTDI	03
Dhyana 9KTDI Pro Series	05
Dhyana 9KTDI	07

Area Scan Series

Leo 5514	09
Leo 5514 Pro	11
Leo 3243	13
Leo 3243 Pro	15
Dhyana 2100	17

High-Sensitivity Cameras

Visible Series

Aries 6510	19
Aries 6506	21
Aries 16	23
Dhyana 400BSI V3	25
Dhyana 95 V2	27
Dhyana 6060 / 6060BSI	29
Dhyana 4040 V2 / 4040BSI	31
Dhyana 400D	33
Dhyana 400DC	34
Dhyana 401A-G	35
Dhyana 401D / 201D	36

Soft X-ray & EUV Series

Dhyana XF95 / XV95	37
Dhyana XF400BSI / XV400BSI	39
Dhyana XF4040BSI / XV4040BSI	40

High-Resolution Cameras

Global Shutter Series

Libra 3405M / 3412M	41
Libra 3405C / 3412C	43
Libra 3405UM / 3412UM	45
Libra 3405UC / 3412UC	47
Libra UV	49
Libra 536	51

Cooled CMOS Series

Libra 16 / 22 / 25	53
FL 26BW	55
FL 9BW / 9BW LT	57
FL 20 / 20BW	59

Smart Series

TrueChrome Series	60
MIchrome Series	61
GT Series	62

Software / SDK

OEM / ODM

Gemini 8KTDI

The Gemini 8KTDI is a back-illuminated TDI camera optimized for biological and industrial environments. It provides 8K resolution with a quantum efficiency of 65.8% at 266 nm, and a peak of 94.2% at 460 nm. Featuring a 100G CoF interface and line rates of up to 1 MHz, it integrates effective cooling and noise suppression to ensure accurate and efficient high-throughput scanning.



Key Features

Benefits

100G CoF Interface	High-speed single-interface bandwidth up to 100 Gbps, reliable, easy to integrate
1 MHz@8K	Doubles data throughput, significantly boosts inspection efficiency ^[1]
180 nm-1100 nm	Covers UV, visible, and near-infrared, peak QE up to 93.4%
UV Enhancement	QE of 65.8% at 266 nm, enhances detection of fine defects
High-Reliability Cooling	Maintains sensor at 0°C, ±0.5°C stability, ensures long-term reliable imaging ^[2]

Typical Applications

- Wafer Inspection
- Packaging Inspection
- Mask Inspection
- FPD Inspection
- High-Throughput Gene Sequencing
- Pathology Slide Scanning

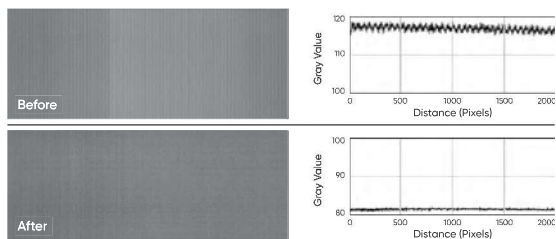
Noted Examples

[1] The Gemini 8KTDI doubles data throughput compared to the previous generation.

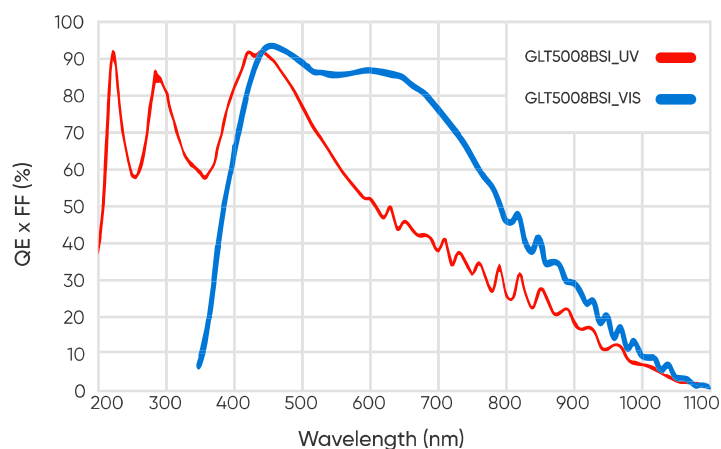
1 MHz@8K **8208 Mpixel/s**

510 KHz@9K **4590 Mpixel/s**

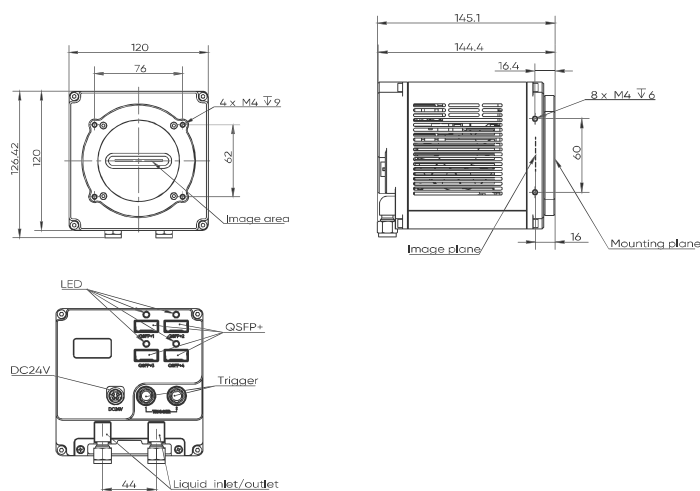
[2] The Gemini 8KTDI features stable cooling, offering excellent noise control and uniform imaging background, providing precise and reliable data for high-accuracy inspections.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Gemini 8KTDI
Sensor Type	BSI sCMOS TDI
Sensor Model	Gpixel GLT5008BSI_UV / Gpixel GLT5008BSI_VIS
Peak QE	Typical: 65.8%@266 nm, 94.2%@460 nm
Spectral Range	180 nm~1100 nm
Chrome	Mono
Array Diagonal	41 mm
Resolution	P1: 8208 pixels x 256 stages; P2: 8208 pixels x 32 stages
Pixel Size	5 μm x 5 μm
Operation Mode	TDI, Area
TDI Stage	P1: 4, 32, 64, 128, 192, 224, 252, 256; P2: 2, 4, 8, 16, 24, 28, 30, 32
Scan Direction	Forward. Reverse. Trigger Control
CTE	≥ 0.99993
Anti-Blooming	$\geq 50\text{X}$
Full Well Capacity	Typical: 16.8 Ke-
Dynamic Range	Typical: 62.8 dB@10 bit ADC
Max. Line Rate	1 MHz@8 / 10 bit; 500 KHz@12 bit
Readout Noise	Typical: 7.4 e-@12 bit, 12.5 e-@10 bit
Dark Current	Typical: 550 e-/p/s@10°C (Corrected)
DSNU	Typical: 5 e-@10 bit (Corrected)
PRNU	Typical: 0.045% (Corrected)
Cooling Method	Hex Cooling, Air Cooling, Liquid Cooling
Cooling Temp.	Hex: 10°C@22°C Ambient; Air: 10°C@22°C Ambient; Liquid: 0°C@22°C Water
Binning	1 x 2, 2 x 2, 4 x 4, 8 x 8
ROI	Support
Trigger Mode	Trigger Input. Scan Direction Input
Trigger Output	Strobe Out
Trigger Interface	Hirose 12
Gain	Analog Gain: x 1~x 4, Digital Gain: x 0.1~x 15.9
Data Interface	QSFP+ / QSFP28
Optical Interface	M72 x 0.75, User Customization
Power Supply	72 W / 21 V~27 V
Dimensions	120 mm (H) x 120 mm (W) x 144.5 mm (L)
Weight	< 3500 g
Software	Sample Pro
SDK	C / C++
Operating System	Windows 10 / 11 (X64), Ubuntu 20.04 / 22.04 (X64), Euler OS (ARM64)
Environment	Working: Temp. 0°C~40°C, Hum. 20%~80%; Storage: Temp. -20°C~60°C, Hum. 20%~80%; Working altitude: 0 m~2000 m

Gemini 16KTDI

The Gemini 16KTDI is designed for large-format industrial inspection, delivering a 16K high-resolution imaging solution. It covers 300 nm–1100 nm spectral range, with 92.4% QE at 460 nm. Equipped with 100G CoF interface, it supports 500 KHz line rate. The stable cooling technology suppresses thermal noise in high-speed operation, enhancing high-end equipment's precision and efficiency.



Key Features

Benefits

100G CoF Interface	High-speed single-interface bandwidth up to 100 Gbps, reliable, easy to integrate
500 KHz@16K	Doubles data throughput, significantly boosts inspection efficiency ^[1]
300 nm–1100 nm	Covers UV, visible, and near-infrared, peak QE up to 92.4%
High-Reliability Cooling	Maintains sensor at target temperature, $\pm 0.5^{\circ}\text{C}$ stability, ensures long-term reliable imaging ^[2]

Typical Applications

- Wafer Inspection
- Packaging Inspection
- Mask Inspection
- FPD Inspection

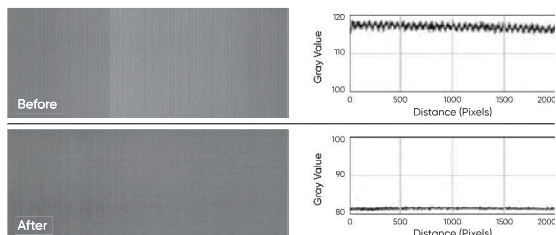
Noted Examples

[1] The Gemini 16KTDI doubles data throughput compared to the previous generation.

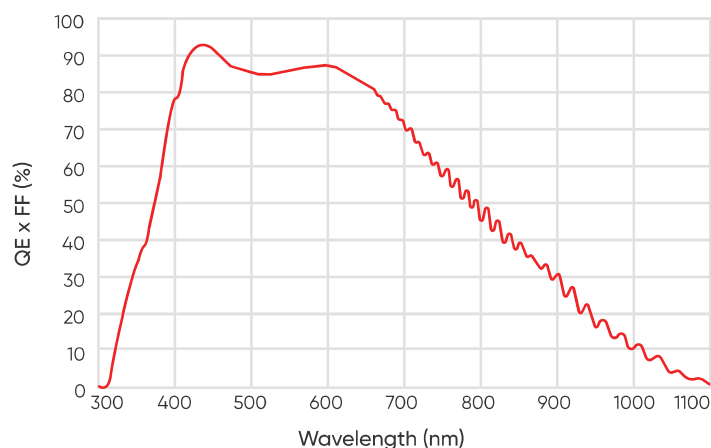
500 KHz@16K **8208 Mpixel/s**

510 KHz@9K **4590 Mpixel/s**

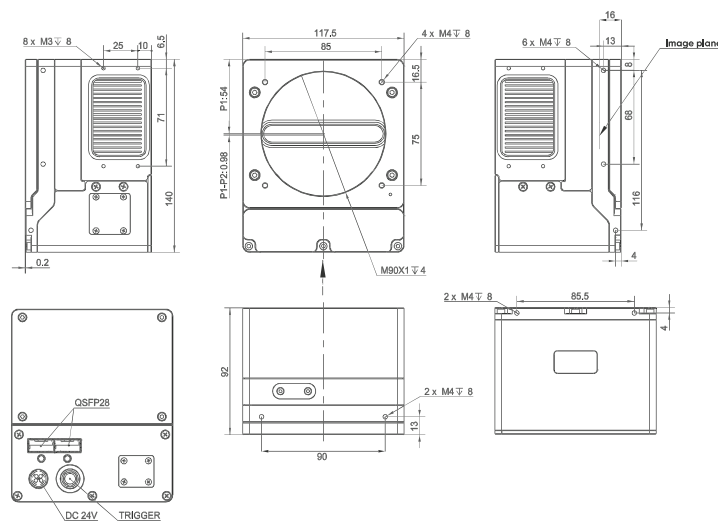
[2] The Gemini 16KTDI features stable cooling, offering excellent noise control and uniform imaging background, providing precise and reliable data for high-accuracy inspections.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Gemini 16KTDI
Sensor Type	BSI sCMOS TDI
Sensor Model	Gpixel GLT5016BSI VIS
Peak QE	Typical: VIS: 92.4%@460 nm
Spectral Range	300 nm~1100 nm
Chrome	Mono
Array Diagonal	82 mm
Resolution	P1: 16416 pixels x 256 stages; P2: 16416 pixels x 32 stages
Pixel Size	5 μm x 5 μm
Operation Mode	TDI, Area
TDI Stage	P1: 4, 32, 64, 128, 192, 224, 252, 256; P2: 2, 4, 8, 16, 24, 28, 30, 32
Scan Direction	Forward, Reverse, Trigger Control
CTE	≥ 0.99993
Anti-Blooming	$\geq 50X$
Full Well Capacity	Typical: 16 Ke-
Dynamic Range	Typical: 63 dB@10 bit ADC
Max. Line Rate	500 KHz@16K
Readout Noise	Typical: 12.1 e-@10 bit, 7.5 e-@12 bit
Dark Current	Typical: 540 e-/p/s@10°C (Corrected)
DSNU	Typical: 6.5 e-@10 bit, 500 KHz (Corrected)
PRNU	Typical: 0.15%@10 bit (Corrected)
Cooling Method	TES Cooling, Hex Cooling
Cooling Temp.	TES Cooling: 33°C@22°C 120 L/Min; Hex Cooling: 33°C@25°C 120 L/Min
Binning	1 x 2, 2 x 2, 4 x 4, 8 x 8
ROI	Support
Trigger Mode	Trigger Input, Scan Direction Input
Trigger Output	Strobe Out
Trigger Interface	Hirose
Gain	Analog Gain: x 1~x 4, Digital Gain: x 0~x 16
Data Interface	QSFP28
Optical Interface	M90 / M95, User Customization
Power Supply	120 W / 21 V~27 V
Dimensions	117.5 mm (H) x 140 mm (W) x 92 mm (L)
Weight	3300 g
Software	Sample Pro
SDK	C / C++
Operating System	Windows 10/11 (X64), Ubuntu 20.04/22.04 (X64)
Environment	Working: Temp. 0°C~40°C, Hum. 20%~80%; Storage: Temp. -20°C~60°C, Hum. 20%~80%; Working altitude: 0 m~2000 m

Dhyana 9KTDI Pro Series

The Dhyana 9KTDI Pro is a back-illuminated TDI camera built with advanced sCMOS thinning and TDI integration technology. Covering the range from 180 nm to 1100 nm, it enhances UV line scanning and low-light detection. With reliable cooling and noise reduction, it provides stable, high-efficiency detection for semiconductor wafer inspection and genomic sequencing.



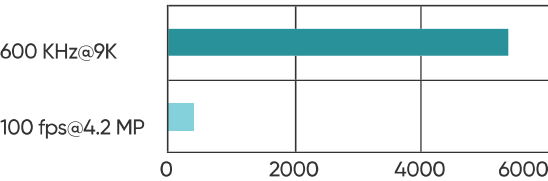
Key Features	Benefits
180 nm-1100 nm	Wide Spectral Response, supports UV, visible, and near-infrared imaging applications.
82% Quantum Efficiency	Provides excellent low-light and weak-signal detection.
256-Stage TDI	Enhances SNR in low-light imaging, improving inspection accuracy.
600 KHz@9K	Delivers data throughput over 10X higher than typical sCMOS cameras. ^[1]
High-Reliability Cooling	Reduces dark current noise and data fluctuations, ensuring stable system operation. ^[2]

Typical Applications

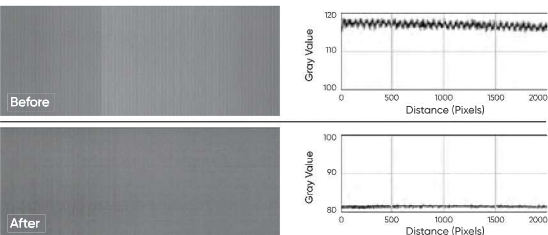
- High-Throughput Imaging
- Neuroscience Imaging
- Spatial Omics Analysis
- Super-Resolution Imaging
- Genomic Sequencing
- Semiconductor Inspection

Noted Examples

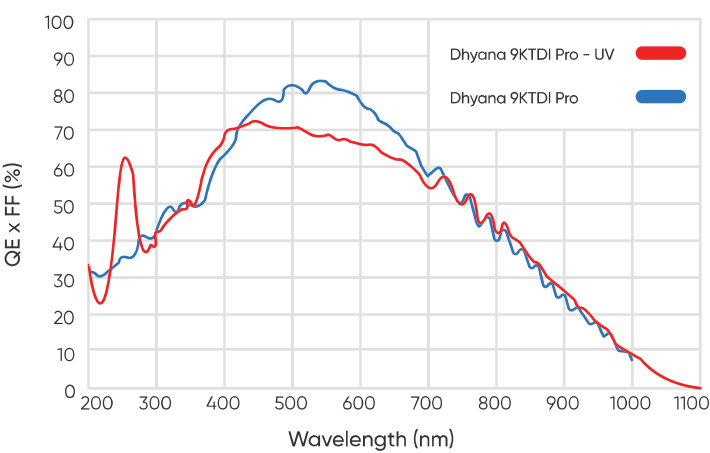
[1] The Dhyana 9KTDI Pro series achieves a data throughput of 5,400 Mpixels/s, over 10X higher than typical sCMOS cameras.



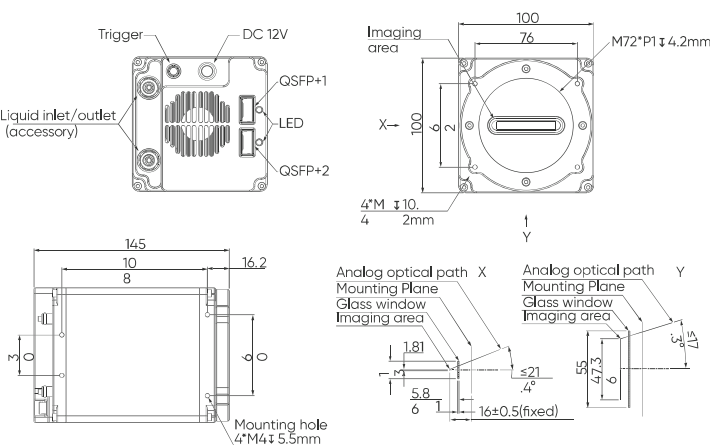
[2] The Dhyana 9KTDI Pro features stable cooling, offering excellent noise control and uniform imaging background, providing precise and reliable data for high-accuracy inspections.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Dhyana 9KTDI Pro	Dhyana 9KTDI Pro-UV
Sensor Type	BSI sCMOS TDI	
Sensor Model	Gpixel GLT5009BSI	Gpixel GLT5009BSI-DUV
Peak QE	82%@550 nm, 50%@350 nm, 38%@800 nm	50%@266 nm
Chrome	Mono	
Array Diagonal	45.4 mm	
Effective Area	45.36 mm x 1.28 mm	
Resolution	9072 (H) x 256 (V)	
Pixel Size	5 μm x 5 μm	
Operation Mode	TDI, Area	
TDI Stage	4, 8, 16, 32, 64, 96, 128, 160, 192, 224, 240, 248, 252, 256	
Scan Direction	Forward, Reverse, Trigger Control	
CTE	≥ 0.99993	
Bit Depth	12 bit, 10 bit, 8 bit	
Full Well Capacity	Typical: 14 Ke-@12 bit, 14 Ke-@10 bit	
Dynamic Range	Typical: 68 dB@12 bit, 63.6 dB@10 bit	
Max. Line Rate	299 KHz@12 bit, 600 KHz@10 bit, 600 KHz@8 bit	
Readout Noise	Typical: 6.2 e-@12 bit, 10.5 e-@10 bit	
DSNU	Typical: 1.6 e-@12 bit, 4 e-@10 bit	
PRNU	Typical: 0.3%	
Cooling Method	Air Cooling, Liquid Cooling	
Cooling Temp.	20°C below ambient (20°C); 35°C below water (20°C)	
Binning	1 x 2 (Sensor Bin), 2 x 2, 4 x 4, 8 x 8 (FPGA Bin)	
ROI	Support	
Trigger Mode	Trigger Input. Scan Direction Input	
Trigger Output	Strobe out	
Trigger Interface	Hirose, HR10A-7R-4S	
Gain	Analog Gain: x 2~x 8; Digital Gain: x 0.5~x 10	
Data Interface	QSFP+	
Optical Interface	M72, User Customization	
Power Supply	12 V / 8 A	
Power Cons.	< 75 W	
Dimensions	100 mm (H) x 100 mm (W) x 145 mm (L)	
Weight	1800 g	
Software	Sample Pro	
SDK	C++ (Supports the GenICam standard)	
Operating System	Windows, Linux	
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%	

Dhyana 9KTDI

The Dhyana 9KTDI back-illuminated TDI camera combines advanced sCMOS back-thinning technology with TDI (time delay integration), effectively enhancing low-light scanning performance. It is designed to provide scientific instruments and industrial vision systems with comprehensive performance in spectral response, precision, and throughput.



Key Features

Benefits

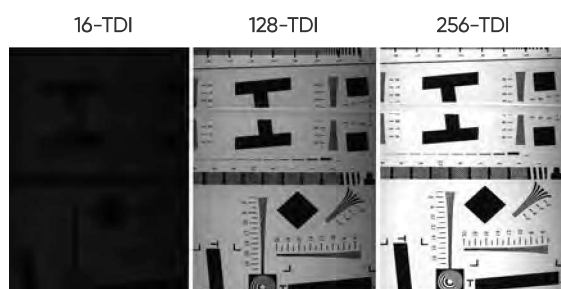
180 nm-1100 nm	Wide Spectral Response, supports UV, visible, and near-infrared imaging applications.
82% Quantum Efficiency	Provides excellent low-light and weak-signal detection.
256-Stage TDI	Enhances SNR in low-light imaging, improving inspection accuracy. ^[1]
510 KHz@9K	Data throughput is nearly 46X higher than TDI-CCD technology. ^[2]
High-Reliability Cooling	Reduces dark current noise and data fluctuations, ensuring stable system operation.

Typical Applications

- Semiconductor / Wafer Inspection
- FPD Inspection
- Fluorescence Detection
- Spectral Analysis

Noted Examples

[1] Higher TDI stages provide improved signal-to-noise ratio (SNR).



[2] The Dhyana 9KTDI achieves data throughput nearly 46X higher than back-illuminated TDI-CCD cameras.

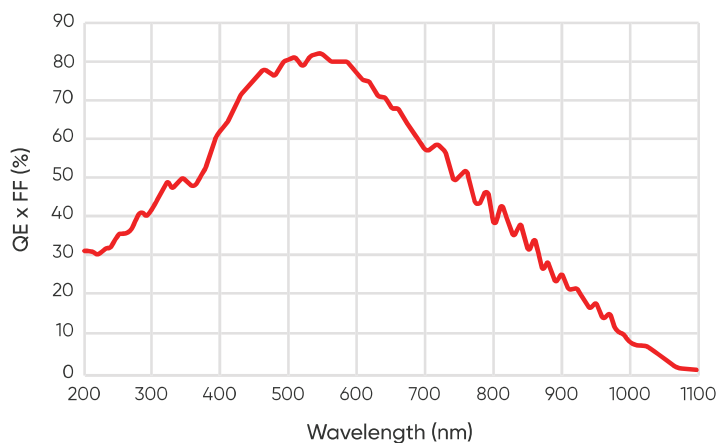
Dhyana 9KTDI
9K@510 KHz

4590 Mpixel/s

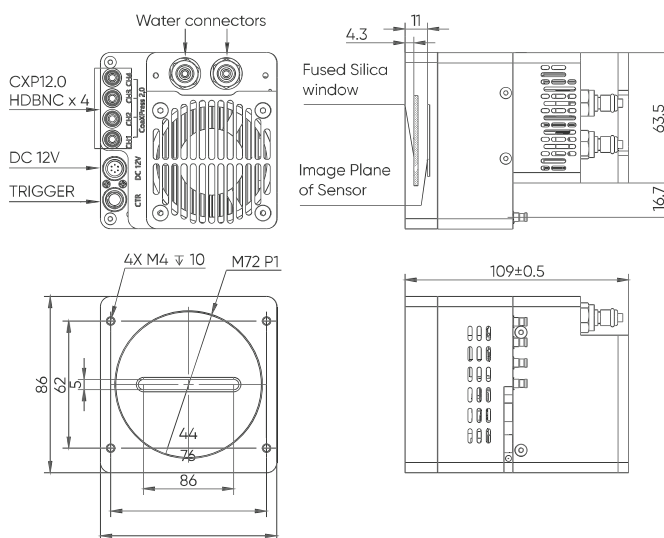
BSI TDI-CCD
2K@50 KHz

100 Mpixel/s

Quantum Efficiency



Dimensions (Unit: mm)



Model	Dhyana 9KTDI
Sensor Type	BSI sCMOS TDI
Sensor Model	Gpixel GLT5009BSI
Peak QE	38%@266 nm, 51%@355 nm; 82%@550 nm, 38%@800 nm
Chrome	Mono
Array Diagonal	45.4 mm
Effective Area	45.36 mm x 1.28 mm
Resolution	9072 (H) x 256 (V)
Pixel Size	5 μm x 5 μm
Operation Mode	TDI, Area
TDI Stage	4, 8, 16, 32, 64, 96, 128, 160, 192, 224, 240, 248, 252, 256
Scan Direction	Forward, Reverse, Trigger Control
CTE	≥ 0.99993
Bit Depth	12 bit, 10 bit, 8 bit
Full-Well Capacity	Typical: 10 Ke-@12 bit, 10 Ke-@10 bit
Dynamic Range	Typical: 66 dB@12 bit, 63 dB@10 bit
Max. Line Rate	299 kHz@12 bit, 345 KHz@10 bit, 510 KHz@8 bit
Readout Noise	Typical: 6.2 e-@12 bit, 6.6 e-@10 bit
DSNU	Typical: 4 e-@12 bit, 4 e-@10 bit
PRNU	Typical: 0.3%
Cooling Method	Air Cooling, Liquid Cooling
Cooling Temp.	20°C below ambient (20°C); 35°C below water (20°C)
Binning	1 x 2 (SENSOR BIN), 2 x 2, 4 x 4, 8 x 8 (FPGA BIN)
ROI	Support
Trigger Mode	Trigger Input, Scan Direction Input
Trigger Output	Strobe out
Trigger Interface	Hirose, HR10A-7R-4S
Gain	Analog Gain: x 2~x 8, Digital Gain: x 0.5~x 10
Data Interface	CoaxPress 2.0
Optical Interface	M72, User Customization
Power Supply	12 V / 8 A
Power Cons.	< 60 W
Dimensions	86 mm (H) x 86 mm (W) x 109 mm (L)
Weight	1100 g
Software	Sample Pro
SDK	C++ (Supports the GenICam standard)
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%

Leo 5514

The Leo 5514 series are the first high-throughput scientific CMOS cameras designed with a back-illuminated global shutter architecture, delivering 83% peak QE and 5.5 μm pixels for exceptional sensitivity. A 40 G CoF interface enables 8 bit image transfer at 330 fps. Compact and low-vibration, they excel in demanding scientific imaging.



Key Features	Benefits
Global Shutter + BSI sCMOS	High speed, large full well, and high sensitivity deliver superior quantitative imaging performance for high-speed & low-light applications.
40 G CoF Interface	Single interface bandwidth up to 40 Gbps, faster and easy integration.
330 fps@14 MP	11X Higher than the throughput of conventional BSI sCMOS cameras. ^[1]
30.5 mm Large Format	2.5X Wider FOV than typical 6.5 μm CMOS. ^[2]
5.5 μm Pixel Size	Optimized for optical systems above 40X to achieve resolution–sensitivity balance.

Typical Applications

- High-throughput imaging
- Neuroscience imaging
- Spatial omics analysis
- Super-resolution imaging
- Gene sequencing
- Voltage imaging
- Semiconductor inspection

Noted Examples

[1]Leo 5514 delivers more than 11X higher throughput by overcoming sensitivity, speed, and full well capacity trade-offs of traditional sCMOS.

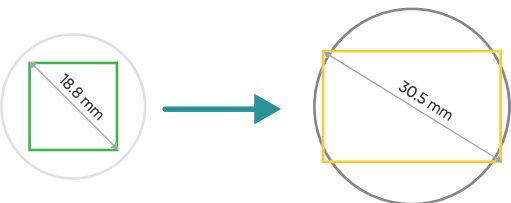
Leo 5514
330 fps@14 MP

4620 Mpixel/s

Typical sCMOS
100 fps@4.2 MP

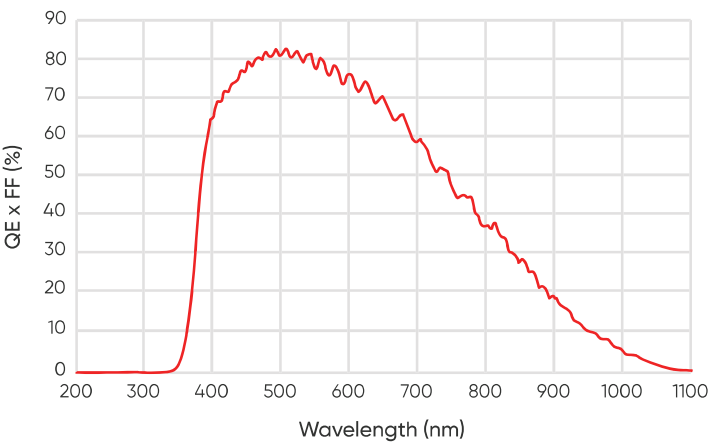
420 Mpixel/s

[2]Traditional sCMOS cameras use an 18.8 mm format, insufficient for high-throughput imaging; The Leo 5514 is better aligned with modern optical design trends.

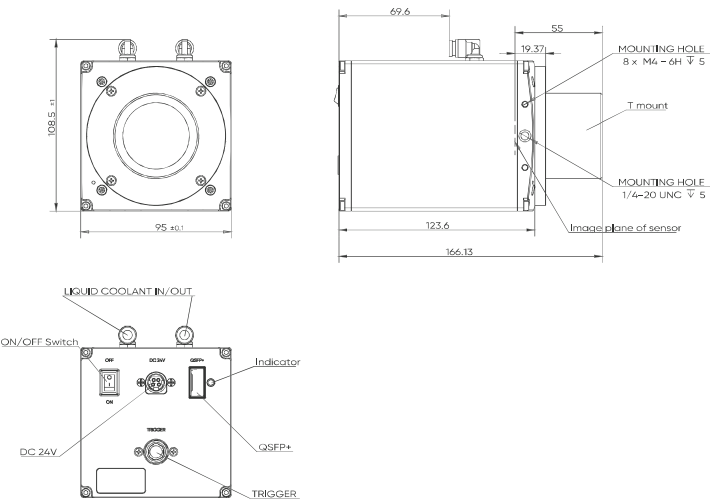


- Traditional sCMOS
- Leo 5514 Series
- Traditional Microscope (22 mm)
- Modern Optical System (30mm)

Quantum Efficiency



Dimensions (Unit: mm)



Model	Leo 5514			
Sensor Type	BSI sCMOS			
Sensor Model	GSPRINT5514BSI			
Peak QE	83%			
Chrome	Mono			
Array Diagonal	30.5 mm			
Effective Area	25.34 mm x 16.90 mm			
Resolution	4608 (H) x 3072 (V)			
Pixel Size	5.5 μm x 5.5 μm			
Readout Mode	Standard 8 bit	Standard 10 bit	Standard 12 bit	HDR
Bit Depth	8 bit	10 bit	12 bit	16 bit
Frame Rate	330 fps	230 fps	220 fps	80 fps
Readout Noise (median)	< 2 e ⁻ (HDR & Standard 12 bit Gain 4)			
Full Well Capacity	15 Ke-@HDR; 30 Ke-@After Binned			
Dynamic Range	77.5 dB			
Shutter Mode	Global			
Exposure Time	2 μs -10 s			
Cooling Method	Air Cooling, Liquid Cooling			
Cooling Temp.	Air cooling: 5°C (ambient 25°C), Liquid cooling: -5°C (Water Temp. 20°C)			
Dark Current	< 1 e ⁻ /pixel/s@-5°C; < 5 e ⁻ /pixel/s@5°C			
Image Correction	DPC			
Binning	2 x 2, 4 x 4			
ROI	Support			
Timestamp Acc.	1 μs			
Trigger Mode	Hardware, Software			
Trigger Output	Low, High, Readout End, Exposure, Exposure Start, Readout, Trigger Ready			
Trigger Interface	Hirose-12-pin			
Data Interface	40G QSFP+			
Optical Interface	T / F / C Mount			
Power Supply	24 V / 6.67 A			
Power Cons.	≤ 100 W			
Dimensions	95 mm (H) x 95 mm (W) x 123.6 mm (L)			
Weight	1850 g			
Software	Mosaic V3, Sample Pro, LabVIEW ,MATLAB, Micro-Manager 2.0			
SDK	C / C++ / C#			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 15°C~30°C, HUM 35%~75%			

Leo 5514 Pro

The Leo 5514 Pro is the first high-throughput scientific CMOS camera designed with a back-illuminated global shutter architecture, delivering 83% peak QE and 5.5 μm pixels for exceptional sensitivity. A 100 G CoF interface enables 8 bit image transfer at 670 fps. Compact and low-vibration design, they excel in demanding scientific imaging.



Key Features

Benefits

Global Shutter + BSI sCMOS	High speed, large full well, and high sensitivity deliver superior quantitative imaging performance for high-speed & low-light applications.
100 G CoF Interface	Single interface bandwidth up to 100 Gbps, faster and easy integration.
670 fps@14 MP	22X higher than the throughput of conventional BSI sCMOS cameras. ^[1]
30.5 mm Large Format	2.5X wider FOV than typical 6.5 μm CMOS. ^[2]
5.5 μm Pixel Size	Optimized for optical systems above 40X to achieve resolution-sensitivity balance.

Typical Applications

- High-throughput imaging
- Neuroscience imaging
- Spatial omics analysis
- Super-resolution imaging
- Gene sequencing
- Voltage imaging
- Semiconductor inspection

Noted Examples

[1] Leo 5514 Pro delivers more than 22X higher throughput by overcoming sensitivity, speed, and full well capacity trade-offs of traditional sCMOS.

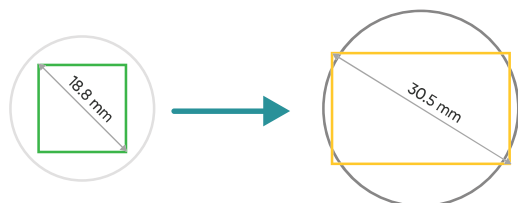
Leo 5514 Pro
670 fps@14 MP

9380 Mpixel/s

Typical sCMOS
100 fps@4.2 MP

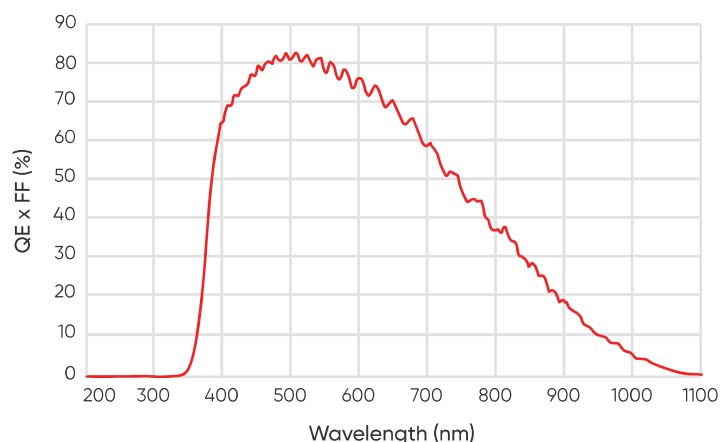
420 Mpixel/s

[2] Traditional sCMOS cameras use an 18.8 mm format, insufficient for high-throughput imaging; The Leo 5514 Pro is better aligned with modern optical design trends.

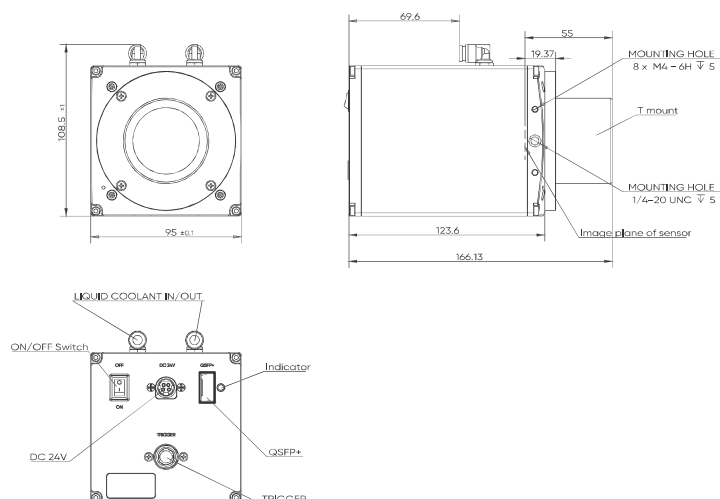


- Traditional sCMOS
- Leo 5514 Series
- Traditional Microscope (22 mm)
- Modern Optical System (30mm)

Quantum Efficiency



Dimensions (Unit: mm)



Model	Leo 5514 Pro			
Sensor Type	BSI sCMOS			
Sensor Model	GSPRINT5514BSI			
Peak QE	83%			
Chrome	Mono			
Array Diagonal	30.5 mm			
Effective Area	25.34 mm x 16.90 mm			
Resolution	4608 (H) x 3072 (V)			
Pixel Size	5.5 μm x 5.5 μm			
Readout Mode	Standard 8 bit	Standard 10 bit	Standard 12 bit	HDR
Bit Depth	8 bit	10 bit	12 bit	16 bit
Frame Rate	670 fps	480 fps	350 fps	80 fps
Readout Noise (median)	< 2 e ⁻ (HDR & Standard 12 bit Gain 4)			
Full Well Capacity	15 Ke ⁻ @HDR; 30 Ke ⁻ @After Binned			
Dynamic Range	77.5 dB			
Shutter Mode	Global			
Exposure Time	1 μs -10 s			
Cooling Method	Air Cooling, Liquid Cooling			
Cooling Temp.	Air cooling: 5°C (ambient 25°C), Liquid cooling: -5°C (Water Temp. 20°C)			
Dark Current	< 1 e ⁻ /pixel/s@-5°C; < 5 e ⁻ /pixel/s@5°C			
Image Correction	DPC			
Binning	2 x 2, 4 x 4			
ROI	Support			
Timestamp Acc.	1 μs			
Trigger Mode	Hardware, Software			
Trigger Output	High, Low, Readout End, Global Exposure, Exposure Start, Readout, Trigger Ready			
Trigger Interface	Hirose-12-pin			
Data Interface	100G QSFP28			
Optical Interface	T / F / C Mount			
Power Supply	24 V / 6.67 A			
Power Cons.	≤ 120 W			
Dimensions	95 mm (H) x 95 mm (W) x 123.6 mm (L)			
Weight	≤ 2 kg			
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
SDK	C / C++ / C#			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%			

Leo 3243

The Leo 3243 is Tucsen's advanced solution for low-light, high-throughput imaging. Powered by next-gen stacked BSI sCMOS technology, it delivers outstanding 43 MP HDR performance at 63 fps via a high-speed 40 G COF interface. With 3.2 μm pixels and 21 Ke- full-well capacity, the Leo 3243 strikes an optimal balance between pixel size and well depth, making it ideal for modern scientific imaging systems.



Key Features

Benefits

Stacked BSI sCMOS	A systematic breakthrough in sensitivity, resolution and throughput has been achieved.
40 G CoF Interface	Single interface bandwidth up to 40 Gbps, faster and easy integration.
63 fps@43 MP	6.5X higher than the throughput of typical BSI sCMOS cameras. ^[1]
31 mm Large Format	2.5X Wider FOV than conventional 6.5 μm sCMOS. ^[2]
3.2 μm pixels	More adapter under 40X optical system of high precision sampling requirements.

Typical Applications

- High Throughput Imaging
- Gene Sequencing
- Spatial Omics
- High Speed Industrial Inspection

Noted Examples

[1] Leo 3243 delivers 6.5X higher throughput by overcoming sensitivity, speed, and full well capacity trade-offs of traditional sCMOS.

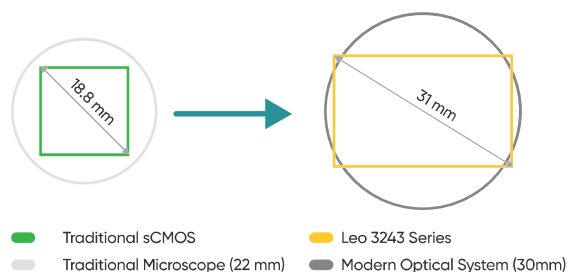
Leo 3243
63 fps@43 MP

2709 Mpixel/s

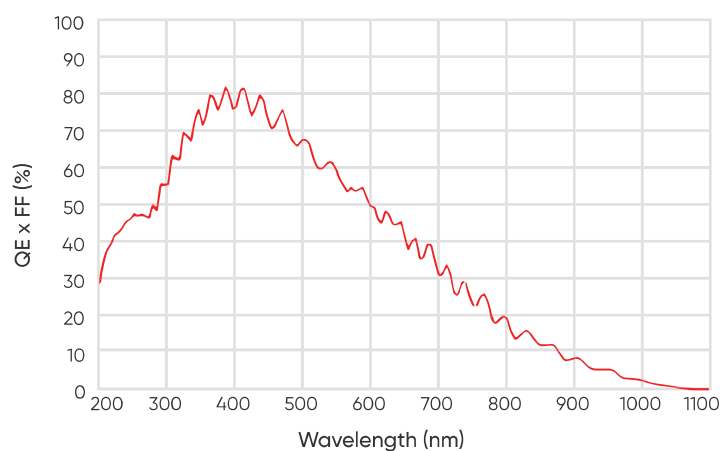
Typical sCMOS
100 fps@4.2 MP

420 Mpixel/s

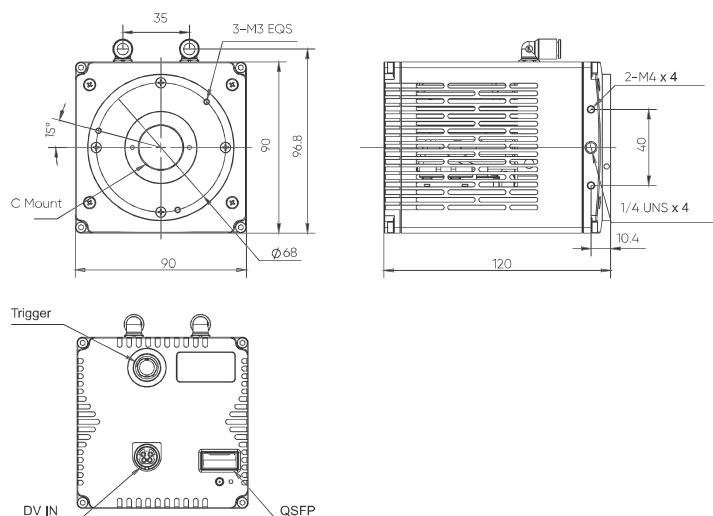
[2] Traditional sCMOS cameras usually have an 18.8 mm format, insufficient for high-throughput systems. The Leo 3243 is better aligned with modern optical design trends.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Leo 3243			
Sensor Type	Stacked BSI sCMOS			
Sensor Model	Gpixel GSENSE3243BSI			
Peak QE	> 80%			
Chrome	Mono			
Array Diagonal	31 mm			
Effective Area	26.2 mm x 16.7 mm			
Resolution	8192 (H) x 5232 (V)			
Pixel Size	3.2 μm x 3.2 μm			
Readout Mode	High Dynamic (HDR)	High Dynamic (Compressed)	High Speed (Low Gain)	High Speed (High Gain)
Bit Depth	16 bit	16 bit	14 bit	14 bit
Frame Rate	50 fps	54 fps	63 fps	63 fps
Readout Noise (median)	2.4 e-	2.5 e-	5.5 e-	1.9 e-
Full Well Capacity	15.5 Ke-	19 Ke-	21 Ke-	7.2 Ke-
Dynamic Range	Typical: 76 dB			
Shutter Mode	Rolling			
Exposure Time	HDR: 60 μs -10 s			
Cooling Method	Air Cooling, Liquid Cooling			
Cooling Temp.	Air: 5°C, Liquid: -5°C (Regulated)			
Dark Current	< 0.5 e-/pixel/s@0°C Air Cooling			
Image Correction	DPC			
Binning	2 x 2, 4 x 4			
ROI	Support			
Timestamp Acc.	1 μs			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Exposure End, Readout, Trigger Ready, First Row, Any Row, All Row			
Trigger Interface	Hirose-12-pin			
Data Interface	40 G QSFP+			
Optical Interface	T / F / C Mount			
Power Supply	24 V / 6.6 A			
Power Cons.	98 W			
Dimensions	< 90 mm (H) x 90 mm (W) x 120 mm (L)			
Weight	< 1 kg			
Software	Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
SDK	C / C++ / C# / Python			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%			

Leo 3243 Pro

The Leo 3243 Pro is Tucsen's advanced solution for low-light, high-throughput imaging. Powered by next-gen stacked BSI sCMOS technology, it delivers outstanding 43 MP HDR performance at 100 fps via a high-speed 100 G CoF interface. With 3.2 μm pixels and 21 Ke⁻ full-well capacity, the Leo 3243 strikes an optimal balance between pixel size and well depth, making it ideal for modern scientific imaging systems.



Key Features

Benefits

Stacked BSI sCMOS	A systematic breakthrough in sensitivity, resolution and throughput has been achieved.
100G CoF Interface	Single interface bandwidth up to 100 Gbps, fast and easy integration.
100 fps@43 MP	10X higher than the throughput of typical BSI sCMOS cameras. ^[1]
31 mm Large Format	2.5X wider FOV than conventional 6.5 μm sCMOS. ^[2]
3.2 μm pixels	More adapter under 40X optical system of high precision sampling requirements.

Typical Applications

- High Throughput Imaging
- Gene Sequencing
- Spatial Omics
- High Speed Industrial Inspection

Noted Examples

[1] Leo 3243 Pro delivers 10X higher throughput by overcoming sensitivity, speed, and full well capacity trade-offs of traditional sCMOS.

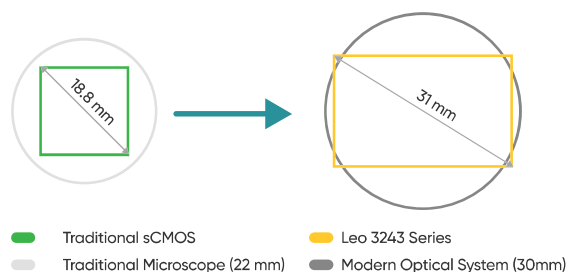
Leo 3243 Pro
100 fps@43 MP

4300 Mpixel/s

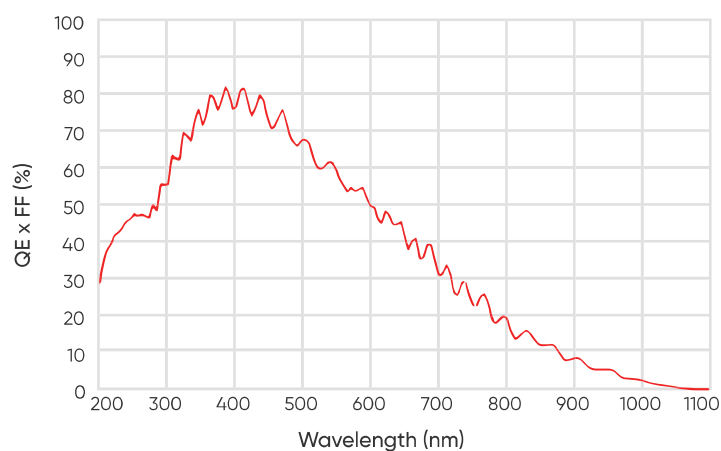
Typical sCMOS
100 fps@4.2 MP

420 Mpixel/s

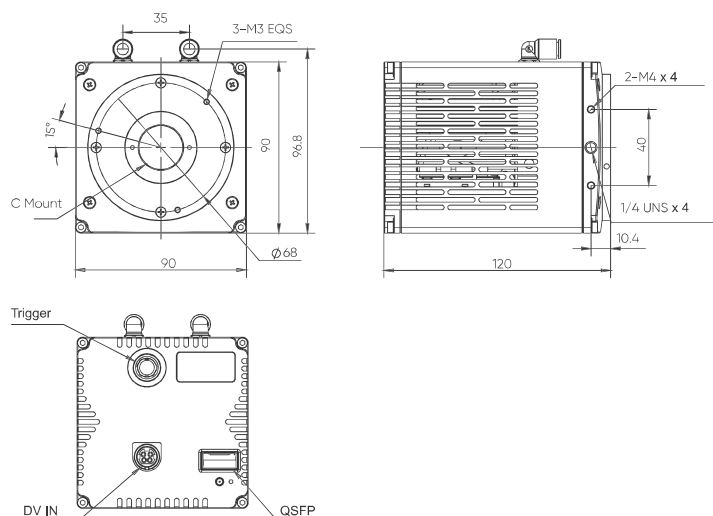
[2] Traditional sCMOS cameras usually have an 18.8 mm format, insufficient for high-throughput systems. The Leo 3243 Pro is better aligned with modern optical design trends.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Leo 3243 Pro			
Sensor Type	Stacked BSI sCMOS			
Sensor Model	Gpixel GSENSE3243BSI			
Peak QE	> 80%			
Chrome	Mono			
Array Diagonal	31 mm			
Effective Area	26.2 mm x 16.7 mm			
Resolution	8192 (H) x 5232 (V)			
Pixel Size	3.2 μm x 3.2 μm			
Readout Mode	High Dynamic (HDR)	High Dynamic (Compressed)	High Speed (Low Gain)	High Speed (High Gain)
Bit Depth	16 bit	16 bit	14 bit	14 bit
Frame Rate	50 fps	100 fps	100 fps	100 fps
Readout Noise (median)	2.4 e-	2.5 e-	5.5 e-	1.9 e-
Full Well Capacity	15.5 Ke-	19 Ke-	21 Ke-	7.2 Ke-
Dynamic Range	Typical: 76 dB			
Shutter Mode	Rolling			
Exposure Time	HDR: 60 μs -10 s			
Cooling Method	Air Cooling, Liquid Cooling			
Cooling Temp.	Air: 5°C, Liquid: -5°C (Regulated)			
Dark Current	< 0.5 e-/pixel/s@0°C Air Cooling			
Image Correction	DPC			
Binning	2 x 2, 4 x 4			
ROI	Support			
Timestamp Acc.	1 μs			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Exposure End, Readout, Trigger Ready, First Row, Any Row, All Row			
Trigger Interface	Hirose-12-pin			
Data Interface	100G QSFP28			
Optical Interface	T / F / C Mount			
Power Supply	24 V / 6.6 A			
Power Cons.	98 W			
Dimensions	< 90 mm (H) x 90 mm (W) x 120 mm (L)			
Weight	< 1 kg			
Software	Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
SDK	C / C++ / C# / Python			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%			

Model	Dhyana 2100
Sensor Type	FSI CMOS
Sensor Model	Gpixel GSPRINT4521
Peak QE	63%@520 nm
Chrome	Mono
Array Diagonal	29.5 mm
Effective Area	23.04 mm x 18.43 mm
Resolution	5120 (H) x 4096 (V)
Pixel Size	4.5 μm x 4.5 μm
Full Well Capacity	Typical: 28 Ke ⁻ (12 bit Gain 0), 120 Ke ⁻ (binned)
Dynamic Range	Typical: 68.8 dB (12 bit Gain 2)
Frame Rate	Full Mode: 450 fps@8 bit, 300 fps@10 bit, 250 fps@12 bit Base Mode: 225 fps@8 bit, 150 fps@10 bit, 150 fps@12 bit Fast Binning: 975 fps@12 bit
Readout Noise	Typical: 3.5 e ⁻ @12 bit
Shutter Mode	Global
Exposure Time	4 μs ~10 s
DSNU	2.0 e ⁻ @12 bit Gain3
PRNU	Typical: 0.15%@12 bit Gain 0; Typical: 0.45%@12 bit Gain 3
Cooling Method	Air Cooling, Liquid Cooling
Cooling Temp.	Air: 25°C below ambient; Liquid: 30°C below Water Temp.
Binning	2 x 2, 4 x 4, 8 x 8
ROI	Support
Trigger Mode	Hardware, Software
Trigger Output	Exposure Start, Readout End
Trigger Interface	Hirose
Data Interface	Full Mode: CXP12 x 8; Base Mode: CXP12 x 4
Bit Depth	8 bit, 10 bit, 12 bit
Optical Interface	M58 / F-Mount / User Customization
Power Supply	24 V / 6.67 A
Power Cons.	≤ 120 W
Dimensions	95 mm (H) x 95 mm (W) x 140 mm (L) (Without water-cooling connectors)
Weight	< 1850 g
Software	Sample Pro
SDK	C / C++
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%

Aries 6510

The Aries 6510 is built on a back-illuminated sCMOS architecture and offers enhanced sensitivity, speed, and field of view. Its 29.4 mm imaging diagonal significantly increases the field of view per frame and supports full-resolution output at up to 150 fps @ 10.2 MP. With versatile readout modes and a stable high-speed interface, it is ideal for high-throughput optical systems and large-area image stitching.



Key Features

Benefits

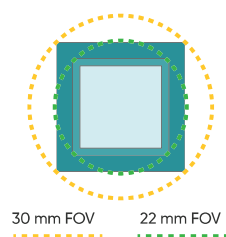
Extreme Sensitivity Mode	Up to 95% QE and readout noise below 0.7 e ⁻ , enabling single-photon detection.
High-throughput Imaging	29.4 mm large FOV for high-throughput optical systems, delivering 150 fps@10.2 MP full resolution. ^[1]
High-Speed & High Dynamic Range	High-speed mode offers 1.24 Ke ⁻ or 20 Ke ⁻ full well options, balancing throughput and measurement accuracy.
GigE Interface	High-speed, lossless data transmission with flexible cabling.
Reliable and Stable Cooling	Effectively suppresses dark current and signal fluctuation, ensuring system stability.

Typical Applications

- Super-Resolution Microscopy
- Light Sheet Microscopy
- Calcium Imaging
- Live-Cell Imaging
- High-Throughput Imaging
- Fluorescence Slide Scanning

Noted Examples

[1] The Aries 6510 has a large 29.4 mm field of view, suited for high-throughput optical systems. Its data throughput per frame is 3.6X that of a typical sCMOS camera.



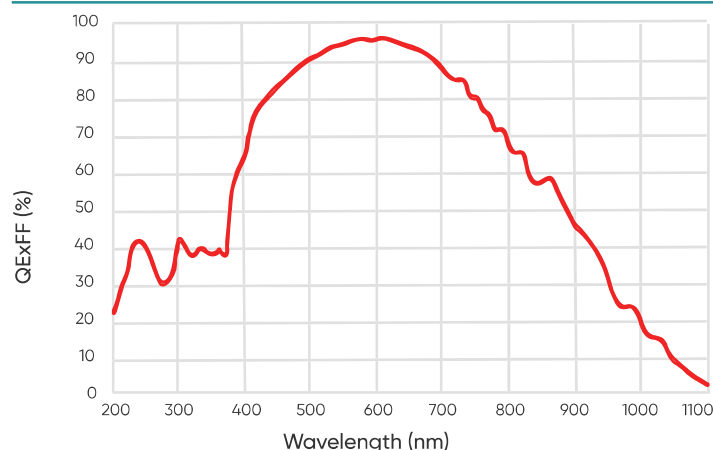
Typical sCMOS
Diagonal: 18.8 mm
Area: 13.3 mm x 13.3 mm

Aries 6506
Diagonal: 22 mm
Area: 15.7 mm x 15.7 mm

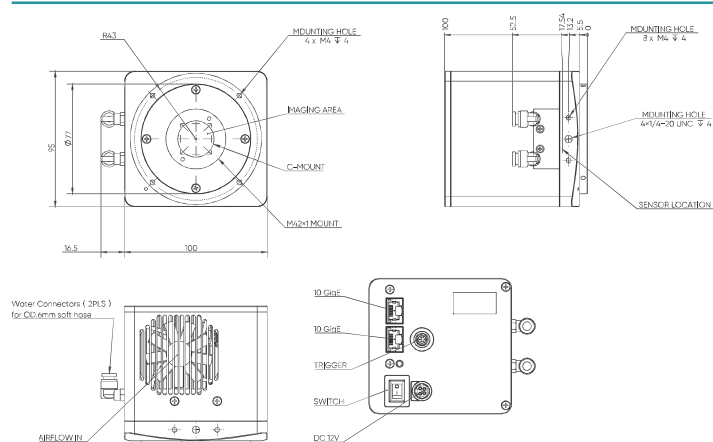
Aries 6510
Diagonal: 29.4 mm
Area: 20.8 mm x 20.8 mm

Aries 6510	1530 Mpixel/s
Aries 6506	1160 Mpixel/s
Typical sCMOS	420 Mpixel/s

Quantum Efficiency



Dimensions (Unit: mm)



Model	Aries 6510		
Sensor Type	BSI sCMOS		
Sensor Model	Gpixel GSENSE 6510BSI		
Peak QE	95%		
Chrome	Mono		
Array Diagonal	29.4 mm		
Effective Area	20.8 mm x 20.8 mm		
Resolution	3200 (H) x 3200 (V)		
Pixel Size	6.5 μm x 6.5 μm		
Readout Mode	Dynamic HDR	Speed High / Mid / Low gain	Sensitivity Standard / Low Noise
Bit Depth	16 bit	11 bit	12 bit
Frame Rate	83 fps	150 fps	88 fps / 5.2 fps
Readout Noise (median)	1.8 e ⁻	1.8 e ⁻ / 3.6 e ⁻ / 9.8 e ⁻	1.3 e ⁻ / 0.7 e ⁻
Full Well Capacity	13.7 Ke ⁻	1.24 Ke ⁻ / 4.5 Ke ⁻ / 20 Ke ⁻	1.55 Ke ⁻ / 0.73 Ke ⁻
Dynamic Range	77 dB@Dynamic-HDR		
Shutter Mode	Rolling, Global Reset		
Exposure Time	6 μs -10 s		
Cooling Method	Air Cooling, Liquid Cooling		
Cooling Temp.	Air: 0°C (Ambient 25°C), Liquid: -10°C (Water Temp. 20°C)		
Dark Current	1.3 e ⁻ /pixel/s@0°C; 0.6 e ⁻ /pixel/s@-10°C		
Image Correction	DPC		
Binning	2 x 2, 4 x 4		
ROI	Support		
Timestamp Acc.	1 μs		
Trigger Mode	Hardware, Software		
Trigger Output	High, Low, Readout End, Global Exposure, Exposure Start, Trigger Ready, First Row, Any Row		
Trigger Interface	Hirose-6-pin		
Data Interface	2 x 10 GigE		
Optical Interface	C / T / F Mount		
Power Supply	12 V / 8.5 A		
Power Cons.	≤ 55 W		
Dimensions	95 mm (H) x 100 mm (W) x 100 mm (L)		
Weight	1350 g		
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0		
SDK	C / C++ / C# / Python		
Operating System	Windows, Linux		
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%		

Aries 6506

The Aries 6506 is built on a back-illuminated sCMOS architecture and offers enhanced sensitivity, speed, and field of view. Its 22 mm imaging diagonal is optimized for standard microscope optics and delivers full-resolution output at up to 200 fps@5.8 MP. With multiple readout modes and a reliable high-speed interface, it excels in live-cell imaging and fast dynamic applications requiring high frame rates.



Key Features

Benefits

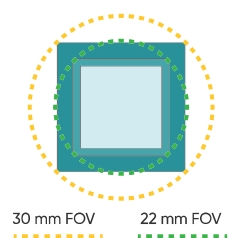
Extreme Sensitivity Mode	Up to 95% QE and readout noise below 0.7 e ⁻ , enabling single-photon detection.
High-throughput Imaging	22 mm FOV optimized for standard microscopes, delivering 200 fps @ 5.8 MP full resolution.sors [1]
High-Speed & High Dynamic Range	High-speed mode offers 1.24 Ke ⁻ or 20 Ke ⁻ full well options, balancing throughput and measurement accuracy.
GigE Interface	High-speed, lossless data transmission with flexible cabling.
Reliable and Stable Cooling	Effectively suppresses dark current and signal fluctuation, ensuring system stability.

Typical Applications

- Super-Resolution Microscopy
- Light Sheet Microscopy
- Calcium Imaging
- Live-Cell Imaging
- High-Throughput Imaging
- Fluorescence Slide Scanning

Noted Examples

[1] The Aries 6506 suits standard microscopes with a 22 mm field of view covering the center, offering better image quality. Its data throughput per frame is 2.8X that of a typical sCMOS camera.



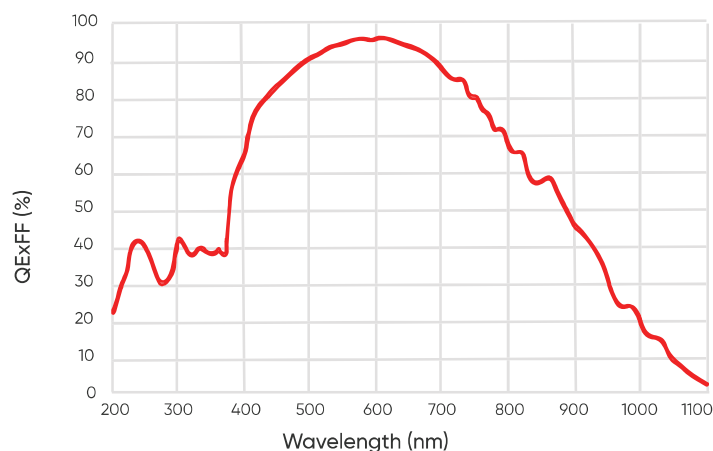
Typical sCMOS
Diagonal: 18.8 mm
Area: 13.3 mm x 13.3 mm

Aries 6506
Diagonal: 22 mm
Area: 15.7 mm x 15.7 mm

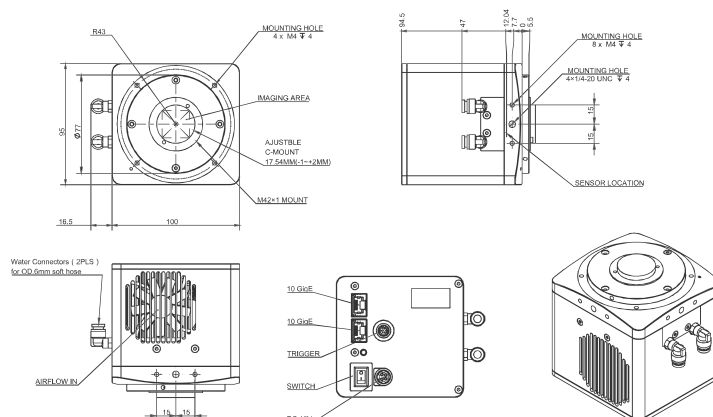
Aries 6510
Diagonal: 29.4 mm
Area: 20.8 mm x 20.8 mm

Aries 6510	1530 Mpixel/s
Aries 6506	1160 Mpixel/s
Typical sCMOS	420 Mpixel/s

Quantum Efficiency



Dimensions (Unit: mm)



Model	Aries 6506		
Sensor Type	BSI sCMOS		
Sensor Model	Gpixel GSENSE 6510BSI		
Peak QE	95%		
Chrome	Mono		
Array Diagonal	22 mm		
Effective Area	15.7 mm x 15.7 mm		
Resolution	2400 (H) x 2400 (V)		
Pixel Size	6.5 μm x 6.5 μm		
Readout Mode	Dynamic HDR	Speed High / Mid / Low gain	Sensitivity Standard / Low Noise
Bit Depth	16 bit	11 bit	12 bit
Frame Rate	111 fps	200 fps	117 fps / 6.9 fps
Readout Noise (median)	1.8 e ⁻	1.8 e ⁻ / 3.6 e ⁻ / 9.8 e ⁻	1.3 e ⁻ / 0.7 e ⁻
Full Well Capacity	13.7 Ke ⁻	1.24 Ke ⁻ / 4.5 Ke ⁻ / 20 Ke ⁻	1.55 Ke ⁻ / 0.73 Ke ⁻
Dynamic Range	77 dB@Dynamic-HDR		
Shutter Mode	Rolling, Global Reset		
Exposure Time	6 μs -10 s		
Cooling Method	Air Cooling, Liquid Cooling		
Cooling Temp.	Air: 0°C (Ambient 25°C), Liquid: -10°C (Water Temp. 20°C)		
Dark Current	1.3 e ⁻ /pixel/s@0°C; 0.6 e ⁻ /pixel/s@-10°C		
Image Correction	DPC		
Binning	2 x 2, 4 x 4		
ROI	Support		
Timestamp Acc.	1 μs		
Trigger Mode	Hardware, Software		
Trigger Output	High, Low, Readout End, Global Exposure, Exposure Start, Trigger Ready, First Row, Any Row		
Trigger Interface	Hirose-6-pin		
Data Interface	2 x 10 GigE		
Optical Interface	C Mount		
Power Supply	12 V / 8.5 A		
Power Cons.	≤ 55 W		
Dimensions	95 mm (H) x 100 mm (W) x 100 mm (L)		
Weight	1350 g		
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0		
SDK	C / C++ / C# / Python		
Operating System	Windows, Linux		
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%		

Aries 16

The Aries 16 is a new generation of BSI sCMOS camera developed exclusively by Tucsen Photonics. With sensitivity which matches EMCCD and surpasses binned sCMOS combined with high full well capacity normally observed in large format CCD cameras, the Aries 16 provides a fantastic solution for both low-light detection and high-dynamic range imaging.



Key Features

Benefits

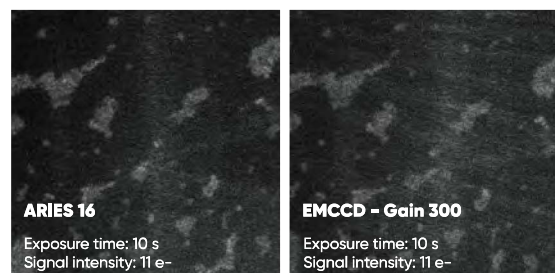
BSI-sCMOS Technology	16 μm large pixels, 0.9 e ⁻ readout noise, and up to 90% QE. ^[1]
Advanced Cooling Technology	To reduce the thermal noise, ensuring high SNR imaging and stable measurement results.
73 Ke ⁻ Well Capacity	Dual modes provide flexibility for high dynamic and low-light applications.
HDR & Low Noise Modes	High dynamic range to capture strong and weak signals simultaneously.

Typical Applications

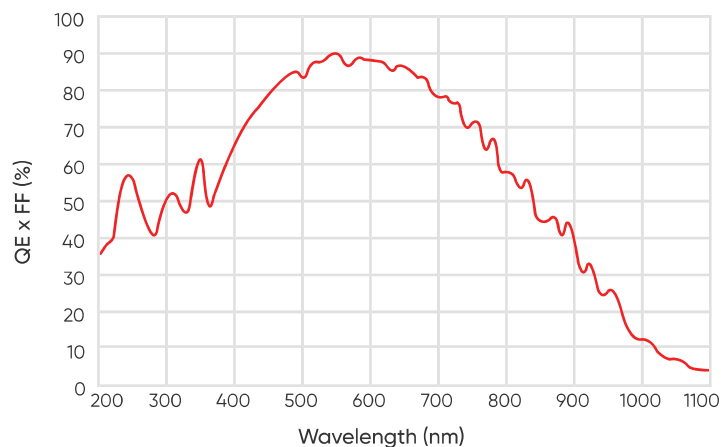
- Cold Atoms
- Quantum Physics
- Single-Molecule Fluorescence
- Super Resolution Microscopy
- FRET
- FCS
- TIRF
- Bioluminescence
- Chemiluminescence

Noted Examples

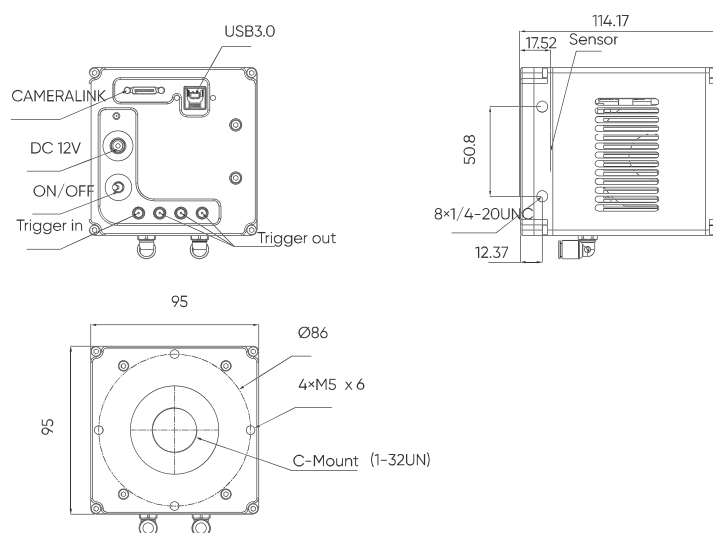
[1] Aries 16 can replace EMCCD in extreme signal detection fields such as Bioluminescence, and the imaging quality is equivalent.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Aries 16
Sensor Type	BSI sCMOS
Peak QE	90.7%@550 nm
Chrome	Mono
Resolution	800 (H) x 600 (V)
Array Diagonal	16 mm
Pixel Size	16 μm x 16 μm
Effective Area	12.8 mm x 9.6 mm
Full Well Capacity	Typical: 73 Ke-
Dynamic Range	Typical: 93 dB
Frame Rate	60 fps@HDR Mode, 25 fps@Low Noise Mode
Readout Noise	Typical: 1.6 e-@HDR Mode, 0.9 e-@Low Noise Mode
Shutter Mode	Rolling, Global Reset
Exposure Time	26 μs ~60 s
DSNU	0.3 e-
PRNU	0.3%
Cooling Method	Air Cooling, Liquid Cooling
Cooling Temp.	Air: 50°C below ambient; Liquid: 60°C below ambient
Dark Current	0.2 e-/pixel/s
Binning	2 x 2, 4 x 4
ROI	Support
Trigger Mode	Hardware, Software
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low
Trigger Interface	SMA
Timestamp Acc.	1 μs
Data Interface	USB 3.0 & CameraLink
SDK	C / C++ / C# / Python
Bit Depth	12 bit & 16 bit
Optical Interface	C-mount
Power Supply	12 V / 8 A
Power Cons.	38 W
Dimensions	95 mm (H) x 95 mm (W) x 114 mm (L)
Weight	1500 g
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%

Dhyana 400BSI V3

The Dhyana 400BSI V3 delivers perfect sensitivity and resolution for high NA microscope objectives, being designed lighter and low power consumption, making it ideal for integrating and fitting into small spaces.^[1]



Key Features

95% QE & Lowest Noise

6.5 μm x 6.5 μm Pixel Size

18 mm Array Diagonal

Rolling Shutter Control Mode

Camera Link & USB 3.0

Air & Liquid Cooling

Benefits

High signal-to-noise ratio across UV / Visible / NIR.

Optimal spatial sampling and sensitivity for 100X, 60X and 40X microscope.

Ideal for the microscopes that have C-mount ports.

Allowed to define line time delays or slit heights for scanning systems such as Light-sheet Microscopy.^[2]

While the USB 3.0 is quite flexible and easy to use, the CameraLink is a faster and stable option up to 100 fps@4.2 MP.

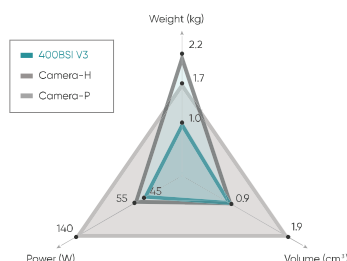
Maintains low dark noise, minimizes vibration, and aids thermal stability.

Typical Applications

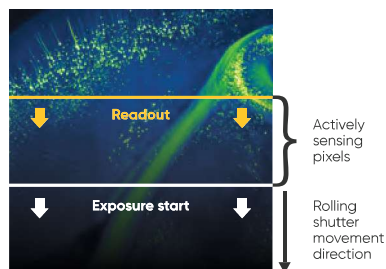
- Advanced Microscopy
- Spectral Imaging
- Astrophysical

Noted Examples

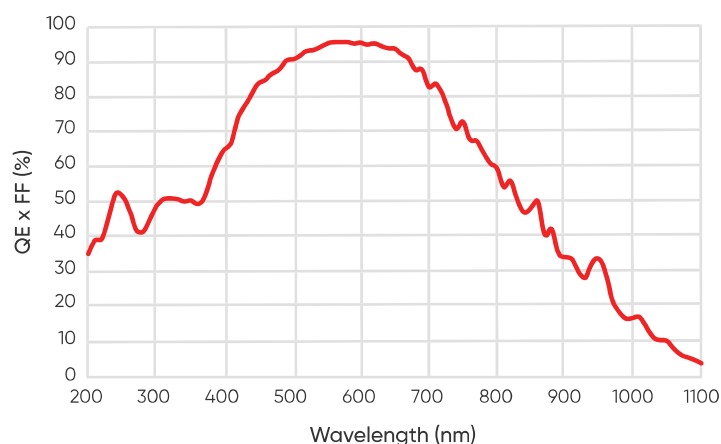
[1] Compact, lighter design low power consumption.



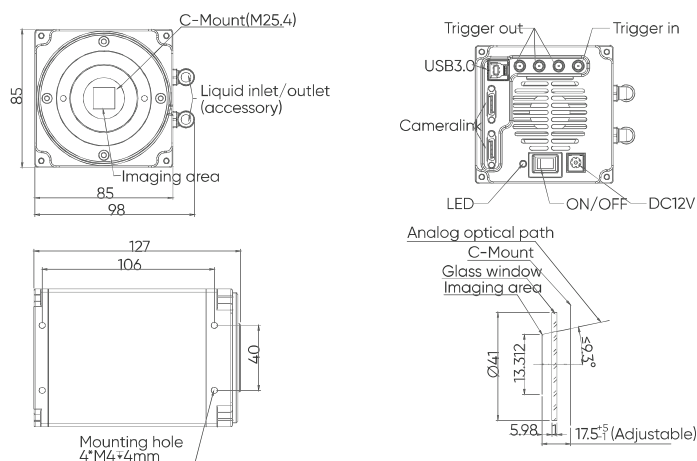
[2] The Rolling Shutter Control Mode applied in Light-sheet Microscopy.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Dhyana 400BSI V3	
Sensor Type	BSI sCMOS	
Sensor Model	Gpixel GSENSE2020BSI	
Peak QE	95%@600 nm	
Chrome	Mono	
Array Diagonal	18.8 mm	
Effective Area	13.3 mm x 13.3 mm	
Resolution	2048 (H) x 2048 (V)	
Pixel Size	6.5 μm x 6.5 μm	
Full Well Capacity	Typical: 45 Ke-	
Dynamic Range	Typical: 90 dB	
Frame Rate	12 bit Firmware HDR: 43 fps@Camera Link, 43 fps@USB 3.0 High Speed: 100 fps@Camera Link, 60 fps@USB 3.0	11 bit Firmware HDR: 74 fps@Camera Link, 45 fps@USB 3.0 High Speed: 100 fps@Camera Link, 60 fps@USB 3.0
Readout Noise	CMS (Typical): 1.1 e- (Median), 1.2 e- (RMS) HDR (Typical): 1.6 e- (Median), 1.7 e- (RMS)	
Shutter Mode	Rolling, Global Reset	
Exposure Time	6.6 μs ~10 s	
DSNU	0.2 e-	
PRNU	0.3%	
Cooling Method	Air Cooling, Liquid Cooling	
Cooling Temp.	45°C below ambient (Liquid cooling)	
Dark Current	0.5 e-/pixel/s@-10°C	
Binning	2 x 2, 4 x 4	
ROI	Support	
Timestamp Acc.	1 μs	
Trigger Mode	Hardware, Software	
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low, Trigger Ready	
Trigger Interface	SMA	
Data Interface	USB 3.0, CameraLink	
Bit Depth	11 bit, 12 bit, 16 bit	
Optical Interface	C-mount	
Power Supply	12 V / 8 A	
Power Cons.	45 W	
Dimensions	85 mm (H) x 85 mm (W) x 127 mm (L)	
Weight	995 g	
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0	
SDK	C / C++ / C# / Python	
Operating System	Windows, Linux	
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%	

Dhyana 95 V2

The Dhyana 95 V2 delivers ultimate sensitivity achieving similar results compare with EMCCD camera technology without the concerns of signal drift, gain aging, multiplication gain noise (1.4X) and pain points of export control restrictions.^[1]



Key Features

200 nm-1100 nm	Wide spectral response, supports UV, visible and near-infrared imaging applications.
95% QE & Lowest Noise	Higher SNR than EMCCD when the signal (photon) > 3 e ⁻ . ^[2]
11 μm x 11 μm Pixel Size	Large pixels capture 3X the light of standard 6.5 μm pixels to maximize photon detection.
100 Ke-Full-well Capacity	High dynamic range for the measurement of bright and dim signals at the same time.
CameraLink & USB 3.0	Use the flexibility of USB or if additional speed is required move to CameraLink.
Reliable and Stable Cooling	Effectively suppresses dark current and signal fluctuation, ensuring system stability.

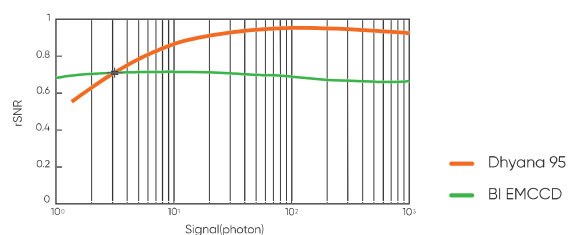
Benefits

Typical Applications

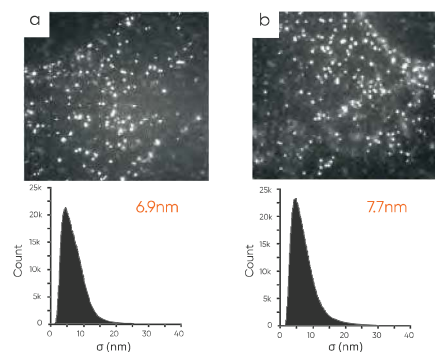
- Advanced Microscopy
- Spectral analyse
- Soft X-ray Imaging
- Astrophysical

Noted Examples

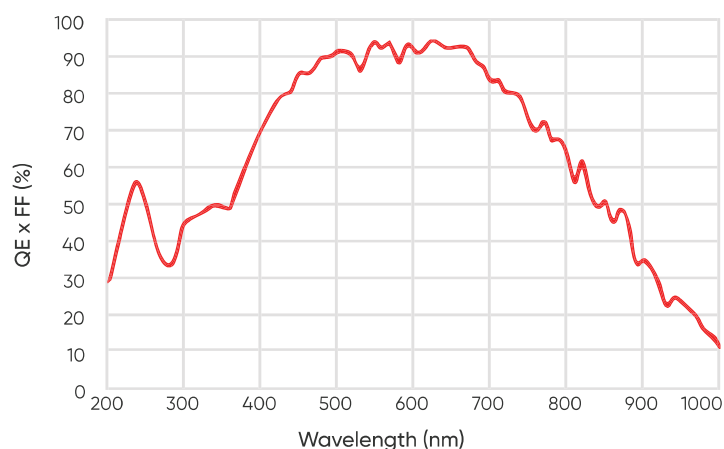
[1] The Higher SNR than EMCCD when the signal (photon) > 3 e⁻.



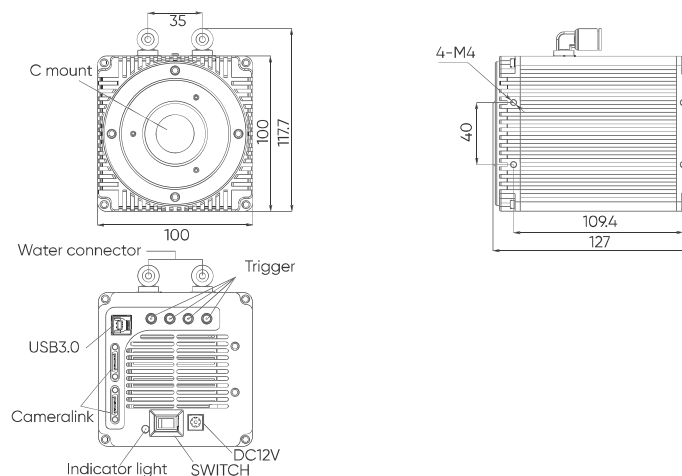
[2] Dhyana 95 V2 demonstrating higher localization accuracy than EMCCD in single-molecule localization experiments.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Dhyana 95 V2
Sensor Type	BSI sCMOS
Sensor Model	Gpixel GSENSE400BSI
Peak QE	95%@560 nm
Chrome	Mono
Array Diagonal	31.9 mm
Effective Area	22.5 mm x 22.5 mm
Resolution	2048 (H) x 2048 (V)
Pixel Size	11 μm x 11 μm
Full Well Capacity	Typical: 80 Ke-@HDR, 100 Ke-@STD
Dynamic Range	Typical: 90 dB
Frame Rate	24 fps@16 bit HDR, 48 fps@12 bit STD
Readout Noise	1.6 e- (Median), 1.7 e- (RMS)
Shutter Mode	Rolling
Exposure Time	21 μs ~10 s
DSNU	0.2 e-
PRNU	0.3%
Cooling Method	Air Cooling, Liquid Cooling
Cooling Temp.	45°C below ambient (Liquid cooling)
Dark Current	0.6 e-/pixel/s@-10°C
Binning	2 x 2, 4 x 4
ROI	Support
Timestamp Acc.	1 μs
Trigger Mode	Hardware, Software
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low, Trigger Ready
Trigger Interface	SMA
Data Interface	USB 3.0, CameraLink
Bit Depth	12 bit, 16 bit
Optical Interface	C-mount / F-mount
Power Supply	12 V / 8 A
Power Cons.	60 W
Dimensions	C-mount: 100 mm (H) x 118 mm (W) x 127 mm (L), F-mount: 100 mm (H) x 118 mm (W) x 157 mm (L)
Weight	1613 g
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0
SDK	C / C++ / C# / Python
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%; Storage: Temp. 0°C~60°C, HUM 0%~90%

Dhyana 6060 / 6060BSI

The Dhyana 6060 / 6060BSI brings the speed and dynamic range to large format imaging missing from previous CCD technology.^[1] With a massive 86 mm diameter, high quantum efficiency and 10 μm pixels size, it is well suited to scientific applications in areas such as Astronomy and Physics.



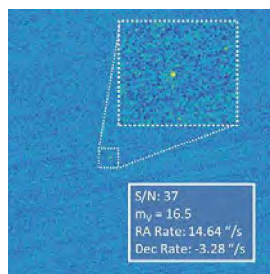
Key Features	6060	6060BSI	Benefits
Field of View	61.4 mm x 61.4 mm	61.4 mm x 61.4 mm	Very large field of view from 36 MP, 10 μm pixel size sensor.
Quantum Efficiency	72 % QE	95% QE	High photon collection efficiency for lower illumination intensity.
Frame Rate	44 fps	26.4 fps	Faster data rates than the previous CCD technology.
Full-Well Capacity	123 Ke-	102 Ke-	High dynamic range for the measurement of bright and dim signals at the same time.
Cooling Method	Air & Liquid	Air & Liquid	Maintains low dark noise, minimizes vibration, and aids thermal stability.

Typical Applications

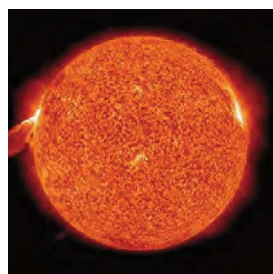
- Space Debris Detection
- Solar Astronomy
- X-ray Detection
- Quantum Optics

Noted Examples

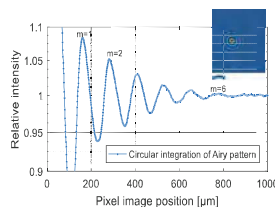
[1] Large-area sCMOS technology can be used in a wide range of applications previously limited by CCD technology.



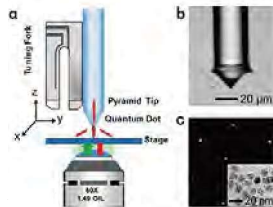
Space Debris



Solar

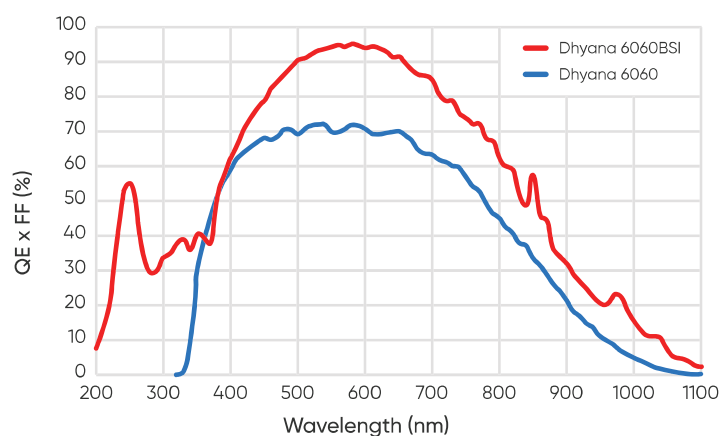


X-ray

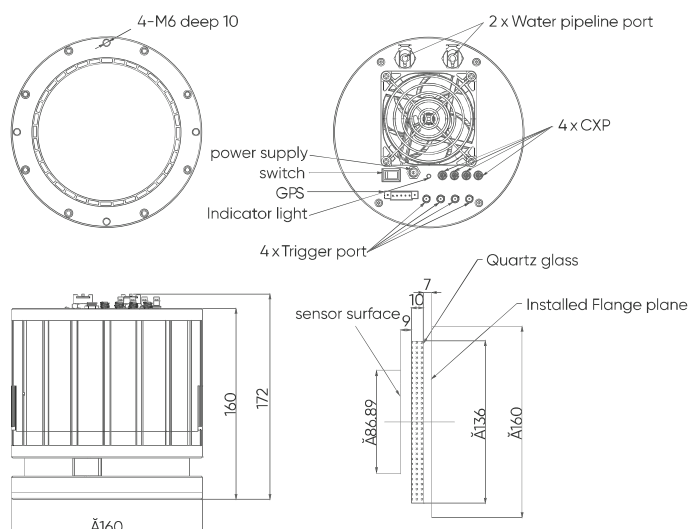


Quantum

Quantum Efficiency



Dimensions (Unit: mm)



Model	Dhyana 6060	Dhyana 6060BSI
Sensor Type	FSI sCMOS	BSI sCMOS
Sensor Model	Gpixel GSENSE6060	Gpixel GSENSE6060BSI
Peak QE	72%@550 nm	95%@580 nm
Chrome	Mono	
Array Diagonal	86.8 mm	
Effective Area	61.4 mm x 61.4 mm	
Resolution	6144 (H) x 6144 (V)	
Pixel Size	10 μm x 10 μm	
Full Well Capacity	Typical: 123 Ke-	Typical: 102 Ke-
Dynamic Range	Typical: 91 dB	Typical: 90 dB
Frame Rate	44 fps@12-bit STD, 19 fps@16-bit HDR 14 fps@14-bit STD	26.4 fps@12-bit STD, 11.3 fps@16-bit HDR 8.6 fps@14-bit STD
Readout Noise	Typical: 3 e- (Median)	
Shutter Mode	Rolling	
Exposure Time	7 μs ~300 s	12 μs ~300 s
DSNU	1.5 e-	
PRNU	0.2%	
Cooling Method	Air Cooling, Liquid Cooling	
Cooling Temp.	45°C below ambient (Liquid cooling)	
Dark Current	Air: 0.25 e-/pixel/s, Liquid: 0.15 e-/pixel/s	
Binning	2 x 2, 4 x 4	
ROI	Support	
Timestamp Acc.	1 μs	
GPS	Support	
Trigger Mode	Hardware, Software	
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low	
Trigger Interface	SMA	
Data Interface	CoaxPress 2.0	
Bit Depth	12 bit, 14 bit, 16 bit	
Optical Interface	User Customization	
Power Supply	12 V / 10 A	
Power Cons.	< 100 W	
Dimensions	ϕ 160 mm x 164 mm	
Weight	4 kg	
Software	Mosaic V3, Sample Pro, MAXIMDL, LabVIEW, MATLAB, EPICS	
SDK	C / C++ / C# / Python	
Operating System	Windows, Linux	
Environment	Working: Temp. -35°C~40°C, HUM 0%~95%; Storage: Temp. -35°C~60°C, HUM 0%~95%	

Dhyana 4040 V2 / 4040BSI

The Dhyana 4040 V2 / 4040BSI brings the speed and dynamic range to large format imaging missing from previous CCD technology.^[1] With a 52 mm diameter, high quantum efficiency and 9 μm pixels size, it is well suited to scientific applications in areas such as Astronomy and Physics.



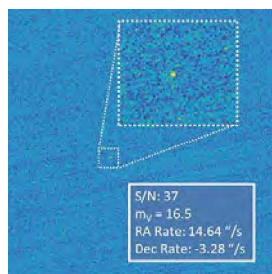
Key Features	4040 V2	4040BSI	Benefits
Field of View	36.9 mm x 36.9 mm	36.9 mm x 36.9 mm	Large field of view from 16 MP, 9 μm pixel size sensor.
Quantum Efficiency	74% QE	90% QE	High photon collection efficiency for lower illumination intensity.
Frame Rate	16.5 fps	16.5 fps	Faster data rates than the previous CCD technology.
Full-well Capacity	70 Ke-	39 Ke-	High dynamic range for the measurement of bright and dim signals at the same time.
Cooling Method	Air & Liquid	Air & Liquid	Maintains low dark noise, minimizes vibration, and aids thermal stability.

Typical Applications

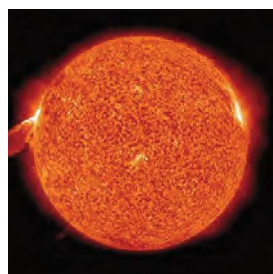
- Space Debris Detection
- Solar Astronomy
- X-ray Detection
- Quantum Optics

Noted Examples

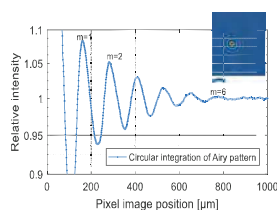
[1] Large-area sCMOS technology can be used in a wide range of applications previously limited by CCD technology.



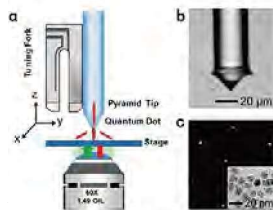
Space Debris



Solar

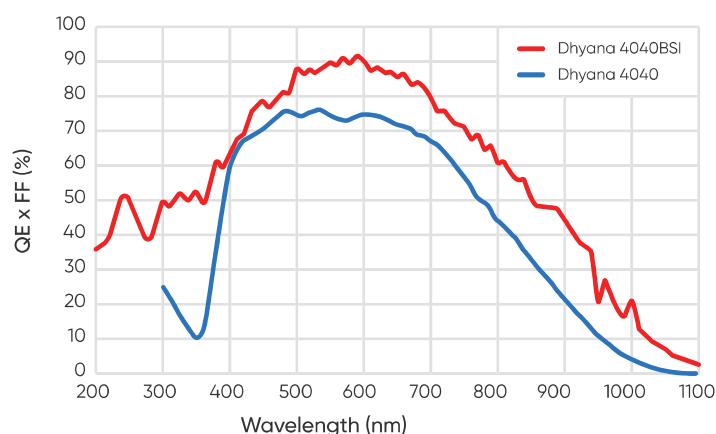


X-ray

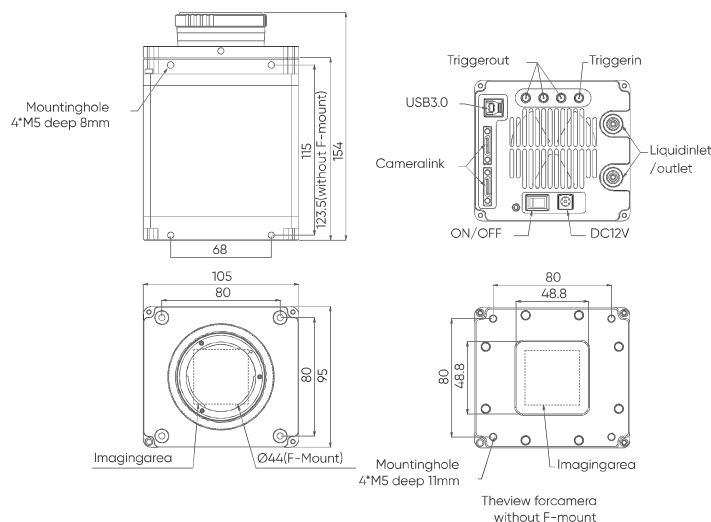


Quantum

Quantum Efficiency



Dimensions (Unit: mm)



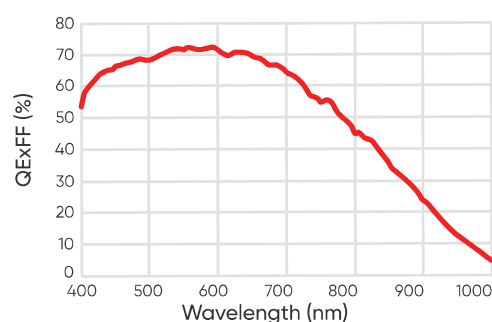
Model	Dhyana 4040 V2	Dhyana 4040BSI
Sensor Type	FSI sCMOS	BSI sCMOS
Sensor Model	Gpixel GSENSE4040	Gpixel GSENSE4040BSI
Peak QE	74%@600 nm	90%@550 nm
Chrome	Mono	
Array Diagonal	52.1 mm	
Effective Area	36.9 mm x 36.9 mm	
Resolution	4096 (H) x 4096 (V)	
Pixel Size	9 μm x 9 μm	
Full Well Capacity	Typical: 70 Ke-	Typical: 39 Ke-
Dynamic Range	Typical: 86 dB	Typical: 85 dB
Frame Rate	16.5 fps@CameraLink, 9.7 fps@USB 3.0	
Readout Noise	Typical: 3.6 e-	Typical: 2.3 e-
Shutter Mode	Rolling	
Exposure Time	10 μs ~3600 s	
DSNU	0.5 e-	
PRNU	0.2%	
Cooling Method	Air Cooling, Liquid Cooling	
Cooling Temp.	45°C below ambient (Liquid cooling)	
Dark Current	Air: 0.15 e-/pixel/s, Liquid: 0.1 e-/pixel/s	1.2 e-/pixel/s
Binning	2 x 2, 4 x 4	
ROI	Support	
Timestamp Acc.	1 μs	
GPS	8 ns	
Trigger Mode	Hardware, Software	
Trigger Output	Exposure Start, Global Exposure, Readout End, High, Low	
Trigger Interface	SMA, CameraLink CC1	
Data Interface	USB 3.0, CameraLink	
Bit Depth	12 bit, 16 bit	
Optical Interface	F-Mount / User Customization	
Power Supply	12 V / 8 A	
Power Cons.	< 45 W	
Dimensions	105 mm (H) x 95 mm (W) x 123.5 mm (L)	
Weight	2 kg	
Software	Mosaic V3, Sample Pro, MAXIMDL, LabVIEW, MATLAB	
SDK	C / C++ / C# / Python	
Operating System	Windows, Linux	
Environment	Working: Temp. -25°C~40°C, HUM 0%~95%; Storage: Temp. -35°C~60°C, HUM 0%~95%	

Dhyana 400D

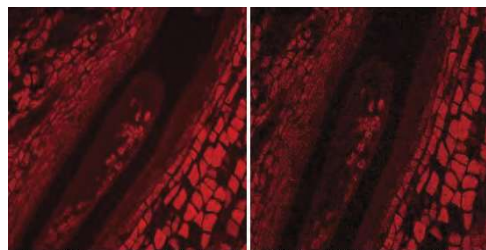
The Dhyana 400D features a front-illuminated sCMOS sensor with a peak quantum efficiency of 72% and a readout noise of only 2.0 e⁻. Combined with advanced cooling and noise reduction technology, it is suitable for most fluorescence imaging applications.



Quantum Efficiency



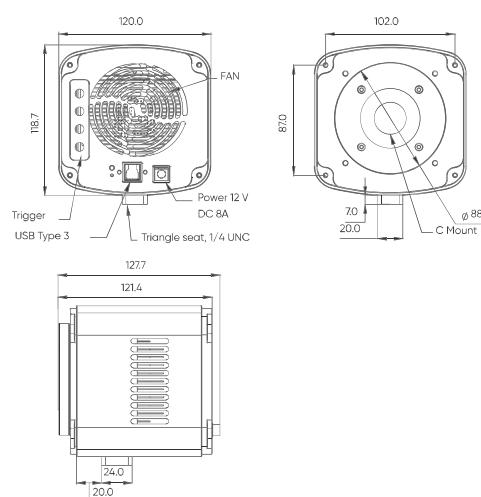
Application Cases



Dhyana 400D, 40 ms

CCD, 40 ms

Dimensions (Unit: mm)



Specification

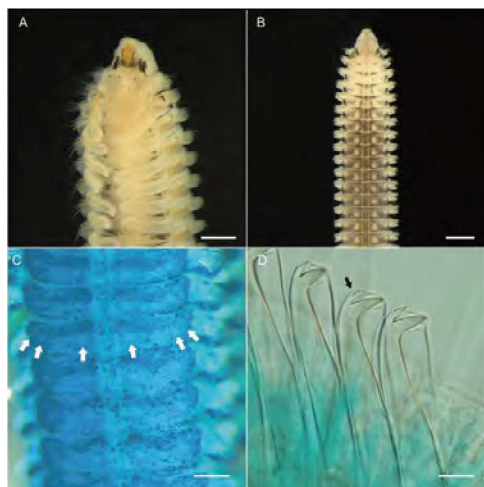
Model	Dhyana 400D
Sensor Type	FSI sCMOS
Sensor Model	Gpixel GSENSE2020
Peak QE	72%@595 nm
Chrome	Mono
Array Diagonal	18.8 mm
Effective Area	13.3 mm x 13.3 mm
Resolution	2048 (H) x 2048 (V)
Pixel Size	6.5 μm x 6.5 μm
Full Well Capacity	Typical: 45 Ke-
Dynamic Range	Typical: 86.6 dB
Frame Rate	35 fps@16 bit
Readout Noise	Typical: 2 e-
Shutter Mode	Rolling
Exposure Time	13 μs~10 s
Cooling Method	Air Cooling
Cooling Temp.	35°C below ambient
Dark Current	0.12 e-/pixel/s@-10°C
Binning	2 x 2
ROI	Support
Trigger Mode	Hardware, Software
Trigger Output	Exposure Start, Global Exposure, Readout End
Trigger Interface	SMA
Data Interface	USB 3.0
Bit Depth	12 bit, 16 bit
Optical Interface	C-mount
Power Supply	12 V / 8 A
Power Cons.	60 W
Dimensions	120 mm (H) x 119 mm (W) x 121 mm (L)
Weight	1853 g
Software	Mosaic V3, LabVIEW, MATLAB, Micro-Manager 2.0
SDK	C / C++ / C# / Python
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%

Dhyana 400DC

The Dhyana 400DC is a front-illuminated color sCMOS camera, combining scientific-grade sensitivity with accurate color reproduction. It offers a large field of view and excellent dynamic range, enabling high-quality color imaging even under low-light conditions.

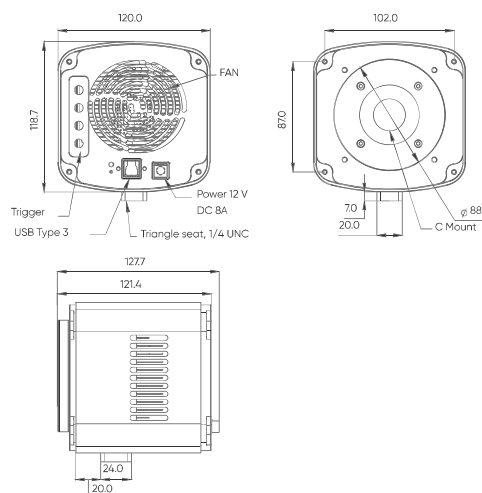


Application Cases



Images (A–D) acquired with the Dhyana 400DC, showing a newly identified algal species under different dark-field/bright-field illumination conditions.

Dimensions (Unit: mm)



Specification

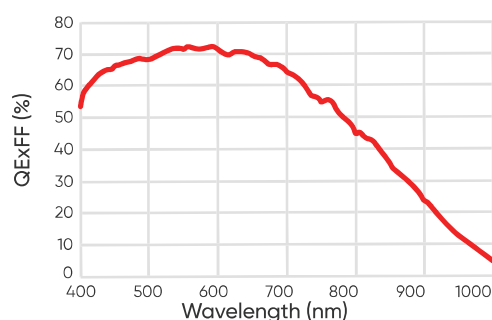
Model	Dhyana 400DC
Sensor Type	FSI sCMOS
Sensor Model	Gpixel GSENSE2020s
Chrome	Color
Array Diagonal	18.8 mm
Effective Area	13.3 mm x 13.3 mm
Resolution	2048 (H) x 2048 (V)
Pixel Size	6.5 μm x 6.5 μm
Full Well Capacity	Typical: 45 Ke ⁻
Dynamic Range	Typical: 86.6 dB
Frame Rate	22 fps@8 bit, 16 fps@16 bit
Readout Noise	1.7 e ⁻
Shutter Mode	Rolling
Exposure Time	21 μs ~10 s
Cooling Method	Air Cooling
Cooling Temp.	35°C below ambient
Dark Current	0.12 e ⁻ /pixel/s@-10°C
Binning	2 x 2
ROI	Support
Trigger Mode	Hardware, Software
Trigger Output	Exposure Start, Global Exposure, Readout End
Trigger Interface	SMA
Data Interface	USB 3.0
Bit Depth	16 bit
Optical Interface	C-mount
Power Supply	12 V / 8 A
Power Cons.	60 W
Dimensions	120 mm (H) x 119 mm (W) x 121 mm (L)
Weight	1853 g
Software	Mosaic V3, LabVIEW, MATLAB, Micro-Manager 2.0
SDK	C / C++ / C# / Python
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%

Dhyana 401D / 201D

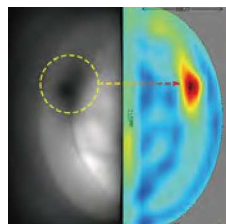
The Dhyana 401D and 201D are compact front-illuminated sCMOS cameras, ideal for instrument system integrators seeking cost-effective solutions. They feature 72% high quantum efficiency and 2.1 e⁻ low readout noise, making them well-suited for general low-light imaging applications.



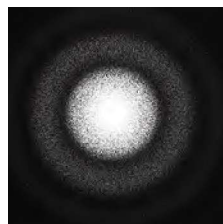
Quantum Efficiency



Application Cases

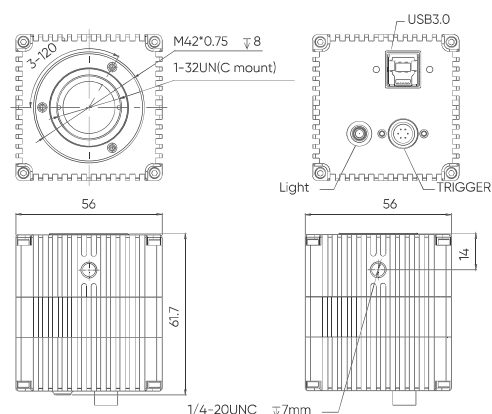


Tumor -
DOT Detection



Blood-Diffractive
Phase Imaging

Dimensions (Unit: mm)



Specification

Model	Dhyana 401D	Dhyana 201D
Sensor Type	FSI sCMOS	
Sensor Model	Gpixel GSENSE2020	Gpixel GSENSE2011
Peak QE	72%@595 nm	
Chrome	Mono	
Array Diagonal	18.8 mm	15.3 mm
Effective Area	13.3 mm x 13.3 mm	13.3 mm x 7.5 mm
Resolution	2048 (H) x 2048 (V)	2048 (H) x 1152 (V)
Pixel Size	6.5 μm x 6.5 μm	
Full Well Capacity	Typical: 43 Ke-	Typical: 45 Ke-
Frame Rate	40 fps@16 bit 45 fps@8 bit	70 fps@16 bit 80 fps@8 bit
Readout Noise	Typical: 2.1 e- (Median)	
Shutter Mode	Rolling	
Exposure Time	10 μs~10 s	
Binning	2 x 2, 4 x 4	
ROI	Support	
Trigger Mode	Hardware, Software	
Trigger Output	Exposure Start, Readout End, Trigger Ready	Exposure Start, Readout End,
Trigger Interface	Hirose	
Data Interface	USB 3.0	
Bit Depth	8 bit, 12bit, 16 bit	
Optical Interface	C-mount	
Power Supply	12 V / 8 A	
Power Cons.	< 4 W	
Dimensions	56 mm (H) x 56 mm (W) x 61.7 mm (L)	
Weight	305 g	
Software	Mosaic V3, LabVIEW, MATLAB, Micro-Manager 2.0, Sample Pro	
SDK	C / C++ / C# / Python	
Operating System	Windows, Linux	
Environment	Temp. 0°C~40°C, HUM 10%~85%	

Dhyana XF95 / XV95

The Dhyana XF95 features a high quantum efficiency (QE) of nearly 100% within the 80 eV to 1000 eV range, utilizing advanced BSI sCMOS technology without an anti-reflection coating. This innovation enhances soft X-ray and EUV imaging performance while providing greater resistance to radiation damage. ^[1]



Key Features

~100% Peak QE@80 eV-1000 eV

Benefits

Excellent soft X-ray and extreme ultraviolet imaging performance.

100 Ke- Full Well Wapacity

High dynamic range for the measurement of bright and dim signals at the same time.

48 fps@4.2 MP

Dozens of times the speed of CCD cameras.

Reliable and Stable Cooling

Effectively suppresses dark current and signal fluctuation, ensuring system stability.

Typical Applications

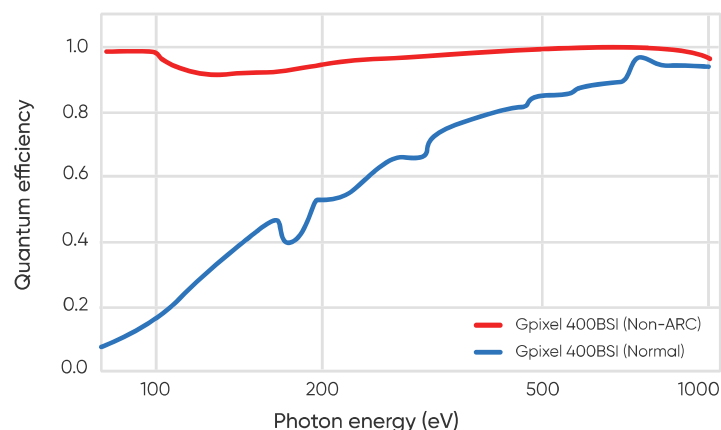
- Soft X-ray Scattering / Spectroscopy
- Extreme Ultraviolet Spectroscopy
- Layered Diffraction Imaging
- High Harmonic Generation Radiation

Noted Examples

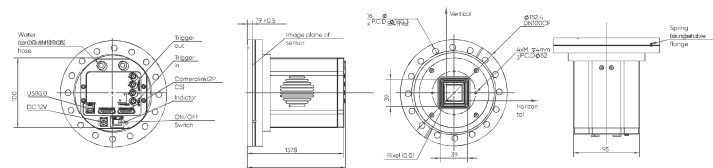
[1] "Backside-illuminated sCMOS technology is very attractive for cost-adapting to specific applications, and overall shows good dynamic range, which can significantly reduce acquisition time for imaging applications compared to commonly used classical backside-illuminated CCD cameras."

—Journal of Synchrotron Radiation, 2020.

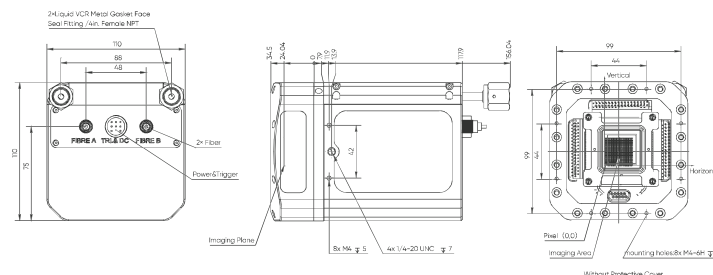
Quantum Efficiency



Dimensions (Unit: mm)



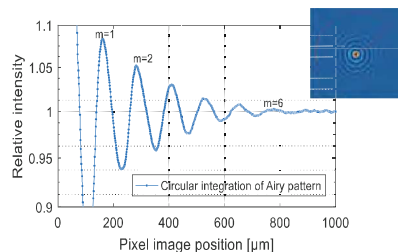
Dhyana XF95 (Open-Front)



Dhyana XV95 (In-Vacuum)



Beamline hutch at SOLEIL Synchrotron, France



Diffraction pattern of 186 eV beam captured with Dhyana camera

Model	Dhyana XF95 (Open-Front)		Dhyana XV95 (In-Vacuum)	
Sensor Type	Non Anti-Reflection Coating / Standard BSI sCMOS			
Sensor Model	GSENSE 400BSI-PS / GSENSE 400BSI			
Peak QE	~100%			
Chrome	Mono			
Array Diagonal	31.9 mm			
Effective Area	22.5 mm x 22.5 mm			
Resolution	4.2 MP, 2048 (H) x 2048 (V)			
Pixel Size	11 μm x 11 μm			
Full Well Capacity	Typical: 85 Ke-		Typical: 85 Ke-	
Dynamic Range	90 dB			
Frame Rate	HDR: 24 fps; STD: 48 fps			
Readout Noise	Typical: 1.6 e- (Median)			
Shutter Mode	Rolling			
Exposure Time	21 μs~300 s			
Linearity	> 99%			
DSNU	0.2 e-			
PRNU	0.3%			
Bit Depth	12 bit, 16 bit			
Cooling Method	Air Cooling, Liquid Cooling		Liquid Cooling	
Cooling Temp.	-30°C@25°C (Ambient Temp.), -50°C@20°C (Water Temp.)		-45°C@20°C (Water Temp.)	
Dark Current	0.3 e-/pixel/s@-40°C chip Temp.		0.3 e-/pixel/s@-40°C chip Temp.	
Vacuum Compatibility	10 ⁻⁷ Pa (Max)		10 ⁻⁶ Pa	
Binning	2 x 2, 4 x 4			
ROI	Support			
Timestamp Acc.	1 μs			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Simulated Global, Readout End, High, Low			
Trigger Interface	SMA		Hirose	
Data Interface	CameraLink, USB 3.0-Over-Fiber		USB 3.0-Over-Fiber	
Flange Size	DN100CF / User Customization		Feedthrough DN100CF / Customization	
Power Supply	12 V / 8 A		AC Power	
Power Cons.	< 65 W		< 65 W (incl. ctrl. box)	
Dimensions	152.4 mm (H)x 152.4 mm (W)x 140.7 mm (L)		110 mm (H)x 110 mm (W)x 191 mm (L)	
Weight	~3700 g		~2600 g (camera body)	
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
SDK	C / C++ / C#		C / C++ / C# / Python	
Operating System	Windows, Linux			
Environment	Temp.: 0°C~40°C; HUM 0%~70%, non-condensing; Bake-out Temp.: < 70°C		Temp.: 0°C~40°C; HUM 0%~70%, non-condensing; Bake-out Temp.: < 70°C	

Libra 3405M / 3412M

The Libra 3405M / 3412M are developed with global shutter CMOS sensors, offering both high speed and high resolution. They feature a wide spectral range of 350 nm–1100 nm, providing superior performance for multi-channel fluorescence imaging. Their compact design also facilitates seamless integration into instrument systems.



Key Features

Benefits

Global Shutter	High-speed, artifact-free imaging, ideal for high-throughput slide scanning.
350 nm–1100 nm wide spectrum	High sensitivity in low light and NIR, ideal for multi-channel fluorescence.
3.4 μm Pixel Size	Optimized for < 40X optical systems, enables higher resolution for cellular and tissue imaging.
10 GigE Interface	Provides higher data throughput and more stable transmission than USB 3.0. ^[1]
Compact Design	Facilitates seamless integration into instrument systems.

Typical Applications

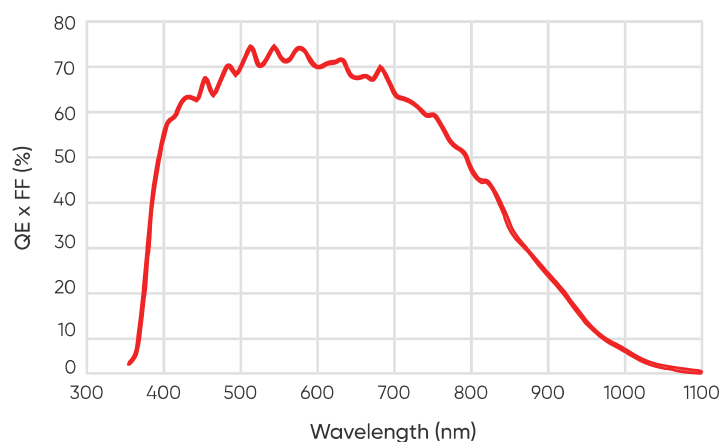
- Digital Pathology
- Microscopy Imaging
- Industrial Inspection

Noted Examples

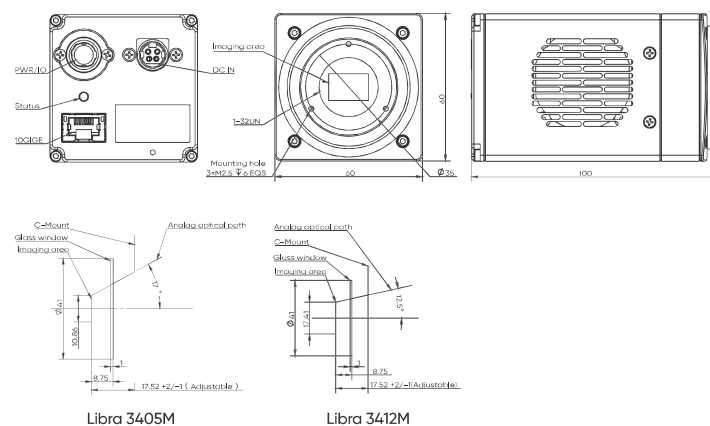
[1] The maximum full-resolution speed is 164 fps for the Libra 3405M and 98 fps for the Libra 3412M, about three times faster than the USB 3.0 version.

Libra 3412	GigE	98 fps
	USB 3.0	28 fps
Libra 3405	GigE	164 fps
	USB 3.0	65 fps

Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra 3405M			Libra 3412M		
Sensor Type	CMOS					
Sensor Model	Gpixel GMAX 3405			Gpixel GMAX 3412		
Chrome	Mono					
Array Diagonal	10.9 mm (2/3")			17.4 mm (1.1")		
Effective Area	8.3 mm x 7.0 mm			14.0mm x 10.5mm		
Pixel Size	3.4 μm x 3.4 μm					
Resolution	2448 (H) x 2048 (V)			4096 (H) x 3072 (V)		
Peak QE	75%@540 nm; 47%@800 nm					
Gain Mode	HighCapacity, Balanced, Sensitive					
Full Well Capacity	12bit: High Capacity 8.9 Ke-, Balanced 4.2 Ke-, Sensitive 0.48 Ke-			12bit: High Capacity 9 Ke-, Balanced 4.5 Ke-, Sensitive 0.7 Ke-		
Frame Rate	12 bit 100 fps	10 bit 163 fps	8 bit 164 fps	12 bit 62 fps	10 bit 65 fps	8 bit 98 fps
Readout Noise	12 bit (Median): 3.7 e-@High Capacity, 2.3 e-@Balanced, 1.4 e-@Sensitive			12 bit (Median): 3.6 e-@High Capacity, 2.4 e-@Balanced, 1.6 e-@Sensitive		
Shutter Mode	Global shutter					
Exposure Time	1 μs~10 s					
Image Correction	DPC					
ROI	Support					
Binning (FPGA)	1x1 , 2x2 , 4x4					
Cooling Method	Air cooling					
Cooling Temp.	10°C@Ambient 25°C					
Dark Current	0.5 e-/p/s@10°C					
Trigger Mode	Hardware, Software					
Trigger Output	High, Low, Exposure out, Readout, Trigger Ready					
Trigger Interface	Hirose-12-Pin					
Data Interface	10 GigE					
Bit Depth	High Depth (12 bit), Standard (10 bit), Speed (8 bit)					
Optical Interface	C-Mount					
Power Supply	12 V / 8 A					
Power Cons.	30 W					
Dimensions	60 mm (H) x 60 mm (W) x 100 mm (L)					
Weight	~489 g					
Software	Mosaic V3, Sample Pro					
SDK	C / C++ / C# / Python					
Operating System	Windows, Linux					
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%; Storage: Temp. -10°C~60°C, HUM 0%~85%					

Libra 3405C / 3412C

The Libra 3405C / 3412C are developed with global shutter Color CMOS sensors, offering both high speed and high resolution. They feature a wide spectral range of 350 nm–1100 nm, providing superior performance for multi-channel fluorescence imaging. Their compact design also facilitates seamless integration into instrument systems.



Key Features

Benefits

Global Shutter	High-speed, artifact-free imaging, ideal for high-throughput slide scanning.
350 nm–1100 nm wide spectrum	High sensitivity in low light and NIR, ideal for multi-channel fluorescence.
3.4 μm Pixel Size	Optimized for < 40X optical systems, enables higher resolution for cellular and tissue imaging.
10 GigE Interface	Provides higher data throughput and more stable transmission than USB 3.0. ^[1]
AI Color Correction	Provides accurate and true color reproduction for pathology applications. ^[2]
Compact Design	Facilitates seamless integration into instrument systems.

Typical Applications

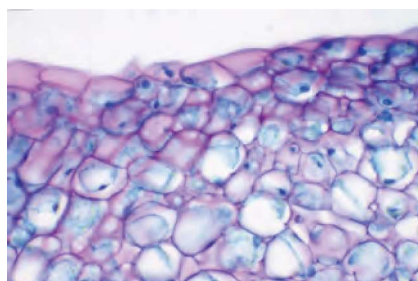
- Digital Pathology
- Microscopy Imaging
- Industrial Inspection

Noted Examples

[1] The maximum full-resolution speed is 164 fps for the Libra 3405C and 98 fps for the Libra 3412C, about three times faster than the USB 3.0 version.

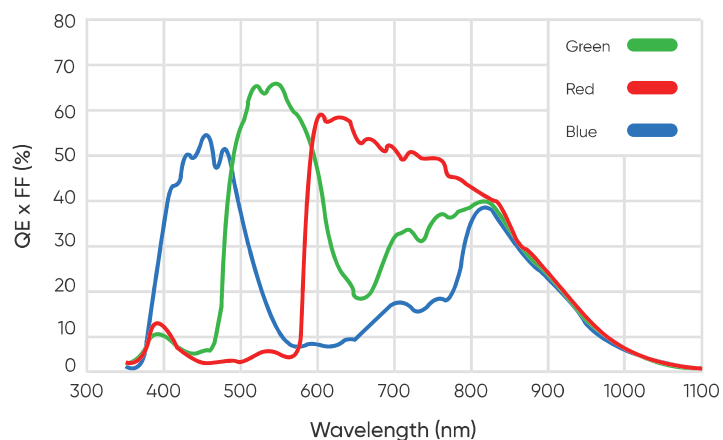
Libra 3412	GigE	98 fps
	USB 3.0	28 fps
Libra 3405	GigE	164 fps
	USB 3.0	65 fps

[2] AI color correction is trained for bright-field microscopy, eliminating manual white balance and accurately reproducing true-to-eye colors.

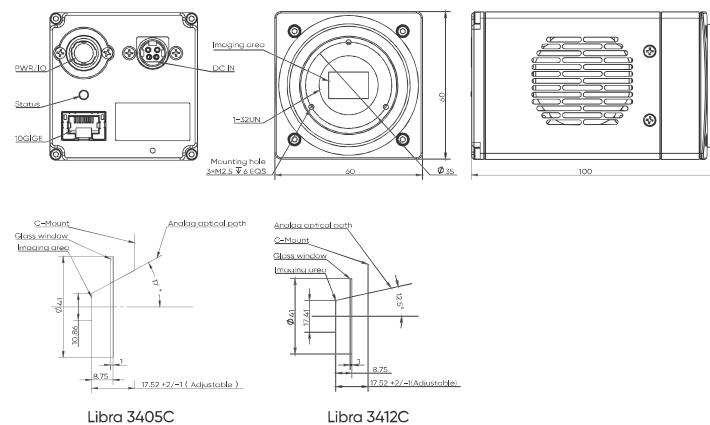


A 40x pathological photo taken by the AI Color Correction function, showing clear cellular details and distinct color gradations.

Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra 3405C			Libra 3412C		
Sensor Type	CMOS					
Sensor Model	Gpixel GMAX 3405			Gpixel GMAX 3412		
Chrome	Color					
Array Diagonal	10.9 mm (2/3")			17.4 mm (1.1")		
Effective Area	8.3 mm x 7.0 mm			14.0mm x 10.5mm		
Pixel Size	3.4 μm x 3.4 μm					
Resolution	2448 (H) x 2048 (V)			4096 (H) x 3072 (V)		
Peak QE	Please refer to the quantum efficiency curve for details					
Gain Mode	HighCapacity, Balanced, Sensitive					
Full Well Capacity	12bit: High Capacity 8.9 Ke-, Balanced 4.2 Ke-, Sensitive 0.48 Ke-			12bit: High Capacity 9 Ke-, Balanced 4.5 Ke-, Sensitive 0.7 Ke-		
Frame Rate	12 bit 100 fps	10 bit 163 fps	8 bit 164 fps	12 bit 62 fps	10 bit 65 fps	8 bit 98 fps
Readout Noise	12 bit (Median): 3.7 e-@High Capacity, 2.3 e-@Balanced, 1.4 e-@Sensitive			12 bit (Median): 3.8 e-@High Capacity, 2.5 e-@Balanced, 1.6 e-@Sensitive		
Shutter Mode	Global shutter					
Exposure Time	1 μs~10 s					
AI White Blance	Support					
Image Correction	DPC					
ROI	Support					
Binning (FPGA)	1x1 , 2x2 , 4x4					
Cooling Method	Air cooling					
Cooling Temp.	10°C@Ambient 25°C					
Dark Current	0.5 e-/p/s@10°C					
Trigger Mode	Hardware, Software					
Trigger Output	High, Low, Exposure out, Readout, Trigger Ready					
Trigger Interface	Hirose-12-Pin					
Data Interface	10 GigE					
Bit Depth	High Depth (12 bit), Standard (10 bit), Speed (8 bit)					
Optical Interface	C-Mount					
Power Supply	12 V / 8 A					
Power Cons.	32 W					
Dimensions	60 mm (H) x 60 mm (W) x 100 mm (L)					
Weight	~489 g					
Software	Sample Pro, Mosaic V3					
SDK	C / C++ / C# / Python					
Operating System	Windows, Linux					
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~90%					

Libra 3405UM / 3412UM

The Libra 3405UM / 3412UM feature global shutter monochrome CMOS sensors, delivering high speed and high resolution imaging. Covering a wide spectral range of 350 nm–1100 nm, they provide excellent performance for multi-channel fluorescence applications. With a USB 3.0 interface, these cameras offer plug-and-play operation with high-speed, low-latency data transfer, enabling direct connection to standard microscopes and computers for efficient workflows.



Key Features

Benefits

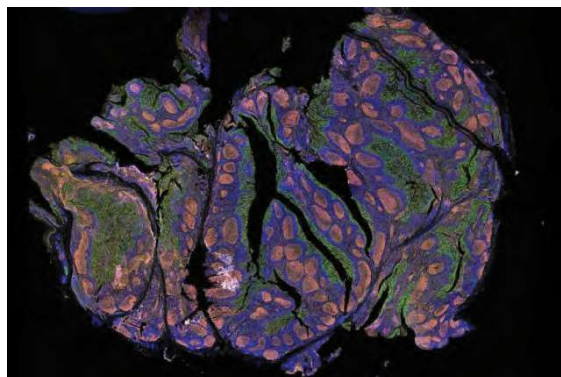
Global Shutter	High-speed, artifact-free imaging, ideal for high-throughput slide scanning.
350 nm–1100 nm Wide Spectrum	Suitable for multi-channel fluorescence and near-infrared detection.
3.4 μm Pixel Size	Optimized for < 40X optical systems, enables higher resolution for cellular and tissue imaging.
USB 3.0 Interface	Plug-and-play, enabling highly efficient microscopy workflows.
Mosaic V3 Software	Provides advanced image processing and real-time quantitative analysis to boost lab efficiency.

Typical Applications

- Fluorescence slide scanning ^[1]
- Live-cell fluorescence imaging
- Dark-field microscopy

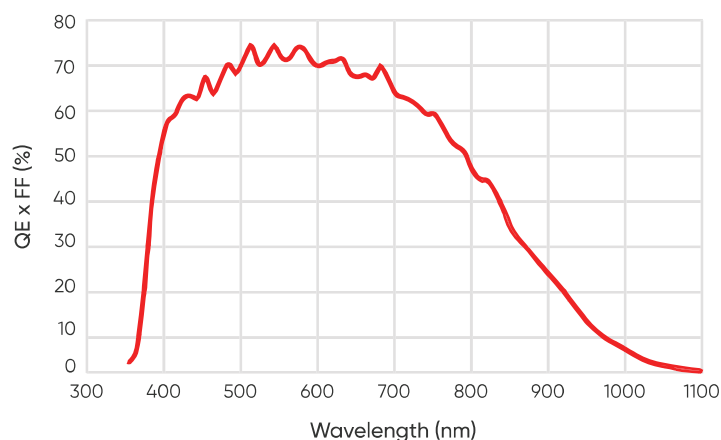
Noted Examples

[1]The Libra 3405UM / 3412UM deliver high-resolution imaging with excellent NIR sensitivity, ideal for tissue fluorescence slide scanning applications.

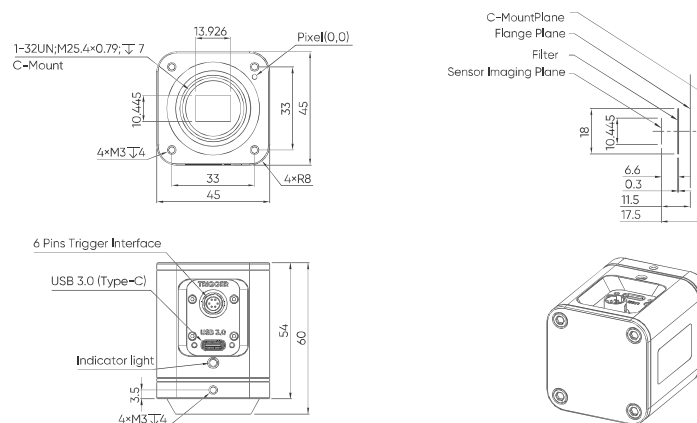


Fluorescence section scanning and stitching example of mouse gastric tissue

Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra 3405UM		Libra 3412UM	
Sensor Type	CMOS			
Sensor Model	Gpixel GMAX 3405		Gpixel GMAX 3412	
Chrome	Mono			
Array Diagonal	10.9 mm (2/3")		17.4 mm (1.1")	
Effective Area	8.3 mm x 7.0 mm		14.0mm x 10.5mm	
Pixel Size	3.4 μm x 3.4 μm			
Resolution	2448 (H) x 2048 (V)		4096 (H) x 3072 (V)	
Peak QE	75%@540 nm; 47%@800 nm			
Gain Mode	High Capacity, Balanced, Sensitive			
Full Well Capacity	12bit: High Capacity 8.7 Ke-, Balanced 4.3 Ke-, Sensitive 0.5 Ke-		12bit: High Capacity 9 Ke-, Balanced 4.5 Ke-, Sensitive 0.7 Ke-	
Frame Rate	12 bit	8 bit	12 bit	8 bit
	45 fps	65 fps	18 fps	28 fps
Readout Noise 12 bit (Median)	3.6 e-@High Capacity, 2.3 e-@Balanced, 1.6 e-@Sensitive		3.9 e-@High Capacity, 2.6 e-@Balanced, 1.3 e-@Sensitive	
Shutter Mode	Global			
Exposure Time	1 μs~10 s			
Image Correction	DPC			
ROI	Support			
Binning (FPGA)	1x1, 2x2, 4x4			
Cooling Method	Passive Cooling			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure out, Readout, Trigger Ready			
Trigger Interface	Hirose-6-Pin			
Data Interface	USB 3.0 Type C			
Bit Depth	12bit, 8bit			
Optical Interface	C-Mount / Customization			
Power Supply	USB			
Power Cons.	< 4 W			
Dimensions	45 mm (H) x 45 mm (W) x 60 mm (L)			
Weight	~162.5 g			
Software	Sample Pro, Mosaic V3, LabVIEW, MATLAB			
SDK	C / C++ / C# / Python			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~90%			

Libra 3405UC / 3412UC

The Libra 3405UC / 3412UC feature global shutter color CMOS sensors, delivering high-speed, high-resolution imaging. Covering a wide spectral range of 350 nm–1100 nm, they provide excellent performance for multi-channel fluorescence applications. Equipped with a USB 3.0 interface, they offer plug-and-play operation and direct connection to standard microscopes and computers for efficient workflows.



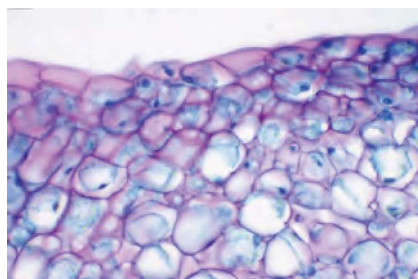
Key Features	Benefits
Global Shutter	High-speed, artifact-free imaging, ideal for high-throughput slide scanning.
350 nm–1100 nm Wide Spectrum	Suitable for multi-channel fluorescence and near-infrared detection.
3.4 μm Pixel Size	Optimized for < 40X optical systems, enables higher resolution for cellular and tissue imaging.
AI Color Correction	Provides accurate and true-to-life color reproduction for pathology applications. ^[1]
USB 3.0 Interface	Plug-and-play, enabling highly efficient microscopy workflows.
Mosaic V3 Software	Provides advanced image processing and real-time quantitative analysis to boost efficiency.

Typical Applications

- Fluorescence Scanning
- Pathology Scanning
- Bright Field Image
- Industrial Inspection

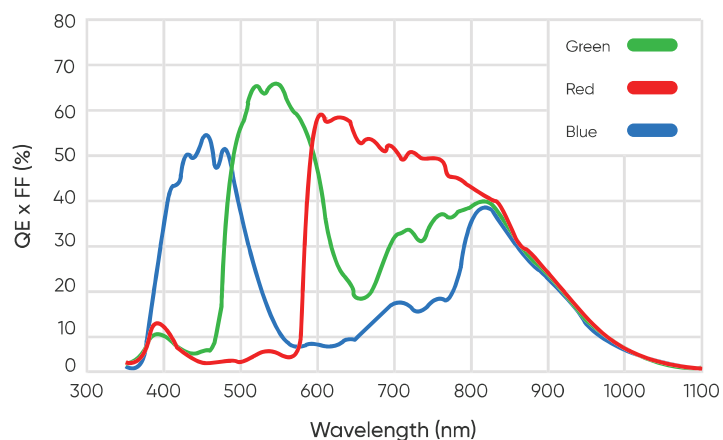
Noted Examples

[1] The AI color correction is trained for bright-field microscopy, eliminating manual white balance and accurately reproducing true-to-eye colors.

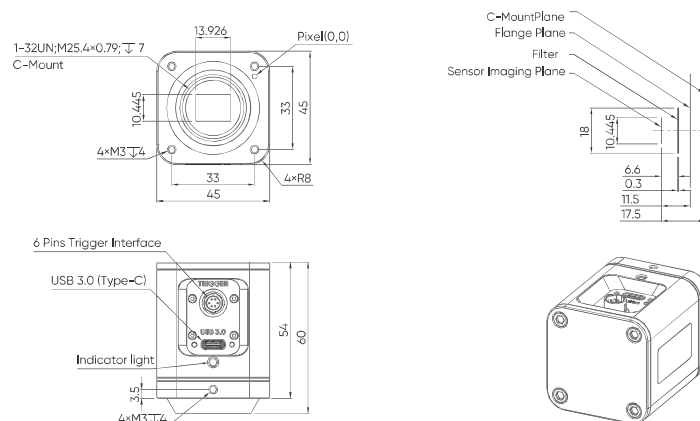


A 40x pathological photo taken by the AI Color Correction function, showing clear cellular details and distinct color gradations.

Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra 3405UC		Libra 3412UC	
Sensor Type	CMOS			
Sensor Model	Gpixel GMAX 3405		Gpixel GMAX 3412	
Chrome	Color			
Array Diagonal	10.9 mm (2/3")		17.4 mm (1.1")	
Effective Area	8.3 mm x 7.0 mm		14.0mm x 10.5mm	
Pixel Size	3.4 μm x 3.4 μm			
Resolution	2448 (H) x 2048 (V)		4096 (H) x 3072 (V)	
Peak QE	Please refer to the quantum efficiency curve for details			
Gain Mode	High Capacity, Balanced, Sensitive			
Full Well Capacity	12bit: High Capacity 8.7 Ke-, Balanced 4.5 Ke-, Sensitive 0.5 Ke-		12bit: High Capacity 9 Ke-, Balanced 4.4 Ke-, Sensitive 0.7 Ke-	
Frame Rate	12 bit	8 bit	12 bit	8 bit
	45 fps	65 fps	18 fps	28 fps
Readout Noise 12 bit (Median)	3.6 e-@High Capacity, 2.3 e-@Balanced, 1.6 e-@Sensitive		3.9 e-@High Capacity, 2.6 e-@Balanced, 1.8 e-@Sensitive	
Shutter Mode	Global			
Exposure Time	1 μs~10 s			
AI White Blance	Support			
Image Correction	DPC			
ROI	Support			
Binning (FPGA)	1x1 , 2x2 , 4x4			
Cooling Method	Passive Cooling			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure, Readout, Trigger Ready			
Trigger Interface	Hirose-6-Pin			
Data Interface	USB 3.0			
Bit Depth	12bit, 8bit			
Optical Interface	C-Mount / Customization			
Power Supply	USB			
Power Cons.	< 4 W			
Dimensions	45 mm (H) x 45 mm (W) x 60 mm (L)			
Weight	~162.5 g			
Software	Sample Pro, Mosaic V3, LabVIEW, MATLAB			
SDK	C / C++ / C# / Python			
Operating System	Windows, Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~90%			

Libra UV

The Libra UV is a UV global shutter CMOS camera for high-speed, high-resolution semiconductor inspection. It's proven in processes like patterned wafer inspection, mask alignment, and wafer bonding. With strong UV sensitivity, it's also promising for biospectral analysis, medical, and electronics testing.



Key Features

Benefits

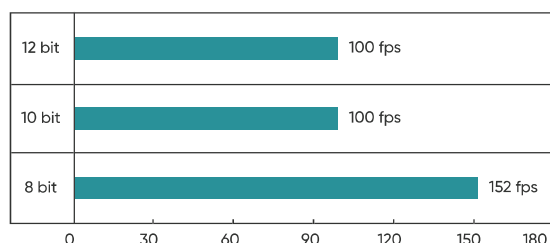
UV Enhancement	Covers 200 nm to 1000 nm, with quantum efficiency up to 48% at 365 nm.
Global Shutter	Enables clear capture of fast-moving samples.
High-Speed & High-Resolution	Up to 100 fps at 12-bit and 152 fps at 8-bit at full 8.1 Megapixel resolution. ^[1]
10 GigE Interface	High-speed and stable transmission, uncompressed data, flexible wiring.
Compact Design	Facilitates seamless integration into instrument systems.

Typical Applications

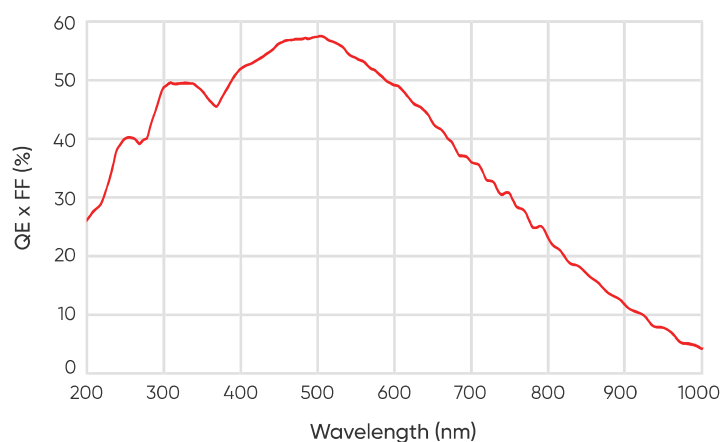
- Semiconductor Inspection
- Material Classification
- Infrastructure Testing
- Life Sciences

Noted Examples

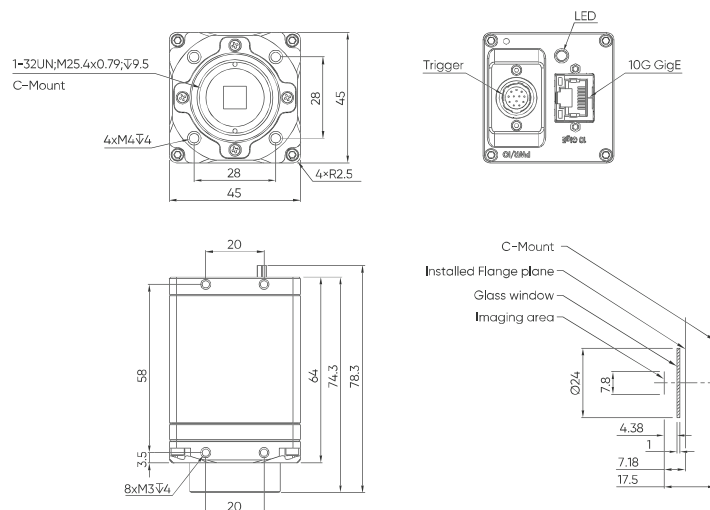
[1] The Libra UV utilizes Global Shutter technology and a 10 GigE interface to achieve transfer speeds of up to 100 fps at 12-bit and 152 fps at 8-bit with full 8.1 megapixel resolution, demonstrating a significant advantage in high-speed performance.



Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra UV
Sensor Type	CMOS
Sensor Model	SONY IMX487
Spectrum	Visible/UV
Chrome	Mono
Peak QE	56%@500 nm, 48%@365 nm
Array Diagonal	11 mm (2/3")
Effective Area	7.8 mm x 7.8 mm
Resolution	2856 (H) x 2848 (V)
Pixel Size	2.74 μm x 2.74 μm
Gain	Supports analog gain (1 ~15.7) and digital gain (15.8 ~ 126)
Frame Rate	152 fps@8 bit, 100 fps@10 bit, 100 fps@12 bit
Full Well Capacity	10 bit: 9000 e ⁻ @gain 1, 580 e ⁻ @gain 15.7; 12 bit: 9250 e ⁻ @gain 1, 555 e ⁻ @gain 15.7
Readout Noise	10 bit: 3.9 e ⁻ (RMS)@gain 1, 2.1 e ⁻ (RMS)@gain 15.7; 12 bit: 2.4 e ⁻ (RMS)@gain 1, 1.5 e ⁻ (RMS)@gain 15.7
Dynamic Range	10 bit: 65 dB@gain 1, 49.1 dB@gain 15.7; 12 bit: 72 dB@gain 1, 52 dB@gain 15.7
Shutter Mode	Global
Exposure Time	8 bit: 2 μs ~10 s; 10, 12 bit: 3 μs ~10 s
DSNU	0.38 e ⁻
PRNU	0.52%
Image Correction	DPC
ROI	Support
Binning	Bin 1 x 2 (Avg and Sum), Bin 2 x 1 (Avg and Sum), Bin 2 x 2 (Sum)
Timestamp Acc.	1 μs
Trigger Mode	Hardware, Software
Trigger Output	High, Low, Trigger Ready, Readout, Exposure Out
Trigger Interface	Hirose-12-pin
Data Interface	10 GigE
Bit Depth	8 bit, 10 bit, 12 bit
Optical Interface	C Mount
Power Supply	12 V / 2 A, PoE support
Power Cons.	≤ 12 W
Dimensions	45 mm (H) x 45 mm (W) x 74.3 mm (L)
Software	Sample Pro
SDK	C / C++ / C# / Python
Operating System	Windows, OpenEuler
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~85%

Model	Libra 536
Sensor Type	CMOS
Sensor Model	SONY IMX536
Spectrum	Visible
Chrome	Mono
Peak QE	72%@470 nm
Array Diagonal	11 mm (2/3")
Effective Area	7.8 mm x 7.8 mm
Resolution	2856 (H) x 2848 (V)
Pixel Size	2.74 μm x 2.74 μm
Gain	Supports analog gain (1 ~15.7) and digital gain (15.8 ~ 126)
Frame Rate	152 fps@8 bit, 100 fps@10 bit, 100 fps@12 bit
Full Well Capacity	10 bit: 9000 e ⁻ @gain 1, 580 e ⁻ @gain 15.7; 12 bit: 9250 e ⁻ @gain 1, 555 e ⁻ @gain 15.7
Readout Noise	10 bit: 3.8 e ⁻ (RMS)@gain 1, 2.0 e ⁻ (RMS)@gain 15.7; 12 bit: 2.5 e ⁻ (RMS)@gain 1, 1.4 e ⁻ (RMS)@gain 15.7
Dynamic Range	10 bit: 65 dB@gain 1, 49.1 dB@gain 15.7; 12 bit: 72 dB@gain 1, 52 dB@gain 15.7
Shutter Mode	Global
Exposure Time	8 bit: 2 μs ~10 s; 10, 12 bit: 3 μs ~10 s
DSNU	0.38 e ⁻
PRNU	0.52%
Image Correction	DPC
ROI	Support
Binning	Bin 1 x 2, Bin 2 x 1, Bin 2 x 2
Timestamp Acc.	1 μs
Trigger Mode	Hardware, Software
Trigger Output	High, Low, Trigger Ready, Readout, Exposure Out
Trigger Interface	Hirose-12-pin
Data Interface	10 GigE
Bit Depth	8 bit, 10 bit, 12 bit
Optical Interface	C Mount
Power Supply	12-24 V, PoE support
Power Cons.	≤ 12 W
Dimensions	45 mm (H) x 45 mm (W) x 74.3 mm (L)
Software	Sample Pro
SDK	C / C++ / C# / Python
Operating System	Windows, Linux
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~85%

Libra 16 / 22 / 25

The Libra 16/22/25 series are designed by Tucsen to meet the growing demand of imaging fields in microscopy. These large-format monochrome cooled cameras are tailored for scientific and industrial applications.



Key Features

Benefits

Large Format Design	16 mm, 22 mm and 25 mm options for large field-of-view microscopy. ^[1]
High SNR Performance	92% QE and 1.0 e ⁻ read noise for high SNR imaging.
High-speed Trigger	Synchronizes with illumination devices to enable high-speed, multi-channel imaging.
Mosaic V3 Compatibility	Supports advanced analysis and smart image processing.

Typical Applications

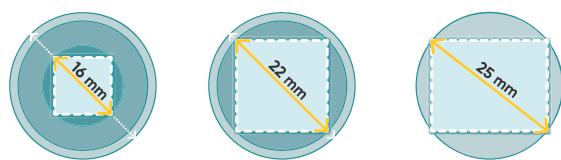
- Fluorescence Imaging
- Tissue Slide Scanning
- High-Throughput Imaging
- Live-Cell Imaging

Noted Examples

[1] Libra 16: Suitable for standard C-mount field of view;

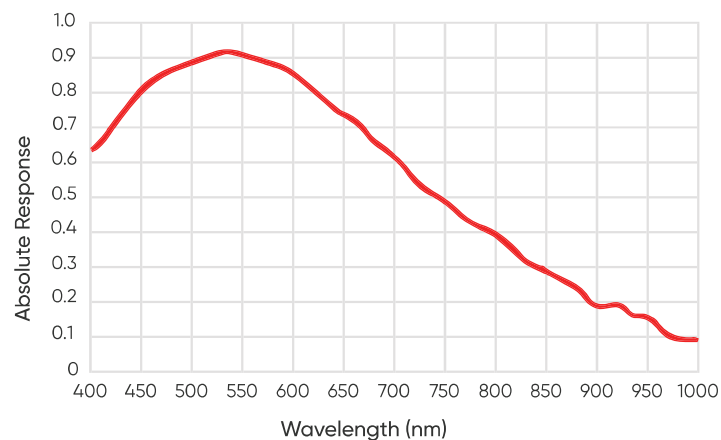
Libra 22: Compatible with mainstream fluorescence microscopy systems;

Libra 25: Designed for ultra-wide field microscopy systems.

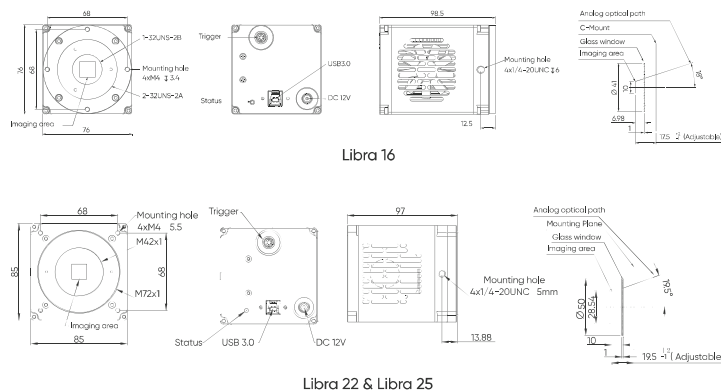


Model	Libra 16	Libra 22	Libra 25
Diagonal	16 mm	22 mm	25 mm
Resolution	1500x1500	2048x2048	2600x2048
Optical Interface	C mount	C mount	T/F mount

Quantum Efficiency



Dimensions (Unit: mm)



Model	Libra 16	Libra 22	Libra 25
Sensor Type	BSI CMOS Sensor		
Chrome	Mono		
Pixel Size	7.52 μm @High Sensitivity Mode, 3.76 μm @High resolution mode		
Array Diagonal	16 mm	22 mm	25 mm
Resolution	1500 x 1500	2048 x 2048	2600 x 2048
Effective Area	11.28 mm x 11.28 mm	15.40 mm x 15.40 mm	19.55 mm x 15.40 mm
Peak QE	92%@530 nm		
Dark Current	< 0.01 e ⁻ /pixel/s		
Bit Depth	14 bit / 16 bit		
Full Well Capacity	3 Ke ⁻ (High Gain) / 48 Ke ⁻ (Low Gain)		
Readout Noise	1.0 e ⁻ (High Gain)		
Frame Rate	59 fps@HS	38 fps@HS	32 fps@HS
Shutter Mode	Rolling		
Binning	2 x 2, 4 x 4		
Exposure Time	6 μs ~60 s		
Image Correction	DPC, DSNU, PRNU		
ROI	Support		
Cooling Method	TEC (Air Cooling)		
Cooling Temp.	Stable cooling to 0°C		
Trigger Mode	Hardware, Software		
Trigger Output	Exposure start, global, readout end, high level, low level		
Trigger Interface	Hirose-6-Pin		
SDK	C / C++ / C#		
Software	Mosaic V3, Sample Pro, Micro-Manager 2.0		
Data Interface	USB 3.0		
Optical Interface	C Mount	C Mount	T / F Mount
Power Supply	12 V / 6 A		
Power Cons.	14 W	25 W	25 W
Dimensions (mm)	76 (H) x 76 (W) x 98.5 (L)	85 (H) x 85 (W) x 97 (L)	85 (H) x 85 (W) x 97 (L)
Weight	835 g	945 g	945 g
Operating System	Windows, Linux		
Environment	Working: Temp. 0°C~40°C, HUM 0%~85%, Storage: Temp. 0°C~60°C, HUM 0%~90%		

FL 26BW

The FL 26BW is a cooled CMOS camera designed for long exposure imaging. It not only incorporates high sensitivity and low noise advantages from latest sensor technologies, but also leverages Tucsen's many years experiences on cooling chamber design and advanced image processing. FL 26BW is able to capture clean and even images for up to 60 minutes exposure time.



Key Features

Benefits

SONY BSI CMOS	92% peak QE, 0.9 e ⁻ readout noise and no glow.
< 0.0005 e ⁻ /p/s Dark Current	Equivalent to the cooled CCD for long exposure imaging.
16000 : 1 Dynamic Range	More than 4X that of the CCD, greatly expanding the signal detection range.
Pixel Correction Technology	High background quality ensures more accurate quantitative analysis. [1]
Flexible Binning Mode	Improving the sensitivity and dynamic range capability.
High Reliability Cooling Chamber	Cooled to -25°C@22°C, no condensation or other problems.
Compact Design	Conducive to instrument system integration.

Typical Applications

- Chemiluminescence
- Bioluminescence
- dPCR
- Fluorescence Imaging

Noted Examples

[1] The FL 26BW has excellent background uniformity, as it has basically eliminated the bad factors such as amplifier glow and bad pixels.

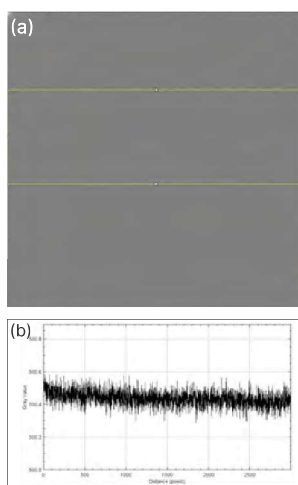
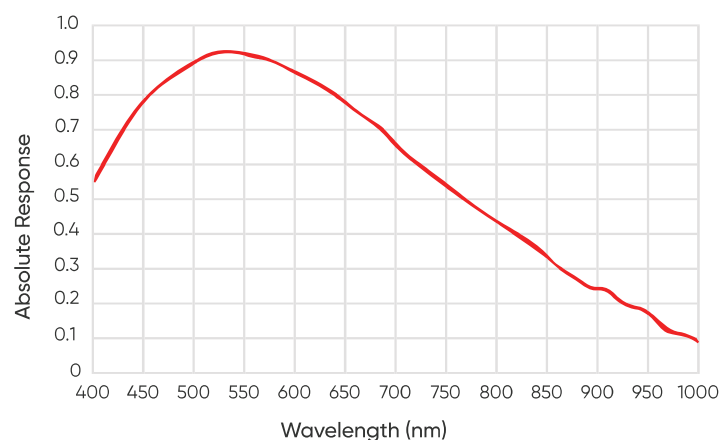
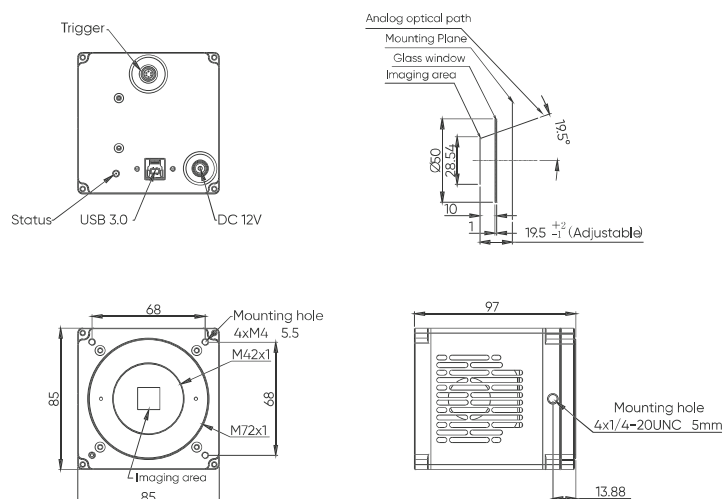


Figure (a) is the background image taken by FL 26BW with 600s exposure. Figure (b) is the grayscale intensity curve corresponding to the yellow region, showing excellent background uniformity.

Quantum Efficiency



Dimensions (Unit: mm)



Model	FL 26BW			
Sensor Type	BSI CMOS			
Sensor Model	SONY IMX571BLR-J			
Chrome	Mono			
Array Diagonal	28.3 mm (1.8")			
Effective area	23.4 mm x 15.6 mm			
Pixel Size	3.76 μm x 3.76 μm			
Resolution	6240 x 4168			
Peak QE	92%@530 nm			
Dark Current	< 0.0005 e ⁻ /p/s			
Bit Depth	16 bit			
Gain Mode	Gain 0	Gain 1	Gain 2	Gain 3
Full Well Capacity	49 Ke ⁻	15 Ke ⁻	7.8 Ke ⁻	3 Ke ⁻
Readout noise	2.7 e ⁻	1.0 e ⁻	0.95 e ⁻	0.85 e ⁻
Frame Rate	6.5 fps@6240 x 4168 (Standard), 3.4 fps@6240 x 4168 (Low Noise), 35.5 fps@3120 x 2084 (Sensor Bin)			
Shutter Mode	Rolling, Global Reset			
Exposure Time	34 μs ~60 min			
Image Correction	DPC			
ROI	Support			
Binning	2 x 2, 3 x 3, 4 x 4, 5 x 5, 6 x 6, 8 x 8, 16 x 16			
Cooling Method	Air Cooling			
Cooling Temp.	-25°C@ambient 22°C			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Global, Readout End, High Level, Low Level			
Trigger Interface	Hirose			
SDK	C / C++ / C# / Python			
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
Data Interface	USB 3.0			
Optical Interface	M42 / Customizable			
Power Supply	12 V / 8 A			
Power Cons.	≤ 50 W			
Dimensions	85 mm (H) x 85 mm (W) x 97 mm (L)			
Weight	945 g			
Operating System	Windows / Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%, Storage: Temp. -10°C~60°C, HUM 0%~85%			

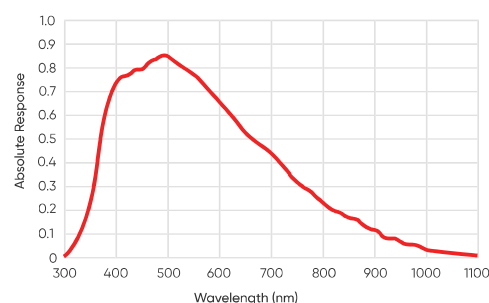
Model	FL 9BW		FL 9BW LT	
Sensor Type	BSI CMOS			
Sensor Model	SONY IMX533CLK-D			
Chrome	Mono			
Array Diagonal	15.96 mm (1")			
Effective area	11.28 mm x 11.28 mm			
Pixel Size	3.76 μm × 3.76 μm			
Resolution	3000 × 3000, 9 MP			
Peak QE	92%@540 nm			
Dark Current	< 0.0005 e-/p/s			
Gain Mode	Gain 0 HFWC	Gain 1 Balance	Gain 2 High Sensitivity 1	Gain 3 High Sensitivity 2
Full Well Capacity	48 Ke-@bin 1	16 Ke-@bin 1	7.8 Ke-@bin 1	3.1 Ke-@bin 1
Readout Mode	Standard, Low-Noise			
Readout Noise (LowNoise)	2.5 e-@Gain 0	1.0 e-@Gain 1	0.85 e-@Gain 2	0.75 e-@Gain 3
Frame Rate	19 fps@Standard Mode, 12 fps@Low Noise Mode			
Shutter Mode	Rolling			
Exposure Time	15 μs~60 min			
Image Correction	DPC			
ROI	Support			
Binning	2 x 2, 3 x 3, 4 x 4, 6 x 6, 8 x 8, 12 x 12, 16 x 16, 24 x 24			
Cooling Method	Air Cooling			
Cooling Temp.	-25°C@Room Temp. (25°C)			
Trigger Mode	Hardware, Software			
Trigger Output	Exposure Start, Global, Readout End, High Level, Low Level			
Trigger Interface	Hirose-6-pin			
SDK	C / C++ / C# / Python			
Data Interface	USB 3.0			
Software	Mosaic V3, Sample Pro, LabVIEW, MATLAB, Micro-Manager 2.0			
Optical Interface	C-Mount / Customizable			
Bit Depth	14 bit, 16 bit			
Power Supply	12 V / 6 A			
Power Cons.	≤ 46 W			
Dimensions	76 mm (H) x 76 mm (W) x 98.5 mm (L)			
Weight	835 g			
Operating System	Windows / Linux			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85% Storage: Temp. -10°C~60°C, HUM 0%~85%			

FL 20 / 20BW

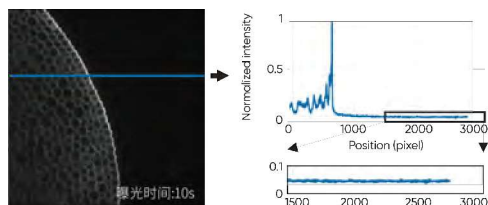
The FL 20 series are cooled CMOS cameras designed for low-magnification fluorescence microscopy. Advanced cooling and noise-reduction technology significantly minimize thermal noise, capturing cleaner fluorescence background images, ideal for high-quality documentation and publication.



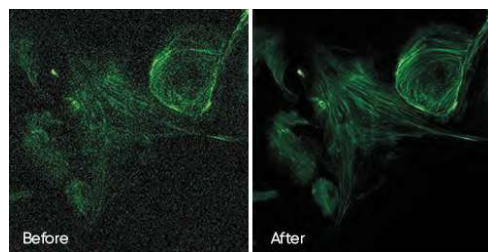
Quantum Efficiency



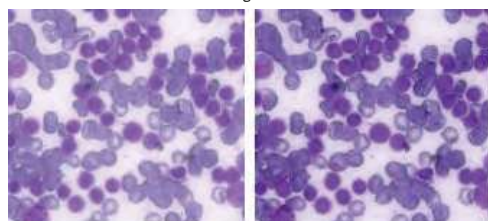
Application Cases



Dark current as low as 0.001 e⁻/pixel/s



Real-time 3D noise reduction for a cleaner fluorescence background



Real-time sharpening for higher-quality color images

Specification

Model	FL 20BW	FL 20
Sensor Type	SONY BSI CMOS (IMX183C)	
Chrome	Mono	Color
Array Diagonal	15.86 mm (1")	
Effective area	13.1 mm x 8.8 mm	
Pixel Size	2.4 μm x 2.4 μm	
Peak QE	84%	
Shutter Mode	Rolling	
Resolution	5472 (H) x 3648 (V), 20 MP	
Frame Rate	16 fps	14 fps
Readout Noise	0.6 e ⁻	< 1 e ⁻
Dark Current	0.001 e ⁻ /p/s	
Full Well Capacity	16 Ke ⁻	
Bit Depth	8 bit, 16 bit	
Exposure Time	3 μs~3600 s	
Binning	Support	
Software	Mosaic V3	
Image Format	TIFF, JPG, PNG, DICOM	
Multi-Camera	Supports 4 Cameras Simultaneously in SDK	
SDK	C / C++ / C# / Directshow / Twain	
Data Interface	USB 3.0	
Optical Interface	C-mount	
Power Supply	12 V	
Dimensions	85 mm (H) x 85 mm (W) x 112 mm (L)	
Weight	980 g	
Operating System	Windows, Linux	
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%	

TrueChrome Series

The TrueChrome series HDMI cameras operate without a computer, allowing “capture–process–measure–save–export” directly via mouse. Some models also feature high-speed USB 3.0 interfaces, fully compatible with Tucsen Mosaic professional image processing software.



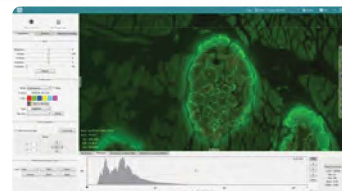
No need for a computer



Autofocus



Fast shooting and measurement



Compatible with Mosaic V3

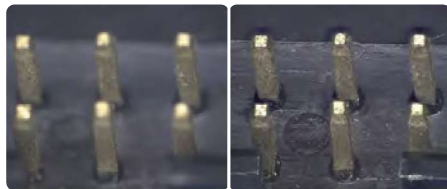
Model	TrueChrome 4K Pro / WiFi	TrueChrome PDAF	TrueChrome Metrics	HD Lite
Sensor Type	SONY CMOS (Color)			
Array Diagonal	13.33 mm	5.28 mm	6.46 mm	7.13 mm
Resolution	3840 (H) x 2160 (V)	2880 (H) x 1620 (V)	1920 (H) x 1080 (V)	2592 (H) x 1944 (V)
Pixel Size	2.9 μm x 2.9 μm	1.6 μm x 1.6 μm	2.9 μm x 2.9 μm	2.2 μm x 2.2 μm
Effective area	11.1 mm x 6.3 mm	4.6 mm x 2.6 mm	5.6 mm x 3.1 mm	5.1 mm x 3.8 mm
Exposure Time	1 μs ~1 s	1 μs ~5 s	1 μs ~1 s	1 ms~2 s
Frame Rate	30 fps@USB 3.0 30 fps@HDMI 30 fps@LAN	50 fps@USB 2.0 60 fps@HDMI	30 fps@USB 2.0 25 fps@HDMI	15 fps@USB 2.0 15 fps@HDMI
HDMI Settings	Preview: 3840 x 2160 Capture: 3840 x 2160 Video: 30 fps@4K	Preview: 1920 x 1080 Capture: 3264 x 1840 Video: 15 fps@1080P	Preview: 1920 x 1080 Capture: 3264 x 1840 Video: 25 fps@1080P	Preview: 1920 x 1080 Capture: 2592 x 1944 Video: 15 fps@1080P
Data Interface	HDMI, USB 3.0, USB 2.0, LAN	HDMI, USB2.0, SD card	HDMI, USB 2.0, SD card	HDMI, USB2.0, SD card
Image Format	TIFF, JPG, PNG, DICOM			
Shutter Mode	Rolling			
Color Temp.	1800 K~10000 K			
SD Format	FAT 32			
Software	HDMI: Cloud 1.0 Ver; USB: Mosaic V3			
Multi-Camera	Supports 4 Cameras Simultaneously in SDK			
Optical Interface	C-mount			
Power Cons.	2.4 W			
Dimensions (mm)	105.7 (H) x 78 (W) x 70.8 (L)	90.7 (H) x 74 (W) x 67.2 (L)	90.7 (H) x 78 (W) x 70.8 (L)	90.7 (H) x 74 (W) x 67.2 (L)
Weight	505 g	452 g	265 g	265 g
PC Configuration	CPU: Intel Core i5 or higher (Quad-core or higher), RAM: 8 GB or higher			
Operating System	Windows 7, 10 (32 Bit / 64 Bit), Mac			

Mlchrome Series

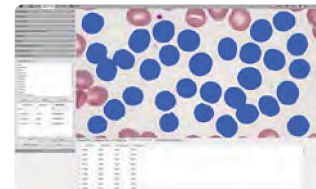
The Mlchrome series offers a range of professional microscopy cameras for brightfield and fluorescence imaging. Equipped with USB 3.0, they fully support Tucsen Mosaic software, including real-time image stitching and depth-of-field fusion, enhancing workflow efficiency.



Real-time Image Stitching



Real-time Depth Fusion



Automatic Counting

Model	Mlchrome 5 Pro	Mlchrome 20	Mlchrome 16	Mlchrome 6
Sensor Type	SONY CMOS (Color)			
Array Diagonal	11.1 mm	15.86 mm	7.77 mm	8.92 mm
Resolution	2448 (H) x 2048 (V)	5472 (H) x 3648 (V)	4608 (H) x 3456 (V)	3072 (H) x 2048 (V)
Pixel Size	3.45 μm x 3.45 μm	2.4 μm x 2.4 μm	1.34 μm x 1.34 μm	2.4 μm x 2.4 μm
Effective area	8.4 mm x 7.1 mm	13.1 mm x 8.8 mm	6.2 mm x 4.6 mm	7.4 mm x 4.9 mm
Exposure Time	124 μs ~15 s	18 μs ~15 s	22 μs ~26 s	11 μs ~12 s
Frame Rate	35.9 fps (2448 x 2048)	14.5 fps (5472 x 3648)	12 fps	41 fps
	88.8 fps (1224 x 1024)	53.1 fps (2736 x 1824)		
		67.3 fps (1824 x 1216)		
Shutter Mode	Global Shutter	Rolling	Rolling	Rolling
Bit Depth	16 bit, 8 bit			
Binning	2 x 2, 3 x 3, 4 x 4			
Color Temp.	2000 K~15000 K			
Software	Mosaic V3			
Image Format	TIFF, JPG, PNG, DICOM			
Multi-Camera	Supports 4 Cameras Simultaneously in SDK			
SDK	C / C++ / C# / Directshow / Twain			
Optical Interface	C-mount			
Power Cons.	3 W			
Data Interface	USB 3.0			
Dimensions	68 mm (H) x 68 mm (W) x 46 mm (L)			
Weight	327 g			
PC Configuration	CPU: Intel Core i5 or higher (Quad-core or higher), RAM: 8GB or higher			
Operating System	Windows 7, 10 (32 Bit / 64 Bit), Mac			
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%			

GT Series

The GT series USB 2.0 cameras use Tucsen's innovative graphics acceleration technology, significantly increasing frame rates while preserving original image output, making them an economical choice for basic microscopy imaging.

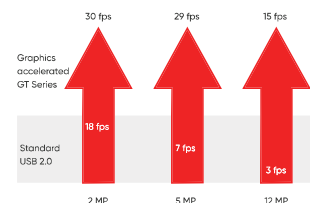
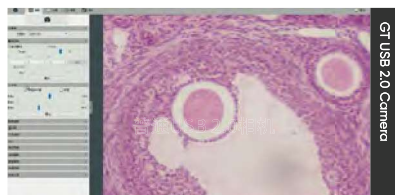


Image Acceleration Technology



Smooth and Clear Display

VS

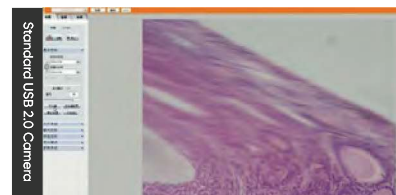


Image Distortion & Latency

Model	GT 12	GT 5.0	GT 2.0
Sensor Type	SONY CMOS (Color)		
Array Diagonal	7.77 mm	6.52 mm	6.23 mm
Resolution	4000 (H) x 3000 (V)	2560 (H) x 1920 (V)	1920 (H) x 1080 (V)
Pixel Size	1.34 μm x 1.34 μm	2.0 μm x 2.0 μm	2.8 μm x 2.8 μm
Effective area	5.4 mm x 4.0 mm	5.1 mm x 3.8 mm	5.4 mm x 3.0 mm
Frame Rate	15 fps	29 fps	30 fps
Shutter Mode	Rolling		
Exposure Time	1 μs ~1 s 941 ms		
Multi-Camera	Supports 4 Cameras Simultaneously in SDK		
Image Format	TIFF, JPG, PNG, DICOM		
Operating System	Windows 7, 10 (32 Bit / 64 Bit), Mac		
Software	Mosaic V3		
SDK	C / C++ / C# / Directshow / Twain		
Power Cons.	2 W		
Optical Interface	C-mount		
Data Interface	USB 2.0		
PC Configuration	CPU: Intel Core i5 or higher (Quad-core or higher), RAM: 8GB or higher		
Dimensions	68 mm (H) x 68 mm (W) x 42.5 mm (L)		
Weight	236 g		
Environment	Working: Temp. 0°C~40°C, HUM 10%~85%		

Mosaic 3.0 Software

1) Precision Imaging Control

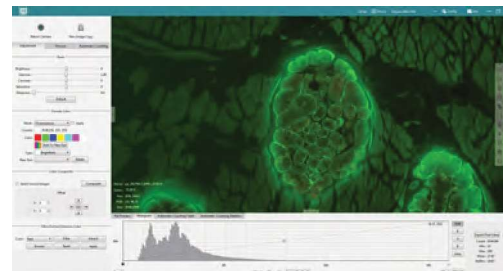
Precise control, processing, and analysis of imaging parameters.

2) Advanced Image Processing

Comprehensive real-time analysis tools and computational imaging functions.

3) Customizable Interface

Create custom layouts and workflows tailored to your tasks.



SDK for Developers

Tucsen SDK is a powerful development tool, enabling easy integration across multiple platforms.

- 1) SDK dynamic library files, development instruction and MFC/C# sample source code.
- 2) Windows, Mac and Linux support using the same interface to develop
- 3) GenICam support using standard protocol and general port and function calling
- 4) C/C++/C#/Python support
- 5) Multi-camera support, integration and development
- 6) Rapid support of newly released product features



Third-Party Software

Tucsen supports a wide variety of third-party software packages, enabling compatibility with numerous markets and applications.

- 1) Scientific Software: Micro-Manager, MATLAB, LabVIEW, ImagePro*, Visiview*
- 2) Astrophysics Software: MAXIMDL, EPICS*
- 3) Medical Imaging Protocols: DirectShow, TWAIN

Note: *Support is limited to specific models and requires assistance from the software provider.

OEM / ODM

Tuscen has extensive experience in OEM/ODM services for scientific cameras. We supply tens of thousands of products to clients annually, which are applied in various markets worldwide. Our services cover new product development, product upgrading, and cost control, enabling us to help clients address issues in fields such as production quality, scientific research, and medical applications. As your premium partner, we are dedicated to providing valuable support.



Benefits

1) Take First-Mover Advantage

We introduce industry-leading technologies every year, such as sCMOS, BSI TDI, large formats, and soft X-ray variations. By rapidly incorporating the latest technology, we help our partners expand their product capabilities, giving them a first-mover advantage in their own markets.

3) Save Switching Time and Costs

We can provide rapid customization by leveraging a series of core technical platforms developed through 10 years of OEM project experience. We understand your space limitations, software needs, and technical and quality requirements.

2) Maintain Quality Consistency

We manage our business efficiently to deliver consistent results. Our advanced manufacturing facilities and China-based supply chains ensure you can be worry-free even in tight supply and demand situations.

4) Efficient Support

We offer a global support network, ensuring you can access information in your own time zone. These teams work quickly and efficiently with our factory teams to provide answers to your questions regarding product functionality or delivery/shipment status.





Camera Technology
Focused on Scientific Imaging
and Challenging Inspection

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