

4. sCMOS Camera

(1) BUC6IA-400A Cooled BSI sCMOS Camera



BUC6IA-400A Cooled BSI sCMOS Camera

Feature

1. Smaller size but more functions

BUC6IA-400A adopts new technology and performance standard. The smallest dimension among peers for scientific imaging make it more popular for demanding compact space. The smallest dimension among peers for scientific imaging makes it more popular for demanding compact space. The water-cooling method and CameraLink interface apply the camera for conditions requiring high stability.

2. Faster readout by doubling speed

ROI	Normal(16-bit)	STD(12-bit)
2048 x 2048	24	48
1608 x 1608	31	61
1200 x 1200	41	81
1024 x 1024	48	95
2048 x 512	95	190
2048 x 256	189	375
2048 x 128	369	739

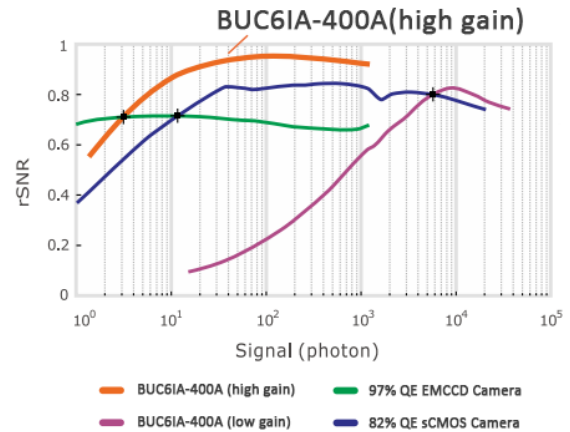
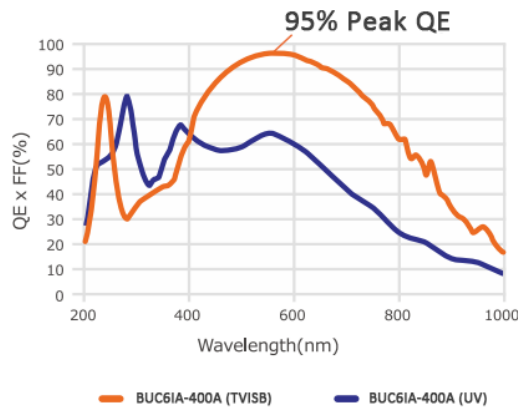
BUC6IA-400A adds a STD high speed readout mode, of which the frame rate is up to 48fps@4.2MP which is twice as the normal mode. It can be achieved progressively by using ROI function for applications demanding special frame rate.

3. Superior background with accurate calibration

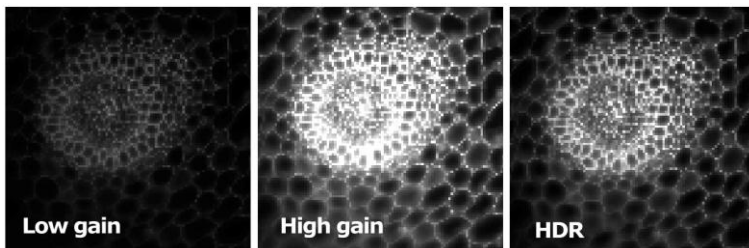
BUC6IA-400A now can provide a superior background for quantitative analysis applications. The DSNU/PRNU have reached the international optimum of 0.2e- and 0.3% respectively, as the problems from sensor production process, such as edge glow, dead pixels as well as pixel non-uniformity, all have been calibrated accurately.

4. 95% quantum efficiency, and excellent SNR

BUC6IA-400A uses backside-illuminated sCMOS thinned chip technology to avoid light interference from the wiring layer. It has excellent response capabilities in the ultraviolet, visible and near-infrared bands, with a peak quantum efficiency of up to 95%@560nm, and when the number of incident photons are more than 3, it can have a better SNR performance than the typical EMCCD camera of 97% peak QE.

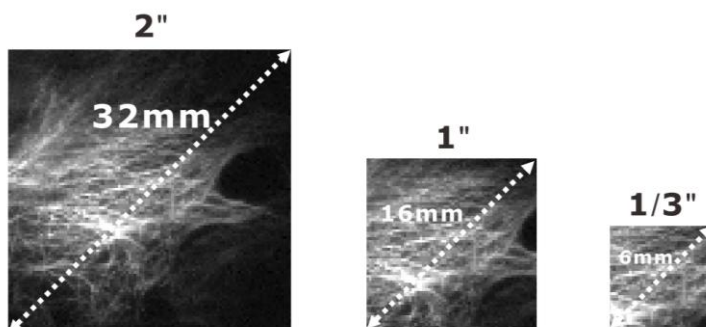


5. 100Ke- full-well capacity, high dynamic range



Thanks to the 11 μ m large pixel, BUC6IA-400C full-well capacity can be up to 100000electrons,. Advanced High Dynamic (HDR) mode, through dual-channel gain combined, it can present high-quality images with rich details of dark and bright in real time, which is very useful in applications such as life science.

6. 2" area, large field of view



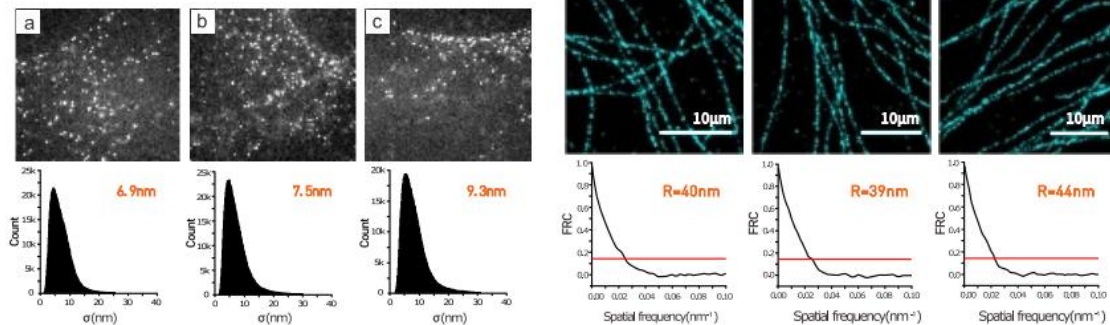
2" array can not only adapt to more optical interfaces and deliver a greater field of view, but also results in fewer lens switches to find the area of interest on the sample.

7. STORM Imaging

"Extensive test and comparisons with other top-of-the-line EMCCD and sCMOS cameras have been performed in our laaboratory. We found BUC6IA-400A, the new sCMOS camera stood its own ground remarkably well and offered satisfactory performance across the board."

-Professor Ning Fang at Georgia State University

- a. 95% QE BUC6IA-400A
- b. 97% QE EMCCD camera
- c. 82% QE sCMOS camera



8. Soft X-ray detection

“The distinctive features of BUC6IA-400A make it an excellent alternative to back-illuminated CCDs which are commonly applied in soft X-ray applications of previous-generation synchrotrons, such as coherent scatter experiments. They would greatly benefit fully from the BUC6IA high frame rates.”

-Kewin Dshardins, from the French SOLEIL synchrotron

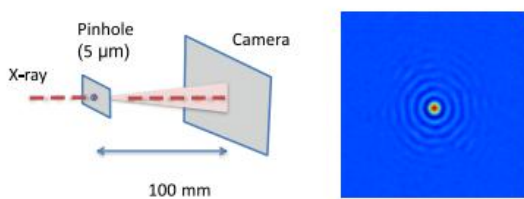


Figure 1

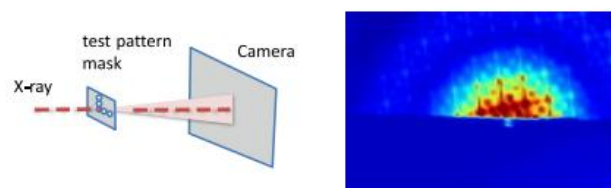


Figure 2

Figure 1. A 5 micron pinhole diffraction spot of 186 eV recorded by BUC6IA-400A, which shows excellent dynamic range with its image diffraction order of the reached to the maximum value, the 6th.

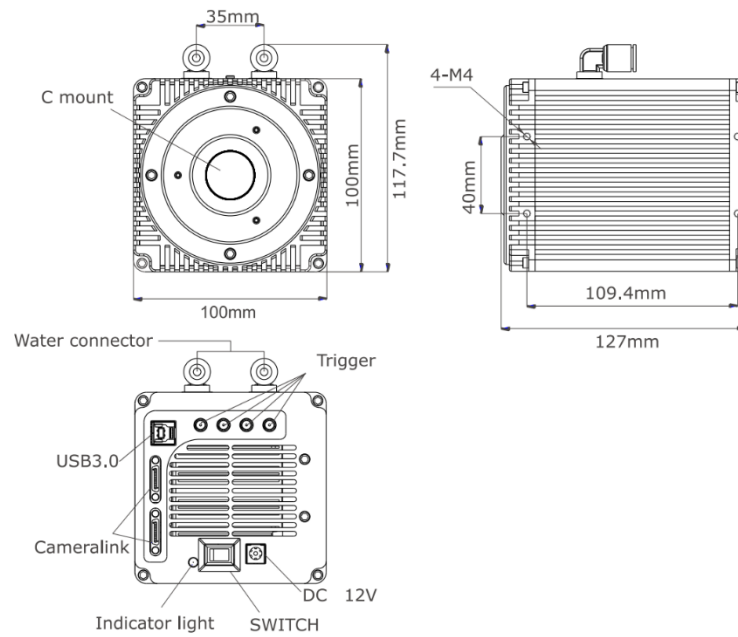
Figure 2. A composited radia-illumination image accumulated from 50 images and each with a 100 ms exposure time by BUC6IA-400A. The total acquisition time of 50 images is less than 10s, while the same iamge effect achieved with a back-illuminated CCD camera is a couple of minutes.

Specification

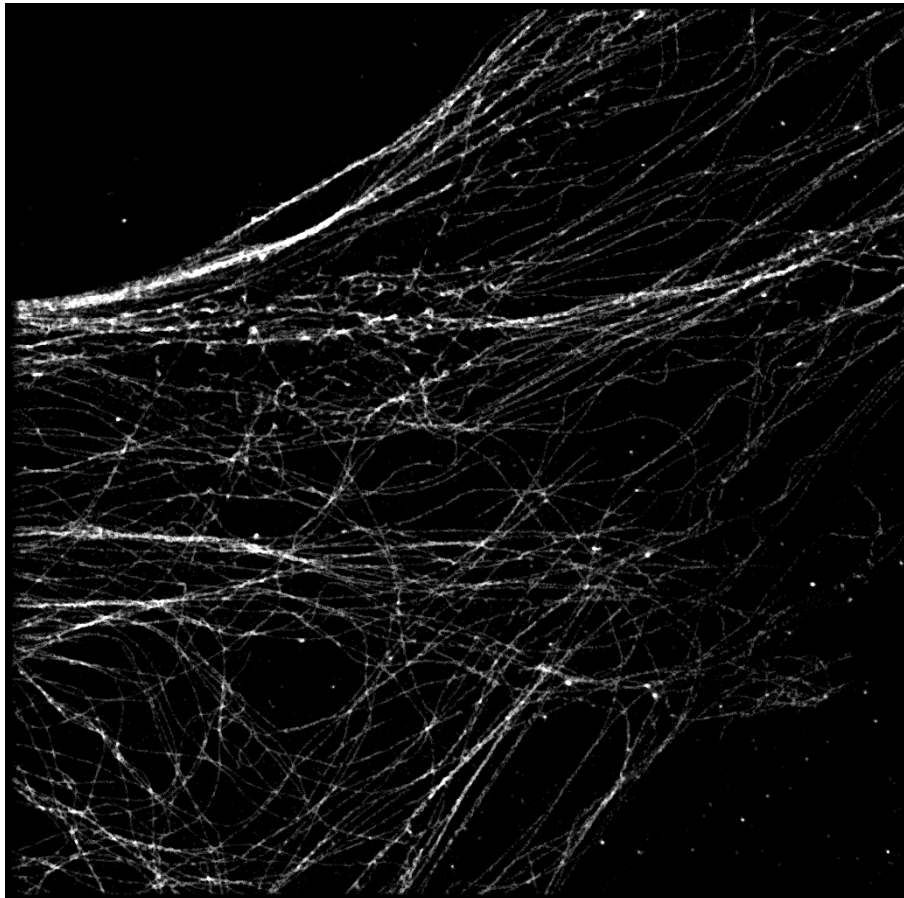
Item	Description
Sensor Type	BSI sCMOS
Sensor Model	Gpixel GSENSE400BSI
Peak QE	95%@560nm
Color/ Mono	Mono
Array Diagonal	31.9mm

Effective Area	22.5mm*22.5mm
Resolution	2048(H)*2048(V)
Pixel Size	11μm(H)*11μm(V)
Full-well Capacity	Typ.: 80ke-@HDR, 100ke-@STD
Dynamic Range	Typ.: 90dB
Frame Rate	24fps@16bit HDR, 48fps@12bit STD
Readout Noise	1.6e-(Median), 1.7e-(RMS)
Shutter Mode	Rolling
Exposure Time	21μs-10s
Cooling Method	Air & Liquid
Max. Cooling Temperature	45°C below ambient
Dark Current	Air: 0.5e-/pixel/s. Liquid: 0.25e-/pixel/s
Binning	2*2, 4*4
ROI	2048*1024, 2048*512, 1608*1608, 1200*1200, 1024*1024, 512*512, 256*256
TimeStamp	1 μs accuracy
Trigger Mode	Hardware & Software
Output Trigger Signal	Exposure, Global, Readout, High level, Low level
Trigger Interface	SMA
Data Interface	USB 3.0/ CameraLink
Bit Depth	16 bit
Optical Interface	C-mount & F-mount
Power Supply	12V/ 8A
Power Consumption	60W
Dimensions	C-mount: 100mm*118mm*127mm F-mount: 100mm*118mm*157mm
Weight	1613g
Software	Mosaic, LabVIEW, MatLab, Micromanager
SDK	C, C++, C#
Operating System	Windows, Linux
Operating Environment	Temperature 0-40°C, Humidity 10-85%

Dimensions



Sample Image



(2) BUC6IA-400B Cooled BSI sCMOS Camera



BUC6IA-400B Cooled BSI sCMOS Camera

Feature

1. Better for system optimization

Camera weight: 995g. Power consumption: 45W

2. For high-speed lowlight imaging

Frame rate: 100fps@4MP

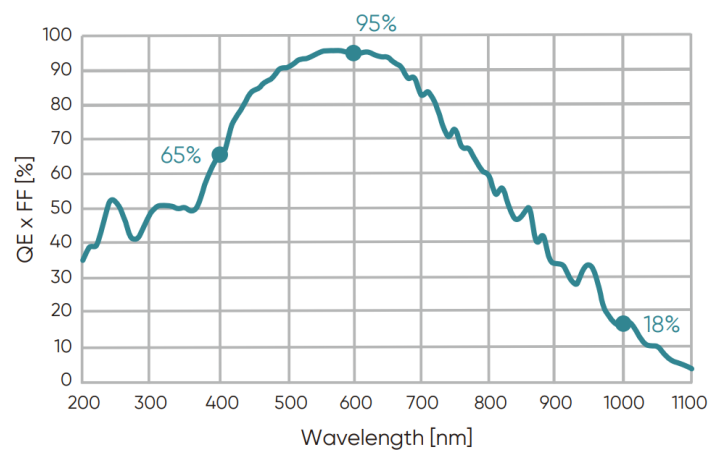
3. Rolling shutter control mode

Rolling shutter control mode for synchronize scanning

Application

Low light imaging: STORM, PALM, SIM , etc. High speed imaging: Calcium, FRET, TIRF, high content, etc. Synchronize scanning : Light-sheet, spinning-disk confocal, spectroscopy, etc.

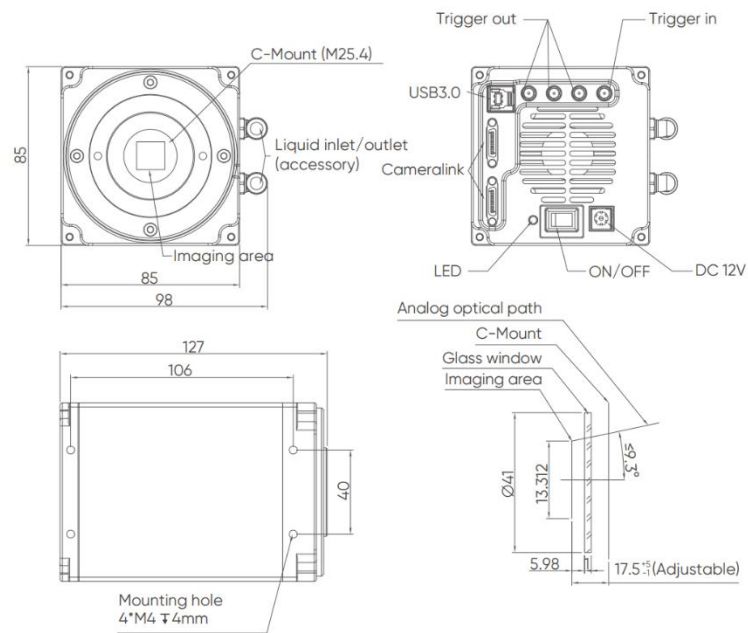
Quantum Efficiency



Specification

Item	Description
Sensor Type	BSI sCMOS
Sensor Model	GSENSE2020BSI
Peak QE	95%@600nm
Color/ Mono	Mono
Array Diagonal	18.8mm
Effective Area	13.3mm*13.3mm
Pixel Size	6.5μm(H)*6.5μm(V)
Full-well Capacity	Typ.: 45 ke-
Dynamic Range	Typ.: 90dB
Frame Rate	HDR mode: 74 fps@CameraLink, 40 fps@USB3.0 High Speed mode: 100 fps@CameraLink
Readout Noise	CMS: 1.1e- (Median), 1.2e- (RMS)
Shutter Mode	Rolling, Global reset
Exposure Time	6.6μs-10s
DSNU	0.2e-
PRNU	0.3%
Cooling Method	Air & Liquid
Max. Cooling Temperature	45°C below ambient
Dark Current	Air: 0.5e-/p/s@-15°C Liquid: 0.2e-/p/s@-25°C
Binning	2*2, 4*4
ROI	Support
Trigger Mode	Hardware & Software
Output Trigger Signal	Exposure start, Global, Readout end, High level, Low level
Trigger Interface	SMA
Data Interface	USB 3.0 & CameraLink
Bit Depth	16 bit
Optical Interface	C-mount
Power Supply	12V/ 8A
Power Consumption	45W
Dimensions	85mm*85mm*127mm
Weight	995g
Software	Mosaic, LabVIEW, Matlab, Micromanager
SDK	C, C++, C#
Operating System	Windows, Linux
Operating Environment	Temperature 0-40°C, Humidity 10-85%

Dimensions



Sample Images

